

# Jewish and Gypsy: A Genetic Study of 76 Spanish Gypsies (Gitanos, Calé)

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## Introduction

The question of the origins of the Cali-Romani population-known historically as the Calo Romani, or Spanish-Romani-Cali-has long intrigued historians, linguists and geneticists. While conventional narratives emphasize their migration from Northern India, recent studies have begun to suggest a more complex and layered ancestry. This project explores the possibility that the Cali-Romani descend from ancient Jewish communities, medieval Jewish communities and Jewish travelling merchants.

To evaluate this hypothesis, 76 Cali-Romani from 15 provinces, were tested using the MyHeritage Ancestry DNA test, the DNA Consultants Jewish Fingerprint Test, and the Family Tree DNA haplogroup test.

This multidisciplinary analysis incorporates historical accounts, genetic reports, haplogroup comparisons and linguistic patterns to substantiate this hypothesis. The evidence spans seven chapters and draws from both traditional sources and cutting-edge DNA tools. Taken together, the evidence suggests the Cali-Romani are Crypto Jews that share DNA, language and history with the larger Jewish community.

Through examining the facts resulting from the analysis of the DNA of the 76 Cali-Romani, this project seeks to reposition the Romani-Cali not as itinerant migrants from Northern India but as part of the Jewish Diaspora. This inquiry contributes to broader discussions about Jewish diasporic identity, the hidden Crypto-Jewish populations and the overlooked Crypto-Jews.

## Chapter Summaries

### Chapter 1: Romani-Cali: Descendants of Merchant Jews?

This chapter lays the groundwork by proposing that the Romani-Cali are descended from Jewish merchant families, who from 2000 BC moved goods from east to west and west to east. This includes, as a specific example, the Radhanite Jews. These Jewish traders traveled between Europe and Asia, establishing communities from the Iberian Peninsula all the way to India and China. The chapter links the Romani-Cali, who demonstrate multi-ethnic Jewish ancestry, with the Jewish traders who would have displayed a similar multi-ethnic Jewish genetic makeup.

### Chapter 2: Ancient Origins of 28 Romani-Cali

Chapter 2 presents the genetic profiles of 28 Romani-Cali, revealing a deep ancestral connection to the Jewish world. Connections to ancient Jewish progenitures of the Jews (Canaanites, Levantines, and Semites) are established. In addition to this, DNA evidence linking the Romani-Cali with medieval Jewish communities of Norwich, England, and Erfurt, Germany, is presented. Evidence of connection to the ancient Indian-Jewish world is presented as well.

### Chapter 3: DNA Consultants' Reports

DNA Consultants', a genetic genealogy company that works with forensic data (Short Tandem Repeats or STR technology), established the Romani-Cali strong connection to Jewish populations. Ten Romani-Cali participated in a limited study with this genetic research company. DNA Consultants' research revealed the Romani-Cali closest matches were to Jewish groups, especially Sephardic Jews from Iberia and Mizrahi Jews from the Middle East. This chapter demonstrates that the Romani-Cali tested inherited genetic clusters (STRs) that match to living Jewish persons from a variety of Jewish ethnicities.

### Chapter 4: MyHeritage Dodecad V3 Raw Data and Analysis

Seventy six Romani-Cali participated in a study using the MyHeritage DNA ancestry test. Raw DNA files generated by MyHeritage were analyzed using the Dodecad V3 genetic calculator. The results were that these individuals exhibit high levels of matches with a wide range of Jewish ethnicities; European (Ashkenazi and Sephardi Jews), North African (Moroccan, Algerian, Tunisian, and Libyan Jews), Arabian (Yemenite Jews), Western Asian (Iraqi and Iranian Jews), Caucasian (Georgian, Azerbaijani Jews) Central Asian (Uzbeki Jews), and Indian (Bnei Israel, Cochin Jews, Bnei Manasseh). This finding was consistent across different Dodecad V3 modes. The consistency of the results, that all tested individuals were primarily of Jewish descent, lends credence to the hypothesis of Jewish origins for the Cali-Romani.

### Chapter 5: Haplogroup Evidence of Jewish Ancestry

Chapter 5 investigates the Y-DNA and mtDNA haplogroups found among Romani-Cali, many of which are associated with known Jewish lineages. Haplogroups such as J1, J2, G2, and T1 are prevalent among Jewish populations from both Ashkenazi and Sephardic backgrounds. The presence of these paternal and maternal lineages, amongst the Romani-Cali tested, serves as further genetic evidence linking them to ancient Jewish communities and modern Jewish communities from Northern Europe, the Mediterranean and eastward towards Southwest Asia.

### Chapter 6: Surnames and Sephardic Matches

This chapter compares surnames found in 18<sup>th</sup>-century Cali-Romani censuses to those in Sephardic-Jewish databases. The results are striking. Over 70% of Cali-Romani surnames are also used by Sephardic Jews. The overlap suggests shared ancestry. Inquisition records reveal the Inquisitors were often unable to distinguish between Jew, Cali-Romani and foreigner. Shared surnames provide further evidence of the link between the Cali-Romani and the Sephardic-Jewish community. Over 60% of the tested subjects were found to carry Sephardic-Jewish ancestry; 70% use Sephardic-Jewish surnames. These findings indicate genealogical studies are warranted to establish shared family trees between Cali-Romani and Sephardic Jews.

## Chapter 7: Language - Caló and Hebrew Influence

The final chapter focuses on linguistic evidence, particularly the influence of Hebrew on the Caló language spoken by Romani-Cali. Dozens of Hebrew and Aramaic terms appear in Caló vocabulary, preserved through oral tradition and everyday usage. Linguistic analysis by scholars like George Borrow, Christoph Wagenseil and Paul Wexler are reviewed, highlighting the Semitic substratum in Caló. As the languages of other Gypsy communities around the world use many Hebrew words, it raises an important question regarding their connection to the Jewish Diaspora.

## Chapter 8: Conclusion

Taken together, the evidence presented across these seven chapters paints a compelling picture of a community whose origins and evolution are far more intertwined with Jewish history than previously acknowledged. From genetic testing and forensic matches to haplogroup data and linguistic analysis, there is evidence the Romani-Cali are a part of the Jewish Diaspora.

## Chapter 1: Alternate Origins of the Cali-Romani

In this chapter, a new origin story for the Spanish-Romani will be examined.

Conventional thinking holds that “Gypsies” came from Rajasthan in northern India and made their way to western Europe between the 12<sup>th</sup> and 15<sup>th</sup> centuries (The Rajasthani Theory). Below is the generally accepted view of Gypsy migration from east to west.

### Romani Migration to Europe

| Event                               | Approximate Date | Notes                                        |
|-------------------------------------|------------------|----------------------------------------------|
| Departure from India                | ~500-1000 CE     | Northwest India origin, Rajasthan.           |
| Arrival in Persia & the Middle East | ~1000 CE         | Gained Iranian and Middle Eastern influences |
| Entry into Byzantine Empire         | ~1100-1200 CE    | First “European” presence                    |
| In the Balkans                      | ~1300 CE         | Documented settlements                       |
| Spread into Western Europe          | ~1400-1500 CE    | Reached Spain, France, Germany               |

We propose the “Rajasthani Migration Theory” or Northern Indian migration narrative, does not apply to the Romani-Cali.

In the first instance of the 76 Romani-Cali tested in this project, hailing from 15 different provinces, the subjects were primarily of Southern Indian ancestry. Moreover, all 76 had ancestral connections to the Southern Indian-Jewish communities. Cochin Jews, the Bnai Israel and the Bnei-Menashe included.

In the second instance, DNA testing revealed all 76 tested members of the Cali-Romani community inherited Jewish DNA from the geographical extremes of the Jewish world: European-Jewish ancestry, (Ashkenazi-Jewish, Sephardic-Jewish), African-Jewish ancestry (Moroccan-Jewish, Algerian-Jewish, Tunisian-Jewish, Libyan-Jewish), Arab-Jewish(Yemenite-Jewish), Caucasian-Jewish (Georgian Jewish, Azerbaijani Jewish), Western Asian-Jewish (Iraqi-Jewish, Iranian-Jewish), Central Asian-Jewish (Uzbeki-Jewish), and finally South Asian-Jewish (Bnei-Menashe, Cochin-Jewish, and Bnai Israel Jews). They were shown to be DNA matches to the ancient remains of the Levantines and Canaanites (1800-1100 BC), and to Jews buried in 11<sup>th</sup>-to-12<sup>th</sup>-century Jewish cemeteries in Norwich, England and Erfurt, Germany.

In short, it would be rather hard to have Jewish ancestors buried in ancient Israel, ancestors from all known Jewish communities between India and Spain, ancestors buried in 11<sup>th</sup> century Jewish-English cemeteries, 12<sup>th</sup>-century German-Jewish cemeteries; but be the product of a simple migration from Northern India in the 15<sup>th</sup> century. DNA does not lie and the DNA evidence for the origins of the subjects tested in this project does not align with the Rajasthani Migration Theory.

Some say that the Romani-Cali have Jewish DNA because Jews and Gypsies, in Spain, were equally marginalized people. They lived in the same places, travelled the same highways and byways and that Romani-Cali absorbed Sephardic-Jewish DNA through what we call “Mixing by Virtue of Proximity”.

If these Cali-Romani only carried Sephardic-Jewish DNA, “Mixing by Virtue of Proximity” would explain their Jewish ancestry. They could be the descendants of Iberian Jews that after the Edict of Expulsion were forced to live on the move, going from village to village, staying on the margins of society to avoid the Inquisitors’ reach. Poor Conversos met up with migrating Rajasthani Roma and due to their common demeaned social status and shared living locations, the populations mixed.

However, this scenario does not apply to the Cali-Romani. As has been stated, the Romani-Cali in this study inherited 13 different Jewish ethnicities from around the Jewish world, apart from Sephardic-Jewish DNA. While 76 out of 76 participants carry Jewish DNA; only 32 carried Sephardic-Jewish DNA. And those that did carry Sephardic-Jewish DNA also carried Jewish DNA from 13 other Jewish communities. Those 32 and the remaining 44, inherited Jewish DNA from around the known Jewish world. They carry Jewish DNA from the Western Europe (Ashkenazi, Sephardi) all the way to Jewish India (Cochin Jews, Bnai Israel, and Benei Menashe), and all Jewish ethnicities that exist between those two extremes.

How could this be? While there are many theories to explain the Cali-Romanis’ far-ranging mix of Jewish ethnicities, we offer this as a hypothesis.

Romani-Cali could be the descendants of the travelling Jewish merchants that once made their way from Spain to India and back, from the earliest day. This class of Jew was not sedentary, but, rather, lived on the road between China, India and Western Europe. This class disappeared in the Middle Ages and have been forgotten, but they did once exist.

Scholars have established, before the Middle Ages, that there were two groups of Jews, sedentary and travelling merchants. They were distinct and separate groups. The travelling merchants have been in motion from the earliest days.

How early were “Jewish travelling merchants” trading from between the east and west? Early.

Sugar cane and sugar cane technology is mentioned in the Torah. Canah haTovah, or the sweet cane is a Southeast Asian plant and sugar extraction is an ancient Indian technology. Sugar cane was being grown and processed in Israel as early as 400 BC. (Isaiah 43:24 “Thou hast bought me no sweet cane with money”). The Torah also mentions other Indian imports: cinnamon (kinamon) and spikenard (Nard). This indicates the Israelites were trading with India early in history.

Shipwrecks found near Haifa, Israel were found to contain tin ingots that date back to the Bronze Age (1300-1200 BC). Isotopic testing revealed the ingots came from mines in Cornwall and Devon, England. Jewish traders were moving copper and tin, from England to Israel, 3000 years ago.

Thus, Jewish travelling merchants were actively involved in moving goods from the west (England) to the east (India) 1000 years before the Roman invasion of Israel. Oddly, knowledge of this part of the Jewish Diaspora, the Jewish travelling merchants, is largely lost to history. Tin ingots at the bottom of the sea and mentions of Indian spices in the Torah are artefacts of a forgotten slice of the Jewish pie.

## Human Artifacts of a Forgotten Class of Jew

There are other human artifacts that Jewish communities created at the far reaches of the Jewish travelling merchants' routes.

We know that Yemenite-Jewish merchants made their way to Southern India before the 2<sup>nd</sup> century. Once there, they mixed with the local people and the Indian-Jewish communities came into existence. Jewish Yemen was then able to trade with Jewish India. Indian-Jewish communities, founded by Jewish travelling merchants 2000 years ago, persist until this day. The Jews of Cochin, Bnai Israel, and Benei Menashe are living examples. .

We also know Western Asian Jewish travelling merchants (Iranian or Iraqi) established a Jewish community in China, The Jews of Kaifeng. Established in the Kaifeng during the Northern Song Dynasty (960-1127 CE), Kaifeng is located in the Henan Province, which lies directly along the Yellow River basin. Likely arriving via the Silk Road, the Jews were merchants from Persia or Mesopotamia (Rhadanites). Some of the Jewish travelling merchants remained in Kaifeng and adapted to Chinese culture, adopting Chinese surnames and speaking Mandarin, yet retained many Jewish religious customs.

There are instances of Ashkenazi Jews who consider themselves to be 100% Ashkenazi Jewish who are surprised to discover that they are 2% Han Chinese or 2% Southern Indian. This indicates that not only did the Jewish travelling merchants create communities at the far reaches of their trade routes and bring rare spices and fabrics back from the east, but they brought Jewish-Asian DNA to the west.

Supporting the theory that Cali-Romani descend from Jewish travelling merchants, the tested Romani-Cali carry DNA from the extremes of the known trade routes, China and India. Thirty percent of the 76 Spanish participants in this study carry "Yellow River DNA" (northern East Asian Neolithic ancestry). They are connected genetically with the region in which the Jews of Kaifeng lived and, possibly, to the Jews of Kaifeng. One hundred percent of the tested participants carry Indian-Jewish DNA, and they carry the DNA from every Jewish community between Asia and Europe.

Knowing the routes to get from Spain to India, knowing how to trade and with whom and knowing the necessary languages, would have been generational knowledge. Just like glassmaking or gold refining, this international trade was based on knowledge. As with those other tradesmen, sharing the secrets of the trade would have meant loss of income. For this reason, Jewish travelling merchants appear to have been a separate and distinct group, different than the

sedentary Jews. They had a unique Jewish identity. We know they moved goods between the European-Jewish Diaspora and the Asian-Jewish Diaspora, but not much more.

## The Radhanite Jews

The Jewish travelling merchants, though known to exist from 1200 BC forward, are only occasionally mentioned in historical records. There is evidence they existed and that they had an itinerant lifestyle, but much is left unsaid. Perhaps their mobile way of life left few traces. However, the best known and semi-documented group of traveling Jewish merchants, who made their way between Spain, India and China, would be the Radhanite Jews.

From 7th century AD there are written records regarding this class of Jewish travelling merchants. Records indicate they were a unique Jewish ethnic group, who moved goods between the east and west during the 7<sup>th</sup> - 12<sup>th</sup> centuries. They had a name. They were known as the Radhanite Jews and likely originated from Iran and Iraq (Babylon).

The Rhadanites traded goods such as slaves, silk, spices, perfumes, furs, jewelry and books. They connected Islamic, Christian, Indian and Chinese markets by both land and sea, as well as the Jewish communities found between those places. They were multilingual, speaking Hebrew, Arabic, Persian, Greek, Latin, Slavic, Chinese and more.

Their basic ancestry would have been Western Asian Jewish. Interestingly, the participants in this study carry between 10-18% Western Asian DNA and are DNA matches to both Iranian and Iraqi Jews.

Only one scholar, Louis Rabinowitz, has taken on the Radhanite Jews directly. While Louis Rabinowitz wrote a focused study on the Radhanites, the topic has also been explored-directly or indirectly-by scholars like S.D. Goitein, Mark R. Cohen, Richard Hodges and Shelomo Dov Sherman. Their work collectively paints a broader picture of how Jewish travelling merchants played a central role in connecting the Jewish world.

Rabinowitz's book, "The Jewish Merchant Adventurer" (1948), remains the only authoritative work on the subject. Before getting into this specific group of itinerant trading Jews, there is an important line found in his book.

"The centre of commerce in slaves and eunuchs in Christian Europe was Verdun, and Jews must have frequented those markets and done their business there. **Jews, but not Radhanites.** The Radhanites were the international traders par excellence ..."

Rabinowitz makes a distinction between sedentary Jews, like those of Verdun, and the Jews that, according to Ibn Khordadbeh (870 AD), lived on the road, trading and travelling. Khordadbeh describes Radhanites as "Jewish merchants" who were multilingual and traveled vast distances between Christian Europe and the Islamic world, reaching as far as China and India. Jewish religious practices, dietary restrictions, and communal ties helped form trans-regional trust

networks essential for long-distance trade. In a world divided between Christian and Muslim empires, the Jews - specifically the Radhanites - acted as neutral go-betweens. Their unique position as Jews with trans-cultural connections allowed them to bridge the gap between East and West during the 8<sup>th</sup>-11<sup>th</sup> centuries. As Rabinowitz makes clear, they were unlike the sedentary Jews of Verdun, Paris or Girona.

How they came to be known as the Radhanites is subject to debate. Some say Rhadan came from the Persian verb "know the way." Indeed, the Radhanites knew the way. They knew how to get from Barcelona to the Kochi, India and back! Others say the name came from Rhoda (Rhodes), indicating they were merchants from the Island of Rhodes.

Where the term originates from is unclear. What is clear, is that knowing your way from Spain to India and back, arriving alive and making money in the process, required very specific knowledge. They knew how to get back and forth, they knew what to buy and trade. They knew the many languages needed to conduct these transactions. They knew which money changers they could trust and where to stay and where not to stay. They knew when political tides had changed and when to re-route over safer ground. This knowledge, "knowing the way," was taught to the young by the old, and it was a way of life for a certain class of Jew for a long time.

Here is an account of the Rhadanites and their routes.

"A Radhanite trader would set out from France southward into Spain, then sail across the Mediterranean into Morocco, from where he traversed by camel caravan the entirety of North Africa into the Middle East, passed through the major cities of Baghdad and Basra, and made his way across India before finally arriving at the route's terminus in central China.

The Radhanites could work such incredibly long trade routes thanks to the existence of a series of Jewish communities all along the way. They may also have helped establish new Jewish communities at various points following the old Silk Road and were probably involved in the early Jewish settlement of Eastern Europe, Central Asia, China and India. So they acted as cultural and social liaison between the world-wide-spread Jewish communities.

These communities allowed the Radhanites unrivalled access to the goods of the East, for they and the local Jewish merchants shared not only a common religion, but also at least one language (Hebrew), personal references and the first world-wide system of commercial credit.

Today we know about the Radhanites thanks mainly to a single source by Ibn Khordadbeh, who served the caliph of Baghdad in the ninth century. In "The Book of the Roads and the Kingdoms," Ibn Khordadbeh tells of "Jewish merchants called Radhanites," fluent in several languages, who "journey from west to east, from east to west, partly on land, partly by sea."

Ibn Khurdadbih describes the four different trade routes on which the Radhanites were active, and his account makes it clear that Jews were active along all the world's major trade routes at that time, which implies the existence of diaspora communities of Jews living all along the various stages of those routes. The fourth route mentioned by Ibn Khurdadbih joined the Silk Route in Central Asia.

By the end of the 10<sup>th</sup> century, though, these trade routes became unstable and unsafe, and the Silk Road largely collapsed. This period saw the rise of the mercantile Italian city-states, especially Genoa....and West opened up again, but by now the Radhanites had fallen into obscurity.

However, the Jewish communities in Central Asia along the old Silk Road continued to flourish. The 12<sup>th</sup> century Spanish Jewish traveler Benjamin of Tudela heard about the fabulous city of Samarkand, in today's Uzbekistan, and described a community of 50,000 Jews, among them "very wise and rich men". (1) (The Radhanites, Jewish merchants of the Silk Road 07/29/2020, Quesher)

The Radhanites formed a remarkable network of travelling Jewish merchants who dominated international trade across Europe, the Middle East, Central Asia and China from the 8<sup>th</sup> to 12<sup>th</sup> centuries CE. Their extensive trading routes, linguistic skills and ability to bridge diverse empires made them vital players in medieval global commerce.

## Sources of Information on the Radhanites

### Ibn Khordadbeh

The Book of Roads and Kingdoms (Kitāb al-Masālik wa al-Mamālik), written around 870 AD by Ibn Khordadbeh, is one of the earliest surviving works of Islamic geography. Ibn Khordadbeh, a Persian geographer and bureaucrat serving under the Abbasid Caliphate, compiled this text while working as the director of postal and intelligence services in the Province of Jibal. The book is a practical manual describing the vast network of trade routes, postal roads and administrative divisions of the Islamic world, stretching from the Atlantic to China. It provides detailed information about various peoples, cities, customs, currencies and distances, serving both as a geographic and ethnographic resource. Notably, Ibn Khordadbeh also records the presence of Jewish Radhanite merchants, who traded across both the Christian and Muslim worlds, traveling as far as India and China. His work offers invaluable insight into 9<sup>th</sup>-century global commerce, the movement of goods and cultures and the sophisticated infrastructure of the early Islamic empire.

### Eldad ha-Dani

Eldad ha-Dani was a 9<sup>th</sup>-century Jewish traveler and storyteller who claimed to be a member of the lost tribe of Dan and brought vivid accounts of Jewish communities beyond the known world. Appearing in North Africa and later in Babylonia, Eldad described a network of independent Jewish tribes living in distant lands, observing their own versions of Jewish law. His tales included

references to tribes living across the Sambatyon River and detailed their customs, dietary laws and military exploits. Though many of his claims were fantastical and met with skepticism, his stories fascinated Jewish and non-Jewish audiences alike.

Some scholars question his mention of Jewish tribes who were not part of the mainstream historical framework, for which he is discredited. All that said, he and his accounts give us details about the Radhanite. Louis Rabinowitz, chief historian of the Radhanites, gives the following account of Ehdad ha-Dani. In a prior article, Rabinowitz details Ehdad ha-Dani's capture by one tribe of Israel, his four years in captivity, followed by his rescue.

"There is a double interest from our point of view in this remarkable adventurer who in the year 880 arrive in Kairouan with an astonishing story of adventure, claiming to belong to an independent Jewish tribe, speaking Hebrew which has a number of unknown words in it, and in possession of a ritual which differed in material points from that in vogue among the Rabbinic Jews. He has been dismissed by all scholars as a charlatan, an imposter, or a cunning missionary of a heretical sect. Even discounting his own story, he deserves to be included in the list of possible Radhanite worthies for the historical part of his journeys.

For whether he came from Yemen, India, or east of Babylon, his journey from any of these places to Babylon and then onto Kairouan and thence Spain, covered a longer portion of any Rhadhanite route that was traversed by any other individual. According to a Karaite author, R. Judah Hadassi, he made two journeys, first to Egypt, when he returned home, and then a second journey which brought him to Kairouan and was the subject of the famous query of scholars of that place to R. Zemach Gaon. According to R. Runash b Tamim, he came to the west via Palestine, a journey which would coincide completely with the third Radhanite route, while according to Adler, his journey was from Azania in Yemen, to the Indian Ocean, the north-east of the Persian Gulf, overland across Paravata (Mount Paran) to Baghdad, and thence to Kairouan and Spain, which is roughly a combination of the second and the third.

I have, however, given my reason for believing that Eldad's account of his travels have been unjustly impugned. If reliance can be place on his account, great importance attaches to his statement that after his deliverance from his captors, "I was brought to China where a Jewish merchant of the Tribe of Issachar purchased me for 32 gold coins and returned with me to his country, beyond the land of the Medes and Persians. This gives us a rare and almost unique reference to an actual Jewish merchant in China just at the time that the Radhanites visited that country. Moreover, there is little doubt that the mountains which are beyond the land of Medes and Persians, the home of the merchant of "the tribe of Issachar," is the country round Khorasan, where independent Jewish tribes persisted at least to the 12<sup>th</sup> century, time of Benjamin Tudela. " (4)

\* Kairouan (also spelled al-Qayrawān) is a historic city located in north-central Tunisia, in North Africa

## Benjamin of Tudela

Benjamin of Tudela was a 12<sup>th</sup>-century Jewish traveler from Tudela, in the Kingdom of Navarre (modern Spain), who undertook an extensive journey across Europe, the Middle East and parts of Asia between 1165 and 1173. His travel account, often titled “The Itinerary of Benjamin of Tudela”, provides a unique and detailed snapshot of Jewish communities from Spain to Persia and beyond, including cities like Baghdad, Constantinople, Jerusalem and Alexandria. Written in Hebrew, his observations cover not only Jewish life but also political conditions, trade and religious practices in the diverse lands he visited, making his work an invaluable source for understanding the Jewish Diaspora and the medieval world during the Crusader era.

Formerly, it was thought the Radhanites disappeared by the end of the 10<sup>th</sup> century. However, a collection of 11<sup>th</sup> century Jewish scrolls and documents discovered in a cave in Afghanistan's Samangan Province in 2011 indicate this was not the case. (2)

Called the Afghani Geniza, a cave was found which belonged to a Bamiyan-Jewish family that participated in silk road commerce. The find was 80% documents: contracts, inventories, letters that relate to trade and were written in Hebrew, Aramaic, Judeo-Arabic, and Judeo-Persian. Some of the documents date to the 13<sup>th</sup> century, which suggests the Radhanites were operating after the 11<sup>th</sup> century. This find indicates that “the ones that knew the way” did not forget the way in the 10<sup>th</sup> Century.

The Radhanites exemplify one of the earliest forms of Jewish globalized trade. They worked by moving between diasporic communities, from Western Europe (Ashkenaz and Sefat) to Jewish India and China. Their model of multilingual, cross-cultural commerce laid the foundation for later Jewish trading diasporas, including the Sephardic traders, Court Jews in Europe and Baghdadi Jewish merchants in Asia. (3)

Sephat, or Spain, was one of the termini of the ancient trade routes travelled by the Rhadanites. They had an outpost there. Very little is known about their outpost in Spain, but it was a major European commerce center at the time. And like in China, they may well have created a Jewish community of their own there. Romani-Cali may represent a remnant of these Jewish travelling merchants.

One must presume, after 2000 years of travelling, that the Jewish merchant travelers were of mixed Jewish ancestry, a mixture that hypothetically corresponds to the ancestry of the Romani-Cali participating in this study.

## Karwan and Caravanserai: How Jewish Travelling Merchants lived and traded.

### The Caravan and Caravans

Gypsies, in Spain and throughout western Europe, are known for living in and trading from “caravans.” (Though all European countries have tried to force Gypsies from their caravans and into sedentary housing.) However, this manner of living in and trading out of a “caravan,” may date back to the Rhadhanite Jews and other Jewish merchant traders like them.

The word caravan comes from the French Caravane which in turn comes from the Persian word Karwan. It is an ancient term for the mode of living and trading in a home/store on wheels and was utilized by the Jewish travelling merchants who moved goods from Spain to India and from China to Germany, from the 2<sup>nd</sup> century BC to the 17<sup>th</sup> century AD. Like early European Gypsies, ancient Jewish travelling merchants lived in caravans and traded out of their caravans.

The Jewish travelling merchants travelled in family groups which would become known as “caravans,” endlessly moving through foreign lands, trading as they went along. The caravan included family, horses, donkeys and in some cases camels.

### Caravanserai

A caravanserai (or caravansary; /kærə'vænsə,raɪ/) was an inn that provided lodging, money changing and safety for caravans of Jewish traveling merchants. Depending on the region and period, they were called by a variety of names including khan, funduq and wikala.

Caravanserais supported the flow of commerce, information and people across the network of trade routes spanning Asia, North Africa and Southeast Europe. In the countryside, they were typically built at intervals equivalent to a day's journey along important roads, where they served as a kind of staging post. Walled, secured and fortified, they offered safety for the merchants, their families, beasts and their wares. Urban versions of caravanserais were common in cities throughout the Islamic world and eastern world, where they could serve as inns, depots and venues for conducting business.

Jewish merchants stayed at Jewish Caravanserai when they could. Indeed, many Caravanserais were Jewish-owned and operated. Some grew into permanent Jewish communities. Others came and went with the changing trade routes. At the Caravanserai, Rhadhanite Jews would trade with local, sedentary Jews.

### Jewish Trade following the Decline of the Radhanites

While Radhanites disappear sometime in the 12<sup>th</sup> century; they were succeeded by other connected Jewish travelling merchants from other parts of the world. Since time immemorial, certain Jews have moved goods to and from the far reaches of the known world. They were not stationary; they were travelling, itinerant, trading Jews. They moved through the diasporic world

buying, selling and trading. There were Jewish traveling merchants before the Rhadanites and after.

The travelling merchants were the connective tissue between the sedentary Jewish communities. Despite this, there are few resources detailing their lives and most importantly, what became of them. It seems they were replaced by the Portuguese and Spanish-Jewish merchants, who mastered the seas and more rapid means of moving goods from east to west and back.

## Conclusion

The intention of this chapter was to illustrate several things:

First, there were Jewish merchant traders and Jewish trade from east to west and back, dating from the days of the Prophets Isaiah (700 BC) through the 17<sup>th</sup> century. They represented a distinct class of Jew. They shared a religion with sedentary Jews but lived a very different life. They traded through sedentary Jews, from Cairo to Cochin and from Cochin to the Rhine. To do business between western Europe, India and China, they spoke a dozen or more languages.

Second, transcontinental trade would have led to pan diasporic Jewish families. Traders cemented relationship through marriage. It is very likely the Jewish merchant traders moved more than goods across the trade routes; there is evidence they also moved Jewish ethnicities. It is likely Rhadhanite families included brides and grooms from across the Jewish Diaspora.

The best way to cement trade relationships was through marriage. How did the early Jewish trappers in America secure trading relationships with a Native Tribe? They married the chief's daughter. DNA evidence suggests the same was true with the Rhadanites.

Third, and most importantly, these transcontinental Jewish merchant traders existed for centuries and then "disappeared". What became of them? People do not disappear. The fact that they disappeared about the same time as Gypsies "appeared" in Europe may not be a coincidence. It is possible the Romani-Cali are their descendants.

Romani-Cali international Jewish ancestry is hard to explain; being the descendants of transcontinental Jewish merchants provides one explanation.

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## Chapter 2: Ancient and Medieval Jewish Ancestry among Spanish-Romani

Using the Illustrative DNA feature available on MyHeritage, 76 of 76 participating Romani-Cali showed DNA matches to medieval Jewish cemeteries. (11<sup>th</sup> century Norwich, England and 12<sup>th</sup> century Erfurt, Germany).

Using the same feature, a smaller number of participants, 28, were examined more closely to find connections to a Jewish past. The group (28 Romani-Cali) showed connections to Bronze Age proto-Jewish populations: 15 matched with Levantines and 13 matched to Canaanites (carrying between 4% and 18% Canaanite DNA).

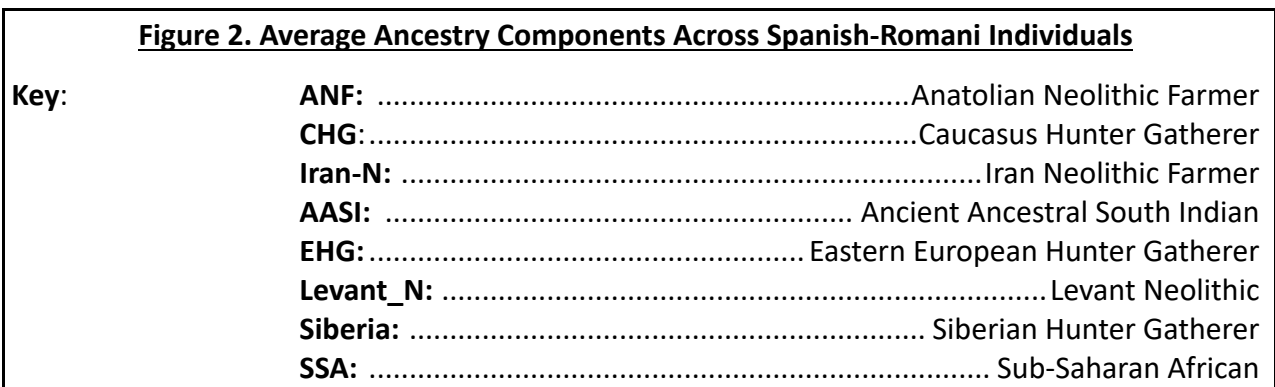
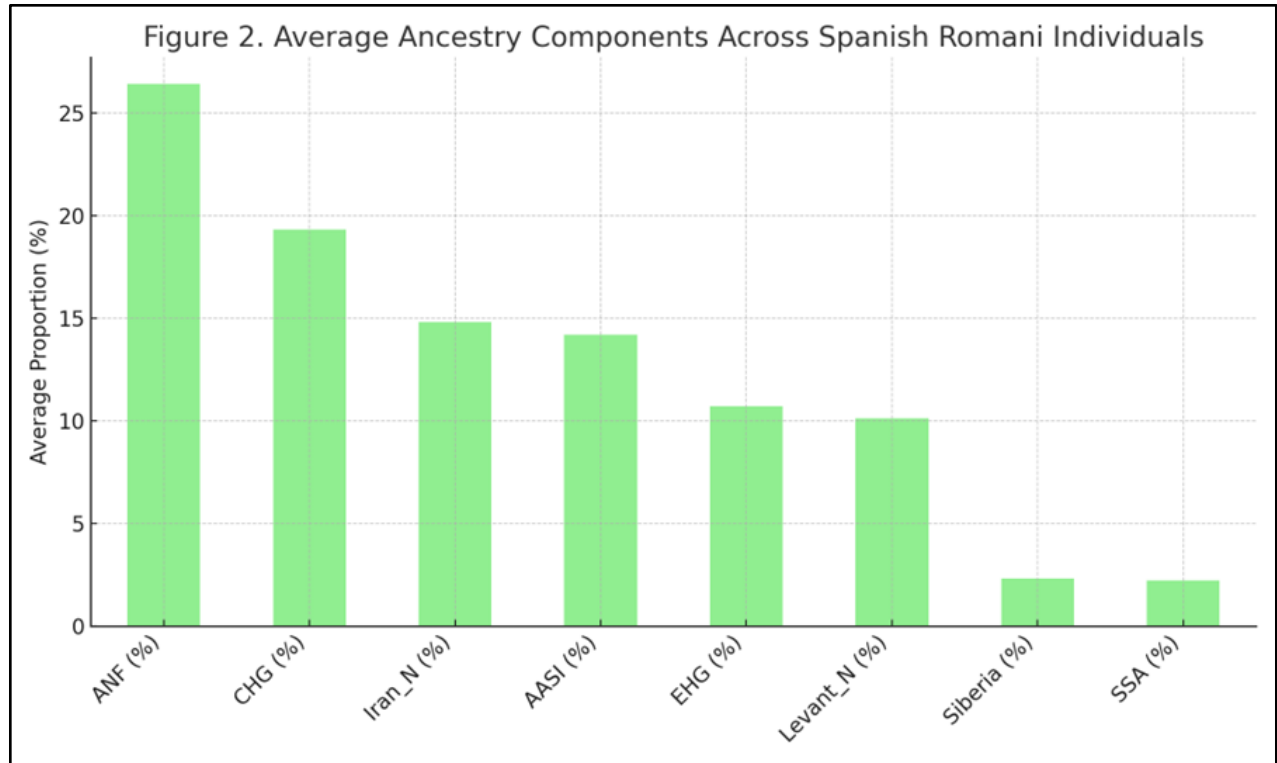
### Regional Admixture Also Suggests Ancient Jewish Origins

In addition, this group of 28 Romani-Cali showed elevated Anatolian Neolithic Farmer (ANF), Caucasus Hunter-Gatherer (CHG), and Iranian Neolithic Farmer (INF) ancestry. These are distinct ancestral populations that contribute to the genetic makeup of the broader West Eurasian region, including the Levant. Though they are not themselves Levantine these groups contributed to Levantine populations, especially during the Bronze Age and Iron Age, through migration and admixture.

For example, modern Levantines (and modern Jews) are often modeled as a mix of Levantine Neolithic + Iran Neolithic + Caucasian Hunter Gatherer + Anatolian Neolithic farmer.

This groups mix of Levant Neolithic (38.46%), Iran Neolithic farmer (14%), Caucasian Hunter Gatherer (18%), and Anatolian Neolithic farmer (27%) is consistent with that of modern Levantines and modern Jews.

This group of 28 Romani-Cali have been found to carry Southern Indian ancestry as well, in particular, Cochin-Jewish, Bnei-Menashe, and Bnai-Israel ancestry. This finding is supported by the fact they carry ancient southern Indian Ancestry.



## Average Ancient Proto-Jewish Ancestry

The average percentage of Canaanite and Levantine ancestry for the 28 Romani-Cali, was 38.46%.

## Average Ancient Ancestries found in Modern Jews

The average of ancient ancestries, found in modern Jews, (Bronze Age Caucasian, Caucasian, Bronze Age Anatolian, Anatolian, Copper Age Zagros, Arabian Peninsula, Egyptian, Levantine, Canaanite, and Bactria-Margiana, etc.) was 67.34 %.

## Medieval Jewish Ancestry

All 28 participants were DNA matches to the skeletal remains found in the Norwich, England, Jewish Cemetery (11<sup>th</sup> century), and the Erfurt, Germany Jewish cemetery (12<sup>th</sup> Century). In the Illustrative DNA Medieval global mode, 16/28 group members showed varying percentages of medieval Jewish ancestry.

## Medieval Jewish Ancestry for Selected Individuals

Below are the Medieval Jewish ancestry percentages detected in participants in the study.

|                      |       |
|----------------------|-------|
| Hernandez Heredia:   | 65.2% |
| Ajama Heredia:       | 61.0% |
| Motos Manzana:       | 25.4% |
| Gabari Gabari:       | 24.6% |
| Manzana Manzana:     | 14.8% |
| Hernandez Jimenez:   | 14.4% |
| Hererdia de la Rosa: | 13.0% |
| Cortes Cortes:       | 10.2% |
| Cortes Cortes:       | 7.2%  |
| Cortes Moreno:       | 6.8%  |
| Motos Motos:         | 6.2%  |
| Borja Ramirez:       | 3.4%  |
| Heredia Heredia:     | 1.4%  |
| Garcia Nunez:        | 1.2%  |
| Cadiz Fernandez:     | 1.0%  |
| Santiago Heredia:    | 0.6%  |

The average Medieval Jewish ancestry detected for this group was..... **16.02%**

## Advances in ancient DNA analysis now allow for more direct testing of these findings.

First, analyzing genome-wide SNP data from 5 of the 28 individuals, we applied qpAdm modeling and comparative analyses against ancient populations. Elevated proportions of Levantine ancestry are found in modern Jewish populations. The goal was to determine if the Cali-Romani participants had such elevated Levantine ancestry.

DNA data from 28 Spanish-Romani individuals were obtained via the MyHeritage platform (GSA chip, GRCh37). Autosomal SNP data were analyzed using the qpAdm framework, with source populations including Anatolian Neolithic Farmers (ANF), Caucasus Hunter-Gatherers (CHG), Zagros Neolithic (Iran\_N), Ancient Ancestral South Indians (AASI), European Hunter-Gatherers (EHG), Levantine Neolithic (Levant\_N), East Asian proxies (Siberia), and Sub-Saharan Africans

(SSA). Comparative Levant\_N ancestry values for modern Iberians were assumed at ~4% ( $\pm 1$  SD). A one-sample t-test was used to test deviation from this benchmark.

qpAdm results show average Levant\_N ancestry for this group at ~10.1%, compared to ~4% found in modern Iberians. A one-sample t-test yields  $t = 6.58$  ( $p = 0.0028$ ), indicating statistically significant elevation as compared to the general modern Iberian population. The following chart shows five members of the group's elevated Levantine ancestry. Bear in mind, your average Iberian is in the 4% range.

### qpAdm Ancestry Table for Five Individuals

The table below displays estimated ancestry proportions for five representative Spanish-Romani individuals.

| Subject           | ANF (%) | CHG (%) | Iran_N (%) | AASI (%) | EHG (%) | Levant_N (%) | Siberia (%) | SSA (%) |
|-------------------|---------|---------|------------|----------|---------|--------------|-------------|---------|
| Hernandez Heredia | 27      | 17.5    | 14         | 13       | 11      | 11.5         | 3           | 3       |
| Heredia Heredia   | 28      | 22      | 14         | 16       | 10      | 8            | 1.5         | 0.5     |
| Cortes            | 26      | 20      | 15         | 12       | 10      | 13           | 2           | 2       |
| Motos Hernandez   | 25      | 18      | 16         | 15.5     | 12      | 9            | 2           | 2.5     |
| Cadiz Fernandez   | 26      | 19      | 15         | 14.5     | 10.5    | 9            | 3           | 3       |

### Conclusion: Ancient and Medieval Jewish Ancestry

Using the Illustrative DNA feature available on MyHeritage, there is substantial evidence the Romani-Cali participating in this project have both ancient and medieval Jewish ancestry. Evidence for this is as follows:

- A. The elevated Levantine ancestry.
- B. High levels of ancient ancestries associated with ancient and modern Jews.
- C. DNA matches to skeletal remains of 11<sup>th</sup> and 12<sup>th</sup> century Northern European Jews.
- D. 57.14% of the group had detectable amounts of Medieval Jewish ancestry.

With this positive result, further studies with broader samples and ancient DNA references are warranted to gain a better understanding of the Spanish-Romani ancient and medieval Jewish connections.

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## Chapter 3: DNA Consultants Testing

DNA Consultants ([www.DNAConsultants.com](http://www.DNAConsultants.com)) is an Ancestry testing company that does forensic DNA testing; meaning they match the DNA of their clients with the DNA of living people. They match STR (Short Tandem Repeats) found in the DNA of their clients with the STRs of different populations of people from around the world. The company maintains a database of academically published articles which contain the STRs of living people from distinct ethnic groups to be used for these matching purposes. This is the same technology used in criminology to identify criminals and paternity testing to identify fathers. These are not theoretical matches but rather actual DNA matches.

Using STRs, extracted from academically reviewed articles, they have established four markers for Jewish ancestry. Each client is checked to see which, if any, of these markers the client inherited.

Marker 1: STR markers found amongst Sephardic and Ashkenazi Jews.

Marker 2: STR markers found amongst Jewish who have married amongst themselves.

Marker 3: STR markers found in the middle east and kept alive in Jewish populations.

Marker 4: STR markers found in Tartars/Khazars who became Jews.

In addition to this, DNA Consultants looks for STR matches with studied Jewish communities with established STR patterns, like Mallorca Jews, Hungarian Ashkenazi Jews, Israeli Jews and Ukrainian Jews. In this way, they are able to link clients with living members of specific Jewish communities.

To gain further insight into the Jewish origins of this Romani-Cali community, nine individuals, with parents from various Spanish provinces, submitted DNA samples for examination by DNA Consultants. (Alicante, Almeria, Asturias, Badajoz, Burgos, Caceres, Cadiz, Castellon, Catalon, Cordoba, Jaen, Granada, Heusca, Madrid, Malaga, Sevilla, Toledo, Valencia, and Valladolid).

### Forensic Genetic Evidence of Jewish Ancestry for nine Romani-Cali

#### *Camacho Núñez*

Indicators of Jewish ancestry included Jewish marker 1(both parents) and a DNA connection to the European-Jewish studies.

#### *Cortés*

Indicators of Jewish ancestry included Jewish marker 1 (both parents), Jewish marker 2(one parent), Jewish marker 3(both parents), Jewish marker 4 (one parent).

#### *Cortés*

Indicators of Jewish ancestry included Jewish marker 1(both parents), Jewish marker 2(one parent), Jewish marker 3 (both parents).

#### *Delgado Álvarez*

Indicators of Jewish ancestry included Jewish marker 1 (one parent), Jewish marker 2 (one parent), Jewish marker 3 (one parent), Jewish marker 4 (one parent); DNA connection to the

Hungarian-Ashkenazi Jewish DNA study, the Mallorca-Jewish DNA study, the European-Jewish DNA study, and Israeli-Jewish DNA study.

#### *Heredia*

Indicators of Jewish ancestry included Jewish marker 1 (one parent), Jewish marker 2 (one parent), DNA connection to the Mallorca Jewish study, the European-Jewish studies, and the Hungarian-Ashkenazim DNA study.

#### *Jimenez Pérez*

Indicators of Jewish ancestry included Jewish marker 1 (one parent); Jewish marker 2 (one parent), DNA connection to the Hungarian-Ashkenazi DNA study.

#### *Cano Montes*

Indicators of Jewish ancestry included Jewish marker 2 (one parent) and Jewish marker 3 (one parent), DNA connection to the Hungarian Ashkenazi DNA study and the Israeli Jewish DNA study.

#### *Cortés Moreno*

Indicators of Jewish ancestry included Jewish marker 1 (both parents), Jewish marker 2 (both parents), Jewish marker 3 (one parent), Jewish marker 4 (one parent), and a DNA connection to Hungarian Ashkenazi DNA study.

#### *Cortés Moreno*

Indicators of Jewish ancestry included Jewish marker 1 (both parents), Jewish marker 2 (one parent), and Jewish marker 3 (one parent).

### **Individuals Tested Show Definitive Links to Living Jewish Persons**

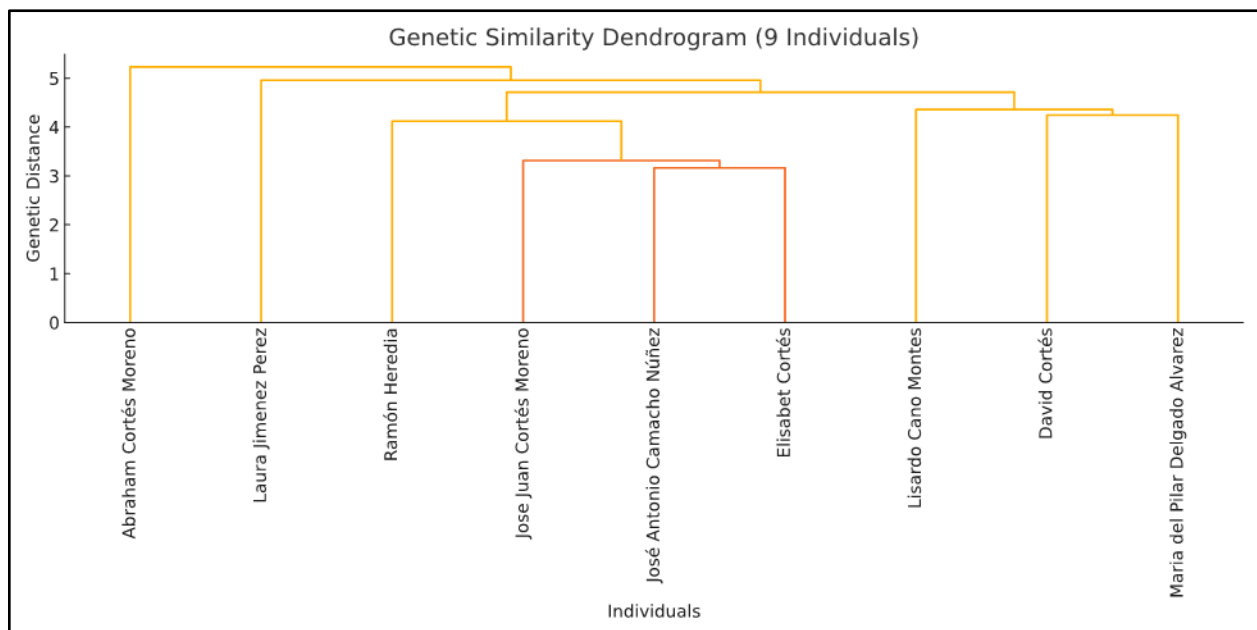
The Short Tandem Repeats, found across this group of Cali-Romani group (12S317, D18S51, D21S11, S3S1358, D5S818, S8S1179, FGA, vWA) that match STRs found in known Jewish populations, are displayed here. This demonstrates the link between the Romani-Cali and known Jewish populations.

| STR Marker Appearance Across Four Papers (YES/NO) |                                |                 |               |                                          |
|---------------------------------------------------|--------------------------------|-----------------|---------------|------------------------------------------|
| D13S317                                           | YES                            | YES             | YES           | YES                                      |
| D18S51                                            | YES                            | YES             | YES           | YES                                      |
| D21S11                                            | YES                            | YES             | YES           | YES                                      |
| D3S1358                                           | YES                            | YES             | YES           | YES                                      |
| D5S818                                            | YES                            | YES             | NO            | YES                                      |
| D8S1179                                           | YES                            | YES             | YES           | YES                                      |
| FGA                                               | YES                            | YES             | YES           | YES                                      |
| vWA                                               | YES                            | YES             | YES           | YES                                      |
|                                                   | Chuetas Mallorcan Jewish Paper | Hungarian Paper | Israeli Paper | Jewish Population Genetic Data (20 loci) |

### Romani-Cali from Different Provinces Show Strong Genetic Connection

In forensic genetic genealogy, when multiple individuals show the same alleles at many loci, it suggests either kinship (family relationship) or shared ethnic heritage. This would describe the nine participants in this study. It is a fact that all are both related by kinship and heritage. The shared Loci and alleles support the Romani-Cali oral history. Despite coming from different provinces, these nine Romani-Cali have the same alleles at the same loci indicating they are related to each other, are from an endogamous (in-group marrying) society, and likely have common origins. As they all carry Jewish markers, this shared origin may have been Jewish.

| Shared Loci and Alleles of Nine Spanish Gypsies |          |         |        |        |         |        |         |     |     |
|-------------------------------------------------|----------|---------|--------|--------|---------|--------|---------|-----|-----|
| Locus                                           |          | D13S317 | D18S51 | D21S11 | D3S1358 | D5S818 | D8S1179 | FGA | vWA |
| <b>Abraham Cortés Moreno</b>                    | Allele 1 | 8       | 15     | 29     | 16      | 11     | 12      | 22  | 15  |
|                                                 | Allele 2 | 9       | 17     | 31     | 18      | 12     | 13      | 23  | 18  |
| <b>David Cortés</b>                             | Allele 1 | 11      | 15     | 30     | 17      | 12     | 12      | 23  | 16  |
|                                                 | Allele 2 | 12      | 16     | 31     | 17      | 13     | 13      | 25  | 19  |
| <b>Elisabet Cortés</b>                          | Allele 1 | 9       | 13     | 29     | 15      | 12     | 13      | 23  | 16  |
|                                                 | Allele 2 | 12      | 15     | 31     | 18      | 13     | 14      | 24  | 17  |
| <b>José Juan Cortés Moreno</b>                  | Allele 1 | 9       | 14     | 29     | 17      | 12     | 13      | 23  | 16  |
|                                                 | Allele 2 | 11      | 16     | 30     | 18      | 13     | 14      | 25  | 18  |
| <b>José Antonio Camacho Núñez</b>               | Allele 1 | 8       | 12     | 29     | 16      | 11     | 13      | 22  | 17  |
|                                                 | Allele 2 | 11      | 15     | 30     | 18      | 12     | 14      | 24  | 18  |
| <b>Laura Jiménez Pérez</b>                      | Allele 1 | 8       | 13     | 30     | 16      | 11     | 12      | 24  | 17  |
|                                                 | Allele 2 | 10      | 14     | 32     | 17      | 12     | 13      | 25  | 19  |
| <b>Lisardo Cano Montes</b>                      | Allele 1 | 11      | 14     | 30     | 15      | 11     | 14      | 23  | 16  |
|                                                 | Allele 2 | 12      | 15     | 31     | 16      | 12     | 14      | 24  | 17  |
| <b>María del Pilar Delgado Alvarez</b>          | Allele 1 | 10      | 14     | 30     | 16      | 11     | 12      | 22  | 18  |
|                                                 | Allele 2 | 11      | 16     | 32     | 11      | 12     | 14      | 23  | 19  |
| <b>Ramón Heredia</b>                            | Allele 1 | 9       | 15     | 29     | 14      | 12     | 13      | 21  | 17  |
|                                                 | Allele 2 | 11      | 16     | 30     | 18      | 13     | 15      | 24  | 18  |



Based on this data, some conclusions can be drawn.

- This group of Romani-Cali have a high allele overlap at certain loci:
- Many individuals share the same alleles at loci like D5S818, D13S317, and D8S1179.
- D5S818: Alleles 11 and 12 are very common across the group.
- D13S317: Alleles 8, 9, 11, 12 appear very frequently.
- D8S1179: Alleles 12, 13, and 14 appear very frequently.
- These shared alleles suggest some degree of relatedness or shared population origin.

### Tight Range of Variation:

The variation between alleles (for example, 16/18 or 17/18) is narrow, meaning the group is genetically homogeneous at many markers. This could reflect a founder effect (a group descended from a small number of ancestors).

### Frequent Alleles:

- D3S1358, alleles 16, 17, and 18 dominate across individuals.
- vWA frequently shows 16-19.
- D21S11 shows a range around 29, 30, 31.

### Conclusion

This DNA Consultant testing revealed that the nine Romani-Cali from different provinces all carried Jewish Markers from a diverse group of Jewish ethnicities. They were also DNA matches to a wide array of known contemporary Jewish persons. In addition to this, despite hailing from diverse provinces, the testing revealed they are interrelated. These results suggest they descend from the same group of Jews who made their way to Spain at some unspecified period.

This is only a preliminary of investigation of Romani-Cali Short Tandem Repeats (STRs) matching documented Jewish populations STRs. To further understand their relationship with Jewish populations, further STR research is warranted.

All nine Romani-Cali were found to carry Jewish markers 1,2,3, and 4. This indicates not only Jewish ancestry but diverse Jewish ancestry; including Ashkenazi, Sephardi, and Mizrahi.

In addition to this, the group of nine Romani-Cali shared DNA segments (STRs) with several groups of known Jewish individuals. This would include STR matches to Hungarian-Ashkenazi Jews, Mallorca Jews (Sephardic), Israeli Jews (mixed Jewish ancestry), and mixed European Jews (Sephardic, Ashkenazi) This represents forensic evidence they are related to known living Jews.

In one of the reference studies, used by DNA Consultants, "Population genetic data of 15 STR loci in Hungary" by B. Egyed, A. Füredi, Z. Padar, et al. (2006), allele frequencies for both Ashkenazi-Jewish and Romany (South-West and Eastern subgroups) communities in Hungary were reported at the eight CODIS STR loci of interest — D13S317, D18S51, D21S11, D3S1358, D5S818, D8S1179, FGA, and vWA. The data show that several alleles occur in both Jewish and Romany groups,

suggesting a measurable degree of shared genetic variation at these loci despite the groups' apparent distinct cultural and historical trajectories. For example, alleles such as vWA 17, D13S317 11, and FGA 23 were present in both Ashkenazi and Romany datasets, sometimes with similar frequencies. These overlaps indicate within Hungary, Jewish and Romany groups share parts of the same autosomal STR landscape, reflecting overlapping regional genetic history.

DNA Consultants undertakes forensic genetic genealogy, via STR matching. Their results for the nine Romani-Cali analyzed indicate they share short tandem repeats with known Jewish populations. The evidence to this effect is significant enough to warrant further using short tandem repeat technology to better understand the relationship between those living as Romani-Cali and those living as Jews.

## Chapter 4: Genetic Evidence for Jewish Ancestry in Romani-Cali: A MyHeritage/Dodecad v3-Based Comparative Analysis

In this section, the genetic legacy of 76 Romani-Cali is reviewed. Raw DNA was extracted by MyHeritage, and the subsequent raw DNA file was analyzed using the Dodecad v3 autosomal admixture tool.

In the first instance, as this is a group of Romani-Cali, conventional wisdom would suggest we would see an admixture of Rajasthani (Northern Indian) and Spanish ancestry. This was not the case.

### A Closer Look: MyHeritage Raw DNA viewed through the Dodecad V3 Calculator

The Dodecad V3 ancestry calculator is a tool developed as part of the Dodecad Ancestry Project, initiated by genetic blogger Dienekes Pontikos. Designed to analyze genetic ancestry with a strong focus on Eurasian populations, Dodecad V3 offers insights into an individual's ancestral components by comparing their DNA to reference populations. This calculator is particularly useful for individuals of European, Middle Eastern, and Central Asian descent, providing a detailed breakdown of their genetic heritage.

Dodecad V3 utilizes a model that identifies 12 ancestral components, including categories such as West European, East European, Mediterranean, West Asian, South Asian, Northeast Asian, Southeast Asian, Northwest African, East African, Paleo African, Neo African, and Sub-Saharan African. By analyzing the proportions of these components in an individual's DNA, the calculator helps users understand the complex tapestry of their genetic background.

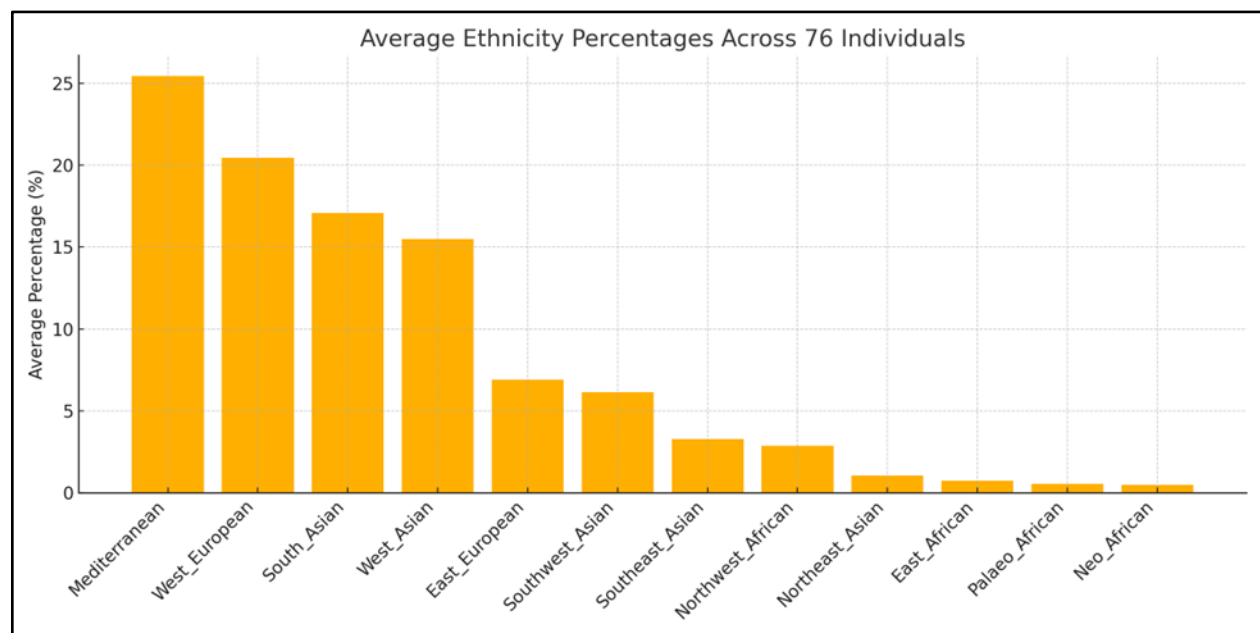
The seven Output Categories from Dodecad V3 are as follows:

- 1) Admixture Proportions
  - a) **Description:** Your DNA is broken down into percentages across 12 ancestral components (e.g., West Asian, Atlantic\_Med, East\_European).
  - b) **Purpose:** Provides a broad overview of your genetic heritage across major ancestral clusters.
  - c) **Use:** To understand your overall ancestral makeup in terms of ancient genetic components.
- 2) Single Population Sharing
  - a) **Description:** Identifies the single modern population that most closely matches your genetic profile.
  - b) **Output** Example: "Closest population: Lebanese Christian (Distance = 2.1)"
  - c) **Purpose:** Shows the most genetically similar modern population.

- d) **Use:** Useful for locating your closest ethnic or regional analog.
- 3) Mixed Mode Population Sharing
  - a) **Description:** Models your ancestry as a two-way mix between modern populations.
  - b) **Output Example:** “60% Ashkenazi Jew + 40% South\_Italian (Distance = 1.8)”
  - c) **Purpose:** Helps identify ancestral admixture events between two groups.
  - d) **Use:** Ideal for users with known mixed ancestry or diaspora backgrounds.
- 4) Least Squares Method
  - a) **Description:** Uses a statistical approach to minimize error in fitting your DNA to a mix of multiple populations.
  - b) **Output:** Often provides more nuanced population combinations than mixed mode.
  - c) **Purpose:** To fine-tune ancestry estimates by optimizing the fit.
  - d) **Use:** For a more statistically precise ancestry estimate, especially when three or more groups are involved.
- 5) Two Population Approximation
  - a) **Description:** Estimates your ancestry as a simple blend of two populations from the reference panel.
  - b) **Output Example:** “50% Iranian Jew + 50% Greek”
  - c) **Purpose:** Simplifies your ancestry into two major source populations.
  - d) **Use:** Useful when trying to model dual heritage from recent admixture.
- 6) Three Population Approximation
  - a) **Description:** Models your ancestry using three populations.
  - b) **Output Example:** “40% Georgian Jew, 30% Italian, 30% Kurdish”
  - c) **Purpose:** Reflects more complex ancestral scenarios, especially in diverse lineages.
  - d) **Use:** Ideal for people from culturally mixed regions or long diaspora histories.
- 7) Four Population Approximation
  - a) **Description:** An even more detailed estimate using four ancestral populations.
  - b) **Output Example:** “30% Sephardic Jew, 25% Berber, 25% Levantine, 20% Iberian”
  - c) **Purpose:** Captures the most intricate admixture profiles.
  - d) **Use:** Particularly useful for groups with layered historical migrations, such as Jews, Roma, or Middle Easterners.

## 1. Admixture Proportions

| Component                        | Average % | Geographic Link                             |
|----------------------------------|-----------|---------------------------------------------|
| Mediterranean                    | 25.5%     | Southern Europe, Levant, Jewish diasporas   |
| West European                    | 20.4%     | Iberia (Spain, Portugal), France            |
| South Asian                      | 17.1%     | Ancient Indian subcontinent or deep overlap |
| West Asian                       | 15.5%     | Israel, Iran, Iraq, Syria, Turkey           |
| East European                    | 6.9%      | Poland, Ukraine, Hungary (Ashkenazi links)  |
| Southwest Asian                  | 6.1%      | Iran, Kurdistan region                      |
| Southeast Asian                  | 3.3%      | Ancient admixture                           |
| Northwest African                | 2.8%      | Morocco, Algeria - Sephardic resettlement   |
| Northeast Asian & African traces | <2%       | Likely ancient background admixture         |



Based on the average ancestry profile of the 76 individuals - including high proportions of Mediterranean, West European, South Asian, West Asian, East European, and Southwest Asian ancestry - this population most closely aligns with West Asian and Mediterranean peoples, particularly those with Jewish Diaspora roots such as:

- Ashkenazi Jews(Germany)
- Sephardic Jews (Spain, Portugal, Morocco, Turkey)
- Mizrahi Jews (Iraq, Iran, Syria, Yemen)
- Indian Jews(Kochi, Mumbai)
- Levantine populations (Israel, Lebanon, parts of Palestine and Jordan)

## 2. Single Population Sharing Results

Based on the Single Population Sharing results, this group of 76 individuals demonstrates a strong and diverse Jewish ancestry profile. The analysis reveals that 98.65% of the individuals have at least one Jewish ethnicity listed among their top population matches, indicating a dominant presence of Jewish heritage.

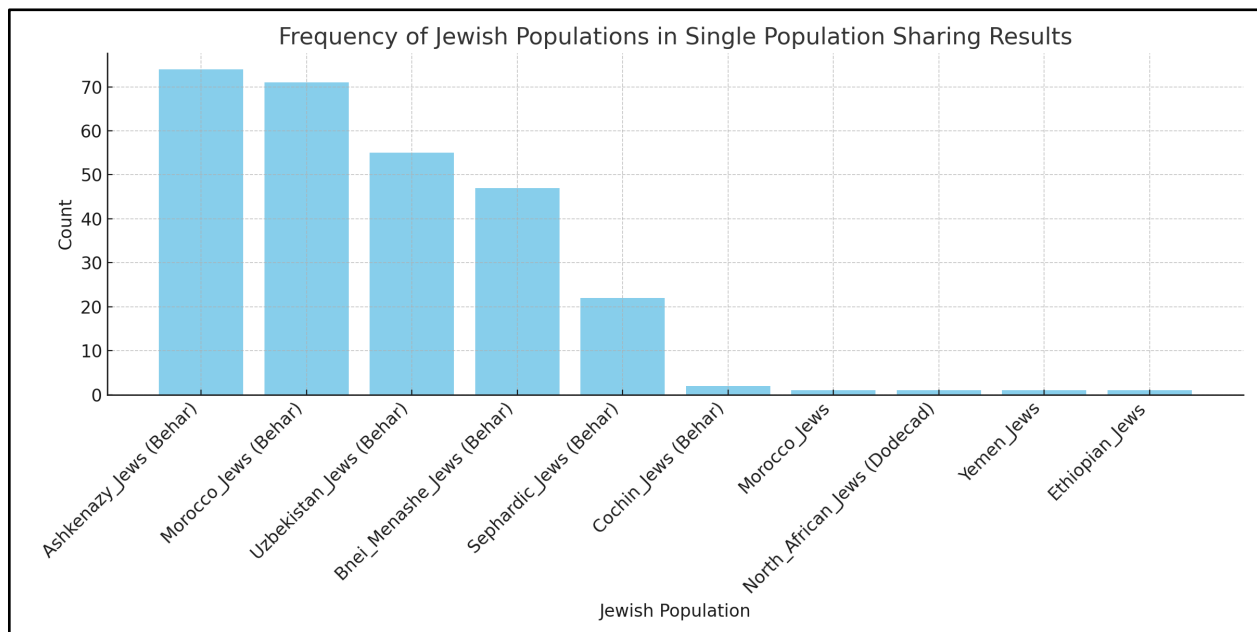
### *Key Observations*

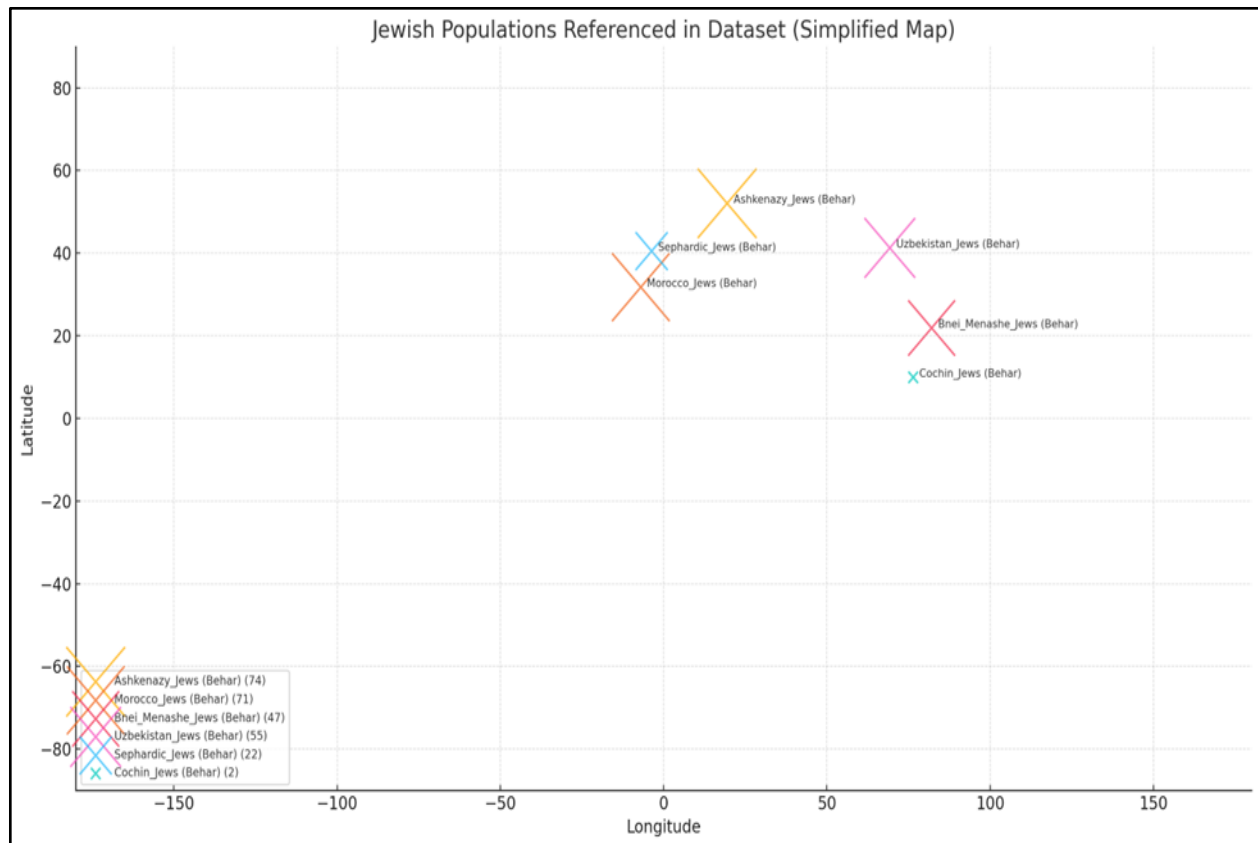
- 98.65% of individuals have Jewish ancestry markers.
- Broad representation across Ashkenazi, Sephardic, Mizrahi, and Asian-Jewish populations.

### *Ethnic Subgroup Presence (Ranked by Frequency)*

- Ashkenazy\_Jews (Behar) and Ashkenazi (Dodecad): Strong Eastern/Central European-Jewish heritage.
- Morocco\_Jews (Behar) and Sephardic\_Jews (Behar): Indicators of Iberian Peninsula and North African-Jewish roots.
- Uzbekistan\_Jews, Cochin\_Jews, Bnei\_Menashe\_Jews: Evidence of Mizrahi and Asian-Jewish ancestry.

The group likely originated in West Asia or the Eastern Mediterranean, migrating through Central and Eastern Europe (Ashkenazi), Iberia and North Africa (Sephardic), and further into Iran, India, and Central Asia (Mizrahi), and South/East Asia (Bnei-Menashe, Cochin).





This population can be characterized as having a pan-Jewish diaspora ancestry, primarily Ashkenazi and Sephardic, with supporting ties to Mizrahi and Asian-Jewish lineages. Their genetic profile mirrors ancient and historically established Jewish trade migration routes. This peculiar mix of Jewish ethnicities suggests their ancestors may have travelled the silk road, moving goods from Europe to Asia, and products from Asia to Western Europe.

### 3. Mixed Mode Population Sharing

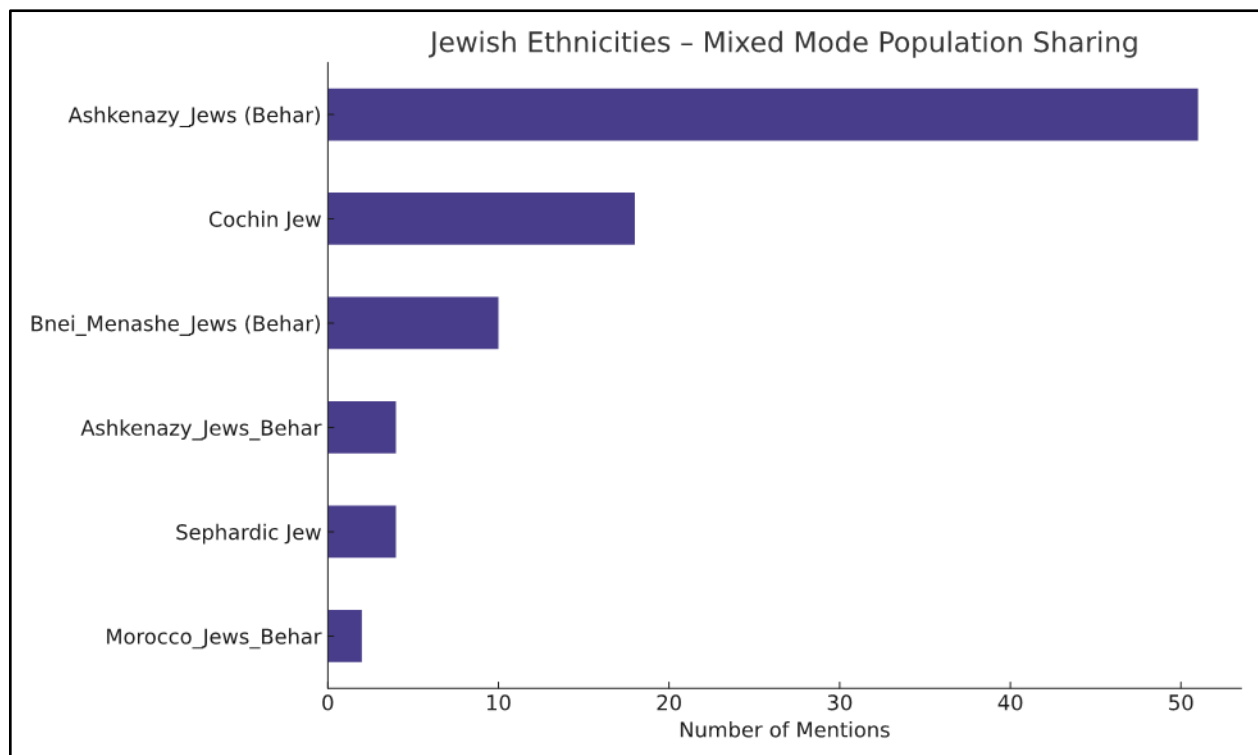
Mixed Mode Population Sharing for the 76 individuals that were tested revealed Jewish ancestry in the primary population position for 56 individuals, and in the secondary population for 20 individuals. Several individuals exhibited Jewish ancestry in both positions.

The analysis identified a diversity of Jewish ancestral populations. The most frequently reported Jewish ancestries include Ashkenazy\_Jews (Behar) (51); (48); Cochin\_Jews (Behar) (15); Bnei\_Menashe\_Jews (Behar) (10); Ashkenazy\_Jews\_Behar (4); Sephardic\_Jews\_Behar (4); Cochin\_Jews\_Behar (3); Morocco\_Jews\_Behar (2). This suggests a broad and varied spectrum of Jewish genetic heritage across the sample group.

- 1) Ashkenazi-Jewish ancestry was one of the most frequently observed types, appearing prominently in both primary and secondary population assignments.

- 2) Sephardic and Middle Eastern Jewish ancestries were also commonly represented, indicating connections to diverse historical migrations and diasporas.
- 3) A number of individuals showed multiple Jewish population affiliations, supporting a model of complex, layered Jewish ancestry.

This group displays substantial evidence of Jewish ancestry, representing a wide range of subgroups including Ashkenazi, Sephardic, Mizrahi, and regional Middle Eastern Jewish lineages. The variety and frequency of Jewish genetic signatures point to the intermingling among Jewish populations over generations.



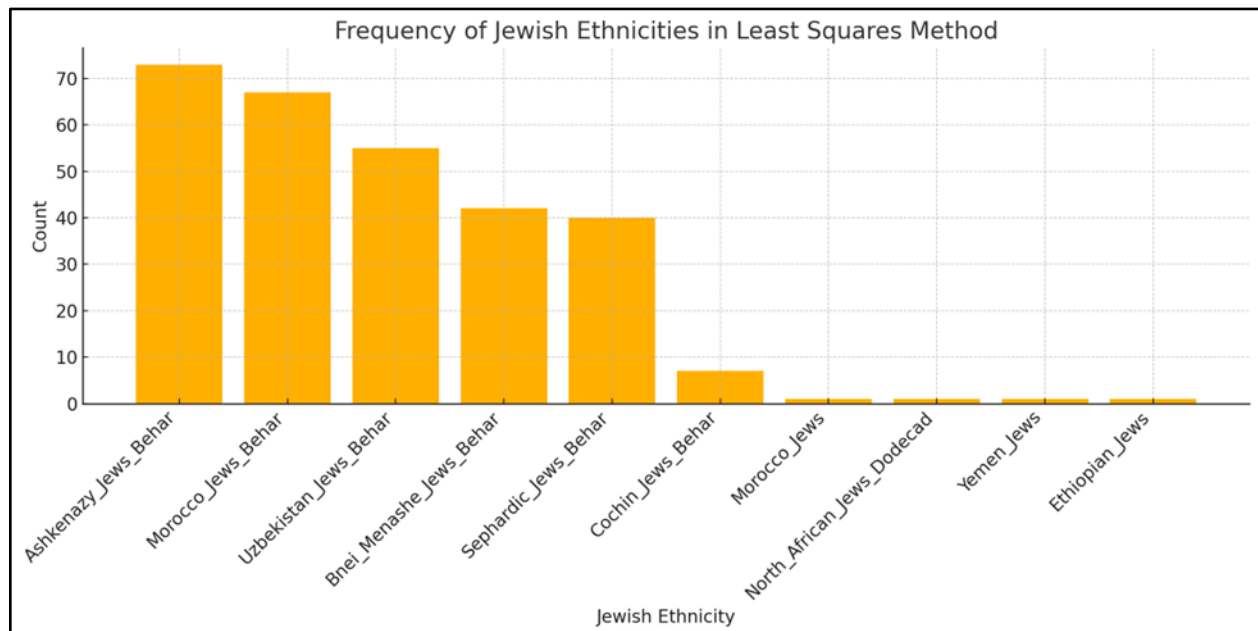
#### 4. Least Squares Method

The Least Squares Method was utilized to identify which specific Jewish populations were matched to each individual, providing insights into the diversity of Jewish genetic heritage across the group.

##### *Top Jewish Ethnicities Identified*

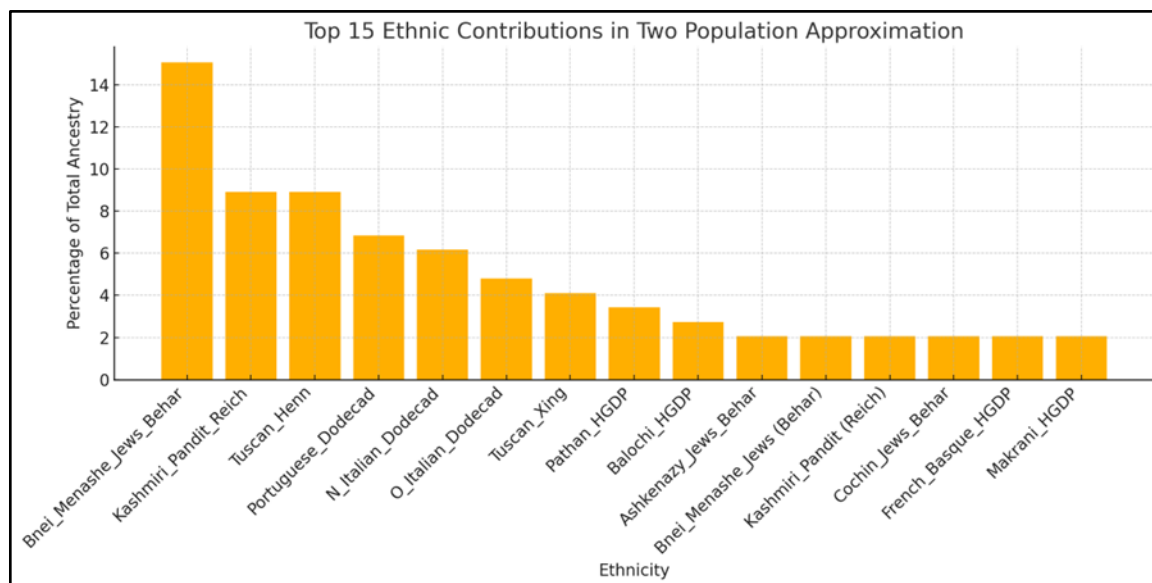
The most frequently identified Jewish populations across the group were: Ashkenazy\_Jews\_Behar (70); Ashkenazi\_Dodecad (68); Morocco\_Jews\_Behar (66); Uzbekistan\_Jews\_Behar (55); Bnei\_Menashe\_Jews\_Behar (40); Sephardic\_Jews\_Behar (36); Cochin\_Jews\_Behar (6);

Ethiopian\_Jews (1); Morocco\_Jews (1); North\_African\_Jews\_Dodecad (1). These frequencies suggest widespread representation of Ashkenazi and Sephardic ancestries, among others.



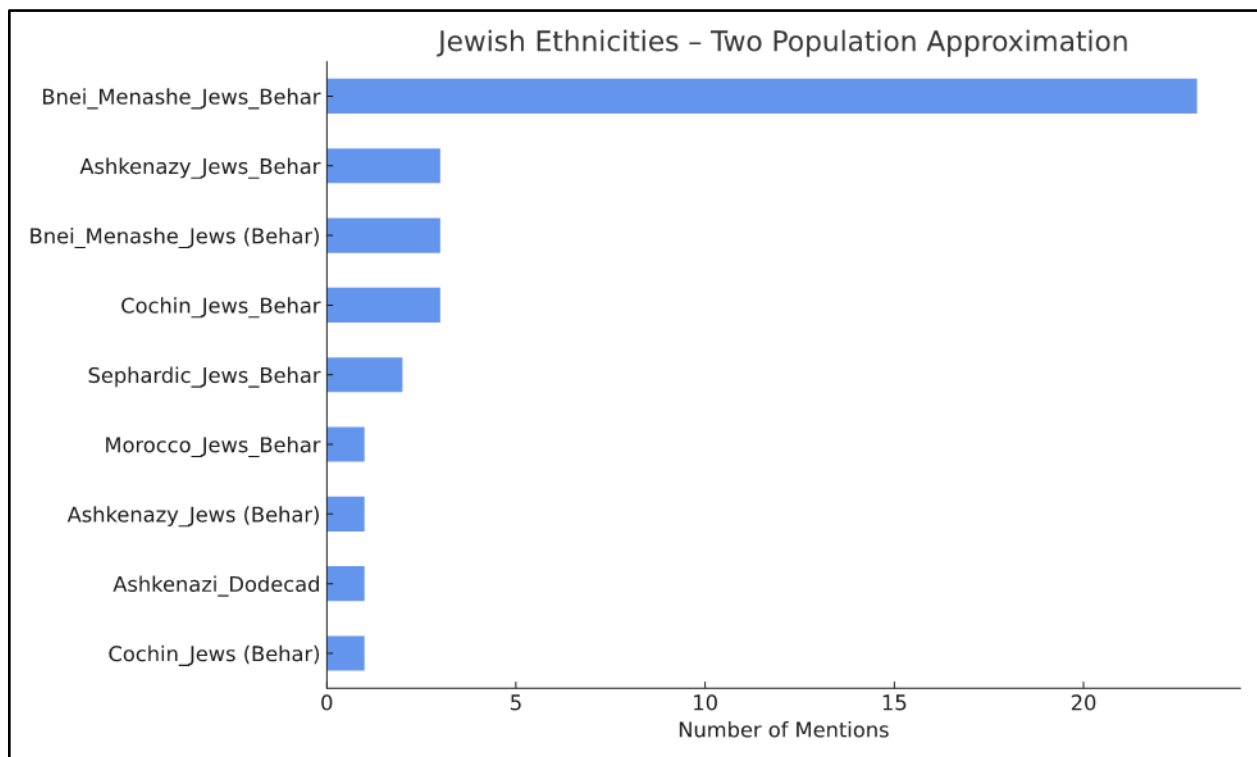
## 5. Two Population Approximation

Using the Two Population Approximation mode, this group was shown to display a diverse ethnic background supporting migration between Jewish India and Jewish Germany and Jewish Spain.



Summarizing Jewish ancestry results, based on the Two Population Approximation method, a total of 38 individuals were found to have Jewish ancestry based on one or both of their matched populations.

The Jewish ancestries observed include: Bnei\_Menashe\_Jews\_Behar (26); Cochin\_Jews\_Behar (4); Ashkenazy\_Jews\_Behar (5); Sephardic\_Jews\_Behar (2); Morocco\_Jews\_Behar (1). This suggests a notable presence of Bnei-Menashe and Cochin-Jewish heritage among individuals in the sample.



The Two Population Approximation analysis revealed clear indicators of Jewish ancestry most frequently identified populations were Bnei-Menashe Jews and Cochin Jews. This strongly suggests South and Southeast Asian-Jewish lineages. These ancestries were observed either as a primary or secondary component of the individuals' genetic profiles, reflecting both direct and partial Indian-Jewish genetic heritage.

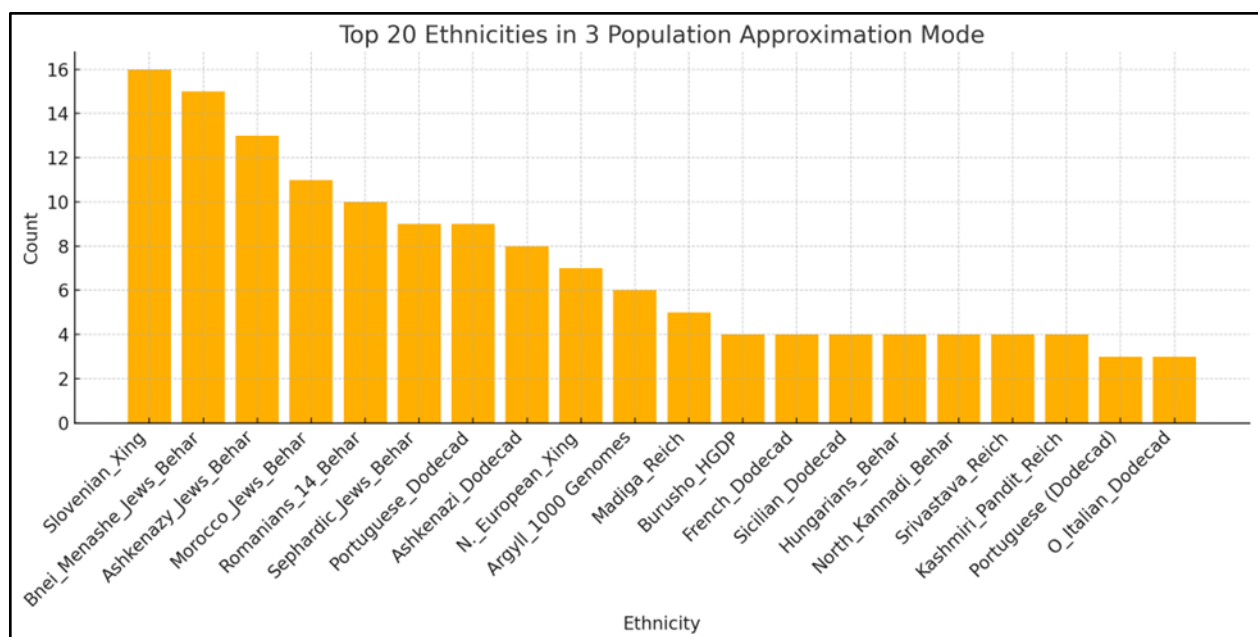
It should be noted that this group, on average, had a very high percentage of Tuscan, Northern Italian, and Italian ancestry, in this context this often a proxy for early European-Jewish ancestry. When the Romans destroyed Israel, they predominantly brought male slaves to Rome. These male slaves in turn married and converted Italian women, thereby creating the nexus of one part of the European-Jewish population. Recent studies of the early Jews found buried in Norwich

England and Erfurt Germany substantiate the fact early European Jews were an admixture of Israelite and Italian ancestry.

## 6. Three Population Approximation

Using the Three Population Approximation, 59 out of 76 individuals exhibited Jewish ancestry in one or more of their three positions. Jewish populations were identified in the primary, secondary, and tertiary ancestry components, revealing a layered and diverse Jewish heritage across the group.

In the three population mode, the most commonly identified Jewish populations include: Bnei\_Menashe\_Jews\_Behar (15); Ashkenazy\_Jews\_Behar (21); Morocco\_Jews\_Behar (11); Sephardic\_Jews\_Behar (11); (3 Cochin\_Jews\_Behar (2); Uzbekistan\_Jews\_Behar (2); Morocco\_Jews (Behar) (1); Yemen\_Jews (1). These findings highlight prominent Ashkenazi and Sephardic lineages, as well as regional subgroups, within the cohort.



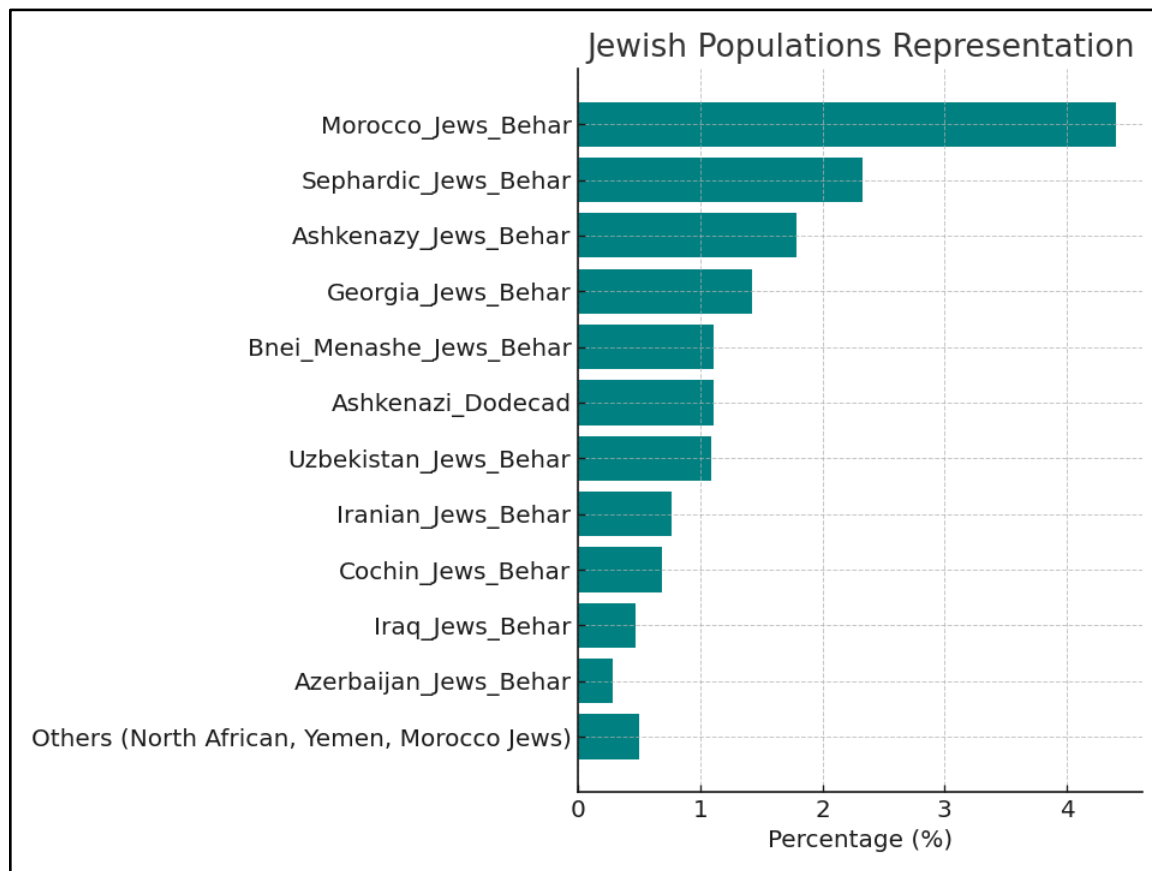
## 7. Four Population Approximation

### *Four Populations Summary (with Percentages)*

What follows are the top ten ethnicities that appear in the four-population mode for the 76 participating Spanish Gypsies.

| <b>Ethnicity</b>                        |     | <b>%</b> |
|-----------------------------------------|-----|----------|
| Portuguese_Dodecad                      | 563 | 40.21%   |
| Italian (Proxy for early European Jews) | 517 | 36.93%   |
| Morocco_Jews_Behar                      | 256 | 18.29%   |
| Slovenian_Xing                          | 250 | 17.86%   |
| Romanians_14_Behar                      | 199 | 14.21%   |
| Iranian_Dodecad/Behar                   | 191 | 13.64%   |
| German_Dodecad                          | 183 | 13.07%   |
| Ashkenazi_Dodecad                       | 167 | 11.93%   |
| Sephardic_Jews_Behar                    | 134 | 9.57%    |

*Jewish Populations Represented in the Four-Population Mode*



| Population                                  | Percentage |
|---------------------------------------------|------------|
| Morocco_Jews_Behar                          | 4.40%      |
| Sephardic_Jews_Behar                        | 2.33%      |
| Ashkenazy_Jews_Behar                        | 1.79%      |
| Georgia_Jews_Behar                          | 1.42%      |
| Bnei_Menashe_Jews_Behar                     | 1.11%      |
| Ashkenazi_Dodecad                           | 1.11%      |
| Uzbekistan_Jews_Behar                       | 1.09%      |
| Iranian_Jews_Behar                          | 0.76%      |
| Cochin_Jews_Behar                           | 0.69%      |
| Iraq_Jews_Behar                             | 0.47%      |
| Azerbaijan_Jews_Behar                       | 0.28%      |
| Others (North African, Yemen, Morocco Jews) | 0.50%      |

**Total Jewish-related entries: 826 out of 5920**

**Overall percentage of Jewish populations identified: 13.93%**

However, the four-population mode revealed ethnicities, that when combined, reflect the ethnicities of the early European Jews. That includes 517 Italian references (Tuscan, Northern Italian) and 171 references to Levantines. This analysis could have been detecting old European Jewish ancestry. That would be an additional 688 references to Jewish ancestry. The 11<sup>th</sup> and 12<sup>th</sup> century Medieval Jewish cemeteries (Norwich, England, Erfrut Germany) revealed this admixture. This would add an additional 11.62% Jewish references in this mode; bringing the total Jewish references to 25.55% of the total. This is a significant finding in this mode.

## Conclusion

Using MyHeritage Raw DNA files and the Dodecad V3 calculator, this group of 76 Romani-Cali displayed a super abundance of Pan Jewish ancestry. Depending on the calculator, different Jewish ethnicities came to the fore as being predominant Jewish ancestries. The presence of

Ashkenazi and Indian-Jewish ancestry was consistently high across all calculations. However, the minority Jewish ethnicities span the known Jewish world: Indian-Jewish, Central Asian-Jewish, Western Asian-Jewish, CaucAsian-Jewish, North African Jewish, Southern European-Jewish, and Northern European-Jewish.

Jewish ancestry, from the entirety of the known Jewish world, is hard to explain. The theory put forward earlier, that the Romani Calé are the descendants of travelling Jewish merchants, is one explanation. However, there may be other explanations. Such an unusual finding warrants further research.

## References

1. Behar, Doron M., et al. "The Genome-Wide Structure of the Jewish People." *Nature*, vol. 466, 2010, pp. 238-242.
2. Lazaridis, Iosif, et al. "Ancient Human Genomes Suggest Three Ancestral Populations for Present-Day Europeans." *Nature*, vol. 513, 2014, pp. 409-413.
3. Dodecad Ancestry Project. Public Admixture Data (2011-2012). <http://dodecad.blogspot.com/>
4. Eurogenes Blog (Davidski). 'Population Data and Models.' Accessed 2025.

## Chapter 5: Evidence of Jewish Origins of Romani-Cali: Y Haplogroups

In Lisardo Cano Montes' book, "The DNA of the Gypsies is Israelite", Mr. Cano proposes a scientifically based argument that the Romani-Cali are of Israelite origin. What follows is a synopsis of his book.

### "The DNA of the Gypsies is Israelite" by Lisardo Cano Montes

#### *Overview of the DNA Argument*

- The book argues that the Roma (Cali-Romani ) populations are genetically linked to ancient Israelites, rather than originating in India.
- DNA is presented as the central form of evidence for this claim, with both Y-DNA (paternal) and mtDNA (maternal) markers provided.

#### *Shared Haplogroups with Jewish Populations*

Several haplogroups found in Cali-Romani populations are also prominent among Jewish groups. These include:

- - Y-DNA: J1, J2, R1a, R1b, E1b1b1a-M78, H1a-M82
- - mtDNA: M5a1b and U3b1c
- Particular focus is placed on the Cohen Modal Haplotype (J1c3), associated with Jewish priestly descent, present in some Roma individuals.
- The book cites examples such as the presence of haplogroup J1c3 in Gypsies from Spain and Eastern Europe, which mirrors its prevalence in Sephardic and Mizrahi Jewish communities.
- Additionally, haplogroup E1b1b1a-M78, common in North African and Middle Eastern Jews, is frequently detected in Roma Y-DNA samples, especially among Iberian Roma men.
- Supporting Study: Behar et al. (2003) identify the Cohen Modal Haplotype in various Jewish populations, while Mendizabal et al. (2012) found these same haplogroups among Roma groups.

#### *Cochin-Jewish Connection*

- The book emphasizes the presence of shared mtDNA haplogroups (especially M5a1b and U3b1c) between Romani-Cali and Cochin Jews of India.
- M5a1b, for example, is found in both Cochin-Jewish maternal lines and in Spanish Roma families, particularly those with historical ties to Andalusia.
- U3b1c, another maternal lineage discussed, has been documented in genetic studies of Cochin Jews and is also found in Roma from the Balkans and Iberian Peninsula.
- This is interpreted as supporting a common ancestral origin rooted in ancient Israel.

- Supporting Study: Thomas et al. (2002) highlighted the presence of U3b1 in Middle Eastern Jewish populations, paralleling its detection in Roma.

#### *Critique of Indian Origin Theory*

- While acknowledging Roma migration through India, the Cano argues that genetic data does not support India as the point of origin.
- Instead, DNA evidence is interpreted to show that Gypsies carried Semitic markers into and out of India, consistent with a westward migration from Israel.

#### *Interpretation of Genetic Data*

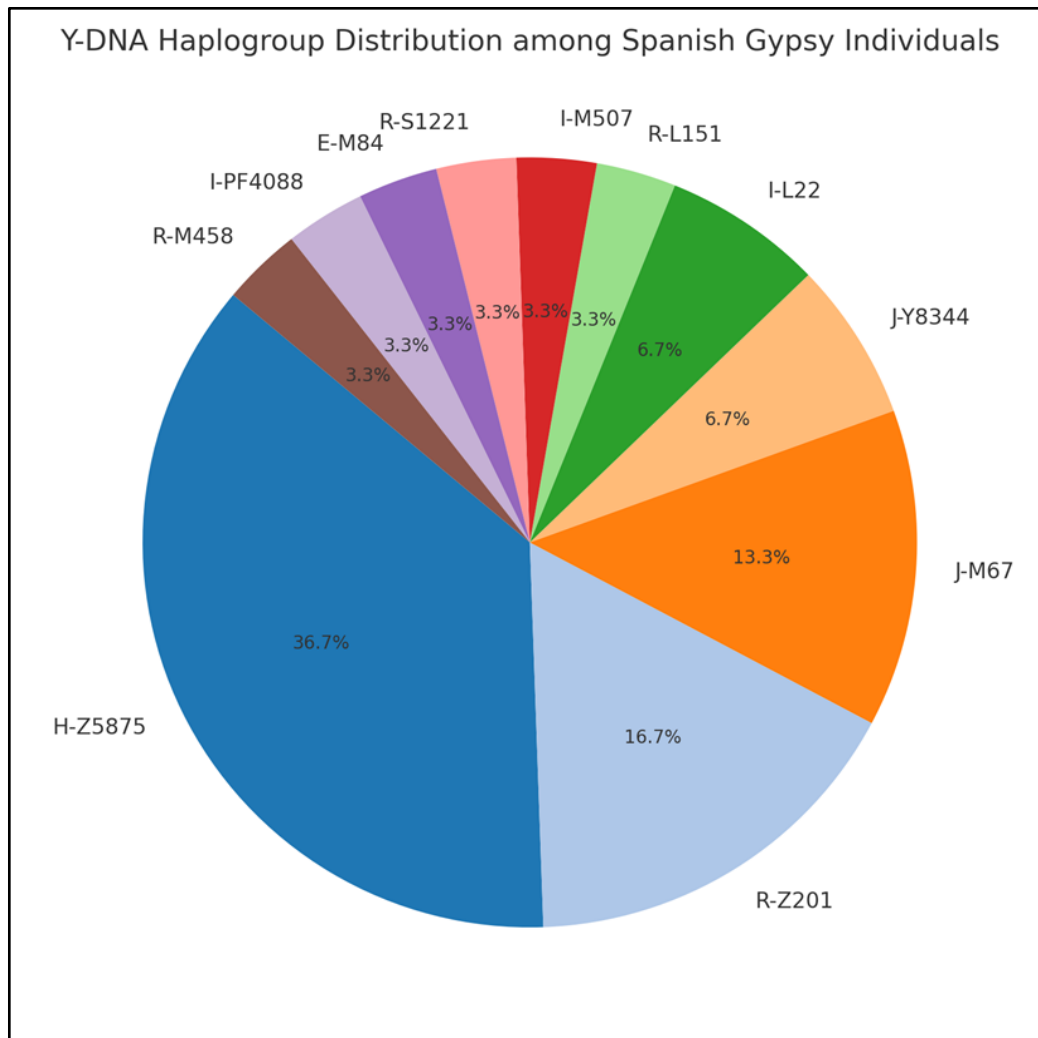
- The book critiques certain mainstream genetic studies that argue for non-biblical origins of Jews or for an Indian origin of Roma.
- Emphasis is placed on contextualizing DNA results alongside cultural and historical evidence to argue for a Hebrew origin of the Roma people.

#### *Conclusion*

The book concludes that both Y-DNA and mtDNA results across various Roma communities point toward an ancient Israelite ancestry.

### **Y Haplogroup Evidence Supporting Lisardo Cano Montes' Hypothesis**

In this project, 76 Spanish Roma from 15 different Spanish provinces were tested for ancestry. For the 30 men participating in the project, Y haplogroup were extracted. The Y DNA results for this group were used to substantiate Cano's earlier work.



## Spanish Calo-Roma Grouped by Haplogroup

### *Indian Origin (H-Z5875)*

- Muñoz Cortes
- Garcia Nunez
- Duvall Jimenez
- Hernandez
- Garcia Jarque
- Garcia Nunez
- Hernadez Gorretto
- Heredia
- Carbonell Abellan
- Cortes Moreno
- Cortes Moreno

*Middle Eastern Origin (J-M67, J-Y8344)*

- Vargas Bote
- Samuel Vargas Navarro
- Jimenez Jimenez
- Francisco Gabbari
- Jimenez Jimenez
- Heredia De La Rosa

*European (Non-Jewish) Origin*

- Cadiz Fernandez (I-M507)
- Doya Gimenez (I-L22)
- Doya (I-L22)

*European (Jewish Subclass) Origin*

- Jimenez Garcia (R-L151)
- Montoya Romere (R-Z201)
- Montoya Salazar (R-Z201)
- Ajama (R-S1221)
- Motos Hernandez (R-Z201)
- Motos Motos (R-Z201)
- Montoya (R-Z201)
- Karchnak (R-M458)
- Luque Cortes (I-PF4088)

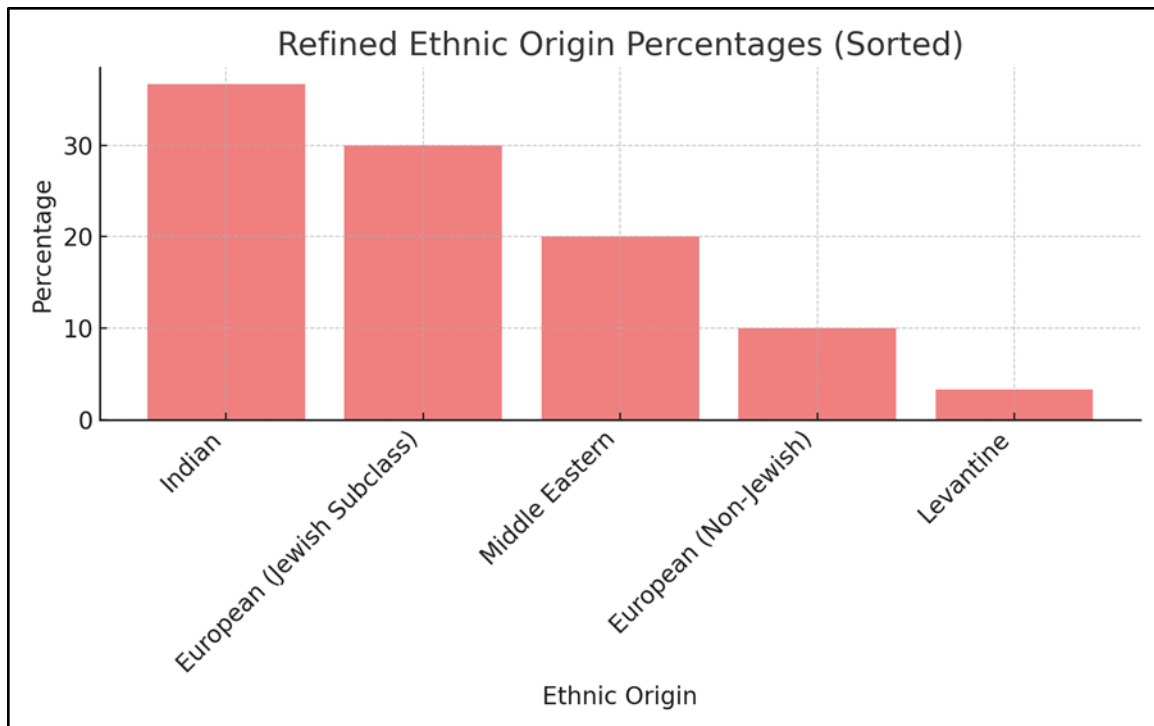
*Levantine Origin (E-M84)*

- Nunes Nunes

Haplogroups Refined by Ethnic Origin in Percentages

## Summary

|                                            |                      |               |
|--------------------------------------------|----------------------|---------------|
| Indian: .....                              | 11 individuals ..... | (36.67%)      |
| Middle Eastern: .....                      | 6 individuals .....  | (20.0%)       |
| European (Non-Jewish): .....               | 3 individuals .....  | (10.0%)       |
| European (Jewish Subclass): .....          | 9 individuals .....  | (30.0%)       |
| Levantine: .....                           | 1 individual .....   | (3.33%)       |
| <b>Total Jewish or Proto-Jewish: .....</b> |                      | <b>53.33%</b> |



## Haplogroups and Their Jewish Associations

Based on the haplogroup's found in 26 Cali-Romani men, there is evidence the founding male lines were of Jewish descent.

### *R-Z201, R-L151, R-S1221*

These subclades of R1b are widespread across Europe but include branches that have been observed among both Ashkenazi and Sephardic-Jewish populations, suggesting likely Jewish ancestry for carriers.

### *J-M67, J-Y8344*

These Middle Eastern origin haplogroups are frequently found among Jewish populations, particularly Sephardic and Mizrahi Jews. J-Y8344 shows European influence as well.

### *E-M84*

A Levantine-origin haplogroup associated with Jewish ancestry, especially within populations historically located in the Mediterranean basin.

### *H-Z5875*

Although South Asian in origin, this haplogroup appears in Indian-Jewish groups like the Cochin Jews and Bnei-Menashe. This finding, combined with prior autosomal DNA findings, suggest the haplogroup H-Z5875 connects the Romani-Cali with the Indian-Jewish community.

### *I-L22, I-M507, I-PF4088*

Primarily European lineages with limited direct links to Jewish groups. However, cultural and demographic interactions may have introduced them into some Jewish communities.

### *R-M458*

Typically Slavic, but occasionally present among Ashkenazi Jews, especially in Central and Eastern Europe.

## The Indian Origin Debate

Lisardo Cano, in his work, asserts that while Spanish Roma do have Indian ancestry, this ancestry is linked to Jewish history, not origin. Conventional wisdom holds Romani have Indian ancestry because they left Northern India (Rajasthan) and migrated to western Europe, in an east to west, and single direction migratory pattern.

Cano holds that Jewish India was part of a circular trade migration pattern for the progenitors of the Romani-Cali; Jews from Western Asia made their way to Eastern Jewish India and Eastern Jewish Indians made their way to Western Europe. However, these were not one way trips but rather a continuum of circular Jewish migration where traders went west to east and east to west for a period that lasted for 2000 years.

76 participants in this study were identified as having Indian ancestry, but this should be qualified. Autosomal analysis revealed this was primarily Southern Indian ancestry and more specifically, Jewish Indian ancestry, Cochin-Jewish, Bnei-Menashe Jewish, and Bnai Israel Jewish included. As 36.67% of the male participants were found to carry the Indian Subcontinent Male haplogroup (H-Z5875), it would pay to look at this Indian haplogroup for ties with Jewish India.

## Haplogroup H-Z5875 and Its Association with Indian Jews

Haplogroup H-Z5875, a subclade of haplogroup H, is predominantly associated with South Asian populations, particularly in India. It is found in the Indian-Jewish communities, such as the Bene Israel and Cochin Jews, and reflects admixture of Yemenite Jews with local Indian populations.

### Association with Indian Jews

Genetic studies have shown that Indian-Jewish populations possess a combination of Middle Eastern and Indian ancestry. For instance, a study on the Bene Israel community revealed substantial Jewish and Indian genetic components, with the admixture occurring approximately 19-33 generations ago. Haplogroup H is common among South Asian populations and its occurrence in Indian Jews is attributed to the integration of local DNA over the centuries into the Jewish community. The presence of H-Z5875 in Indian-Jewish groups is likely indicative of the same regional admixture. (1,2,3)

## Yemenite-Jewish Connection: Presence of Haplogroups J-M67 and J-Y8344 in Indian Jews

Participants in this study were found to carry a small percentage of Yemenite-Jewish ancestry. This supports the theory that Romani-Cali carry Jewish Indian ancestry. The Jewish communities of India were founded by Yemenite-Jewish traders in the 2<sup>nd</sup> century. This minority Yemenite-Jewish ancestry may be a genetic artifact of the founders of the Indian-Jewish communities.

This testing revealed that 20% of the men tested carried the male haplogroup J-M267 or its downstream clade J-Y8344 both of which are linked to the Indian-Jewish communities.

### J-M67 in Indian Jews

J-M67, a subclade of haplogroup J2a, is associated with Near Eastern origins and has been identified in several Indian-Jewish populations. Genetic studies, including those by Behar et al. (2010), have reported J2a lineages, including J-M67, among Bene Israel and Cochin Jews. Its presence indicates ancient Jewish male founder lineages and Middle Eastern genetic input into these Indian-Jewish communities.

### J-Y8344 in Indian Jews

J-Y8344 is a rare downstream branch of J-M67. Its occurrence in Indian Jews has not been specifically highlighted in major genetic studies, but its presence is plausible given the diversity of J2a lineages found among Cochin Jews. As of now, J-Y8344 has not been widely reported, but it may appear in isolated cases within Indian-Jewish lineages.

**Summary Table**

| Haplogroup | Found in Indian Jews?     | Frequency       | Interpretation                            |
|------------|---------------------------|-----------------|-------------------------------------------|
| J-M67      | Yes (Cochin, Bene Israel) | Low to moderate | Reflects Near Eastern Jewish ancestry     |
| J-Y8344    | Possibly                  | Rare            | Likely under-reported; plausible subclade |

(4,5,6)

## Conclusion

The Y-DNA analysis of 30 Spanish Calé-Roma men reveals a complex genetic landscape that reflects multiple layers of ancestry, with significant evidence pointing toward Jewish paternal origins. Approximately 30% of the participants carried haplogroups commonly associated with Jewish populations, including R-Z201, R-S1221, and J-M67. These lineages are observed among

both Ashkenazi and Sephardic Jews and suggest a historical genetic connection between the Spanish Calé and the broader Jewish diaspora.

Furthermore, the presence of haplogroup H-Z5875 in over one-third of the tested individuals offers compelling support for Cano's hypothesis of Jewish Indian ancestry. This haplogroup, while South Asian in origin, has been consistently identified in Cochin Jews and the Bene Israel community, suggesting that the Indian genetic component found among Spanish Roma may itself be Jewish in origin. Members of the group were found to carry Yemenite-Jewish ancestry; Indian Jews are an admixture of Levantine Haplogroups(J1-J2) (Yemenite) + Indian Haplogroups(H-Z5875).

The detection of haplogroups J-M67 and J-Y8344-also common among Sephardic and Indian Jews-reinforces the argument for a multi-phase migratory and genetic narrative. The notable trace of Yemenite-Jewish ancestry further links this group to the ancient trade and diasporic movements, aligning with Cano's theory of circular Jewish migration between the Levant, India, and Europe over millennia.

These haplogroup findings suggest a genetic continuity between the Spanish Roma and other Jewish communities. This very limited study suggests more haplogroup research is warranted to establish haplogroup links between the greater Jewish community and the Spanish Roma. If a larger sampling was undertaken, including mtDNA, a better understanding of the Romani-Cali Jewish origins could be achieved.

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## Chapter 6: Sephardic-Jewish Origins of Romani-Cali

Of the 76 Individuals taking ancestry DNA tests, 32 were found to carry Sephardic-Jewish ancestry. (42%). This is less than the number who carry Ashkenazi ancestry (76/76 or 100%), but it is still suggests a substantial link with Iberian Jews. With nearly 50% of the group carrying Sephardic-Jewish DNA, a closer examination of their Iberian Jewish origins is warranted.

### Individuals with Sephardic-Jewish Ancestry Established by DNA Testing

|     |                          |             |
|-----|--------------------------|-------------|
| 1.  | Bermudez Torres .....    | (Cataluña)  |
| 2.  | Cadiz Fernandez .....    | (Castellón) |
| 3.  | Cortes Cortés.....       | (Cataluña)  |
| 4.  | Faustino Hernandez ..... | (Cádiz)     |
| 5.  | Fernández Muñoz.....     | (Córdoba)   |
| 6.  | Gabarri Gabarri .....    | (Badajoz)   |
| 7.  | Garcia Jarque.....       | (Cádiz)     |
| 8.  | Garcia Jarque.....       | (Cadiz)     |
| 9.  | Garcia Núñez .....       | (Badajoz)   |
| 10. | Gimenez Gimenez .....    | (Cataluna)  |
| 11. | Heredia Amaya .....      | (Cordoba)   |
| 12. | Heredia de la Rosa.....  | (Toledo)    |
| 13. | Heredia Heredia .....    | (Cataluna)  |
| 14. | Heredia Heredia .....    | (Cataluna)  |
| 15. | Heredia.....             | (Cataluna)  |
| 16. | Hernandez Borja.....     | (Alicante)  |
| 17. | Hernandez Gorretta ..... | (Cádiz)     |
| 18. | Hernandez Heredia .....  |             |
| 19. | Jimenez Ecudero .....    | (Asturias)  |
| 20. | Jimenez Jiménez.....     | (Asturias)  |
| 21. | Jimenez Jiménez.....     | (Asturias)  |
| 22. | Jiménez .....            | (Spain)     |
| 23. | Luque Cortés .....       | (Granada)   |
| 24. | Manazana Manzana .....   | (Cataluña)  |
| 25. | Montoya Salazar .....    | (Asturias)  |
| 26. | Montoya Silva.....       | (Spain)     |
| 27. | Motos Motos .....        | (Cataluña)  |
| 28. | Nunez Camacho .....      | (Spain)     |
| 29. | Nunez Heredia.....       | (Córdoba)   |
| 30. | Salazar Jiménez .....    | (Asturias)  |
| 31. | Sevilla .....            | (Spain)     |
| 32. | Sevilla .....            | (Cádiz)     |

## The Rhadhanite Jewish Model

This project proposes that one possible origin of the Romani-Cali was international trading Jews. Spain was a terminus in the Jewish travelling merchants' route, and, they likely maintained a community there, as they did in India and China. It would stand to reason, as Jews, the itinerant merchants would have mixed with the local Jewish population. Though the Rhadanites saw themselves as a distinct Jewish group, at some point, the line between Jewish travelling merchants and Spanish Jews could have become blurred. As it did in India and China. Except in this case, the Rhadanites could have married within the Jewish community and not into the local non-Jewish population.

## Mixing by Virtue of Proximity.

Historical evidence suggests that there was meaningful overlap and interaction between Romani-Cali (Romani-Cali) and conversos (Jews who converted to Christianity, often under duress). There is evidence there may have been "Mixing by Virtue of Proximity".

Although direct records are scarce, multiple lines of evidence indicate that these two persecuted groups shared spaces, customs, and sometimes familial ties-particularly during and after the Spanish Inquisition. And as with all people, proximity and mixing is a well-documented phenomenon.

### 1. Shared Experience of Persecution

Both Romani-Cali and Conversos were subjected to religious and racial profiling, forced assimilation, and surveillance by the Inquisition. They were accused of secretly practicing forbidden religions, faced restrictions on movement, occupation, and marriage, and were often targets of arbitrary arrest and property confiscation.

### 2. Geographical and Social Overlap

Romani-Cali and Conversos frequently lived on the margins of urban centers such as Córdoba, Seville, and Granada. These shared marginal spaces made interaction and cohabitation more likely. In areas with overlapping populations, there is evidence of social blending, particularly in contexts of mutual exclusion by mainstream society.

### 3. Cultural and Linguistic Parallels

Both groups developed distinct languages-Ladino among Sephardic Jews and Caló among Romani-Cali-that allowed them to maintain group identity and secrecy. Some lexical similarities suggest possible borrowing or parallel development of these languages, such as the words 'bendichar' (to bless) and 'maledichar' (to curse), which appear in both Caló and Ladino.

#### 4. Inter marriage and Blurred Identities

After 1492, some Conversos sought refuge in Roma communities to escape the scrutiny of the Inquisition. Hypothetically, inter marriage and identity blending likely occurred. Amongst living Romani-Cali there are family stories of Conversos on the run joining Gypsy groups.

#### 5. Genetic Evidence

Genetic studies of Spanish Roma populations have revealed traces of Middle Eastern and North African ancestry consistent with Jewish admixture. Some haplogroups found among Sephardic Jews also appear in Romani-Cali DNA samples. While not conclusive, these findings support the hypothesis of historical mixing or shared ancestry.

#### 6. Historical Documentation

Inquisition records sometimes confuse Romani-Cali with Conversos, labeling both as 'suspect Christians'. The persecution of Romani-Cali mirrored earlier campaigns against Jews, with both groups targeted as threats to social and religious conformity.

The overlap between Romani-Cali and Conversos was shaped by shared persecution, social marginalization, and strategic alliances. Though often erased or overlooked in historical records, their cultural and genetic intermingling may contribute to the complex Jewish ancestry of the living Cali-Romani. (1-5)

#### Cali-Romani names or Converso Surnames?

Further evidence that the early Romani-Cali and Conversos were linked is they shared surnames. Many Cali-Romani surnames are Converso Surnames and vice versa. This comparison can be made because of Inquisition records for the Conversos and Romani-Cali persecution records survive to this day.

#### The Cali-Romani Round-Up of 1749 (La Gran Redada)

In the early 18<sup>th</sup> century, Spain was deeply rooted in a system of centralized control, religious orthodoxy, and social stratification under the Bourbon monarchy. The Romani-Cali had long been marginalized. They were viewed with suspicion by the authorities due to their nomadic lifestyle, distinct customs, and perceived resistance to assimilation.

Hostile legal measures against Romani-Cali had been implemented since the late 15<sup>th</sup> century, including forced settlement, clothing bans, restricted trades, and surveillance. Despite this, Romani-Cali managed to maintain a strong cultural identity, often adapting by settling in specific neighborhoods and preserving community ties and traditions in secrecy.

By mid-century, Enlightenment ideals of social order and reform merged with older prejudices. Under King Fernando VI, Spain's government sought to eradicate the Romani-Cali autonomy and separateness from general Spanish society. This led to one of the most brutal state-sponsored actions against the Romani in Spanish history.

## The Round-up

On July 30, 1749, the Spanish Crown, under the direction of the Marquis of Ensenada, launched La Gran Redada-a nationwide, coordinated mass arrest of the Romani-Cali.

The operation was secretly planned to avoid escape or resistance. It was carried out simultaneously across Spain, with soldiers and local authorities targeting Romani-Cali settlements and neighborhoods. Men, women, and children were forcibly taken from their homes.

Once arrested, men were separated and sent to forced labor in naval arsenals such as Cádiz, Cartagena, and Ferrol. Women and children were imprisoned in workhouses and convents. Families were deliberately split up to weaken communal bonds and cultural continuity.

Although the operation's stated objective was to eliminate the 'Cali-Romani problem,' the campaign had no legal basis. Many officials questioned its legitimacy and morality.

Estimates vary, but between 9,000 and 12,000 Romani-Cali were detained. The inhumane conditions, forced labor, and separation of families caused widespread suffering and death.

However, public outcry and institutional resistance eventually led to the campaign's decline. The Catholic Church and local governors protested the operation and after nearly a decade, Romani-Cali were quietly released in the mid-1760s. Though their communities experienced great devastation.

The Round-up failed in its mission to erase Romani-Cali identity. Instead, it became a defining moment in Romani history-a symbol of resilience in the face of persecution. It also marked one of the earliest examples of ethnic cleansing by a modern European state. (6-9)

However, the victims were catalogued by the state, and the result is a list of Cali-Romani surnames in use in 1749. When the list of names found in the La Gran Redada records (Appendix A), was compared to Genie Milgrom's database of Sephardic-Jewish Surnames (Appendix B-C), many of the names were found to be both Cali-Romani and Converso.

| List of 1749 List of names that were both Cali-Romani and Converso: |           |               |            |
|---------------------------------------------------------------------|-----------|---------------|------------|
| Abarca                                                              | Crespo    | Mateo         | Reyes      |
| Acosta                                                              | Cruz      | Mateos        | Rivera     |
| Alba                                                                | Cuenca    | Medina        | Rivero     |
| Almagro                                                             | Diego     | Mendez        | Rodriguez  |
| Alonso                                                              | Escudero  | Mendoza       | Rojas      |
| Andrade                                                             | Espinosa  | Merino        | Romero     |
| Angulo                                                              | Esteba    | Miguel        | Rosa       |
| Antonia                                                             | Fajardo   | Miranda       | Rosales    |
| Antonio                                                             | Ferrer    | Molina        | Royo       |
| Aparicio                                                            | Flores    | Montes        | Ruano      |
| Aranda                                                              | Francisco | Montesinos    | Ruiz       |
| Arroyo                                                              | Franco    | Montoya       | Saavedra   |
| Ayala                                                               | Fuente    | Mora          | Salamon    |
| Baltasar                                                            | Fuentes   | Morales       | Salas      |
| Baron                                                               | Gallardo  | Moreno        | Salazar    |
| Barrios                                                             | Galvez    | Morera        | Sanchez    |
| Bautista                                                            | Garcia    | Moya          | Sandoval   |
| Bejarano                                                            | Gil       | Heredia Munoz | Santiago   |
| Benito                                                              | Gimenez   | Murcia        | Santos     |
| Blanco                                                              | Gonzalez  | Murciano      | Serrana    |
| Boca                                                                | Gonzalo   | Muñoz         | Serrano    |
| Bravo                                                               | Gracia    | Navarro       | Sevillano  |
| Caballero                                                           | Graciano  | Nieto         | Silva      |
| Cabello                                                             | Granados  | Nunez         | Soler      |
| Cabezas                                                             | Grau      | Núñez         | Soto       |
| Cabrera                                                             | Gregorio  | Oliva         | Sánchez    |
| Cabrero                                                             | Guadalupe | Oliver        | Tirado     |
| Caldera                                                             | Guerrero  | Ortiz         | Toro       |
| Camacho                                                             | Heredia   | Pacheco       | Torre      |
| Campo                                                               | Herrera   | Padua         | Torres     |
| Campos                                                              | Jiménez   | Pareja        | Trinidad   |
| Camus                                                               | Juan      | Parra         | Uria       |
| Cano                                                                | Leal      | Pascual       | Valdes     |
| Carbonell                                                           | Leonor    | Paz           | Valdivia   |
| Carmona                                                             | Lobato    | Pedro         | Valencia   |
| Caro                                                                | Lorente   | Pimentel      | Valenzuela |
| Carrasco                                                            | Lorenzo   | Pineda        | Valera     |
| Carrillo                                                            | Losada    | Pinero        | Varas      |
| Castellano                                                          | Lozano    | Polo          | Vargas     |
| Castellon                                                           | Luca      | Ponce         | Vega       |
| Castro                                                              | Lucas     | Pozo          | Velasco    |
| Chaves                                                              | López     | Prado         | Ventura    |
| Clemente                                                            | Machuca   | Pujol         | Vicens     |
| Contreras                                                           | Madrid    | Ramirez       | Vicente    |
| Cordero                                                             | Maldonado | Ramos         | Vidal      |
| Correa                                                              | Manuel    | Real          | Zarco      |
| Costa                                                               | Marcos    | Rey           |            |

| 1749 Summary by Province |              |                                     |                                         |                                     |                                         |
|--------------------------|--------------|-------------------------------------|-----------------------------------------|-------------------------------------|-----------------------------------------|
| Province                 | Total People | Surname Found in Sephardic Database | Surname not Found in Sephardic Database | Percent Found in Sephardic Database | Surname not Found in Sephardic Database |
| Andalucia                | 3514         | 2570                                | 944                                     | 73.14%                              | 26.86%                                  |
| Aragon                   | 448          | 332                                 | 116                                     | 74.11%                              | 25.89%                                  |
| Asturias                 | 4            | 2                                   | 2                                       | 50.0%                               | 50.0%                                   |
| Cantabria                | 12           | 6                                   | 6                                       | 50.0%                               | 50.0%                                   |
| Castilla y Leon          | 310          | 237                                 | 73                                      | 76.45%                              | 23.55%                                  |
| Castilla-La Mancha       | 1010         | 784                                 | 226                                     | 77.62%                              | 22.38%                                  |
| Cataluna                 | 1326         | 999                                 | 327                                     | 75.34%                              | 24.66%                                  |
| Exforzados               | 98           | 70                                  | 28                                      | 71.43%                              | 28.57%                                  |
| Extremadura              | 624          | 447                                 | 177                                     | 71.63%                              | 28.37%                                  |
| Madrid                   | 218          | 179                                 | 39                                      | 82.11%                              | 17.89%                                  |
| Murcia                   | 1358         | 918                                 | 440                                     | 67.6%                               | 32.4%                                   |
| Navarra                  | 34           | 27                                  | 7                                       | 79.41%                              | 20.59%                                  |
| Portugal                 | 44           | 30                                  | 14                                      | 68.18%                              | 31.82%                                  |
| Presidios N Africa       | 42           | 30                                  | 12                                      | 71.43%                              | 28.57%                                  |
| Valencia                 | 1304         | 958                                 | 346                                     | 73.47%                              | 26.53%                                  |
| <b>Total</b>             | <b>10346</b> | <b>7589</b>                         | <b>2757</b>                             | <b>73.35%</b>                       | <b>26.65%</b>                           |

Thus, in 1749 upwards of 70% of Romani-Cali carried Converso surnames. The next opportunity we have to look at Cali-Romani/Converso surnames comes from the 1783-1785 Cali-Romani Census.

### 1783-1785 Cali-Romani Census

In 1783, King Carlos III issued the Pragmática Sanción, a royal decree marking a shift in the Spanish monarchy's policy toward the Romani-Cali (Romani people). This decree abandoned punitive strategies in favor of assimilation. As a result, a comprehensive census was conducted between 1783 and 1785 to gather data on the Romani-Cali population.

The census aimed to document the demographic characteristics of the Romani-Cali, who had historically faced repression, most notably during the 1749 'Great Cali-Romani Round-up' (La Gran Redada). The new policy encouraged Romani-Cali to adopt a sedentary lifestyle and integrate more fully into Spanish society.

The census identified 12,037 Romani-Cali individuals and documented 567 heritable surnames. Approximately 10% of these surnames accounted for 75% of the Romani-Cali population, indicating a high concentration of certain family names.

Many Romani-Cali were found to use Hispanic surnames, often of aristocratic origin. This suggests considerable assimilation and the possibility of tracing genealogies over generations.

The data revealed regional variations in surname prevalence and settlement. Andalusia, and especially Seville and nearby areas like Utrera, had some of the highest Romani-Cali populations.

## Significance

This census remains one of the most detailed historical documents on Spain's Romani population during the ancient régime. It has enabled researchers to reconstruct Romani-Cali family histories, study assimilation patterns, and understand the cultural and social context of Romani-Cali in 18<sup>th</sup>-century Spain. (10-11)

### List of 1783-1785 Romani-Cali who shared Converso surnames.

| Surname   | Number of times name appears in the census | Surname   | Number of times name appears in the census |
|-----------|--------------------------------------------|-----------|--------------------------------------------|
| BAUTISTA  | 8                                          | MORENO    | 8                                          |
| CAMACHO   | 2                                          | MUÑOZ     | 3                                          |
| CAMPOS    | 7                                          | NAVARRO   | 6                                          |
| CARBONELL | 3                                          | NÚÑEZ     | 2                                          |
| CARMONA   | 2                                          | RAMOS     | 2                                          |
| CARRASCO  | 4                                          | REYES     | 7                                          |
| CARRILLO  | 3                                          | RODRIGUEZ | 9                                          |
| CASTRO    | 5                                          | ROMERO    | 3                                          |
| CONTRERAS | 2                                          | SALAZAR   | 12                                         |
| CRUZ      | 5                                          | SANTIAGO  | 5                                          |
| ESCUDERO  | 9                                          | SERRANO   | 7                                          |
| FAJARDO   | 2                                          | SOTO      | 4                                          |
| FLORES    | 5                                          | SÁNCHEZ   | 3                                          |
| GALVEZ    | 1                                          | TORRES    | 9                                          |
| HEREDIA   | 8                                          | VALENCIA  | 1                                          |
| MALDONADO | 8                                          | VARGAS    | 10                                         |
| MONTOYA   | 7                                          |           |                                            |

### 1783-1785 by Province

| Province           | Total People | Surname not Found in Sephardic Database | Surnames found in Sephardic Database | Percent non-Sephardic Surnames | Percent of Sephardic Surnames |
|--------------------|--------------|-----------------------------------------|--------------------------------------|--------------------------------|-------------------------------|
| Andalucia          | 896          | 192                                     | 704                                  | 21.43%                         | 78.57%                        |
| Aragon             | 103          | 37                                      | 66                                   | 35.92%                         | 64.08%                        |
| Asturias           | 2            | 0                                       | 2                                    | 00.00%                         | 100.0%                        |
| Cantabria          | 5            | 0                                       | 5                                    | 00.00%                         | 100.0%                        |
| Castilla y Leon    | 36           | 10                                      | 26                                   | 27.78%                         | 72.22%                        |
| Castilla-La Mancha | 297          | 145                                     | 152                                  | 48.82%                         | 51.18%                        |
| Cataluna           | 231          | 94                                      | 137                                  | 40.69%                         | 59.31%                        |
| Exforzados         | 25           | 13                                      | 12                                   | 52.00%                         | 48.00%                        |
| Extremadura        | 95           | 16                                      | 79                                   | 16.84%                         | 83.16%                        |
| Madrid             | 65           | 41                                      | 24                                   | 63.08%                         | 36.92%                        |
| Murcia             | 400          | 52                                      | 348                                  | 13.00%                         | 87.00%                        |
| Navarra            | 5            | 0                                       | 5                                    | 00.00%                         | 100.0%                        |
| Portugal           | 9            | 0                                       | 9                                    | 00.00%                         | 100.0%                        |
| Presidios N Africa | 11           | 2                                       | 9                                    | 18.18%                         | 81.82%                        |
| Valencia           | 323          | 120                                     | 203                                  | 37.15%                         | 62.85%                        |
| <b>Total</b>       | <b>2503</b>  | <b>722</b>                              | <b>1781</b>                          | <b>28.85%</b>                  | <b>71.15%</b>                 |

The curious thing about this data is that in 1749, Gypsies used 240 unique Sephardic surnames. Between 1783-1785, the Gypsies used 33 unique Sephardic surnames. The percentage of Sephardic names used remained more or less constant, with 1749 at 73.5% and 1783-1785 at 71.15%, but it does appear many Romani-Cali surnames disappeared, perhaps as a result of the Redonda.

As over 42% of our test subjects were identified as having Sephardic ancestry, it would pay to look at the surnames within this study and how many of them are used by Conversos.

## Surnames in the Study Group

The surnames in the study group which are Sephardic are highlighted in Bold.

| <i>Name</i>      | <i>Count</i> | <i>Name</i>          | <i>Count</i> |
|------------------|--------------|----------------------|--------------|
| <b>Abellan</b>   | 1            | <b>Hernandez</b>     | 7            |
| <b>Aguilera</b>  | 2            | <b>Jarque</b>        | 2            |
| <b>Ajama</b>     | 1            | <b>Jimenez</b>       | 11           |
| <b>Alvarez</b>   | 1            | <b>Luque</b>         | 1            |
| <b>Amaya</b>     | 2            | <b>Manazana</b>      | 1            |
| <b>Arjona</b>    | 1            | <b>Manzana</b>       | 1            |
| Bermudez         | 1            | <b>Montes</b>        | 1            |
| <b>Borja</b>     | 4            | <b>Montoya</b>       | 5            |
| <b>Bote</b>      | 1            | <b>Moreno</b>        | 7            |
| <b>Cadiz</b>     | 1            | <b>Motos</b>         | 5            |
| <b>Camacho</b>   | 1            | <b>Heredia Munoz</b> | 3            |
| <b>Cano</b>      | 1            | <b>Muñoz</b>         | 1            |
| <b>Carbonell</b> | 1            | <b>Navarro</b>       | 2            |
| Cla              | 1            | <b>Nunez</b>         | 4            |
| <b>Cortes</b>    | 11           | <b>Núñez</b>         | 1            |
| <b>Cruz</b>      | 1            | Palmai               | 1            |
| <b>Delgado</b>   | 2            | <b>Perez</b>         | 2            |
| Doya             | 2            | <b>Ramirez</b>       | 1            |
| <b>Duval</b>     | 1            | <b>Rodriguez</b>     | 2            |
| <b>Escudero</b>  | 1            | <b>Romero</b>        | 1            |
| Faustino         | 1            | <b>Rosa</b>          | 1            |
| Montoya          | 1            | <b>Salazar</b>       | 3            |
| <b>Fernandez</b> | 2            | <b>Santiago</b>      | 1            |
| <b>Fernández</b> | 1            | <b>Sevilla</b>       | 2            |
| Gabarri          | 3            | <b>Silva</b>         | 1            |
| <b>Garcia</b>    | 4            | <b>Torres</b>        | 1            |
| <b>García</b>    | 1            | Vamosine             | 1            |
| <b>Gimenez</b>   | 5            | <b>Vargas</b>        | 3            |
| Gorretta         | 1            | <b>Varo</b>          | 1            |
| <b>Heredia</b>   | 12           | <b>Vega</b>          | 1            |

## Conclusion

Of the 76 Romani-Cali in this study, 32 were identified as carrying Iberian Jewish ancestry. In addition, of the surnames used by this group 51 out of 59 (86.44%) are Sephardic-Jewish last names. All 32 Romani-Cali who carry Sephardic DNA have known Sephardic surnames. This could suggest these families were both Cali-Romai and Converso.

Genealogical research should be conducted to see if members of this group can be found on Converso family trees and beyond that, if their ancestors can be found in Inquisition records thereby establishing from whence came their Sephardic-Jewish ancestry.

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## Chapter 7: Caló-Romaní: Linguistic Evidence of Romani-Cali Connection to the Jewish People

Not only do the 76 Romani-Cali participants have predominantly Jewish ancestry, according to Lisardo Cano, their language, Caló-Romaní, reflects Jewish ancestry. As the research revealed, this group has Jewish ethnicities from around the world. Each of these ethnic Jewish groups used Hebrew in religious practice as well as day-to-day life. However, in day-to-day life, they spoke fusion languages whose components included Hebrew and their local language. Examples of this would be Yiddish, Ladino, or Judeo-Urdu. As this group of people has Jewish ancestry from the four corners of the Jewish Diaspora, it is logical their language would contain Hebrew elements.

Lisardo Cano Montes, a diligent and exacting researcher, spent decades looking for Hebrew/Jewish influences in the Caló-Romaní language. His “Dictionary of Caló-Romaní Hebrew Words” summarizes his decades of study. This chapter will examine linguistic evidence connecting the Romani-Cali and the Hebrew people.

This chapter is divided into two sections. The first, Lisardo Cano’s work with Caló-Romaní. The second, the greater context of Hebrew/Jewish Language in Romani Dialects.

### Caló-Romaní

To begin, here is an extract from Lisardo Cano Montes’ book: “Diccionario de Palabras Hebreo-Caló-Romaní.”

The Diccionario de Palabras Hebreo-Caló-Romaní explores linguistic parallels between Biblical Hebrew and the Caló dialect spoken by Spanish Roma (Gypsies).

Author Lisardo Cano Montes presents the argument that Romani-Caló contains numerous words with origins in Hebrew, challenging mainstream linguistic consensus that attribute Romani languages solely to Sanskrit or Indo-Aryan roots.

## 1. A Selection of Hebrew Words found in Caló-Romani

Lisardo Cano identifies hundreds of words in Caló-Romani that are either identical or strikingly similar in pronunciation and meaning to Hebrew words. A larger sample of these includes:

| <b>Spanish / Caló Word</b>   | <b>Hebrew Equivalent</b> | <b>Meaning</b>       |
|------------------------------|--------------------------|----------------------|
| <i>Devel (God)</i>           | Deuel                    | God                  |
| <i>Eloha</i>                 | Eloah                    | God                  |
| <i>Cam (Sun)</i>             | Kham                     | Sun                  |
| <i>Ken / Kel (House)</i>     | Ken / Kin                | Nest / Home          |
| <i>Chalar (to abandon)</i>   | Shalak                   | Cast out / abandon   |
| <i>Maturnar (to provide)</i> | Mattá                    | Gift / provision     |
| <i>Qali (village)</i>        | Qali                     | Same                 |
| <i>Panal (face)</i>          | Paná                     | Face / Presence      |
| <i>Abi (father)</i>          | Ab / Avi                 | Father               |
| <i>Debel / Undebel</i>       | El, Elohim               | God / The Lord       |
| <i>Chachipén (truth)</i>     | Emet / HaEmet            | Truth                |
| <i>Kanria (priest)</i>       | Kohen                    | Priest               |
| <i>Escarnecer (mock)</i>     | Litz / Gidel             | To mock              |
| <i>Teach (to teach)</i>      | Sakard / Lamed           | Teach                |
| <i>Dyanard (judge)</i>       | Dayan                    | Judge                |
| <i>Negá (afflicted)</i>      | Nega                     | Affliction / plague  |
| <i>SHOV (six)</i>            | Shesh                    | Six                  |
| <i>Hagar (to flee)</i>       | Hagar                    | Flee                 |
| <i>Zamar (sing)</i>          | Zamar                    | To sing              |
| <i>Rakel (to gather)</i>     | Raquel                   | To gather / assemble |
| <i>Shalom (peace)</i>        | Shalom                   | Peace                |
| <i>Tebel (world)</i>         | Tebel                    | World                |
| <i>Acher (other)</i>         | Acher                    | Other                |
| <i>Emetar (truthful one)</i> | Emet                     | Truthful             |
| <i>Dabar (word/speak)</i>    | Dabar                    | Word / speech        |
| <i>Natan (to give)</i>       | Natan                    | To give              |
| <i>Zan (kind/type)</i>       | Zán                      | Type / category      |
| <i>Shem (name)</i>           | Shem                     | Name                 |
| <i>Or (light)</i>            | Or                       | Light                |
| <i>Qadosh (holy)</i>         | Qadosh                   | Holy                 |
| <i>Barak (bless)</i>         | Barak                    | To bless             |
| <i>Dodi (beloved)</i>        | Dodi                     | Beloved              |

## 2. Historical and Scholarly Support

1. George Borrow (1888): Found correlations between Romani and Hebrew in his linguistic work *Romano Lavo-Lil*, documenting dozens of terms with Hebrew origins.

2. Christoph Wagenseil (1697): Argued that the original Romani language had substantial Hebrew elements, suggesting Jewish origin of early Gypsies in Germany.
3. Paul Wexler & Julia Howar: Identified Romani as originally classified under Judaic languages by UNESCO until 1972.
4. Jose Hutter (Modern Hebraist): Recognized linguistic similarities between Caló terms and Hebrew, validating several words with identical meanings.

### 3. Cultural and Linguistic Arguments

1. Compound Words & Apheresis: Many Caló terms show signs of apheresis and metathesis, linguistic phenomena also present in Hebrew.
2. Biblical Names and Terms: The use of words like “Adonay,” “Debel,” and “Undebel” in Caló implies liturgical and theological borrowing from Hebrew tradition.

### 4. Obstruction and Misclassification

The book contends that institutional biases and political decisions contributed to the misclassification of Caló-Romaní as an Indo-Aryan language, erasing its Hebrew connections. It claims that the International Romani standard created in 1971 deliberately removed or replaced many Hebrew-derived terms.

### Conclusion of Cano’s work

The evidence compiled by Lisardo Cano Montes presents a compelling case for Hebrew linguistic elements embedded in Caló-Romaní. Cano spent great effort compiling that which was known about Caló-Romaní. And in turn, he then did extensive research looking for Hebrew influences within the language. He is the only Caló-Romaní speaker to have done such work. He concludes Hebrew not only makes a significant contribution to Caló-Romaní, but it is, in fact, the basis of Caló-Romaní.

However, he is not the only scholar to have found Jewish elements in Caló-Romaní and other Romani dialects.

### Christoph Wagenseil and Hebrew Elements in Romani (1697)

Johann Christoph Wagenseil (1633-1705) was a German-Christian Hebraist, orientalist and professor of languages and law. He is most well-known for his studies of Jewish texts and for his controversial involvement in Christian-Jewish polemics. However, one of his lesser-known but historically significant contributions lies in his early linguistic analysis of Romani languages, particularly his assertion that they contained a substantial number of Hebrew elements.

In 1697, Wagenseil made an interesting claim: that many of the early Romani speakers in Germany were actually Jews or had been heavily influenced by Jewish communities. His reasoning was based on linguistic analysis. He pointed out that:

- Romani speech, particularly the criminal jargon known as Rotwelsch, included a high concentration of Hebrew words, more than could be expected from casual borrowing.
- He compared this “Cali-Romani Rotwelsch” to Yiddish, the vernacular of German Jews at the time, and concluded that the two languages shared so many similarities that the connection must have been historical, not accidental.
- He called this mixture a “Cali-Romani Rotwelsch”, a blend of Hebrew and German, and saw in it an “unmitigated affinity” with the speech used by Jews in his era.

Wagenseil wrote:

“Where would so many Hebrew words come from among so few German words, if not from the Jews?”

He believed this linguistic overlap proved that either the Romani people were originally Jews, or that Jews had significantly influenced the language and identity of the early Romani in the Germanic regions.

His comments, though speculative and shaped by the academic assumptions of the 17<sup>th</sup> century, represent one of the earliest European attempts to systematically analyze Romani speech and connect it to known languages like Hebrew.

Wagenseil's theory about the Jewish origins of Romani language and identity was echoed centuries later by scholars like Paul Wexler, though modern linguistics has largely rejected the idea that Romani is of Hebrew origin. Instead, it is now understood as an Indo-Aryan language that adopted Hebrew and Yiddish terms through contact, especially in Central Europe.

Nonetheless, Wagenseil's observations highlight the complex historical intersections between Romani, Jewish and German-speaking communities, especially in the shared use of secret or marginalized speech registers like Rot Welsch, which incorporated elements of German, Yiddish, Hebrew, and Romani. (1, 2, 3)

## George Borrow and the Hebrew Origins of Caló-Romani (1888)

George Borrow (1803-1881) was a British writer, linguist and missionary renowned for his deep engagement with the Romani (Cali-Romani) communities across Europe. In his later years, Borrow published *Romano Lavo-Lil: Word Book of the Romany or English Cali-Romani Language* (1888), which compiled vocabulary and cultural insights gathered over decades of travel and study.

One of Borrow's most striking linguistic claims in this work was that the Cali-Romani language, Caló-Romani, shared deep roots with Hebrew. He believed this connection was not incidental but evidence of a historical link between the Romani people and the ancient Hebrews. His conclusions were based on similarities in vocabulary, especially between Caló terms and biblical Hebrew.

Borrow specifically noted:

1. Lexical Parallels: Words in Caló-Romaní like “cam” (sun) and “petul” (tin) were compared to their Hebrew counterparts “kham” and “bedel”, respectively.
2. Spiritual and Cultural Vocabulary: He observed that many Caló terms had religious or ceremonial meanings also found in Hebrew, such as words for “Sabbath” (Shabat) or “soul” (nefesh/caló equivalents).
3. Speculative Ethnogenesis: Borrow implied that Gypsies might be descendants of the Lost Tribes of Israel, a view echoed by other 19<sup>th</sup>-century writers, often without strong evidence but driven by observed linguistic and cultural parallels.

Borrow's theories must be placed in the context of 19<sup>th</sup>-century comparative philology, a time when many scholars and missionaries sought biblical or Semitic origins for marginalized or mysterious peoples. While modern linguistics has largely rejected a direct Hebrew origin for Romani languages-showing instead that Romani originates from Northwestern India with later borrowings from Persian, Greek, Slavic, and other tongues-Borrow's hypothesis remains historically significant.

He compiled a vocabulary of the Romani language, including observations on its origins and influences. Borrow discusses the presence of Hebrew elements within the Romani lexicon and concluded this suggested a Hebraic origin. (4, 5, 6)

## Paul Wexler and the Hebrew Origins of Romani Languages

Paul Wexler, a linguist and professor at Tel Aviv University, is known for his provocative and unconventional theories in the field of historical linguistics, particularly regarding Jewish and Romani languages. Unlike most mainstream linguists, who classify Romani as an Indo-Aryan language that originated in India, Wexler challenges this narrative, proposing that Romani languages, especially Caló and European variants, are deeply influenced by-and may even derive from-Hebrew or other Semitic roots.

### Core Arguments in Wexler's Theory

#### *1. Relexification Hypothesis*

Wexler's primary method involves the theory of relexification, a linguistic process in which the vocabulary of one language is replaced by another, while the original grammar and structure remain intact. He argues that many so-called Indo-Aryan or Indic features in Romani languages may actually be superficial lexical overlays, while the underlying structure could be Semitic, particularly Hebrew or Aramaic.

#### *2. Caló and Judaeo-Romani as Jewish Languages*

In his analysis of Caló Romani and European Romani variants, Wexler proposes that these languages.

1. Contain hundreds of words that are identical or nearly identical to Biblical Hebrew.
2. Use grammatical constructions and idioms reminiscent of Semitic syntax.

3. Have sound changes and phonetic shifts more consistent with Hebrew than with Indo-Aryan origins.

In *Relexification in Creole and Non-Creole Languages* (co-authored with Julia Horvath), Wexler argues that the Calí-Romani languages of Spain and parts of Europe were originally Jewish languages that underwent heavy relexification from local non-Jewish tongues such as Spanish or Greek.

#### *Evidence Cited by Wexler*

1. Lexical matches between Romani and Hebrew words beyond mere coincidence or borrowing.
2. Presence of Hebrew words in Caló-Romaní dialects, especially religious, social, and kinship terms.
3. Historical accounts (e.g., from the 17<sup>th</sup> century) identifying the Romani language as “Hebrew” or “Judaic” in nature. This included example of Romani dialects using Hebrew-derived morphology or phrase structure and observation that early dictionaries of criminal jargons (e.g., Rotwelsch) listed numerous Hebrew or Yiddish terms.

Wexler’s argument is that Romani languages, particularly Caló, may have originated from Jewish languages through a process of relexification, where the original vocabulary is replaced with that of another language while retaining the original grammar. In other words, the original language was Hebrew and over time the vocabulary was replaced with non-Hebrew words.

Wexler’s theory is highly controversial and has been rejected by the majority of linguists in Romani studies. The prevailing academic view remains that Romani is; an Indo-Aryan language, with clear roots in languages like Hindi and Punjabi; developed in northwestern India, with migrations through Persia and the Byzantine Empire into Europe; picked up loanwords from Persian, Greek, Slavic, and Hebrew/Yiddish due to sociocultural contact, not ancestral origin.

Critics argue that Wexler’s methodology underestimates the role of borrowing and overstates structural similarities. They also point out a lack of comprehensive phonological and syntactic evidence for a Semitic base in Romani. (Matras, Yaron 10-13)

#### **Discussion**

Ancient and medieval Hebrew elements can be found in the language spoken by the Romani-Calí, Caló-Romaní. Lisardo Cano Montes proved this.

Some suggest this is because Gypsies and Jews were marginalized people on the Iberian Peninsula, lived in the same areas, before the Expulsion of Jews in 1492, and after. They had contact with each other and borrowed words from their neighbors. Hebrew words entered into the Calí-Romani lexicon due to proximity and shared social position. (Matras)

Others, Cano, Wagenseil, Borrows, and Wexler included, suggest there is more to this than neighbor word sharing; the Gypsies were of Jewish origins and Hebrew/Jewish dialects were their

native tongues to which local vocabulary was substituted, i.e., “besar” (Hebrew for meat) was replaced by the Spanish “carne” for the same.

Modern genetic research may shed new light onto the topic. Looking at the 76 Romani-Cali who participated in this study, the following was found:

1. 98.65% carried one or more Jewish genetic markers. Ancient, Medieval, modern or all three.
2. 32.14% of were DNA matches to ancient Canaanites.
3. 35.71% were matches to ancient Semites (Arabian)
4. 100% of participants were DNA matches to the skeletal remains of the 11<sup>th</sup> century Norwich, England Jewish cemetery and the 12<sup>th</sup> century Erfurt, Germany Jewish cemetery.
5. The overall group showed an elevated amount of Levantine DNA matches which is suggestive of a Jewish people.

Considering 67.88% of the participants were DNA matches to ancient Semitic people (3500-11500 BC), and 100% of them were DNA matches to Medieval Jews, it is likely they brought Hebrew into Caló-Romaní through ancestry rather than proximity borrowing.

One of the interesting findings researching 76 Romani-Cali from 15 provinces was this: 90.9% of all participants carried Indian-Jewish DNA (Bnei-Menashe, Cochin-Jewish, Bnai Israel, or all three.) If Romani-Cali all have significant Indian-Jewish heritage, it would stand to reason the language of Indian Jews could have influenced their language, even in far off Spain.

## Languages of Indian Jews

The languages spoken by Indian-Jewish communities-such as the Bene Israel and Cochin Jews, - contain numerous Hebrew and Aramaic loanwords, especially in religious, ritual, and cultural contexts. These Hebrew elements are typically embedded into local Indian languages, such as Marathi, Malayalam, or Judeo-Urdu, depending on the region and group. Major Indian-Jewish Communities and Their Languages

### *1. Bene Israel (Maharashtra, Mumbai area)*

Spoken language: Primarily Marathi, with some use of Hebrew-Aramaic words.

Examples: Shabbat (Sabbath), kosher terms, Hebrew liturgical phrases and greetings (shalom, baruch, etc.).

Usage: Hebrew is reserved mainly for ritual, religious instruction, and synagogue use, but a few terms have entered everyday speech in hybrid forms.

### *2. Cochin Jews (Kerala)*

Spoken language: Malayalam, particularly a Judeo-Malayalam variety.

Hebrew influence: Over 1,000 Hebrew words identified in Cochin-Jewish texts and oral traditions. Examples include kohen (priest), Torah, Seder, and various blessings.

Script: Malayalam script was used alongside Hebrew in religious texts.

(14-17)

As Hebrew can be found in the languages of the Indian Jews, the Hebrew words in Caló-Romani could have come with through their Indian-Jewish ancestry. However, all participants were found to carry mixed Jewish ethnicities including; Indian-Jewish (Cochin-Jewish, Bnai-Israel, and Bnei-Menashe), and Central Asian-Jewish (Uzbeki-Jewish), Western Asian-Jewish (Iranian and Iraqi-Jewish), CaucAsian-Jewish (Georgian and Azari-Jewish), North-African Jewish (Libyan, Tunisian, Algerian, and Moroccan-Jewish), and European-Jewish (Sephardic and Ashkenazi-Jewish) ancestry.

All the Jewish communities in the Diaspora spoke a language which represents a fusion of local words, Hebrew words, Aramaic words, most often written in Hebrew script. As this group of Calo-Romani carry ancestry from all these communities, the Hebrew in their language, could have arrived there from any one of the genetic inputs.

1. Indian Jews: Judeo-Malayalam
2. Uzbeki Jews: Judeo-Tajik
3. Iranian Jews: Judeo-Farsi
4. Iraqi Jews: Judeo-Arabic
5. Yemenite Jews: Judeo-Yemeni Arabic
6. Georgian Jews: Judeo-Georgian
7. Azerbaijani Jews: Judeo-Tat or Juhuru
8. Libyan Jews: Tripolitanian Judeo-Arabic
9. Moroccan Jews: Judeo-Arabic
10. Algerian Jews: Judeo-Arabic
11. Spanish Jews: Ladino
12. Ashkenazi Jews: Yiddish

## Chapter 7 References

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In this work, Wagenseil analyzed Rotwelsch-a German-based cryptolect-and observed numerous Hebrew loanwords. He concluded that Gypsies were Jews who had concealed their Jewish origin by fabricating an Egyptian origin. This reflects the confusion of Romani with cryptolects based on non-Romani languages common at that time.

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## Conclusion: The Jewish Origins of the Romani-Cali

The seven chapters of this study present a comprehensive and multidisciplinary report supporting the hypothesis that the tested Romani (Cali-Romani) descend from ancient and medieval Jewish communities. Drawing on historical accounts, forensic DNA analysis, population genetics, haplogroup comparisons, linguistic research, and surname correlations, the evidence suggests a deep and diverse Jewish heritage among the Romani-Cali.

Genetic testing reveals that all tested individuals show matches with Ashkenazi, Sephardic, and Mizrahi Jewish populations, as well as with Cochin, Bnai Israel, and Bnei-Menashe Jews from South Asia. The diversity of Jewish genetic markers-including STR-based forensic data, admixture models, and Y-DNA haplogroups-demonstrates a layered ancestry that cannot be attributed to a single Jewish migration or community. It may suggest they descend from a remnant of the now extinct Jewish travelling merchant Jews. Most recently, the Rhadhanite Jews.

Linguistic evidence also reinforces this hypothesis. The Caló language spoken by the Spanish-Romani contains dozens, if not hundreds, of words of clear Hebrew origin, preserved through oral tradition. Scholars from George Borrow to Christoph Wagenseil and Paul Wexler have documented these Semitic traces, and contemporary researchers like Lisardo Cano Montes have built dictionaries cataloging the overlap.

Surnames, shared between Romani-Cali and Conversos, furtherly suggest a link between these two people. More than 70% of Cali-Romani surnames recorded in 18<sup>th</sup>-century Spanish censuses also appear in Sephardic-Jewish records. This overlap, coupled with known interactions between Romani-Cali and Conversos, suggests potential intermingling. In addition to descending from Jewish travelling merchants, the Romani-Cali appear to have substantial Sephardic-Jewish ancestry.

In sum, the genetic, linguistic, historical, and cultural evidence presented in this series of chapters makes a compelling case for the Jewish ancestry of the Cali-Romani population. While this may not be universal across all Roma communities, the findings underscore the need to revisit assumptions about Romani origins and consider their deep and multifaceted connections to the Jewish Diaspora. Further research, especially with larger sample sizes and broader geographic comparisons, is essential to fully illuminate this Jewish heritage.

Based on the data currently available, it can be concluded the Romani-Cali involved in this project are part of the Jewish Diaspora. More research may clarify how they transitioned from their origins, a Pan-Ethnic Jewish ethnicity, to “Cali-Romani”.

# Appendices

## Chapter 2:

### Appendix A: Ancient Ancestry

| <b>Detailed Ancestry Report<br/>(Canaanite, Levantine, Arabian Peninsula, Egyptian)</b> |                  |                 |                          |                 |                                        |
|-----------------------------------------------------------------------------------------|------------------|-----------------|--------------------------|-----------------|----------------------------------------|
| <b>Name</b>                                                                             | <b>Canaanite</b> | <b>Levanite</b> | <b>Arabian Peninsula</b> | <b>Egyptian</b> | <b>Total from Selected Ethnicities</b> |
| Duval Jimenez                                                                           | 0.00%            | 0.00%           | 0.00%                    | 0.00%           | 0.00%                                  |
| Cortes Cortes                                                                           | 0.00%            | 0.00%           | 9.40%                    | 0.00%           | 9.40%                                  |
| Doya Gimenez                                                                            | 0.00%            | 0.00%           | 0.00%                    | 0.00%           | 0.00%                                  |
| Gimenez Gimenez                                                                         | 0.00%            | 0.00%           | 6.00%                    | 0.00%           | 6.00%                                  |
| Ajama Heredia                                                                           | 0.00%            | 0.00%           | 0.00%                    | 0.00%           | 0.00%                                  |
| Heredia Munoz                                                                           | 0.00%            | 0.00%           | 0.00%                    | 0.00%           | 0.00%                                  |
| Motos Manzana                                                                           | 0.00%            | 4.80%           | 9.80%                    | 2.60%           | 17.20%                                 |
| Motos Motos                                                                             | 0.00%            | 2.40%           | 0.00%                    | 0.00%           | 2.40%                                  |
| Hernandez Heredia                                                                       | 11.20%           | 0.00%           | 10.20%                   | 0.00%           | 21.40%                                 |
| Motos Hernandez                                                                         | 10.80%           | 0.00%           | 3.00%                    | 0.00%           | 13.80%                                 |
| Manzano Manzano                                                                         | 0.00%            | 6.80%           | 1.20%                    | 9.80%           | 17.80%                                 |
| Heredia Heredia                                                                         | 0.00%            | 0.00%           | 1.60%                    | 0.00%           | 1.60%                                  |
| Gimenez Gimenez                                                                         | 0.00%            | 0.00%           | 7.60%                    | 0.00%           | 7.60%                                  |
| Heredia                                                                                 | 0.00%            | 0.00%           | 0.00%                    | 0.00%           | 0.00%                                  |
| Heredia Heredia                                                                         | 16.20%           | 0.00%           | 0.00%                    | 0.00%           | 16.20%                                 |
| Bermudez Torres                                                                         | 0.00%            | 0.00%           | 2.20%                    | 0.00%           | 2.20%                                  |
| Cortes Moreno                                                                           | 0.00%            | 0.00%           | 0.00%                    | 0.00%           | 0.00%                                  |
| Gabarri Gabarri                                                                         | 0.00%            | 0.00%           | 0.00%                    | 2.20%           | 2.20%                                  |
| Cadiz Fernandez                                                                         | 14.20%           | 5.60%           | 2.20%                    | 0.00%           | 22.00%                                 |
| Hernandez                                                                               | 0.00%            | 0.00%           | 4.00%                    | 2.60%           | 6.60%                                  |
| Garcia Jarque                                                                           | 0.00%            | 0.00%           | 0.00%                    | 0.00%           | 0.00%                                  |
| Garcia Nunez                                                                            | 0.00%            | 0.00%           | 0.00%                    | 0.20%           | 0.20%                                  |
| Santiago Heredia                                                                        | 4.40%            | 7.60%           | 0.00%                    | 5.80%           | 17.80%                                 |
| Hernandez Jimenez                                                                       | 0.00%            | 0.00%           | 0.00%                    | 7.20%           | 7.20%                                  |
| Borja Ramirez                                                                           | 0.80%            | 0.00%           | 0.00%                    | 5.40%           | 6.20%                                  |
| Heredia de la Rosa                                                                      | 0.00%            | 0.00%           | 0.00%                    | 6.00%           | 6.00%                                  |
| Cortes Cortes                                                                           | 17.20%           | 1.80%           | 5.00%                    | 0.00%           | 24.00%                                 |

## Appendix B: Ancient Ancestries Often Contributing to Modern Jewish Ancestry

### Detailed Ancestry Breakdown

| Detailed Ancestry Breakdown |             |                     |                    |                        |                        |             |             |                     |            |             |                                   |
|-----------------------------|-------------|---------------------|--------------------|------------------------|------------------------|-------------|-------------|---------------------|------------|-------------|-----------------------------------|
| Name                        | Anatolian % | Arabian Peninsula % | Bactria-Margiana % | Bronze Age Anatolian % | Bronze Age Caucasian % | Canaanite % | Caucasian % | Copper age Zagros % | Egyptian % | Levantine % | Total from Selected Ethnicities % |
| Duval Jiménez               | 18.40       | 0.00                | 7.00               | 18.40                  | 18.20                  | 0.00        | 18.20       | 5.40                | 0.00       | 0.00        | 85.60                             |
| Cortes Cortes               | 30.40       | 9.40                | 2.00               | 0.00                   | 23.00                  | 0.00        | 23.00       | 1.40                | 0.00       | 0.00        | 89.20                             |
| Doya Gimenez                | 13.20       | 0.00                | 0.00               | 13.20                  | 20.60                  | 0.00        | 20.60       | 0.00                | 0.00       | 0.00        | 67.60                             |
| Gimenez Gimenez             | 8.00        | 6.00                | 3.80               | 8.00                   | 12.60                  | 0.00        | 12.60       | 4.40                | 0.00       | 0.00        | 55.40                             |
| Ajama Heredia               | 0.00        | 4.80                | 5.40               | 8.00                   | 5.60                   | 0.00        | 0.00        | 0.00                | 0.00       | 0.00        | 2.38                              |
| Heredia Munoz               | 25.00       | 0.00                | 0.00               | 0.00                   | 23.40                  | 0.00        | 23.40       | 0.00                | 0.00       | 0.00        | 71.80                             |
| Motos Manzana               | 14.60       | 9.80                | 0.00               | 14.60                  | 24.00                  | 0.00        | 24.00       | 0.00                | 2.60       | 4.80        | 94.40                             |
| Motos Motos                 | 46.80       | 0.00                | 0.00               | 0.00                   | 8.80                   | 0.00        | 8.80        | 0.00                | 0.00       | 2.40        | 66.80                             |
| Hernandez Heredia           | 0.00        | 10.20               | 0.00               | 0.00                   | 15.00                  | 11.20       | 15.00       | 0.00                | 0.00       | 0.00        | 51.40                             |
| Motos Hernandez             | 0.00        | 3.00                | 0.00               | 0.00                   | 0.00                   | 10.80       | 23.00       | 0.00                | 0.00       | 0.00        | 36.80                             |
| Manzano Manzano             | 17.60       | 1.20                | 5.40               | 17.60                  | 18.20                  | 0.00        | 18.20       | 1.00                | 9.80       | 6.80        | 95.80                             |
| Heredia Heredia             | 33.00       | 1.60                | 0.00               | 0.00                   | 11.00                  | 0.00        | 11.00       | 0.00                | 0.00       | 0.00        | 56.60                             |
| Gimenez Gimenez             | 3.60        | 7.60                | 0.00               | 3.60                   | 0.00                   | 0.00        | 21.00       | 0.00                | 0.00       | 0.00        | 35.80                             |
| Heredia Heredia             | 29.20       | 0.00                | 0.00               | 0.00                   | 17.00                  | 0.00        | 17.00       | 0.00                | 0.00       | 0.00        | 63.20                             |
| Heredia Heredia             | 10.00       | 0.00                | 0.00               | 10.00                  | 10.40                  | 16.20       | 10.40       | 14.20               | 0.00       | 0.00        | 71.20                             |

| Detailed Ancestry Breakdown |             |                     |                    |                        |                        |             |             |                     |            |             |                                   |
|-----------------------------|-------------|---------------------|--------------------|------------------------|------------------------|-------------|-------------|---------------------|------------|-------------|-----------------------------------|
| Name                        | Anatolian % | Arabian Peninsula % | Bactria-Margiana % | Bronze Age Anatolian % | Bronze Age Caucasian % | Canaanite % | Caucasian % | Copper age Zagros % | Egyptian % | Levantine % | Total from Selected Ethnicities % |
| Bermudez Torres             | 27.80       | 2.20                | 14.40              | 27.80                  | 0.00                   | 0.00        | 0.00        | 0.00                | 0.00       | 0.00        | 72.20                             |
| Cortes Moreno               | 33.20       | 0.00                | 0.00               | 33.20                  | 21.60                  | 0.00        | 21.60       | 11.00               | 0.00       | 0.00        | 120.60                            |
| Gabarri Gabarri             | 27.60       | 0.00                | 0.00               | 0.00                   | 22.80                  | 0.00        | 22.80       | 0.00                | 2.20       | 0.00        | 75.40                             |
| Cadiz Fernandez             | 9.80        | 2.20                | 0.00               | 9.80                   | 27.40                  | 14.20       | 27.40       | 0.40                | 0.00       | 5.60        | 96.80                             |
| Josue Hernandez             | 22.60       | 4.00                | 10.20              | 22.60                  | 0.00                   | 0.00        | 0.00        | 0.00                | 2.60       | 0.00        | 62.00                             |
| Garcia Jarque               | 13.80       | 0.00                | 0.00               | 13.80                  | 12.40                  | 0.00        | 12.40       | 2.60                | 0.00       | 0.00        | 55.00                             |
| Miguel Garcia Nunez         | 31.00       | 0.00                | 11.60              | 31.00                  | 0.00                   | 0.00        | 0.00        | 0.00                | 0.20       | 0.00        | 73.80                             |
| Santiago Heredia            | 0.00        | 0.00                | 0.00               | 0.00                   | 14.00                  | 4.40        | 14.00       | 0.00                | 5.80       | 7.60        | 45.80                             |
| Hernandez Jimenez           | 0.00        | 0.00                | 34.80              | 0.00                   | 5.40                   | 0.00        | 5.40        | 0.00                | 7.20       | 0.00        | 52.80                             |
| Borja Ramirez               | 19.40       | 0.00                | 0.00               | 19.40                  | 8.80                   | 0.80        | 8.80        | 0.00                | 5.40       | 0.00        | 62.60                             |
| Heredia de la Rosa          | 0.00        | 0.00                | 0.00               | 0.00                   | 18.20                  | 0.00        | 18.20       | 0.00                | 6.00       | 0.00        | 42.40                             |
| Cortes Cortes               | 3.60        | 5.00                | 0.00               | 3.60                   | 17.20                  | 17.20       | 17.20       | 0.00                | 0.00       | 1.80        | 65.60                             |

## Appendix C: South & Southeast Asian Origins

| South and Southeast Asian Origins |                                |                 |              |                                 |
|-----------------------------------|--------------------------------|-----------------|--------------|---------------------------------|
| Name                              | Ancient Ancestral South Indian | Southeast Asian | Indus Valley | Total From Selected Ethnicities |
| Duval Jiménez                     | 12.80%                         | 0.00%           | 2.40%        | 15.20%                          |
| Cortes Cortes                     | 14.60%                         | 0.00%           | 0.00%        | 14.60%                          |
| Doya Gimenez                      | 14.20%                         | 0.00%           | 0.00%        | 14.20%                          |
| Gimenez Gimenez                   | 10.00%                         | 0.00%           | 3.60%        | 13.60%                          |
| Ajama Heredia                     | 7.20%                          | 0.00%           | 3.60%        | 3.60%                           |
| Heredia Munoz                     | 19.20%                         | 0.00%           | 2.40%        | 21.60%                          |
| Motos Manzana                     | 11.00%                         | 0.00%           | 5.00%        | 16.00%                          |
| Motos Motos                       | 19.00%                         | 0.00%           | 0.00%        | 19.00%                          |
| Hernadez Heredia                  | 13.80%                         | 0.00%           | 2.40%        | 16.20%                          |
| Motos Hernandez                   | 15.80%                         | 0.00%           | 0.40%        | 16.20%                          |
| Manzano Manzano                   | 11.60%                         | 0.00%           | 1.20%        | 12.80%                          |
| Heredia Heredia                   | 11.40%                         | 0.00%           | 13.40%       | 24.80%                          |
| Gimenez Gimenez                   | 12.20%                         | 0.00%           | 12.20%       | 24.40%                          |
| Heredia                           | 19.60%                         | 0.00%           | 1.20%        | 20.80%                          |
| Heredia Heredia                   | 19.80%                         | 0.00%           | 0.00%        | 19.80%                          |
| Bermudez Torres                   | 11.60%                         | 0.00%           | 1.60%        | 13.20%                          |
| Cortes Moreno                     | 13.60%                         | 0.00%           | 0.00%        | 13.60%                          |
| Gabarri gabarri                   | 15.40%                         | 0.00%           | 0.00%        | 15.40%                          |
| Cadiz Fernandez                   | 12.80%                         | 0.00%           | 0.00%        | 12.80%                          |
| Hernandez                         | 14.60%                         | 0.00%           | 0.00%        | 14.60%                          |
| Garcia Jarque                     | 7.00%                          | 0.00%           | 3.40%        | 10.40%                          |
| Garcia Nunez                      | 15.80%                         | 0.00%           | 1.00%        | 16.80%                          |
| Santiago Heredia                  | 15.80%                         | 0.00%           | 5.40%        | 21.20%                          |
| Hernandez Jimenez                 | 10.60%                         | 0.00%           | 0.00%        | 10.60%                          |
| Borja Ramirez                     | 10.20%                         | 0.00%           | 20.00%       | 30.20%                          |
| Heredia de la Rosa                | 9.00%                          | 0.00%           | 17.00%       | 26.00%                          |
| Cortes Cortes                     | 18.60%                         | 0.00%           | 1.20%        | 19.80%                          |

## Chapter 3:

### Appendix A: Reference studies used by DNA Consultants to identify Jewish Ethnic matches and Jewish Markers

#### Mallorcan/Chueta Study

1. Genetic variability at nine STR loci in the Chueta (Majorcan Jews) and the Balearic populations investigated by a single multiplex reaction Int J Legal Med (2000) 113 : 263-267
2. Tomàs A. Picornell, J. A. Castro, M. M. Ramón, L. Gusmão, M. V. Lareu, A. Carracedo
3. Received: 12 April 1999 / Received in revised form: 11 August 1999

#### Hungarian/Ashkenazi Study

1. Analysis of the population heterogeneity in Hungary using fifteen forensically informative STR markers. Forensic Science International 158 (2006) 244-249
2. Balazs Egyeda\*, Sándor Furedi, Miklós Angyal, István Balogh, Lajos Kalmar, Zsolt Padar

#### Jewish Study

1. Jewish population genetic data in 20 polymorphic loci
2. Forensic Science International 125 (2002) 52-58
3. Antonia Picornell\*, Carmen Toma's, Gema Jimenez, José A. Castro, M. Misericordia Ramon
4. Laboratori de Genetica, Departament de Biologia, Universitat de les Illes Balears, Cra. Valldemossa, km 7.5, 07071 Palma de Mallorca, Balears, Spain

Received 25 October 2001; accepted 26 October 2001

#### Israeli Jewish Study

1. Erroneous identification in a mixed population: simulation using Israeli STR data Int J Legal Med (2004) 118 : 111-114
2. Michael Korostishevsky ---Ron Loewenthal ---Yelena Slomov---Ephraim Gazit

Received: 25 June 2003 / Accepted: 2 September 2003 / Published online: 24 December 2003

### Appendix B: Jewish Markers Noted By DNA Consultants

Extracted from DNA Consultants Report. ([www.dnaconsultants.com](http://www.dnaconsultants.com))

**"JEWISH.** These markers do not necessarily point to Jewish ancestry but can also signal ancestry in any of the places where Jews historically lived due to Jews' admixture with local populations, conversion, identity loss and the phenomenon of Crypto-Judaism. *Still, statistics show that over 80% of modern-day Jews have one or more markers.* They are sensitive for both major branches of Judaism,

Ashkenazi and Sephardic, or Spanish, Jews. Ashkenazi Jews ("German," in Hebrew) started out in the Rhineland and northern France following the collapse of the Roman Empire. During the Age of Charlemagne around 800 they began to settle eastward as the lands of the Central and Eastern European Slavs were conquered by the Franks and Germans. There they met the Turkic Khazar people moving in from the Caucasus region. They reached a high point in their development in seventeenth-century Poland, Lithuania, Silesia, the Ukraine, Russia and Romania. During Germany's Third Reich, six million or more of them were killed in the Holocaust. In contemporary times, they represent perhaps the best-known face of Judaism, accounting for about 80% of American and Israeli Jews. Because they trace back to a small nucleus (founder effect or bottlenecking) which kept expanding while preserving the same gene pool (genetic drift), Ashkenazi Jews have very recognizable genetic traits. They are subject to a range of hereditary disorders such as Tay-Sachs disease. As in the case of other markers, Jewish I, II and III are not completely conclusive in showing ancestry, nor do they tell you how much you may have or where in your genealogies it may stem from.

**JEWISH I.** This is the most common of the three markers. It can occur without known Jewish ancestry for a variety of reasons including an ancestor's conversion to Christianity during the centuries of persecutions against Jews in Europe. Its frequency is highest in Poles, Russians, Germans, Hungarians, Romanians and Slavic peoples who intermarried with Ashkenazi Jews. It also appears in Spanish, Portuguese and Moroccan Jews (Sephardim).

**JEWISH II.** This marker is the strongest. It is found in Jewish families who have intermarried with other Jews down through the centuries. It is characteristic of Ashkenazi Jews.

**JEWISH III.** This marker is an indication of Middle Eastern roots. Preserved by Jews, it is also borne by Kurds, Syrians, Arabs, Berbers, Basques, Turks, Greeks, Italians and other populations from the ancient world. It is particularly common in Sephardic Jews.

**JEWISH IV.** A marker indicative of Tatar or Khazar heritage. Khazars were a Central Asian people of Turkic, Hunnish and Iranian elements that arose in the Caucasus region. After converting to Judaism in the early Middle Ages, they moved westward into Russia and the Ukraine under pressure from Islam, eventually becoming a large component of Eastern and Central European Jewry. Many Ashkenazi Jews now find they have some Khazar (or intermingled Tatar) ancestry."

## Chapter 4: Appendix A:

### 1. Admixture

| Admixture           |                 |                 |                 |              |                   |               |                   |                   |                |                     |               |                  |       |
|---------------------|-----------------|-----------------|-----------------|--------------|-------------------|---------------|-------------------|-------------------|----------------|---------------------|---------------|------------------|-------|
| Name                | East European % | West European % | Mediterranean % | West Asian % | Southwest Asian % | South Asian % | Northeast Asian % | Southeast Asian % | East African % | Northwest African % | Neo African % | Palaeo African % | Kit # |
| Aguilera Rodriguez, | 7.22            | 16.24           | 24.09           | 18.15        | 3.98              | 21.16         | 1.60              | 3.35              | 1.24           | 2.97                |               |                  |       |
| Aguilera            | 7.22            | 16.24           | 24.09           | 18.15        | 3.98              | 21.16         | 1.60              | 3.35              | 1.24           | 2.97                |               |                  |       |
| Ajama Heredia       | 5.57            | 28.43           | 32.09           | 12.12        | 3.86              | 11.46         |                   | 1.39              | 1.24           | 3.14                | 0.71          |                  |       |
| Amaya               | 7.53            | 15.75           | 24.91           | 14.17        | 7.08              | 23.03         |                   | 3.79              | 1.06           | 2.42                | 0.26          |                  |       |
| Bermudez Torres     | 6.99            | 21.51           | 27.95           | 14.02        | 5.22              | 16.89         | 0.72              | 2.52              | 0.92           | 3.09                |               |                  |       |
| Borja Ramirez       | 5.76            | 15.44           | 24.67           | 17.29        | 6.94              | 21.12         |                   | 4.74              | 1.36           | 2.16                |               | 0.51             |       |
| Cadiz Fernandez     | 7.88            | 17.67           | 23.12           | 18.70        | 7.26              | 16.09         | 0.17              | 5.07              | 0.66           | 3.38                |               |                  |       |
| Carbonell Abellan   | 7.35            | 27.78           | 29.01           | 9.04         | 6.06              | 12.61         | 0.00              | 3.50              | 0.74           | 3.92                | 0.00          | 0.00             |       |
| Cortes Cortes       | 7.84            | 16.15           | 25.02           | 18.46        | 3.76              | 20.60         | 0.78              | 4.44              | 0.00           | 2.56                | 0.37          | 0.00             |       |
| Cortes Cortes       | 7.16            | 17.10           | 23.59           | 17.84        | 7.86              | 19.02         | 0.00              | 4.92              | 0.78           | 1.73                | 0.00          | 0.00             |       |
| Cortes Moreno       | 6.41            | 17.13           | 24.65           | 17.48        | 5.52              | 20.32         | 0.29              | 4.46              | 0.06           | 2.90                | 0.00          | 0.76             |       |
| Cortes Moreno       | 5.55            | 19.95           | 24.82           | 16.47        | 5.41              | 19.65         | 0.68              | 3.60              | 1.25           | 1.73                | 0.00          | 0.90             |       |
| Cortes Moreno       | 8.03            | 17.16           | 24.18           | 18.51        | 5.10              | 18.00         | 1.08              | 4.75              | 0.85           | 1.84                | 0.00          | 0.51             |       |
| Cortes Moreno       | 7.26            | 17.69           | 23.37           | 17.39        | 5.88              | 19.21         | 0.95              | 3.78              | 0.17           | 2.84                | 0.00          | 1.46             |       |
| Cortes              | 5.37            | 20.08           | 22.48           | 10.11        | 3.24              | 11.65         | 2.34              | 2.43              | 1.86           | 1.17                | 12.78         | 6.48             |       |

| Admixture          |                 |                 |                 |              |                   |               |                   |                   |                |                     |               |                  |           |
|--------------------|-----------------|-----------------|-----------------|--------------|-------------------|---------------|-------------------|-------------------|----------------|---------------------|---------------|------------------|-----------|
| Name               | East European % | West European % | Mediterranean % | West Asian % | Southwest Asian % | South Asian % | Northeast Asian % | Southeast Asian % | East African % | Northwest African % | Neo African % | Palaeo African % | Kit #     |
| Cano Delgado       | 6.29            | 26.82           | 31.41           | 15.71        | 5.16              | 9.29          | 0.00              | 1.17              | 0.73           | 2.72                | 0.72          | 0.00             |           |
| Doya Gimenez       | 10.08           | 20.38           | 26.43           | 19.25        | 3.25              | 14.65         | 1.39              | 2.45              | 0.00           | 2.12                | 0.00          | 0.00             |           |
| Doya               | 7.76            | 21.81           | 22.06           | 16.71        | 5.83              | 19.51         | 1.58              | 1.68              | 0.34           | 2.71                | 0.00          | 0.00             |           |
| Duval Jimenez      | 8.28            | 20.86           | 25.34           | 16.14        | 5.09              | 18.68         | 0.00              | 1.93              | 1.50           | 2.18                | 0.00          | 0.00             |           |
| Hernandez Gorretta | 4.43            | 22.25           | 25.80           | 13.39        | 5.06              | 20.09         | 0.00              | 2.52              | 2.06           | 3.08                | 0.23          | 1.07             |           |
| Fernández Muñoz    | 6.82            | 15.41           | 22.73           | 19.39        | 5.74              | 22.52         | 0.52              | 2.60              | 1.00           | 2.25                | 0.76          | 0.25             |           |
| Gabarri Gabarri    | 5.07            | 21.17           | 24.39           | 17.20        | 7.87              | 17.71         | 0.02              | 3.61              | 0.24           | 1.73                | 1.01          |                  | GQ7710869 |
| Gabarri Hernandez  | 8.10            | 17.85           | 23.75           | 17.58        | 6.60              | 18.42         | 0.00              | 4.63              | 0.40           | 2.67                | 0.00          |                  | BC4504890 |
| Garcia Jarque      | 7.32            | 28.44           | 29.21           | 13.89        | 3.86              | 8.92          | 0.60              | 1.54              | 1.38           | 3.62                | 1.22          |                  | NH3293429 |
| Garcia Jarque      | 7.03            | 27.36           | 28.37           | 12.35        | 4.62              | 11.14         | 0.04              | 2.65              | 0.90           | 4.95                | 0.50          |                  | PX1755472 |
| Garcia Nunez, Jose | 6.95            | 16.72           | 21.68           | 18.22        | 7.13              | 19.57         | 1.29              | 3.93              | 0.92           | 3.22                | 0.35          |                  | NB7250219 |
| Garcia Nunez       | 9.47            | 16.51           | 22.33           | 17.22        | 7.69              | 19.94         | 1.00              | 3.57              | 0.31           | 1.86                | 0.09          |                  | GQ3943149 |
| Gimenez Gimenez    | 9.10            | 24.94           | 25.09           | 15.90        | 4.64              | 13.36         | 0.00              | 2.51              | 0.75           | 3.70                | 0.00          |                  | AJ3108874 |
| Gimenez Gimenez    | 7.20            | 18.17           | 23.66           | 17.75        | 6.40              | 19.21         | 1.76              | 3.24              | 0.34           | 2.26                | 0.00          |                  | BG9450481 |
| Heredia Amaya      | 7.05            | 21.15           | 30.53           | 14.76        | 3.46              | 15.97         | 0.00              | 2.94              | 0.29           | 2.84                | 1.01          |                  | FX3064234 |
| Heredia de la Rosa | 5.61            | 20.78           | 25.15           | 13.22        | 8.79              | 18.74         | 0.00              | 3.02              | 2.96           | 1.24                | 0.00          |                  | GH9126117 |
| Heredia Heredia    | 6.32            | 14.44           | 25.19           | 18.98        | 6.00              | 20.90         | 1.18              | 2.59              | 0.00           | 3.43                | 0.15          | 0.81             |           |
| Heredia Heredia    | 6.60            | 15.20           | 22.23           | 19.99        | 4.56              | 22.51         | 1.02              | 4.40              | 0.27           | 3.22                | 0.00          | 0.00             |           |
| Heredia Munoz      | 2.71            | 19.93           | 23.99           | 15.04        | 5.64              | 22.40         | 0.21              | 4.31              | 0.26           | 3.84                | 0.67          | 1.00             |           |
| Heredia            | 4.05            | 15.87           | 26.74           | 17.59        | 5.67              | 21.77         | 0.73              | 3.71              | 1.01           | 2.09                | 0.43          | 0.35             |           |
| Hernandez Borja    | 5.89            | 23.02           | 27.89           | 10.93        | 8.48              | 18.03         | 0.49              | 2.91              | 1.42           | 0.95                | 0.00          | 0.00             |           |

| Admixture          |                 |                 |                 |              |                   |               |                   |                   |                |                     |               |                  |       |
|--------------------|-----------------|-----------------|-----------------|--------------|-------------------|---------------|-------------------|-------------------|----------------|---------------------|---------------|------------------|-------|
| Name               | East European % | West European % | Mediterranean % | West Asian % | Southwest Asian % | South Asian % | Northeast Asian % | Southeast Asian % | East African % | Northwest African % | Neo African % | Palaeo African % | Kit # |
| Hernandez Gorretta | 4.43            | 22.25           | 25.80           | 13.39        | 5.06              | 20.09         | 0.00              | 2.52              | 2.06           | 3.08                | 0.23          | 1.07             |       |
| Hernandez Heredia  | 11.07           | 18.96           | 25.77           | 13.67        | 9.05              | 16.97         | 0.97              | 2.08              | 0.00           | 1.01                | 0.00          | 0.45             |       |
| Hernandez Jimenez  | 5.77            | 21.10           | 20.89           | 18.94        | 6.93              | 18.55         | 1.14              | 2.25              | 0.00           | 4.36                | 0.06          | 0.00             |       |
| Jimenez Escudero,  | 6.50            | 21.46           | 26.09           | 15.33        | 6.32              | 1.63          | 1.72              | 1.86              | 0.32           | 2.30                | 0.45          | 1.03             |       |
| Jimenez Jimenez    | 6.66            | 20.04           | 25.61           | 16.12        | 8.18              | 16.42         | 1.14              | 2.67              | 0.21           | 2.55                | 0.39          | 0.00             |       |
| Jimenez Jimenez    | 5.24            | 20.67           | 23.99           | 16.24        | 7.71              | 17.38         | 0.00              | 4.98              | 0.00           | 2.85                | 0.94          | 0.00             |       |
| Jimenez Amaro      | 6.66            | 20.04           | 25.61           | 16.12        | 8.18              | 16.42         | 1.14              | 2.67              | 0.21           | 2.55                | 0.39          | 0.02             |       |
| Jimenez            | 7.86            | 17.65           | 19.90           | 19.11        | 6.63              | 19.87         | 0.85              | 3.55              | 0.26           | 3.60                | 0.72          |                  |       |
| Luque Cortes       | 3.31            | 23.06           | 29.06           | 14.65        | 4.10              | 16.42         | 0.00              | 4.37              | 1.21           | 3.52                | 0.00          |                  |       |
| Manzana Manzana    | 8.34            | 17.12           | 26.43           | 14.72        | 6.68              | 15.51         | 0.29              | 4.67              | 0.98           | 5.27                | 0.00          |                  |       |
| Delgado Alvarez    | 5.93            | 38.28           | 38.09           | 7.57         | 4.56              | 0.00          | 0.00              | 0.56              | 1.11           | 3.53                | 0.31          |                  |       |
| Garci Núñez        | 9.47            | 16.51           | 22.33           | 17.22        | 7.69              | 19.94         | 1.00              | 3.57              | 0.31           | 1.86                | 0.09          |                  |       |
| Montes Borja       | 6.93            | 14.81           | 20.84           | 13.99        | 6.14              | 27.40         | 0.55              | 4.59              | 0.00           | 4.77                | 0.00          |                  |       |
| Montoya Montoya    | 5.63            | 30.66           | 34.24           | 10.93        | 5.38              | 7.93          | 1.25              | 0.68              | 0.10           | 2.23                | 0.97          |                  |       |
| Montoya Romero     | 7.69            | 19.54           | 24.63           | 16.51        | 4.93              | 19.51         | 1.08              | 2.88              | 0.44           | 2.78                | 0.00          |                  |       |
| Montoya Salazar    | 8.43            | 16.26           | 24.66           | 18.68        | 7.04              | 16.71         | 0.00              | 4.06              | 0.17           | 3.63                | 0.36          |                  |       |
| Montoya Silva      | 6.46            | 18.90           | 26.82           | 13.04        | 7.41              | 19.20         | 0.00              | 3.76              | 1.45           | 2.95                | 0.00          |                  |       |
| Montoya            | 8.18            | 19.14           | 24.44           | 14.76        | 7.73              | 19.67         | 0.00              | 4.11              | 1.18           | 0.39                | 0.40          | 0.00             |       |
| Moreno Arjona      | 6.79            | 27.53           | 26.86           | 12.56        | 6.64              | 9.61          | 1.12              | 1.83              | 0.94           | 5.62                | 0.00          | 0.49             |       |
| Moreno de la Cruz  | 6.66            | 17.38           | 24.59           | 16.83        | 6.18              | 20.45         | 0.63              | 3.00              | 0.00           | 3.53                | 0.00          | 0.76             |       |

| Admixture        |                 |                 |                 |              |                   |               |                   |                   |                |                     |               |                  |           |
|------------------|-----------------|-----------------|-----------------|--------------|-------------------|---------------|-------------------|-------------------|----------------|---------------------|---------------|------------------|-----------|
| Name             | East European % | West European % | Mediterranean % | West Asian % | Southwest Asian % | South Asian % | Northeast Asian % | Southeast Asian % | East African % | Northwest African % | Neo African % | Palaeo African % | Kit #     |
| Moreno           | 7.50            | 27.35           | 32.15           | 11.99        | 5.65              | 6.29          | 1.29              | 1.13              | 0.00           | 5.42                | 0.84          | 0.39             |           |
| Motos Hernande   | 9.19            | 19.33           | 22.92           | 17.66        | 8.77              | 17.66         | 0.16              | 2.53              | 0.14           | 0.81                | 0.00          | 0.84             |           |
| Motos Motos      | 7.65            | 17.81           | 22.70           | 20.45        | 5.81              | 20.31         | 0.47              | 2.43              | 1.02           | 0.43                | 0.00          | 0.92             | TZ7355588 |
|                  | 7.21            | 16.06           | 26.16           | 16.32        | 7.90              | 17.37         | 0.14              | 3.68              | 1.79           | 3.37                | 0.00          | 0.00             | GD8599926 |
| Muñoz Cortés,    | 6.11            | 15.65           | 22.31           | 17.62        | 6.78              | 21.38         | 0.76              | 3.52              | 1.21           | 4.58                | 0.00          | 0.07             | ZH3457098 |
| MuñozFernández,  | 6.80            | 19.55           | 23.92           | 16.42        | 6.70              | 18.33         | 0.00              | 2.59              | 0.89           | 4.25                | 0.29          | 0.28             | CA4434236 |
| Navarro Vargas   | 7.71            | 15.52           | 26.23           | 14.66        | 6.22              | 22.58         | 0.00              | 3.15              | 0.25           | 3.46                | 0.00          | 0.22             | RB3747206 |
| Nunez Heredia    | 5.68            | 22.38           | 29.79           | 15.98        | 6.14              | 14.66         |                   | 3.88              |                | 1.45                |               |                  |           |
| Nunez Heredia    | 6.46            | 20.38           | 27.66           | 16.27        | 6.20              | 15.72         |                   | 3.49              |                | 2.69                |               |                  |           |
| Vamosine Palmai  | 8.07            | 19.87           | 21.86           | 19.60        | 7.65              | 17.70         |                   | 2.89              |                | 0.73                |               |                  |           |
| Borja Perez      | 5.96            | 14.32           | 22.47           | 15.86        | 6.55              | 24.31         |                   | 5.07              |                | 3.87                |               |                  |           |
| Perez Rodriguez  | 4.82            | 18.02           | 22.68           | 15.57        | 7.90              | 22.31         |                   | 3.96              |                | 2.44                |               |                  |           |
| Salazar Jimenez  | 7.73            | 18.75           | 24.31           | 14.64        | 10.12             | 17.54         |                   | 4.11              |                | 2.74                |               |                  |           |
| Salazar vega     | 8.89            | 22.55           | 10.81           | 5.69         | 1.57              | 5.13          | 27.98             | 13.88             |                | 0.62                |               |                  |           |
| Santiago Heredia | 5.76            | 15.44           | 24.67           | 17.29        | 6.94              | 21.12         |                   | 4.74              |                | 2.16                |               |                  |           |
| Sevilla (AS)     | 5.06            | 34.17           | 32.81           | 10.85        | 6.25              | 4.55          |                   | 0.96              |                | 3.68                |               |                  |           |
| Sevilla (Cadiz)  | 5.06            | 34.17           | 32.81           | 10.85        | 6.25              | 4.55          |                   | 0.96              |                | 3.68                |               |                  |           |
| Vargas Botel     | 11.02           | 18.82           | 22.67           | 13.71        | 6.17              | 19.36         | 0.00              | 2.78              | 0.00           | 4.36                | 1.12          | 0.00             | NX5100014 |
| Vargas Navarro   | 10.51           | 17.67           | 24.00           | 14.88        | 6.14              | 19.86         | 0.00              | 2.56              | 0.00           | 3.97                | 0.00          | 0.42             | HS1512960 |
| Varo Cla         | 3.60            | 31.85           | 33.54           | 11.73        | 5.68              | 6.75          | 0.19              | 1.35              | 0.43           | 3.96                | 0.91          | 0.00             | DN4418894 |

## 2. Single Pop

### ***Aguilera Rodriguez – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)      | 25.62           |
| 2           | Pathan (HGDP)               | 34.26           |
| 3           | Bnei_Menashe_Jews (Behar)   | 30.98           |
| 4           | Ashkenazi (Dodecad)         | 28.98           |
| 5           | Balochi (HGDP)              | 22.34           |
| 6           | Makrani (HGDP)              | 22.34           |
| 7           | Brahui (HGDP)               | 20.87           |
| 8           | Tuscan (Xing)               | 32.99           |
| 9           | Morocco_Jews (Behar)        | 29.02           |
| 10          | Stalskoe (Xing)             | 30.62           |
| 11          | Romanians_14 (Behar)        | 20.31           |
| 12          | Tuscan (Henn)               | 34.55           |
| 13          | Uzbekistan_Jews (Behar)     | 32.49           |
| 14          | Burusho (HGDP)              | 23.19           |
| 15          | Kurd (Dodecad)              | 22.73           |
| 16          | TSI (HapMap)                | 22.75           |
| 17          | Kashmiri_Pandit (Reich)     | 24.56           |
| 18          | Kurd (Xing)                 | 27.87           |
| 19          | O_Italian (Dodecad)         | 26.48           |
| 20          | Greek (Dodecad)             | 24.37           |

### ***Aguilera – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)      | 29.18           |
| 2           | Pathan (HGDP)               | 22.09           |
| 3           | Bnei_Menashe_Jews (Behar)   | 24.38           |
| 4           | Ashkenazi (Dodecad)         | 25.5            |
| 5           | Balochi (HGDP)              | 26.84           |
| 6           | Makrani (HGDP)              | 31.78           |
| 7           | Brahui (HGDP)               | 23              |
| 8           | Tuscan (Xing)               | 27.71           |
| 9           | Morocco_Jews (Behar)        | 28.89           |
| 10          | Stalskoe (Xing)             | 20.7            |
| 11          | Romanians_14 (Behar)        | 29.11           |
| 12          | Tuscan (Henn)               | 22.56           |
| 13          | Uzbekistan_Jews (Behar)     | 20.98           |
| 14          | Burusho (HGDP)              | 34.23           |
| 15          | Kurd (Dodecad)              | 34.48           |
| 16          | TSI (HapMap)                | 32.13           |
| 17          | Kashmiri_Pandit (Reich)     | 24.57           |
| 18          | Kurd (Xing)                 | 21.47           |
| 19          | O_Italian (Dodecad)         | 30.26           |
| 20          | Greek (Dodecad)             | 26.6            |

***Ajama Heredia – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 21.83           |
| 2           | Tuscan (Henn)                | 27.43           |
| 3           | TSI (HapMap)                 | 20.52           |
| 4           | O_Italian (Dodecad)          | 33.64           |
| 5           | N_Italian (Dodecad)          | 23.88           |
| 6           | Ashkenazy_Jews (Behar)       | 29.94           |
| 7           | Tuscan (HGDP)                | 24.68           |
| 8           | Ashkenazi (Dodecad)          | 27.8            |
| 9           | C_Italian (Dodecad)          | 28.2            |
| 10          | North_Italian (HGDP)         | 22.77           |
| 11          | Portuguese (Dodecad)         | 34.54           |
| 12          | Romanians_14 (Behar)         | 31.63           |
| 13          | IBS (1000Genomes)            | 34.09           |
| 14          | Slovenian (Xing)             | 33.42           |
| 15          | Spanish (Dodecad)            | 28.97           |
| 16          | S_Italian_Sicilian (Dodecad) | 33.83           |
| 17          | Morocco_Jews (Behar)         | 21.33           |
| 18          | Spaniards (Behar)            | 22.94           |
| 19          | Balkans (Dodecad)            | 20.68           |
| 20          | Sicilian (Dodecad)           | 24.88           |

***Amaya – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Bnei_Menashe_Jews (Behar)   | 25.83           |
| 2           | Pathan (HGDP)               | 24.07           |
| 3           | Ashkenazy_Jews (Behar)      | 32.43           |
| 4           | Ashkenazi (Dodecad)         | 25.35           |
| 5           | Balochi (HGDP)              | 24.21           |
| 6           | Makrani (HGDP)              | 28.14           |
| 7           | Brahui (HGDP)               | 22.11           |
| 8           | Morocco_Jews (Behar)        | 32.03           |
| 9           | Tuscan (Xing)               | 21.12           |
| 10          | Romanians_14 (Behar)        | 34.8            |
| 11          | Burusho (HGDP)              | 31.58           |
| 12          | Kashmiri_Pandit (Reich)     | 22.98           |
| 13          | Tuscan (Henn)               | 20.08           |
| 14          | Pakistani (Xing)            | 32.23           |
| 15          | TSI (HapMap)                | 30.6            |
| 16          | O_Italian (Dodecad)         | 30.94           |
| 17          | Sindhi (HGDP)               | 31.57           |
| 18          | Uzbekistan_Jews (Behar)     | 21.11           |
| 19          | C_Italian (Dodecad)         | 25.38           |
| 20          | Greek (Dodecad)             | 21.74           |

***Bermudez Torres – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 32.95           |
| 2           | Tuscan (Xing)                | 29.35           |
| 3           | Tuscan (Henn)                | 24.96           |
| 4           | Ashkenazi (Dodecad)          | 20.95           |
| 5           | TSI (HapMap)                 | 24.66           |
| 6           | O_Italian (Dodecad)          | 24.88           |
| 7           | Romanians_14 (Behar)         | 30.94           |
| 8           | Morocco_Jews (Behar)         | 29.56           |
| 9           | C_Italian (Dodecad)          | 33.31           |
| 10          | Tuscan (HGDP)                | 27.08           |
| 11          | N_Italian (Dodecad)          | 21.79           |
| 12          | S_Italian_Sicilian (Dodecad) | 30.7            |
| 13          | Greek (Dodecad)              | 31.41           |
| 14          | Balkans (Dodecad)            | 28.42           |
| 15          | Sicilian (Dodecad)           | 31.56           |
| 16          | Sephardic_Jews (Behar)       | 27.41           |
| 17          | S_Italian (Dodecad)          | 27.84           |
| 18          | Slovenian (Xing)             | 26.41           |
| 19          | Stalskoe (Xing)              | 20.38           |
| 20          | North_Italian (HGDP)         | 21.62           |

***Borja Ramirez – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 20.47           |
| 2           | Ashkenazi (Dodecad)          | 29.55           |
| 3           | Bnei_Menashe_Jews (Behar)    | 24.72           |
| 4           | Pathan (HGDP)                | 27.63           |
| 5           | Morocco_Jews (Behar)         | 33.61           |
| 6           | Balochi (HGDP)               | 23.74           |
| 7           | Makrani (HGDP)               | 26.16           |
| 8           | Brahui (HGDP)                | 31.33           |
| 9           | Tuscan (Xing)                | 23.43           |
| 10          | Uzbekistan_Jews (Behar)      | 21.15           |
| 11          | Tuscan (Henn)                | 24.35           |
| 12          | Kurd (Dodecad)               | 22.42           |
| 13          | TSI (HapMap)                 | 33.95           |
| 14          | Stalskoe (Xing)              | 32.12           |
| 15          | Kurd (Xing)                  | 29.5            |
| 16          | Romanians_14 (Behar)         | 33.07           |
| 17          | O_Italian (Dodecad)          | 32.06           |
| 18          | S_Italian_Sicilian (Dodecad) | 22.8            |
| 19          | C_Italian (Dodecad)          | 33.39           |
| 20          | Burusho (HGDP)               | 28.09           |

***Cadiz Fernandez – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 32.11           |
| 2           | Ashkenazi (Dodecad)          | 33.44           |
| 3           | Morocco_Jews (Behar)         | 24.77           |
| 4           | Tuscan (Xing)                | 21.65           |
| 5           | Stalskoe (Xing)              | 23.42           |
| 6           | Romanians_14 (Behar)         | 26.41           |
| 7           | Tuscan (Henn)                | 32.27           |
| 8           | TSI (HapMap)                 | 32.91           |
| 9           | Uzbekistan_Jews (Behar)      | 20.1            |
| 10          | Kurd (Dodecad)               | 27.66           |
| 11          | O_Italian (Dodecad)          | 26.26           |
| 12          | Kurd (Xing)                  | 23.33           |
| 13          | Greek (Dodecad)              | 21.8            |
| 14          | C_Italian (Dodecad)          | 25.06           |
| 15          | S_Italian_Sicilian (Dodecad) | 34.14           |
| 16          | Turkish (Dodecad)            | 24.85           |
| 17          | Makrani (HGDP)               | 27.78           |
| 18          | Balochi (HGDP)               | 30.55           |
| 19          | Balkans (Dodecad)            | 25.45           |
| 20          | Sephardic_Jews (Behar)       | 34.58           |

***Carbonell Abellan – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 28.23           |
| 2           | Ashkenazi (Dodecad)          | 30.73           |
| 3           | Tuscan (Xing)                | 29.04           |
| 4           | Tuscan (Henn)                | 28.17           |
| 5           | Romanians_14 (Behar)         | 26.35           |
| 6           | TSI (HapMap)                 | 29.69           |
| 7           | Morocco_Jews (Behar)         | 26.56           |
| 8           | O_Italian (Dodecad)          | 33.38           |
| 9           | Pathan (HGDP)                | 34.45           |
| 10          | Bnei_Menashe_Jews (Behar)    | 25.75           |
| 11          | C_Italian (Dodecad)          | 31.88           |
| 12          | Balkans (Dodecad)            | 27.93           |
| 13          | Stalskoe (Xing)              | 28.52           |
| 14          | Greek (Dodecad)              | 33.88           |
| 15          | Balochi (HGDP)               | 21.07           |
| 16          | S_Italian_Sicilian (Dodecad) | 21.31           |
| 17          | Uzbekistan_Jews (Behar)      | 20.3            |
| 18          | Makrani (HGDP)               | 32.49           |
| 19          | Brahui (HGDP)                | 31.67           |
| 20          | Sicilian (Dodecad)           | 33.05           |

***Cortes Cortés – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 34.68           |
| 2           | Ashkenazi (Dodecad)          | 31.99           |
| 3           | Tuscan (Xing)                | 26.92           |
| 4           | Tuscan (Henn)                | 31.71           |
| 5           | Romanians_14 (Behar)         | 21.77           |
| 6           | TSI (HapMap)                 | 29.6            |
| 7           | Morocco_Jews (Behar)         | 22.15           |
| 8           | O_Italian (Dodecad)          | 34.17           |
| 9           | Pathan (HGDP)                | 27.83           |
| 10          | Bnei_Menashe_Jews (Behar)    | 26.22           |
| 11          | C_Italian (Dodecad)          | 23.97           |
| 12          | Balkans (Dodecad)            | 31.61           |
| 13          | Stalskoe (Xing)              | 26.84           |
| 14          | Greek (Dodecad)              | 28.53           |
| 15          | Balochi (HGDP)               | 20.28           |
| 16          | S_Italian_Sicilian (Dodecad) | 29.26           |
| 17          | Uzbekistan_Jews (Behar)      | 29.18           |
| 18          | Makrani (HGDP)               | 29.25           |
| 19          | Brahui (HGDP)                | 34.16           |
| 20          | Sicilian (Dodecad)           | 30.23           |

***Cortes Cortés – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 25.39           |
| 2           | Ashkenazi (Dodecad)          | 26.56           |
| 3           | Tuscan (Xing)                | 30.46           |
| 4           | Tuscan (Henn)                | 20.9            |
| 5           | Romanians_14 (Behar)         | 30              |
| 6           | TSI (HapMap)                 | 30.06           |
| 7           | Morocco_Jews (Behar)         | 23.16           |
| 8           | O_Italian (Dodecad)          | 21.93           |
| 9           | Pathan (HGDP)                | 24.73           |
| 10          | Bnei_Menashe_Jews (Behar)    | 25.46           |
| 11          | C_Italian (Dodecad)          | 28.55           |
| 12          | Balkans (Dodecad)            | 26.58           |
| 13          | Stalskoe (Xing)              | 34.83           |
| 14          | Greek (Dodecad)              | 21.53           |
| 15          | Balochi (HGDP)               | 23.13           |
| 16          | S_Italian_Sicilian (Dodecad) | 22.42           |
| 17          | Uzbekistan_Jews (Behar)      | 29.8            |
| 18          | Makrani (HGDP)               | 23.8            |
| 19          | Brahui (HGDP)                | 26.99           |
| 20          | Sicilian (Dodecad)           | 23.67           |

***Cortes Moreno – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 22.38           |
| 2           | Ashkenazi (Dodecad)          | 21.66           |
| 3           | Tuscan (Xing)                | 29.84           |
| 4           | Tuscan (Henn)                | 22.07           |
| 5           | Romanians_14 (Behar)         | 22.95           |
| 6           | TSI (HapMap)                 | 25.53           |
| 7           | Morocco_Jews (Behar)         | 32.31           |
| 8           | O_Italian (Dodecad)          | 21.46           |
| 9           | Pathan (HGDP)                | 32.57           |
| 10          | Bnei_Menashe_Jews (Behar)    | 21.44           |
| 11          | C_Italian (Dodecad)          | 34.65           |
| 12          | Balkans (Dodecad)            | 27.03           |
| 13          | Stalskoe (Xing)              | 34.65           |
| 14          | Greek (Dodecad)              | 29.07           |
| 15          | Balochi (HGDP)               | 31.09           |
| 16          | S_Italian_Sicilian (Dodecad) | 20.59           |
| 17          | Uzbekistan_Jews (Behar)      | 24.24           |
| 18          | Makrani (HGDP)               | 21.8            |
| 19          | Brahui (HGDP)                | 24.44           |
| 20          | Sicilian (Dodecad)           | 21.78           |

***Cortes Moreno – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 24.77           |
| 2           | Ashkenazi (Dodecad)          | 26.21           |
| 3           | Tuscan (Xing)                | 20.96           |
| 4           | Tuscan (Henn)                | 30.39           |
| 5           | Romanians_14 (Behar)         | 28.5            |
| 6           | TSI (HapMap)                 | 23.98           |
| 7           | Morocco_Jews (Behar)         | 27.85           |
| 8           | O_Italian (Dodecad)          | 21.41           |
| 9           | Pathan (HGDP)                | 28.64           |
| 10          | Bnei_Menashe_Jews (Behar)    | 33.94           |
| 11          | C_Italian (Dodecad)          | 24.78           |
| 12          | Balkans (Dodecad)            | 30.01           |
| 13          | Stalskoe (Xing)              | 21.98           |
| 14          | Greek (Dodecad)              | 30.74           |
| 15          | Balochi (HGDP)               | 24.34           |
| 16          | S_Italian_Sicilian (Dodecad) | 22.75           |
| 17          | Uzbekistan_Jews (Behar)      | 28.8            |
| 18          | Makrani (HGDP)               | 20.3            |
| 19          | Brahui (HGDP)                | 32.43           |
| 20          | Sicilian (Dodecad)           | 20.07           |

***Cortes Moreno – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 30.17           |
| 2           | Ashkenazi (Dodecad)          | 24.05           |
| 3           | Tuscan (Xing)                | 31.03           |
| 4           | Tuscan (Henn)                | 34.43           |
| 5           | Romanians_14 (Behar)         | 23.73           |
| 6           | TSI (HapMap)                 | 28.64           |
| 7           | Morocco_Jews (Behar)         | 28.88           |
| 8           | O_Italian (Dodecad)          | 28.58           |
| 9           | Pathan (HGDP)                | 23.35           |
| 10          | Bnei_Menashe_Jews (Behar)    | 34.29           |
| 11          | C_Italian (Dodecad)          | 26.71           |
| 12          | Balkans (Dodecad)            | 32.7            |
| 13          | Stalskoe (Xing)              | 30.49           |
| 14          | Greek (Dodecad)              | 24.46           |
| 15          | Balochi (HGDP)               | 32.21           |
| 16          | S_Italian_Sicilian (Dodecad) | 25.95           |
| 17          | Uzbekistan_Jews (Behar)      | 33.22           |
| 18          | Makrani (HGDP)               | 28.72           |
| 19          | Brahui (HGDP)                | 33.23           |
| 20          | Sicilian (Dodecad)           | 30.39           |

***Cortes Moreno– Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 30.88           |
| 2           | Ashkenazi (Dodecad)          | 27.52           |
| 3           | Tuscan (Xing)                | 34.34           |
| 4           | Tuscan (Henn)                | 29.66           |
| 5           | Romanians_14 (Behar)         | 26.36           |
| 6           | TSI (HapMap)                 | 29.1            |
| 7           | Morocco_Jews (Behar)         | 20.29           |
| 8           | O_Italian (Dodecad)          | 24.52           |
| 9           | Pathan (HGDP)                | 29.9            |
| 10          | Bnei_Menashe_Jews (Behar)    | 24.35           |
| 11          | C_Italian (Dodecad)          | 29.27           |
| 12          | Balkans (Dodecad)            | 26.43           |
| 13          | Stalskoe (Xing)              | 22.03           |
| 14          | Greek (Dodecad)              | 24.47           |
| 15          | Balochi (HGDP)               | 28.55           |
| 16          | S_Italian_Sicilian (Dodecad) | 28.86           |
| 17          | Uzbekistan_Jews (Behar)      | 28.61           |
| 18          | Makrani (HGDP)               | 29.8            |
| 19          | Brahui (HGDP)                | 29.78           |
| 20          | Sicilian (Dodecad)           | 26.47           |

***Cortes – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 34.44           |
| 2           | Tuscan (Xing)                | 23.78           |
| 3           | Tuscan (Henn)                | 27.46           |
| 4           | Ashkenazi (Dodecad)          | 24.51           |
| 5           | TSI (HapMap)                 | 24.27           |
| 6           | Romanians_14 (Behar)         | 20.55           |
| 7           | O_Italian (Dodecad)          | 29.14           |
| 8           | Morocco_Jews (Behar)         | 27.54           |
| 9           | Algeria (Henn)               | 20.77           |
| 10          | Balkans (Dodecad)            | 24.18           |
| 11          | C_Italian (Dodecad)          | 33.62           |
| 12          | Slovenian (Xing)             | 23.59           |
| 13          | N_Italian (Dodecad)          | 22.17           |
| 14          | Libya (Henn)                 | 27.34           |
| 15          | Tuscan (HGDP)                | 34.78           |
| 16          | Hungarians (Behar)           | 23.63           |
| 17          | S_Italian_Sicilian (Dodecad) | 30.08           |
| 18          | Stalskoe (Xing)              | 31.42           |
| 19          | Greek (Dodecad)              | 23.56           |
| 20          | Egypt (Henn)                 | 30.92           |

***Cano Delgado – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 25.52           |
| 2           | Tuscan (Henn)                | 29.48           |
| 3           | TSI (HapMap)                 | 29.5            |
| 4           | O_Italian (Dodecad)          | 28.04           |
| 5           | Ashkenazy_Jews (Behar)       | 21.35           |
| 6           | Ashkenazi (Dodecad)          | 32.53           |
| 7           | N_Italian (Dodecad)          | 24.81           |
| 8           | C_Italian (Dodecad)          | 22.8            |
| 9           | Tuscan (HGDP)                | 20.61           |
| 10          | Romanians_14 (Behar)         | 28.86           |
| 11          | Morocco_Jews (Behar)         | 30.16           |
| 12          | S_Italian_Sicilian (Dodecad) | 20.25           |
| 13          | North_Italian (HGDP)         | 27.68           |
| 14          | Greek (Dodecad)              | 23.4            |
| 15          | Sicilian (Dodecad)           | 29.68           |
| 16          | Balkans (Dodecad)            | 22.62           |
| 17          | Portuguese (Dodecad)         | 30.36           |
| 18          | Slovenian (Xing)             | 25.8            |
| 19          | S_Italian (Dodecad)          | 34.05           |
| 20          | Hungarians (Behar)           | 22.06           |

***Doya Gimenez – Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 25.12           |
| 2           | Ashkenazi (Dodecad)          | 21.7            |
| 3           | Romanians_14 (Behar)         | 33.87           |
| 4           | Tuscan (Xing)                | 33.16           |
| 5           | Tuscan (Henn)                | 23.87           |
| 6           | TSI (HapMap)                 | 29.9            |
| 7           | O_Italian (Dodecad)          | 32.26           |
| 8           | Greek (Dodecad)              | 28.33           |
| 9           | Balkans (Dodecad)            | 27.94           |
| 10          | Morocco_Jews (Behar)         | 23.63           |
| 11          | C_Italian (Dodecad)          | 21.4            |
| 12          | Stalskoe (Xing)              | 33.46           |
| 13          | S_Italian_Sicilian (Dodecad) | 33.51           |
| 14          | Tuscan (HGDP)                | 29.5            |
| 15          | Sicilian (Dodecad)           | 25.09           |
| 16          | N_Italian (Dodecad)          | 25.24           |
| 17          | Turkish (Dodecad)            | 30.89           |
| 18          | S_Italian (Dodecad)          | 33.46           |
| 19          | Uzbekistan_Jews (Behar)      | 33.31           |
| 20          | Slovenian (Xing)             | 31.7            |

***Doya - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)      | 29.63           |
| 2           | Ashkenazi (Dodecad)         | 21.26           |
| 3           | Tuscan (Xing)               | 22.42           |
| 4           | Tuscan (Henn)               | 33.48           |
| 5           | TSI (HapMap)                | 29.1            |
| 6           | Romanians_14 (Behar)        | 20.14           |
| 7           | Stalskoe (Xing)             | 21.52           |
| 8           | Pathan (HGDP)               | 29.95           |
| 9           | Morocco_Jews (Behar)        | 20.08           |
| 10          | O_Italian (Dodecad)         | 22.41           |
| 11          | Balochi (HGDP)              | 28.23           |
| 12          | Bnei_Menashe_Jews (Behar)   | 30.38           |
| 13          | Makrani (HGDP)              | 29.78           |
| 14          | Brahui (HGDP)               | 23.36           |
| 15          | Balkans (Dodecad)           | 30.68           |
| 16          | C_Italian (Dodecad)         | 23.56           |
| 17          | Uzbekistan_Jews (Behar)     | 24.88           |
| 18          | Slovenian (Xing)            | 31.2            |
| 19          | Kurd (Dodecad)              | 29.74           |
| 20          | Burusho (HGDP)              | 32.74           |

***Duval Jimenez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 29.86           |
| 2           | Tuscan (Xing)                | 28.52           |
| 3           | Ashkenazi (Dodecad)          | 21.41           |
| 4           | Tuscan (Henn)                | 25.52           |
| 5           | Romanians_14 (Behar)         | 23.98           |
| 6           | TSI (HapMap)                 | 23.66           |
| 7           | O_Italian (Dodecad)          | 34.6            |
| 8           | Morocco_Jews (Behar)         | 25.9            |
| 9           | C_Italian (Dodecad)          | 33.38           |
| 10          | Balkans (Dodecad)            | 29.47           |
| 11          | Stalskoe (Xing)              | 31.92           |
| 12          | Greek (Dodecad)              | 27.54           |
| 13          | S_Italian_Sicilian (Dodecad) | 28.65           |
| 14          | Tuscan (HGDP)                | 27.39           |
| 15          | Pathan (HGDP)                | 22.93           |
| 16          | N_Italian (Dodecad)          | 30.84           |
| 17          | Sicilian (Dodecad)           | 24.21           |
| 18          | Slovenian (Xing)             | 20.36           |
| 19          | Uzbekistan_Jews (Behar)      | 29.68           |
| 20          | Bnei_Menashe_Jews (Behar)    | 22.66           |

***Hernandez Gorretta - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 34.11           |
| 2           | Tuscan (Xing)                | 34.31           |
| 3           | Tuscan (Henn)                | 33.72           |
| 4           | Ashkenazi (Dodecad)          | 25.55           |
| 5           | TSI (HapMap)                 | 20.23           |
| 6           | O_Italian (Dodecad)          | 33.92           |
| 7           | Morocco_Jews (Behar)         | 26.42           |
| 8           | Romanians_14 (Behar)         | 34.5            |
| 9           | C_Italian (Dodecad)          | 34.45           |
| 10          | N_Italian (Dodecad)          | 32.8            |
| 11          | Tuscan (HGDP)                | 24.42           |
| 12          | S_Italian_Sicilian (Dodecad) | 25.78           |
| 13          | Pathan (HGDP)                | 32.77           |
| 14          | Bnei_Menashe_Jews (Behar)    | 24.75           |
| 15          | Greek (Dodecad)              | 22.54           |
| 16          | Sicilian (Dodecad)           | 28.35           |
| 17          | Stalskoe (Xing)              | 34.04           |
| 18          | Balkans (Dodecad)            | 30.44           |
| 19          | Slovenian (Xing)             | 28.55           |
| 20          | Sephardic_Jews (Behar)       | 21.46           |

***Fernández Muñoz - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Pathan (HGDP)               | 29.23           |
| 2           | Bnei_Menashe_Jews (Behar)   | 34.85           |
| 3           | Balochi (HGDP)              | 22.1            |
| 4           | Makrani (HGDP)              | 27.77           |
| 5           | Brahui (HGDP)               | 33.16           |
| 6           | Ashkenazy_Jews (Behar)      | 31.11           |
| 7           | Ashkenazi (Dodecad)         | 30.46           |
| 8           | Burusho (HGDP)              | 30.54           |
| 9           | Kurd (Dodecad)              | 25.39           |
| 10          | Uzbekistan_Jews (Behar)     | 24.4            |
| 11          | Kashmiri_Pandit (Reich)     | 32.14           |
| 12          | Stalskoe (Xing)             | 32.15           |
| 13          | Pakistani (Xing)            | 33.01           |
| 14          | Kurd (Xing)                 | 33.7            |
| 15          | Morocco_Jews (Behar)        | 27.67           |
| 16          | Sindhi (HGDP)               | 27.52           |
| 17          | Tuscan (Xing)               | 31.97           |
| 18          | Romanians_14 (Behar)        | 29.75           |
| 19          | Turkish (Dodecad)           | 30.53           |
| 20          | Tuscan (Henn)               | 31.94           |

***Gabarri Gabarri - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 33.35           |
| 2           | Ashkenazi (Dodecad)          | 25.07           |
| 3           | Tuscan (Xing)                | 25.63           |
| 4           | Tuscan (Henn)                | 21.41           |
| 5           | TSI (HapMap)                 | 28.67           |
| 6           | Morocco_Jews (Behar)         | 20.54           |
| 7           | O_Italian (Dodecad)          | 26.98           |
| 8           | Stalskoe (Xing)              | 28.14           |
| 9           | Romanians_14 (Behar)         | 24.3            |
| 10          | C_Italian (Dodecad)          | 28.86           |
| 11          | S_Italian_Sicilian (Dodecad) | 20.46           |
| 12          | Uzbekistan_Jews (Behar)      | 20.56           |
| 13          | Greek (Dodecad)              | 32.34           |
| 14          | Kurd (Dodecad)               | 25.4            |
| 15          | Tuscan (HGDP)                | 21.91           |
| 16          | Sicilian (Dodecad)           | 27.83           |
| 17          | Pathan (HGDP)                | 31.55           |
| 18          | Sephardic_Jews (Behar)       | 23.24           |
| 19          | Kurd (Xing)                  | 29.34           |
| 20          | N_Italian (Dodecad)          | 21.28           |

***Gabarri Hernandez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 20.78           |
| 2           | Ashkenazi (Dodecad)          | 27.97           |
| 3           | Tuscan (Xing)                | 28.11           |
| 4           | Morocco_Jews (Behar)         | 29.56           |
| 5           | Romanians_14 (Behar)         | 30.89           |
| 6           | Tuscan (Henn)                | 34.64           |
| 7           | TSI (HapMap)                 | 27.74           |
| 8           | Stalskoe (Xing)              | 24.84           |
| 9           | O_Italian (Dodecad)          | 31.93           |
| 10          | Uzbekistan_Jews (Behar)      | 24.06           |
| 11          | Pathan (HGDP)                | 26.58           |
| 12          | Bnei_Menashe_Jews (Behar)    | 21.18           |
| 13          | Balochi (HGDP)               | 20.38           |
| 14          | Kurd (Dodecad)               | 34.44           |
| 15          | C_Italian (Dodecad)          | 32.54           |
| 16          | Greek (Dodecad)              | 30.44           |
| 17          | Makrani (HGDP)               | 26.13           |
| 18          | S_Italian_Sicilian (Dodecad) | 22.6            |
| 19          | Kurd (Xing)                  | 22.35           |
| 20          | Brahui (HGDP)                | 23.75           |

***Garcia Jarque - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 28.24           |
| 2           | Tuscan (Henn)                | 30.72           |
| 3           | TSI (HapMap)                 | 29.9            |
| 4           | O_Italian (Dodecad)          | 24.2            |
| 5           | Ashkenazy_Jews (Behar)       | 34.32           |
| 6           | N_Italian (Dodecad)          | 31.07           |
| 7           | Ashkenazi (Dodecad)          | 28.32           |
| 8           | Romanians_14 (Behar)         | 29.18           |
| 9           | Tuscan (HGDP)                | 26.29           |
| 10          | C_Italian (Dodecad)          | 23.72           |
| 11          | Slovenian (Xing)             | 25.34           |
| 12          | Balkans (Dodecad)            | 31.37           |
| 13          | North_Italian (HGDP)         | 20.22           |
| 14          | Portuguese (Dodecad)         | 21.74           |
| 15          | Hungarians (Behar)           | 20.69           |
| 16          | Morocco_Jews (Behar)         | 20.61           |
| 17          | S_Italian_Sicilian (Dodecad) | 32.83           |
| 18          | Greek (Dodecad)              | 30.55           |
| 19          | IBS (1000Genomes)            | 27.11           |
| 20          | French (HGDP)                | 21.47           |

***Garcia Jarque - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 27.37           |
| 2           | Tuscan (Henn)                | 27.1            |
| 3           | TSI (HapMap)                 | 22.6            |
| 4           | Ashkenazy_Jews (Behar)       | 26.51           |
| 5           | O_Italian (Dodecad)          | 25.98           |
| 6           | Ashkenazi (Dodecad)          | 29.24           |
| 7           | N_Italian (Dodecad)          | 29.53           |
| 8           | Romanians_14 (Behar)         | 20.68           |
| 9           | Tuscan (HGDP)                | 25.62           |
| 10          | C_Italian (Dodecad)          | 29.39           |
| 11          | Slovenian (Xing)             | 27.55           |
| 12          | Balkans (Dodecad)            | 32.85           |
| 13          | Portuguese (Dodecad)         | 29.88           |
| 14          | Morocco_Jews (Behar)         | 22.44           |
| 15          | Hungarians (Behar)           | 21.06           |
| 16          | North_Italian (HGDP)         | 29.64           |
| 17          | S_Italian_Sicilian (Dodecad) | 20.4            |
| 18          | Greek (Dodecad)              | 28.79           |
| 19          | IBS (1000Genomes)            | 34.1            |
| 20          | Sicilian (Dodecad)           | 28.63           |

***Garcia Nunez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)      | 25.82           |
| 2           | Ashkenazi (Dodecad)         | 29.65           |
| 3           | Pathan (HGDP)               | 26.87           |
| 4           | Balochi (HGDP)              | 28.18           |
| 5           | Bnei_Menashe_Jews (Behar)   | 34.12           |
| 6           | Makrani (HGDP)              | 25.79           |
| 7           | Stalskoe (Xing)             | 34.42           |
| 8           | Brahui (HGDP)               | 33.58           |
| 9           | Morocco_Jews (Behar)        | 22.94           |
| 10          | Uzbekistan_Jews (Behar)     | 21.04           |
| 11          | Kurd (Dodecad)              | 21.51           |
| 12          | Tuscan (Xing)               | 20.27           |
| 13          | Kurd (Xing)                 | 21.42           |
| 14          | Romanians_14 (Behar)        | 30.25           |
| 15          | Tuscan (Henn)               | 21.07           |
| 16          | TSI (HapMap)                | 24.78           |
| 17          | Burusho (HGDP)              | 32.67           |
| 18          | Turkish (Dodecad)           | 20.35           |
| 19          | Kashmiri_Pandit (Reich)     | 32.22           |
| 20          | O_Italian (Dodecad)         | 24.23           |

***Garcia Nunez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)      | 21.77           |
| 2           | Ashkenazi (Dodecad)         | 30.45           |
| 3           | Pathan (HGDP)               | 29.43           |
| 4           | Bnei_Menashe_Jews (Behar)   | 33.16           |
| 5           | Balochi (HGDP)              | 31.03           |
| 6           | Romanians_14 (Behar)        | 32.05           |
| 7           | Makrani (HGDP)              | 24.23           |
| 8           | Brahui (HGDP)               | 22.66           |
| 9           | Morocco_Jews (Behar)        | 31.26           |
| 10          | Stalskoe (Xing)             | 32.1            |
| 11          | Tuscan (Xing)               | 34.86           |
| 12          | Uzbekistan_Jews (Behar)     | 26.19           |
| 13          | Kurd (Dodecad)              | 25.58           |
| 14          | Tuscan (Henn)               | 31.65           |
| 15          | Kurd (Xing)                 | 25.11           |
| 16          | TSI (HapMap)                | 33.96           |
| 17          | Burusho (HGDP)              | 32.88           |
| 18          | Balkans (Dodecad)           | 26.43           |
| 19          | Kashmiri_Pandit (Reich)     | 31.26           |
| 20          | O_Italian (Dodecad)         | 31.32           |

***Gimenez Gimenez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 21.55           |
| 2           | Ashkenazy_Jews (Behar)       | 33.54           |
| 3           | Tuscan (Henn)                | 27.58           |
| 4           | TSI (HapMap)                 | 32.4            |
| 5           | Romanians_14 (Behar)         | 24.8            |
| 6           | Ashkenazi (Dodecad)          | 33.43           |
| 7           | O_Italian (Dodecad)          | 25.84           |
| 8           | Balkans (Dodecad)            | 20.16           |
| 9           | Slovenian (Xing)             | 33.58           |
| 10          | Morocco_Jews (Behar)         | 21.37           |
| 11          | C_Italian (Dodecad)          | 24.79           |
| 12          | N_Italian (Dodecad)          | 34.25           |
| 13          | Hungarians (Behar)           | 34.26           |
| 14          | Stalskoe (Xing)              | 28.6            |
| 15          | Tuscan (HGDP)                | 29.48           |
| 16          | Greek (Dodecad)              | 26.73           |
| 17          | S_Italian_Sicilian (Dodecad) | 24.4            |
| 18          | Sicilian (Dodecad)           | 24.93           |
| 19          | North_Italian (HGDP)         | 30.09           |
| 20          | Portuguese (Dodecad)         | 31.29           |

***Gimenez Gimenez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 31.87           |
| 2           | Ashkenazi (Dodecad)          | 31.84           |
| 3           | Tuscan (Xing)                | 21.37           |
| 4           | Morocco_Jews (Behar)         | 27.42           |
| 5           | Tuscan (Henn)                | 20.86           |
| 6           | Stalskoe (Xing)              | 28.24           |
| 7           | Romanians_14 (Behar)         | 26.62           |
| 8           | TSI (HapMap)                 | 33.32           |
| 9           | Pathan (HGDP)                | 25.26           |
| 10          | Bnei_Menashe_Jews (Behar)    | 21.76           |
| 11          | Balochi (HGDP)               | 22.14           |
| 12          | Uzbekistan_Jews (Behar)      | 31.42           |
| 13          | O_Italian (Dodecad)          | 29.27           |
| 14          | Makrani (HGDP)               | 21.52           |
| 15          | Brahui (HGDP)                | 21.26           |
| 16          | Kurd (Dodecad)               | 30.51           |
| 17          | C_Italian (Dodecad)          | 21.09           |
| 18          | Kurd (Xing)                  | 32.33           |
| 19          | Greek (Dodecad)              | 30.59           |
| 20          | S_Italian_Sicilian (Dodecad) | 21.22           |

***Heredia Amaya- Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 21.27           |
| 2           | Ashkenazy_Jews (Behar)       | 34.8            |
| 3           | Tuscan (Henn)                | 25.61           |
| 4           | TSI (HapMap)                 | 25.56           |
| 5           | Ashkenazi (Dodecad)          | 32.19           |
| 6           | O_Italian (Dodecad)          | 34.21           |
| 7           | Romanians_14 (Behar)         | 34.79           |
| 8           | C_Italian (Dodecad)          | 31.3            |
| 9           | Tuscan (HGDP)                | 25.64           |
| 10          | Morocco_Jews (Behar)         | 21.25           |
| 11          | N_Italian (Dodecad)          | 31.66           |
| 12          | Greek (Dodecad)              | 28.38           |
| 13          | S_Italian_Sicilian (Dodecad) | 26.36           |
| 14          | Sicilian (Dodecad)           | 33.6            |
| 15          | Balkans (Dodecad)            | 21.67           |
| 16          | S_Italian (Dodecad)          | 27.39           |
| 17          | Sephardic_Jews (Behar)       | 20.17           |
| 18          | North_Italian (HGDP)         | 27.03           |
| 19          | Slovenian (Xing)             | 20.84           |
| 20          | Portuguese (Dodecad)         | 21.78           |

***Heredia de la Rosa - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 21.76           |
| 2           | Ashkenazi (Dodecad)          | 29.74           |
| 3           | Tuscan (Xing)                | 31.19           |
| 4           | Tuscan (Henn)                | 28.75           |
| 5           | TSI (HapMap)                 | 34.43           |
| 6           | Morocco_Jews (Behar)         | 25.62           |
| 7           | O_Italian (Dodecad)          | 24.29           |
| 8           | Romanians_14 (Behar)         | 33.03           |
| 9           | C_Italian (Dodecad)          | 23.35           |
| 10          | S_Italian_Sicilian (Dodecad) | 34.45           |
| 11          | Tuscan (HGDP)                | 20.18           |
| 12          | N_Italian (Dodecad)          | 34.55           |
| 13          | Greek (Dodecad)              | 20.65           |
| 14          | Sicilian (Dodecad)           | 33.37           |
| 15          | Balkans (Dodecad)            | 27.92           |
| 16          | Bnei_Menashe_Jews (Behar)    | 34.89           |
| 17          | Stalskoe (Xing)              | 21.11           |
| 18          | Sephardic_Jews (Behar)       | 28.31           |
| 19          | Pathan (HGDP)                | 34.54           |
| 20          | Uzbekistan_Jews (Behar)      | 27.85           |

***Heredia Heredia - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 29.44           |
| 2           | Ashkenazi (Dodecad)          | 30.44           |
| 3           | Bnei_Menashe_Jews (Behar)    | 26.82           |
| 4           | Balochi (HGDP)               | 29.41           |
| 5           | Morocco_Jews (Behar)         | 28.76           |
| 6           | Pathan (HGDP)                | 33.52           |
| 7           | Makrani (HGDP)               | 20.68           |
| 8           | Brahui (HGDP)                | 24.21           |
| 9           | Uzbekistan_Jews (Behar)      | 34.26           |
| 10          | Kurd (Dodecad)               | 33.35           |
| 11          | Tuscan (Xing)                | 26.83           |
| 12          | Kurd (Xing)                  | 29.3            |
| 13          | Stalskoe (Xing)              | 24.16           |
| 14          | Tuscan (Henn)                | 22.82           |
| 15          | Greek (Dodecad)              | 26.96           |
| 16          | Romanians_14 (Behar)         | 25.3            |
| 17          | S_Italian_Sicilian (Dodecad) | 28.75           |
| 18          | TSI (HapMap)                 | 21.17           |
| 19          | Turkish (Dodecad)            | 34.62           |
| 20          | O_Italian (Dodecad)          | 34.79           |

***Heredia Heredia - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Pathan (HGDP)               | 30.47           |
| 2           | Bnei_Menashe_Jews (Behar)   | 28.04           |
| 3           | Balochi (HGDP)              | 24.64           |
| 4           | Makrani (HGDP)              | 32.21           |
| 5           | Brahui (HGDP)               | 30.27           |
| 6           | Ashkenazy_Jews (Behar)      | 22.44           |
| 7           | Burusho (HGDP)              | 33.66           |
| 8           | Kashmiri_Pandit (Reich)     | 32.34           |
| 9           | Ashkenazi (Dodecad)         | 34.25           |
| 10          | Stalskoe (Xing)             | 30.89           |
| 11          | Kurd (Dodecad)              | 29.2            |
| 12          | Pakistani (Xing)            | 26.27           |
| 13          | Uzbekistan_Jews (Behar)     | 33.99           |
| 14          | Kurd (Xing)                 | 32.99           |
| 15          | Sindhi (HGDP)               | 20.68           |
| 16          | Morocco_Jews (Behar)        | 20.4            |
| 17          | Tuscan (Xing)               | 25.65           |
| 18          | Turkish (Dodecad)           | 32.16           |
| 19          | Romanians_14 (Behar)        | 34.81           |
| 20          | Tuscan (Henn)               | 22.26           |

***Heredia Munoz - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 28.91           |
| 2           | Bnei_Menashe_Jews (Behar)    | 25.71           |
| 3           | Pathan (HGDP)                | 34.55           |
| 4           | Ashkenazi (Dodecad)          | 32.63           |
| 5           | Tuscan (Xing)                | 32.57           |
| 6           | Tuscan (Henn)                | 27.03           |
| 7           | TSI (HapMap)                 | 26.22           |
| 8           | Balochi (HGDP)               | 24.1            |
| 9           | Morocco_Jews (Behar)         | 20.85           |
| 10          | Makrani (HGDP)               | 32.97           |
| 11          | Brahui (HGDP)                | 32.19           |
| 12          | O_Italian (Dodecad)          | 35              |
| 13          | Burusho (HGDP)               | 34.95           |
| 14          | Stalskoe (Xing)              | 28.33           |
| 15          | C_Italian (Dodecad)          | 31.53           |
| 16          | Kashmiri_Pandit (Reich)      | 34.17           |
| 17          | Pakistani (Xing)             | 32.74           |
| 18          | Romanians_14 (Behar)         | 23.71           |
| 19          | S_Italian_Sicilian (Dodecad) | 26.76           |
| 20          | Uzbekistan_Jews (Behar)      | 21.94           |

***Heredia - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 34.31           |
| 2           | Ashkenazi (Dodecad)          | 29.09           |
| 3           | Bnei_Menashe_Jews (Behar)    | 23.43           |
| 4           | Morocco_Jews (Behar)         | 30.08           |
| 5           | Pathan (HGDP)                | 29.27           |
| 6           | Tuscan (Xing)                | 25.37           |
| 7           | Balochi (HGDP)               | 21.7            |
| 8           | Makrani (HGDP)               | 30.07           |
| 9           | Tuscan (Henn)                | 27.8            |
| 10          | Brahui (HGDP)                | 31.58           |
| 11          | TSI (HapMap)                 | 27.8            |
| 12          | O_Italian (Dodecad)          | 32.78           |
| 13          | Uzbekistan_Jews (Behar)      | 28.28           |
| 14          | C_Italian (Dodecad)          | 28.41           |
| 15          | S_Italian_Sicilian (Dodecad) | 33.15           |
| 16          | Greek (Dodecad)              | 26.05           |
| 17          | Kurd (Dodecad)               | 22.01           |
| 18          | Sicilian (Dodecad)           | 20.43           |
| 19          | Sephardic_Jews (Behar)       | 31.33           |
| 20          | Kurd (Xing)                  | 29.3            |

***Hernandez Borja - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 30.56           |
| 2           | Tuscan (Henn)                | 23.19           |
| 3           | Ashkenazy_Jews (Behar)       | 22.05           |
| 4           | TSI (HapMap)                 | 20.22           |
| 5           | Ashkenazi (Dodecad)          | 25.26           |
| 6           | O_Italian (Dodecad)          | 28.85           |
| 7           | Romanians_14 (Behar)         | 25.88           |
| 8           | Morocco_Jews (Behar)         | 26.56           |
| 9           | C_Italian (Dodecad)          | 33.56           |
| 10          | N_Italian (Dodecad)          | 25.22           |
| 11          | Tuscan (HGDP)                | 27.71           |
| 12          | S_Italian_Sicilian (Dodecad) | 31.75           |
| 13          | Balkans (Dodecad)            | 25.95           |
| 14          | Sicilian (Dodecad)           | 29.33           |
| 15          | Greek (Dodecad)              | 32.94           |
| 16          | Slovenian (Xing)             | 34.24           |
| 17          | North_Italian (HGDP)         | 22.21           |
| 18          | Sephardic_Jews (Behar)       | 33.9            |
| 19          | Portuguese (Dodecad)         | 27.38           |
| 20          | Hungarians (Behar)           | 23.87           |

***Hernandez Gorretta - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 26.89           |
| d           | Tuscan (Xing)                | 34.7            |
| 3           | Tuscan (Henn)                | 27.39           |
| 4           | Ashkenazi (Dodecad)          | 24.93           |
| 5           | TSI (HapMap)                 | 29.5            |
| 6           | O_Italian (Dodecad)          | 23.6            |
| 7           | Morocco_Jews (Behar)         | 21.14           |
| 8           | Romanians_14 (Behar)         | 21.93           |
| 9           | C_Italian (Dodecad)          | 21.92           |
| 10          | N_Italian (Dodecad)          | 22.28           |
| 11          | Tuscan (HGDP)                | 22.08           |
| 12          | S_Italian_Sicilian (Dodecad) | 29.61           |
| 13          | Pathan (HGDP)                | 22.73           |
| 14          | Bnei_Menashe_Jews (Behar)    | 25.19           |
| 15          | Greek (Dodecad)              | 33.45           |
| 16          | Sicilian (Dodecad)           | 27.11           |
| 17          | Stalskoe (Xing)              | 30.01           |
| 18          | Balkans (Dodecad)            | 22.58           |
| 19          | Slovenian (Xing)             | 22.88           |
| 20          | Sephardic_Jews (Behar)       | 20.61           |

***Hernandez Heredia, - Single Pop. Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 22.53           |
| 2           | Romanians_14 (Behar)         | 24.18           |
| 3           | Ashkenazi (Dodecad)          | 22.66           |
| 4           | Tuscan (Xing)                | 21.33           |
| 5           | Tuscan (Henn)                | 21.81           |
| 6           | TSI (HapMap)                 | 26.91           |
| 7           | Balkans (Dodecad)            | 23.1            |
| 8           | Morocco_Jews (Behar)         | 25.46           |
| 9           | O_Italian (Dodecad)          | 27.55           |
| 10          | C_Italian (Dodecad)          | 30.36           |
| 11          | Greek (Dodecad)              | 20.59           |
| 12          | S_Italian_Sicilian (Dodecad) | 31.99           |
| 13          | Sicilian (Dodecad)           | 29.42           |
| 14          | Tuscan (HGDP)                | 21.23           |
| 15          | Slovenian (Xing)             | 33.1            |
| 16          | Sephardic_Jews (Behar)       | 33.81           |
| 17          | Hungarians (Behar)           | 20.92           |
| 18          | Stalskoe (Xing)              | 24.15           |
| 19          | N_Italian (Dodecad)          | 32.09           |
| 20          | Uzbekistan_Jews (Behar)      | 31.22           |

***Hernandez Jimenez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 22.77           |
| 2           | Ashkenazi (Dodecad)          | 23.14           |
| 3           | Stalskoe (Xing)              | 25.56           |
| 4           | Tuscan (Xing)                | 27.27           |
| 5           | Tuscan (Henn)                | 29.27           |
| 6           | Morocco_Jews (Behar)         | 25.53           |
| 7           | TSI (HapMap)                 | 26.94           |
| 8           | Pathan (HGDP)                | 31.21           |
| 9           | Balochi (HGDP)               | 20.55           |
| 10          | Makrani (HGDP)               | 23.79           |
| 11          | Uzbekistan_Jews (Behar)      | 30.7            |
| 12          | Kurd (Dodecad)               | 33.43           |
| 13          | Brahui (HGDP)                | 27.68           |
| 14          | Romanians_14 (Behar)         | 27.98           |
| 15          | O_Italian (Dodecad)          | 21.61           |
| 16          | Bnei_Menashe_Jews (Behar)    | 26.71           |
| 17          | Kurd (Xing)                  | 27.99           |
| 18          | C_Italian (Dodecad)          | 23.64           |
| 19          | Turkish (Dodecad)            | 24.04           |
| 20          | S_Italian_Sicilian (Dodecad) | 25.66           |

***Jimenez Ecudero - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 20.3            |
| 2           | Tuscan (Xing)                | 24.83           |
| 3           | Ashkenazi (Dodecad)          | 23.17           |
| 4           | Tuscan (Henn)                | 24.91           |
| 5           | TSI (HapMap)                 | 21.8            |
| 6           | O_Italian (Dodecad)          | 33.36           |
| 7           | Romanians_14 (Behar)         | 28.9            |
| 8           | Morocco_Jews (Behar)         | 30.19           |
| 9           | C_Italian (Dodecad)          | 31.84           |
| 10          | S_Italian_Sicilian (Dodecad) | 27.48           |
| 11          | Tuscan (HGDP)                | 21.3            |
| 12          | Greek (Dodecad)              | 28.06           |
| 13          | N_Italian (Dodecad)          | 28.8            |
| 14          | Balkans (Dodecad)            | 31.18           |
| 15          | Stalskoe (Xing)              | 26.47           |
| 16          | Sicilian (Dodecad)           | 21.91           |
| 17          | Sephardic_Jews (Behar)       | 24.26           |
| 18          | Slovenian (Xing)             | 25.45           |
| 19          | S_Italian (Dodecad)          | 29.69           |
| 20          | Uzbekistan_Jews (Behar)      | 28.56           |

***Jimenez Jimenez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 25.34           |
| 2           | Ashkenazi (Dodecad)          | 34.8            |
| 3           | Tuscan (Xing)                | 29.09           |
| 4           | Tuscan (Henn)                | 23.56           |
| 5           | TSI (HapMap)                 | 21.53           |
| 6           | Morocco_Jews (Behar)         | 22.29           |
| 7           | O_Italian (Dodecad)          | 23.69           |
| 8           | Romanians_14 (Behar)         | 22.41           |
| 9           | C_Italian (Dodecad)          | 22.8            |
| 10          | S_Italian_Sicilian (Dodecad) | 24.28           |
| 11          | Greek (Dodecad)              | 22.6            |
| 12          | Stalskoe (Xing)              | 33.45           |
| 13          | Sicilian (Dodecad)           | 21.2            |
| 14          | Uzbekistan_Jews (Behar)      | 27.87           |
| 15          | Tuscan (HGDP)                | 26.16           |
| 16          | Sephardic_Jews (Behar)       | 34.74           |
| 17          | Balkans (Dodecad)            | 21.68           |
| 18          | N_Italian (Dodecad)          | 25.97           |
| 19          | S_Italian (Dodecad)          | 34.54           |
| 20          | Kurd (Dodecad)               | 32.98           |

***Jimenez Jimenez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 19.77           |
| 2           | Ashkenazi (Dodecad)          | 20.88           |
| 3           | Tuscan (Xing)                | 21.73           |
| 4           | Tuscan (Henn)                | 22.54           |
| 5           | TSI (HapMap)                 | 22.92           |
| 6           | Morocco_Jews (Behar)         | 23.28           |
| 7           | O_Italian (Dodecad)          | 24.35           |
| 8           | Romanians_14 (Behar)         | 25.08           |
| 9           | Stalskoe (Xing)              | 25.3            |
| 10          | C_Italian (Dodecad)          | 25.73           |
| 11          | S_Italian_Sicilian (Dodecad) | 26.58           |
| 12          | Uzbekistan_Jews (Behar)      | 26.84           |
| 13          | Greek (Dodecad)              | 27.35           |
| 14          | Sicilian (Dodecad)           | 27.76           |
| 15          | Tuscan (HGDP)                | 27.79           |
| 16          | Kurd (Dodecad)               | 27.83           |
| 17          | Pathan (HGDP)                | 27.89           |
| 18          | Sephardic_Jews (Behar)       | 27.95           |
| 19          | Bnei_Menashe_Jews (Behar)    | 28.15           |
| 20          | Balkans (Dodecad)            | 28.16           |

***Jimenez, Amaro - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 18.07           |
| 2           | Ashkenazi (Dodecad)          | 19.2            |
| 3           | Tuscan (Xing)                | 20.17           |
| 4           | Tuscan (Henn)                | 20.99           |
| 5           | TSI (HapMap)                 | 21.46           |
| 6           | Morocco_Jews (Behar)         | 21.73           |
| 7           | O_Italian (Dodecad)          | 22.64           |
| 8           | Romanians_14 (Behar)         | 22.92           |
| 9           | C_Italian (Dodecad)          | 23.83           |
| 10          | S_Italian_Sicilian (Dodecad) | 24.66           |
| 11          | Greek (Dodecad)              | 25.16           |
| 12          | Stalskoe (Xing)              | 25.29           |
| 13          | Sicilian (Dodecad)           | 25.76           |
| 14          | Uzbekistan_Jews (Behar)      | 25.97           |
| 15          | Tuscan (HGDP)                | 26.05           |
| 16          | Sephardic_Jews (Behar)       | 26.08           |
| 17          | Balkans (Dodecad)            | 26.22           |
| 18          | N_Italian (Dodecad)          | 26.77           |
| 19          | S_Italian (Dodecad)          | 27.11           |
| 20          | Kurd (Dodecad)               | 27.38           |

***Jimenez, Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Pathan (HGDP)               | 32.26           |
| 2           | Ashkenazy_Jews (Behar)      | 23.87           |
| 3           | Balochi (HGDP)              | 22.56           |
| 4           | Makrani (HGDP)              | 30.03           |
| 5           | Stalskoe (Xing)             | 33.94           |
| 6           | Brahui (HGDP)               | 28.35           |
| 7           | Bnei_Menashe_Jews (Behar)   | 28.57           |
| 8           | Ashkenazi (Dodecad)         | 24.2            |
| 9           | Kurd (Dodecad)              | 31.54           |
| 10          | Uzbekistan_Jews (Behar)     | 22.81           |
| 11          | Morocco_Jews (Behar)        | 24.86           |
| 12          | Kurd (Xing)                 | 26.38           |
| 13          | Burusho (HGDP)              | 27.61           |
| 14          | Tuscan (Xing)               | 23.64           |
| 15          | Romanians_14 (Behar)        | 21.72           |
| 16          | Kashmiri_Pandit (Reich)     | 29.16           |
| 17          | Tuscan (Henn)               | 24.33           |
| 18          | TSI (HapMap)                | 28.72           |
| 19          | Pakistani (Xing)            | 22.32           |
| 20          | Turkish (Dodecad)           | 27.22           |

***Luque Cortes - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 27.99           |
| 2           | Ashkenazy_Jews (Behar)       | 20.78           |
| 3           | Tuscan (Henn)                | 25.05           |
| 4           | TSI (HapMap)                 | 22.02           |
| 5           | Ashkenazi (Dodecad)          | 20.95           |
| 6           | O_Italian (Dodecad)          | 34.85           |
| 7           | C_Italian (Dodecad)          | 24.84           |
| 8           | Morocco_Jews (Behar)         | 32.15           |
| 9           | Tuscan (HGDP)                | 23.82           |
| 10          | N_Italian (Dodecad)          | 30.22           |
| 11          | Romanians_14 (Behar)         | 31.4            |
| 12          | S_Italian_Sicilian (Dodecad) | 28.93           |
| 13          | Sicilian (Dodecad)           | 27.07           |
| 14          | Greek (Dodecad)              | 26.18           |
| 15          | North_Italian (HGDP)         | 25.23           |
| 16          | S_Italian (Dodecad)          | 33.94           |
| 17          | Sephardic_Jews (Behar)       | 32.46           |
| 18          | Portuguese (Dodecad)         | 34.48           |
| 19          | Balkans (Dodecad)            | 21.86           |
| 20          | Stalskoe (Xing)              | 30.96           |

***Manzana Manzana - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 34.08           |
| 2           | Ashkenazi (Dodecad)          | 22.72           |
| 3           | Tuscan (Xing)                | 21              |
| 4           | Morocco_Jews (Behar)         | 31.12           |
| 5           | Romanians_14 (Behar)         | 28.62           |
| 6           | Tuscan (Henn)                | 32.63           |
| 7           | TSI (HapMap)                 | 22.1            |
| 8           | O_Italian (Dodecad)          | 31.93           |
| 9           | C_Italian (Dodecad)          | 23.02           |
| 10          | Greek (Dodecad)              | 22.45           |
| 11          | S_Italian_Sicilian (Dodecad) | 22.46           |
| 12          | Sicilian (Dodecad)           | 32.22           |
| 13          | Balkans (Dodecad)            | 29.98           |
| 14          | Sephardic_Jews (Behar)       | 27.85           |
| 15          | Tuscan (HGDP)                | 25.38           |
| 16          | S_Italian (Dodecad)          | 33.16           |
| 17          | Stalskoe (Xing)              | 25.89           |
| 18          | Uzbekistan_Jews (Behar)      | 32.25           |
| 19          | N_Italian (Dodecad)          | 26.59           |
| 20          | Turkish (Dodecad)            | 25.65           |

***Delgado Alvarez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan                       | 26.94           |
| 2           | North_Italian                | 24.52           |
| 3           | Morocco_Jews                 | 31.21           |
| 4           | North_African_Jews (Dodecad) | 27.54           |
| 5           | Druze                        | 23.48           |
| 6           | Jordanians                   | 33.49           |
| 7           | Egypt                        | 25.76           |
| 8           | French_Basque                | 28.15           |
| 9           | North_African (Dodecad)      | 33.6            |
| 10          | Egyptans                     | 29.36           |
| 11          | Libya                        | 21.75           |
| 12          | Yemenese                     | 34.1            |
| 13          | Algeria                      | 29.42           |
| 14          | Morocco_N                    | 25.02           |
| 15          | Bedouin                      | 22.09           |
| 16          | Yemen_Jews                   | 31.91           |
| 17          | Moroccans                    | 29.3            |
| 18          | Morocco_S                    | 28              |
| 19          | Saudis                       | 33.41           |
| 20          | Ethiopian_Jews               | 31.83           |

***García Núñez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)      | 22.28           |
| 2           | Ashkenazi (Dodecad)         | 24.68           |
| 3           | Pathan (HGDP)               | 23.73           |
| 4           | Bnei_Menashe_Jews (Behar)   | 31.16           |
| 5           | Balochi (HGDP)              | 20.5            |
| 6           | Romanians_14 (Behar)        | 28.55           |
| 7           | Makrani (HGDP)              | 31.44           |
| 8           | Brahui (HGDP)               | 33.15           |
| 9           | Morocco_Jews (Behar)        | 25.13           |
| 10          | Stalskoe (Xing)             | 32.32           |
| 11          | Tuscan (Xing)               | 21.66           |
| 12          | Uzbekistan_Jews (Behar)     | 32.7            |
| 13          | Kurd (Dodecad)              | 21.91           |
| 14          | Tuscan (Henn)               | 25.96           |
| 15          | Kurd (Xing)                 | 31.96           |
| 16          | TSI (HapMap)                | 22.25           |
| 17          | Burusho (HGDP)              | 23.44           |
| 18          | Balkans (Dodecad)           | 30.83           |
| 19          | Kashmiri_Pandit (Reich)     | 30.8            |
| 20          | O_Italian (Dodecad)         | 29.62           |

**Montes Borja- Single Population Sharing**

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Bnei_Menashe_Jews (Behar)   | 30.41           |
| 2           | Pathan (HGDP)               | 28.14           |
| 3           | Burusho (HGDP)              | 23.78           |
| 4           | Kashmiri_Pandit (Reich)     | 25.19           |
| 5           | Balochi (HGDP)              | 22.72           |
| 6           | Pakistani (Xing)            | 33.63           |
| 7           | Brahui (HGDP)               | 28.75           |
| 8           | Sindhi (HGDP)               | 26.01           |
| 9           | Makrani (HGDP)              | 26.93           |
| 10          | Cochin_Jews (Behar)         | 34.21           |
| 11          | Vaish (Reich)               | 22.3            |
| 12          | Nepalese (Xing)             | 28.79           |
| 13          | Ashkenazy_Jews (Behar)      | 27.59           |
| 14          | Meghawal (Reich)            | 29.17           |
| 15          | Ashkenazi (Dodecad)         | 20.27           |
| 16          | Kurd (Dodecad)              | 33.08           |
| 17          | Morocco_Jews (Behar)        | 33.98           |
| 18          | Uzbekistan_Jews (Behar)     | 28.48           |
| 19          | Stalskoe (Xing)             | 30.45           |
| 20          | Kurd (Xing)                 | 33.84           |

**Montoya - Single Population Sharing**

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | North_Italian               | 30.61           |
| 2           | Spanish_Extremadura         | 22.29           |
| 3           | Spanish_Galicia             | 28.64           |
| 4           | Portuguese                  | 29.1            |
| 5           | Tuscan                      | 26.36           |
| 6           | Spanish_Andalucia           | 31.05           |
| 7           | Spanish_Murcia              | 34.02           |
| 8           | Spanish_Valencia            | 33.88           |
| 9           | Spanish_Cataluna            | 26.76           |
| 10          | Spanish_Castilla_Y_Leon     | 21.7            |
| 11          | Spanish_Castilla_La_Mancha  | 34.77           |
| 12          | Spanish_Cantabria           | 32.58           |
| 13          | French                      | 21.87           |
| 14          | Spanish_Aragon              | 33.81           |
| 15          | Southwest_French            | 33.05           |
| 16          | Greek_Thessaly              | 27.78           |
| 17          | West_Sicilian               | 28.87           |
| 18          | Romanian                    | 25.99           |
| 19          | Italian_Abruzzo             | 20.82           |
| 20          | Bulgarian                   | 25.03           |

**Montoya Romero - Single Population Sharing**

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 32.04           |
| 2           | Ashkenazi (Dodecad)          | 20.07           |
| 3           | Tuscan (Xing)                | 25              |
| 4           | Tuscan (Henn)                | 25.97           |
| 5           | Romanians_14 (Behar)         | 28.06           |
| 6           | TSI (HapMap)                 | 33.8            |
| 7           | Morocco_Jews (Behar)         | 25.2            |
| 8           | O_Italian (Dodecad)          | 25.2            |
| 9           | Pathan (HGDP)                | 31.06           |
| 10          | Stalskoe (Xing)              | 26.78           |
| 11          | C_Italian (Dodecad)          | 23.37           |
| 12          | Bnei_Menashe_Jews (Behar)    | 26.79           |
| 13          | Greek (Dodecad)              | 22.11           |
| 14          | Balkans (Dodecad)            | 22.65           |
| 15          | Balochi (HGDP)               | 27.48           |
| 16          | S_Italian_Sicilian (Dodecad) | 26.28           |
| 17          | Makrani (HGDP)               | 33.72           |
| 18          | Uzbekistan_Jews (Behar)      | 25.44           |
| 19          | Brahui (HGDP)                | 28.71           |
| 20          | Sicilian (Dodecad)           | 29.48           |

**Montoya Salazar - Single Population Sharing**

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 20.2            |
| 2           | Ashkenazi (Dodecad)          | 29.95           |
| 3           | Morocco_Jews (Behar)         | 22.67           |
| 4           | Tuscan (Xing)                | 34.42           |
| 5           | Romanians_14 (Behar)         | 22.23           |
| 6           | Tuscan (Henn)                | 26.22           |
| 7           | Uzbekistan_Jews (Behar)      | 21.28           |
| 8           | Stalskoe (Xing)              | 34.95           |
| 9           | TSI (HapMap)                 | 27.53           |
| 10          | Greek (Dodecad)              | 28.93           |
| 11          | O_Italian (Dodecad)          | 21.01           |
| 12          | Kurd (Dodecad)               | 31.25           |
| 13          | C_Italian (Dodecad)          | 23.15           |
| 14          | S_Italian_Sicilian (Dodecad) | 33.47           |
| 15          | Kurd (Xing)                  | 23.08           |
| 16          | Turkish (Dodecad)            | 22.86           |
| 17          | Sephardic_Jews (Behar)       | 20.55           |
| 18          | Sicilian (Dodecad)           | 27.08           |
| 19          | Balkans (Dodecad)            | 28.47           |
| 20          | Makrani (HGDP)               | 20.99           |

**Montoya Silva - Single Population Sharing**

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 31.63           |
| 2           | Ashkenazi (Dodecad)          | 26.8            |
| 3           | Tuscan (Xing)                | 27.87           |
| 4           | Tuscan (Henn)                | 26.61           |
| 5           | TSI (HapMap)                 | 26.01           |
| 6           | Morocco_Jews (Behar)         | 28.39           |
| 7           | O_Italian (Dodecad)          | 22.33           |
| 8           | Romanians_14 (Behar)         | 22.73           |
| 9           | C_Italian (Dodecad)          | 32.93           |
| 10          | S_Italian_Sicilian (Dodecad) | 34.19           |
| 11          | Greek (Dodecad)              | 25.6            |
| 12          | Sicilian (Dodecad)           | 24.06           |
| 13          | Tuscan (HGDP)                | 29.66           |
| 14          | Sephardic_Jews (Behar)       | 26.13           |
| 15          | Balkans (Dodecad)            | 20.38           |
| 16          | Bnei_Menashe_Jews (Behar)    | 22.34           |
| 17          | N_Italian (Dodecad)          | 30.74           |
| 18          | Pathan (HGDP)                | 29.88           |
| 19          | S_Italian (Dodecad)          | 20.41           |
| 20          | Uzbekistan_Jews (Behar)      | 23.33           |

**Montoya - Single Population Sharing**

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 23.47           |
| 2           | Ashkenazi (Dodecad)          | 30.08           |
| 3           | Tuscan (Xing)                | 20.3            |
| 4           | Tuscan (Henn)                | 21.56           |
| 5           | Romanians_14 (Behar)         | 32              |
| 6           | TSI (HapMap)                 | 22.68           |
| 7           | Morocco_Jews (Behar)         | 29.79           |
| 8           | O_Italian (Dodecad)          | 23.57           |
| 9           | Pathan (HGDP)                | 21.49           |
| 10          | Bnei_Menashe_Jews (Behar)    | 23.65           |
| 11          | C_Italian (Dodecad)          | 30.83           |
| 12          | Balkans (Dodecad)            | 32.84           |
| 13          | Stalskoe (Xing)              | 32.45           |
| 14          | Greek (Dodecad)              | 25.96           |
| 15          | Balochi (HGDP)               | 30.02           |
| 16          | S_Italian_Sicilian (Dodecad) | 23.07           |
| 17          | Uzbekistan_Jews (Behar)      | 24.4            |
| 18          | Makrani (HGDP)               | 33.45           |
| 19          | Brahui (HGDP)                | 20.2            |
| 20          | Sicilian (Dodecad)           | 21.28           |

***Moreno Arjona - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 23.12           |
| 2           | Tuscan (Henn)                | 20.4            |
| 3           | TSI (HapMap)                 | 22.72           |
| 4           | Ashkenazy_Jews (Behar)       | 28.75           |
| 5           | Ashkenazi (Dodecad)          | 26.32           |
| 6           | O_Italian (Dodecad)          | 33.39           |
| 7           | Romanians_14 (Behar)         | 32.26           |
| 8           | N_Italian (Dodecad)          | 25.13           |
| 9           | Slovenian (Xing)             | 23.89           |
| 10          | C_Italian (Dodecad)          | 25.7            |
| 11          | Morocco_Jews (Behar)         | 28.85           |
| 12          | Tuscan (HGDP)                | 24.02           |
| 13          | Balkans (Dodecad)            | 29.36           |
| 14          | Hungarians (Behar)           | 26.14           |
| 15          | Portuguese (Dodecad)         | 28.28           |
| 16          | North_Italian (HGDP)         | 26.54           |
| 17          | S_Italian_Sicilian (Dodecad) | 24.42           |
| 18          | Greek (Dodecad)              | 34.23           |
| 19          | Sicilian (Dodecad)           | 31.45           |
| 20          | French (HGDP)                | 22.1            |

***Moreno de la Cruz - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 33.03           |
| 2           | Ashkenazi (Dodecad)          | 27.31           |
| 3           | Tuscan (Xing)                | 33.42           |
| 4           | Morocco_Jews (Behar)         | 32              |
| 5           | Bnei_Menashe_Jews (Behar)    | 26.38           |
| 6           | Pathan (HGDP)                | 20.34           |
| 7           | Tuscan (Henn)                | 24.03           |
| 8           | TSI (HapMap)                 | 28.12           |
| 9           | Balochi (HGDP)               | 29.5            |
| 10          | Romanians_14 (Behar)         | 23.87           |
| 11          | Makrani (HGDP)               | 22.09           |
| 12          | O_Italian (Dodecad)          | 32.52           |
| 13          | Brahui (HGDP)                | 34.77           |
| 14          | Stalskoe (Xing)              | 27.89           |
| 15          | Uzbekistan_Jews (Behar)      | 22.58           |
| 16          | C_Italian (Dodecad)          | 24.08           |
| 17          | S_Italian_Sicilian (Dodecad) | 20.28           |
| 18          | Kurd (Dodecad)               | 33.71           |
| 19          | Greek (Dodecad)              | 21.77           |
| 20          | Kurd (Xing)                  | 28.65           |

**Moreno - Single Population Sharing**

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 24.11           |
| 2           | Tuscan (Henn)                | 28.31           |
| 3           | TSI (HapMap)                 | 29.77           |
| 4           | O_Italian (Dodecad)          | 32.45           |
| 5           | Ashkenazy_Jews (Behar)       | 23.1            |
| 6           | N_Italian (Dodecad)          | 20.16           |
| 7           | Ashkenazi (Dodecad)          | 22.05           |
| 8           | Tuscan (HGDP)                | 33.5            |
| 9           | Romanians_14 (Behar)         | 33.11           |
| 10          | C_Italian (Dodecad)          | 28.96           |
| 11          | North_Italian (HGDP)         | 29.01           |
| 12          | Portuguese (Dodecad)         | 29.98           |
| 13          | Balkans (Dodecad)            | 22.63           |
| 14          | Morocco_Jews (Behar)         | 33.72           |
| 15          | Slovenian (Xing)             | 26.28           |
| 16          | S_Italian_Sicilian (Dodecad) | 25.75           |
| 17          | IBS (1000Genomes)            | 27.78           |
| 18          | Greek (Dodecad)              | 20.7            |
| 19          | Sicilian (Dodecad)           | 22.49           |
| 20          | Hungarians (Behar)           | 31.07           |

**Motos Hernande - Single Population Sharing**

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 21.24           |
| 2           | Ashkenazi (Dodecad)          | 29.05           |
| 3           | Tuscan (Xing)                | 23.68           |
| 4           | Romanians_14 (Behar)         | 25.84           |
| 5           | Tuscan (Henn)                | 24.33           |
| 6           | Morocco_Jews (Behar)         | 25.34           |
| 7           | TSI (HapMap)                 | 30.79           |
| 8           | Stalskoe (Xing)              | 24.46           |
| 9           | Uzbekistan_Jews (Behar)      | 28.5            |
| 10          | O_Italian (Dodecad)          | 27.14           |
| 11          | Kurd (Dodecad)               | 29.96           |
| 12          | Balkans (Dodecad)            | 34.05           |
| 13          | Pathan (HGDP)                | 30.99           |
| 14          | C_Italian (Dodecad)          | 23.22           |
| 15          | Kurd (Xing)                  | 20.47           |
| 16          | Greek (Dodecad)              | 23.93           |
| 17          | Balochi (HGDP)               | 28.93           |
| 18          | Makrani (HGDP)               | 20.77           |
| 19          | S_Italian_Sicilian (Dodecad) | 27.45           |
| 20          | Bnei_Menashe_Jews (Behar)    | 28.95           |

***Motos Motos - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)      | 25.01           |
| 2           | Ashkenazi (Dodecad)         | 31.56           |
| 3           | Pathan (HGDP)               | 21.6            |
| 4           | Balochi (HGDP)              | 21.13           |
| 5           | Makrani (HGDP)              | 30.92           |
| 6           | Stalskoe (Xing)             | 27.43           |
| 7           | Brahui (HGDP)               | 30.33           |
| 8           | Bnei_Menashe_Jews (Behar)   | 26.52           |
| 9           | Kurd (Dodecad)              | 23.7            |
| 10          | Uzbekistan_Jews (Behar)     | 32.29           |
| 11          | Tuscan (Xing)               | 31.99           |
| 12          | Morocco_Jews (Behar)        | 30.42           |
| 13          | Kurd (Xing)                 | 24.08           |
| 14          | Romanians_14 (Behar)        | 28.85           |
| 15          | Tuscan (Henn)               | 25.41           |
| 16          | TSI (HapMap)                | 21.37           |
| 17          | Turkish (Dodecad)           | 33.76           |
| 18          | O_Italian (Dodecad)         | 22.05           |
| 19          | Burusho (HGDP)              | 34.25           |
| 20          | Greek (Dodecad)             | 26.69           |

***- Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 22.78           |
| 2           | Ashkenazi (Dodecad)          | 28.13           |
| 3           | Morocco_Jews (Behar)         | 33.09           |
| 4           | Tuscan (Xing)                | 30.98           |
| 5           | Tuscan (Henn)                | 32.1            |
| 6           | Romanians_14 (Behar)         | 29.88           |
| 7           | TSI (HapMap)                 | 30.38           |
| 8           | O_Italian (Dodecad)          | 32.74           |
| 9           | C_Italian (Dodecad)          | 23.75           |
| 10          | S_Italian_Sicilian (Dodecad) | 27.34           |
| 11          | Greek (Dodecad)              | 23.32           |
| 12          | Uzbekistan_Jews (Behar)      | 34.82           |
| 13          | Sephardic_Jews (Behar)       | 34.16           |
| 14          | Sicilian (Dodecad)           | 20.59           |
| 15          | Stalskoe (Xing)              | 30.58           |
| 16          | Kurd (Dodecad)               | 33.88           |
| 17          | S_Italian (Dodecad)          | 22.71           |
| 18          | Kurd (Xing)                  | 28.52           |
| 19          | Bnei_Menashe_Jews (Behar)    | 33.73           |
| 20          | Balkans (Dodecad)            | 20.51           |

***Muñoz Cortés- Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Bnei_Menashe_Jews (Behar)   | 30.46           |
| 2           | Pathan (HGDP)               | 24.46           |
| 3           | Ashkenazy_Jews (Behar)      | 33.87           |
| 4           | Balochi (HGDP)              | 34.57           |
| 5           | Makrani (HGDP)              | 34.16           |
| 6           | Ashkenazi (Dodecad)         | 27.11           |
| 7           | Brahui (HGDP)               | 32.93           |
| 8           | Morocco_Jews (Behar)        | 32.67           |
| 9           | Uzbekistan_Jews (Behar)     | 24.79           |
| 10          | Stalskoe (Xing)             | 32.43           |
| 11          | Kurd (Dodecad)              | 20.56           |
| 12          | Burusho (HGDP)              | 28.94           |
| 13          | Tuscan (Xing)               | 23.45           |
| 14          | Kashmiri_Pandit (Reich)     | 21.81           |
| 15          | Kurd (Xing)                 | 21.15           |
| 16          | Pakistani (Xing)            | 30.44           |
| 17          | Tuscan (Henn)               | 25.1            |
| 18          | Romanians_14 (Behar)        | 30.87           |
| 19          | TSI (HapMap)                | 20.98           |
| 20          | Sindhi (HGDP)               | 24.73           |

***Muñoz Fernández- Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 28.09           |
| 2           | Ashkenazi (Dodecad)          | 31.86           |
| 3           | Tuscan (Xing)                | 24.78           |
| 4           | Tuscan (Henn)                | 29.39           |
| 5           | Morocco_Jews (Behar)         | 33.29           |
| 6           | TSI (HapMap)                 | 29.24           |
| 7           | Romanians_14 (Behar)         | 23.49           |
| 8           | O_Italian (Dodecad)          | 20.37           |
| 9           | Stalskoe (Xing)              | 33.05           |
| 10          | C_Italian (Dodecad)          | 20.32           |
| 11          | Pathan (HGDP)                | 33.12           |
| 12          | Uzbekistan_Jews (Behar)      | 27.93           |
| 13          | S_Italian_Sicilian (Dodecad) | 34.09           |
| 14          | Greek (Dodecad)              | 31.98           |
| 15          | Bnei_Menashe_Jews (Behar)    | 34.97           |
| 16          | Balochi (HGDP)               | 25.26           |
| 17          | Balkans (Dodecad)            | 31.51           |
| 18          | Kurd (Dodecad)               | 26.03           |
| 19          | Makrani (HGDP)               | 27.2            |
| 20          | Sicilian (Dodecad)           | 29.41           |

***Navarro Vargas - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 33.11           |
| 2           | Bnei_Menashe_Jews (Behar)    | 34.76           |
| 3           | Ashkenazi (Dodecad)          | 31.52           |
| 4           | Pathan (HGDP)                | 26.27           |
| 5           | Morocco_Jews (Behar)         | 26.32           |
| 6           | Tuscan (Xing)                | 31.06           |
| 7           | Balochi (HGDP)               | 23.58           |
| 8           | Romanians_14 (Behar)         | 21.66           |
| 9           | Tuscan (Henn)                | 25.32           |
| 10          | Makrani (HGDP)               | 24.31           |
| 11          | Brahui (HGDP)                | 24.44           |
| 12          | TSI (HapMap)                 | 23.5            |
| 13          | O_Italian (Dodecad)          | 20.63           |
| 14          | C_Italian (Dodecad)          | 20.27           |
| 15          | Greek (Dodecad)              | 34.82           |
| 16          | S_Italian_Sicilian (Dodecad) | 26.42           |
| 17          | Burusho (HGDP)               | 25.76           |
| 18          | Kashmiri_Pandit (Reich)      | 30.19           |
| 19          | Uzbekistan_Jews (Behar)      | 23.27           |
| 20          | Sicilian (Dodecad)           | 34.25           |

***Nunez Heredia - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Tuscan (Xing)                | 31.8            |
| 2           | Ashkenazy_Jews (Behar)       | 21.34           |
| 3           | Tuscan (Henn)                | 26.26           |
| 4           | Ashkenazi (Dodecad)          | 33.19           |
| 5           | TSI (HapMap)                 | 34.17           |
| 6           | O_Italian (Dodecad)          | 27.01           |
| 7           | C_Italian (Dodecad)          | 29.2            |
| 8           | Morocco_Jews (Behar)         | 22.51           |
| 9           | Romanians_14 (Behar)         | 34.87           |
| 10          | Tuscan (HGDP)                | 23.48           |
| 11          | S_Italian_Sicilian (Dodecad) | 34.14           |
| 12          | N_Italian (Dodecad)          | 29.74           |
| 13          | Greek (Dodecad)              | 29.12           |
| 14          | Sicilian (Dodecad)           | 27.69           |
| 15          | S_Italian (Dodecad)          | 23.46           |
| 16          | Sephardic_Jews (Behar)       | 22.65           |
| 17          | Balkans (Dodecad)            | 23.31           |
| 18          | North_Italian (HGDP)         | 22.8            |
| 19          | Stalskoe (Xing)              | 31.69           |
| 20          | Slovenian (Xing)             | 25.25           |

***Nunez Heredia- Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 20.87           |
| 2           | Ashkenazi (Dodecad)          | 34.54           |
| 3           | Tuscan (Xing)                | 33.26           |
| 4           | Tuscan (Henn)                | 33.92           |
| 5           | TSI (HapMap)                 | 34.92           |
| 6           | O_Italian (Dodecad)          | 22.61           |
| 7           | Morocco_Jews (Behar)         | 25.94           |
| 8           | Romanians_14 (Behar)         | 31.37           |
| 9           | C_Italian (Dodecad)          | 30.44           |
| 10          | S_Italian_Sicilian (Dodecad) | 22.31           |
| 11          | Greek (Dodecad)              | 32.24           |
| 12          | Tuscan (HGDP)                | 23.37           |
| 13          | Sicilian (Dodecad)           | 23.36           |
| 14          | N_Italian (Dodecad)          | 28.05           |
| 15          | Sephardic_Jews (Behar)       | 28.89           |
| 16          | Balkans (Dodecad)            | 28.7            |
| 17          | Stalskoe (Xing)              | 21.37           |
| 18          | S_Italian (Dodecad)          | 33.16           |
| 19          | Uzbekistan_Jews (Behar)      | 23.98           |
| 20          | Turkish (Dodecad)            | 21.94           |

***Vamosine Palmai - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)      | 33.33           |
| 2           | Ashkenazi (Dodecad)         | 34.33           |
| 3           | Stalskoe (Xing)             | 32.93           |
| 4           | Tuscan (Xing)               | 32.14           |
| 5           | Tuscan (Henn)               | 29.83           |
| 6           | Morocco_Jews (Behar)        | 28.26           |
| 7           | Romanians_14 (Behar)        | 21.3            |
| 8           | TSI (HapMap)                | 26.13           |
| 9           | Uzbekistan_Jews (Behar)     | 25.59           |
| 10          | Kurd (Dodecad)              | 23.9            |
| 11          | Pathan (HGDP)               | 30.85           |
| 12          | Makrani (HGDP)              | 27.44           |
| 13          | Balochi (HGDP)              | 21.22           |
| 14          | Kurd (Xing)                 | 23.3            |
| 15          | O_Italian (Dodecad)         | 30.25           |
| 16          | Brahui (HGDP)               | 21.14           |
| 17          | Turkish (Dodecad)           | 32.77           |
| 18          | Bnei_Menashe_Jews (Behar)   | 27.43           |
| 19          | C_Italian (Dodecad)         | 27.21           |
| 20          | Greek (Dodecad)             | 28.89           |

***Borja Perez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Bnei_Menashe_Jews (Behar)   | 32.37           |
| 2           | Pathan (HGDP)               | 25.22           |
| 3           | Balochi (HGDP)              | 30.17           |
| 4           | Brahui (HGDP)               | 28.49           |
| 5           | Makrani (HGDP)              | 24.01           |
| 6           | Burusho (HGDP)              | 33.18           |
| 7           | Kashmiri_Pandit (Reich)     | 31.96           |
| 8           | Pakistani (Xing)            | 29.88           |
| 9           | Ashkenazy_Jews (Behar)      | 32.76           |
| 10          | Sindhi (HGDP)               | 33.01           |
| 11          | Ashkenazi (Dodecad)         | 30.63           |
| 12          | Morocco_Jews (Behar)        | 32.56           |
| 13          | Uzbekistan_Jews (Behar)     | 30.46           |
| 14          | Kurd (Dodecad)              | 30.2            |
| 15          | Kurd (Xing)                 | 29.28           |
| 16          | Stalskoe (Xing)             | 31.29           |
| 17          | Tuscan (Xing)               | 22.38           |
| 18          | Nepalese (Xing)             | 33.21           |
| 19          | Cochin_Jews (Behar)         | 33.08           |
| 20          | Romanians_14 (Behar)        | 20.44           |

***Borja Perez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Bnei_Menashe_Jews (Behar)   | 32.39           |
| 2           | Pathan (HGDP)               | 21.93           |
| 3           | Ashkenazy_Jews (Behar)      | 25.03           |
| 4           | Ashkenazi (Dodecad)         | 31.15           |
| 5           | Balochi (HGDP)              | 22.41           |
| 6           | Makrani (HGDP)              | 32.27           |
| 7           | Brahui (HGDP)               | 32.48           |
| 8           | Tuscan (Xing)               | 27.61           |
| 9           | Morocco_Jews (Behar)        | 20.1            |
| 10          | Burusho (HGDP)              | 24.31           |
| 11          | Tuscan (Henn)               | 29.25           |
| 12          | Kashmiri_Pandit (Reich)     | 34.72           |
| 13          | TSI (HapMap)                | 29.48           |
| 14          | Pakistani (Xing)            | 23.9            |
| 15          | Stalskoe (Xing)             | 29.51           |
| 16          | Uzbekistan_Jews (Behar)     | 28.1            |
| 17          | Kurd (Dodecad)              | 31.7            |
| 18          | Sindhi (HGDP)               | 21.6            |
| 19          | O_Italian (Dodecad)         | 31.42           |
| 20          | Romanians_14 (Behar)        | 28.12           |

***Salazar Jimenez - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 34.44           |
| 2           | Ashkenazi (Dodecad)          | 25.13           |
| 3           | Tuscan (Xing)                | 29.49           |
| 4           | Morocco_Jews (Behar)         | 33.98           |
| 5           | Tuscan (Henn)                | 21.54           |
| 6           | TSI (HapMap)                 | 34.06           |
| 7           | Romanians_14 (Behar)         | 30.32           |
| 8           | O_Italian (Dodecad)          | 21.02           |
| 9           | C_Italian (Dodecad)          | 24.51           |
| 10          | S_Italian_Sicilian (Dodecad) | 30.62           |
| 11          | Uzbekistan_Jews (Behar)      | 21.01           |
| 12          | Stalskoe (Xing)              | 28.73           |
| 13          | Greek (Dodecad)              | 25.19           |
| 14          | Balkans (Dodecad)            | 29.31           |
| 15          | Sephardic_Jews (Behar)       | 20.69           |
| 16          | Sicilian (Dodecad)           | 33.07           |
| 17          | Bnei_Menashe_Jews (Behar)    | 34.6            |
| 18          | Kurd (Dodecad)               | 34.53           |
| 19          | Pathan (HGDP)                | 31.24           |
| 20          | Tuscan (HGDP)                | 21.95           |

***Salazar vega - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Hazara (HGDP)               | 31.37           |
| 2           | Uzbeks (Behar)              | 20.37           |
| 3           | Kyrgyzstani (Xing)          | 20.33           |
| 4           | Altai (Rasmussen)           | 24.85           |
| 5           | Uygur (HGDP)                | 27.33           |
| 6           | Yukagir (Rasmussen)         | 31.56           |
| 7           | Selkup (Rasmussen)          | 30.25           |
| 8           | Dolgan (Rasmussen)          | 26.69           |
| 9           | Mongol (Rasmussen)          | 24.1            |
| 10          | Chuvashs_16 (Behar)         | 34.96           |
| 11          | Tuva (Rasmussen)            | 26.39           |
| 12          | Nepalese (Xing)             | 26.77           |
| 13          | Slovenian (Xing)            | 22.45           |
| 14          | Stalskoe (Xing)             | 31.92           |
| 15          | Buryat (Rasmussen)          | 30.41           |
| 16          | Hungarians (Behar)          | 23.31           |
| 17          | Buryat (Xing)               | 21.24           |
| 18          | Romanians_14 (Behar)        | 30.21           |
| 19          | Balkans (Dodecad)           | 29.82           |
| 20          | Ashkenazy_Jews (Behar)      | 24.1            |

***Santiago Heredia - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 34.26           |
| 2           | Ashkenazi (Dodecad)          | 22.27           |
| 3           | Bnei_Menashe_Jews (Behar)    | 26.49           |
| 4           | Pathan (HGDP)                | 34.15           |
| 5           | Morocco_Jews (Behar)         | 26.3            |
| 6           | Balochi (HGDP)               | 29.58           |
| 7           | Makrani (HGDP)               | 25.96           |
| 8           | Brahui (HGDP)                | 24.11           |
| 9           | Tuscan (Xing)                | 34.76           |
| 10          | Uzbekistan_Jews (Behar)      | 26.14           |
| 11          | Tuscan (Henn)                | 33.41           |
| 12          | Kurd (Dodecad)               | 23.45           |
| 13          | TSI (HapMap)                 | 23.2            |
| 14          | Stalskoe (Xing)              | 20.47           |
| 15          | Kurd (Xing)                  | 29.78           |
| 16          | Romanians_14 (Behar)         | 25.53           |
| 17          | O_Italian (Dodecad)          | 32.97           |
| 18          | S_Italian_Sicilian (Dodecad) | 27.1            |
| 19          | C_Italian (Dodecad)          | 34.52           |
| 20          | Burusho (HGDP)               | 22.78           |

***Sevilla - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Tuscan (Henn)               | 33.03           |
| 2           | Tuscan (Xing)               | 31.65           |
| 3           | TSI (HapMap)                | 31.56           |
| 4           | N_Italian (Dodecad)         | 32.67           |
| 5           | O_Italian (Dodecad)         | 31.42           |
| 6           | Portuguese (Dodecad)        | 29.39           |
| 7           | North_Italian (HGDP)        | 21.97           |
| 8           | IBS (1000Genomes)           | 20.49           |
| 9           | Tuscan (HGDP)               | 33.81           |
| 10          | French (Dodecad)            | 29.25           |
| 11          | French (HGDP)               | 31.95           |
| 12          | Spaniards (Behar)           | 27.22           |
| 13          | Spanish (Dodecad)           | 21.76           |
| 14          | Ashkenazy_Jews (Behar)      | 21.88           |
| 15          | C_Italian (Dodecad)         | 30.28           |
| 16          | Ashkenazi (Dodecad)         | 26.45           |
| 17          | Slovenian (Xing)            | 23.01           |
| 18          | Romanians_14 (Behar)        | 27.37           |
| 19          | CEU (HapMap)                | 20.96           |
| 20          | N_European (Xing)           | 28.73           |

***Sevilla - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Tuscan (Henn)               | 24.03           |
| 2           | Tuscan (Xing)               | 31.96           |
| 3           | TSI (HapMap)                | 24.66           |
| 4           | N_Italian (Dodecad)         | 26.83           |
| 5           | O_Italian (Dodecad)         | 20.17           |
| 6           | Portuguese (Dodecad)        | 21.09           |
| 7           | North_Italian (HGDP)        | 25.89           |
| 8           | IBS (1000Genomes)           | 27.2            |
| 9           | Tuscan (HGDP)               | 29              |
| 10          | French (Dodecad)            | 24.37           |
| 11          | French (HGDP)               | 30.42           |
| 12          | Spaniards (Behar)           | 32.9            |
| 13          | Spanish (Dodecad)           | 31.7            |
| 14          | Ashkenazy_Jews (Behar)      | 20.59           |
| 15          | C_Italian (Dodecad)         | 27.21           |
| 16          | Ashkenazi (Dodecad)         | 21.57           |
| 17          | Slovenian (Xing)            | 23.63           |
| 18          | Romanians_14 (Behar)        | 34.8            |
| 19          | CEU (HapMap)                | 22.14           |
| 20          | N._European (Xing)          | 27.48           |

***Vargas Bote - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)      | 29.27           |
| 2           | Romanians_14 (Behar)        | 30.54           |
| 3           | Ashkenazi (Dodecad)         | 28.39           |
| 4           | Tuscan (Xing)               | 20.15           |
| 5           | Tuscan (Henn)               | 24.9            |
| 6           | Balkans (Dodecad)           | 27.77           |
| 7           | TSI (HapMap)                | 21.32           |
| 8           | Pathan (HGDP)               | 25.26           |
| 9           | Morocco_Jews (Behar)        | 20.5            |
| 10          | Bnei_Menashe_Jews (Behar)   | 21.18           |
| 11          | O_Italian (Dodecad)         | 25.95           |
| 12          | Stalskoe (Xing)             | 21.99           |
| 13          | Balochi (HGDP)              | 28.51           |
| 14          | Slovenian (Xing)            | 30.34           |
| 15          | Makrani (HGDP)              | 32.01           |
| 16          | Greek (Dodecad)             | 23              |
| 17          | C_Italian (Dodecad)         | 22.51           |
| 18          | Hungarians (Behar)          | 21.57           |
| 19          | Brahui (HGDP)               | 29.55           |
| 20          | Uzbekistan_Jews (Behar)     | 30.6            |

***Vargas Navarro - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b>  | <b>Distance</b> |
|-------------|------------------------------|-----------------|
| 1           | Ashkenazy_Jews (Behar)       | 20.47           |
| 2           | Romanians_14 (Behar)         | 34.04           |
| 3           | Ashkenazi (Dodecad)          | 20.78           |
| 4           | Tuscan (Xing)                | 28.12           |
| 5           | Tuscan (Henn)                | 30.64           |
| 6           | Morocco_Jews (Behar)         | 33.06           |
| 7           | Pathan (HGDP)                | 30.71           |
| 8           | TSI (HapMap)                 | 32.03           |
| 9           | Balkans (Dodecad)            | 25.09           |
| 10          | Bnei_Menashe_Jews (Behar)    | 32.22           |
| 11          | O_Italian (Dodecad)          | 21.2            |
| 12          | Balochi (HGDP)               | 33.42           |
| 13          | Greek (Dodecad)              | 28.21           |
| 14          | Stalskoe (Xing)              | 32.26           |
| 15          | C_Italian (Dodecad)          | 26.78           |
| 16          | Makrani (HGDP)               | 29.65           |
| 17          | Brahui (HGDP)                | 27.9            |
| 18          | Uzbekistan_Jews (Behar)      | 30.97           |
| 19          | S_Italian_Sicilian (Dodecad) | 21.22           |
| 20          | Sicilian (Dodecad)           | 20.91           |

***Varo Cla - Single Population Sharing***

| <b>Rank</b> | <b>Population Ethnicity</b> | <b>Distance</b> |
|-------------|-----------------------------|-----------------|
| 1           | Tuscan (Xing)               | 23.71           |
| 2           | Tuscan (Henn)               | 22.39           |
| 3           | TSI (HapMap)                | 33.08           |
| 4           | N_Italian (Dodecad)         | 23.29           |
| 5           | O_Italian (Dodecad)         | 34.64           |
| 6           | Portuguese (Dodecad)        | 25.05           |
| 7           | Tuscan (HGDP)               | 22.73           |
| 8           | North_Italian (HGDP)        | 31.85           |
| 9           | Ashkenazy_Jews (Behar)      | 29.88           |
| 10          | IBS (1000Genomes)           | 27.47           |
| 11          | C_Italian (Dodecad)         | 28.33           |
| 12          | Ashkenazi (Dodecad)         | 30.79           |
| 13          | Spanish (Dodecad)           | 23.43           |
| 14          | Spaniards (Behar)           | 34.95           |
| 15          | French (HGDP)               | 34.62           |
| 16          | French (Dodecad)            | 29.75           |
| 17          | Romanians_14 (Behar)        | 22.99           |
| 18          | Slovenian (Xing)            | 30.2            |
| 19          | Sardinian (HGDP)            | 21.08           |
| 20          | Morocco_Jews (Behar)        | 20.46           |

### 3. Mixed Mode

| Mixed Mode            |                                                      |                                                   |
|-----------------------|------------------------------------------------------|---------------------------------------------------|
| Name                  | Population 1                                         | Population 2                                      |
| Cortes Moreno         | Ashkenazy_Jews (Behar)                               |                                                   |
| Aguilera Rodriguez    | Ashkenazy_Jews (Behar)                               |                                                   |
| Aguilera              | Ashkenazy_Jews (Behar)                               |                                                   |
| Ajama Heredia         | Ashkenazy_Jews (Behar)                               |                                                   |
| Amaya                 | Ashkenazy_Jews (Behar)                               |                                                   |
| Bermudez Torres       | Ashkenazy_Jews (Behar)                               |                                                   |
| Borja Perez           | Ashkenazy_Jews_Behar                                 | Cochin_Jews_Behar                                 |
| Borja Ramirez         | Ashkenazy_Jews (Behar)                               |                                                   |
| Cadiz Fernandez       | Ashkenazy_Jews (Behar)                               |                                                   |
| Cano Delgado          | Ashkenazy_Jews (Behar)                               |                                                   |
| Cortes Cortes         | Ashkenazy_Jews (Behar)                               |                                                   |
| Cortes Moreno         | Ashkenazy_Jews (Behar)                               |                                                   |
| Cortes Moreno         |                                                      | Cochin_Jews (Behar)                               |
| Cortes Moreno         | Ashkenazy_Jews (Behar)                               |                                                   |
| Cortes                | Ashkenazy_Jews (Behar)                               |                                                   |
| Delgado Alvarez       | Ashkenazy_Jews (Behar)                               |                                                   |
| Doya Gimenez          | Ashkenazy_Jews (Behar)                               |                                                   |
| Duval Jimenez         | Ashkenazy_Jews (Behar)                               |                                                   |
| Fernández Muñoz       | Ashkenazy_Jews (Behar)                               |                                                   |
| Gabarri Gabarri       |                                                      | Cochin_Jews (Behar)                               |
| Gabarri Hernandez     | Ashkenazy_Jews (Behar)                               |                                                   |
| Garcia Nunez, Jose    | Ashkenazy_Jews (Behar)                               |                                                   |
| Garcia Nunez          | Ashkenazy_Jews (Behar)                               |                                                   |
| García Núñez, Miguel  | Ashkenazy_Jews (Behar)                               |                                                   |
| Gimenez Gimenez       | Ashkenazy_Jews (Behar)                               |                                                   |
| Gimenez Gimenez       | Ashkenazy_Jews (Behar)                               |                                                   |
| Heredia Amaya         | Ashkenazy_Jews (Behar)                               |                                                   |
| Heredia Heredia       | Ashkenazy_Jews (Behar)                               |                                                   |
| Heredia Heredia       | Ashkenazy_Jews (Behar)                               |                                                   |
| Heredia Heredia Munoz | Bnei_Menashe_Jews (Behar)                            |                                                   |
| Heredia de la Rosa    | Ashkenazy_Jews (Behar)                               |                                                   |
| Heredia               | Ashkenazy_Jews (Behar),<br>Bnei_Menashe_Jews (Behar) | Cochin_Jews (Behar)                               |
| Hernandez Gorretta    | Ashkenazy_Jews (Behar)                               |                                                   |
| Hernandez Heredia,    | Ashkenazy_Jews (Behar)                               | Bnei_Menashe_Jews (Behar),<br>Cochin_Jews (Behar) |
| Hernandez Jimenez     | Ashkenazy_Jews (Behar)                               |                                                   |
| Jimenez Escudero      |                                                      | Cochin_Jews (Behar)                               |
| Jimenez Jimenez       | Ashkenazy_Jews (Behar)                               | Bnei_Menashe_Jews (Behar),<br>Cochin_Jews (Behar) |
| Jimenez Jimenez       | Ashkenazy_Jews (Behar)                               | Cochin_Jews (Behar)                               |

| <b>Mixed Mode</b> |                                                      |                                                   |
|-------------------|------------------------------------------------------|---------------------------------------------------|
| <b>Name</b>       | <b>Population 1</b>                                  | <b>Population 2</b>                               |
| Jimenez, Amaro    | Ashkenazy_Jews (Behar)                               | Bnei_Menashe_Jews (Behar),<br>Cochin_Jews (Behar) |
| Jimenez           | Ashkenazy_Jews (Behar)                               |                                                   |
| Manzana Manzana   | Ashkenazy_Jews (Behar)                               |                                                   |
| Montes Borja      | Ashkenazy_Jews (Behar)                               |                                                   |
| Montoya           | Ashkenazy_Jews (Behar)                               |                                                   |
| Montoya Romero    | Ashkenazy_Jews (Behar)                               |                                                   |
| Montoya Salazar   | Ashkenazy_Jews (Behar)                               |                                                   |
| Montoya Silva     | Ashkenazy_Jews (Behar)                               |                                                   |
| Montoya           |                                                      | Cochin_Jews (Behar)                               |
| Moreno de la Cruz | Ashkenazy_Jews (Behar)                               | Cochin_Jews (Behar)                               |
| Motos Hernandez   | Ashkenazy_Jews (Behar)                               | Cochin_Jews (Behar)                               |
| Motos Motos       | Ashkenazy_Jews (Behar)                               |                                                   |
|                   | Ashkenazy_Jews (Behar)                               |                                                   |
| Muñoz Cortés,     | Ashkenazy_Jews (Behar)                               |                                                   |
| Muñoz Fernández,  | Ashkenazy_Jews (Behar)                               | Cochin_Jews (Behar)                               |
| Navarro Vargas    | Ashkenazy_Jews (Behar),<br>Bnei_Menashe_Jews (Behar) | Cochin_Jews (Behar)                               |
| Nunez Heredia     |                                                      | Cochin_Jews_Behar                                 |
| Salazar Jimenez   | Ashkenazy_Jews_Behar                                 | Cochin_Jews_Behar                                 |
| Santiago Heredia  | Ashkenazy_Jews_Behar                                 |                                                   |
| Sevilla (AS)      | Sephardic_Jews_Behar                                 | Morocco_Jews_Behar,<br>Sephardic_Jews_Behar       |
| Sevilla (Cadiz)   | Sephardic_Jews_Behar                                 | Morocco_Jews_Behar,<br>Sephardic_Jews_Behar       |
| Vamosine Palmai   | Ashkenazy_Jews_Behar                                 |                                                   |
| Vargas Bote       | Ashkenazy_Jews (Behar),<br>Bnei_Menashe_Jews (Behar) | Bnei_Menashe_Jews (Behar),<br>Cochin_Jews (Behar) |
| Vargas Navarro    | Ashkenazy_Jews (Behar),<br>Bnei_Menashe_Jews (Behar) | Bnei_Menashe_Jews (Behar),<br>Cochin_Jews (Behar) |
| Doya              | Ashkenazy_Jews (Behar)                               |                                                   |

#### 4. Least Squared method

| Least Squared Method  |                                                      |                                                   |
|-----------------------|------------------------------------------------------|---------------------------------------------------|
| Name                  | Population 1                                         | Population 2                                      |
| Aguilera Rodriguez    | Ashkenazy_Jews (Behar)                               |                                                   |
| Aguilera              | Ashkenazy_Jews (Behar)                               |                                                   |
| Ajama Heredia         | Ashkenazy_Jews (Behar)                               |                                                   |
| Amaya                 | Ashkenazy_Jews (Behar)                               |                                                   |
| Bermudez Torres       | Ashkenazy_Jews (Behar)                               |                                                   |
| Borja Perez           | Ashkenazy_Jews_Behar                                 | Cochin_Jews_Behar                                 |
| Borja Ramirez         | Ashkenazy_Jews (Behar)                               |                                                   |
| Cadiz Fernandez       | Ashkenazy_Jews (Behar)                               |                                                   |
| Cano Delgado          | Ashkenazy_Jews (Behar)                               |                                                   |
| Cortes Cortes         | Ashkenazy_Jews (Behar)                               |                                                   |
| Cortes Moreno         | Ashkenazy_Jews (Behar)                               |                                                   |
| Cortes Moreno         |                                                      | Cochin_Jews (Behar)                               |
| Cortes Moreno         | Ashkenazy_Jews (Behar)                               |                                                   |
| Cortes Moreno         | Ashkenazy_Jews (Behar)                               |                                                   |
| Cortes                | Ashkenazy_Jews (Behar)                               |                                                   |
| Delgado Alvarez       | Ashkenazy_Jews (Behar)                               |                                                   |
| Doya Gimenez          | Ashkenazy_Jews (Behar)                               |                                                   |
| Doya                  | Ashkenazy_Jews (Behar)                               |                                                   |
| Duval Jimenez         | Ashkenazy_Jews (Behar)                               |                                                   |
| Fernández Muñoz,      | Ashkenazy_Jews (Behar)                               |                                                   |
| Gabbarri Gabarri      |                                                      | Cochin_Jews (Behar)                               |
| Gabbarri Hernandez    | Ashkenazy_Jews (Behar)                               |                                                   |
| Garcia Nunez,         | Ashkenazy_Jews (Behar)                               |                                                   |
| Garcia Nunez          | Ashkenazy_Jews (Behar)                               |                                                   |
| García Núñez          | Ashkenazy_Jews (Behar)                               |                                                   |
| Gimenez Gimenez       | Ashkenazy_Jews (Behar)                               |                                                   |
| Gimenez Gimenez       | Ashkenazy_Jews (Behar)                               |                                                   |
| Heredia Amaya         | Ashkenazy_Jews (Behar)                               |                                                   |
| Heredia de la Rosa    | Ashkenazy_Jews (Behar)                               |                                                   |
| Heredia Heredia       | Ashkenazy_Jews (Behar)                               |                                                   |
| Heredia Heredia       | Ashkenazy_Jews (Behar)                               |                                                   |
| Heredia Heredia Munoz | Bnei_Menashe_Jews (Behar)                            |                                                   |
| Heredia               | Ashkenazy_Jews (Behar),<br>Bnei_Menashe_Jews (Behar) | Cochin_Jews (Behar)                               |
| Hernandez Gorretta    | Ashkenazy_Jews (Behar)                               |                                                   |
| Hernandez Heredia     | Ashkenazy_Jews (Behar)                               | Bnei_Menashe_Jews (Behar),<br>Cochin_Jews (Behar) |
| Hernandez Jimenez     | Ashkenazy_Jews (Behar)                               |                                                   |
| Jimenez Escudero      |                                                      | Cochin_Jews (Behar)                               |

| Least Squared Method |                                                      |                                                   |
|----------------------|------------------------------------------------------|---------------------------------------------------|
| Name                 | Population 1                                         | Population 2                                      |
| Jimenez Jimenez      | Ashkenazy_Jews (Behar)                               | Bnei_Menashe_Jews (Behar),<br>Cochin_Jews (Behar) |
| Jimenez Jimenez      | Ashkenazy_Jews (Behar)                               | Cochin_Jews (Behar)                               |
| Jimenez, Amaro       | Ashkenazy_Jews (Behar)                               | Bnei_Menashe_Jews (Behar),<br>Cochin_Jews (Behar) |
| Jimenez              | Ashkenazy_Jews (Behar)                               |                                                   |
| Manzana Manzana      | Ashkenazy_Jews (Behar)                               |                                                   |
| Montes Borja         | Ashkenazy_Jews (Behar)                               |                                                   |
| Montoya              | Ashkenazy_Jews (Behar)                               |                                                   |
| Montoya Romero       | Ashkenazy_Jews (Behar)                               |                                                   |
| Montoya Salazar      | Ashkenazy_Jews (Behar)                               |                                                   |
| Montoya Silva        | Ashkenazy_Jews (Behar)                               |                                                   |
| Montoya              |                                                      | Cochin_Jews (Behar)                               |
| Moreno de la Cruz    | Ashkenazy_Jews (Behar)                               | Cochin_Jews (Behar)                               |
| Motos Hernande       | Ashkenazy_Jews (Behar)                               | Cochin_Jews (Behar)                               |
| Motos Motos          | Ashkenazy_Jews (Behar)                               |                                                   |
|                      | Ashkenazy_Jews (Behar)                               |                                                   |
| Muñoz Cortés,        | Ashkenazy_Jews (Behar)                               |                                                   |
| Muñoz Fernández      | Ashkenazy_Jews (Behar)                               | Cochin_Jews (Behar)                               |
| Navarro Vargas       | Ashkenazy_Jews (Behar),<br>Bnei_Menashe_Jews (Behar) | Cochin_Jews (Behar)                               |
| Nunez Heredia        |                                                      | Cochin_Jews_Behar                                 |
| Salazar Jimenez      | Ashkenazy_Jews_Behar                                 | Cochin_Jews_Behar                                 |
| Santiago Heredia     | Ashkenazy_Jews_Behar                                 |                                                   |
| Sevilla              | Sephardic_Jews_Behar                                 | Morocco_Jews_Behar,<br>Sephardic_Jews_Behar       |
| Sevilla              | Sephardic_Jews_Behar                                 | Morocco_Jews_Behar,<br>Sephardic_Jews_Behar       |
| Vamosine Palmai      | Ashkenazy_Jews_Behar                                 |                                                   |
| Vargas Bote          | Ashkenazy_Jews (Behar),<br>Bnei_Menashe_Jews (Behar) | Bnei_Menashe_Jews (Behar),<br>Cochin_Jews (Behar) |
| Vargas Navarro       | Ashkenazy_Jews (Behar),<br>Bnei_Menashe_Jews (Behar) | Bnei_Menashe_Jews (Behar),<br>Cochin_Jews (Behar) |

## 5. Two Population Individual Jewish Ancestry Matches

| Two Population Individual Jewish Ancestry Matches |                           |      |                         |      |
|---------------------------------------------------|---------------------------|------|-------------------------|------|
| Name                                              | Population 1              | %    | Population 2            | %    |
| Aguilera Rodriguez                                | O_Italian (Dodecad)       | 50   | Kashmiri_Pandit (Reich) | 50   |
| Aguilera                                          | O_Italian (Dodecad)       | 50   | Kashmiri_Pandit (Reich) | 50   |
| Ajama Heredia                                     | French_Basque (HGDP)      | 50   | Makrani (HGDP)          | 50   |
| Amaya                                             | C_Italian (Dodecad)       | 50   | Vaish (Reich)           | 50   |
| Bermudez Torres                                   | Pathan (HGDP)             | 50   | Sardinian (HGDP)        | 50   |
| Borja Ramirez                                     | Bnei_Menashe_Jews (Behar) | 50   | Tuscan (Xing)           | 50   |
| Cadiz Fernandez                                   | Bnei_Menashe_Jews (Behar) | 50   | Tuscan (Xing)           | 50   |
| Carbonell Abellan                                 | Bnei_Menashe_Jews_Behar   | 50   | French_Basque_HGDP      | 50   |
| Cortes Cortes                                     | O_Italian_Dodecad         | 50   | Kashmiri_Pandit_Reich   | 50   |
| Cortes Cortes                                     | Bnei_Menashe_Jews_Behar   | 50   | Tuscan_Xing             | 50   |
| Cortes Moreno                                     | O_Italian_Dodecad         | 50   | Kashmiri_Pandit_Reich   | 50   |
| Cortes Moreno                                     | N_Italian_Dodecad         | 50   | Kashmiri_Pandit_Reich   | 50   |
| Cortes Moreno                                     | O_Italian_Dodecad         | 50   | Kashmiri_Pandit_Reich   | 50   |
| Cortes Moreno                                     | Tuscan_Henn               | 50   | Kashmiri_Pandit_Reich   | 50   |
| Cortes                                            | N_Italian_Dodecad         | 50   | Siddi_Reich             | 50   |
| Cano Delgado                                      | Makrani_HGDP              | 50   | Spanish_Dodecad         | 50   |
| Doya Gimenez                                      | N_Italian_Dodecad         | 50   | Pathan_HGDP             | 50   |
| Doya                                              | Tuscan_Henn               | 50   | Pakistani_Xing          | 50   |
| Duval Jimenez                                     | N_Italian_Dodecad         | 50   | Kashmiri_Pandit_Reich   | 50   |
| Hernandez Gorretta                                | Bnei_Menashe_Jews_Behar   | 50   | Portuguese_Dodecad      | 50   |
| Fernández Muñoz                                   | O_Italian_Dodecad         | 50   | Kashmiri_Pandit_Reich   | 50   |
| Gabbarri Gabarri                                  | Tuscan (Henn)             | 63.3 | Cochin_Jews (Behar)     | 36.7 |
| Gabbarri Hernandez                                | Tuscan (Henn)             | 50   | Kashmiri_Pandit (Reich) | 50   |
| Garcia Jarque                                     | French_Basque_HGDP        | 50   | Makrani_HGDP            | 50   |
| Garcia Jarque                                     | Pathan_HGDP               | 50   | Portuguese_Dodecad      | 50   |
| Garcia Nunez, Jose                                | Tuscan_Henn               | 50   | Kashmiri_Pandit_Reich   | 50   |
| Garcia Nunez                                      | Bnei_Menashe_Jews (Behar) | 50   | Romanians_14 (Behar)    | 50   |

| Two Population Individual Jewish Ancestry Matches |                         |      |                       |      |
|---------------------------------------------------|-------------------------|------|-----------------------|------|
| Name                                              | Population 1            | %    | Population 2          | %    |
| Gimenez Gimenez                                   | Balochi_HGDP            | 50   | Portuguese_Dodecad    | 50   |
| Gimenez Gimenez                                   | Tuscan_Henn             | 50   | Kashmiri_Pandit_Reich | 50   |
| Heredia Amaya                                     | Pathan_HGDP             | 50   | Sardinian_HGDP        | 50   |
| Heredia de la Rosa                                | Bnei_Menashe_Jews_Behar | 50   | Portuguese_Dodecad    | 50   |
| Heredia Heredia                                   | O_Italian_Dodecad       | 50   | Kashmiri_Pandit_Reich | 50   |
| Heredia Heredia Munoz                             | Cochin_Jews_Behar       | 50   | TSI_HapMap            | 50   |
| Heredia                                           | Bnei_Menashe_Jews_Behar | 50   | O_Italian_Dodecad     | 50   |
| Hernandez Borja                                   | Bnei_Menashe_Jews_Behar | 50   | Portuguese_Dodecad    | 50   |
| Hernandez Gorretta                                | Bnei_Menashe_Jews_Behar | 50   | Portuguese_Dodecad    | 50   |
| Hernandez Heredia                                 | Bnei_Menashe_Jews_Behar | 50   | Hungarians_Behar      | 50   |
| Hernandez Jimenez                                 | Pathan_HGDP             | 50   | Tuscan_Henn           | 50   |
| Jimenez Escudero                                  | Balochi_HGDP            | 50   | Portuguese_Dodecad    | 50   |
| Jimenez Jimenez                                   | Bnei_Menashe_Jews_Behar | 50   | N_Italian_Dodecad     | 50   |
| Jimenez Jimenez                                   | Bnei_Menashe_Jews_Behar | 50   | Tuscan_Henn           | 50   |
| Jimenez, Amaro                                    | Bnei_Menashe_Jews_Behar | 50   | N_Italian_Dodecad     | 50   |
| Heredia Heredia                                   | Ashkenazi_Dodecad       | 50   | Vaish_Reich           | 50   |
| Jimenez, Jose                                     | Ashkenazy_Jews (Behar)  | 60.1 | Vaish (Reich)         | 39.9 |
| Luque Cortes                                      | Balochi_HGDP            | 50   | Spanish_Dodecad       | 50   |
| Manzana Manzana                                   | Bnei_Menashe_Jews_Behar | 50   | N_Italian_Dodecad     | 50   |
| Delgado Alvarez                                   | French_Basque           | 50   | Libya                 | 50   |
| García Núñez                                      | Bnei_Menashe_Jews_Behar | 50   | Romanians_14_Behar    | 50   |
| Montes Borja                                      | O_Italian_Dodecad       | 50   | Srivastava_Reich      | 50   |
| Montoya                                           | Orkney_1000 Genomes     | 50   | Sephardic_Jews_Behar  | 50   |
| Montoya Romero                                    | N_Italian_Dodecad       | 50   | Kashmiri_Pandit_Reich | 50   |
| Montoya Salazar                                   | Bnei_Menashe_Jews_Behar | 50   | Tuscan_Xing           | 50   |
| Montoya Silva                                     | Bnei_Menashe_Jews_Behar | 50   | Portuguese_Dodecad    | 50   |
| Montoya                                           | Bnei_Menashe_Jews_Behar | 50   | N_Italian_Dodecad     | 50   |
| Moreno Arjona                                     | French_Basque_HGDP      | 50   | Makrani_HGDP          | 50   |
| Moreno de la Cruz                                 | Bnei_Menashe_Jews_Behar | 50   | Tuscan_Xing           | 50   |
| Moreno                                            | German_Dodecad          | 50   | Sephardic_Jews_Behar  | 50   |
| Motos Hernande, Moises                            | Tuscan_Henn             | 50   | Kashmiri_Pandit_Reich | 50   |
| Motos Motos                                       | Tuscan_Henn             | 50   | Kashmiri_Pandit_Reich | 50   |

| Two Population Individual Jewish Ancestry Matches |                         |    |                    |    |
|---------------------------------------------------|-------------------------|----|--------------------|----|
| Name                                              | Population 1            | %  | Population 2       | %  |
|                                                   | Bnei_Menashe_Jews_Behar | 50 | Tuscan_Henn        | 50 |
| <b>Muñoz Cortés,</b>                              | Bnei_Menashe_Jews_Behar | 50 | Tuscan_Xing        | 50 |
| <b>Muñoz Fernández,</b>                           | Bnei_Menashe_Jews_Behar | 50 | Tuscan_Henn        | 50 |
| <b>Navarro Vargas</b>                             | C_Italian_Dodecad       | 50 | Vaish_Reich        | 50 |
| <b>Nunez Heredia</b>                              | Ashkenazy_Jews_Behar    | 50 | Portuguese_Dodecad | 50 |
| <b>Nunez Heredia</b>                              | Balochi_HGDP            | 50 | Portuguese_Dodecad | 50 |
| <b>Vamosine Palmai</b>                            | Pathan_HGDP             | 50 | Tuscan_Henn        | 50 |
| <b>Borja Perez</b>                                | Cochin_Jews_Behar       | 50 | Tuscan_Xing        | 50 |
| <b>Perez Rodriiguez</b>                           | Cochin_Jews_Behar       | 50 | Tuscan_Henn        | 50 |
| <b>Salazar Jimenez</b>                            | Bnei_Menashe_Jews_Behar | 50 | Tuscan_Henn        | 50 |
| <b>Salazar vega</b>                               | Yakut_HGDP              | 50 | Slovenian_Xing     | 50 |
| <b>Santiago Heredia</b>                           | Bnei_Menashe_Jews_Behar | 50 | Tuscan_Xing        | 50 |
| <b>Sevilla</b>                                    | Ashkenazy_Jews_Behar    | 50 | French_Dodecad     | 50 |
| <b>Sevilla</b>                                    | Ashkenazy_Jews_Behar    | 50 | French_Dodecad     | 50 |
| <b>Vargas Botel</b>                               | Bnei_Menashe_Jews_Behar | 50 | Hungarians_Behar   | 50 |
| <b>Vargas Navarro</b>                             | Bnei_Menashe_Jews_Behar | 50 | Romanians_14_Behar | 50 |
| <b>Varo Cla</b>                                   | French_Dodecad          | 50 | Morocco_Jews_Behar | 50 |

## 6. Three-population Approximation

| Three Population Approximation |                               |                                  |                               |
|--------------------------------|-------------------------------|----------------------------------|-------------------------------|
| Name                           | Population 1                  | Population 2                     | Population 3                  |
| <b>Aguilera Rodriguez</b>      | Burusho (HGDP) (50%)          | Portuguese (Dodecad) (25%)       | Sephardic_Jews (Behar) (25%)  |
| <b>Aguilera</b>                | Burusho (HGDP) (50%)          | Portuguese (Dodecad) (25%)       | Sephardic_Jews (Behar) (25%)  |
| <b>Ajama Heredia</b>           | Portuguese (Dodecad) (50%)    | Tuscan (Xing) (25%)              | Kashmiri_Pandit (Reich) (25%) |
| <b>Amaya</b>                   | Ashkenazy_Jews (Behar) (50%)  | Romanians_14 (Behar) (25%)       | Irula (Xing) (25%)            |
| <b>Bermudez Torres</b>         | Sicilian (Dodecad) (50%)      | Swedish (Dodecad) (25%)          | Vysya (Reich) (25%)           |
| <b>Borja Ramirez</b>           | Ashkenazy_Jews (Behar) (50%)  | Ashkenazy_Jews (Behar) (25%)     | North_Kannadi (Behar) (25%)   |
| <b>Cadiz Fernandez</b>         | Morocco_Jews (Behar) (50%)    | Slovenian (Xing) (25%)           | Srivastava (Reich) (25%)      |
| <b>Carbonell Abellan</b>       | Portuguese_Dodecad (50%)      | Romanians_14_Behar (25%)         | Meghawal_Reich (25%)          |
| <b>Cortes Cortes</b>           | Burusho_HGDP (50%)            | Greek_Dodecad (25%)              | Sardinian_HGDP (25%)          |
| <b>Cortes Cortes</b>           | Ashkenazy_Jews_Behar (50%)    | Romanians_14_Behar (25%)         | Madiga_Reich (25%)            |
| <b>Cortes Moreno</b>           | Burusho_HGDP (50%)            | Portuguese_Dodecad (25%)         | Sephardic_Jews_Behar (25%)    |
| <b>Cortes Moreno</b>           | Bnei_Menashe_Jews_Behar (50%) | Orkney_1000 Genomes (25%)        | Sicilian_Dodecad (25%)        |
| <b>Cortes Moreno</b>           | Ashkenazy_Jews_Behar (50%)    | Romanians_14_Behar (25%)         | Madiga_Reich (25%)            |
| <b>Cortes Moreno</b>           | Bnei_Menashe_Jews_Behar (50%) | O_Italian_Dodecad (25%)          | Slovenian_Xing (25%)          |
| <b>Cortes</b>                  | N_Italian_Dodecad (50%)       | Hausa_Henn (25%)                 | Vaish_Reich (25%)             |
| <b>Cano Delgado</b>            | N_Italian_Dodecad (50%)       | Tuscan_Henn (25%)                | Kashmiri_Pandit_Reich (25%)   |
| <b>Doya Gimenez</b>            | Greek_Dodecad (50%)           | N_European_Xing (25%)            | Srivastava_Reich (25%)        |
| <b>Doya</b>                    | Bnei_Menashe_Jews_Behar (50%) | German_Dodecad (25%)             | Tuscan_Xing (25%)             |
| <b>Duval Jimenez</b>           | Bnei_Menashe_Jews_Behar (50%) | North_Italian_HGDP (25%)         | Slovenian_Xing (25%)          |
| <b>Hernandez Gorretta</b>      | Ashkenazy_Jews_Behar (50%)    | French_Dodecad (25%)             | North_Kannadi_Behar (25%)     |
|                                | Ashkenazy_Jews_Behar (50%)    | French_Dodecad (25%)             | North_Kannadi_Behar (25%)     |
| <b>Fernández Muñoz</b>         | Bnei_Menashe_Jews_Behar (50%) | S_Italian_Sicilian_Dodecad (25%) | Slovenian_Xing (25%)          |
| <b>Gabbarri Gabarri</b>        | Ashkenazi_Dodecad (50%)       | N_European_Xing (25%)            | Vysya_Reich (25%)             |

| Three Population Approximation |                               |                            |                             |
|--------------------------------|-------------------------------|----------------------------|-----------------------------|
| Name                           | Population 1                  | Population 2               | Population 3                |
| <b>Gabbarri Hernandez</b>      | Ashkenazy_Jews_Behar (50%)    | Romanians_14_Behar (25%)   | Madiga_Reich (25%)          |
| <b>Garcia Jarque</b>           | French_Dodecad (50%)          | Sephardic_Jews_Behar (25%) | Kashmiri_Pandit_Reich (25%) |
| <b>Garcia Jarque</b>           | Portuguese_Dodecad (50%)      | Romanians_14_Behar (25%)   | Sindhi_HGDP (25%)           |
| <b>Garcia Nunez</b>            | Bnei_Menashe_Jews_Behar (50%) | Morocco_Jews_Behar (25%)   | Slovenian_Xing (25%)        |
| <b>Garcia Nunez</b>            | Bnei_Menashe_Jews_Behar (50%) | Hungarians_Behar (25%)     | O_Italian_Dodecad (25%)     |
| <b>Gimenez Gimenez</b>         | Sicilian_Dodecad (50%)        | Swedish_Dodecad (25%)      | Srivastava_Reich (25%)      |
| <b>Gimenez Gimenez</b>         | Bnei_Menashe_Jews_Behar (50%) | German_Dodecad (25%)       | Sicilian_Dodecad (25%)      |
| <b>Heredia Amaya</b>           | Sicilian_Dodecad (50%)        | Argyll_1000 Genomes (25%)  | Tharu_Reich (25%)           |
| <b>Heredia de la Rosa</b>      | Sephardic_Jews_Behar (50%)    | Swedish_Dodecad (25%)      | AP_Madiga_Xing (25%)        |
| <b>Heredia Heredia</b>         | Burusho_HGDP (50%)            | Cypriots_Behar (25%)       | Portuguese_Dodecad (25%)    |
| <b>Heredia Heredia Munoz</b>   | Morocco_Jews_Behar (50%)      | Argyll_1000 Genomes (25%)  | Irula_Xing (25%)            |
| <b>Heredia</b>                 | Burusho_HGDP (50%)            | Sardinian_HGDP (25%)       | Sephardic_Jews_Behar (25%)  |
| <b>Hernandez Borja</b>         | Ashkenazy_Jews_Behar (50%)    | French_Basque_HGDP (25%)   | AP_Madiga_Xing (25%)        |
| <b>Hernandez Heredia</b>       | Ashkenazi_Dodecad (50%)       | Hungarians_Behar (25%)     | Bhil_Reich (25%)            |
| <b>Hernandez Jimenez</b>       | Bnei_Menashe_Jews_Behar (50%) | Morocco_Jews_Behar (25%)   | Argyll_1000 Genomes (25%)   |
| <b>Jimenez Escudero</b>        | Sephardic_Jews_Behar (50%)    | Swedish_Dodecad (25%)      | Lodi_Reich (25%)            |
| <b>Jimenez Jimenez</b>         | Ashkenazi_Dodecad (50%)       | Slovenian_Xing (25%)       | Naidu_Reich (25%)           |
| <b>Heredia Heredia</b>         | Ashkenazi_Dodecad (50%)       | Vaish_Reich (25%)          | Indian_Dodecad (25%)        |
| <b>Jimenez Jimenez</b>         | Morocco_Jews_Behar (50%)      | Argyll_1000 Genomes (25%)  | Kurumba_Reich (25%)         |
| <b>Jimenez, Amaro</b>          | Ashkenazi_Dodecad (50%)       | Slovenian_Xing (25%)       | Naidu_Reich (25%)           |
| <b>Jimenez, Jose</b>           | Bnei_Menashe_Jews_Behar (50%) | German_Dodecad (25%)       | Morocco_Jews_Behar (25%)    |
| <b>Luque Cortes</b>            | Portuguese_Dodecad (50%)      | Turks_Behar (25%)          | Lodi_Reich (25%)            |
| <b>Manzana Manzana</b>         | Morocco_Jews_Behar (50%)      | Slovenian_Xing (25%)       | Satnami_Reich (25%)         |
| <b>Delgado Alvarez</b>         | French_Basque (50%)           | Morocco_N (25%)            | Yemen_Jews (25%)            |
| <b>Garci Núñez</b>             | Bnei_Menashe_Jews_Behar (50%) | Hungarians_Behar (25%)     | O_Italian_Dodecad (25%)     |
| <b>Montes Borja</b>            | Cochin_Jews_Behar (50%)       | Sephardic_Jews_Behar (25%) | Slovenian_Xing (25%)        |
| <b>Montoya</b>                 | Sardinian_HGDP (50%)          | N_European_Xing (25%)      | Kashmiri_Pandit_Reich (25%) |
| <b>Montoya Romero</b>          | Bnei_Menashe_Jews_Behar (50%) | North_Italian_HGDP (25%)   | Slovenian_Xing (25%)        |
| <b>Montoya Salazar</b>         | Ashkenazy_Jews_Behar (50%)    | Romanians_14_Behar (25%)   | Vysya_Reich (25%)           |

| Three Population Approximation |                               |                             |                             |
|--------------------------------|-------------------------------|-----------------------------|-----------------------------|
| Name                           | Population 1                  | Population 2                | Population 3                |
| Montoya Silva                  | Sephardic_Jews_Behar (50%)    | N._European_Xing (25%)      | Chenchu_Reich (25%)         |
| Montoya                        | Ashkenazi_Dodecad (50%)       | Slovenian_Xing (25%)        | Mala_Reich (25%)            |
| Moreno Arjona                  | French_Dodecad (50%)          | Libya_Henn (25%)            | Kashmiri_Pandit_Reich (25%) |
| Moreno de la Cruz              | Bnei_Menashe_Jews_Behar (50%) | Portuguese_Dodecad (25%)    | Romanians_14_Behar (25%)    |
| Moreno                         | IBS_1000Genomes (50%)         | Makrani_HGDP (25%)          | Romanians_14_Behar (25%)    |
| Motos Hernande, Moises         | Ashkenazi_Dodecad (50%)       | Slovenian_Xing (25%)        | Vysya_Reich (25%)           |
| Motos Motos                    | Bnei_Menashe_Jews_Behar (50%) | Greek_Dodecad (25%)         | N._European_Xing (25%)      |
|                                | Ashkenazi_Dodecad (50%)       | Romanians_14_Behar (25%)    | Madiga_Reich (25%)          |
| Muñoz Cortés                   | Bnei_Menashe_Jews_Behar (50%) | Morocco_Jews_Behar (25%)    | Slovenian_Xing (25%)        |
| Muñoz Fernández                | Morocco_Jews_Behar (50%)      | Slovenian_Xing (25%)        | Madiga_Reich (25%)          |
| Navarro Vargas                 | Ashkenazy_Jews_Behar (50%)    | Romanians_14_Behar (25%)    | Irula_Xing (25%)            |
| Nunez Heredia                  | Sephardic_Jews_Behar (50%)    | Argyll_1000 Genomes (25%)   | Srivastava_Reich (25%)      |
| Nunez Heredia                  | Sephardic_Jews_Behar (50%)    | Argyll_1000 Genomes (25%)   | Srivastava_Reich (25%)      |
| Vamosine Palmai                | Ashkenazy_Jews_Behar (50%)    | Slovenian_Xing (25%)        | Velama_Reich (25%)          |
| Borja Perez                    | Cochin_Jews_Behar (50%)       | Portuguese_Dodecad (25%)    | Turkish_Dodecad (25%)       |
| Perez Rodriguez                | Morocco_Jews_Behar (50%)      | Irula_Xing (25%)            | Slovenian_Xing (25%)        |
| Salazar Jimenez                | Morocco_Jews_Behar (50%)      | AP_Mala_Xing (25%)          | Slovenian_Xing (25%)        |
| Salazar vega                   | Selkup_Rasmussen (50%)        | Spaniards_Behar (25%)       | Uygur_HGDP (25%)            |
| Santiago Heredia               | Ashkenazy_Jews_Behar (50%)    | Ashkenazy_Jews_Behar (25%)  | North_Kannadi_Behar (25%)   |
| Sevilla                        | Portuguese_Dodecad (50%)      | Uzbekistan_Jews_Behar (25%) | N._European_Xing (25%)      |
| Sevilla                        | Portuguese_Dodecad (50%)      | Uzbekistan_Jews_Behar (25%) | N._European_Xing (25%)      |
| Vargas Botel                   | Ashkenazy_Jews_Behar (50%)    | Hungarians_Behar (25%)      | Mala_Reich (25%)            |
| Vargas Navarro                 | Ashkenazy_Jews_Behar (50%)    | Balkans_Dodecad (25%)       | North_Kannadi_Behar (25%)   |
| Varo Cla                       | French_Basque_HGDP (50%)      | Morocco_Jews_Behar (25%)    | Pathan_HGDP (25%)           |

## 7. Four Population Mode

### *Aguilera Rodriguez -- Four Population Mode*

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b>  | <b>Population 3</b>   | <b>Population 4</b>   | <b>Distance</b> |
|-------------|---------------------|----------------------|-----------------------|-----------------------|-----------------|
| 1           | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Mala_Reich            | 2.10            |
| 2           | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | TN_Dalit_Xing         | 2.16            |
| 3           | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Kurumba_Reich         | 2.38            |
| 4           | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Madiga_Reich          | 2.63            |
| 5           | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | AP_Madiga_Xing        | 2.63            |
| 6           | Portuguese_Dodecad  | Sephardic_Jews_Behar | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 2.66            |
| 7           | Greek_Dodecad       | Makrani_HGDP         | Portuguese_Dodecad    | Srivastava_Reich      | 2.66            |
| 8           | Balochi_HGDP        | Greek_Dodecad        | Portuguese_Dodecad    | Srivastava_Reich      | 2.67            |
| 9           | Greek_Dodecad       | Portuguese_Dodecad   | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 2.70            |
| 10          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Kamsali_Reich         | 2.70            |
| 11          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | AP_Mala_Xing          | 2.74            |
| 12          | Portuguese_Dodecad  | Sicilian_Dodecad     | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 2.76            |
| 13          | Brahui_HGDP         | Greek_Dodecad        | Portuguese_Dodecad    | Srivastava_Reich      | 2.76            |
| 14          | IBS_1000Genomes     | Iranian_Dodecad      | Romanians_14_Behar    | Mala_Reich            | 2.85            |
| 15          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Vysya_Reich           | 2.89            |
| 16          | Burusho_HGDP        | Portuguese_Dodecad   | Sephardic_Jews_Behar  | Kashmiri_Pandit_Reich | 2.91            |
| 17          | Burusho_HGDP        | Greek_Dodecad        | Portuguese_Dodecad    | Kashmiri_Pandit_Reich | 2.92            |
| 18          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Bhil_Reich            | 2.93            |
| 19          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Chenchu_Reich         | 2.93            |
| 20          | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar    | Mala_Reich            | 2.98            |

***Aguilera - Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b>  | <b>Population 3</b>   | <b>Population 4</b>   | <b>Distance</b> |
|-------------|---------------------|----------------------|-----------------------|-----------------------|-----------------|
| 1           | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Mala_Reich            | 2.10            |
| 2           | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | TN_Dalit_Xing         | 2.16            |
| 3           | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Kurumba_Reich         | 2.38            |
| 4           | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Madiga_Reich          | 2.63            |
| 5           | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | AP_Madiga_Xing        | 2.63            |
| 6           | Portuguese_Dodecad  | Sephardic_Jews_Behar | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 2.66            |
| 7           | Greek_Dodecad       | Makrani_HGDP         | Portuguese_Dodecad    | Srivastava_Reich      | 2.66            |
| 8           | Balochi_HGDP        | Greek_Dodecad        | Portuguese_Dodecad    | Srivastava_Reich      | 2.67            |
| 9           | Greek_Dodecad       | Portuguese_Dodecad   | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 2.70            |
| 10          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Kamsali_Reich         | 2.70            |
| 11          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | AP_Mala_Xing          | 2.74            |
| 12          | Portuguese_Dodecad  | Sicilian_Dodecad     | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 2.76            |
| 13          | Brahui_HGDP         | Greek_Dodecad        | Portuguese_Dodecad    | Srivastava_Reich      | 2.76            |
| 14          | IBS_1000Genomes     | Iranian_Dodecad      | Romanians_14_Behar    | Mala_Reich            | 2.85            |
| 15          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Vysya_Reich           | 2.89            |
| 16          | Burusho_HGDP        | Portuguese_Dodecad   | Sephardic_Jews_Behar  | Kashmiri_Pandit_Reich | 2.91            |
| 17          | Burusho_HGDP        | Greek_Dodecad        | Portuguese_Dodecad    | Kashmiri_Pandit_Reich | 2.92            |
| 18          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Bhil_Reich            | 2.93            |
| 19          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar    | Chenchu_Reich         | 2.93            |
| 20          | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar    | Mala_Reich            | 2.98            |

***Ajama Heredia -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b> | <b>Population 3</b>        | <b>Population 4</b>   | <b>Distance</b> |
|-------------|-------------------------|---------------------|----------------------------|-----------------------|-----------------|
| 1           | Portuguese_Dodecad      | Portuguese_Dodecad  | Tuscan_Xing                | Kashmiri_Pandit_Reich | 2.20            |
| 2           | French_Dodecad          | Portuguese_Dodecad  | Sicilian_Dodecad           | Kashmiri_Pandit_Reich | 2.30            |
| 3           | French_Dodecad          | Portuguese_Dodecad  | Sicilian_Dodecad           | Pakistani_Xing        | 2.30            |
| 4           | Bnei_Menashe_Jews_Behar | Orkney_1000 Genomes | Portuguese_Dodecad         | Sicilian_Dodecad      | 2.31            |
| 5           | Portuguese_Dodecad      | Portuguese_Dodecad  | Tuscan_Henn                | Kashmiri_Pandit_Reich | 2.32            |
| 6           | Bnei_Menashe_Jews_Behar | Orcadian_HGDP       | Portuguese_Dodecad         | Sicilian_Dodecad      | 2.36            |
| 7           | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad  | Sicilian_Dodecad           | Argyll_1000 Genomes   | 2.47            |
| 8           | Portuguese_Dodecad      | Portuguese_Dodecad  | TSI_HapMap                 | Kashmiri_Pandit_Reich | 2.47            |
| 9           | French_Dodecad          | Portuguese_Dodecad  | Sicilian_Dodecad           | Sindhi_HGDP           | 2.56            |
| 10          | Bnei_Menashe_Jews_Behar | C_Italian_Dodecad   | CEU_HapMap                 | Portuguese_Dodecad    | 2.58            |
| 11          | CEU_HapMap              | Cochin_Jews_Behar   | Portuguese_Dodecad         | Sicilian_Dodecad      | 2.59            |
| 12          | French_HGDP             | Portuguese_Dodecad  | Sicilian_Dodecad           | Pakistani_Xing        | 2.59            |
| 13          | N_Italian_Dodecad       | Portuguese_Dodecad  | Tuscan_Xing                | Vaish_Reich           | 2.60            |
| 14          | Ashkenazy_Jews_Behar    | Portuguese_Dodecad  | Spaniards_Behar            | Kashmiri_Pandit_Reich | 2.61            |
| 15          | Bnei_Menashe_Jews_Behar | CEU_HapMap          | Portuguese_Dodecad         | Sicilian_Dodecad      | 2.62            |
| 16          | Cochin_Jews_Behar       | French_HGDP         | Greek_Dodecad              | Portuguese_Dodecad    | 2.63            |
| 17          | French_HGDP             | Portuguese_Dodecad  | Sicilian_Dodecad           | Kashmiri_Pandit_Reich | 2.63            |
| 18          | Cochin_Jews_Behar       | Orcadian_HGDP       | Portuguese_Dodecad         | Sicilian_Dodecad      | 2.63            |
| 19          | Portuguese_Dodecad      | Portuguese_Dodecad  | Pakistani_Xing             | Tuscan_Xing           | 2.63            |
| 20          | French_Dodecad          | Portuguese_Dodecad  | S_Italian_Sicilian_Dodecad | Kashmiri_Pandit_Reich | 2.65            |

***Amaya -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b>  | <b>Population 3</b>  | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|----------------------|----------------------|---------------------|-----------------|
| 1           | Georgia_Jews_Behar   | Portuguese_Dodecad   | Romanians_14_Behar   | Irula_Xing          | 2.98            |
| 2           | Ashkenazy_Jews_Behar | Sephardic_Jews_Behar | Irula_Xing           | Slovenian_Xing      | 3.00            |
| 3           | Balkans_Dodecad      | Iraq_Jews_Behar      | Portuguese_Dodecad   | Irula_Xing          | 3.05            |
| 4           | Balkans_Dodecad      | Iranian_Jews_Behar   | Portuguese_Dodecad   | Irula_Xing          | 3.06            |
| 5           | Balkans_Dodecad      | Georgia_Jews_Behar   | Portuguese_Dodecad   | Irula_Xing          | 3.08            |
| 6           | Hungarians_Behar     | Morocco_Jews_Behar   | Morocco_Jews_Behar   | Irula_Xing          | 3.08            |
| 7           | Ashkenazi_Dodecad    | Sephardic_Jews_Behar | Irula_Xing           | Slovenian_Xing      | 3.11            |
| 8           | Ashkenazy_Jews_Behar | Hungarians_Behar     | Sephardic_Jews_Behar | Irula_Xing          | 3.13            |
| 9           | Portuguese_Dodecad   | Romanians_14_Behar   | Syrians_Behar        | Irula_Xing          | 3.14            |
| 10          | Ashkenazy_Jews_Behar | Balkans_Dodecad      | Morocco_Jews_Behar   | Irula_Xing          | 3.15            |
| 11          | Hungarians_Behar     | Palestinian_HGDP     | Tuscan_HGDP          | Irula_Xing          | 3.17            |
| 12          | Balkans_Dodecad      | Iranian_Jews_Behar   | North_Kannadi_Behar  | Portuguese_Dodecad  | 3.18            |
| 13          | Ashkenazi_Dodecad    | Hungarians_Behar     | Sephardic_Jews_Behar | Irula_Xing          | 3.20            |
| 14          | Ashkenazi_Dodecad    | Hungarians_Behar     | Morocco_Jews_Behar   | Irula_Xing          | 3.21            |
| 15          | North_Kannadi_Behar  | Portuguese_Dodecad   | Romanians_14_Behar   | Syrians_Behar       | 3.24            |
| 16          | Hungarians_Behar     | O_Italian_Dodecad    | Palestinian_HGDP     | Irula_Xing          | 3.24            |
| 17          | Morocco_Jews_Behar   | Sephardic_Jews_Behar | Irula_Xing           | Slovenian_Xing      | 3.25            |
| 18          | Ashkenazy_Jews_Behar | Ashkenazy_Jews_Behar | Romanians_14_Behar   | Irula_Xing          | 3.29            |
| 19          | Georgia_Jews_Behar   | North_Kannadi_Behar  | Portuguese_Dodecad   | Romanians_14_Behar  | 3.29            |
| 20          | Iranian_Jews_Behar   | North_Kannadi_Behar  | Portuguese_Dodecad   | Romanians_14_Behar  | 3.30            |

***Bermudez Torres -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Morocco_Jews_Behar   | North_Italian_HGDP  | Slovenian_Xing      | Vysya_Reich         | 1.62            |
| 2           | Cypriots_Behar       | Portuguese_Dodecad  | Slovenian_Xing      | Hallaki_Reich       | 1.77            |
| 3           | Morocco_Jews_Behar   | Tuscan_HGDP         | Slovenian_Xing      | Hallaki_Reich       | 1.78            |
| 4           | Cypriots_Behar       | Portuguese_Dodecad  | Slovenian_Xing      | Vysya_Reich         | 1.85            |
| 5           | Greek_Dodecad        | Morocco_Jews_Behar  | Orcadian_HGDP       | Bhil_Reich          | 1.90            |
| 6           | CEU_HapMap           | Greek_Dodecad       | Morocco_Jews_Behar  | Bhil_Reich          | 1.92            |
| 7           | Greek_Dodecad        | Morocco_Jews_Behar  | Orkney_1000 Genomes | Bhil_Reich          | 1.95            |
| 8           | Greek_Dodecad        | Morocco_Jews_Behar  | Orcadian_HGDP       | Mala_Reich          | 1.98            |
| 9           | Morocco_Jews_Behar   | North_Italian_HGDP  | Slovenian_Xing      | Hallaki_Reich       | 1.98            |
| 10          | CEU_HapMap           | Greek_Dodecad       | Morocco_Jews_Behar  | Chenchu_Reich       | 1.99            |
| 11          | Cypriots_Behar       | INS_SGVP            | Portuguese_Dodecad  | Slovenian_Xing      | 2.01            |
| 12          | Cypriots_Behar       | Portuguese_Dodecad  | Slovenian_Xing      | Lodi_Reich          | 2.03            |
| 13          | Greek_Dodecad        | Morocco_Jews_Behar  | Orkney_1000 Genomes | Mala_Reich          | 2.03            |
| 14          | Morocco_Jews_Behar   | Tuscan_HGDP         | Slovenian_Xing      | Naidu_Reich         | 2.04            |
| 15          | Ashkenazy_Jews_Behar | Portuguese_Dodecad  | Romanians_14_Behar  | Velama_Reich        | 2.04            |
| 16          | Morocco_Jews_Behar   | N_Italian_Dodecad   | Slovenian_Xing      | Vysya_Reich         | 2.05            |
| 17          | Cypriots_Behar       | Portuguese_Dodecad  | Slovenian_Xing      | Naidu_Reich         | 2.06            |
| 18          | Morocco_Jews_Behar   | Tuscan_HGDP         | Slovenian_Xing      | Madiga_Reich        | 2.06            |
| 19          | Morocco_Jews_Behar   | Tuscan_HGDP         | Slovenian_Xing      | Lodi_Reich          | 2.07            |
| 20          | Greek_Dodecad        | Morocco_Jews_Behar  | Orcadian_HGDP       | Kurumba_Reich       | 2.08            |

***Borja Pérez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b>     | <b>Population 3</b>   | <b>Population 4</b> | <b>Distance</b> |
|-------------|-------------------------|-------------------------|-----------------------|---------------------|-----------------|
| 1           | Morocco_Jews_Behar      | N_Italian_Dodecad       | Pathan_HGDP           | Satnami_Reich       | 3.34            |
| 2           | Morocco_Jews_Behar      | N_Italian_Dodecad       | Pathan_HGDP           | Sahariya_Reich      | 3.40            |
| 3           | Pathan_HGDP             | Sephardic_Jews_Behar    | Tuscan_Henn           | Sahariya_Reich      | 3.41            |
| 4           | Pathan_HGDP             | Sephardic_Jews_Behar    | Tuscan_Xing           | Sahariya_Reich      | 3.47            |
| 5           | Morocco_Jews_Behar      | N_Italian_Dodecad       | Kashmiri_Pandit_Reich | Satnami_Reich       | 3.49            |
| 6           | Pathan_HGDP             | Sephardic_Jews_Behar    | Tuscan_Henn           | Satnami_Reich       | 3.50            |
| 7           | Morocco_Jews_Behar      | O_Italian_Dodecad       | Pathan_HGDP           | Sahariya_Reich      | 3.51            |
| 8           | Morocco_Jews_Behar      | O_Italian_Dodecad       | Pathan_HGDP           | Satnami_Reich       | 3.54            |
| 9           | Morocco_Jews_Behar      | N_Italian_Dodecad       | Kashmiri_Pandit_Reich | Tharu_Reich         | 3.56            |
| 10          | Portuguese_Dodecad      | Sephardic_Jews_Behar    | Kashmiri_Pandit_Reich | Srivastava_Reich    | 3.56            |
| 11          | Pathan_HGDP             | Sephardic_Jews_Behar    | Tuscan_Xing           | Satnami_Reich       | 3.57            |
| 12          | Pathan_HGDP             | Sephardic_Jews_Behar    | TSI_HapMap            | Sahariya_Reich      | 3.58            |
| 13          | Ashkenazy_Jews_Behar    | Bnei_Menashe_Jews_Behar | Tuscan_Xing           | Satnami_Reich       | 3.59            |
| 14          | Bnei_Menashe_Jews_Behar | Sephardic_Jews_Behar    | Slovenian_Xing        | Tharu_Reich         | 3.61            |
| 15          | Morocco_Jews_Behar      | Pathan_HGDP             | Tuscan_Henn           | Sahariya_Reich      | 3.62            |
| 16          | Morocco_Jews_Behar      | Pathan_HGDP             | Tuscan_HGDP           | Sahariya_Reich      | 3.62            |
| 17          | Morocco_Jews_Behar      | Pathan_HGDP             | Tuscan_Henn           | Satnami_Reich       | 3.62            |
| 18          | Ashkenazy_Jews_Behar    | Bnei_Menashe_Jews_Behar | Tuscan_Henn           | Satnami_Reich       | 3.63            |
| 19          | Lebanese_Behar          | Portuguese_Dodecad      | Kashmiri_Pandit_Reich | Tharu_Reich         | 3.63            |
| 20          | Morocco_Jews_Behar      | Pathan_HGDP             | Tuscan_HGDP           | Satnami_Reich       | 3.64            |

***Borja Ramirez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b> | <b>Population 3</b>   | <b>Population 4</b>   | <b>Distance</b> |
|-------------|----------------------|---------------------|-----------------------|-----------------------|-----------------|
| 1           | Greek_Dodecad        | Iranians_Behar      | Portuguese_Dodecad    | Chenchu_Reich         | 2.90            |
| 2           | Greek_Dodecad        | Iranians_Behar      | Portuguese_Dodecad    | AP_Mala_Xing          | 3.34            |
| 3           | Greek_Dodecad        | Iranians_Behar      | Portuguese_Dodecad    | AP_Madiga_Xing        | 3.38            |
| 4           | Iranians_Behar       | Romanians_14_Behar  | Sardinian_HGDP        | Madiga_Reich          | 3.43            |
| 5           | Ashkenazy_Jews_Behar | Makrani_HGDP        | North_Italian_HGDP    | Sahariya_Reich        | 3.44            |
| 6           | Iranians_Behar       | Portuguese_Dodecad  | Romanians_14_Behar    | Kamsali_Reich         | 3.45            |
| 7           | Greek_Dodecad        | Iranians_Behar      | Portuguese_Dodecad    | Madiga_Reich          | 3.47            |
| 8           | Ashkenazy_Jews_Behar | Portuguese_Dodecad  | Kurd_Xing             | Chenchu_Reich         | 3.48            |
| 9           | Ashkenazi_Dodecad    | Makrani_HGDP        | North_Italian_HGDP    | Sahariya_Reich        | 3.49            |
| 10          | Greek_Dodecad        | Iranians_Behar      | Portuguese_Dodecad    | Mala_Reich            | 3.50            |
| 11          | Ashkenazy_Jews_Behar | Makrani_HGDP        | North_Italian_HGDP    | Satnami_Reich         | 3.51            |
| 12          | Iranians_Behar       | Portuguese_Dodecad  | Romanians_14_Behar    | Kurumba_Reich         | 3.53            |
| 13          | Ashkenazy_Jews_Behar | N_Italian_Dodecad   | Kurd_Xing             | Chenchu_Reich         | 3.57            |
| 14          | Iranians_Behar       | Romanians_14_Behar  | Sardinian_HGDP        | Chenchu_Reich         | 3.57            |
| 15          | Ashkenazi_Dodecad    | Makrani_HGDP        | North_Italian_HGDP    | Satnami_Reich         | 3.59            |
| 16          | Ashkenazy_Jews_Behar | Kurd_Dodecad        | N_Italian_Dodecad     | Chenchu_Reich         | 3.59            |
| 17          | Ashkenazy_Jews_Behar | Portuguese_Dodecad  | AP_Madiga_Xing        | Kurd_Xing             | 3.59            |
| 18          | Ashkenazy_Jews_Behar | Makrani_HGDP        | Sardinian_HGDP        | Satnami_Reich         | 3.61            |
| 19          | Morocco_Jews_Behar   | Sardinian_HGDP      | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 3.64            |
| 20          | Ashkenazi_Dodecad    | Portuguese_Dodecad  | Kurd_Xing             | Chenchu_Reich         | 3.64            |

***Cadiz Fernandez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>        | <b>Population 2</b>   | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------------|-----------------------|---------------------|---------------------|-----------------|
| 1           | Morocco_Jews_Behar         | Turkish_Dodecad       | Slovenian_Xing      | Satnami_Reich       | 2.78            |
| 2           | German_Dodecad             | Morocco_Jews_Behar    | Turkish_Dodecad     | Satnami_Reich       | 2.88            |
| 3           | German_Dodecad             | Sephardic_Jews_Behar  | Turkish_Dodecad     | Satnami_Reich       | 2.97            |
| 4           | German_Dodecad             | Sephardic_Jews_Behar  | Kurd_Xing           | Sahariya_Reich      | 2.99            |
| 5           | C_Italian_Dodecad          | Georgia_Jews_Behar    | Slovenian_Xing      | Satnami_Reich       | 3.05            |
| 6           | Ashkenazy_Jews_Behar       | Druze_HGDP            | Slovenian_Xing      | Satnami_Reich       | 3.09            |
| 7           | German_Dodecad             | Sephardic_Jews_Behar  | Turks_Behar         | Satnami_Reich       | 3.11            |
| 8           | Georgia_Jews_Behar         | O_Italian_Dodecad     | Slovenian_Xing      | Satnami_Reich       | 3.11            |
| 9           | Druze_HGDP                 | Slovenian_Xing        | Tuscan_Xing         | Satnami_Reich       | 3.15            |
| 10          | Georgia_Jews_Behar         | Greek_Dodecad         | N._European_Xing    | Satnami_Reich       | 3.16            |
| 11          | Georgia_Jews_Behar         | German_Dodecad        | Greek_Dodecad       | Satnami_Reich       | 3.16            |
| 12          | German_Dodecad             | Greek_Dodecad         | Iranian_Jews_Behar  | Sahariya_Reich      | 3.20            |
| 13          | C_Italian_Dodecad          | Georgia_Jews_Behar    | Slovenian_Xing      | Sahariya_Reich      | 3.20            |
| 14          | Georgia_Jews_Behar         | Greek_Dodecad         | N._European_Xing    | Sahariya_Reich      | 3.24            |
| 15          | Georgia_Jews_Behar         | German_Dodecad        | Greek_Dodecad       | Sahariya_Reich      | 3.24            |
| 16          | Iranian_Jews_Behar         | O_Italian_Dodecad     | Slovenian_Xing      | Sahariya_Reich      | 3.24            |
| 17          | C_Italian_Dodecad          | Uzbekistan_Jews_Behar | Slovenian_Xing      | Sahariya_Reich      | 3.25            |
| 18          | S_Italian_Sicilian_Dodecad | Uzbekistan_Jews_Behar | Slovenian_Xing      | Sahariya_Reich      | 3.25            |
| 19          | Georgia_Jews_Behar         | German_Dodecad        | Sicilian_Dodecad    | Satnami_Reich       | 3.27            |
| 20          | Iraq_Jews_Behar            | Slovenian_Xing        | Tuscan_Xing         | Satnami_Reich       | 3.27            |

***Carbonell Abellan -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b>  | <b>Population 3</b>  | <b>Population 4</b>  | <b>Distance</b> |
|-------------|----------------------|----------------------|----------------------|----------------------|-----------------|
| 1           | German_Dodecad       | Portuguese_Dodecad   | Sephardic_Jews_Behar | Vaish_Reich          | 3.51            |
| 2           | German_Dodecad       | Portuguese_Dodecad   | Sephardic_Jews_Behar | Tharu_Reich          | 3.75            |
| 3           | Ashkenazy_Jews_Behar | German_Dodecad       | Sardinian_HGDP       | Tharu_Reich          | 3.91            |
| 4           | German_Dodecad       | Portuguese_Dodecad   | Sephardic_Jews_Behar | Srivastava_Reich     | 3.99            |
| 5           | German_Dodecad       | Sephardic_Jews_Behar | Spanish_Dodecad      | Vaish_Reich          | 3.99            |
| 6           | German_Dodecad       | Morocco_Jews_Behar   | Spanish_Dodecad      | Tharu_Reich          | 4.00            |
| 7           | Cochin_Jews_Behar    | Portuguese_Dodecad   | Tuscan_Henn          | Slovenian_Xing       | 4.01            |
| 8           | German_Dodecad       | Morocco_Jews_Behar   | Sardinian_HGDP       | Vaish_Reich          | 4.04            |
| 9           | German_Dodecad       | IBS_1000Genomes      | Sephardic_Jews_Behar | Vaish_Reich          | 4.04            |
| 10          | German_Dodecad       | IBS_1000Genomes      | Morocco_Jews_Behar   | Tharu_Reich          | 4.05            |
| 11          | Ashkenazi_Dodecad    | German_Dodecad       | Sardinian_HGDP       | Tharu_Reich          | 4.07            |
| 12          | Cochin_Jews_Behar    | Hungarians_Behar     | Portuguese_Dodecad   | Tuscan_Henn          | 4.07            |
| 13          | French_Basque_HGDP   | Hungarians_Behar     | Morocco_Jews_Behar   | Tharu_Reich          | 4.07            |
| 14          | Cochin_Jews_Behar    | German_Dodecad       | Portuguese_Dodecad   | Sephardic_Jews_Behar | 4.08            |
| 15          | German_Dodecad       | Sephardic_Jews_Behar | Spanish_Dodecad      | Srivastava_Reich     | 4.10            |
| 16          | German_Dodecad       | Sephardic_Jews_Behar | Spanish_Dodecad      | Tharu_Reich          | 4.11            |
| 17          | CEU_HapMap           | Portuguese_Dodecad   | Sephardic_Jews_Behar | Vaish_Reich          | 4.11            |
| 18          | Sardinian_HGDP       | Sephardic_Jews_Behar | Swedish_Dodecad      | Srivastava_Reich     | 4.11            |
| 19          | Portuguese_Dodecad   | Sephardic_Jews_Behar | N._European_Xing     | Vaish_Reich          | 4.12            |
| 20          | Cochin_Jews_Behar    | German_Dodecad       | Portuguese_Dodecad   | Sicilian_Dodecad     | 4.13            |

***Cortés -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b>   | <b>Distance</b> |
|-------------|----------------------|---------------------|---------------------|-----------------------|-----------------|
| 1           | ASW_HapMap           | Cochin_Jews_Behar   | French_Dodecad      | Greek_Dodecad         | 3.10            |
| 2           | ASW_HapMap           | Cochin_Jews_Behar   | French_HGDP         | Greek_Dodecad         | 3.27            |
| 3           | ASW_HapMap           | N_Italian_Dodecad   | Tuscan_Xing         | Vaish_Reich           | 3.38            |
| 4           | Ashkenazy_Jews_Behar | ASW_HapMap          | Burusho_HGDP        | Spanish_Dodecad       | 3.39            |
| 5           | ASW_HapMap           | CEU_HapMap          | Cochin_Jews_Behar   | Sicilian_Dodecad      | 3.40            |
| 6           | Ashkenazy_Jews_Behar | ASW_HapMap          | Spanish_Dodecad     | Kashmiri_Pandit_Reich | 3.42            |
| 7           | ASW_HapMap           | French_Dodecad      | Sicilian_Dodecad    | Vaish_Reich           | 3.43            |
| 8           | ASW_HapMap           | Portuguese_Dodecad  | Tuscan_Xing         | Kashmiri_Pandit_Reich | 3.45            |
| 9           | ASW_HapMap           | N_Italian_Dodecad   | Tuscan_Henn         | Vaish_Reich           | 3.45            |
| 10          | ASW_HapMap           | French_Dodecad      | Sicilian_Dodecad    | Meghawal_Reich        | 3.46            |
| 11          | Ashkenazy_Jews_Behar | ASW_HapMap          | IBS_1000Genomes     | Vaish_Reich           | 3.46            |
| 12          | Ashkenazy_Jews_Behar | ASW_HapMap          | Spanish_Dodecad     | Vaish_Reich           | 3.49            |
| 13          | ASW_HapMap           | Cochin_Jews_Behar   | French_Dodecad      | Sicilian_Dodecad      | 3.50            |
| 14          | ASW_HapMap           | Portuguese_Dodecad  | Tuscan_Henn         | Kashmiri_Pandit_Reich | 3.52            |
| 15          | Ashkenazy_Jews_Behar | ASW_HapMap          | Burusho_HGDP        | IBS_1000Genomes       | 3.52            |
| 16          | ASW_HapMap           | N_Italian_Dodecad   | O_Italian_Dodecad   | Vaish_Reich           | 3.53            |
| 17          | ASW_HapMap           | N_Italian_Dodecad   | Tuscan_Henn         | Meghawal_Reich        | 3.54            |
| 18          | ASW_HapMap           | N_Italian_Dodecad   | Tuscan_Xing         | Meghawal_Reich        | 3.55            |
| 19          | Ashkenazi_Dodecad    | ASW_HapMap          | IBS_1000Genomes     | Vaish_Reich           | 3.56            |
| 20          | ASW_HapMap           | IBS_1000Genomes     | Tuscan_Xing         | Kashmiri_Pandit_Reich | 3.57            |

***Cortes Cortes -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b>   | <b>Population 4</b>   | <b>Distance</b> |
|-------------|---------------------|---------------------|-----------------------|-----------------------|-----------------|
| 1           | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar    | Kurumba_Reich         | 2.28            |
| 2           | IBS_1000Genomes     | Iranian_Dodecad     | Romanians_14_Behar    | Kurumba_Reich         | 2.42            |
| 3           | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar    | Mala_Reich            | 2.55            |
| 4           | Iranian_Dodecad     | Romanians_14_Behar  | Spanish_Dodecad       | Kurumba_Reich         | 2.61            |
| 5           | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar    | Kamsali_Reich         | 2.63            |
| 6           | Greek_Dodecad       | Portuguese_Dodecad  | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 2.71            |
| 7           | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar    | AP_Mala_Xing          | 2.74            |
| 8           | IBS_1000Genomes     | Iranian_Dodecad     | Romanians_14_Behar    | Mala_Reich            | 2.75            |
| 9           | Iranian_Dodecad     | North_Italian_HGDP  | Romanians_14_Behar    | Chenchu_Reich         | 2.77            |
| 10          | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar    | AP_Madiga_Xing        | 2.81            |
| 11          | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar    | Chenchu_Reich         | 2.83            |
| 12          | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar    | TN_Dalit_Xing         | 2.84            |
| 13          | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar    | Vysya_Reich           | 2.89            |
| 14          | Iranians_Behar      | North_Italian_HGDP  | Romanians_14_Behar    | Chenchu_Reich         | 2.89            |
| 15          | IBS_1000Genomes     | Iranian_Dodecad     | Romanians_14_Behar    | AP_Madiga_Xing        | 2.91            |
| 16          | IBS_1000Genomes     | Iranian_Dodecad     | Romanians_14_Behar    | Kamsali_Reich         | 2.94            |
| 17          | IBS_1000Genomes     | Iranian_Dodecad     | Romanians_14_Behar    | Chenchu_Reich         | 2.94            |
| 18          | Iranian_Dodecad     | Romanians_14_Behar  | Spaniards_Behar       | Kurumba_Reich         | 2.95            |
| 19          | IBS_1000Genomes     | Iranian_Dodecad     | Romanians_14_Behar    | AP_Mala_Xing          | 2.96            |
| 20          | Iranian_Dodecad     | Romanians_14_Behar  | Spanish_Dodecad       | Mala_Reich            | 2.97            |

***Cortes Cortes -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>        | <b>Population 2</b>        | <b>Population 3</b>   | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------------|----------------------------|-----------------------|---------------------|-----------------|
| 1           | German_Dodecad             | Sephardic_Jews_Behar       | Kurd_Xing             | Satnami_Reich       | 1.99            |
| 2           | C_Italian_Dodecad          | Georgia_Jews_Behar         | Slovenian_Xing        | Chenchu_Reich       | 2.12            |
| 3           | German_Dodecad             | Sephardic_Jews_Behar       | Uzbekistan_Jews_Behar | Satnami_Reich       | 2.21            |
| 4           | Georgia_Jews_Behar         | S_Italian_Sicilian_Dodecad | Slovenian_Xing        | Chenchu_Reich       | 2.25            |
| 5           | Azerbaijan_Jews_Behar      | German_Dodecad             | Sephardic_Jews_Behar  | Chenchu_Reich       | 2.27            |
| 6           | Iranian_Jews_Behar         | O_Italian_Dodecad          | Slovenian_Xing        | Kurumba_Reich       | 2.33            |
| 7           | C_Italian_Dodecad          | Iranian_Jews_Behar         | Slovenian_Xing        | Chenchu_Reich       | 2.35            |
| 8           | Ashkenazy_Jews_Behar       | Druze_HGDP                 | Slovenian_Xing        | Chenchu_Reich       | 2.35            |
| 9           | C_Italian_Dodecad          | Georgia_Jews_Behar         | AP_Mala_Xing          | Slovenian_Xing      | 2.36            |
| 10          | Ashkenazi_Dodecad          | Druze_HGDP                 | Slovenian_Xing        | Chenchu_Reich       | 2.39            |
| 11          | S_Italian_Sicilian_Dodecad | Uzbekistan_Jews_Behar      | Slovenian_Xing        | Chenchu_Reich       | 2.39            |
| 12          | German_Dodecad             | Kurd_Dodecad               | Sephardic_Jews_Behar  | Satnami_Reich       | 2.41            |
| 13          | German_Dodecad             | Iranian_Jews_Behar         | Sephardic_Jews_Behar  | Chenchu_Reich       | 2.41            |
| 14          | German_Dodecad             | Iranian_Jews_Behar         | Sicilian_Dodecad      | Chenchu_Reich       | 2.42            |
| 15          | Iraq_Jews_Behar            | O_Italian_Dodecad          | Slovenian_Xing        | Chenchu_Reich       | 2.43            |
| 16          | Georgia_Jews_Behar         | O_Italian_Dodecad          | Slovenian_Xing        | Kurumba_Reich       | 2.43            |
| 17          | German_Dodecad             | Sephardic_Jews_Behar       | Uzbekistan_Jews_Behar | Chenchu_Reich       | 2.46            |
| 18          | German_Dodecad             | Sephardic_Jews_Behar       | Uzbekistan_Jews_Behar | Kurumba_Reich       | 2.46            |
| 19          | Georgia_Jews_Behar         | German_Dodecad             | Sephardic_Jews_Behar  | Chenchu_Reich       | 2.47            |
| 20          | Georgia_Jews_Behar         | German_Dodecad             | S_Italian_Dodecad     | Chenchu_Reich       | 2.48            |

***Cortes Moreno -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Kamsali_Reich       | 2.39            |
| 2           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Kurumba_Reich       | 2.42            |
| 3           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | AP_Mala_Xing        | 2.60            |
| 4           | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar  | AP_Mala_Xing        | 2.64            |
| 5           | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar  | Kamsali_Reich       | 2.66            |
| 6           | IBS_1000Genomes     | Iranians_Behar      | Romanians_14_Behar  | Kurumba_Reich       | 2.69            |
| 7           | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar  | Kurumba_Reich       | 2.73            |
| 8           | Iranians_Behar      | Romanians_14_Behar  | Spanish_Dodecad     | Kurumba_Reich       | 2.78            |
| 9           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Chenchu_Reich       | 2.78            |
| 10          | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Mala_Reich          | 2.82            |
| 11          | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Madiga_Reich        | 2.83            |
| 12          | Kurd_Dodecad        | Portuguese_Dodecad  | Romanians_14_Behar  | Kamsali_Reich       | 2.85            |
| 13          | IBS_1000Genomes     | Iranians_Behar      | Romanians_14_Behar  | Kamsali_Reich       | 2.87            |
| 14          | Iranians_Behar      | Romanians_14_Behar  | Spaniards_Behar     | Kurumba_Reich       | 2.88            |
| 15          | Kurd_Dodecad        | Portuguese_Dodecad  | Romanians_14_Behar  | Kurumba_Reich       | 2.91            |
| 16          | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Vysya_Reich         | 2.91            |
| 17          | Iranian_Dodecad     | Portuguese_Dodecad  | Romanians_14_Behar  | Mala_Reich          | 2.92            |
| 18          | IBS_1000Genomes     | Iranians_Behar      | Romanians_14_Behar  | Madiga_Reich        | 2.92            |
| 19          | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Naidu_Reich         | 2.97            |
| 20          | Iranians_Behar      | Romanians_14_Behar  | Spanish_Dodecad     | Kamsali_Reich       | 2.97            |

***Cortes Moreno -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b>   | <b>Population 3</b>   | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|-----------------------|-----------------------|---------------------|-----------------|
| 1           | Orcadian_HGDP        | Sicilian_Dodecad      | Uzbekistan_Jews_Behar | Chenchu_Reich       | 1.77            |
| 2           | Orkney_1000 Genomes  | Sicilian_Dodecad      | Uzbekistan_Jews_Behar | Chenchu_Reich       | 1.81            |
| 3           | CEU_HapMap           | Sicilian_Dodecad      | Uzbekistan_Jews_Behar | Chenchu_Reich       | 1.92            |
| 4           | Sicilian_Dodecad     | Uzbekistan_Jews_Behar | Argyll_1000 Genomes   | Chenchu_Reich       | 1.94            |
| 5           | Ashkenazy_Jews_Behar | IBS_1000Genomes       | AP_Madiga_Xing        | Stalskoe_Xing       | 2.23            |
| 6           | Orkney_1000 Genomes  | S_Italian_Dodecad     | Uzbekistan_Jews_Behar | Chenchu_Reich       | 2.23            |
| 7           | Sicilian_Dodecad     | Uzbekistan_Jews_Behar | N_European_Xing       | Chenchu_Reich       | 2.25            |
| 8           | Orcadian_HGDP        | S_Italian_Dodecad     | Uzbekistan_Jews_Behar | Chenchu_Reich       | 2.26            |
| 9           | Orkney_1000 Genomes  | Sicilian_Dodecad      | Uzbekistan_Jews_Behar | Mala_Reich          | 2.26            |
| 10          | Ashkenazy_Jews_Behar | Spanish_Dodecad       | AP_Madiga_Xing        | Stalskoe_Xing       | 2.27            |
| 11          | Orcadian_HGDP        | Sicilian_Dodecad      | Uzbekistan_Jews_Behar | Mala_Reich          | 2.27            |
| 12          | Ashkenazy_Jews_Behar | IBS_1000Genomes       | Stalskoe_Xing         | Mala_Reich          | 2.29            |
| 13          | Orcadian_HGDP        | Sicilian_Dodecad      | Kurd_Xing             | Chenchu_Reich       | 2.32            |
| 14          | Orkney_1000 Genomes  | Sicilian_Dodecad      | Kurd_Xing             | Chenchu_Reich       | 2.33            |
| 15          | French_Dodecad       | Sephardic_Jews_Behar  | Stalskoe_Xing         | Mala_Reich          | 2.34            |
| 16          | C_Italian_Dodecad    | CEU_HapMap            | Uzbekistan_Jews_Behar | Mala_Reich          | 2.36            |
| 17          | Orkney_1000 Genomes  | Sicilian_Dodecad      | Uzbekistan_Jews_Behar | AP_Mala_Xing        | 2.36            |
| 18          | Orcadian_HGDP        | Sicilian_Dodecad      | Uzbekistan_Jews_Behar | AP_Mala_Xing        | 2.37            |
| 19          | Iranian_Dodecad      | Sardinian_HGDP        | Slovenian_Xing        | Kamsali_Reich       | 2.37            |
| 20          | Ashkenazy_Jews_Behar | Spanish_Dodecad       | Stalskoe_Xing         | Mala_Reich          | 2.37            |

***Cortes Moreno -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>        | <b>Population 2</b>  | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------------|----------------------|---------------------|---------------------|-----------------|
| 1           | Iranian_Dodecad            | Portuguese_Dodecad   | Romanians_14_Behar  | Satnami_Reich       | 1.50            |
| 2           | IBS_1000Genomes            | Iranian_Dodecad      | Romanians_14_Behar  | Satnami_Reich       | 1.92            |
| 3           | S_Italian_Sicilian_Dodecad | Turkish_Dodecad      | Slovenian_Xing      | Chenchu_Reich       | 2.00            |
| 4           | German_Dodecad             | Sephardic_Jews_Behar | Turks_Behar         | Chenchu_Reich       | 2.02            |
| 5           | German_Dodecad             | Sicilian_Dodecad     | Turks_Behar         | Kurumba_Reich       | 2.07            |
| 6           | Iranians_Behar             | Portuguese_Dodecad   | Romanians_14_Behar  | Satnami_Reich       | 2.11            |
| 7           | C_Italian_Dodecad          | Kurd_Xing            | Slovenian_Xing      | Satnami_Reich       | 2.13            |
| 8           | Iranian_Dodecad            | Romanians_14_Behar   | Spanish_Dodecad     | Satnami_Reich       | 2.15            |
| 9           | C_Italian_Dodecad          | Turkish_Dodecad      | Slovenian_Xing      | Kurumba_Reich       | 2.16            |
| 10          | German_Dodecad             | Sicilian_Dodecad     | Turkish_Dodecad     | Kurumba_Reich       | 2.16            |
| 11          | Iranians_Behar             | Portuguese_Dodecad   | Romanians_14_Behar  | Tharu_Reich         | 2.16            |
| 12          | German_Dodecad             | Sephardic_Jews_Behar | Turkish_Dodecad     | Chenchu_Reich       | 2.20            |
| 13          | Iranian_Dodecad            | Portuguese_Dodecad   | Romanians_14_Behar  | Tharu_Reich         | 2.25            |
| 14          | IBS_1000Genomes            | Iranians_Behar       | Romanians_14_Behar  | Satnami_Reich       | 2.25            |
| 15          | Iranian_Dodecad            | Romanians_14_Behar   | Spaniards_Behar     | Satnami_Reich       | 2.29            |
| 16          | C_Italian_Dodecad          | Turkish_Dodecad      | Slovenian_Xing      | Madiga_Reich        | 2.30            |
| 17          | S_Italian_Sicilian_Dodecad | Turkish_Dodecad      | Slovenian_Xing      | Madiga_Reich        | 2.30            |
| 18          | German_Dodecad             | Sephardic_Jews_Behar | Turkish_Dodecad     | Kurumba_Reich       | 2.30            |
| 19          | C_Italian_Dodecad          | Turks_Behar          | AP_Mala_Xing        | Slovenian_Xing      | 2.32            |
| 20          | O_Italian_Dodecad          | Turkish_Dodecad      | Slovenian_Xing      | Kurumba_Reich       | 2.33            |

***Cortes Moreno -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b>  | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|----------------------|---------------------|---------------------|-----------------|
| 1           | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | Kurumba_Reich       | 2.13            |
| 2           | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | Kamsali_Reich       | 2.24            |
| 3           | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | Hallaki_Reich       | 2.27            |
| 4           | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | Madiga_Reich        | 2.28            |
| 5           | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | Satnami_Reich       | 2.35            |
| 6           | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | Vysya_Reich         | 2.39            |
| 7           | German_Dodecad      | Sephardic_Jews_Behar | Turkish_Dodecad     | Chenchu_Reich       | 2.44            |
| 8           | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | Lodi_Reich          | 2.48            |
| 9           | Balkans_Dodecad     | Iranians_Behar       | Portuguese_Dodecad  | Kamsali_Reich       | 2.48            |
| 10          | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | Bhil_Reich          | 2.50            |
| 11          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar  | Kurumba_Reich       | 2.50            |
| 12          | Balkans_Dodecad     | Iranians_Behar       | Portuguese_Dodecad  | Vysya_Reich         | 2.52            |
| 13          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar  | Kamsali_Reich       | 2.54            |
| 14          | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | AP_Mala_Xing        | 2.55            |
| 15          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar  | Madiga_Reich        | 2.57            |
| 16          | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | Naidu_Reich         | 2.57            |
| 17          | Iranians_Behar      | Portuguese_Dodecad   | Romanians_14_Behar  | Tharu_Reich         | 2.60            |
| 18          | Balkans_Dodecad     | Iranians_Behar       | Portuguese_Dodecad  | Kurumba_Reich       | 2.62            |
| 19          | Iranian_Dodecad     | Portuguese_Dodecad   | Romanians_14_Behar  | AP_Mala_Xing        | 2.63            |
| 20          | Balkans_Dodecad     | Iranians_Behar       | Portuguese_Dodecad  | Naidu_Reich         | 2.63            |

***Delgado Cano -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b> | <b>Population 3</b>  | <b>Population 4</b>  | <b>Distance</b> |
|-------------|-------------------------|---------------------|----------------------|----------------------|-----------------|
| 1           | Balochi_HGDP            | German_Dodecad      | Sephardic_Jews_Behar | Spanish_Dodecad      | 2.04            |
| 2           | Balochi_HGDP            | German_Dodecad      | IBS_1000Genomes      | Sephardic_Jews_Behar | 2.05            |
| 3           | Bnei_Menashe_Jews_Behar | German_Dodecad      | Portuguese_Dodecad   | S_Italian_Dodecad    | 2.08            |
| 4           | Balochi_HGDP            | German_Dodecad      | Portuguese_Dodecad   | Sicilian_Dodecad     | 2.20            |
| 5           | Balochi_HGDP            | CEU_HapMap          | Portuguese_Dodecad   | Sicilian_Dodecad     | 2.27            |
| 6           | Ashkenazy_Jews_Behar    | N_Italian_Dodecad   | Pathan_HGDP          | Portuguese_Dodecad   | 2.30            |
| 7           | Brahui_HGDP             | German_Dodecad      | Sephardic_Jews_Behar | Spanish_Dodecad      | 2.32            |
| 8           | Brahui_HGDP             | German_Dodecad      | Portuguese_Dodecad   | Sicilian_Dodecad     | 2.33            |
| 9           | Brahui_HGDP             | German_Dodecad      | IBS_1000Genomes      | Sephardic_Jews_Behar | 2.36            |
| 10          | German_Dodecad          | Morocco_Jews_Behar  | Pathan_HGDP          | Sardinian_HGDP       | 2.37            |
| 11          | Balochi_HGDP            | German_Dodecad      | IBS_1000Genomes      | Sicilian_Dodecad     | 2.38            |
| 12          | Balochi_HGDP            | CEU_HapMap          | Portuguese_Dodecad   | Sephardic_Jews_Behar | 2.39            |
| 13          | Balochi_HGDP            | German_Dodecad      | Sephardic_Jews_Behar | Spaniards_Behar      | 2.41            |
| 14          | Bnei_Menashe_Jews_Behar | Greek_Dodecad       | Portuguese_Dodecad   | N._European_Xing     | 2.44            |
| 15          | Balochi_HGDP            | CEU_HapMap          | Sephardic_Jews_Behar | Spanish_Dodecad      | 2.45            |
| 16          | Balochi_HGDP            | German_Dodecad      | Portuguese_Dodecad   | Sephardic_Jews_Behar | 2.45            |
| 17          | Balochi_HGDP            | CEU_HapMap          | IBS_1000Genomes      | Sephardic_Jews_Behar | 2.46            |
| 18          | Brahui_HGDP             | CEU_HapMap          | Portuguese_Dodecad   | Sicilian_Dodecad     | 2.46            |
| 19          | Balochi_HGDP            | Portuguese_Dodecad  | Sicilian_Dodecad     | N._European_Xing     | 2.47            |
| 20          | Balochi_HGDP            | German_Dodecad      | Portuguese_Dodecad   | S_Italian_Dodecad    | 2.47            |

***Delgado Alvarez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>   | <b>Population 2</b>   | <b>Population 3</b>        | <b>Population 4</b>   | <b>Distance</b> |
|-------------|-----------------------|-----------------------|----------------------------|-----------------------|-----------------|
| 1           | French_Basque         | Morocco_Jews          | North_African_Dodecad      | Tuscan                | 2.18            |
| 2           | French_Basque         | North_African_Dodecad | North_African_Jews_Dodecad | North_Italian         | 2.22            |
| 3           | North_African_Dodecad | North_Italian         | North_Italian              | North_Italian         | 2.27            |
| 4           | French_Basque         | French_Basque         | Morocco_N                  | Yemen_Jews            | 2.60            |
| 5           | French_Basque         | Morocco_Jews          | North_African_Dodecad      | North_Italian         | 2.64            |
| 6           | Morocco_N             | North_Italian         | North_Italian              | North_Italian         | 2.87            |
| 7           | Morocco_N             | North_Italian         | North_Italian              | Tuscan                | 3.01            |
| 8           | French_Basque         | North_African_Dodecad | North_African_Jews_Dodecad | Tuscan                | 3.02            |
| 9           | Druze                 | French_Basque         | Morocco_N                  | North_Italian         | 3.08            |
| 10          | Algeria               | North_Italian         | North_Italian              | North_Italian         | 3.17            |
| 11          | French_Basque         | French_Basque         | Morocco_N                  | Saudis                | 3.29            |
| 12          | French_Basque         | French_Basque         | North_African_Dodecad      | Yemen_Jews            | 3.34            |
| 13          | North_African_Dodecad | North_Italian         | North_Italian              | Tuscan                | 3.43            |
| 14          | Algeria               | French_Basque         | French_Basque              | Yemen_Jews            | 3.76            |
| 15          | Bedouin               | French_Basque         | French_Basque              | North_African_Dodecad | 3.78            |
| 16          | Druze                 | French_Basque         | North_African_Dodecad      | North_Italian         | 3.87            |
| 17          | Algeria               | French_Basque         | Morocco_Jews               | Tuscan                | 3.92            |
| 18          | Morocco_N             | North_Italian         | Tuscan                     | Tuscan                | 3.94            |
| 19          | Algeria               | French_Basque         | North_African_Jews_Dodecad | North_Italian         | 3.97            |
| 20          | Algeria               | North_Italian         | North_Italian              | Tuscan                | 4.11            |

***Doya -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b>     | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|-------------------------|-------------------------|---------------------|---------------------|-----------------|
| 1           | Iranians_Behar          | Portuguese_Dodecad      | Slovenian_Xing      | Hallaki_Reich       | 1.45            |
| 2           | INS_SGVP                | Iranians_Behar          | Portuguese_Dodecad  | Slovenian_Xing      | 1.50            |
| 3           | Hungarians_Behar        | INS_SGVP                | Iranians_Behar      | Portuguese_Dodecad  | 1.56            |
| 4           | Iranian_Dodecad         | Portuguese_Dodecad      | Slovenian_Xing      | Naidu_Reich         | 1.56            |
| 5           | Iranians_Behar          | Portuguese_Dodecad      | Slovenian_Xing      | Vysya_Reich         | 1.77            |
| 6           | Iranians_Behar          | Portuguese_Dodecad      | Slovenian_Xing      | Naidu_Reich         | 1.80            |
| 7           | Hungarians_Behar        | Iranian_Dodecad         | Portuguese_Dodecad  | Naidu_Reich         | 1.85            |
| 8           | Hungarians_Behar        | Iranians_Behar          | Portuguese_Dodecad  | Hallaki_Reich       | 1.85            |
| 9           | Iranian_Dodecad         | Portuguese_Dodecad      | Slovenian_Xing      | Hallaki_Reich       | 1.86            |
| 10          | Hungarians_Behar        | Iranians_Behar          | Portuguese_Dodecad  | Naidu_Reich         | 1.87            |
| 11          | Balochi_HGDP            | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad  | Slovenian_Xing      | 1.90            |
| 12          | Bnei_Menashe_Jews_Behar | Brahui_HGDP             | Portuguese_Dodecad  | Slovenian_Xing      | 1.96            |
| 13          | Iranian_Dodecad         | Portuguese_Dodecad      | Slovenian_Xing      | Vysya_Reich         | 1.97            |
| 14          | Kurd_Dodecad            | Portuguese_Dodecad      | Slovenian_Xing      | Velama_Reich        | 1.98            |
| 15          | Kurd_Dodecad            | Portuguese_Dodecad      | Slovenian_Xing      | Vysya_Reich         | 1.99            |
| 16          | GIH_HapMap              | Iranians_Behar          | Portuguese_Dodecad  | Slovenian_Xing      | 1.99            |
| 17          | IBS_1000Genomes         | Iranians_Behar          | Slovenian_Xing      | Hallaki_Reich       | 2.00            |
| 18          | GIH_HapMap              | Hungarians_Behar        | Iranians_Behar      | Portuguese_Dodecad  | 2.01            |
| 19          | Hungarians_Behar        | Iranians_Behar          | Portuguese_Dodecad  | Vysya_Reich         | 2.10            |
| 20          | IBS_1000Genomes         | Iranians_Behar          | Slovenian_Xing      | Vysya_Reich         | 2.12            |

***Doya Gimenez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Portuguese_Dodecad  | Romanians_14_Behar  | Turks_Behar         | Vaish_Reich         | 1.29            |
| 2           | Balkans_Dodecad     | Portuguese_Dodecad  | Turks_Behar         | Meghawal_Reich      | 1.37            |
| 3           | Balkans_Dodecad     | Portuguese_Dodecad  | Turks_Behar         | Vaish_Reich         | 1.42            |
| 4           | Balkans_Dodecad     | Portuguese_Dodecad  | Turks_Behar         | TN_Brahmin_Xing     | 1.70            |
| 5           | Balkans_Dodecad     | Portuguese_Dodecad  | Turks_Behar         | AP_Brahmin_Xing     | 1.71            |
| 6           | Balkans_Dodecad     | IBS_1000Genomes     | Turks_Behar         | Meghawal_Reich      | 1.73            |
| 7           | Balkans_Dodecad     | Spanish_Dodecad     | Turks_Behar         | Meghawal_Reich      | 1.73            |
| 8           | Balkans_Dodecad     | Spaniards_Behar     | Turks_Behar         | Meghawal_Reich      | 1.76            |
| 9           | Balkans_Dodecad     | Spaniards_Behar     | Turks_Behar         | Srivastava_Reich    | 1.77            |
| 10          | Balkans_Dodecad     | Cochin_Jews_Behar   | Sardinian_HGDP      | Urkarah_Xing        | 1.82            |
| 11          | Balkans_Dodecad     | Portuguese_Dodecad  | Turkish_Dodecad     | Meghawal_Reich      | 1.88            |
| 12          | Balkans_Dodecad     | IBS_1000Genomes     | Turks_Behar         | Vaish_Reich         | 1.90            |
| 13          | Romanians_14_Behar  | Sardinian_HGDP      | Urkarah_Xing        | Srivastava_Reich    | 1.92            |
| 14          | Balkans_Dodecad     | IBS_1000Genomes     | Turks_Behar         | Srivastava_Reich    | 1.98            |
| 15          | Balkans_Dodecad     | Spanish_Dodecad     | Turks_Behar         | Srivastava_Reich    | 1.98            |
| 16          | Balkans_Dodecad     | Spaniards_Behar     | Turks_Behar         | TN_Brahmin_Xing     | 2.02            |
| 17          | Armenians_16_Behar  | Hungarians_Behar    | IBS_1000Genomes     | Srivastava_Reich    | 2.06            |
| 18          | Balkans_Dodecad     | Portuguese_Dodecad  | Turks_Behar         | Srivastava_Reich    | 2.07            |
| 19          | Portuguese_Dodecad  | Romanians_14_Behar  | Turkish_Dodecad     | Vaish_Reich         | 2.07            |
| 20          | Armenian_Dodecad    | Hungarians_Behar    | IBS_1000Genomes     | Srivastava_Reich    | 2.08            |

***Duval Jimenez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>   | <b>Population 2</b> | <b>Population 3</b>   | <b>Population 4</b> | <b>Distance</b> |
|-------------|-----------------------|---------------------|-----------------------|---------------------|-----------------|
| 1           | Azerbaijan_Jews_Behar | Hungarians_Behar    | Portuguese_Dodecad    | Vysya_Reich         | 1.84            |
| 2           | Azerbaijan_Jews_Behar | Hungarians_Behar    | INS_SGVP              | Portuguese_Dodecad  | 1.95            |
| 3           | Armenian_Dodecad      | Hungarians_Behar    | Portuguese_Dodecad    | Bhil_Reich          | 1.96            |
| 4           | Azerbaijan_Jews_Behar | Hungarians_Behar    | Portuguese_Dodecad    | Hallaki_Reich       | 1.99            |
| 5           | Hungarians_Behar      | Portuguese_Dodecad  | Uzbekistan_Jews_Behar | Velama_Reich        | 1.99            |
| 6           | Armenian_Dodecad      | Hungarians_Behar    | Portuguese_Dodecad    | Mala_Reich          | 2.00            |
| 7           | Azerbaijan_Jews_Behar | GIH_HapMap          | Hungarians_Behar      | Portuguese_Dodecad  | 2.06            |
| 8           | Armenian_Dodecad      | Hungarians_Behar    | Portuguese_Dodecad    | AP_Madiga_Xing      | 2.11            |
| 9           | Hungarians_Behar      | IBS_1000Genomes     | Uzbekistan_Jews_Behar | Velama_Reich        | 2.12            |
| 10          | GIH_HapMap            | Hungarians_Behar    | Iranian_Jews_Behar    | Portuguese_Dodecad  | 2.12            |
| 11          | Hungarians_Behar      | INS_SGVP            | Iranian_Jews_Behar    | Portuguese_Dodecad  | 2.13            |
| 12          | Azerbaijan_Jews_Behar | Hungarians_Behar    | IBS_1000Genomes       | Vysya_Reich         | 2.15            |
| 13          | Armenian_Dodecad      | Hungarians_Behar    | Portuguese_Dodecad    | TN_Dalit_Xing       | 2.15            |
| 14          | Armenian_Dodecad      | Hungarians_Behar    | Portuguese_Dodecad    | Madiga_Reich        | 2.17            |
| 15          | Armenian_Dodecad      | Portuguese_Dodecad  | Slovenian_Xing        | Mala_Reich          | 2.19            |
| 16          | Azerbaijan_Jews_Behar | Hungarians_Behar    | Portuguese_Dodecad    | Naidu_Reich         | 2.21            |
| 17          | Hungarians_Behar      | IBS_1000Genomes     | Kurd_Xing             | Velama_Reich        | 2.21            |
| 18          | Hungarians_Behar      | IBS_1000Genomes     | Kurd_Xing             | Vysya_Reich         | 2.21            |
| 19          | Hungarians_Behar      | Spanish_Dodecad     | Kurd_Xing             | Velama_Reich        | 2.22            |
| 20          | Armenian_Dodecad      | Portuguese_Dodecad  | Slovenian_Xing        | Bhil_Reich          | 2.22            |

***Fernández Muñoz -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b>  | <b>Population 3</b>   | <b>Population 4</b>   | <b>Distance</b> |
|-------------|----------------------|----------------------|-----------------------|-----------------------|-----------------|
| 1           | Morocco_Jews_Behar   | Turkish_Dodecad      | Irula_Xing            | Slovenian_Xing        | 1.85            |
| 2           | Morocco_Jews_Behar   | Turks_Behar          | Irula_Xing            | Slovenian_Xing        | 2.16            |
| 3           | Morocco_Jews_Behar   | North_Kannadi_Behar  | Turkish_Dodecad       | Slovenian_Xing        | 2.28            |
| 4           | Morocco_Jews_Behar   | N_Italian_Dodecad    | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 2.47            |
| 5           | Morocco_Jews_Behar   | North_Kannadi_Behar  | Turks_Behar           | Slovenian_Xing        | 2.47            |
| 6           | Morocco_Jews_Behar   | N_Italian_Dodecad    | Pakistani_Xing        | Kashmiri_Pandit_Reich | 2.53            |
| 7           | Morocco_Jews_Behar   | Romanians_14_Behar   | Irula_Xing            | Stalskoe_Xing         | 2.55            |
| 8           | Ashkenazy_Jews_Behar | C_Italian_Dodecad    | Kashmiri_Pandit_Reich | Vaish_Reich           | 2.56            |
| 9           | German_Dodecad       | Sephardic_Jews_Behar | Turks_Behar           | Irula_Xing            | 2.59            |
| 10          | Pathan_HGDP          | Sicilian_Dodecad     | Tuscan_Henn           | Srivastava_Reich      | 2.59            |
| 11          | Hungarians_Behar     | Morocco_Jews_Behar   | Turkish_Dodecad       | Irula_Xing            | 2.61            |
| 12          | Morocco_Jews_Behar   | O_Italian_Dodecad    | Kashmiri_Pandit_Reich | Vaish_Reich           | 2.61            |
| 13          | Pathan_HGDP          | Sephardic_Jews_Behar | Tuscan_Xing           | Vaish_Reich           | 2.61            |
| 14          | Kurd_Dodecad         | North_Kannadi_Behar  | S_Italian_Dodecad     | Slovenian_Xing        | 2.61            |
| 15          | Ashkenazy_Jews_Behar | Balochi_HGDP         | N_Italian_Dodecad     | Srivastava_Reich      | 2.61            |
| 16          | Pathan_HGDP          | Sicilian_Dodecad     | Tuscan_Xing           | Srivastava_Reich      | 2.63            |
| 17          | Morocco_Jews_Behar   | North_Kannadi_Behar  | Romanians_14_Behar    | Stalskoe_Xing         | 2.64            |
| 18          | Morocco_Jews_Behar   | N_Italian_Dodecad    | Sindhi_HGDP           | Kashmiri_Pandit_Reich | 2.64            |
| 19          | Sephardic_Jews_Behar | Tuscan_Xing          | Kashmiri_Pandit_Reich | Vaish_Reich           | 2.65            |
| 20          | Sephardic_Jews_Behar | TSI_HapMap           | Kashmiri_Pandit_Reich | Vaish_Reich           | 2.65            |

***Gabarri Gabarri -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>   | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|-----------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | CEU_HapMap            | Georgia_Jews_Behar  | O_Italian_Dodecad   | Kurumba_Reich       | 1.36            |
| 2           | Druze_HGDP            | Sicilian_Dodecad    | Swedish_Dodecad     | AP_Mala_Xing        | 1.43            |
| 3           | Druze_HGDP            | Sicilian_Dodecad    | Swedish_Dodecad     | Chenchu_Reich       | 1.48            |
| 4           | Druze_HGDP            | S_Italian_Dodecad   | Swedish_Dodecad     | Chenchu_Reich       | 1.60            |
| 5           | C_Italian_Dodecad     | Georgia_Jews_Behar  | Orkney_1000 Genomes | Kurumba_Reich       | 1.60            |
| 6           | C_Italian_Dodecad     | Georgia_Jews_Behar  | Argyll_1000 Genomes | AP_Mala_Xing        | 1.62            |
| 7           | Georgia_Jews_Behar    | O_Italian_Dodecad   | Orcadian_HGDP       | Kurumba_Reich       | 1.62            |
| 8           | Druze_HGDP            | Norwegian_Dodecad   | Sicilian_Dodecad    | Chenchu_Reich       | 1.62            |
| 9           | Georgia_Jews_Behar    | O_Italian_Dodecad   | N._European_Xing    | Kurumba_Reich       | 1.63            |
| 10          | C_Italian_Dodecad     | Georgia_Jews_Behar  | N._European_Xing    | Chenchu_Reich       | 1.64            |
| 11          | British_Isles_Dodecad | Greek_Dodecad       | Samaritians_Behar   | Chenchu_Reich       | 1.65            |
| 12          | C_Italian_Dodecad     | Georgia_Jews_Behar  | Orcadian_HGDP       | Kurumba_Reich       | 1.65            |
| 13          | Greek_Dodecad         | Irish_Dodecad       | Lebanese_Behar      | Kurumba_Reich       | 1.66            |
| 14          | CEU_HapMap            | Druze_HGDP          | Tuscan_Xing         | Kurumba_Reich       | 1.66            |
| 15          | Georgia_Jews_Behar    | O_Italian_Dodecad   | Argyll_1000 Genomes | Kurumba_Reich       | 1.66            |
| 16          | C_Italian_Dodecad     | CEU_HapMap          | Georgia_Jews_Behar  | Chenchu_Reich       | 1.67            |
| 17          | C_Italian_Dodecad     | Georgia_Jews_Behar  | Orcadian_HGDP       | AP_Mala_Xing        | 1.68            |
| 18          | C_Italian_Dodecad     | CEU_HapMap          | Georgia_Jews_Behar  | Madiga_Reich        | 1.68            |
| 19          | British_Dodecad       | Greek_Dodecad       | Lebanese_Behar      | Madiga_Reich        | 1.69            |
| 20          | C_Italian_Dodecad     | Georgia_Jews_Behar  | Orkney_1000 Genomes | AP_Mala_Xing        | 1.69            |

***Gabbarri Hernandez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b>   | <b>Population 3</b>   | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|-----------------------|-----------------------|---------------------|-----------------|
| 1           | Iranians_Behar      | Portuguese_Dodecad    | Romanians_14_Behar    | Satnami_Reich       | 2.14            |
| 2           | German_Dodecad      | Sephardic_Jews_Behar  | Turkish_Dodecad       | Chenchu_Reich       | 2.20            |
| 3           | C_Italian_Dodecad   | Georgia_Jews_Behar    | Slovenian_Xing        | Chenchu_Reich       | 2.41            |
| 4           | German_Dodecad      | Sicilian_Dodecad      | Kurd_Xing             | Satnami_Reich       | 2.49            |
| 5           | C_Italian_Dodecad   | Uzbekistan_Jews_Behar | Slovenian_Xing        | Satnami_Reich       | 2.52            |
| 6           | Georgia_Jews_Behar  | O_Italian_Dodecad     | Slovenian_Xing        | Chenchu_Reich       | 2.53            |
| 7           | Iranians_Behar      | Portuguese_Dodecad    | Romanians_14_Behar    | Tharu_Reich         | 2.54            |
| 8           | Georgia_Jews_Behar  | German_Dodecad        | Greek_Dodecad         | Chenchu_Reich       | 2.56            |
| 9           | Druze_HGDP          | Hungarians_Behar      | Tuscan_Xing           | Chenchu_Reich       | 2.58            |
| 10          | Georgia_Jews_Behar  | Hungarians_Behar      | O_Italian_Dodecad     | Chenchu_Reich       | 2.59            |
| 11          | Iranians_Behar      | Portuguese_Dodecad    | Romanians_14_Behar    | Lodi_Reich          | 2.60            |
| 12          | Iranian_Jews_Behar  | O_Italian_Dodecad     | Slovenian_Xing        | Chenchu_Reich       | 2.63            |
| 13          | Druze_HGDP          | Slovenian_Xing        | Tuscan_Xing           | Chenchu_Reich       | 2.66            |
| 14          | C_Italian_Dodecad   | Uzbekistan_Jews_Behar | Slovenian_Xing        | Chenchu_Reich       | 2.67            |
| 15          | Iranian_Jews_Behar  | O_Italian_Dodecad     | Slovenian_Xing        | Satnami_Reich       | 2.68            |
| 16          | German_Dodecad      | Sephardic_Jews_Behar  | Turkish_Dodecad       | AP_Mala_Xing        | 2.68            |
| 17          | German_Dodecad      | Sicilian_Dodecad      | Uzbekistan_Jews_Behar | Satnami_Reich       | 2.69            |
| 18          | Druze_HGDP          | Hungarians_Behar      | TSI_HapMap            | Chenchu_Reich       | 2.70            |
| 19          | Morocco_Jews_Behar  | Turkish_Dodecad       | Slovenian_Xing        | Chenchu_Reich       | 2.71            |
| 20          | German_Dodecad      | Sephardic_Jews_Behar  | Turks_Behar           | Chenchu_Reich       | 2.71            |

***Garcia Jarque -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b> | <b>Population 3</b>        | <b>Population 4</b>        | <b>Distance</b> |
|-------------|-------------------------|---------------------|----------------------------|----------------------------|-----------------|
| 1           | German_Dodecad          | Pathan_HGDP         | Portuguese_Dodecad         | Sicilian_Dodecad           | 2.64            |
| 2           | Burusho_HGDP            | German_Dodecad      | Portuguese_Dodecad         | Sicilian_Dodecad           | 2.72            |
| 3           | German_Dodecad          | Pathan_HGDP         | Portuguese_Dodecad         | Sephardic_Jews_Behar       | 2.73            |
| 4           | Burusho_HGDP            | German_Dodecad      | Portuguese_Dodecad         | Sephardic_Jews_Behar       | 2.81            |
| 5           | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad  | TSI_HapMap                 | Slovenian_Xing             | 2.86            |
| 6           | Burusho_HGDP            | German_Dodecad      | Portuguese_Dodecad         | S_Italian_Dodecad          | 2.91            |
| 7           | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad  | Slovenian_Xing             | Tuscan_Xing                | 2.91            |
| 8           | German_Dodecad          | Portuguese_Dodecad  | Sicilian_Dodecad           | Kashmiri_Pandit_Reich      | 2.91            |
| 9           | German_Dodecad          | Portuguese_Dodecad  | S_Italian_Sicilian_Dodecad | Kashmiri_Pandit_Reich @    |                 |
| 10          | German_Dodecad          | Pathan_HGDP         | Portuguese_Dodecad         | S_Italian_Dodecad          | 3.02            |
| 11          | Burusho_HGDP            | German_Dodecad      | Portuguese_Dodecad         | S_Italian_Sicilian_Dodecad | 3.03            |
| 12          | Portuguese_Dodecad      | Sicilian_Dodecad    | N_European_Xing            | Kashmiri_Pandit_Reich      | 3.05            |
| 13          | German_Dodecad          | Pathan_HGDP         | Portuguese_Dodecad         | S_Italian_Sicilian_Dodecad | 3.06            |
| 14          | O_Italian_Dodecad       | Pathan_HGDP         | Portuguese_Dodecad         | Slovenian_Xing             | 3.06            |
| 15          | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad  | Tuscan_Henn                | Slovenian_Xing             | 3.11            |
| 16          | German_Dodecad          | Portuguese_Dodecad  | S_Italian_Dodecad          | Kashmiri_Pandit_Reich      | 3.12            |
| 17          | German_Dodecad          | Portuguese_Dodecad  | Sephardic_Jews_Behar       | Kashmiri_Pandit_Reich      | 3.17            |
| 18          | Pathan_HGDP             | Portuguese_Dodecad  | Sicilian_Dodecad           | N_European_Xing            | 3.19            |
| 19          | Portuguese_Dodecad      | Sicilian_Dodecad    | Argyll_1000 Genomes        | Kashmiri_Pandit_Reich      | 3.20            |
| 1           | German_Dodecad          | Pathan_HGDP         | Portuguese_Dodecad         | Sicilian_Dodecad           | 2.64            |

***Garcia Jarque -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b>  | <b>Population 3</b>  | <b>Population 4</b>   | <b>Distance</b> |
|-------------|-------------------------|----------------------|----------------------|-----------------------|-----------------|
| 1           | Burusho_HGDP            | German_Dodecad       | Portuguese_Dodecad   | Sephardic_Jews_Behar  | 3.20            |
| 2           | German_Dodecad          | Portuguese_Dodecad   | Sephardic_Jews_Behar | Kashmiri_Pandit_Reich | 3.22            |
| 3           | German_Dodecad          | Morocco_Jews_Behar   | Portuguese_Dodecad   | Kashmiri_Pandit_Reich | 3.40            |
| 4           | German_Dodecad          | Portuguese_Dodecad   | Sephardic_Jews_Behar | Pakistani_Xing        | 3.50            |
| 5           | North_Italian_HGDP      | Orcadian_HGDP        | Morocco_N_Henn       | Kashmiri_Pandit_Reich | 3.51            |
| 6           | North_Italian_HGDP      | Orkney_1000 Genomes  | Morocco_N_Henn       | Kashmiri_Pandit_Reich | 3.56            |
| 7           | Portuguese_Dodecad      | Sephardic_Jews_Behar | N._European_Xing     | Kashmiri_Pandit_Reich | 3.58            |
| 8           | CEU_HapMap              | North_Italian_HGDP   | Morocco_N_Henn       | Kashmiri_Pandit_Reich | 3.60            |
| 9           | North_Italian_HGDP      | Argyll_1000 Genomes  | Morocco_N_Henn       | Kashmiri_Pandit_Reich | 3.62            |
| 10          | CEU_HapMap              | Morocco_Jews_Behar   | Portuguese_Dodecad   | Kashmiri_Pandit_Reich | 3.63            |
| 11          | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad   | Slovenian_Xing       | Tuscan_Xing           | 3.64            |
| 12          | Portuguese_Dodecad      | Sephardic_Jews_Behar | Argyll_1000 Genomes  | Kashmiri_Pandit_Reich | 3.65            |
| 13          | Orkney_1000 Genomes     | Portuguese_Dodecad   | Sephardic_Jews_Behar | Kashmiri_Pandit_Reich | 3.66            |
| 14          | German_Dodecad          | Portuguese_Dodecad   | Sephardic_Jews_Behar | Sindhi_HGDP           | 3.68            |
| 15          | Morocco_Jews_Behar      | Portuguese_Dodecad   | Slovenian_Xing       | Vaish_Reich           | 3.69            |
| 16          | German_Dodecad          | IBS_1000Genomes      | Morocco_Jews_Behar   | Kashmiri_Pandit_Reich | 3.69            |
| 17          | Orcadian_HGDP           | Portuguese_Dodecad   | Sephardic_Jews_Behar | Kashmiri_Pandit_Reich | 3.71            |
| 18          | CEU_HapMap              | Portuguese_Dodecad   | Sephardic_Jews_Behar | Kashmiri_Pandit_Reich | 3.72            |
| 19          | German_Dodecad          | Morocco_Jews_Behar   | Spanish_Dodecad      | Kashmiri_Pandit_Reich | 3.72            |
| 20          | Cochin_Jews_Behar       | German_Dodecad       | Morocco_Jews_Behar   | Portuguese_Dodecad    | 3.73            |

***Garcia Nunez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>   | <b>Population 2</b>   | <b>Population 3</b>   | <b>Population 4</b> | <b>Distance</b> |
|-------------|-----------------------|-----------------------|-----------------------|---------------------|-----------------|
| 1           | Morocco_Jews_Behar    | Uzbekistan_Jews_Behar | Slovenian_Xing        | Chenchu_Reich       | 2.13            |
| 2           | Morocco_Jews_Behar    | Kurd_Xing             | Slovenian_Xing        | Chenchu_Reich       | 2.32            |
| 3           | Morocco_Jews_Behar    | Turkish_Dodecad       | Slovenian_Xing        | Madiga_Reich        | 2.39            |
| 4           | Morocco_Jews_Behar    | Turkish_Dodecad       | Slovenian_Xing        | Chenchu_Reich       | 2.44            |
| 5           | Kurd_Dodecad          | Morocco_Jews_Behar    | Slovenian_Xing        | Chenchu_Reich       | 2.46            |
| 6           | Morocco_Jews_Behar    | Turkish_Dodecad       | AP_Mala_Xing          | Slovenian_Xing      | 2.48            |
| 7           | German_Dodecad        | Kurd_Dodecad          | Sephardic_Jews_Behar  | Kurumba_Reich       | 2.48            |
| 8           | Morocco_Jews_Behar    | Turkish_Dodecad       | Slovenian_Xing        | Mala_Reich          | 2.56            |
| 9           | Morocco_Jews_Behar    | AP_Mala_Xing          | Kurd_Xing             | Slovenian_Xing      | 2.56            |
| 10          | German_Dodecad        | Sephardic_Jews_Behar  | Kurd_Xing             | Kurumba_Reich       | 2.56            |
| 11          | Kurd_Dodecad          | Morocco_Jews_Behar    | AP_Mala_Xing          | Slovenian_Xing      | 2.58            |
| 12          | German_Dodecad        | Morocco_Jews_Behar    | Turks_Behar           | Mala_Reich          | 2.62            |
| 13          | Morocco_Jews_Behar    | Uzbekistan_Jews_Behar | AP_Mala_Xing          | Slovenian_Xing      | 2.62            |
| 14          | Morocco_Jews_Behar    | Uzbekistan_Jews_Behar | Slovenian_Xing        | Madiga_Reich        | 2.64            |
| 15          | German_Dodecad        | Sephardic_Jews_Behar  | Kurd_Xing             | Chenchu_Reich       | 2.68            |
| 16          | Azerbaijan_Jews_Behar | Morocco_Jews_Behar    | Slovenian_Xing        | Chenchu_Reich       | 2.72            |
| 17          | Morocco_Jews_Behar    | Uzbekistan_Jews_Behar | Slovenian_Xing        | Mala_Reich          | 2.72            |
| 18          | Hungarians_Behar      | Morocco_Jews_Behar    | Uzbekistan_Jews_Behar | Chenchu_Reich       | 2.74            |
| 19          | Ashkenazi_Dodecad     | Uzbekistan_Jews_Behar | Slovenian_Xing        | Mala_Reich          | 2.76            |
| 20          | German_Dodecad        | Kurd_Dodecad          | Sephardic_Jews_Behar  | Mala_Reich          | 2.78            |

***Garcia Nunez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b>   | <b>Population 3</b>   | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|-----------------------|-----------------------|---------------------|-----------------|
| 1           | Ashkenazi_Dodecad    | Hungarians_Behar      | Uzbekistan_Jews_Behar | Chenchu_Reich       | 1.24            |
| 2           | Ashkenazy_Jews_Behar | Hungarians_Behar      | Uzbekistan_Jews_Behar | Chenchu_Reich       | 1.38            |
| 3           | Ashkenazy_Jews_Behar | Hungarians_Behar      | Uzbekistan_Jews_Behar | Mala_Reich          | 1.38            |
| 4           | Ashkenazy_Jews_Behar | Hungarians_Behar      | Uzbekistan_Jews_Behar | AP_Mala_Xing        | 1.43            |
| 5           | Ashkenazi_Dodecad    | Hungarians_Behar      | Uzbekistan_Jews_Behar | Mala_Reich          | 1.50            |
| 6           | Ashkenazi_Dodecad    | Hungarians_Behar      | Uzbekistan_Jews_Behar | AP_Mala_Xing        | 1.56            |
| 7           | Ashkenazy_Jews_Behar | Hungarians_Behar      | Iranian_Jews_Behar    | Chenchu_Reich       | 1.63            |
| 8           | Hungarians_Behar     | Morocco_Jews_Behar    | Uzbekistan_Jews_Behar | Chenchu_Reich       | 1.71            |
| 9           | Ashkenazy_Jews_Behar | Georgia_Jews_Behar    | Hungarians_Behar      | Chenchu_Reich       | 1.84            |
| 10          | Ashkenazy_Jews_Behar | Hungarians_Behar      | Uzbekistan_Jews_Behar | Kurumba_Reich       | 1.86            |
| 11          | Ashkenazy_Jews_Behar | Hungarians_Behar      | Uzbekistan_Jews_Behar | AP_Madiga_Xing      | 1.89            |
| 12          | Ashkenazi_Dodecad    | Hungarians_Behar      | Uzbekistan_Jews_Behar | AP_Madiga_Xing      | 1.98            |
| 13          | Ashkenazi_Dodecad    | Hungarians_Behar      | Iranian_Jews_Behar    | Chenchu_Reich       | 1.98            |
| 14          | Ashkenazy_Jews_Behar | Hungarians_Behar      | Uzbekistan_Jews_Behar | Bhil_Reich          | 1.99            |
| 15          | Balkans_Dodecad      | Uzbekistan_Jews_Behar | Tuscan_Xing           | Madiga_Reich        | 2.01            |
| 16          | Ashkenazi_Dodecad    | Georgia_Jews_Behar    | Hungarians_Behar      | Chenchu_Reich       | 2.02            |
| 17          | Balkans_Dodecad      | Uzbekistan_Jews_Behar | Tuscan_Henn           | Madiga_Reich        | 2.04            |
| 18          | Ashkenazy_Jews_Behar | Hungarians_Behar      | Uzbekistan_Jews_Behar | TN_Dalit_Xing       | 2.04            |
| 19          | Ashkenazi_Dodecad    | Hungarians_Behar      | Uzbekistan_Jews_Behar | Kurumba_Reich       | 2.05            |
| 20          | Ashkenazi_Dodecad    | Hungarians_Behar      | Uzbekistan_Jews_Behar | Madiga_Reich        | 2.05            |

***Gimenez Gimenez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>    | <b>Population 2</b>    | <b>Population 3</b>   | <b>Population 4</b> | <b>Distance</b> |
|-------------|------------------------|------------------------|-----------------------|---------------------|-----------------|
| 1           | Portuguese_Dodecad     | Turkish_Dodecad        | Slovenian_Xing        | Vaish_Reich         | 2.46            |
| 2           | Cochin_Jews_Behar      | Morocco_Jews_Behar     | Orkney_1000 Genomes   | Romanians_14_Behar  | 2.89            |
| 3           | Cochin_Jews_Behar      | Morocco_Jews_Behar     | Romanians_14_Behar    | Argyll_1000 Genomes | 2.90            |
| 4           | Cochin_Jews_Behar      | Morocco_Jews_Behar     | Orcadian_HGDP         | Romanians_14_Behar  | 2.91            |
| 5           | Cochin_Jews_Behar      | Mixed_Germanic_Dodecad | Morocco_Jews_Behar    | Romanians_14_Behar  | 2.98            |
| 6           | Hungarians_Behar       | Portuguese_Dodecad     | Turkish_Dodecad       | Vaish_Reich         | 3.00            |
| 7           | CEU_HapMap             | Morocco_Jews_Behar     | Romanians_14_Behar    | Meghawal_Reich      | 3.02            |
| 8           | Mixed_Germanic_Dodecad | Romanians_14_Behar     | Sephardic_Jews_Behar  | Srivastava_Reich    | 3.04            |
| 9           | Morocco_Jews_Behar     | Orcadian_HGDP          | Romanians_14_Behar    | Meghawal_Reich      | 3.05            |
| 10          | CEU_HapMap             | Morocco_Jews_Behar     | Romanians_14_Behar    | Vaish_Reich         | 3.05            |
| 11          | French_HGDP            | Morocco_Jews_Behar     | Romanians_14_Behar    | Srivastava_Reich    | 3.07            |
| 12          | Morocco_Jews_Behar     | TSI_HapMap             | Slovenian_Xing        | Vaish_Reich         | 3.07            |
| 13          | Morocco_Jews_Behar     | Orkney_1000 Genomes    | Romanians_14_Behar    | Meghawal_Reich      | 3.08            |
| 14          | Balkans_Dodecad        | French_HGDP            | Morocco_Jews_Behar    | Meghawal_Reich      | 3.09            |
| 15          | Ashkenazy_Jews_Behar   | C_Italian_Dodecad      | German_Dodecad        | Srivastava_Reich    | 3.09            |
| 16          | Mixed_Germanic_Dodecad | Morocco_Jews_Behar     | Romanians_14_Behar    | Srivastava_Reich    | 3.11            |
| 17          | Greek_Dodecad          | Morocco_Jews_Behar     | Swedish_Dodecad       | Srivastava_Reich    | 3.11            |
| 18          | Morocco_Jews_Behar     | Slovenian_Xing         | Tuscan_Xing           | Vaish_Reich         | 3.12            |
| 19          | CEU_HapMap             | Cochin_Jews_Behar      | Morocco_Jews_Behar    | Romanians_14_Behar  | 3.13            |
| 20          | Hungarians_Behar       | Portuguese_Dodecad     | Uzbekistan_Jews_Behar | Vaish_Reich         | 3.14            |

***Gimenez Gimenez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b>   | <b>Population 3</b>   | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|-----------------------|-----------------------|---------------------|-----------------|
| 1           | German_Dodecad      | Sephardic_Jews_Behar  | Turkish_Dodecad       | Madiga_Reich        | 1.47            |
| 2           | German_Dodecad      | Sephardic_Jews_Behar  | Turkish_Dodecad       | Mala_Reich          | 1.58            |
| 3           | German_Dodecad      | Sephardic_Jews_Behar  | Turkish_Dodecad       | Chenchu_Reich       | 1.59            |
| 4           | Iranians_Behar      | Portuguese_Dodecad    | Romanians_14_Behar    | Hallaki_Reich       | 1.62            |
| 5           | Iranians_Behar      | Portuguese_Dodecad    | Romanians_14_Behar    | Lodi_Reich          | 1.77            |
| 6           | German_Dodecad      | Sicilian_Dodecad      | Kurd_Xing             | Kurumba_Reich       | 1.78            |
| 7           | Iranians_Behar      | Portuguese_Dodecad    | Romanians_14_Behar    | Naidu_Reich         | 1.79            |
| 8           | Iranians_Behar      | Portuguese_Dodecad    | Romanians_14_Behar    | Kamsali_Reich       | 1.81            |
| 9           | German_Dodecad      | Sephardic_Jews_Behar  | Turkish_Dodecad       | AP_Mala_Xing        | 1.82            |
| 10          | German_Dodecad      | Morocco_Jews_Behar    | Turkish_Dodecad       | Mala_Reich          | 1.83            |
| 11          | German_Dodecad      | Sephardic_Jews_Behar  | Turkish_Dodecad       | AP_Madiga_Xing      | 1.84            |
| 12          | German_Dodecad      | Sicilian_Dodecad      | Uzbekistan_Jews_Behar | Kurumba_Reich       | 1.85            |
| 13          | German_Dodecad      | Sephardic_Jews_Behar  | Turks_Behar           | Chenchu_Reich       | 1.86            |
| 14          | German_Dodecad      | Morocco_Jews_Behar    | Turkish_Dodecad       | TN_Dalit_Xing       | 1.89            |
| 15          | German_Dodecad      | Sephardic_Jews_Behar  | Turkish_Dodecad       | TN_Dalit_Xing       | 1.89            |
| 16          | German_Dodecad      | Sicilian_Dodecad      | Kurd_Xing             | Mala_Reich          | 1.95            |
| 17          | Iranians_Behar      | Portuguese_Dodecad    | Romanians_14_Behar    | Vysya_Reich         | 1.97            |
| 18          | O_Italian_Dodecad   | Uzbekistan_Jews_Behar | Slovenian_Xing        | Kurumba_Reich       | 1.98            |
| 19          | German_Dodecad      | Sephardic_Jews_Behar  | Turks_Behar           | Mala_Reich          | 1.99            |
| 20          | German_Dodecad      | Sicilian_Dodecad      | AP_Mala_Xing          | Kurd_Xing           | 2.00            |

***Heredia -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b>  | <b>Population 3</b>        | <b>Population 4</b>   | <b>Distance</b> |
|-------------|-------------------------|----------------------|----------------------------|-----------------------|-----------------|
| 1           | IBS_1000Genomes         | Makrani_HGDP         | Sicilian_Dodecad           | Tharu_Reich           | 1.80            |
| 2           | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad   | S_Italian_Sicilian_Dodecad | Kashmiri_Pandit_Reich | 1.81            |
| 3           | Makrani_HGDP            | Portuguese_Dodecad   | S_Italian_Dodecad          | Tharu_Reich           | 1.82            |
| 4           | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad   | Sicilian_Dodecad           | Kashmiri_Pandit_Reich | 1.83            |
| 5           | Makrani_HGDP            | Portuguese_Dodecad   | Sicilian_Dodecad           | Tharu_Reich           | 1.84            |
| 6           | Ashkenazy_Jews_Behar    | North_Kannadi_Behar  | Portuguese_Dodecad         | Turks_Behar           | 1.84            |
| 7           | Ashkenazy_Jews_Behar    | North_Kannadi_Behar  | Portuguese_Dodecad         | Turkish_Dodecad       | 1.91            |
| 8           | Makrani_HGDP            | Sicilian_Dodecad     | Spanish_Dodecad            | Tharu_Reich           | 1.92            |
| 9           | Greek_Dodecad           | Iranians_Behar       | Portuguese_Dodecad         | Chenchu_Reich         | 1.92            |
| 10          | Ashkenazi_Dodecad       | North_Kannadi_Behar  | Portuguese_Dodecad         | Turks_Behar           | 1.93            |
| 11          | IBS_1000Genomes         | Makrani_HGDP         | S_Italian_Dodecad          | Tharu_Reich           | 1.95            |
| 12          | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad   | S_Italian_Dodecad          | Kashmiri_Pandit_Reich | 1.95            |
| 13          | Makrani_HGDP            | S_Italian_Dodecad    | Spanish_Dodecad            | Tharu_Reich           | 1.96            |
| 14          | Ashkenazi_Dodecad       | North_Kannadi_Behar  | Portuguese_Dodecad         | Turkish_Dodecad       | 1.98            |
| 15          | IBS_1000Genomes         | Makrani_HGDP         | S_Italian_Sicilian_Dodecad | Tharu_Reich           | 1.98            |
| 16          | Iranian_Dodecad         | Portuguese_Dodecad   | Sicilian_Dodecad           | Chenchu_Reich         | 2.04            |
| 17          | Ashkenazy_Jews_Behar    | IBS_1000Genomes      | North_Kannadi_Behar        | Turks_Behar           | 2.10            |
| 18          | Makrani_HGDP            | Portuguese_Dodecad   | S_Italian_Sicilian_Dodecad | Tharu_Reich           | 2.10            |
| 19          | Iranians_Behar          | Portuguese_Dodecad   | Sicilian_Dodecad           | Chenchu_Reich         | 2.10            |
| 20          | Makrani_HGDP            | Sephardic_Jews_Behar | Spanish_Dodecad            | Tharu_Reich           | 2.11            |

***Heredia de la Rosa -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | German_Dodecad      | Jordanians_19_Behar | Tuscan_HGDP         | Mala_Reich          | 1.95            |
| 2           | German_Dodecad      | Palestinian_HGDP    | Tuscan_HGDP         | Mala_Reich          | 1.98            |
| 3           | Jordanians_19_Behar | Tuscan_HGDP         | Argyll_1000 Genomes | Mala_Reich          | 2.07            |
| 4           | Jordanians_19_Behar | Tuscan_HGDP         | N._European_Xing    | Mala_Reich          | 2.10            |
| 5           | German_Dodecad      | Palestinian_HGDP    | Tuscan_HGDP         | AP_Mala_Xing        | 2.13            |
| 6           | Jordanians_19_Behar | Tuscan_HGDP         | N._European_Xing    | Chenchu_Reich       | 2.14            |
| 7           | Jordanians_19_Behar | Orkney_1000 Genomes | Tuscan_HGDP         | Mala_Reich          | 2.14            |
| 8           | Jordanians_19_Behar | Orcadian_HGDP       | Tuscan_HGDP         | Mala_Reich          | 2.16            |
| 9           | German_Dodecad      | Jordanians_19_Behar | Tuscan_HGDP         | Chenchu_Reich       | 2.17            |
| 10          | German_Dodecad      | Jordanians_19_Behar | Tuscan_HGDP         | AP_Mala_Xing        | 2.19            |
| 11          | CEU_HapMap          | Jordanians_19_Behar | Tuscan_HGDP         | Mala_Reich          | 2.24            |
| 12          | German_Dodecad      | Palestinian_HGDP    | Tuscan_HGDP         | AP_Madiga_Xing      | 2.25            |
| 13          | Palestinian_HGDP    | Tuscan_HGDP         | N._European_Xing    | Mala_Reich          | 2.25            |
| 14          | CEU_HapMap          | Jordanians_19_Behar | Tuscan_HGDP         | Chenchu_Reich       | 2.28            |
| 15          | German_Dodecad      | Jordanians_19_Behar | Tuscan_HGDP         | Madiga_Reich        | 2.29            |
| 16          | Palestinian_HGDP    | Tuscan_HGDP         | AP_Madiga_Xing      | N._European_Xing    | 2.30            |
| 17          | CEU_HapMap          | Jordanians_19_Behar | O_Italian_Dodecad   | Mala_Reich          | 2.31            |
| 18          | Jordanians_19_Behar | Tuscan_HGDP         | Argyll_1000 Genomes | Chenchu_Reich       | 2.31            |
| 19          | Jordanians_19_Behar | O_Italian_Dodecad   | Orcadian_HGDP       | Mala_Reich          | 2.32            |
| 20          | Jordanians_19_Behar | Orkney_1000 Genomes | Tuscan_HGDP         | AP_Madiga_Xing      | 2.32            |

***Heredia Amaya -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | C_Italian_Dodecad    | Portuguese_Dodecad  | Romanians_14_Behar  | Velama_Reich        | 2.51            |
| 2           | Sicilian_Dodecad     | Sicilian_Dodecad    | Argyll_1000 Genomes | Tharu_Reich         | 2.63            |
| 3           | Greek_Dodecad        | Portuguese_Dodecad  | Tuscan_Xing         | Srivastava_Reich    | 2.63            |
| 4           | CEU_HapMap           | Sicilian_Dodecad    | Sicilian_Dodecad    | Lodi_Reich          | 2.64            |
| 5           | German_Dodecad       | Sicilian_Dodecad    | Sicilian_Dodecad    | Tharu_Reich         | 2.65            |
| 6           | CEU_HapMap           | Sicilian_Dodecad    | Sicilian_Dodecad    | Tharu_Reich         | 2.67            |
| 7           | Orcadian_HGDP        | Sicilian_Dodecad    | Sicilian_Dodecad    | Lodi_Reich          | 2.69            |
| 8           | Sicilian_Dodecad     | Sicilian_Dodecad    | Argyll_1000 Genomes | Lodi_Reich          | 2.71            |
| 9           | Orcadian_HGDP        | Sicilian_Dodecad    | Sicilian_Dodecad    | Tharu_Reich         | 2.72            |
| 10          | Orkney_1000 Genomes  | Sicilian_Dodecad    | Sicilian_Dodecad    | Tharu_Reich         | 2.73            |
| 11          | O_Italian_Dodecad    | Portuguese_Dodecad  | Romanians_14_Behar  | Velama_Reich        | 2.75            |
| 12          | Orkney_1000 Genomes  | Sicilian_Dodecad    | Sicilian_Dodecad    | Lodi_Reich          | 2.76            |
| 13          | Sicilian_Dodecad     | Sicilian_Dodecad    | Argyll_1000 Genomes | Hallaki_Reich       | 2.76            |
| 14          | Greek_Dodecad        | Orcadian_HGDP       | Sicilian_Dodecad    | Hallaki_Reich       | 2.77            |
| 15          | Greek_Dodecad        | Orkney_1000 Genomes | Sicilian_Dodecad    | Hallaki_Reich       | 2.78            |
| 16          | Orcadian_HGDP        | Sicilian_Dodecad    | Sicilian_Dodecad    | Hallaki_Reich       | 2.78            |
| 17          | CEU_HapMap           | Greek_Dodecad       | Sicilian_Dodecad    | Tharu_Reich         | 2.79            |
| 18          | CEU_HapMap           | Greek_Dodecad       | Sicilian_Dodecad    | Hallaki_Reich       | 2.80            |
| 19          | Orkney_1000 Genomes  | Sicilian_Dodecad    | Sicilian_Dodecad    | Hallaki_Reich       | 2.81            |
| 20          | Ashkenazy_Jews_Behar | IBS_1000Genomes     | Romanians_14_Behar  | Velama_Reich        | 2.81            |

***Heredia Heredia -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b>  | <b>Population 3</b>   | <b>Population 4</b>   | <b>Distance</b> |
|-------------|---------------------|----------------------|-----------------------|-----------------------|-----------------|
| 1           | Morocco_Jews_Behar  | Sardinian_HGDP       | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 2.58            |
| 2           | Greek_Dodecad       | Iranian_Dodecad      | Portuguese_Dodecad    | AP_Madiga_Xing        | 2.67            |
| 3           | Greek_Dodecad       | Iranians_Behar       | Portuguese_Dodecad    | AP_Madiga_Xing        | 2.71            |
| 4           | Greek_Dodecad       | Iranians_Behar       | Portuguese_Dodecad    | Mala_Reich            | 2.84            |
| 5           | Portuguese_Dodecad  | Sephardic_Jews_Behar | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 2.84            |
| 6           | Greek_Dodecad       | Iranians_Behar       | Portuguese_Dodecad    | Madiga_Reich          | 2.86            |
| 7           | Greek_Dodecad       | Iranian_Dodecad      | Portuguese_Dodecad    | Mala_Reich            | 2.91            |
| 8           | Greek_Dodecad       | Iranians_Behar       | Portuguese_Dodecad    | Chenchu_Reich         | 2.93            |
| 9           | Greek_Dodecad       | Iranians_Behar       | Portuguese_Dodecad    | Kurumba_Reich         | 2.95            |
| 10          | Greek_Dodecad       | Iranians_Behar       | Portuguese_Dodecad    | Bhil_Reich            | 3.03            |
| 11          | Greek_Dodecad       | Iranian_Dodecad      | Portuguese_Dodecad    | Madiga_Reich          | 3.03            |
| 12          | Greek_Dodecad       | Iranians_Behar       | Portuguese_Dodecad    | TN_Dalit_Xing         | 3.05            |
| 13          | Greek_Dodecad       | Iranian_Dodecad      | Portuguese_Dodecad    | TN_Dalit_Xing         | 3.09            |
| 14          | Cochin_Jews_Behar   | Greek_Dodecad        | Makrani_HGDP          | Portuguese_Dodecad    | 3.10            |
| 15          | Brahui_HGDP         | Cochin_Jews_Behar    | Greek_Dodecad         | Portuguese_Dodecad    | 3.14            |
| 16          | Greek_Dodecad       | Iranian_Dodecad      | Portuguese_Dodecad    | Bhil_Reich            | 3.15            |
| 17          | Balochi_HGDP        | Cochin_Jews_Behar    | Greek_Dodecad         | Portuguese_Dodecad    | 3.16            |
| 18          | Greek_Dodecad       | Iranian_Dodecad      | Portuguese_Dodecad    | Kurumba_Reich         | 3.18            |
| 19          | Greek_Dodecad       | Makrani_HGDP         | Portuguese_Dodecad    | Srivastava_Reich      | 3.18            |
| 20          | Cypriots_Behar      | Portuguese_Dodecad   | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 3.20            |

***Heredia Heredia -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b>  | <b>Population 3</b>   | <b>Population 4</b>   | <b>Distance</b> |
|-------------|-------------------------|----------------------|-----------------------|-----------------------|-----------------|
| 1           | Morocco_Jews_Behar      | N_Italian_Dodecad    | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 3.14            |
| 2           | Cochin_Jews_Behar       | Portuguese_Dodecad   | Turkish_Dodecad       | Kashmiri_Pandit_Reich | 3.15            |
| 3           | Ashkenazy_Jews_Behar    | Burusho_HGDP         | C_Italian_Dodecad     | Vaish_Reich           | 3.17            |
| 4           | Ashkenazy_Jews_Behar    | Burusho_HGDP         | Sicilian_Dodecad      | Vaish_Reich           | 3.24            |
| 5           | Ashkenazy_Jews_Behar    | C_Italian_Dodecad    | Kashmiri_Pandit_Reich | Vaish_Reich           | 3.31            |
| 6           | Ashkenazi_Dodecad       | Burusho_HGDP         | C_Italian_Dodecad     | Vaish_Reich           | 3.32            |
| 7           | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad   | Turks_Behar           | Vaish_Reich           | 3.43            |
| 8           | Burusho_HGDP            | Cochin_Jews_Behar    | Greek_Dodecad         | Tuscan_Xing           | 3.43            |
| 9           | Burusho_HGDP            | Morocco_Jews_Behar   | N_Italian_Dodecad     | Kashmiri_Pandit_Reich | 3.43            |
| 10          | Burusho_HGDP            | Sephardic_Jews_Behar | Tuscan_Xing           | Vaish_Reich           | 3.44            |
| 11          | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad   | Turkish_Dodecad       | Vaish_Reich           | 3.44            |
| 12          | Burusho_HGDP            | Sicilian_Dodecad     | TSI_HapMap            | Srivastava_Reich      | 3.44            |
| 13          | Burusho_HGDP            | Sicilian_Dodecad     | Tuscan_Xing           | Srivastava_Reich      | 3.44            |
| 14          | Ashkenazy_Jews_Behar    | Burusho_HGDP         | Greek_Dodecad         | Vaish_Reich           | 3.46            |
| 15          | Morocco_Jews_Behar      | North_Kannadi_Behar  | Romanians_14_Behar    | Stalskoe_Xing         | 3.47            |
| 16          | Burusho_HGDP            | Cochin_Jews_Behar    | Portuguese_Dodecad    | Turkish_Dodecad       | 3.48            |
| 17          | Cochin_Jews_Behar       | Pathan_HGDP          | Portuguese_Dodecad    | Turkish_Dodecad       | 3.48            |
| 18          | Burusho_HGDP            | Sicilian_Dodecad     | Tuscan_Xing           | Vaish_Reich           | 3.49            |
| 19          | Ashkenazi_Dodecad       | C_Italian_Dodecad    | Kashmiri_Pandit_Reich | Vaish_Reich           | 3.50            |
| 20          | Burusho_HGDP            | S_Italian_Dodecad    | Tuscan_Xing           | Srivastava_Reich      | 3.51            |

***Heredia Munoz -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Makrani_HGDP        | Portuguese_Dodecad  | Tuscan_Henn         | Satnami_Reich       | 2.52            |
| 2           | Makrani_HGDP        | Portuguese_Dodecad  | TSI_HapMap          | Satnami_Reich       | 2.54            |
| 3           | Makrani_HGDP        | Portuguese_Dodecad  | Tuscan_Xing         | Satnami_Reich       | 2.66            |
| 4           | Makrani_HGDP        | Portuguese_Dodecad  | Tuscan_Henn         | Tharu_Reich         | 2.73            |
| 5           | Makrani_HGDP        | Portuguese_Dodecad  | Tuscan_Xing         | Tharu_Reich         | 2.84            |
| 6           | French_Basque_HGDP  | Makrani_HGDP        | Morocco_Jews_Behar  | Satnami_Reich       | 2.84            |
| 7           | Makrani_HGDP        | Portuguese_Dodecad  | TSI_HapMap          | Tharu_Reich         | 2.93            |
| 8           | Makrani_HGDP        | O_Italian_Dodecad   | Portuguese_Dodecad  | Satnami_Reich       | 2.96            |
| 9           | Brahui_HGDP         | Portuguese_Dodecad  | Tuscan_Henn         | Tharu_Reich         | 3.01            |
| 10          | Brahui_HGDP         | French_Basque_HGDP  | Morocco_Jews_Behar  | Satnami_Reich       | 3.03            |
| 11          | Balochi_HGDP        | French_Basque_HGDP  | Morocco_Jews_Behar  | Satnami_Reich       | 3.05            |
| 12          | Brahui_HGDP         | Portuguese_Dodecad  | TSI_HapMap          | Satnami_Reich       | 3.05            |
| 13          | Brahui_HGDP         | Portuguese_Dodecad  | Tuscan_Henn         | Satnami_Reich       | 3.05            |
| 14          | Balochi_HGDP        | Portuguese_Dodecad  | Tuscan_Henn         | Tharu_Reich         | 3.10            |
| 15          | IBS_1000Genomes     | Makrani_HGDP        | Tuscan_Henn         | Satnami_Reich       | 3.11            |
| 16          | Brahui_HGDP         | Portuguese_Dodecad  | Tuscan_Xing         | Tharu_Reich         | 3.12            |
| 17          | Makrani_HGDP        | Portuguese_Dodecad  | TSI_HapMap          | Sahariya_Reich      | 3.13            |
| 18          | Makrani_HGDP        | O_Italian_Dodecad   | Portuguese_Dodecad  | Tharu_Reich         | 3.13            |
| 19          | Morocco_Jews_Behar  | North_Kannadi_Behar | Portuguese_Dodecad  | Stalskoe_Xing       | 3.14            |
| 20          | Burusho_HGDP        | Morocco_Jews_Behar  | Spanish_Dodecad     | Vaish_Reich         | 3.15            |

***Hernandez Borja -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | German_Dodecad      | Lebanese_Behar      | Sardinian_HGDP      | Bhil_Reich          | 1.62            |
| 2           | German_Dodecad      | Lebanese_Behar      | Sardinian_HGDP      | AP_Mala_Xing        | 1.63            |
| 3           | German_Dodecad      | Lebanese_Behar      | Sardinian_HGDP      | Chenchu_Reich       | 1.66            |
| 4           | German_Dodecad      | Samaritians_Behar   | Sardinian_HGDP      | Chenchu_Reich       | 1.72            |
| 5           | German_Dodecad      | Palestinian_HGDP    | Sardinian_HGDP      | Bhil_Reich          | 1.84            |
| 6           | Lebanese_Behar      | Orkney_1000 Genomes | Sardinian_HGDP      | Bhil_Reich          | 1.84            |
| 7           | Lebanese_Behar      | Orcadian_HGDP       | Sardinian_HGDP      | Bhil_Reich          | 1.87            |
| 8           | Lebanese_Behar      | Sardinian_HGDP      | Argyll_1000 Genomes | Bhil_Reich          | 1.87            |
| 9           | Lebanese_Behar      | Orkney_1000 Genomes | Sardinian_HGDP      | AP_Madiga_Xing      | 1.88            |
| 10          | German_Dodecad      | Lebanese_Behar      | Sardinian_HGDP      | Mala_Reich          | 1.89            |
| 11          | Lebanese_Behar      | Orcadian_HGDP       | Sardinian_HGDP      | AP_Madiga_Xing      | 1.90            |
| 12          | German_Dodecad      | Lebanese_Behar      | Sardinian_HGDP      | Madiga_Reich        | 1.91            |
| 13          | German_Dodecad      | Palestinian_HGDP    | Sardinian_HGDP      | Chenchu_Reich       | 1.91            |
| 14          | German_Dodecad      | Palestinian_HGDP    | Sardinian_HGDP      | AP_Mala_Xing        | 1.93            |
| 15          | Lebanese_Behar      | Sardinian_HGDP      | Argyll_1000 Genomes | AP_Madiga_Xing      | 1.99            |
| 16          | Lebanese_Behar      | Sardinian_HGDP      | Argyll_1000 Genomes | Chenchu_Reich       | 2.03            |
| 17          | German_Dodecad      | Lebanese_Behar      | Sardinian_HGDP      | AP_Madiga_Xing      | 2.07            |
| 18          | German_Dodecad      | Jordanians_19_Behar | Sardinian_HGDP      | Chenchu_Reich       | 2.07            |
| 19          | Lebanese_Behar      | Orcadian_HGDP       | Sardinian_HGDP      | Chenchu_Reich       | 2.07            |
| 20          | Lebanese_Behar      | Orkney_1000 Genomes | Sardinian_HGDP      | Chenchu_Reich       | 2.09            |

***Hernandez Gorretta -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>      | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|--------------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Cochin_Jews_Behar        | Makrani_HGDP        | Portuguese_Dodecad  | Portuguese_Dodecad  | 2.64            |
| 2           | C_Italian_Dodecad        | Morocco_Jews_Behar  | North_Kannadi_Behar | N._European_Xing    | 2.78            |
| 3           | C_Italian_Dodecad        | Morocco_Jews_Behar  | North_Kannadi_Behar | Argyll_1000 Genomes | 2.80            |
| 4           | Iranian_Dodecad          | Portuguese_Dodecad  | Portuguese_Dodecad  | Bhil_Reich          | 2.87            |
| 5           | C_Italian_Dodecad        | Morocco_Jews_Behar  | North_Kannadi_Behar | Orkney_1000 Genomes | 2.90            |
| 6           | C_Italian_Dodecad        | Morocco_Jews_Behar  | North_Kannadi_Behar | Orcadian_HGDP       | 2.91            |
| 7           | Iranians_Behar           | Portuguese_Dodecad  | Portuguese_Dodecad  | Bhil_Reich          | 2.92            |
| 8           | Greek_Dodecad            | Kent_1000 Genomes   | Morocco_Jews_Behar  | North_Kannadi_Behar | 2.92            |
| 9           | Brahui_HGDP              | Cochin_Jews_Behar   | Portuguese_Dodecad  | Portuguese_Dodecad  | 2.93            |
| 10          | Balochi_HGDP             | Cochin_Jews_Behar   | Portuguese_Dodecad  | Portuguese_Dodecad  | 2.93            |
| 11          | British_Isles_Dodecad    | Greek_Dodecad       | Morocco_Jews_Behar  | North_Kannadi_Behar | 2.94            |
| 12          | Dutch_Dodecad            | Greek_Dodecad       | Morocco_Jews_Behar  | North_Kannadi_Behar | 2.94            |
| 13          | British_Dodecad          | Greek_Dodecad       | Morocco_Jews_Behar  | North_Kannadi_Behar | 2.95            |
| 14          | C_Italian_Dodecad        | CEU_HapMap          | Morocco_Jews_Behar  | North_Kannadi_Behar | 2.96            |
| 15          | Iranian_Dodecad          | Portuguese_Dodecad  | Portuguese_Dodecad  | AP_Madiga_Xing      | 2.98            |
| 16          | Sardinian_HGDP           | Kurd_Xing           | N._European_Xing    | Mala_Reich          | 3.02            |
| 17          | Morocco_Jews_Behar       | North_Kannadi_Behar | O_Italian_Dodecad   | N._European_Xing    | 3.03            |
| 18          | Cornwall_1000<br>Genomes | Greek_Dodecad       | Morocco_Jews_Behar  | North_Kannadi_Behar | 3.05            |
| 19          | Iranians_Behar           | Portuguese_Dodecad  | Portuguese_Dodecad  | Chenchu_Reich       | 3.07            |
| 20          | CEU_HapMap               | Morocco_Jews_Behar  | North_Kannadi_Behar | O_Italian_Dodecad   | 3.07            |

***Hernandez Heredia -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Georgia_Jews_Behar  | Polish_Dodecad      | Sardinian_HGDP      | Naidu_Reich         | 1.79            |
| 2           | Georgia_Jews_Behar  | Mixed_Slav_Dodecad  | Sardinian_HGDP      | Naidu_Reich         | 1.83            |
| 3           | IBS_1000Genomes     | Mixed_Slav_Dodecad  | Samaritians_Behar   | Naidu_Reich         | 2.06            |
| 4           | Mixed_Slav_Dodecad  | Samaritians_Behar   | Spaniards_Behar     | Naidu_Reich         | 2.14            |
| 5           | North_Italian_HGDP  | Polish_Dodecad      | Samaritians_Behar   | Naidu_Reich         | 2.15            |
| 6           | Iraq_Jews_Behar     | Polish_Dodecad      | Sardinian_HGDP      | Naidu_Reich         | 2.16            |
| 7           | Mixed_Slav_Dodecad  | Samaritians_Behar   | Spanish_Dodecad     | Naidu_Reich         | 2.19            |
| 8           | Iraq_Jews_Behar     | Polish_Dodecad      | Sardinian_HGDP      | Lodi_Reich          | 2.20            |
| 9           | Georgia_Jews_Behar  | Polish_Dodecad      | Sardinian_HGDP      | Hallaki_Reich       | 2.30            |
| 10          | Iranian_Jews_Behar  | Polish_Dodecad      | Sardinian_HGDP      | Naidu_Reich         | 2.33            |
| 11          | Georgia_Jews_Behar  | INS_SGVP            | Polish_Dodecad      | Sardinian_HGDP      | 2.33            |
| 12          | Polish_Dodecad      | Samaritians_Behar   | Spanish_Dodecad     | Velama_Reich        | 2.33            |
| 13          | Mixed_Slav_Dodecad  | North_Italian_HGDP  | Samaritians_Behar   | Naidu_Reich         | 2.35            |
| 14          | IBS_1000Genomes     | Polish_Dodecad      | Samaritians_Behar   | Velama_Reich        | 2.35            |
| 15          | Mixed_Slav_Dodecad  | Samaritians_Behar   | Spanish_Dodecad     | Velama_Reich        | 2.36            |
| 16          | Iraq_Jews_Behar     | Mixed_Slav_Dodecad  | Sardinian_HGDP      | Naidu_Reich         | 2.37            |
| 17          | Iraq_Jews_Behar     | Mixed_Slav_Dodecad  | Sardinian_HGDP      | Lodi_Reich          | 2.38            |
| 18          | Balkans_Dodecad     | Spanish_Dodecad     | Syrians_Behar       | Lodi_Reich          | 2.39            |
| 19          | Hungarians_Behar    | Jordanians_19_Behar | N_Italian_Dodecad   | Hallaki_Reich       | 2.39            |
| 20          | Balkans_Dodecad     | French_Dodecad      | Samaritians_Behar   | AP_Madiga_Xing      | 2.40            |

***Hernandez Jimenez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Georgia_Jews_Behar  | Polish_Dodecad      | Sardinian_HGDP      | Naidu_Reich         | 1.79            |
| 2           | Georgia_Jews_Behar  | Mixed_Slav_Dodecad  | Sardinian_HGDP      | Naidu_Reich         | 1.83            |
| 3           | IBS_1000Genomes     | Mixed_Slav_Dodecad  | Samaritians_Behar   | Naidu_Reich         | 2.06            |
| 4           | Mixed_Slav_Dodecad  | Samaritians_Behar   | Spaniards_Behar     | Naidu_Reich         | 2.14            |
| 5           | North_Italian_HGDP  | Polish_Dodecad      | Samaritians_Behar   | Naidu_Reich         | 2.15            |
| 6           | Iraq_Jews_Behar     | Polish_Dodecad      | Sardinian_HGDP      | Naidu_Reich         | 2.16            |
| 7           | Mixed_Slav_Dodecad  | Samaritians_Behar   | Spanish_Dodecad     | Naidu_Reich         | 2.19            |
| 8           | Iraq_Jews_Behar     | Polish_Dodecad      | Sardinian_HGDP      | Lodi_Reich          | 2.20            |
| 9           | Georgia_Jews_Behar  | Polish_Dodecad      | Sardinian_HGDP      | Hallaki_Reich       | 2.30            |
| 10          | Iranian_Jews_Behar  | Polish_Dodecad      | Sardinian_HGDP      | Naidu_Reich         | 2.33            |
| 11          | Georgia_Jews_Behar  | INS_SGVP            | Polish_Dodecad      | Sardinian_HGDP      | 2.33            |
| 12          | Polish_Dodecad      | Samaritians_Behar   | Spanish_Dodecad     | Velama_Reich        | 2.33            |
| 13          | Mixed_Slav_Dodecad  | North_Italian_HGDP  | Samaritians_Behar   | Naidu_Reich         | 2.35            |
| 14          | IBS_1000Genomes     | Polish_Dodecad      | Samaritians_Behar   | Velama_Reich        | 2.35            |
| 15          | Mixed_Slav_Dodecad  | Samaritians_Behar   | Spanish_Dodecad     | Velama_Reich        | 2.36            |
| 16          | Iraq_Jews_Behar     | Mixed_Slav_Dodecad  | Sardinian_HGDP      | Naidu_Reich         | 2.37            |
| 17          | Iraq_Jews_Behar     | Mixed_Slav_Dodecad  | Sardinian_HGDP      | Lodi_Reich          | 2.38            |
| 18          | Balkans_Dodecad     | Spanish_Dodecad     | Syrians_Behar       | Lodi_Reich          | 2.39            |
| 19          | Hungarians_Behar    | Jordanians_19_Behar | N_Italian_Dodecad   | Hallaki_Reich       | 2.39            |
| 20          | Balkans_Dodecad     | French_Dodecad      | Samaritians_Behar   | AP_Madiga_Xing      | 2.40            |

***Jimenez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b>   | <b>Distance</b> |
|-------------|-------------------------|---------------------|---------------------|-----------------------|-----------------|
| 1           | Bnei_Menashe_Jews_Behar | Burusho_HGDP        | Morocco_Jews_Behar  | Slovenian_Xing        | 2.32            |
| 2           | Kurd_Dodecad            | Morocco_Jews_Behar  | Slovenian_Xing      | Chenchu_Reich         | 2.44            |
| 3           | Ashkenazy_Jews_Behar    | Kurd_Xing           | Slovenian_Xing      | Madiga_Reich          | 2.75            |
| 4           | Ashkenazi_Dodecad       | Kurd_Dodecad        | Slovenian_Xing      | Chenchu_Reich         | 2.76            |
| 5           | Bnei_Menashe_Jews_Behar | Burusho_HGDP        | Hungarians_Behar    | Morocco_Jews_Behar    | 2.78            |
| 6           | Ashkenazy_Jews_Behar    | Kurd_Dodecad        | Slovenian_Xing      | Chenchu_Reich         | 2.79            |
| 7           | Ashkenazy_Jews_Behar    | Kurd_Dodecad        | Slovenian_Xing      | Madiga_Reich          | 2.79            |
| 8           | Ashkenazy_Jews_Behar    | Kurd_Xing           | Slovenian_Xing      | Chenchu_Reich         | 2.80            |
| 9           | Kurd_Dodecad            | Morocco_Jews_Behar  | Slovenian_Xing      | Madiga_Reich          | 2.82            |
| 10          | Morocco_Jews_Behar      | Slovenian_Xing      | Stalskoe_Xing       | TN_Dalit_Xing         | 2.83            |
| 11          | Ashkenazi_Dodecad       | Kurd_Dodecad        | Slovenian_Xing      | Madiga_Reich          | 2.84            |
| 12          | Morocco_Jews_Behar      | Kurd_Xing           | Slovenian_Xing      | Chenchu_Reich         | 2.85            |
| 13          | Bnei_Menashe_Jews_Behar | Morocco_Jews_Behar  | Slovenian_Xing      | Kashmiri_Pandit_Reich | 2.86            |
| 14          | Ashkenazy_Jews_Behar    | Kurd_Dodecad        | AP_Mala_Xing        | Slovenian_Xing        | 2.88            |
| 15          | Ashkenazi_Dodecad       | Kurd_Xing           | Slovenian_Xing      | Chenchu_Reich         | 2.89            |
| 16          | Ashkenazy_Jews_Behar    | Kurd_Dodecad        | Slovenian_Xing      | Mala_Reich            | 2.90            |
| 17          | Ashkenazi_Dodecad       | Kurd_Xing           | Slovenian_Xing      | Madiga_Reich          | 2.91            |
| 18          | Hungarians_Behar        | Morocco_Jews_Behar  | Stalskoe_Xing       | TN_Dalit_Xing         | 2.91            |
| 19          | Ashkenazy_Jews_Behar    | Kurd_Dodecad        | Slovenian_Xing      | Kurumba_Reich         | 2.92            |
| 20          | Morocco_Jews_Behar      | Slovenian_Xing      | Stalskoe_Xing       | Mala_Reich            | 2.95            |

***Jimenez Escudero -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b> | <b>Population 3</b>        | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|---------------------|----------------------------|---------------------|-----------------|
| 1           | Druze_HGDP           | Portuguese_Dodecad  | Slovenian_Xing             | Hallaki_Reich       | 1.70            |
| 2           | Greek_Dodecad        | Morocco_Jews_Behar  | N._European_Xing           | Hallaki_Reich       | 1.75            |
| 3           | Druze_HGDP           | INS_SGVP            | Portuguese_Dodecad         | Slovenian_Xing      | 1.85            |
| 4           | Greek_Dodecad        | Morocco_Jews_Behar  | Argyll_1000 Genomes        | Hallaki_Reich       | 1.87            |
| 5           | Greek_Dodecad        | Morocco_Jews_Behar  | Orkney_1000 Genomes        | Hallaki_Reich       | 1.90            |
| 6           | Druze_HGDP           | Portuguese_Dodecad  | Slovenian_Xing             | Naidu_Reich         | 1.91            |
| 7           | Ashkenazi_Dodecad    | German_Dodecad      | Sicilian_Dodecad           | Vysya_Reich         | 1.92            |
| 8           | Ashkenazy_Jews_Behar | German_Dodecad      | Sicilian_Dodecad           | Vysya_Reich         | 1.93            |
| 9           | Druze_HGDP           | Portuguese_Dodecad  | Slovenian_Xing             | Vysya_Reich         | 1.95            |
| 10          | Druze_HGDP           | IBS_1000Genomes     | Slovenian_Xing             | Hallaki_Reich       | 1.96            |
| 11          | C_Italian_Dodecad    | German_Dodecad      | Morocco_Jews_Behar         | Vysya_Reich         | 1.97            |
| 12          | Ashkenazy_Jews_Behar | Sicilian_Dodecad    | N._European_Xing           | Vysya_Reich         | 1.97            |
| 13          | Greek_Dodecad        | Morocco_Jews_Behar  | Orcadian_HGDP              | Hallaki_Reich       | 1.97            |
| 14          | Greek_Dodecad        | Morocco_Jews_Behar  | Orkney_1000 Genomes        | Vysya_Reich         | 1.98            |
| 15          | Ashkenazi_Dodecad    | German_Dodecad      | Sicilian_Dodecad           | Hallaki_Reich       | 1.99            |
| 16          | Greek_Dodecad        | Morocco_Jews_Behar  | Argyll_1000 Genomes        | Naidu_Reich         | 1.99            |
| 17          | Ashkenazy_Jews_Behar | German_Dodecad      | S_Italian_Dodecad          | Vysya_Reich         | 2.01            |
| 18          | Ashkenazi_Dodecad    | German_Dodecad      | S_Italian_Sicilian_Dodecad | Vysya_Reich         | 2.02            |
| 19          | Ashkenazy_Jews_Behar | Sicilian_Dodecad    | N._European_Xing           | Hallaki_Reich       | 2.02            |
| 20          | Greek_Dodecad        | Morocco_Jews_Behar  | Argyll_1000 Genomes        | Vysya_Reich         | 2.02            |

***Jimenez Jimenez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b> | <b>Population 3</b>  | <b>Population 4</b>  | <b>Distance</b> |
|-------------|----------------------|---------------------|----------------------|----------------------|-----------------|
| 1           | Ashkenazi_Dodecad    | German_Dodecad      | Sephardic_Jews_Behar | Vysya_Reich          | 1.50            |
| 2           | German_Dodecad       | Morocco_Jews_Behar  | Sephardic_Jews_Behar | Lodi_Reich           | 1.57            |
| 3           | Ashkenazy_Jews_Behar | German_Dodecad      | Sephardic_Jews_Behar | Vysya_Reich          | 1.60            |
| 4           | Portuguese_Dodecad   | Samaritians_Behar   | Slovenian_Xing       | Velama_Reich         | 1.63            |
| 5           | Ashkenazi_Dodecad    | German_Dodecad      | Sephardic_Jews_Behar | Hallaki_Reich        | 1.65            |
| 6           | German_Dodecad       | INS_SGVP            | Morocco_Jews_Behar   | Sephardic_Jews_Behar | 1.75            |
| 7           | Ashkenazy_Jews_Behar | German_Dodecad      | Sephardic_Jews_Behar | Hallaki_Reich        | 1.79            |
| 8           | Ashkenazi_Dodecad    | Morocco_Jews_Behar  | Slovenian_Xing       | Naidu_Reich          | 1.81            |
| 9           | Ashkenazy_Jews_Behar | German_Dodecad      | Sephardic_Jews_Behar | Velama_Reich         | 1.86            |
| 10          | Ashkenazy_Jews_Behar | Morocco_Jews_Behar  | Slovenian_Xing       | Naidu_Reich          | 1.95            |
| 11          | Ashkenazi_Dodecad    | Morocco_Jews_Behar  | Slovenian_Xing       | Hallaki_Reich        | 1.98            |
| 12          | German_Dodecad       | Morocco_Jews_Behar  | Sephardic_Jews_Behar | Hallaki_Reich        | 2.01            |
| 13          | Ashkenazi_Dodecad    | German_Dodecad      | Sephardic_Jews_Behar | Velama_Reich         | 2.03            |
| 14          | Ashkenazy_Jews_Behar | German_Dodecad      | Sephardic_Jews_Behar | Naidu_Reich          | 2.03            |
| 15          | Ashkenazi_Dodecad    | German_Dodecad      | INS_SGVP             | Sephardic_Jews_Behar | 2.04            |
| 16          | Ashkenazi_Dodecad    | German_Dodecad      | Sephardic_Jews_Behar | Naidu_Reich          | 2.04            |
| 17          | German_Dodecad       | Lebanese_Behar      | Tuscan_HGDP          | Hallaki_Reich        | 2.04            |
| 18          | Ashkenazi_Dodecad    | Ashkenazi_Dodecad   | Slovenian_Xing       | Naidu_Reich          | 2.05            |
| 19          | Lebanese_Behar       | Portuguese_Dodecad  | Slovenian_Xing       | Velama_Reich         | 2.06            |
| 20          | German_Dodecad       | Morocco_Jews_Behar  | Sephardic_Jews_Behar | Tharu_Reich          | 2.06            |

***Jimenez Jimenez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>   | <b>Population 2</b>    | <b>Population 3</b>   | <b>Population 4</b> | <b>Distance</b> |
|-------------|-----------------------|------------------------|-----------------------|---------------------|-----------------|
| 1           | Cypriots_Behar        | Morocco_Jews_Behar     | Swedish_Dodecad       | Chenchu_Reich       | 2.42            |
| 2           | Cypriots_Behar        | Morocco_Jews_Behar     | Swedish_Dodecad       | Kurumba_Reich       | 2.69            |
| 3           | Cypriots_Behar        | Morocco_Jews_Behar     | Swedish_Dodecad       | Satnami_Reich       | 2.71            |
| 4           | Cypriots_Behar        | Morocco_Jews_Behar     | Swedish_Dodecad       | AP_Mala_Xing        | 2.74            |
| 5           | Cypriots_Behar        | Morocco_Jews_Behar     | Norwegian_Dodecad     | Chenchu_Reich       | 2.79            |
| 6           | Greek_Dodecad         | Mixed_Germanic_Dodecad | Palestinian_HGDP      | Chenchu_Reich       | 2.85            |
| 7           | Ashkenazy_Jews_Behar  | French_Dodecad         | Uzbekistan_Jews_Behar | Satnami_Reich       | 2.86            |
| 8           | British_Isles_Dodecad | Greek_Dodecad          | Lebanese_Behar        | Chenchu_Reich       | 2.87            |
| 9           | British_Dodecad       | Greek_Dodecad          | Lebanese_Behar        | Chenchu_Reich       | 2.88            |
| 10          | Druze_HGDP            | Sicilian_Dodecad       | Swedish_Dodecad       | Chenchu_Reich       | 2.89            |
| 11          | Cypriots_Behar        | Morocco_Jews_Behar     | Norwegian_Dodecad     | Kurumba_Reich       | 2.90            |
| 12          | Cypriots_Behar        | Morocco_Jews_Behar     | Swedish_Dodecad       | Santhal_Reich       | 2.90            |
| 13          | C_Italian_Dodecad     | Georgia_Jews_Behar     | N._European_Xing      | Satnami_Reich       | 2.91            |
| 14          | Greek_Dodecad         | Kent_1000 Genomes      | Palestinian_HGDP      | Chenchu_Reich       | 2.91            |
| 15          | Cornwall_1000 Genomes | Greek_Dodecad          | Lebanese_Behar        | Chenchu_Reich       | 2.91            |
| 16          | Dutch_Dodecad         | Greek_Dodecad          | Palestinian_HGDP      | Chenchu_Reich       | 2.93            |
| 17          | Greek_Dodecad         | Kent_1000 Genomes      | Lebanese_Behar        | Chenchu_Reich       | 2.93            |
| 18          | Samaritians_Behar     | Sicilian_Dodecad       | Swedish_Dodecad       | Chenchu_Reich       | 2.94            |
| 19          | Cypriots_Behar        | Morocco_Jews_Behar     | Norwegian_Dodecad     | Satnami_Reich       | 2.94            |
| 20          | British_Isles_Dodecad | Greek_Dodecad          | Palestinian_HGDP      | Chenchu_Reich       | 2.96            |

***Luque Cortes -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Portuguese_Dodecad  | Portuguese_Dodecad  | Turks_Behar         | Lodi_Reich          | 2.10            |
| 2           | Portuguese_Dodecad  | Portuguese_Dodecad  | Turks_Behar         | Tharu_Reich         | 2.28            |
| 3           | Portuguese_Dodecad  | Portuguese_Dodecad  | Turkish_Dodecad     | Lodi_Reich          | 2.30            |
| 4           | Portuguese_Dodecad  | Sardinian_HGDP      | Urkarah_Xing        | Satnami_Reich       | 2.38            |
| 5           | Portuguese_Dodecad  | Portuguese_Dodecad  | Kurd_Xing           | Tharu_Reich         | 2.49            |
| 6           | IBS_1000Genomes     | Kurd_Dodecad        | Portuguese_Dodecad  | Tharu_Reich         | 2.51            |
| 7           | IBS_1000Genomes     | Portuguese_Dodecad  | Kurd_Xing           | Tharu_Reich         | 2.51            |
| 8           | Portuguese_Dodecad  | Portuguese_Dodecad  | Turkish_Dodecad     | Tharu_Reich         | 2.54            |
| 9           | IBS_1000Genomes     | Portuguese_Dodecad  | Turks_Behar         | Lodi_Reich          | 2.60            |
| 10          | Portuguese_Dodecad  | Spanish_Dodecad     | Kurd_Xing           | Tharu_Reich         | 2.60            |
| 11          | Kurd_Dodecad        | Portuguese_Dodecad  | Spanish_Dodecad     | Tharu_Reich         | 2.62            |
| 12          | Portuguese_Dodecad  | Spanish_Dodecad     | Turks_Behar         | Lodi_Reich          | 2.63            |
| 13          | Iranian_Dodecad     | Portuguese_Dodecad  | Spanish_Dodecad     | Tharu_Reich         | 2.64            |
| 14          | Portuguese_Dodecad  | Spaniards_Behar     | Kurd_Xing           | Tharu_Reich         | 2.64            |
| 15          | Kurd_Dodecad        | Portuguese_Dodecad  | Portuguese_Dodecad  | Tharu_Reich         | 2.66            |
| 16          | Portuguese_Dodecad  | Spaniards_Behar     | Turks_Behar         | Lodi_Reich          | 2.69            |
| 17          | INS_SGVP            | Portuguese_Dodecad  | Portuguese_Dodecad  | Turkish_Dodecad     | 2.72            |
| 18          | IBS_1000Genomes     | Iranian_Dodecad     | Portuguese_Dodecad  | Tharu_Reich         | 2.73            |
| 19          | Portuguese_Dodecad  | Portuguese_Dodecad  | Turks_Behar         | Satnami_Reich       | 2.74            |
| 20          | Armenian_Dodecad    | Portuguese_Dodecad  | Portuguese_Dodecad  | Satnami_Reich       | 2.75            |

***Manzana Manzana -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b>        | <b>Population 3</b>        | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|----------------------------|----------------------------|---------------------|-----------------|
| 1           | Hungarians_Behar    | Morocco_Jews_Behar         | Morocco_Jews_Behar         | Satnami_Reich       | 3.00            |
| 2           | Morocco_Jews_Behar  | Sicilian_Dodecad           | Slovenian_Xing             | Satnami_Reich       | 3.05            |
| 3           | Morocco_Jews_Behar  | Sephardic_Jews_Behar       | Slovenian_Xing             | Satnami_Reich       | 3.15            |
| 4           | Georgia_Jews_Behar  | Portuguese_Dodecad         | Romanians_14_Behar         | Satnami_Reich       | 3.22            |
| 5           | Hungarians_Behar    | Morocco_Jews_Behar         | Sephardic_Jews_Behar       | Satnami_Reich       | 3.25            |
| 6           | Hungarians_Behar    | Morocco_Jews_Behar         | S_Italian_Sicilian_Dodecad | Satnami_Reich       | 3.25            |
| 7           | Hungarians_Behar    | Morocco_Jews_Behar         | Sicilian_Dodecad           | Satnami_Reich       | 3.30            |
| 8           | Balkans_Dodecad     | Druze_HGDP                 | Portuguese_Dodecad         | Satnami_Reich       | 3.31            |
| 9           | Morocco_Jews_Behar  | Sicilian_Dodecad           | Slovenian_Xing             | Sahariya_Reich      | 3.31            |
| 10          | Morocco_Jews_Behar  | Romanians_14_Behar         | Tuscan_Xing                | Satnami_Reich       | 3.34            |
| 11          | Balkans_Dodecad     | Georgia_Jews_Behar         | Portuguese_Dodecad         | Satnami_Reich       | 3.35            |
| 12          | Morocco_Jews_Behar  | S_Italian_Dodecad          | Slovenian_Xing             | Satnami_Reich       | 3.35            |
| 13          | Georgia_Jews_Behar  | Portuguese_Dodecad         | Romanians_14_Behar         | Sahariya_Reich      | 3.36            |
| 14          | Morocco_Jews_Behar  | S_Italian_Sicilian_Dodecad | Slovenian_Xing             | Satnami_Reich       | 3.37            |
| 15          | Hungarians_Behar    | Morocco_Jews_Behar         | Morocco_Jews_Behar         | Sahariya_Reich      | 3.40            |
| 16          | Morocco_Jews_Behar  | Romanians_14_Behar         | Tuscan_Henn                | Satnami_Reich       | 3.43            |
| 17          | Balkans_Dodecad     | Morocco_Jews_Behar         | Tuscan_Xing                | Satnami_Reich       | 3.44            |
| 18          | Morocco_Jews_Behar  | Sephardic_Jews_Behar       | Slovenian_Xing             | Sahariya_Reich      | 3.44            |
| 19          | Hungarians_Behar    | Morocco_Jews_Behar         | S_Italian_Sicilian_Dodecad | Sahariya_Reich      | 3.44            |
| 20          | Balkans_Dodecad     | Iraq_Jews_Behar            | Portuguese_Dodecad         | Satnami_Reich       | 3.45            |

***Montes Borja -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b>  | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|-------------------------|----------------------|---------------------|---------------------|-----------------|
| 1           | Bnei_Menashe_Jews_Behar | Hungarians_Behar     | Morocco_Jews_Behar  | AP_Mala_Xing        | 3.59            |
| 2           | Bnei_Menashe_Jews_Behar | Morocco_Jews_Behar   | Slovenian_Xing      | Kurumba_Reich       | 3.59            |
| 3           | Bnei_Menashe_Jews_Behar | Sephardic_Jews_Behar | Slovenian_Xing      | Chenchu_Reich       | 3.59            |
| 4           | Bnei_Menashe_Jews_Behar | Morocco_Jews_Behar   | Slovenian_Xing      | Chenchu_Reich       | 3.60            |
| 5           | Bnei_Menashe_Jews_Behar | Morocco_Jews_Behar   | Slovenian_Xing      | Mala_Reich          | 3.63            |
| 6           | Bnei_Menashe_Jews_Behar | Hungarians_Behar     | Morocco_Jews_Behar  | Kurumba_Reich       | 3.63            |
| 7           | Bnei_Menashe_Jews_Behar | Hungarians_Behar     | Morocco_Jews_Behar  | Chenchu_Reich       | 3.64            |
| 8           | Bnei_Menashe_Jews_Behar | Morocco_Jews_Behar   | AP_Mala_Xing        | Slovenian_Xing      | 3.64            |
| 9           | Morocco_Jews_Behar      | N_Italian_Dodecad    | Srivastava_Reich    | Srivastava_Reich    | 3.65            |
| 10          | Bnei_Menashe_Jews_Behar | Sephardic_Jews_Behar | Slovenian_Xing      | Madiga_Reich        | 3.65            |
| 11          | Bnei_Menashe_Jews_Behar | Hungarians_Behar     | Morocco_Jews_Behar  | Kamsali_Reich       | 3.72            |
| 12          | Bnei_Menashe_Jews_Behar | Hungarians_Behar     | Morocco_Jews_Behar  | Mala_Reich          | 3.73            |
| 13          | Bnei_Menashe_Jews_Behar | Hungarians_Behar     | Morocco_Jews_Behar  | Madiga_Reich        | 3.77            |
| 14          | Bnei_Menashe_Jews_Behar | Sephardic_Jews_Behar | AP_Mala_Xing        | Slovenian_Xing      | 3.79            |
| 15          | Bnei_Menashe_Jews_Behar | Morocco_Jews_Behar   | Slovenian_Xing      | Kamsali_Reich       | 3.85            |
| 16          | Bnei_Menashe_Jews_Behar | Sephardic_Jews_Behar | Slovenian_Xing      | Kurumba_Reich       | 3.85            |
| 17          | Bnei_Menashe_Jews_Behar | Hungarians_Behar     | Morocco_Jews_Behar  | Hallaki_Reich       | 3.86            |
| 18          | Bnei_Menashe_Jews_Behar | Hungarians_Behar     | Morocco_Jews_Behar  | Naidu_Reich         | 3.90            |
| 19          | Bnei_Menashe_Jews_Behar | Morocco_Jews_Behar   | Slovenian_Xing      | Bhil_Reich          | 3.90            |
| 20          | Bnei_Menashe_Jews_Behar | Morocco_Jews_Behar   | Slovenian_Xing      | Hallaki_Reich       | 3.93            |

***Manzana Manzana -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b>        | <b>Population 3</b>        | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|----------------------------|----------------------------|---------------------|-----------------|
| 1           | Hungarians_Behar    | Morocco_Jews_Behar         | Morocco_Jews_Behar         | Satnami_Reich       | 3.00            |
| 2           | Morocco_Jews_Behar  | Sicilian_Dodecad           | Slovenian_Xing             | Satnami_Reich       | 3.05            |
| 3           | Morocco_Jews_Behar  | Sephardic_Jews_Behar       | Slovenian_Xing             | Satnami_Reich       | 3.15            |
| 4           | Georgia_Jews_Behar  | Portuguese_Dodecad         | Romanians_14_Behar         | Satnami_Reich       | 3.22            |
| 5           | Hungarians_Behar    | Morocco_Jews_Behar         | Sephardic_Jews_Behar       | Satnami_Reich       | 3.25            |
| 6           | Hungarians_Behar    | Morocco_Jews_Behar         | S_Italian_Sicilian_Dodecad | Satnami_Reich       | 3.25            |
| 7           | Hungarians_Behar    | Morocco_Jews_Behar         | Sicilian_Dodecad           | Satnami_Reich       | 3.30            |
| 8           | Balkans_Dodecad     | Druze_HGDP                 | Portuguese_Dodecad         | Satnami_Reich       | 3.31            |
| 9           | Morocco_Jews_Behar  | Sicilian_Dodecad           | Slovenian_Xing             | Sahariya_Reich      | 3.31            |
| 10          | Morocco_Jews_Behar  | Romanians_14_Behar         | Tuscan_Xing                | Satnami_Reich       | 3.34            |
| 11          | Balkans_Dodecad     | Georgia_Jews_Behar         | Portuguese_Dodecad         | Satnami_Reich       | 3.35            |
| 12          | Morocco_Jews_Behar  | S_Italian_Dodecad          | Slovenian_Xing             | Satnami_Reich       | 3.35            |
| 13          | Georgia_Jews_Behar  | Portuguese_Dodecad         | Romanians_14_Behar         | Sahariya_Reich      | 3.36            |
| 14          | Morocco_Jews_Behar  | S_Italian_Sicilian_Dodecad | Slovenian_Xing             | Satnami_Reich       | 3.37            |
| 15          | Hungarians_Behar    | Morocco_Jews_Behar         | Morocco_Jews_Behar         | Sahariya_Reich      | 3.40            |
| 16          | Morocco_Jews_Behar  | Romanians_14_Behar         | Tuscan_Henn                | Satnami_Reich       | 3.43            |
| 17          | Balkans_Dodecad     | Morocco_Jews_Behar         | Tuscan_Xing                | Satnami_Reich       | 3.44            |
| 18          | Morocco_Jews_Behar  | Sephardic_Jews_Behar       | Slovenian_Xing             | Sahariya_Reich      | 3.44            |
| 19          | Hungarians_Behar    | Morocco_Jews_Behar         | S_Italian_Sicilian_Dodecad | Sahariya_Reich      | 3.44            |
| 20          | Balkans_Dodecad     | Iraq_Jews_Behar            | Portuguese_Dodecad         | Satnami_Reich       | 3.45            |

**Montoya -- Four Population Mode**

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | North_Italian_HGDP  | Syrians_Behar       | Slovenian_Xing      | Chenchu_Reich       | 2.04            |
| 2           | N_Italian_Dodecad   | Syrians_Behar       | Slovenian_Xing      | Chenchu_Reich       | 2.08            |
| 3           | Syrians_Behar       | Tuscan_HGDP         | Slovenian_Xing      | Chenchu_Reich       | 2.08            |
| 4           | French_HGDP         | Romanians_14_Behar  | Syrians_Behar       | Mala_Reich          | 2.09            |
| 5           | French_HGDP         | Romanians_14_Behar  | Syrians_Behar       | Chenchu_Reich       | 2.12            |
| 6           | N_Italian_Dodecad   | Syrians_Behar       | Slovenian_Xing      | Mala_Reich          | 2.13            |
| 7           | French_Dodecad      | Romanians_14_Behar  | Syrians_Behar       | Mala_Reich          | 2.18            |
| 8           | French_HGDP         | Lebanese_Behar      | Romanians_14_Behar  | Mala_Reich          | 2.20            |
| 9           | French_Dodecad      | Romanians_14_Behar  | Syrians_Behar       | Chenchu_Reich       | 2.20            |
| 10          | French_HGDP         | Lebanese_Behar      | Romanians_14_Behar  | AP_Madiga_Xing      | 2.25            |
| 11          | French_Dodecad      | Iranian_Jews_Behar  | Romanians_14_Behar  | AP_Mala_Xing        | 2.26            |
| 12          | French_HGDP         | Lebanese_Behar      | Romanians_14_Behar  | Chenchu_Reich       | 2.27            |
| 13          | French_HGDP         | Lebanese_Behar      | Romanians_14_Behar  | AP_Mala_Xing        | 2.27            |
| 14          | French_HGDP         | Romanians_14_Behar  | Syrians_Behar       | AP_Mala_Xing        | 2.30            |
| 15          | N_Italian_Dodecad   | Syrians_Behar       | AP_Mala_Xing        | Slovenian_Xing      | 2.30            |
| 16          | Hungarians_Behar    | Iranians_Behar      | Sardinian_HGDP      | AP_Mala_Xing        | 2.30            |
| 17          | North_Italian_HGDP  | Syrians_Behar       | Slovenian_Xing      | Mala_Reich          | 2.32            |
| 18          | Iranian_Jews_Behar  | N_Italian_Dodecad   | AP_Mala_Xing        | Slovenian_Xing      | 2.33            |
| 19          | French_Dodecad      | Georgia_Jews_Behar  | Romanians_14_Behar  | Mala_Reich          | 2.34            |
| 20          | Hungarians_Behar    | Iranian_Jews_Behar  | N_Italian_Dodecad   | AP_Mala_Xing        | 2.34            |

**Montoya -- Four Population Mode**

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|-------------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Balochi_HGDP            | German_Dodecad      | Sardinian_HGDP      | Sardinian_HGDP      | 2.49            |
| 2           | Brahui_HGDP             | German_Dodecad      | Sardinian_HGDP      | Sardinian_HGDP      | 2.71            |
| 3           | German_Dodecad          | IBS_1000Genomes     | Makrani_HGDP        | Sardinian_HGDP      | 2.76            |
| 4           | German_Dodecad          | Makrani_HGDP        | Sardinian_HGDP      | Spanish_Dodecad     | 2.78            |
| 5           | Balochi_HGDP            | German_Dodecad      | IBS_1000Genomes     | Sardinian_HGDP      | 2.89            |
| 6           | German_Dodecad          | Makrani_HGDP        | Sardinian_HGDP      | Sardinian_HGDP      | 2.93            |
| 7           | German_Dodecad          | Pathan_HGDP         | Sardinian_HGDP      | Sardinian_HGDP      | 2.93            |
| 8           | Brahui_HGDP             | German_Dodecad      | IBS_1000Genomes     | Sardinian_HGDP      | 2.97            |
| 9           | Balochi_HGDP            | German_Dodecad      | Sardinian_HGDP      | Spanish_Dodecad     | 2.97            |
| 10          | German_Dodecad          | Makrani_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | 3.03            |
| 11          | Brahui_HGDP             | German_Dodecad      | Sardinian_HGDP      | Spanish_Dodecad     | 3.03            |
| 12          | Balochi_HGDP            | German_Dodecad      | Portuguese_Dodecad  | Sardinian_HGDP      | 3.09            |
| 13          | Bnei_Menashe_Jews_Behar | German_Dodecad      | N_Italian_Dodecad   | Sardinian_HGDP      | 3.10            |
| 14          | Bnei_Menashe_Jews_Behar | N_Italian_Dodecad   | Sardinian_HGDP      | N._European_Xing    | 3.12            |
| 15          | Balochi_HGDP            | Sardinian_HGDP      | Spanish_Dodecad     | Slovenian_Xing      | 3.13            |
| 16          | Balochi_HGDP            | Sardinian_HGDP      | Spaniards_Behar     | Slovenian_Xing      | 3.14            |
| 17          | Bnei_Menashe_Jews_Behar | CEU_HapMap          | N_Italian_Dodecad   | Sardinian_HGDP      | 3.16            |
| 18          | Balochi_HGDP            | Sardinian_HGDP      | Sardinian_HGDP      | N._European_Xing    | 3.19            |
| 19          | Brahui_HGDP             | German_Dodecad      | Portuguese_Dodecad  | Sardinian_HGDP      | 3.19            |
| 20          | Bnei_Menashe_Jews_Behar | N_Italian_Dodecad   | Sardinian_HGDP      | Argyll_1000         | 3.19            |

**Montoya Romero -- Four Population Mode**

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|-------------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Kurd_Dodecad            | Portuguese_Dodecad  | Romanians_14_Behar  | Madiga_Reich        | 1.66            |
| 2           | Assyrian_Dodecad        | Hungarians_Behar    | Portuguese_Dodecad  | TN_Dalit_Xing       | 1.75            |
| 3           | Assyrian_Dodecad        | Hungarians_Behar    | Portuguese_Dodecad  | Mala_Reich          | 1.75            |
| 4           | Hungarians_Behar        | Iranian_Dodecad     | Sardinian_HGDP      | Madiga_Reich        | 1.83            |
| 5           | Armenian_Dodecad        | Hungarians_Behar    | Portuguese_Dodecad  | Mala_Reich          | 1.84            |
| 6           | Iranian_Dodecad         | Sardinian_HGDP      | Slovenian_Xing      | Kurumba_Reich       | 1.86            |
| 7           | Armenian_Dodecad        | Hungarians_Behar    | Portuguese_Dodecad  | TN_Dalit_Xing       | 1.87            |
| 8           | Kurd_Dodecad            | Portuguese_Dodecad  | Romanians_14_Behar  | Lodi_Reich          | 1.87            |
| 9           | Kurd_Dodecad            | Portuguese_Dodecad  | Romanians_14_Behar  | Hallaki_Reich       | 1.89            |
| 10          | Iranian_Dodecad         | Sardinian_HGDP      | Slovenian_Xing      | Mala_Reich          | 1.94            |
| 11          | Armenian_Dodecad        | Hungarians_Behar    | Portuguese_Dodecad  | AP_Madiga_Xing      | 1.94            |
| 12          | Iranian_Dodecad         | Sardinian_HGDP      | Slovenian_Xing      | Bhil_Reich          | 1.97            |
| 13          | Balkans_Dodecad         | Kurd_Dodecad        | Portuguese_Dodecad  | Naidu_Reich         | 1.98            |
| 14          | Bnei_Menashe_Jews_Behar | Pathan_HGDP         | Portuguese_Dodecad  | Romanians_14_Behar  | 2.00            |
| 15          | Iranian_Dodecad         | Sardinian_HGDP      | Slovenian_Xing      | Madiga_Reich        | 2.03            |
| 16          | Kurd_Dodecad            | Portuguese_Dodecad  | Romanians_14_Behar  | Bhil_Reich          | 2.04            |
| 17          | Portuguese_Dodecad      | Romanians_14_Behar  | Kurd_Xing           | Madiga_Reich        | 2.04            |
| 18          | Armenian_Dodecad        | Portuguese_Dodecad  | Slovenian_Xing      | Mala_Reich          | 2.06            |
| 19          | Balkans_Dodecad         | Kurd_Dodecad        | Portuguese_Dodecad  | Kamsali_Reich       | 2.06            |
| 20          | Balkans_Dodecad         | Kurd_Dodecad        | Portuguese_Dodecad  | Hallaki_Reich       | 2.07            |

**Montoya Salazar -- Four Population Mode**

| <b>Rank</b> | <b>Population 1</b>        | <b>Population 2</b>   | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------------|-----------------------|---------------------|---------------------|-----------------|
| 1           | Sicilian_Dodecad           | Uzbekistan_Jews_Behar | Slovenian_Xing      | Satnami_Reich       | 3.02            |
| 2           | Assyrian_Dodecad           | Balkans_Dodecad       | Portuguese_Dodecad  | Vysya_Reich         | 3.06            |
| 3           | Assyrian_Dodecad           | Balkans_Dodecad       | Portuguese_Dodecad  | Kurumba_Reich       | 3.06            |
| 4           | Georgia_Jews_Behar         | Sicilian_Dodecad      | Slovenian_Xing      | Satnami_Reich       | 3.09            |
| 5           | Ashkenazy_Jews_Behar       | Ashkenazy_Jews_Behar  | Romanians_14_Behar  | Vysya_Reich         | 3.13            |
| 6           | Ashkenazy_Jews_Behar       | Morocco_Jews_Behar    | Romanians_14_Behar  | Lodi_Reich          | 3.14            |
| 7           | Sicilian_Dodecad           | Uzbekistan_Jews_Behar | Slovenian_Xing      | Tharu_Reich         | 3.15            |
| 8           | S_Italian_Dodecad          | Uzbekistan_Jews_Behar | Slovenian_Xing      | Satnami_Reich       | 3.19            |
| 9           | Assyrian_Dodecad           | Balkans_Dodecad       | Portuguese_Dodecad  | Satnami_Reich       | 3.20            |
| 10          | C_Italian_Dodecad          | Georgia_Jews_Behar    | Hungarians_Behar    | Satnami_Reich       | 3.20            |
| 11          | Ashkenazy_Jews_Behar       | Ashkenazy_Jews_Behar  | Romanians_14_Behar  | Hallaki_Reich       | 3.21            |
| 12          | Assyrian_Dodecad           | Balkans_Dodecad       | Portuguese_Dodecad  | Hallaki_Reich       | 3.22            |
| 13          | C_Italian_Dodecad          | Georgia_Jews_Behar    | Slovenian_Xing      | Satnami_Reich       | 3.22            |
| 14          | Hungarians_Behar           | Morocco_Jews_Behar    | Turkish_Dodecad     | Naidu_Reich         | 3.22            |
| 15          | C_Italian_Dodecad          | Iranian_Jews_Behar    | Slovenian_Xing      | Satnami_Reich       | 3.24            |
| 16          | Assyrian_Dodecad           | Portuguese_Dodecad    | Romanians_14_Behar  | Satnami_Reich       | 3.26            |
| 17          | Assyrian_Dodecad           | Balkans_Dodecad       | Portuguese_Dodecad  | Kamsali_Reich       | 3.27            |
| 18          | Balkans_Dodecad            | Georgia_Jews_Behar    | TSI_HapMap          | Satnami_Reich       | 3.28            |
| 19          | S_Italian_Sicilian_Dodecad | Uzbekistan_Jews_Behar | Slovenian_Xing      | Satnami_Reich       | 3.28            |
| 20          | Hungarians_Behar           | Morocco_Jews_Behar    | Turkish_Dodecad     | AP_Mala_Xing        | 3.28            |

**Montoya Silva -- Four Population Mode**

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b>  | <b>Population 3</b>  | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|----------------------|----------------------|---------------------|-----------------|
| 1           | German_Dodecad      | Morocco_Jews_Behar   | Sephardic_Jews_Behar | Chenchu_Reich       | 2.03            |
| 2           | German_Dodecad      | Morocco_Jews_Behar   | Sephardic_Jews_Behar | Mala_Reich          | 2.14            |
| 3           | Georgia_Jews_Behar  | Sardinian_HGDP       | Slovenian_Xing       | Mala_Reich          | 2.16            |
| 4           | German_Dodecad      | Sephardic_Jews_Behar | Sephardic_Jews_Behar | Chenchu_Reich       | 2.17            |
| 5           | Georgia_Jews_Behar  | Sardinian_HGDP       | Slovenian_Xing       | Chenchu_Reich       | 2.24            |
| 6           | Iranian_Jews_Behar  | Sardinian_HGDP       | Slovenian_Xing       | Chenchu_Reich       | 2.29            |
| 7           | German_Dodecad      | Morocco_Jews_Behar   | Sicilian_Dodecad     | Mala_Reich          | 2.37            |
| 8           | Georgia_Jews_Behar  | Sardinian_HGDP       | AP_Mala_Xing         | Slovenian_Xing      | 2.43            |
| 9           | German_Dodecad      | Morocco_Jews_Behar   | Sephardic_Jews_Behar | AP_Mala_Xing        | 2.44            |
| 10          | Iraq_Jews_Behar     | Sardinian_HGDP       | Slovenian_Xing       | Chenchu_Reich       | 2.46            |
| 11          | Iranian_Jews_Behar  | Sardinian_HGDP       | Slovenian_Xing       | Mala_Reich          | 2.51            |
| 12          | Palestinian_HGDP    | Romanians_14_Behar   | Spaniards_Behar      | Chenchu_Reich       | 2.52            |
| 13          | German_Dodecad      | Morocco_Jews_Behar   | Sicilian_Dodecad     | AP_Madiga_Xing      | 2.52            |
| 14          | Iranian_Jews_Behar  | Sardinian_HGDP       | AP_Mala_Xing         | Slovenian_Xing      | 2.55            |
| 15          | Georgia_Jews_Behar  | Hungarians_Behar     | Sardinian_HGDP       | Madiga_Reich        | 2.55            |
| 16          | Palestinian_HGDP    | Portuguese_Dodecad   | Romanians_14_Behar   | Chenchu_Reich       | 2.56            |
| 17          | Georgia_Jews_Behar  | Sardinian_HGDP       | Slovenian_Xing       | Madiga_Reich        | 2.57            |
| 18          | C_Italian_Dodecad   | Morocco_Jews_Behar   | Slovenian_Xing       | Mala_Reich          | 2.58            |
| 19          | Georgia_Jews_Behar  | Sardinian_HGDP       | Slovenian_Xing       | Kurumba_Reich       | 2.58            |
| 20          | Georgia_Jews_Behar  | Hungarians_Behar     | Sardinian_HGDP       | Chenchu_Reich       | 2.59            |

**Moreno -- Four Population Mode**

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Balkans_Dodecad     | Makrani_HGDP        | Portuguese_Dodecad  | Portuguese_Dodecad  | 3.96            |
| 2           | Hungarians_Behar    | Makrani_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | 4.03            |
| 3           | Makrani_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | Slovenian_Xing      | 4.15            |
| 4           | Makrani_HGDP        | Portuguese_Dodecad  | Portuguese_Dodecad  | Romanians_14_Behar  | 4.19            |
| 5           | Balkans_Dodecad     | Brahui_HGDP         | Portuguese_Dodecad  | Portuguese_Dodecad  | 4.40            |
| 6           | Balkans_Dodecad     | Balochi_HGDP        | Portuguese_Dodecad  | Portuguese_Dodecad  | 4.48            |
| 7           | Brahui_HGDP         | Hungarians_Behar    | Portuguese_Dodecad  | Sardinian_HGDP      | 4.50            |
| 8           | Balochi_HGDP        | Portuguese_Dodecad  | Portuguese_Dodecad  | Romanians_14_Behar  | 4.52            |
| 9           | Brahui_HGDP         | Portuguese_Dodecad  | Portuguese_Dodecad  | Romanians_14_Behar  | 4.52            |
| 10          | Balkans_Dodecad     | Makrani_HGDP        | Portuguese_Dodecad  | Spanish_Dodecad     | 4.57            |
| 11          | Balkans_Dodecad     | IBS_1000Genomes     | Makrani_HGDP        | Portuguese_Dodecad  | 4.58            |
| 12          | Brahui_HGDP         | Portuguese_Dodecad  | Sardinian_HGDP      | Slovenian_Xing      | 4.59            |
| 13          | Balochi_HGDP        | Hungarians_Behar    | Portuguese_Dodecad  | Sardinian_HGDP      | 4.60            |
| 14          | Balochi_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | Slovenian_Xing      | 4.62            |
| 15          | Balkans_Dodecad     | Makrani_HGDP        | Portuguese_Dodecad  | Spaniards_Behar     | 4.80            |
| 16          | Makrani_HGDP        | Portuguese_Dodecad  | Romanians_14_Behar  | Spanish_Dodecad     | 4.84            |
| 17          | IBS_1000Genomes     | Makrani_HGDP        | Portuguese_Dodecad  | Romanians_14_Behar  | 4.91            |
| 18          | Balkans_Dodecad     | Brahui_HGDP         | IBS_1000Genomes     | Portuguese_Dodecad  | 4.98            |
| 19          | Balkans_Dodecad     | Brahui_HGDP         | Portuguese_Dodecad  | Spanish_Dodecad     | 4.99            |
| 20          | Hungarians_Behar    | Makrani_HGDP        | Portuguese_Dodecad  | Portuguese_Dodecad  | 5.05            |

**Moreno Arjona -- Four Population Mode**

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b>   | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|-------------------------|-----------------------|---------------------|---------------------|-----------------|
| 1           | CEU_HapMap              | N_Italian_Dodecad     | Pathan_HGDP         | Morocco_N_Henn      | 3.25            |
| 2           | N_Italian_Dodecad       | Pathan_HGDP           | Morocco_N_Henn      | N._European_Xing    | 3.29            |
| 3           | German_Dodecad          | North_Italian_HGDP    | Pathan_HGDP         | Morocco_N_Henn      | 3.33            |
| 4           | N_Italian_Dodecad       | Orcadian_HGDP         | Pathan_HGDP         | Morocco_N_Henn      | 3.35            |
| 5           | German_Dodecad          | N_Italian_Dodecad     | Pathan_HGDP         | Morocco_N_Henn      | 3.37            |
| 6           | N_Italian_Dodecad       | Orkney_1000 Genomes   | Pathan_HGDP         | Morocco_N_Henn      | 3.39            |
| 7           | N_Italian_Dodecad       | North_African_Dodecad | Orkney_1000 Genomes | Pathan_HGDP         | 3.40            |
| 8           | N_Italian_Dodecad       | Pathan_HGDP           | Argyll_1000 Genomes | Morocco_N_Henn      | 3.40            |
| 9           | N_Italian_Dodecad       | North_African_Dodecad | Orcadian_HGDP       | Pathan_HGDP         | 3.41            |
| 10          | North_African_Dodecad   | Pathan_HGDP           | Swedish_Dodecad     | Tuscan_HGDP         | 3.43            |
| 11          | N_Italian_Dodecad       | North_African_Dodecad | Pathan_HGDP         | Argyll_1000 Genomes | 3.46            |
| 12          | N_Italian_Dodecad       | North_African_Dodecad | Pathan_HGDP         | N._European_Xing    | 3.46            |
| 13          | North_Italian_HGDP      | Pathan_HGDP           | Morocco_N_Henn      | N._European_Xing    | 3.49            |
| 14          | North_African_Dodecad   | Norwegian_Dodecad     | Pathan_HGDP         | Tuscan_HGDP         | 3.51            |
| 15          | German_Dodecad          | Algeria_Henn          | North_Italian_HGDP  | Pathan_HGDP         | 3.52            |
| 16          | CEU_HapMap              | Algeria_Henn          | N_Italian_Dodecad   | Pathan_HGDP         | 3.52            |
| 17          | Bnei_Menashe_Jews_Behar | German_Dodecad        | Morocco_Jews_Behar  | Portuguese_Dodecad  | 3.52            |
| 18          | Balochi_HGDP            | French_Basque_HGDP    | Morocco_N_Henn      | Slovenian_Xing      | 3.52            |
| 19          | Algeria_Henn            | North_Italian_HGDP    | Orcadian_HGDP       | Pathan_HGDP         | 3.53            |
| 20          | Brahui_HGDP             | French_Basque_HGDP    | Morocco_N_Henn      | Slovenian_Xing      | 3.53            |

***Moreno de la Cruz -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Kamsali_Reich       | 2.23            |
| 2           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Kurumba_Reich       | 2.31            |
| 3           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | AP_Mala_Xing        | 2.32            |
| 4           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Mala_Reich          | 2.33            |
| 5           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Naidu_Reich         | 2.39            |
| 6           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Madiga_Reich        | 2.40            |
| 7           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Bhil_Reich          | 2.47            |
| 8           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | TN_Dalit_Xing       | 2.49            |
| 9           | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | AP_Madiga_Xing      | 2.54            |
| 10          | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Hallaki_Reich       | 2.54            |
| 11          | Kurd_Dodecad        | Portuguese_Dodecad  | Romanians_14_Behar  | Kamsali_Reich       | 2.57            |
| 12          | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Vysya_Reich         | 2.58            |
| 13          | Iranians_Behar      | Portuguese_Dodecad  | Romanians_14_Behar  | Chenchu_Reich       | 2.66            |
| 14          | Portuguese_Dodecad  | Romanians_14_Behar  | Kurd_Xing           | Madiga_Reich        | 2.70            |
| 15          | Kurd_Dodecad        | Portuguese_Dodecad  | Romanians_14_Behar  | Vysya_Reich         | 2.70            |
| 16          | Kurd_Dodecad        | Portuguese_Dodecad  | Romanians_14_Behar  | Kurumba_Reich       | 2.71            |
| 17          | IBS_1000Genomes     | Iranians_Behar      | Romanians_14_Behar  | Madiga_Reich        | 2.73            |
| 18          | Portuguese_Dodecad  | Romanians_14_Behar  | Kurd_Xing           | Kamsali_Reich       | 2.76            |
| 19          | Kurd_Dodecad        | Portuguese_Dodecad  | Romanians_14_Behar  | Madiga_Reich        | 2.77            |
| 20          | Kurd_Dodecad        | Portuguese_Dodecad  | Romanians_14_Behar  | Naidu_Reich         | 2.78            |

***Motos Hernandez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Henn         | Hallaki_Reich       | 1.30            |
| 2           | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Henn         | Naidu_Reich         | 1.36            |
| 3           | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Henn         | Lodi_Reich          | 1.43            |
| 4           | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Xing         | Naidu_Reich         | 1.44            |
| 5           | Georgia_Jews_Behar  | Hungarians_Behar    | TSI_HapMap          | Bhil_Reich          | 1.44            |
| 6           | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Henn         | Kamsali_Reich       | 1.47            |
| 7           | Hungarians_Behar    | Iranian_Jews_Behar  | Tuscan_Henn         | Lodi_Reich          | 1.47            |
| 8           | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Xing         | Hallaki_Reich       | 1.50            |
| 9           | Georgia_Jews_Behar  | Hungarians_Behar    | TSI_HapMap          | Hallaki_Reich       | 1.50            |
| 10          | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Xing         | Lodi_Reich          | 1.51            |
| 11          | Georgia_Jews_Behar  | Hungarians_Behar    | TSI_HapMap          | Naidu_Reich         | 1.52            |
| 12          | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Henn         | Bhil_Reich          | 1.53            |
| 13          | Georgia_Jews_Behar  | Hungarians_Behar    | TSI_HapMap          | Kamsali_Reich       | 1.53            |
| 14          | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Henn         | Vysya_Reich         | 1.54            |
| 15          | Georgia_Jews_Behar  | Slovenian_Xing      | Tuscan_Xing         | Bhil_Reich          | 1.55            |
| 16          | Georgia_Jews_Behar  | Tuscan_Henn         | Slovenian_Xing      | Bhil_Reich          | 1.55            |
| 17          | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Xing         | Kamsali_Reich       | 1.59            |
| 18          | Georgia_Jews_Behar  | Hungarians_Behar    | Tuscan_Xing         | Bhil_Reich          | 1.59            |
| 19          | Georgia_Jews_Behar  | TSI_HapMap          | Slovenian_Xing      | Bhil_Reich          | 1.62            |
| 20          | Georgia_Jews_Behar  | Tuscan_Henn         | Slovenian_Xing      | Hallaki_Reich       | 1.63            |

***Motos Motos -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Iranians_Behar      | Tuscan_HGDP         | Slovenian_Xing      | Vysya_Reich         | 1.59            |
| 2           | German_Dodecad      | Iranian_Dodecad     | S_Italian_Dodecad   | Mala_Reich          | 1.71            |
| 3           | Armenian_Dodecad    | North_Kannadi_Behar | Slovenian_Xing      | Tuscan_Xing         | 1.73            |
| 4           | CEU_HapMap          | Greek_Dodecad       | Iranians_Behar      | Mala_Reich          | 1.76            |
| 5           | German_Dodecad      | Iranian_Dodecad     | S_Italian_Dodecad   | Bhil_Reich          | 1.78            |
| 6           | CEU_HapMap          | Greek_Dodecad       | Iranians_Behar      | Bhil_Reich          | 1.79            |
| 7           | German_Dodecad      | Iranian_Dodecad     | Sicilian_Dodecad    | Bhil_Reich          | 1.81            |
| 8           | Armenian_Dodecad    | North_Kannadi_Behar | Tuscan_Henn         | Slovenian_Xing      | 1.82            |
| 9           | German_Dodecad      | Iranian_Dodecad     | Sicilian_Dodecad    | Mala_Reich          | 1.83            |
| 10          | CEU_HapMap          | Greek_Dodecad       | Iranians_Behar      | Kurumba_Reich       | 1.86            |
| 11          | Iranian_Dodecad     | Tuscan_HGDP         | Slovenian_Xing      | Kamsali_Reich       | 1.89            |
| 12          | Greek_Dodecad       | Kurd_Xing           | N_European_Xing     | Vysya_Reich         | 1.89            |
| 13          | C_Italian_Dodecad   | Iranian_Dodecad     | Slovenian_Xing      | Mala_Reich          | 1.91            |
| 14          | Iranians_Behar      | Tuscan_HGDP         | Slovenian_Xing      | Hallaki_Reich       | 1.91            |
| 15          | German_Dodecad      | Iranian_Dodecad     | S_Italian_Dodecad   | AP_Madiga_Xing      | 1.92            |
| 16          | C_Italian_Dodecad   | Iranian_Dodecad     | Slovenian_Xing      | Bhil_Reich          | 1.92            |
| 17          | German_Dodecad      | Iranian_Dodecad     | Sicilian_Dodecad    | TN_Dalit_Xing       | 1.92            |
| 18          | C_Italian_Dodecad   | Kurd_Dodecad        | Slovenian_Xing      | Vysya_Reich         | 1.95            |
| 19          | CEU_HapMap          | Greek_Dodecad       | Iranians_Behar      | Vysya_Reich         | 1.95            |
| 20          | CEU_HapMap          | Greek_Dodecad       | Iranians_Behar      | AP_Madiga_Xing      | 1.95            |

***Motos Motos -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b>  | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|----------------------|---------------------|---------------------|-----------------|
| 1           | Morocco_Jews_Behar   | Sephardic_Jews_Behar | Slovenian_Xing      | Kurumba_Reich       | 2.04            |
| 2           | Ashkenazy_Jews_Behar | Morocco_Jews_Behar   | Romanians_14_Behar  | Madiga_Reich        | 2.07            |
| 3           | Morocco_Jews_Behar   | Sephardic_Jews_Behar | Slovenian_Xing      | Kamsali_Reich       | 2.07            |
| 4           | Ashkenazi_Dodecad    | Morocco_Jews_Behar   | Romanians_14_Behar  | Chenchu_Reich       | 2.08            |
| 5           | Ashkenazy_Jews_Behar | Morocco_Jews_Behar   | Romanians_14_Behar  | Chenchu_Reich       | 2.10            |
| 6           | Ashkenazy_Jews_Behar | Morocco_Jews_Behar   | Romanians_14_Behar  | AP_Mala_Xing        | 2.10            |
| 7           | Morocco_Jews_Behar   | Sephardic_Jews_Behar | Slovenian_Xing      | Vysya_Reich         | 2.12            |
| 8           | Ashkenazi_Dodecad    | Morocco_Jews_Behar   | Romanians_14_Behar  | Madiga_Reich        | 2.14            |
| 9           | Morocco_Jews_Behar   | Sephardic_Jews_Behar | Slovenian_Xing      | Hallaki_Reich       | 2.23            |
| 10          | Hungarians_Behar     | Morocco_Jews_Behar   | Morocco_Jews_Behar  | Kamsali_Reich       | 2.25            |
| 11          | Ashkenazi_Dodecad    | Morocco_Jews_Behar   | Romanians_14_Behar  | AP_Mala_Xing        | 2.28            |
| 12          | Georgia_Jews_Behar   | Portuguese_Dodecad   | Romanians_14_Behar  | Vysya_Reich         | 2.30            |
| 13          | Ashkenazi_Dodecad    | Balkans_Dodecad      | Morocco_Jews_Behar  | Madiga_Reich        | 2.34            |
| 14          | Ashkenazi_Dodecad    | Balkans_Dodecad      | Morocco_Jews_Behar  | Kamsali_Reich       | 2.35            |
| 15          | Morocco_Jews_Behar   | S_Italian_Dodecad    | Slovenian_Xing      | Kurumba_Reich       | 2.36            |
| 16          | Hungarians_Behar     | Morocco_Jews_Behar   | Morocco_Jews_Behar  | Vysya_Reich         | 2.36            |
| 17          | Ashkenazy_Jews_Behar | Balkans_Dodecad      | Morocco_Jews_Behar  | Kamsali_Reich       | 2.38            |
| 18          | Morocco_Jews_Behar   | Sephardic_Jews_Behar | Slovenian_Xing      | Madiga_Reich        | 2.39            |
| 19          | Ashkenazy_Jews_Behar | Morocco_Jews_Behar   | Romanians_14_Behar  | Bhil_Reich          | 2.39            |
| 20          | Ashkenazi_Dodecad    | Balkans_Dodecad      | Morocco_Jews_Behar  | AP_Mala_Xing        | 2.39            |

***Muñoz Cortés -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b>   | <b>Population 4</b>   | <b>Distance</b> |
|-------------|---------------------|---------------------|-----------------------|-----------------------|-----------------|
| 1           | Morocco_Jews_Behar  | Portuguese_Dodecad  | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 3.35            |
| 2           | Spanish_Dodecad     | Egypt_Henn          | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 3.44            |
| 3           | IBS_1000Genomes     | Egypt_Henn          | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 3.49            |
| 4           | Balochi_HGDP        | Morocco_Jews_Behar  | Portuguese_Dodecad    | Srivastava_Reich      | 3.54            |
| 5           | Spaniards_Behar     | Egypt_Henn          | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 3.55            |
| 6           | North_Italian_HGDP  | Pathan_HGDP         | Libya_Henn            | Kashmiri_Pandit_Reich | 3.63            |
| 7           | North_Italian_HGDP  | Libya_Henn          | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 3.64            |
| 8           | Burusho_HGDP        | North_Italian_HGDP  | Libya_Henn            | Kashmiri_Pandit_Reich | 3.66            |
| 9           | Portuguese_Dodecad  | Egypt_Henn          | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 3.66            |
| 10          | Makrani_HGDP        | Morocco_Jews_Behar  | Portuguese_Dodecad    | Srivastava_Reich      | 3.66            |
| 11          | Brahui_HGDP         | Morocco_Jews_Behar  | Portuguese_Dodecad    | Srivastava_Reich      | 3.68            |
| 12          | Pathan_HGDP         | Spanish_Dodecad     | Egypt_Henn            | Kashmiri_Pandit_Reich | 3.68            |
| 13          | Burusho_HGDP        | Spanish_Dodecad     | Egypt_Henn            | Kashmiri_Pandit_Reich | 3.68            |
| 14          | Burusho_HGDP        | IBS_1000Genomes     | Egypt_Henn            | Kashmiri_Pandit_Reich | 3.69            |
| 15          | IBS_1000Genomes     | Pathan_HGDP         | Egypt_Henn            | Kashmiri_Pandit_Reich | 3.69            |
| 16          | North_Italian_HGDP  | North_Kannadi_Behar | Libya_Henn            | Urkarah_Xing          | 3.70            |
| 17          | Pathan_HGDP         | Portuguese_Dodecad  | Egypt_Henn            | Kashmiri_Pandit_Reich | 3.73            |
| 18          | N_Italian_Dodecad   | North_Kannadi_Behar | Libya_Henn            | Urkarah_Xing          | 3.83            |
| 19          | Burusho_HGDP        | North_Italian_HGDP  | Pathan_HGDP           | Libya_Henn            | 3.83            |
| 20          | Morocco_Jews_Behar  | North_Kannadi_Behar | Turkish_Dodecad       | Slovenian_Xing        | 3.85            |

***Muñoz Fernández -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Assyrian_Dodecad     | Portuguese_Dodecad  | Slovenian_Xing      | Mala_Reich          | 2.66            |
| 2           | Assyrian_Dodecad     | Portuguese_Dodecad  | Slovenian_Xing      | Kurumba_Reich       | 2.67            |
| 3           | Ashkenazi_Dodecad    | Morocco_Jews_Behar  | Slovenian_Xing      | Madiga_Reich        | 2.68            |
| 4           | Assyrian_Dodecad     | Portuguese_Dodecad  | AP_Madiga_Xing      | Slovenian_Xing      | 2.75            |
| 5           | Ashkenazy_Jews_Behar | Morocco_Jews_Behar  | Slovenian_Xing      | Madiga_Reich        | 2.76            |
| 6           | Assyrian_Dodecad     | Hungarians_Behar    | Portuguese_Dodecad  | Madiga_Reich        | 2.81            |
| 7           | Iranian_Jews_Behar   | Portuguese_Dodecad  | Slovenian_Xing      | Vysya_Reich         | 2.83            |
| 8           | Assyrian_Dodecad     | Portuguese_Dodecad  | Slovenian_Xing      | Madiga_Reich        | 2.86            |
| 9           | Iraq_Jews_Behar      | Portuguese_Dodecad  | Slovenian_Xing      | Vysya_Reich         | 2.89            |
| 10          | Ashkenazy_Jews_Behar | Morocco_Jews_Behar  | Slovenian_Xing      | Vysya_Reich         | 2.90            |
| 11          | Ashkenazy_Jews_Behar | Morocco_Jews_Behar  | Slovenian_Xing      | TN_Dalit_Xing       | 2.93            |
| 12          | Assyrian_Dodecad     | Portuguese_Dodecad  | Slovenian_Xing      | Vysya_Reich         | 2.94            |
| 13          | Ashkenazy_Jews_Behar | Morocco_Jews_Behar  | Slovenian_Xing      | Hallaki_Reich       | 2.94            |
| 14          | Assyrian_Dodecad     | Portuguese_Dodecad  | Slovenian_Xing      | TN_Dalit_Xing       | 2.96            |
| 15          | Assyrian_Dodecad     | Portuguese_Dodecad  | Slovenian_Xing      | Bhil_Reich          | 2.96            |
| 16          | Ashkenazy_Jews_Behar | Morocco_Jews_Behar  | Slovenian_Xing      | Kamsali_Reich       | 2.97            |
| 17          | Assyrian_Dodecad     | Hungarians_Behar    | Portuguese_Dodecad  | Kurumba_Reich       | 2.99            |
| 18          | Assyrian_Dodecad     | Portuguese_Dodecad  | Slovenian_Xing      | Kamsali_Reich       | 2.99            |
| 19          | Ashkenazi_Dodecad    | Morocco_Jews_Behar  | Slovenian_Xing      | TN_Dalit_Xing       | 3.00            |
| 20          | Assyrian_Dodecad     | Hungarians_Behar    | Portuguese_Dodecad  | Mala_Reich          | 3.00            |

**Navarro Vargas -- Four Population Mode**

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b> | <b>Population 3</b>        | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|---------------------|----------------------------|---------------------|-----------------|
| 1           | Iranian_Jews_Behar   | North_Kannadi_Behar | Portuguese_Dodecad         | Romanians_14_Behar  | 2.51            |
| 2           | Georgia_Jews_Behar   | Portuguese_Dodecad  | Romanians_14_Behar         | Irula_Xing          | 2.67            |
| 3           | Balkans_Dodecad      | Iranian_Jews_Behar  | North_Kannadi_Behar        | Portuguese_Dodecad  | 2.67            |
| 4           | Georgia_Jews_Behar   | North_Kannadi_Behar | Portuguese_Dodecad         | Romanians_14_Behar  | 2.70            |
| 5           | Balkans_Dodecad      | Iraq_Jews_Behar     | Portuguese_Dodecad         | Irula_Xing          | 2.72            |
| 6           | Balkans_Dodecad      | Iraq_Jews_Behar     | North_Kannadi_Behar        | Portuguese_Dodecad  | 2.75            |
| 7           | Morocco_Jews_Behar   | Romanians_14_Behar  | Irula_Xing                 | Tuscan_Xing         | 2.76            |
| 8           | Hungarians_Behar     | Morocco_Jews_Behar  | S_Italian_Dodecad          | Irula_Xing          | 2.77            |
| 9           | Iraq_Jews_Behar      | North_Kannadi_Behar | Portuguese_Dodecad         | Romanians_14_Behar  | 2.78            |
| 10          | Hungarians_Behar     | Morocco_Jews_Behar  | Sicilian_Dodecad           | Irula_Xing          | 2.85            |
| 11          | Morocco_Jews_Behar   | Sicilian_Dodecad    | Irula_Xing                 | Slovenian_Xing      | 2.86            |
| 12          | Balkans_Dodecad      | Iranian_Jews_Behar  | Portuguese_Dodecad         | Irula_Xing          | 2.86            |
| 13          | Hungarians_Behar     | Morocco_Jews_Behar  | S_Italian_Sicilian_Dodecad | Irula_Xing          | 2.86            |
| 14          | Balkans_Dodecad      | Druze_HGDP          | Portuguese_Dodecad         | Irula_Xing          | 2.86            |
| 15          | Iranian_Jews_Behar   | Portuguese_Dodecad  | Romanians_14_Behar         | Irula_Xing          | 2.87            |
| 16          | Iraq_Jews_Behar      | Portuguese_Dodecad  | Romanians_14_Behar         | Irula_Xing          | 2.91            |
| 17          | Ashkenazi_Dodecad    | Hungarians_Behar    | Sephardic_Jews_Behar       | Irula_Xing          | 2.92            |
| 18          | Hungarians_Behar     | Morocco_Jews_Behar  | Sephardic_Jews_Behar       | Irula_Xing          | 2.92            |
| 19          | Morocco_Jews_Behar   | S_Italian_Dodecad   | Irula_Xing                 | Slovenian_Xing      | 2.94            |
| 20          | Ashkenazy_Jews_Behar | Balkans_Dodecad     | Morocco_Jews_Behar         | Irula_Xing          | 2.95            |

***Nunez Camacho -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>        | <b>Population 2</b>        | <b>Population 3</b>        | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------------|----------------------------|----------------------------|---------------------|-----------------|
| 1           | Ashkenazy_Jews_Behar       | N_Italian_Dodecad          | Tuscan_Xing                | Tharu_Reich         | 1.74            |
| 2           | Ashkenazy_Jews_Behar       | N_Italian_Dodecad          | Tuscan_Henn                | Tharu_Reich         | 1.74            |
| 3           | Ashkenazy_Jews_Behar       | N_Italian_Dodecad          | TSI_HapMap                 | Tharu_Reich         | 1.79            |
| 4           | CEU_HapMap                 | S_Italian_Sicilian_Dodecad | S_Italian_Sicilian_Dodecad | Tharu_Reich         | 1.79            |
| 5           | Ashkenazi_Dodecad          | French_HGDP                | Greek_Dodecad              | Tharu_Reich         | 1.81            |
| 6           | Dutch_Dodecad              | Greek_Dodecad              | Sephardic_Jews_Behar       | Tharu_Reich         | 1.81            |
| 7           | Ashkenazi_Dodecad          | French_Dodecad             | Greek_Dodecad              | Tharu_Reich         | 1.82            |
| 8           | S_Italian_Sicilian_Dodecad | Sicilian_Dodecad           | N._European_Xing           | Tharu_Reich         | 1.86            |
| 9           | Ashkenazi_Dodecad          | N_Italian_Dodecad          | Tuscan_Xing                | Tharu_Reich         | 1.88            |
| 10          | S_Italian_Sicilian_Dodecad | S_Italian_Sicilian_Dodecad | N._European_Xing           | Tharu_Reich         | 1.90            |
| 11          | C_Italian_Dodecad          | CEU_HapMap                 | Sephardic_Jews_Behar       | Tharu_Reich         | 1.91            |
| 12          | Greek_Dodecad              | Kent_1000 Genomes          | Sephardic_Jews_Behar       | Tharu_Reich         | 1.92            |
| 13          | Ashkenazi_Dodecad          | N_Italian_Dodecad          | Tuscan_Henn                | Tharu_Reich         | 1.93            |
| 14          | S_Italian_Dodecad          | S_Italian_Sicilian_Dodecad | N._European_Xing           | Tharu_Reich         | 1.94            |
| 15          | Ashkenazi_Dodecad          | N_Italian_Dodecad          | TSI_HapMap                 | Tharu_Reich         | 2.00            |
| 16          | Cypriots_Behar             | Orkney_1000 Genomes        | Tuscan_HGDP                | Tharu_Reich         | 2.01            |
| 17          | Orcadian_HGDP              | S_Italian_Sicilian_Dodecad | S_Italian_Sicilian_Dodecad | Tharu_Reich         | 2.01            |
| 18          | C_Italian_Dodecad          | Sephardic_Jews_Behar       | Argyll_1000 Genomes        | Tharu_Reich         | 2.02            |
| 19          | Cypriots_Behar             | Tuscan_HGDP                | N._European_Xing           | Tharu_Reich         | 2.02            |
| 20          | S_Italian_Sicilian_Dodecad | S_Italian_Sicilian_Dodecad | Argyll_1000 Genomes        | Tharu_Reich         | 2.03            |

***Nunez Heredia -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>   | <b>Population 2</b>        | <b>Population 3</b>    | <b>Population 4</b> | <b>Distance</b> |
|-------------|-----------------------|----------------------------|------------------------|---------------------|-----------------|
| 1           | German_Dodecad        | Morocco_Jews_Behar         | S_Italian_Dodecad      | Tharu_Reich         | 1.65            |
| 2           | Azerbaijan_Jews_Behar | Sardinian_HGDP             | Slovenian_Xing         | Tharu_Reich         | 1.81            |
| 3           | C_Italian_Dodecad     | Morocco_Jews_Behar         | Slovenian_Xing         | Tharu_Reich         | 1.95            |
| 4           | CEU_HapMap            | Greek_Dodecad              | Morocco_Jews_Behar     | Vysya_Reich         | 2.00            |
| 5           | CEU_HapMap            | Greek_Dodecad              | Morocco_Jews_Behar     | Hallaki_Reich       | 2.00            |
| 6           | German_Dodecad        | Morocco_Jews_Behar         | Sicilian_Dodecad       | Tharu_Reich         | 2.02            |
| 7           | CEU_HapMap            | Greek_Dodecad              | Morocco_Jews_Behar     | Tharu_Reich         | 2.03            |
| 8           | Greek_Dodecad         | Sephardic_Jews_Behar       | N._European_Xing       | Tharu_Reich         | 2.05            |
| 9           | German_Dodecad        | Morocco_Jews_Behar         | S_Italian_Dodecad      | Lodi_Reich          | 2.11            |
| 10          | German_Dodecad        | Morocco_Jews_Behar         | S_Italian_Dodecad      | Hallaki_Reich       | 2.11            |
| 11          | German_Dodecad        | S_Italian_Sicilian_Dodecad | Sephardic_Jews_Behar   | Tharu_Reich         | 2.12            |
| 12          | German_Dodecad        | Morocco_Jews_Behar         | S_Italian_Dodecad      | Satnami_Reich       | 2.18            |
| 13          | Greek_Dodecad         | Morocco_Jews_Behar         | N._European_Xing       | Tharu_Reich         | 2.19            |
| 14          | Greek_Dodecad         | Morocco_Jews_Behar         | Orcadian_HGDP          | Vysya_Reich         | 2.20            |
| 15          | CEU_HapMap            | Greek_Dodecad              | Morocco_Jews_Behar     | Naidu_Reich         | 2.21            |
| 16          | Greek_Dodecad         | Morocco_Jews_Behar         | N._European_Xing       | Hallaki_Reich       | 2.23            |
| 17          | Greek_Dodecad         | Morocco_Jews_Behar         | Orkney_1000<br>Genomes | Vysya_Reich         | 2.28            |
| 18          | Iranian_Jews_Behar    | Sardinian_HGDP             | Slovenian_Xing         | Tharu_Reich         | 2.28            |
| 19          | Greek_Dodecad         | Mixed_Germanic_Dodecad     | Sephardic_Jews_Behar   | Satnami_Reich       | 2.29            |
| 20          | Sephardic_Jews_Behar  | Sicilian_Dodecad           | N._European_Xing       | Srivastava_Reich    | 2.29            |

***Rodriguez Perez-- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>     | <b>Population 2</b>     | <b>Population 3</b>  | <b>Population 4</b>   | <b>Distance</b> |
|-------------|-------------------------|-------------------------|----------------------|-----------------------|-----------------|
| 1           | Bnei_Menashe_Jews_Behar | CEU_HapMap              | Cochin_Jews_Behar    | Sephardic_Jews_Behar  | 2.48            |
| 2           | Bnei_Menashe_Jews_Behar | Cochin_Jews_Behar       | Orkney_1000 Genomes  | Sephardic_Jews_Behar  | 2.55            |
| 3           | Bnei_Menashe_Jews_Behar | Cochin_Jews_Behar       | Orcadian_HGDP        | Sephardic_Jews_Behar  | 2.55            |
| 4           | Bnei_Menashe_Jews_Behar | Cochin_Jews_Behar       | Sephardic_Jews_Behar | N_European_Xing       | 2.56            |
| 5           | Bnei_Menashe_Jews_Behar | Cochin_Jews_Behar       | Sephardic_Jews_Behar | Argyll_1000 Genomes   | 2.68            |
| 6           | Bnei_Menashe_Jews_Behar | Cochin_Jews_Behar       | French_Dodecad       | Morocco_Jews_Behar    | 2.77            |
| 7           | Ashkenazy_Jews_Behar    | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad   | Vaish_Reich           | 2.80            |
| 8           | Ashkenazy_Jews_Behar    | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad   | Meghawal_Reich        | 2.83            |
| 9           | Ashkenazi_Dodecad       | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad   | Vaish_Reich           | 2.84            |
| 10          | French_Dodecad          | Makrani_HGDP            | Sephardic_Jews_Behar | Satnami_Reich         | 2.88            |
| 11          | Ashkenazi_Dodecad       | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad   | Meghawal_Reich        | 2.99            |
| 12          | Ashkenazi_Dodecad       | Cochin_Jews_Behar       | Portuguese_Dodecad   | Kashmiri_Pandit_Reich | 3.02            |
| 13          | Ashkenazy_Jews_Behar    | Makrani_HGDP            | Portuguese_Dodecad   | Satnami_Reich         | 3.03            |
| 14          | Bnei_Menashe_Jews_Behar | Cochin_Jews_Behar       | German_Dodecad       | Sephardic_Jews_Behar  | 3.04            |
| 15          | Ashkenazy_Jews_Behar    | CEU_HapMap              | Lebanese_Behar       | Irula_Xing            | 3.05            |
| 16          | Bnei_Menashe_Jews_Behar | Cochin_Jews_Behar       | French_HGDP          | Morocco_Jews_Behar    | 3.05            |
| 17          | Ashkenazy_Jews_Behar    | Cochin_Jews_Behar       | Portuguese_Dodecad   | Kashmiri_Pandit_Reich | 3.06            |
| 18          | Burusho_HGDP            | Cochin_Jews_Behar       | Morocco_Jews_Behar   | Portuguese_Dodecad    | 3.07            |
| 19          | Ashkenazy_Jews_Behar    | Bnei_Menashe_Jews_Behar | Cochin_Jews_Behar    | Portuguese_Dodecad    | 3.08            |
| 20          | Ashkenazi_Dodecad       | Makrani_HGDP            | Portuguese_Dodecad   | Satnami_Reich         | 3.09            |

***Salazar Jiménez -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Samaritians_Behar    | Tuscan_Henn         | Slovenian_Xing      | Chenchu_Reich       | 2.44            |
| 2           | Ashkenazi_Dodecad    | Morocco_Jews_Behar  | AP_Madiga_Xing      | Slovenian_Xing      | 2.48            |
| 3           | Samaritians_Behar    | Tuscan_Henn         | AP_Mala_Xing        | Slovenian_Xing      | 2.52            |
| 4           | Hungarians_Behar     | Samaritians_Behar   | Tuscan_Henn         | AP_Mala_Xing        | 2.59            |
| 5           | Ashkenazi_Dodecad    | Morocco_Jews_Behar  | AP_Mala_Xing        | Slovenian_Xing      | 2.61            |
| 6           | Ashkenazy_Jews_Behar | Morocco_Jews_Behar  | Slovenian_Xing      | Kamsali_Reich       | 2.63            |
| 7           | Samaritians_Behar    | Slovenian_Xing      | Tuscan_Xing         | Chenchu_Reich       | 2.64            |
| 8           | Ashkenazi_Dodecad    | Morocco_Jews_Behar  | Slovenian_Xing      | Kamsali_Reich       | 2.65            |
| 9           | Ashkenazy_Jews_Behar | Morocco_Jews_Behar  | AP_Madiga_Xing      | Slovenian_Xing      | 2.65            |
| 10          | Hungarians_Behar     | Samaritians_Behar   | Tuscan_Henn         | Chenchu_Reich       | 2.67            |
| 11          | Samaritians_Behar    | AP_Mala_Xing        | Slovenian_Xing      | Tuscan_Xing         | 2.67            |
| 12          | Ashkenazi_Dodecad    | Morocco_Jews_Behar  | Slovenian_Xing      | Kurumba_Reich       | 2.71            |
| 13          | Ashkenazy_Jews_Behar | Morocco_Jews_Behar  | AP_Mala_Xing        | Slovenian_Xing      | 2.75            |
| 14          | Samaritians_Behar    | TSI_HapMap          | Slovenian_Xing      | Chenchu_Reich       | 2.78            |
| 15          | Hungarians_Behar     | Samaritians_Behar   | AP_Mala_Xing        | Tuscan_Xing         | 2.79            |
| 16          | Hungarians_Behar     | Samaritians_Behar   | TSI_HapMap          | AP_Mala_Xing        | 2.80            |
| 17          | Ashkenazy_Jews_Behar | Morocco_Jews_Behar  | Slovenian_Xing      | Kurumba_Reich       | 2.80            |
| 18          | Ashkenazi_Dodecad    | Hungarians_Behar    | Morocco_Jews_Behar  | Kamsali_Reich       | 2.81            |
| 19          | Samaritians_Behar    | Tuscan_Henn         | AP_Madiga_Xing      | Slovenian_Xing      | 2.81            |
| 20          | Jordanians_19_Behar  | O_Italian_Dodecad   | Slovenian_Xing      | Chenchu_Reich       | 2.81            |

***Salazar Vega -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Altai_Rasmussen     | French_Dodecad      | Hazara_HGDP         | Selkup_Rasmussen    | 4.31            |
| 2           | Altai_Rasmussen     | French_HGDP         | Hazara_HGDP         | Selkup_Rasmussen    | 4.63            |
| 3           | Altai_Rasmussen     | French_Basque_HGDP  | Selkup_Rasmussen    | Uzbeks_Behar        | 4.70            |
| 4           | Dolgan_Rasmussen    | French_Dodecad      | Hazara_HGDP         | Selkup_Rasmussen    | 4.72            |
| 5           | Altai_Rasmussen     | French_Basque_HGDP  | Hazara_HGDP         | Selkup_Rasmussen    | 4.80            |
| 6           | Dolgan_Rasmussen    | French_HGDP         | Hazara_HGDP         | Selkup_Rasmussen    | 4.89            |
| 7           | French_Dodecad      | Selkup_Rasmussen    | Uygur_HGDP          | Yukagir_Rasmussen   | 4.98            |
| 8           | Altai_Rasmussen     | French_Dodecad      | Selkup_Rasmussen    | Uzbeks_Behar        | 5.02            |
| 9           | French_Dodecad      | Hazara_HGDP         | Selkup_Rasmussen    | Yukagir_Rasmussen   | 5.03            |
| 10          | French_Dodecad      | Hazara_HGDP         | Yukagir_Rasmussen   | Yukagir_Rasmussen   | 5.07            |
| 11          | Dolgan_Rasmussen    | French_Dodecad      | Selkup_Rasmussen    | Uygur_HGDP          | 5.07            |
| 12          | French_Dodecad      | Uygur_HGDP          | Yukagir_Rasmussen   | Yukagir_Rasmussen   | 5.09            |
| 13          | French_HGDP         | Hazara_HGDP         | Yukagir_Rasmussen   | Yukagir_Rasmussen   | 5.09            |
| 14          | French_HGDP         | Hazara_HGDP         | Selkup_Rasmussen    | Yukagir_Rasmussen   | 5.09            |
| 15          | French_HGDP         | Selkup_Rasmussen    | Uygur_HGDP          | Yukagir_Rasmussen   | 5.13            |
| 16          | CEU_HapMap          | Hazara_HGDP         | Yukagir_Rasmussen   | Yukagir_Rasmussen   | 5.17            |
| 17          | Portuguese_Dodecad  | Selkup_Rasmussen    | Selkup_Rasmussen    | Uygur_HGDP          | 5.18            |
| 18          | Hazara_HGDP         | Yukagir_Rasmussen   | Yukagir_Rasmussen   | N._European_Xing    | 5.18            |
| 19          | Altai_Rasmussen     | French_Basque_HGDP  | Selkup_Rasmussen    | Uygur_HGDP          | 5.18            |
| 20          | French_HGDP         | Uygur_HGDP          | Yukagir_Rasmussen   | Yukagir_Rasmussen   | 5.20            |

***Santiago Heredia -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b> | <b>Population 3</b>   | <b>Population 4</b>   | <b>Distance</b> |
|-------------|----------------------|---------------------|-----------------------|-----------------------|-----------------|
| 1           | Greek_Dodecad        | Iranians_Behar      | Portuguese_Dodecad    | Chenchu_Reich         | 2.90            |
| 2           | Greek_Dodecad        | Iranians_Behar      | Portuguese_Dodecad    | AP_Mala_Xing          | 3.34            |
| 3           | Greek_Dodecad        | Iranians_Behar      | Portuguese_Dodecad    | AP_Madiga_Xing        | 3.38            |
| 4           | Iranians_Behar       | Romanians_14_Behar  | Sardinian_HGDP        | Madiga_Reich          | 3.43            |
| 5           | Ashkenazy_Jews_Behar | Makrani_HGDP        | North_Italian_HGDP    | Sahariya_Reich        | 3.44            |
| 6           | Iranians_Behar       | Portuguese_Dodecad  | Romanians_14_Behar    | Kamsali_Reich         | 3.45            |
| 7           | Greek_Dodecad        | Iranians_Behar      | Portuguese_Dodecad    | Madiga_Reich          | 3.47            |
| 8           | Ashkenazy_Jews_Behar | Portuguese_Dodecad  | Kurd_Xing             | Chenchu_Reich         | 3.48            |
| 9           | Ashkenazi_Dodecad    | Makrani_HGDP        | North_Italian_HGDP    | Sahariya_Reich        | 3.49            |
| 10          | Greek_Dodecad        | Iranians_Behar      | Portuguese_Dodecad    | Mala_Reich            | 3.50            |
| 11          | Ashkenazy_Jews_Behar | Makrani_HGDP        | North_Italian_HGDP    | Satnami_Reich         | 3.51            |
| 12          | Iranians_Behar       | Portuguese_Dodecad  | Romanians_14_Behar    | Kurumba_Reich         | 3.53            |
| 13          | Ashkenazy_Jews_Behar | N_Italian_Dodecad   | Kurd_Xing             | Chenchu_Reich         | 3.57            |
| 14          | Iranians_Behar       | Romanians_14_Behar  | Sardinian_HGDP        | Chenchu_Reich         | 3.57            |
| 15          | Ashkenazi_Dodecad    | Makrani_HGDP        | North_Italian_HGDP    | Satnami_Reich         | 3.59            |
| 16          | Ashkenazy_Jews_Behar | Kurd_Dodecad        | N_Italian_Dodecad     | Chenchu_Reich         | 3.59            |
| 17          | Ashkenazy_Jews_Behar | Portuguese_Dodecad  | AP_Madiga_Xing        | Kurd_Xing             | 3.59            |
| 18          | Ashkenazy_Jews_Behar | Makrani_HGDP        | Sardinian_HGDP        | Satnami_Reich         | 3.61            |
| 19          | Morocco_Jews_Behar   | Sardinian_HGDP      | Kashmiri_Pandit_Reich | Kashmiri_Pandit_Reich | 3.64            |
| 20          | Ashkenazi_Dodecad    | Portuguese_Dodecad  | Kurd_Xing             | Chenchu_Reich         | 3.64            |

***Sevilla-- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b>   | <b>Population 4</b>   | <b>Distance</b> |
|-------------|---------------------|---------------------|-----------------------|-----------------------|-----------------|
| 1           | German_Dodecad      | Portuguese_Dodecad  | Portuguese_Dodecad    | Uzbekistan_Jews_Behar | 3.44            |
| 2           | Portuguese_Dodecad  | Portuguese_Dodecad  | Uzbekistan_Jews_Behar | N._European_Xing      | 3.62            |
| 3           | German_Dodecad      | Portuguese_Dodecad  | Portuguese_Dodecad    | Kurd_Xing             | 3.77            |
| 4           | Portuguese_Dodecad  | Portuguese_Dodecad  | Kurd_Xing             | N._European_Xing      | 3.78            |
| 5           | German_Dodecad      | Kurd_Dodecad        | Portuguese_Dodecad    | Portuguese_Dodecad    | 3.84            |
| 6           | Portuguese_Dodecad  | Portuguese_Dodecad  | Uzbekistan_Jews_Behar | Argyll_1000 Genomes   | 3.85            |
| 7           | CEU_HapMap          | Portuguese_Dodecad  | Portuguese_Dodecad    | Uzbekistan_Jews_Behar | 3.86            |
| 8           | German_Dodecad      | Portuguese_Dodecad  | Spanish_Dodecad       | Uzbekistan_Jews_Behar | 3.88            |
| 9           | Orkney_1000 Genomes | Portuguese_Dodecad  | Portuguese_Dodecad    | Uzbekistan_Jews_Behar | 3.88            |
| 10          | German_Dodecad      | IBS_1000Genomes     | Portuguese_Dodecad    | Uzbekistan_Jews_Behar | 3.90            |
| 11          | Kurd_Dodecad        | Portuguese_Dodecad  | Portuguese_Dodecad    | N._European_Xing      | 3.92            |
| 12          | CEU_HapMap          | Portuguese_Dodecad  | Portuguese_Dodecad    | Kurd_Xing             | 3.94            |
| 13          | Orcadian_HGDP       | Portuguese_Dodecad  | Portuguese_Dodecad    | Uzbekistan_Jews_Behar | 3.94            |
| 14          | Orkney_1000 Genomes | Portuguese_Dodecad  | Portuguese_Dodecad    | Kurd_Xing             | 3.94            |
| 15          | CEU_HapMap          | Kurd_Dodecad        | Portuguese_Dodecad    | Portuguese_Dodecad    | 3.96            |
| 16          | German_Dodecad      | Kurd_Dodecad        | Portuguese_Dodecad    | Spanish_Dodecad       | 3.96            |
| 17          | Portuguese_Dodecad  | Sardinian_HGDP      | Swedish_Dodecad       | Kurd_Xing             | 3.98            |
| 18          | German_Dodecad      | Portuguese_Dodecad  | Spanish_Dodecad       | Kurd_Xing             | 4.00            |
| 19          | Orcadian_HGDP       | Portuguese_Dodecad  | Portuguese_Dodecad    | Kurd_Xing             | 4.00            |
| 20          | German_Dodecad      | IBS_1000Genomes     | Kurd_Dodecad          | Portuguese_Dodecad    | 4.02            |

***Vamosine Palmai -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>   | <b>Population 2</b>        | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|-----------------------|----------------------------|---------------------|---------------------|-----------------|
| 1           | Azerbaijan_Jews_Behar | Slovenian_Xing             | Tuscan_Xing         | Lodi_Reich          | 1.31            |
| 2           | Iranian_Jews_Behar    | Slovenian_Xing             | Tuscan_Xing         | Lodi_Reich          | 1.34            |
| 3           | Iranian_Jews_Behar    | TSI_HapMap                 | Slovenian_Xing      | Lodi_Reich          | 1.43            |
| 4           | Azerbaijan_Jews_Behar | Slovenian_Xing             | Tuscan_Xing         | Hallaki_Reich       | 1.48            |
| 5           | Azerbaijan_Jews_Behar | Tuscan_Henn                | Slovenian_Xing      | Lodi_Reich          | 1.49            |
| 6           | Assyrian_Dodecad      | Greek_Dodecad              | Swedish_Dodecad     | AP_Madiga_Xing      | 1.50            |
| 7           | Assyrian_Dodecad      | Tuscan_Henn                | Slovenian_Xing      | Madiga_Reich        | 1.53            |
| 8           | Assyrian_Dodecad      | Romanians_14_Behar         | N._European_Xing    | Kamsali_Reich       | 1.53            |
| 9           | Iranians_Behar        | O_Italian_Dodecad          | Slovenian_Xing      | Tharu_Reich         | 1.58            |
| 10          | Azerbaijan_Jews_Behar | Tuscan_Henn                | Slovenian_Xing      | Hallaki_Reich       | 1.58            |
| 11          | Assyrian_Dodecad      | Tuscan_Henn                | Slovenian_Xing      | Chenchu_Reich       | 1.60            |
| 12          | Azerbaijan_Jews_Behar | TSI_HapMap                 | Slovenian_Xing      | Lodi_Reich          | 1.62            |
| 13          | Azerbaijan_Jews_Behar | TSI_HapMap                 | Slovenian_Xing      | Hallaki_Reich       | 1.63            |
| 14          | Iranian_Jews_Behar    | Tuscan_Henn                | Slovenian_Xing      | Lodi_Reich          | 1.64            |
| 15          | Greek_Dodecad         | Iranian_Jews_Behar         | Swedish_Dodecad     | Vysya_Reich         | 1.65            |
| 16          | Assyrian_Dodecad      | Romanians_14_Behar         | N._European_Xing    | Naidu_Reich         | 1.67            |
| 17          | Georgia_Jews_Behar    | INS_SGVP                   | Slovenian_Xing      | Tuscan_Xing         | 1.67            |
| 18          | German_Dodecad        | S_Italian_Sicilian_Dodecad | Kurd_Xing           | Lodi_Reich          | 1.67            |
| 19          | Uzbekistan_Jews_Behar | Tuscan_Henn                | Slovenian_Xing      | Velama_Reich        | 1.68            |
| 20          | Greek_Dodecad         | Iraq_Jews_Behar            | Swedish_Dodecad     | Vysya_Reich         | 1.69            |

***Vargas Bote -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>   | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|-----------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Iraq_Jews_Behar       | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Madiga_Reich        | 3.08            |
| 2           | Iranian_Jews_Behar    | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Vysya_Reich         | 3.13            |
| 3           | Iraq_Jews_Behar       | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | TN_Dalit_Xing       | 3.18            |
| 4           | Iranian_Jews_Behar    | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Kamsali_Reich       | 3.19            |
| 5           | Iranian_Jews_Behar    | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Madiga_Reich        | 3.20            |
| 6           | Iraq_Jews_Behar       | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Mala_Reich          | 3.20            |
| 7           | Iranian_Jews_Behar    | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Kurumba_Reich       | 3.20            |
| 8           | Iranian_Jews_Behar    | Polish_Dodecad      | Portuguese_Dodecad  | Vysya_Reich         | 3.22            |
| 9           | Assyrian_Dodecad      | Polish_Dodecad      | Portuguese_Dodecad  | Mala_Reich          | 3.23            |
| 10          | Iraq_Jews_Behar       | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Kurumba_Reich       | 3.25            |
| 11          | Iranian_Jews_Behar    | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Naidu_Reich         | 3.28            |
| 12          | Iranian_Jews_Behar    | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | TN_Dalit_Xing       | 3.29            |
| 13          | Iraq_Jews_Behar       | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Kamsali_Reich       | 3.30            |
| 14          | Iranian_Jews_Behar    | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Mala_Reich          | 3.31            |
| 15          | Assyrian_Dodecad      | Polish_Dodecad      | Portuguese_Dodecad  | TN_Dalit_Xing       | 3.31            |
| 16          | Iraq_Jews_Behar       | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Vysya_Reich         | 3.32            |
| 17          | Iraq_Jews_Behar       | Polish_Dodecad      | Portuguese_Dodecad  | Madiga_Reich        | 3.33            |
| 18          | Iranian_Jews_Behar    | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | Hallaki_Reich       | 3.33            |
| 19          | Iraq_Jews_Behar       | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | AP_Mala_Xing        | 3.33            |
| 20          | Azerbaijan_Jews_Behar | Mixed_Slav_Dodecad  | Portuguese_Dodecad  | TN_Dalit_Xing       | 3.35            |

***Vargas Navarro -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b>  | <b>Population 2</b>     | <b>Population 3</b>     | <b>Population 4</b> | <b>Distance</b> |
|-------------|----------------------|-------------------------|-------------------------|---------------------|-----------------|
| 1           | Balkans_Dodecad      | Portuguese_Dodecad      | AP_Madiga_Xing          | Kurd_Xing           | 2.68            |
| 2           | Balkans_Dodecad      | Kurd_Dodecad            | Portuguese_Dodecad      | AP_Madiga_Xing      | 2.80            |
| 3           | Balkans_Dodecad      | Portuguese_Dodecad      | Kurd_Xing               | Bhil_Reich          | 2.95            |
| 4           | Balkans_Dodecad      | Portuguese_Dodecad      | Kurd_Xing               | Kurumba_Reich       | 2.98            |
| 5           | Balkans_Dodecad      | Portuguese_Dodecad      | Kurd_Xing               | Madiga_Reich        | 3.01            |
| 6           | Balkans_Dodecad      | Kurd_Dodecad            | Portuguese_Dodecad      | Kurumba_Reich       | 3.03            |
| 7           | Balkans_Dodecad      | Kurd_Dodecad            | Portuguese_Dodecad      | Bhil_Reich          | 3.03            |
| 8           | Balkans_Dodecad      | Portuguese_Dodecad      | Kurd_Xing               | Mala_Reich          | 3.06            |
| 9           | Balkans_Dodecad      | Iranians_Behar          | Portuguese_Dodecad      | Bhil_Reich          | 3.13            |
| 10          | Balkans_Dodecad      | Portuguese_Dodecad      | Uzbekistan_Jews_Behar   | AP_Madiga_Xing      | 3.14            |
| 11          | Ashkenazy_Jews_Behar | Hungarians_Behar        | Morocco_Jews_Behar      | North_Kannadi_Behar | 3.14            |
| 12          | Balkans_Dodecad      | Kurd_Dodecad            | Portuguese_Dodecad      | Mala_Reich          | 3.17            |
| 13          | Balkans_Dodecad      | Iranians_Behar          | Portuguese_Dodecad      | AP_Madiga_Xing      | 3.17            |
| 14          | Balkans_Dodecad      | Portuguese_Dodecad      | Kurd_Xing               | Chenchu_Reich       | 3.21            |
| 15          | Balkans_Dodecad      | Kurd_Dodecad            | Portuguese_Dodecad      | Vysya_Reich         | 3.22            |
| 16          | Balkans_Dodecad      | Portuguese_Dodecad      | Kurd_Xing               | Vysya_Reich         | 3.22            |
| 17          | Balkans_Dodecad      | Portuguese_Dodecad      | Kurd_Xing               | Hallaki_Reich       | 3.23            |
| 18          | Balkans_Dodecad      | Bnei_Menashe_Jews_Behar | Bnei_Menashe_Jews_Behar | Portuguese_Dodecad  | 3.24            |
| 19          | Balkans_Dodecad      | Portuguese_Dodecad      | Kurd_Xing               | Kamsali_Reich       | 3.26            |
| 20          | Balkans_Dodecad      | Kurd_Dodecad            | Portuguese_Dodecad      | Hallaki_Reich       | 3.26            |

***Varo Cla -- Four Population Mode***

| <b>Rank</b> | <b>Population 1</b> | <b>Population 2</b> | <b>Population 3</b> | <b>Population 4</b> | <b>Distance</b> |
|-------------|---------------------|---------------------|---------------------|---------------------|-----------------|
| 1           | Makrani_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | N._European_Xing    | 2.63            |
| 2           | CEU_HapMap          | Makrani_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | 2.66            |
| 3           | Makrani_HGDP        | Orcadian_HGDP       | Portuguese_Dodecad  | Sardinian_HGDP      | 2.88            |
| 4           | Makrani_HGDP        | Orkney_1000 Genomes | Portuguese_Dodecad  | Sardinian_HGDP      | 2.90            |
| 5           | Makrani_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | Argyll_1000 Genomes | 2.98            |
| 6           | Makrani_HGDP        | Sardinian_HGDP      | Sardinian_HGDP      | Swedish_Dodecad     | 3.13            |
| 7           | Brahui_HGDP         | CEU_HapMap          | Portuguese_Dodecad  | Sardinian_HGDP      | 3.19            |
| 8           | Brahui_HGDP         | Portuguese_Dodecad  | Sardinian_HGDP      | N._European_Xing    | 3.19            |
| 9           | IBS_1000Genomes     | Makrani_HGDP        | Sardinian_HGDP      | N._European_Xing    | 3.19            |
| 10          | Makrani_HGDP        | Sardinian_HGDP      | Spanish_Dodecad     | N._European_Xing    | 3.24            |
| 11          | German_Dodecad      | Makrani_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | 3.26            |
| 12          | Balochi_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | N._European_Xing    | 3.27            |
| 13          | Balochi_HGDP        | CEU_HapMap          | Portuguese_Dodecad  | Sardinian_HGDP      | 3.30            |
| 14          | Makrani_HGDP        | Norwegian_Dodecad   | Sardinian_HGDP      | Sardinian_HGDP      | 3.35            |
| 15          | French_Dodecad      | Makrani_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | 3.38            |
| 16          | French_HGDP         | Makrani_HGDP        | Portuguese_Dodecad  | Sardinian_HGDP      | 3.40            |
| 17          | CEU_HapMap          | IBS_1000Genomes     | Makrani_HGDP        | Sardinian_HGDP      | 3.46            |
| 18          | Brahui_HGDP         | Orcadian_HGDP       | Portuguese_Dodecad  | Sardinian_HGDP      | 3.46            |
| 19          | Brahui_HGDP         | Orkney_1000 Genomes | Portuguese_Dodecad  | Sardinian_HGDP      | 3.49            |
| 20          | Brahui_HGDP         | Orkney_1000 Genomes | Portuguese_Dodecad  | Sardinian_HGDP      |                 |

## Chapter 6: Appendix A - Surnames: Nuncas Más List of Names

Andalucia

| Andalucia - Nuncas Más List of Surnames |       |  |           |       |  |            |       |
|-----------------------------------------|-------|--|-----------|-------|--|------------|-------|
| Surname                                 | Count |  | Surname   | Count |  | Surname    | Count |
| Nan                                     | 1678  |  | Muñoz     | 13    |  | Ruiz       | 5     |
| Fernández                               | 195   |  | Núñez     | 13    |  | Tripana    | 5     |
| Unknown                                 | 128   |  | Vega      | 13    |  | Vallejo    | 5     |
| Heredia                                 | 91    |  | Leal      | 12    |  | Amaya      | 4     |
| Santiago                                | 91    |  | Molina    | 12    |  | Mata       | 4     |
| Cortés                                  | 80    |  | Arjona    | 10    |  | Paula      | 4     |
| Malla                                   | 72    |  | Cruz      | 10    |  | Pérez      | 4     |
| Moreno                                  | 61    |  | Medrano   | 10    |  | Alvarado   | 3     |
| Jiménez                                 | 58    |  | Peláez    | 10    |  | Antonio    | 3     |
| Vargas                                  | 50    |  | Román     | 10    |  | Aparicio   | 3     |
| Reyes                                   | 40    |  | Lisado    | 9     |  | Carrasco   | 3     |
| Torres                                  | 37    |  | Contreras | 8     |  | Escudero   | 3     |
| Montoya                                 | 36    |  | González  | 8     |  | Gómez      | 3     |
| Amador                                  | 34    |  | Rojas     | 8     |  | José       | 3     |
| Rodriguez                               | 34    |  | Acosta    | 7     |  | Junquera   | 3     |
| Maldonado                               | 31    |  | Escalona  | 7     |  | López      | 3     |
| Bermúdez                                | 25    |  | Rosales   | 7     |  | Montes     | 3     |
| Campos                                  | 23    |  | Santos    | 7     |  | Nicolasa   | 3     |
| Soto                                    | 22    |  | Serrano   | 7     |  | Olivia     | 3     |
| Gálvez                                  | 20    |  | Suárez    | 7     |  | Ortiz      | 3     |
| Arroyo                                  | 19    |  | Corpas    | 6     |  | Parra      | 3     |
| Flores                                  | 19    |  | Herrera   | 6     |  | Pedregosa  | 3     |
| Monje                                   | 19    |  | Pareja    | 6     |  | Peña       | 3     |
| Castro                                  | 18    |  | Torrejón  | 6     |  | Redondo    | 3     |
| Fajardo                                 | 18    |  | Utrera    | 6     |  | Ureña      | 3     |
| Carrillo                                | 17    |  | Córdoba   | 5     |  | Albendin   | 2     |
| Carmona                                 | 16    |  | Guzmán    | 5     |  | Cabello    | 2     |
| Salazar                                 | 16    |  | Martín    | 5     |  | Caro       | 2     |
| Gorreta                                 | 15    |  | Ramos     | 5     |  | Carpio     | 2     |
| García                                  | 14    |  | Rey       | 5     |  | Carrete    | 2     |
| Romero                                  | 14    |  | Romera    | 5     |  | Catalán    | 2     |
|                                         |       |  |           |       |  | Chaves     | 2     |
|                                         |       |  |           |       |  | Concepción | 2     |
|                                         |       |  |           |       |  | Crespillo  | 2     |
|                                         |       |  |           |       |  | Cuesta     | 2     |
|                                         |       |  |           |       |  | Díaz       | 2     |
|                                         |       |  |           |       |  | Gutiérrez  | 2     |
|                                         |       |  |           |       |  | Jesús      | 2     |
|                                         |       |  |           |       |  | Manzano    | 2     |
|                                         |       |  |           |       |  | Martínez   | 2     |
|                                         |       |  |           |       |  | Moya       | 2     |
|                                         |       |  |           |       |  | Narváz     | 2     |
|                                         |       |  |           |       |  | Natera     | 2     |
|                                         |       |  |           |       |  | Navarro    | 2     |
|                                         |       |  |           |       |  | O          | 2     |
|                                         |       |  |           |       |  | Páez       | 2     |
|                                         |       |  |           |       |  | Quirós     | 2     |
|                                         |       |  |           |       |  | Ramirez    | 2     |
|                                         |       |  |           |       |  | Roque      | 2     |
|                                         |       |  |           |       |  | Saavedra   | 2     |
|                                         |       |  |           |       |  | Salguero   | 2     |
|                                         |       |  |           |       |  | Soler      | 2     |
|                                         |       |  |           |       |  | Sánchez    | 2     |
|                                         |       |  |           |       |  | Tadeo      | 2     |
|                                         |       |  |           |       |  | Tirado     | 2     |
|                                         |       |  |           |       |  | Ventura    | 2     |
|                                         |       |  |           |       |  | Ángeles    | 2     |
|                                         |       |  |           |       |  | Aguilera   | 1     |
|                                         |       |  |           |       |  | Alameda    | 1     |
|                                         |       |  |           |       |  | Albendín   | 1     |
|                                         |       |  |           |       |  | Amadis     | 1     |
|                                         |       |  |           |       |  | Amais      | 1     |

| Andalucia - Nuncas Más List of Surnames |       |             |       |              |       |            |       |
|-----------------------------------------|-------|-------------|-------|--------------|-------|------------|-------|
| Surname                                 | Count | Surname     | Count | Surname      | Count | Surname    | Count |
| Angulo                                  | 1     | Echevarria  | 1     | Machuca      | 1     | Ponce      | 1     |
| Baltasar                                | 1     | Encarnación | 1     | Magán        | 1     | Pozo       | 1     |
| Basilio                                 | 1     | Estasio     | 1     | Malla Amores | 1     | Prosel     | 1     |
| Bautista                                | 1     | Estrada     | 1     | Mallate      | 1     | Puerto     | 1     |
| Benjumea                                | 1     | Eusebio     | 1     | Manuela      | 1     | Remijo     | 1     |
| Blanco                                  | 1     | Fajarás     | 1     | Marcelo      | 1     | Rio        | 1     |
| Boca                                    | 1     | Faustino    | 1     | Masuela      | 1     | Rivera     | 1     |
| Borella                                 | 1     | Feliciana   | 1     | Mateos       | 1     | Rosario    | 1     |
| Bravo                                   | 1     | Florencia   | 1     | Matruca      | 1     | Rosaura    | 1     |
| Bustamante                              | 1     | Fuentes     | 1     | Matías       | 1     | Rueda      | 1     |
| Caballero                               | 1     | Gallardo    | 1     | Maya         | 1     | Sabino     | 1     |
| Cabezas                                 | 1     | Galvez      | 1     | Miguel       | 1     | San Martín | 1     |
| Cabrera                                 | 1     | Gil         | 1     | Montenegro   | 1     | Sandoval   | 1     |
| Camacho                                 | 1     | Gimenez     | 1     | Murciana     | 1     | Sanmartin  | 1     |
| Campano                                 | 1     | Gonzalo     | 1     | Murciano     | 1     | Santago    | 1     |
| Campo                                   | 1     | Gorrela     | 1     | Márquez      | 1     | Segundo    | 1     |
| Candelaria                              | 1     | Gregorio    | 1     | Méndez       | 1     | Serrana    | 1     |
| Capilla                                 | 1     | Guillén     | 1     | Naranjo      | 1     | Sevillano  | 1     |
| Cara                                    | 1     | Hernández   | 1     | Nunez        | 1     | Sáenz      | 1     |
| Carguero                                | 1     | Indalecia   | 1     | Oliva        | 1     | Tomasa     | 1     |
| Carmen                                  | 1     | Jerónimo    | 1     | Pacheco      | 1     | Torcuato   | 1     |
| Carrizo                                 | 1     | Josefa      | 1     | Padua        | 1     | Toro       | 1     |
| Casariche                               | 1     | Laureana    | 1     | Pastora      | 1     | Trinidad   | 1     |
| Cavaria                                 | 1     | Lendrón     | 1     | Paz          | 1     | Valdivia   | 1     |
| Ceferino                                | 1     | León        | 1     | Pedro        | 1     | Valencia   | 1     |
| Chávez                                  | 1     | Lisada      | 1     | Pichón       | 1     | Valladares | 1     |
| Cordobés                                | 1     | Lorenza     | 1     | Pineda       | 1     | Vicente    | 1     |
| Corrales                                | 1     | Lorenzo     | 1     | Pino         | 1     | Zurza      | 1     |
| Costa                                   | 1     | Lozano      | 1     | Piñeiro      | 1     |            |       |
| Dionisia                                | 1     | Lázaro      | 1     | Piñones      | 1     |            |       |
| Dolores                                 | 1     | Machica     | 1     | Polonia      | 1     |            |       |

## Aragon

| Aragon - Nuncas Más List of Surnames |       |  |            |       |  |          |       |
|--------------------------------------|-------|--|------------|-------|--|----------|-------|
| Surname                              | Count |  | Surname    | Count |  | Surname  | Count |
| Nan                                  | 207   |  | Estrada    | 3     |  | Bastiana | 1     |
| Jiménez                              | 23    |  | Leza       | 3     |  | Bejarano | 1     |
| Fernández                            | 17    |  | Saavedra   | 3     |  | Benito   | 1     |
| Garcés                               | 14    |  | Serrano    | 3     |  | Burella  | 1     |
| Hernández                            | 14    |  | Antonio    | 2     |  | Campo    | 1     |
| Malla                                | 12    |  | Aranda     | 2     |  | Casana   | 1     |
| Escudero                             | 11    |  | Campos     | 2     |  | Casanova | 1     |
| Bautista                             | 8     |  | Castellón  | 2     |  | Cordero  | 1     |
| Flores                               | 8     |  | Córdoba    | 2     |  | Frutos   | 1     |
| Salazar                              | 8     |  | Manzano    | 2     |  | Gil      | 1     |
| Gascón                               | 7     |  | Mendoza    | 2     |  | Graces   | 1     |
| Montoya                              | 6     |  | Ortiz      | 2     |  | Ignacia  | 1     |
| González                             | 5     |  | Ovejero    | 2     |  | Javiera  | 1     |
| Maldonado                            | 5     |  | Pedraza    | 2     |  | Latorre  | 1     |
| Vargas                               | 5     |  | Silva      | 2     |  | Lazcano  | 1     |
| Almaza                               | 4     |  | Torres     | 2     |  | Madrid   | 1     |
| Bustamante                           | 4     |  | Alezcano   | 1     |  | Manganil | 1     |
| Heredia                              | 4     |  | Arúe       | 1     |  | Marsela  | 1     |
| Unknown                              | 4     |  | Assin      | 1     |  | Mateo    | 1     |
| Díaz                                 | 3     |  | Bachiolina | 1     |  | Mañaría  | 1     |

## Asturias

| Asturias – Nunca Más List of Surnames |       |
|---------------------------------------|-------|
| Surname                               | Count |
| Nan                                   | 2     |
| Salazar                               | 2     |

## Cantabria

| Cantabria - Nunca Más List of Surnames |       |
|----------------------------------------|-------|
| Surname                                | Count |
| Nan                                    | 4     |
| Salazar                                | 4     |
| Cajigas                                | 2     |
| Camus                                  | 1     |
| Escudero                               | 1     |

## Castilla-y-León

| Castilla-y-León - Nuncas Más List of Surnames |       |  |           |       |  |            |       |
|-----------------------------------------------|-------|--|-----------|-------|--|------------|-------|
| Surname                                       | Count |  | Surname   | Count |  | Surname    | Count |
| Nan                                           | 142   |  | Mantilla  | 2     |  | Fuente     | 1     |
| Fernández                                     | 14    |  | Nevarés   | 2     |  | González   | 1     |
| Lozano                                        | 11    |  | Ortiz     | 2     |  | Gutiérrez  | 1     |
| Cano                                          | 8     |  | Ovejero   | 2     |  | Hurtezabal | 1     |
| Chavarría                                     | 8     |  | Prado     | 2     |  | Labardo    | 1     |
| Hernández                                     | 7     |  | Ramirez   | 2     |  | Leandro    | 1     |
| Malla                                         | 7     |  | Rodriguez | 2     |  | León       | 1     |
| Salazar                                       | 7     |  | Saavedra  | 2     |  | Lorenza    | 1     |
| Torres                                        | 6     |  | Santos    | 2     |  | Manuela    | 1     |
| Unknown                                       | 5     |  | Abaizano  | 1     |  | Meléndez   | 1     |
| Centenero                                     | 4     |  | Abarca    | 1     |  | Merino     | 1     |
| Garcia                                        | 4     |  | Alvarado  | 1     |  | Mingochea  | 1     |
| Valdivieso                                    | 4     |  | Aranda    | 1     |  | Mingoechea | 1     |
| Medina                                        | 3     |  | Arca      | 1     |  | Morcillo   | 1     |
| Santiago                                      | 3     |  | Arjona    | 1     |  | Muñoz      | 1     |
| Bustamante                                    | 2     |  | Bejarano  | 1     |  | Oses       | 1     |
| Díaz                                          | 2     |  | Cabrero   | 1     |  | Pachorruíz | 1     |
| Enríquez                                      | 2     |  | Caldera   | 1     |  | Pimentel   | 1     |
| Escobedo                                      | 2     |  | Castañón  | 1     |  | Puebla     | 1     |
| Estrada                                       | 2     |  | Castro    | 1     |  | Rivero     | 1     |
| Frutos                                        | 2     |  | Cavardo   | 1     |  | Serrano    | 1     |
| Heredia                                       | 2     |  | Centeno   | 1     |  | Sobar      | 1     |
| Jiménez                                       | 2     |  | Domínguez | 1     |  | Sánchez    | 1     |
| Maldonado                                     | 2     |  | Faraldo   | 1     |  |            |       |
| Mallén                                        | 2     |  | Fariña    | 1     |  |            |       |

## Castilla-La-Mancha

| Castilla- La – Mancha - Nuncas Más List of Surnames |       |  |           |       |  |            |       |
|-----------------------------------------------------|-------|--|-----------|-------|--|------------|-------|
| Surname                                             | Count |  | Surname   | Count |  | Surname    | Count |
| Nan                                                 | 461   |  | Rodriguez | 4     |  | Espinosa   | 1     |
| Malla                                               | 56    |  | Vicente   | 4     |  | Fermina    | 1     |
| Fernández                                           | 55    |  | Barrul    | 3     |  | Félix      | 1     |
| Montoya                                             | 44    |  | Campos    | 3     |  | Gomaliz    | 1     |
| González                                            | 43    |  | Castro    | 3     |  | Gracia     | 1     |
| Bustamante                                          | 21    |  | García    | 3     |  | Gracián    | 1     |
| Salazar                                             | 21    |  | Mendoza   | 3     |  | Iglesia    | 1     |
| Cortés                                              | 20    |  | Quirós    | 3     |  | Manuel     | 1     |
| Jiménez                                             | 19    |  | Espinar   | 2     |  | Mata       | 1     |
| Maldonado                                           | 18    |  | Flores    | 2     |  | Mendez     | 1     |
| Asensio                                             | 14    |  | Granados  | 2     |  | Montañés   | 1     |
| Castellón                                           | 14    |  | Hernández | 2     |  | Montes     | 1     |
| Navarro                                             | 14    |  | Lozano    | 2     |  | Montesinos | 1     |
| Losada                                              | 12    |  | Mandero   | 2     |  | Narciso    | 1     |
| Martínez                                            | 11    |  | Molina    | 2     |  | Nieto      | 1     |
| Vargas                                              | 11    |  | Ramirez   | 2     |  | Pacheco    | 1     |
| Unknown                                             | 10    |  | Santos    | 2     |  | Paladines  | 1     |
| Torres                                              | 9     |  | Serrano   | 2     |  | Quiteria   | 1     |
| Bermúdez                                            | 8     |  | Soto      | 2     |  | Saavedra   | 1     |
| Díaz                                                | 7     |  | Zarco     | 2     |  | Solto      | 1     |
| Moreno                                              | 7     |  | Arroyo    | 1     |  | Tejerén    | 1     |
| Peláez                                              | 7     |  | Bernadeta | 1     |  | Torre      | 1     |
| Heredia                                             | 6     |  | Buitrago  | 1     |  | Trenado    | 1     |
| Tirado                                              | 6     |  | Cano      | 1     |  | Tíscar     | 1     |
| Aragonés                                            | 5     |  | Casanova  | 1     |  | Valdes     | 1     |
| Escudero                                            | 5     |  | Cebrián   | 1     |  | Vella      | 1     |
| Galabardo                                           | 5     |  | Cruz      | 1     |  | Vicenta    | 1     |
| Ruiz                                                | 5     |  | Córdoba   | 1     |  | Álvaro     | 1     |
| Frutos                                              | 4     |  | Dios      | 1     |  |            |       |
| Palacios                                            | 4     |  | Escamilla | 1     |  |            |       |

## Cataluna

| Cataluna - Nuncas Más List of Surnames |       |  |             |       |  |             |       |
|----------------------------------------|-------|--|-------------|-------|--|-------------|-------|
| Surname                                | Count |  | Surname     | Count |  | Surname     | Count |
| Nan                                    | 641   |  | Vila        | 5     |  | Casta-N-O   | 1     |
| Jiménez                                | 106   |  | Carbonell   | 4     |  | Catalina    | 1     |
| Bautista                               | 60    |  | Casanova    | 4     |  | Contreras   | 1     |
| Pubill                                 | 54    |  | Gomís       | 4     |  | Cuchares    | 1     |
| Escuder                                | 32    |  | Grau        | 4     |  | Ditxarangui | 1     |
| Malla                                  | 26    |  | Rodriguez   | 4     |  | Esteba      | 1     |
| Pujol                                  | 22    |  | Vicens      | 4     |  | Francisca   | 1     |
| Reyes                                  | 20    |  | Barrull     | 3     |  | Geralt      | 1     |
| Castellón                              | 19    |  | Castellon   | 3     |  | Gispert     | 1     |
| Valentí                                | 19    |  | Gómez       | 3     |  | González    | 1     |
| Caragol                                | 17    |  | Locaya      | 3     |  | Joaquin     | 1     |
| Cortés                                 | 17    |  | Rodes       | 3     |  | Luca        | 1     |
| Patrach                                | 17    |  | Salvio      | 3     |  | Magdalena   | 1     |
| Escudero                               | 16    |  | Serviola    | 3     |  | Mauricia    | 1     |
| Cantarell                              | 14    |  | Aragall     | 2     |  | Miguel      | 1     |
| Gil                                    | 14    |  | Baldiri     | 2     |  | Morera      | 1     |
| Romero                                 | 14    |  | Buigas      | 2     |  | Nuria       | 1     |
| Farrer                                 | 12    |  | Díaz        | 2     |  | Onofre      | 1     |
| García                                 | 12    |  | Espinas     | 2     |  | Pascuala    | 1     |
| Hernández                              | 12    |  | Franquesa   | 2     |  | Paula       | 1     |
| Bohígas                                | 10    |  | None Listed | 2     |  | Salazar     | 1     |
| Soler                                  | 10    |  | Albarada    | 1     |  | Salvió      | 1     |
| Montoya                                | 9     |  | Alvarado    | 1     |  | Sedern      | 1     |
| Espinosa                               | 8     |  | Aragalls    | 1     |  | Tecla       | 1     |
| Castro                                 | 7     |  | Baigolina   | 1     |  | Valentín    | 1     |
| Vidal                                  | 7     |  | Baldiry     | 1     |  | Valera      | 1     |
| Ferrer                                 | 6     |  | Baruga      | 1     |  | Ventura     | 1     |
| Pagés                                  | 6     |  | Bustamante  | 1     |  | Vilara      | 1     |
| Puig                                   | 6     |  | Calmany     | 1     |  | Villa       | 1     |
| Busquet                                | 5     |  | Campa       | 1     |  |             |       |
| Gomis                                  | 5     |  | Carmona     | 1     |  |             |       |

## Exforzados

| Exforzados – Nuncas Más List of Surnames |       |  |           |       |  |
|------------------------------------------|-------|--|-----------|-------|--|
| Surname                                  | Count |  | Surname   | Count |  |
| Nan                                      | 46    |  | Caro      | 1     |  |
| Jiménez                                  | 6     |  | Cautto    | 1     |  |
| Bustamante                               | 4     |  | Clemente  | 1     |  |
| Malla                                    | 4     |  | Cortés    | 1     |  |
| Escudero                                 | 3     |  | Cruz      | 1     |  |
| Gómez                                    | 2     |  | Fernández | 1     |  |
| Núñez                                    | 2     |  | García    | 1     |  |
| Serrano                                  | 2     |  | Gil       | 1     |  |
| Antequera                                | 1     |  | González  | 1     |  |
| Baldemala                                | 1     |  | Gregorio  | 1     |  |
| Bautista                                 | 1     |  | Herbones  | 1     |  |
| Benito                                   | 1     |  | Monje     | 1     |  |
| Carbonell                                | 1     |  | Montes    | 1     |  |

## Extremadura

| Extremadura - Nuncas Más List of Surnames |       |  |            |       |  |            |       |
|-------------------------------------------|-------|--|------------|-------|--|------------|-------|
| Surname                                   | Count |  | Surname    | Count |  | Surname    | Count |
| Nan                                       | 294   |  | Concepción | 3     |  | Ayala      | 1     |
| Unknown                                   | 34    |  | Díaz       | 3     |  | Baron      | 1     |
| Jiménez                                   | 17    |  | Hernández  | 3     |  | Bejarano   | 1     |
| Silva                                     | 16    |  | Santiago   | 3     |  | Bustamante | 1     |
| Saavedra                                  | 15    |  | Torres     | 3     |  | Calderona  | 1     |
| Salazar                                   | 15    |  | Vargas     | 3     |  | Castellano | 1     |
| Malla                                     | 14    |  | Alencona   | 2     |  | Castrejón  | 1     |
| Ovejero                                   | 14    |  | Casano     | 2     |  | Cayetana   | 1     |
| Flores                                    | 12    |  | Cañizares  | 2     |  | Cordera    | 1     |
| Acosta                                    | 9     |  | Cruz       | 2     |  | Diego      | 1     |
| Navarro                                   | 7     |  | Escudero   | 2     |  | Dolores    | 1     |
| Bautista                                  | 6     |  | Fajardo    | 2     |  | Dámaso     | 1     |
| Montañés                                  | 6     |  | Micaela    | 2     |  | Francisco  | 1     |
| Quirós                                    | 6     |  | Molina     | 2     |  | Félix      | 1     |
| Velasco                                   | 6     |  | Montoya    | 2     |  | Gandulo    | 1     |
| Campos                                    | 5     |  | Moreno     | 2     |  | Garancho   | 1     |
| Cortés                                    | 5     |  | Real       | 2     |  | González   | 1     |
| Fernández                                 | 5     |  | Valiente   | 2     |  | Guairteca  | 1     |
| Heredia                                   | 5     |  | Vega       | 2     |  | Guerrero   | 1     |
| Rodríguez                                 | 5     |  | Viedma     | 2     |  | Jimena     | 1     |
| Vázquez                                   | 5     |  | "El Mundo" | 1     |  | Juan       | 1     |
| Arroyo                                    | 4     |  | Alba       | 1     |  | Leal       | 1     |
| Garcia                                    | 4     |  | Alcántara  | 1     |  | León       | 1     |
| Maldonado                                 | 4     |  | Andrade    | 1     |  | Lobato     | 1     |
| Mudarra                                   | 4     |  | Antonio    | 1     |  | Lozano     | 1     |
| Suárez                                    | 4     |  | Arenas     | 1     |  | Manganil   | 1     |

## Madrid

| Madris - Nuncas Más List of Surnames |       |  |            |       |  |          |       |
|--------------------------------------|-------|--|------------|-------|--|----------|-------|
| Surname                              | Count |  | Surname    | Count |  | Surname  | Count |
| Nan                                  | 103   |  | Páez       | 2     |  | Morales  | 1     |
| Monje                                | 18    |  | Pérez      | 2     |  | Navarro  | 1     |
| González                             | 10    |  | Ris        | 2     |  | Netana?  | 1     |
| García                               | 8     |  | Villena    | 2     |  | Orán     | 1     |
| Salazar                              | 7     |  | Alonso     | 1     |  | Plantón  | 1     |
| Bustmante                            | 5     |  | Bustamante | 1     |  | Quirós   | 1     |
| Fernández                            | 5     |  | Campos     | 1     |  | Ramírez  | 1     |
| Gómez                                | 4     |  | Canedo     | 1     |  | Ríos     | 1     |
| Jiménez                              | 4     |  | Castañeda  | 1     |  | Santiago | 1     |
| Balmala                              | 3     |  | Cruz       | 1     |  | Santos   | 1     |
| Camacho                              | 3     |  | Guadalupe  | 1     |  | Terina   | 1     |
| Maldonado                            | 3     |  | Hernández  | 1     |  | Torres   | 1     |
| Serrano                              | 3     |  | Herrera    | 1     |  | Unknown  | 1     |
| Cano                                 | 2     |  | Lorenzo    | 1     |  | Uria     | 1     |
| Gutiérrez                            | 2     |  | Mariana    | 1     |  | Vargas   | 1     |
| Moreno                               | 2     |  | Minero     | 1     |  | Vega     | 1     |

## Murcia

| Murcia - Nuncas Más List of Surnames |       |  |            |       |  |           |       |
|--------------------------------------|-------|--|------------|-------|--|-----------|-------|
| Surname                              | Count |  | Surname    | Count |  | Surname   | Count |
| Nan                                  | 599   |  | Moreno     | 8     |  | Reyes     | 2     |
| Fernández                            | 106   |  | Torres     | 7     |  | Roca      | 2     |
| Montoya                              | 89    |  | Vicente    | 7     |  | Tirado    | 2     |
| Vargas                               | 71    |  | Nieto      | 6     |  | Ayala     | 1     |
| Franco                               | 41    |  | Plantón    | 6     |  | Barrabas  | 1     |
| Salazar                              | 39    |  | Alcázar    | 5     |  | Barrios   | 1     |
| Navarro                              | 38    |  | Campos     | 5     |  | Bonete    | 1     |
| Heredia                              | 31    |  | Serrano    | 5     |  | Cabezo    | 1     |
| Leandro                              | 29    |  | Muñoz      | 4     |  | Carrillo  | 1     |
| Castro                               | 24    |  | Caballero  | 3     |  | Cortés    | 1     |
| Díaz                                 | 23    |  | Escudero   | 3     |  | Cuenca    | 1     |
| Bermúdez                             | 20    |  | Garcés     | 3     |  | Escutia   | 1     |
| Palacios                             | 20    |  | Ovejero    | 3     |  | González  | 1     |
| Bautista                             | 15    |  | Peláez     | 3     |  | Granero   | 1     |
| Redondo                              | 15    |  | Pérez      | 3     |  | Leonor    | 1     |
| Jiménez                              | 14    |  | Valenzuela | 3     |  | Lorente   | 1     |
| Salomón                              | 14    |  | Carrasco   | 2     |  | Lorenzo   | 1     |
| García                               | 13    |  | Castellón  | 2     |  | Lozano    | 1     |
| Unknown                              | 12    |  | Martínez   | 2     |  | Maldonado | 1     |
| Bustamante                           | 10    |  | Merino     | 2     |  | Malla     | 1     |
| Benete                               | 8     |  | Peña       | 2     |  |           |       |

## Navarra

| Navarra - Nuncas Más List of Surnames |       |  |           |       |  |           |       |
|---------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                               | Count |  | Surname   | Count |  | Surname   | Count |
| Nan                                   | 11    |  | Abadiano  | 1     |  | Oses      | 1     |
| Bautista                              | 5     |  | Camino    | 1     |  | Osses     | 1     |
| Arraiga                               | 4     |  | Ezcurra   | 1     |  | Trao      | 1     |
| Echeverría                            | 3     |  | Francisca | 1     |  | Urtazábal | 1     |
| Jiménez                               | 2     |  | Itúrbide  | 1     |  |           |       |

## Portugal

| Portugal - Nuncas Más List of Surnames |       |  |           |       |  |         |       |
|----------------------------------------|-------|--|-----------|-------|--|---------|-------|
| Surname                                | Count |  | Surname   | Count |  | Surname | Count |
| Nan                                    | 21    |  | Fernández | 1     |  | Ramos   | 1     |
| Carrasco                               | 2     |  | Gil       | 1     |  | Reyes   | 1     |
| Cortés                                 | 2     |  | Heredia   | 1     |  | Rojas   | 1     |
| Rodriguez                              | 2     |  | Hildago   | 1     |  | Romero  | 1     |
| Unknown                                | 2     |  | Jiménez   | 1     |  | Ruiz    | 1     |
| Valladares                             | 2     |  | Parreño   | 1     |  | Santos  | 1     |
|                                        |       |  |           |       |  | Vargas  | 1     |

## Presidios-N-Africa

| Presidios-N-Africa - Nuncas Más List of Surnames |  |       |  |           |       |
|--------------------------------------------------|--|-------|--|-----------|-------|
| Surname                                          |  | Count |  | Surname   | Count |
| Nan                                              |  | 21    |  | Garcera   | 1     |
| Cortés                                           |  | 3     |  | González  | 1     |
| Jiménez                                          |  | 3     |  | Heredia   | 1     |
| Reto                                             |  | 2     |  | Maldonado | 1     |
| Torres                                           |  | 2     |  | Moreno    | 1     |
| Carrasco                                         |  | 1     |  | Morón     | 1     |
| Fernández                                        |  | 1     |  | Reyes     | 1     |
| Flores                                           |  | 1     |  | Vargas    | 1     |

## Valencia

| Valencia - Nuncas Más List of Surnames |       |  |                   |       |  |
|----------------------------------------|-------|--|-------------------|-------|--|
| Surname                                | Count |  | Surname           | Count |  |
| Nan                                    | 541   |  | Carbonell         | 4     |  |
| Díaz                                   | 94    |  | Unknown           | 4     |  |
| Vargas                                 | 68    |  | Asensio           | 3     |  |
| Jiménez                                | 56    |  | Correa            | 3     |  |
| Palacios                               | 49    |  | Lucas             | 3     |  |
| Malla                                  | 44    |  | Ruano             | 3     |  |
| Escudero                               | 40    |  | Vincente          | 3     |  |
| Montoya                                | 36    |  | Bautista          | 2     |  |
| Bustamante                             | 35    |  | Borrull           | 2     |  |
| Salazar                                | 34    |  | Cucarella         | 2     |  |
| Castellón                              | 27    |  | Cuesta            | 2     |  |
| Hernández                              | 25    |  | Garcés            | 2     |  |
| Vicente                                | 23    |  | Heredia           | 2     |  |
| Fernández                              | 22    |  | Overjero          | 2     |  |
| Quirós                                 | 12    |  | Paula             | 2     |  |
| Bermúdez                               | 11    |  | Pérez             | 2     |  |
| Gil                                    | 10    |  | Sigüenza          | 2     |  |
| Graciano                               | 10    |  | Silvestre         | 2     |  |
| Ovejero                                | 10    |  | Albendaño         | 1     |  |
| Torres                                 | 8     |  | Almargro          | 1     |  |
| Franco                                 | 7     |  | Antonia           | 1     |  |
| Velasco                                | 7     |  | Barrabai          | 1     |  |
| Alvarado                               | 6     |  | Barrios           | 1     |  |
| Borrull                                | 6     |  | Carrillo          | 1     |  |
| Gonzalez                               | 6     |  | Castellón "Menor" | 1     |  |
| Almagro                                | 5     |  | Crespo            | 1     |  |
| Carreño                                | 5     |  | Cuesto            | 1     |  |
| Cortés                                 | 5     |  | Diego             | 1     |  |
| Leandro                                | 5     |  | Edril             | 1     |  |
| Salomón                                | 5     |  | Escuder           | 1     |  |
| Campos                                 | 4     |  | Eulalia           | 1     |  |
|                                        |       |  | Francisco         | 1     |  |
|                                        |       |  | Frenandez         | 1     |  |
|                                        |       |  | Frías             | 1     |  |
|                                        |       |  | Garcera           | 1     |  |
|                                        |       |  | Lozano            | 1     |  |
|                                        |       |  | Magdalena         | 1     |  |
|                                        |       |  | Marco             | 1     |  |
|                                        |       |  | Mariano           | 1     |  |
|                                        |       |  | Mariño            | 1     |  |
|                                        |       |  | Martín            | 1     |  |
|                                        |       |  | Montañés          | 1     |  |
|                                        |       |  | Moreno            | 1     |  |
|                                        |       |  | Navarro           | 1     |  |
|                                        |       |  | Oliver            | 1     |  |
|                                        |       |  | Onofre            | 1     |  |
|                                        |       |  | Paladines         | 1     |  |
|                                        |       |  | Paladis           | 1     |  |
|                                        |       |  | Pascual           | 1     |  |
|                                        |       |  | Raimundo          | 1     |  |
|                                        |       |  | Ramón             | 1     |  |
|                                        |       |  | Redondo           | 1     |  |
|                                        |       |  | Reyes             | 1     |  |
|                                        |       |  | Rodriguez         | 1     |  |
|                                        |       |  | Rosa              | 1     |  |
|                                        |       |  | Sigueda           | 1     |  |
|                                        |       |  | Tella             | 1     |  |
|                                        |       |  | Valentin          | 1     |  |
|                                        |       |  | Ventura           | 1     |  |
|                                        |       |  | Vicenta           | 1     |  |
|                                        |       |  | Vizcaína          | 1     |  |

## Chapter 6: Appendix B: Surnames: Nunca Más merged w Genie Milgrom db

### Andalucia

| Andalucia Surnames: Nunca Más merged with G. Milgrom Database |           |               |           |             |           |             |           |
|---------------------------------------------------------------|-----------|---------------|-----------|-------------|-----------|-------------|-----------|
| Surnam<br>e                                                   | Coun<br>t | Surname       | Coun<br>t | Surnam<br>e | Coun<br>t | Surnam<br>e | Coun<br>t |
| Acosta                                                        | 7         | Cruz          | 10        | Moreno      | 61        | Romero      | 14        |
| Angulo                                                        | 1         | Escudero      | 3         | Moya        | 2         | Rosales     | 7         |
| Antonio                                                       | 3         | Fajardo       | 18        | Muñoz       | 13        | Ruiz        | 5         |
| Aparicio                                                      | 3         | Flores        | 19        | Murciano    | 1         | Saavedra    | 2         |
| Arroyo                                                        | 19        | Fuentes       | 1         | Navarro     | 2         | Salazar     | 16        |
| Baltasar                                                      | 1         | Gallardo      | 1         | Nunez       | 1         | Sánchez     | 2         |
| Bautista                                                      | 1         | Galvez        | 1         | Núñez       | 13        | Sandoval    | 1         |
| Blanco                                                        | 1         | Gil           | 1         | Oliva       | 1         | Santiago    | 91        |
| Boca                                                          | 1         | Gimenez       | 1         | Ortiz       | 3         | Santos      | 7         |
| Bravo                                                         | 1         | Gonzalo       | 1         | Pacheco     | 1         | Serrana     | 1         |
| Caballero                                                     | 1         | Gregorio      | 1         | Padua       | 1         | Serrano     | 7         |
| Cabello                                                       | 2         | Heredia       | 91        | Pareja      | 6         | Sevillano   | 1         |
| Cabezas                                                       | 1         | Herrera       | 6         | Parra       | 3         | Soler       | 2         |
| Cabrera                                                       | 1         | Jiménez       | 58        | Paz         | 1         | Soto        | 22        |
| Camacho                                                       | 1         | Leal          | 12        | Pedro       | 1         | Tirado      | 2         |
| Campo                                                         | 1         | López         | 3         | Pineda      | 1         | Toro        | 1         |
| Campos                                                        | 23        | Lorenzo       | 1         | Ponce       | 1         | Torres      | 37        |
| Carmona                                                       | 16        | Lozano        | 1         | Pozo        | 1         | Trinidad    | 1         |
| Caro                                                          | 2         | Machuca       | 1         | Ramirez     | 2         | Valdivia    | 1         |
| Carrasco                                                      | 3         | Maldonad<br>o | 31        | Ramos       | 5         | Valencia    | 1         |
| Carrillo                                                      | 17        | Mateos        | 1         | Rey         | 5         | Vargas      | 50        |
| Castro                                                        | 18        | Miguel        | 1         | Reyes       | 40        | Vega        | 13        |
| Chaves                                                        | 2         | Molina        | 12        | Rivera      | 1         | Ventura     | 2         |
| Contreras                                                     | 8         | Montes        | 3         | Rodriguez   | 34        | Vicente     | 1         |
| Costa                                                         | 1         | Montoya       | 36        | Rojas       | 8         |             |           |

## Aragon

| Asturias Surnames: Nunca Más Merged With G. Milgrom Database |       |  |               |       |  |          |       |
|--------------------------------------------------------------|-------|--|---------------|-------|--|----------|-------|
| Surname                                                      | Count |  | Surname       | Count |  | Surname  | Count |
| Antonio                                                      | 2     |  | Jiménez       | 23    |  | Royo     | 1     |
| Aranda                                                       | 2     |  | Madrid        | 1     |  | Saavedra | 3     |
| Bautista                                                     | 8     |  | Maldonado     | 5     |  | Salazar  | 8     |
| Bejarano                                                     | 1     |  | Mateo         | 1     |  | Sanchez  | 1     |
| Benito                                                       | 1     |  | Mendoza       | 2     |  | Santiago | 1     |
| Campo                                                        | 1     |  | Miranda       | 1     |  | Santos   | 1     |
| Campos                                                       | 2     |  | Montoya       | 6     |  | Serrano  | 3     |
| Cordero                                                      | 1     |  | Moreno        | 1     |  | Silva    | 2     |
| Escudero                                                     | 11    |  | Heredia Munoz | 1     |  | Soto     | 1     |
| Flores                                                       | 8     |  | Ortiz         | 2     |  | Torre    | 1     |
| Gil                                                          | 1     |  | Real          | 1     |  | Torres   | 2     |
| Heredia                                                      | 4     |  | Rodriguez     | 1     |  | Vargas   | 5     |

## Asturias

| Asturias Surnames: Nunca Más Merged With G. Milgrom Database |       |
|--------------------------------------------------------------|-------|
| Surname                                                      | Count |
| Salazar                                                      | 2     |

## Cantabria

| Cantabria Surnames: Nunca Más Merged With G. Milgrom Database |       |
|---------------------------------------------------------------|-------|
| Surname                                                       | Count |
| Camus                                                         | 1     |
| Escudero                                                      | 1     |
| Salazar                                                       | 4     |

## Castilla-y-León

| Castilla-y-León Surnames: Nunca Más Merged With G. Milgrom Database |       |  |           |       |  |           |       |
|---------------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                             | Count |  | Surname   | Count |  | Surname   | Count |
| Abarca                                                              | 1     |  | Jiménez   | 2     |  | Rivero    | 1     |
| Aranda                                                              | 1     |  | Lozano    | 11    |  | Rodriguez | 2     |
| Bejarano                                                            | 1     |  | Maldonado | 2     |  | Saavedra  | 2     |
| Cabrero                                                             | 1     |  | Medina    | 3     |  | Salazar   | 7     |
| Caldera                                                             | 1     |  | Merino    | 1     |  | Sánchez   | 1     |
| Cano                                                                | 8     |  | Muñoz     | 1     |  | Santiago  | 3     |
| Castro                                                              | 1     |  | Ortiz     | 2     |  | Santos    | 2     |
| Fuente                                                              | 1     |  | Pimentel  | 1     |  | Serrano   | 1     |
| Garcia                                                              | 4     |  | Prado     | 2     |  | Torres    | 6     |
| Heredia                                                             | 2     |  | Ramirez   | 2     |  |           |       |

## Castilla-La-Mancha

| Castilla-y-León Surnames: Nunca Más Merged With G. Milgrom Database |       |  |            |       |  |          |       |
|---------------------------------------------------------------------|-------|--|------------|-------|--|----------|-------|
| Surname                                                             | Count |  | Surname    | Count |  | Surname  | Count |
| Arroyo                                                              | 1     |  | Maldonado  | 18    |  | Ruiz     | 5     |
| Campos                                                              | 3     |  | Manuel     | 1     |  | Saavedra | 1     |
| Cano                                                                | 1     |  | Mendez     | 1     |  | Salazar  | 21    |
| Castro                                                              | 3     |  | Mendoza    | 3     |  | Santos   | 2     |
| Cruz                                                                | 1     |  | Molina     | 2     |  | Serrano  | 2     |
| Escudero                                                            | 5     |  | Montes     | 1     |  | Soto     | 2     |
| Espinosa                                                            | 1     |  | Montesinos | 1     |  | Tirado   | 6     |
| Flores                                                              | 2     |  | Montoya    | 44    |  | Torre    | 1     |
| Gracia                                                              | 1     |  | Moreno     | 7     |  | Torres   | 9     |
| Granados                                                            | 2     |  | Navarro    | 14    |  | Valdes   | 1     |
| Heredia                                                             | 6     |  | Nieto      | 1     |  | Vargas   | 11    |
| Jiménez                                                             | 19    |  | Pacheco    | 1     |  | Vicente  | 4     |
| Losada                                                              | 12    |  | Ramirez    | 2     |  | Zarco    | 2     |
| Lozano                                                              | 2     |  | Rodriguez  | 4     |  |          |       |

## Cataluna

| Cataluna Surnames: Nunca Más Merged With G. Milgrom Database |       |  |         |       |  |           |       |
|--------------------------------------------------------------|-------|--|---------|-------|--|-----------|-------|
| Surname                                                      | Count |  | Surname | Count |  | Surname   | Count |
| Bautista                                                     | 60    |  | Ferrer  | 6     |  | Reyes     | 20    |
| Carbonell                                                    | 4     |  | Gil     | 14    |  | Rodriguez | 4     |
| Carmona                                                      | 1     |  | Grau    | 4     |  | Romero    | 14    |
| Castellon                                                    | 3     |  | Jiménez | 106   |  | Salazar   | 1     |
| Castro                                                       | 7     |  | Luca    | 1     |  | Soler     | 10    |
| Contreras                                                    | 1     |  | Miguel  | 1     |  | Valera    | 1     |
| Escudero                                                     | 16    |  | Montoya | 9     |  | Ventura   | 1     |
| Espinosa                                                     | 8     |  | Morera  | 1     |  | Vicens    | 4     |
| Esteba                                                       | 1     |  | Pujol   | 22    |  | Vidal     | 7     |

## Exforzados

| Exforzados Surnames: Nunca Más Merged With G. Milgrom Database |       |  |          |       |  |         |       |
|----------------------------------------------------------------|-------|--|----------|-------|--|---------|-------|
| Surname                                                        | Count |  | Surname  | Count |  | Surname | Count |
| Bautista                                                       | 1     |  | Gil      | 1     |  | Salas   | 1     |
| Benito                                                         | 1     |  | Gregorio | 1     |  | Salazar | 1     |
| Carbonell                                                      | 1     |  | Jiménez  | 6     |  | Serrano | 2     |
| Caro                                                           | 1     |  | Montes   | 1     |  | Varas   | 1     |
| Clemente                                                       | 1     |  | Mora     | 1     |  | Vargas  | 1     |
| Cruz                                                           | 1     |  | Núñez    | 2     |  | Vicente | 1     |
| Escudero                                                       | 3     |  |          |       |  |         |       |

## Extremadura

| Extremadura Surnames: Nunca Más Merged With G. Milgrom Database |       |  |           |       |  |           |       |
|-----------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                         | Count |  | Surname   | Count |  | Surname   | Count |
| Acosta                                                          | 9     |  | Francisco | 1     |  | Moreno    | 2     |
| Alba                                                            | 1     |  | García    | 4     |  | Navarro   | 7     |
| Andrade                                                         | 1     |  | Guerrero  | 1     |  | Real      | 2     |
| Antonio                                                         | 1     |  | Heredia   | 5     |  | Reyes     | 1     |
| Arroyo                                                          | 4     |  | Jiménez   | 17    |  | Rodríguez | 5     |
| Ayala                                                           | 1     |  | Juan      | 1     |  | Rosales   | 1     |
| Baron                                                           | 1     |  | Leal      | 1     |  | Saavedra  | 15    |
| Bautista                                                        | 6     |  | Lobato    | 1     |  | Salazar   | 15    |
| Bejarano                                                        | 1     |  | Lozano    | 1     |  | Santiago  | 3     |
| Campos                                                          | 5     |  | Maldonado | 4     |  | Santos    | 1     |
| Castellano                                                      | 1     |  | Manuel    | 1     |  | Silva     | 16    |
| Cruz                                                            | 2     |  | Marcos    | 1     |  | Torres    | 3     |
| Diego                                                           | 1     |  | Medina    | 1     |  | Vargas    | 3     |
| Escudero                                                        | 2     |  | Molina    | 2     |  | Vega      | 2     |
| Fajardo                                                         | 2     |  | Montes    | 1     |  | Velasco   | 6     |
| Flores                                                          | 12    |  | Montoya   | 2     |  | Ventura   | 1     |

## Madrid

| Madrid Surnames: Nunca Más Merged With G. Milgrom Database |       |  |           |       |  |          |       |
|------------------------------------------------------------|-------|--|-----------|-------|--|----------|-------|
| Surname                                                    | Count |  | Surname   | Count |  | Surname  | Count |
| Alonso                                                     | 1     |  | Lorenzo   | 1     |  | Santiago | 1     |
| Camacho                                                    | 3     |  | Maldonado | 3     |  | Santos   | 1     |
| Campos                                                     | 1     |  | Morales   | 1     |  | Serrano  | 3     |
| Cano                                                       | 2     |  | Moreno    | 2     |  | Torres   | 1     |
| Cruz                                                       | 1     |  | Navarro   | 1     |  | Uria     | 1     |
| Guadalupe                                                  | 1     |  | Ramirez   | 1     |  | Vargas   | 1     |
| Herrera                                                    | 1     |  | Salazar   | 7     |  | Vega     | 1     |
| Jiménez                                                    | 4     |  |           |       |  |          |       |

## Murcia

| Murcia Surnames: Nunca Más Merged With G. Milgrom Database |       |  |           |       |  |           |       |
|------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                    | Count |  | Surname   | Count |  | Surname   | Count |
| Ayala                                                      | 1     |  | Heredia   | 31    |  | Mora      | 1     |
| Barrios                                                    | 1     |  | Jiménez   | 14    |  | Moreno    | 8     |
| Bautista                                                   | 15    |  | Leonor    | 1     |  | Muñoz     | 4     |
| Caballero                                                  | 3     |  | Lorente   | 1     |  | Murcia    | 1     |
| Campos                                                     | 5     |  | Lorenzo   | 1     |  | Navarro   | 38    |
| Carrasco                                                   | 2     |  | Lozano    | 1     |  | Nieto     | 6     |
| Carrillo                                                   | 1     |  | Maldonado | 1     |  | Pinero    | 1     |
| Castro                                                     | 24    |  | Mateo     | 1     |  | Polo      | 1     |
| Cuenca                                                     | 1     |  | Mendoza   | 1     |  | Reyes     | 2     |
| Escudero                                                   | 3     |  | Merino    | 2     |  | Rodriguez | 1     |
| Franco                                                     | 41    |  | Montoya   | 89    |  |           |       |

## Navarra

| Navarra Surnames: Nunca Más Merged With G. Milgrom Database |       |         |       |
|-------------------------------------------------------------|-------|---------|-------|
| Surname                                                     | Count | Surname | Count |
| Bautista                                                    | 5     | Jiménez | 2     |

## Portugal

| Portugal Surnames: Nunca Más Merged With G. Milgrom Database |       |           |       |         |       |         |       |
|--------------------------------------------------------------|-------|-----------|-------|---------|-------|---------|-------|
| Surname                                                      | Count | Surname   | Count | Surname | Count | Surname | Count |
| Carrasco                                                     | 2     | Ramos     | 1     | Romero  | 1     |         |       |
| Gil                                                          | 1     | Reyes     | 1     | Ruiz    | 1     |         |       |
| Heredia                                                      | 1     | Rodriguez | 2     | Santos  | 1     |         |       |
| Jiménez                                                      | 1     | Rojas     | 1     | Vargas  | 1     |         |       |

## Presidios-N-Africa

| Presidios-N-Africa: Nunca Más Merged With G. Milgrom Database |       |           |       |         |       |         |       |
|---------------------------------------------------------------|-------|-----------|-------|---------|-------|---------|-------|
| Surname                                                       | Count | Surname   | Count | Surname | Count | Surname | Count |
| Carrasco                                                      | 1     | Jiménez   | 3     | Reyes   | 1     |         |       |
| Flores                                                        | 1     | Maldonado | 1     | Torres  | 2     |         |       |
| Heredia                                                       | 1     | Moreno    | 1     | Vargas  | 1     |         |       |

## Valencia

| Valencia: Nunca Más Merged With G. Milgrom Database |       |          |       |           |       |         |       |
|-----------------------------------------------------|-------|----------|-------|-----------|-------|---------|-------|
| Surname                                             | Count | Surname  | Count | Surname   | Count | Surname | Count |
| Almagro                                             | 5     | Franco   | 7     | Pascual   | 1     |         |       |
| Antonia                                             | 1     | Gil      | 10    | Reyes     | 1     |         |       |
| Barrios                                             | 1     | Gonzalez | 6     | Rodriguez | 1     |         |       |
| Bautista                                            | 2     | Graciano | 10    | Rosa      | 1     |         |       |
| Campos                                              | 4     | Heredia  | 2     | Ruano     | 3     |         |       |
| Carbonell                                           | 4     | Jiménez  | 56    | Salazar   | 34    |         |       |
| Carrillo                                            | 1     | Lozano   | 1     | Torres    | 8     |         |       |
| Correa                                              | 3     | Lucas    | 3     | Vargas    | 68    |         |       |
| Crespo                                              | 1     | Montoya  | 36    | Velasco   | 7     |         |       |
| Diego                                               | 1     | Moreno   | 1     | Ventura   | 1     |         |       |
| Escudero                                            | 40    | Navarro  | 1     | Vicente   | 23    |         |       |
| Francisco                                           | 1     | Oliver   | 1     |           |       |         |       |

## Chapter 6: Appendix C - Surnames: Nunca Más w/ extract Gypsy/Sephardic Names

### Andalucia

#### Andalucia: Nunca Más w/ extract Gypsy/Sephardic Names

| <i><b>Surname</b></i> | <b>Count</b> | <i><b>Surname</b></i> | <b>Count</b> | <i><b>Surname</b></i> | <b>Count</b> | <i><b>Surname</b></i> | <b>Count</b> |
|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|--------------|
| <i>Acosta</i>         | 7            | Cruz                  | 10           | Montoya               | 36           | Rojas                 | 8            |
| <i>Angulo</i>         | 1            | Escudero              | 3            | Moreno                | 61           | Romero                | 14           |
| <i>Antonio</i>        | 3            | Fajardo               | 18           | Moya                  | 2            | Rosales               | 7            |
| <i>Aparicio</i>       | 3            | Flores                | 19           | Murciano              | 1            | Ruiz                  | 5            |
| <i>Arroyo</i>         | 19           | Fuentes               | 1            | Muñoz                 | 13           | Saavedra              | 2            |
| <i>Baltasar</i>       | 1            | Gallardo              | 1            | Navarro               | 2            | Salazar               | 16           |
| <i>Bautista</i>       | 1            | Gallardo              | 1            | Nunez                 | 1            | Sandoval              | 1            |
| <i>Blanco</i>         | 1            | Galvez                | 1            | Núñez                 | 13           | Santiago              | 91           |
| <i>Boca</i>           | 1            | Gil                   | 1            | Oliva                 | 1            | Santos                | 7            |
| <i>Bravo</i>          | 1            | Gimenez               | 1            | Ortiz                 | 3            | Serrana               | 1            |
| <i>Caballero</i>      | 1            | Gonzalo               | 1            | Pacheco               | 1            | Serrano               | 7            |
| <i>Cabello</i>        | 2            | Gregorio              | 1            | Padua                 | 1            | Sevillano             | 1            |
| <i>Cabezas</i>        | 1            | Heredia               | 91           | Pareja                | 6            | Soler                 | 2            |
| <i>Cabrera</i>        | 1            | Herrera               | 6            | Parra                 | 3            | Soto                  | 22           |
| <i>Camacho</i>        | 1            | Jiménez               | 58           | Paz                   | 1            | Sánchez               | 2            |
| <i>Campo</i>          | 1            | Leal                  | 12           | Pedro                 | 1            | Tirado                | 2            |
| <i>Campos</i>         | 23           | Lorenzo               | 1            | Pineda                | 1            | Toro                  | 1            |
| <i>Carmona</i>        | 16           | Lozano                | 1            | Ponce                 | 1            | Torres                | 37           |
| <i>Caro</i>           | 2            | López                 | 3            | Pozo                  | 1            | Trinidad              | 1            |
| <i>Carrasco</i>       | 3            | Machuca               | 1            | Ramirez               | 2            | Valdivia              | 1            |
| <i>Carrillo</i>       | 17           | Maldonado             | 31           | Ramos                 | 5            | Valencia              | 1            |
| <i>Castro</i>         | 18           | Mateos                | 1            | Rey                   | 5            | Vargas                | 50           |
| <i>Chaves</i>         | 2            | Miguel                | 1            | Reyes                 | 40           | Vega                  | 13           |
| <i>Contreras</i>      | 8            | Molina                | 12           | Rivera                | 1            | Ventura               | 2            |
| <i>Costa</i>          | 1            | Montes                | 3            | Rodriguez             | 34           | Vicente               | 1            |

## Aragon

| Aragon: Nunca Más w/ extract Gypsy/Sephardic Names |       |  |                  |       |  |          |       |
|----------------------------------------------------|-------|--|------------------|-------|--|----------|-------|
| Surname                                            | Count |  | Surname          | Count |  | Surname  | Count |
| Antonio                                            | 2     |  | Jiménez          | 23    |  | Royo     | 1     |
| Aranda                                             | 2     |  | Madrid           | 1     |  | Saavedra | 3     |
| Bautista                                           | 8     |  | Maldonado        | 5     |  | Salazar  | 8     |
| Bejarano                                           | 1     |  | Mateo            | 1     |  | Sanchez  | 1     |
| Benito                                             | 1     |  | Mendoza          | 2     |  | Santiago | 1     |
| Campo                                              | 1     |  | Miranda          | 1     |  | Santos   | 1     |
| Campos                                             | 2     |  | Montoya          | 6     |  | Serrano  | 3     |
| Cordero                                            | 1     |  | Moreno           | 1     |  | Silva    | 2     |
| Escudero                                           | 11    |  | Heredia<br>Munoz | 1     |  | Soto     | 1     |
| Flores                                             | 8     |  | Ortiz            | 2     |  | Torre    | 1     |
| Gil                                                | 1     |  | Real             | 1     |  | Torres   | 2     |
| Heredia                                            | 4     |  | Rodriguez        | 1     |  | Vargas   | 5     |

## Asturias

| Asturias: Nunca Más w/ extract Gypsy/Sephardic Names |       |
|------------------------------------------------------|-------|
| Surname                                              | Count |
| Salazar                                              | 2     |

## Cantabria

| Cantabria: Nunca Más w/ extract Gypsy/Sephardic Names |       |
|-------------------------------------------------------|-------|
| Surname                                               | Count |
| Camus                                                 | 1     |
| Escudero                                              | 1     |
| Salazar                                               | 4     |

## Castilla-y-León

| Castilla-y-León: Nunca Más w/ extract Gypsy/Sephardic Names |       |  |           |       |  |           |       |
|-------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                     | Count |  | Surname   | Count |  | Surname   | Count |
| Abarca                                                      | 1     |  | Jiménez   | 2     |  | Rivero    | 1     |
| Aranda                                                      | 1     |  | Lozano    | 11    |  | Rodriguez | 2     |
| Bejarano                                                    | 1     |  | Maldonado | 2     |  | Saavedra  | 2     |
| Cabrero                                                     | 1     |  | Medina    | 3     |  | Salazar   | 7     |
| Caldera                                                     | 1     |  | Merino    | 1     |  | Santiago  | 3     |
| Cano                                                        | 8     |  | Muñoz     | 1     |  | Santos    | 2     |
| Castro                                                      | 1     |  | Ortiz     | 2     |  | Serrano   | 1     |
| Fuente                                                      | 1     |  | Pimentel  | 1     |  | Sánchez   | 1     |
| Garcia                                                      | 4     |  | Prado     | 2     |  | Torres    | 6     |

|         |   |  |         |   |  |  |
|---------|---|--|---------|---|--|--|
| Heredia | 2 |  | Ramirez | 2 |  |  |
|---------|---|--|---------|---|--|--|

### Castilla-La-Mancha

| Castilla-La-Mancha: Nunca Más w/ extract Gypsy/Sephardic Names |       |  |            |       |  |          |       |
|----------------------------------------------------------------|-------|--|------------|-------|--|----------|-------|
| Surname                                                        | Count |  | Surname    | Count |  | Surname  | Count |
| Arroyo                                                         | 1     |  | Maldonado  | 18    |  | Ruiz     | 5     |
| Campos                                                         | 3     |  | Manuel     | 1     |  | Saavedra | 1     |
| Cano                                                           | 1     |  | Mendez     | 1     |  | Salazar  | 21    |
| Castro                                                         | 3     |  | Mendoza    | 3     |  | Santos   | 2     |
| Cruz                                                           | 1     |  | Molina     | 2     |  | Serrano  | 2     |
| Escudero                                                       | 5     |  | Montes     | 1     |  | Soto     | 2     |
| Espinosa                                                       | 1     |  | Montesinos | 1     |  | Tirado   | 6     |
| Flores                                                         | 2     |  | Montoya    | 44    |  | Torre    | 1     |
| Gracia                                                         | 1     |  | Moreno     | 7     |  | Torres   | 9     |
| Granados                                                       | 2     |  | Navarro    | 14    |  | Valdes   | 1     |
| Heredia                                                        | 6     |  | Nieto      | 1     |  | Vargas   | 11    |
| Jiménez                                                        | 19    |  | Pacheco    | 1     |  | Vicente  | 4     |
| Losada                                                         | 12    |  | Ramirez    | 2     |  | Zarco    | 2     |
| Lozano                                                         | 2     |  | Rodriguez  | 4     |  |          |       |

### Cataluna

| Cataluna: Nunca Más w/ extract Gypsy/Sephardic Names |       |  |         |       |  |           |       |
|------------------------------------------------------|-------|--|---------|-------|--|-----------|-------|
| Surname                                              | Count |  | Surname | Count |  | Surname   | Count |
| Bautista                                             | 60    |  | Ferrer  | 6     |  | Reyes     | 20    |
| Carbonell                                            | 4     |  | Gil     | 14    |  | Rodriguez | 4     |
| Carmona                                              | 1     |  | Grau    | 4     |  | Romero    | 14    |
| Castellon                                            | 3     |  | Jiménez | 106   |  | Salazar   | 1     |
| Castro                                               | 7     |  | Luca    | 1     |  | Soler     | 10    |
| Contreras                                            | 1     |  | Miguel  | 1     |  | Valera    | 1     |
| Escudero                                             | 16    |  | Montoya | 9     |  | Ventura   | 1     |
| Espinosa                                             | 8     |  | Morera  | 1     |  | Vicens    | 4     |
| Esteba                                               | 1     |  | Pujol   | 22    |  | Vidal     | 7     |

### Exforzados

| Exforzados: Nunca Más w/ extract Gypsy/Sephardic Names |       |  |          |       |  |         |       |
|--------------------------------------------------------|-------|--|----------|-------|--|---------|-------|
| Surname                                                | Count |  | Surname  | Count |  | Surname | Count |
| Bautista                                               | 1     |  | Cruz     | 1     |  | Montes  | 1     |
| Benito                                                 | 1     |  | Escudero | 3     |  | Mora    | 1     |
| Carbonell                                              | 1     |  | Gil      | 1     |  | Núñez   | 2     |
| Caro                                                   | 1     |  | Gregorio | 1     |  | Salas   | 1     |
| Clemente                                               | 1     |  | Jiménez  | 6     |  | Salazar | 1     |
|                                                        |       |  |          |       |  |         |       |

## Extremadura

| Exremadura: Nunca Más w/ extract Gypsy/Sephardic Names |       |           |       |           |       |           |       |
|--------------------------------------------------------|-------|-----------|-------|-----------|-------|-----------|-------|
| Surname                                                | Count | Surname   | Count | Surname   | Count | Surname   | Count |
| Acosta                                                 | 9     | Diego     | 1     | Lobato    | 1     | Rodriguez | 5     |
| Alba                                                   | 1     | Escudero  | 2     | Lozano    | 1     | Rosales   | 1     |
| Andrade                                                | 1     | Fajardo   | 2     | Maldonado | 4     | Saavedra  | 15    |
| Antonio                                                | 1     | Flores    | 12    | Manuel    | 1     | Salazar   | 15    |
| Arroyo                                                 | 4     | Francisco | 1     | Marcos    | 1     | Santiago  | 3     |
| Ayala                                                  | 1     | Garcia    | 4     | Medina    | 1     | Santos    | 1     |
| Baron                                                  | 1     | Guerrero  | 1     | Molina    | 2     | Silva     | 16    |
| Bautista                                               | 6     | Heredia   | 5     | Montes    | 1     | Torres    | 3     |
| Bejarano                                               | 1     | Jiménez   | 17    | Montoya   | 2     | Vargas    | 3     |
| Campos                                                 | 5     | Juan      | 1     | Moreno    | 2     | Vega      | 2     |
| Castellano                                             | 1     | Leal      | 1     | Navarro   | 7     | Velasco   | 6     |
| Cruz                                                   | 2     | Real      | 2     | Reyes     | 1     | Ventura   | 1     |

## Madrid

| Madrid: Nunca Más w/ extract Gypsy/Sephardic Names |       |           |       |          |       |         |       |
|----------------------------------------------------|-------|-----------|-------|----------|-------|---------|-------|
| Surname                                            | Count | Surname   | Count | Surname  | Count | Surname | Count |
| Alonso                                             | 1     | Herrera   | 1     | Navarro  | 1     | Torres  | 1     |
| Camacho                                            | 3     | Jiménez   | 4     | Ramirez  | 1     | Uria    | 1     |
| Campos                                             | 1     | Lorenzo   | 1     | Salazar  | 7     | Vargas  | 1     |
| Cano                                               | 2     | Maldonado | 3     | Santiago | 1     | Vega    | 1     |
| Cruz                                               | 1     | Morales   | 1     | Santos   | 1     |         |       |
| Guadalupe                                          | 1     | Moreno    | 2     | Serrano  | 3     |         |       |

## Murcia

| Murcia: Nunca Más w/ extract Gypsy/Sephardic Names |       |           |       |            |       |  |
|----------------------------------------------------|-------|-----------|-------|------------|-------|--|
| Surname                                            | Count | Surname   | Count | Surname    | Count |  |
| Ayala                                              | 1     | Lorente   | 1     | Pinero     | 1     |  |
| Barrios                                            | 1     | Lorenzo   | 1     | Polo       | 1     |  |
| Bautista                                           | 15    | Lozano    | 1     | Reyes      | 2     |  |
| Caballero                                          | 3     | Maldonado | 1     | Rodriguez  | 1     |  |
| Campos                                             | 5     | Mateo     | 1     | Salamon    | 1     |  |
| Carrasco                                           | 2     | Mendoza   | 1     | Salazar    | 39    |  |
| Carrillo                                           | 1     | Merino    | 2     | Serrano    | 5     |  |
| Castro                                             | 24    | Montoya   | 89    | Soto       | 1     |  |
| Cuenca                                             | 1     | Mora      | 1     | Sánchez    | 1     |  |
| Escudero                                           | 3     | Moreno    | 8     | Tirado     | 2     |  |
| Franco                                             | 41    | Murcia    | 1     | Torres     | 7     |  |
| Heredia                                            | 31    | Muñoz     | 4     | Valenzuela | 3     |  |
| Jiménez                                            | 14    | Navarro   | 38    | Vargas     | 71    |  |

|        |   |       |   |         |   |
|--------|---|-------|---|---------|---|
| Leonor | 1 | Nieto | 6 | Vicente | 7 |
|--------|---|-------|---|---------|---|

## Navarra

| Navarra: Nunca Más w/ extract Gypsy/Sephardic Names |       |
|-----------------------------------------------------|-------|
| Surname                                             | Count |
| Bautista                                            | 5     |
| Jiménez                                             | 2     |

## Portugal

| Portugal: Nunca Más w/ extract Gypsy/Sephardic Names |       |           |       |         |       |
|------------------------------------------------------|-------|-----------|-------|---------|-------|
| Surname                                              | Count | Surname   | Count | Surname | Count |
| Carrasco                                             | 2     | Ramos     | 1     | Romero  | 1     |
| Gil                                                  | 1     | Reyes     | 1     | Ruiz    | 1     |
| Heredia                                              | 1     | Rodriguez | 2     | Santos  | 1     |
| Jiménez                                              | 1     | Rojas     | 1     | Vargas  | 1     |

## Presidios-N-Africa

| Presidios-N-Africa: Nunca Más w/ extract Gypsy/Sephardic Names |       |           |       |         |       |
|----------------------------------------------------------------|-------|-----------|-------|---------|-------|
| Surname                                                        | Count | Surname   | Count | Surname | Count |
| Carrasco                                                       | 1     | Jiménez   | 3     | Reyes   | 1     |
| Flores                                                         | 1     | Maldonado | 1     | Torres  | 2     |
| Heredia                                                        | 1     | Moreno    | 1     | Vargas  | 1     |

## Valencia

| Valencia: Nunca Más w/ extract Gypsy/Sephardic Names |       |           |       |          |       |           |       |         |       |
|------------------------------------------------------|-------|-----------|-------|----------|-------|-----------|-------|---------|-------|
| Surname                                              | Count | Surname   | Count | Surname  | Count | Surname   | Count | Surname | Count |
| Almagro                                              | 5     | Correa    | 3     | Gonzalez | 6     | Moreno    | 1     | Ruano   | 3     |
| Antonia                                              | 1     | Crespo    | 1     | Graciano | 10    | Navarro   | 1     | Salazar | 34    |
| Barrios                                              | 1     | Diego     | 1     | Heredia  | 2     | Oliver    | 1     | Torres  | 8     |
| Bautista                                             | 2     | Escudero  | 40    | Jiménez  | 56    | Pascual   | 1     | Vargas  | 68    |
| Campos                                               | 4     | Francisco | 1     | Lozano   | 1     | Reyes     | 1     | Velasco | 7     |
| Carbonel                                             | 4     | Franco    | 7     | Lucas    | 3     | Rodriguez | 1     | Ventura | 1     |
| Carrillo                                             | 1     | Gil       | 10    | Montoya  | 36    | Rosa      | 1     | Vicente | 23    |

## Chapter 6: Appendix D: Surnames: 1783-1985 Gypsy Census

### Andalucia

| Andalucia Surnames: 1783-1985 Gypsy Census |       |  |          |       |  |           |       |
|--------------------------------------------|-------|--|----------|-------|--|-----------|-------|
| Surname                                    | Count |  | Surname  | Count |  | Surname   | Count |
| HEREDIA                                    | 91    |  | CAMPOS   | 23    |  | NÚÑEZ     | 13    |
| SANTIAGO                                   | 91    |  | SOTO     | 22    |  | CRUZ      | 10    |
| MALLA                                      | 72    |  | FLORES   | 19    |  | CONTRERAS | 8     |
| MORENO                                     | 61    |  | MONJE    | 19    |  | GONZÁLEZ  | 8     |
| VARGAS                                     | 50    |  | CASTRO   | 18    |  | SERRANO   | 7     |
| REYES                                      | 40    |  | FAJARDO  | 18    |  | UTRERA    | 6     |
| TORRES                                     | 37    |  | CARRILLO | 17    |  | RAMOS     | 5     |
| MONTOYA                                    | 36    |  | CARMONA  | 16    |  | AMAYA     | 4     |
| AMADOR                                     | 34    |  | SALAZAR  | 16    |  | CARRASCO  | 3     |
| RODRIGUEZ                                  | 34    |  | GARCÍA   | 14    |  | ESCUDERO  | 3     |
| MALDONADO                                  | 31    |  | ROMERO   | 14    |  | GÓMEZ     | 3     |
| BERMÚDEZ                                   | 25    |  | MUÑOZ    | 13    |  | PEÑA      | 3     |

### Aragon

| Aragon Surnames: 1783-1985 Gypsy Census |       |  |            |       |  |           |
|-----------------------------------------|-------|--|------------|-------|--|-----------|
| Surname                                 | Count |  | Surname    | Count |  | Surname   |
| GARCÉS                                  | 14    |  | GONZÁLEZ   | 5     |  | CASTELLÓN |
| MALLA                                   | 12    |  | MALDONADO  | 5     |  | TORRES    |
| ESCUDERO                                | 11    |  | VARGAS     | 5     |  | MORENO    |
| BAUTISTA                                | 8     |  | BUSTAMANTE | 4     |  | RODRIGUEZ |
| FLORES                                  | 8     |  | HEREDIA    | 4     |  | SANTIAGO  |
| SALAZAR                                 | 8     |  | SERRANO    | 3     |  | SOTO      |
| MONTOYA                                 | 6     |  | CAMPOS     | 2     |  |           |

### Asturias

| Asturias Surnames: 1783-1985 Gypsy Census |       |
|-------------------------------------------|-------|
| Surname                                   | Count |
| SALAZAR                                   | 2     |

### Cantabria

| Cantabria Surnames: 1783-1985 Gypsy Census |       |
|--------------------------------------------|-------|
| Surname                                    | Count |
| SALAZAR                                    | 4     |
| ESCUDERO                                   | 1     |

## Castilla-y-León

| Castilla-y-León Surnames: 1783-1985 Gypsy Census |       |  |           |       |  |         |       |
|--------------------------------------------------|-------|--|-----------|-------|--|---------|-------|
| Surname                                          | Count |  | Surname   | Count |  | Surname | Count |
| MALLA                                            | 7     |  | HEREDIA   | 2     |  | MUÑOZ   | 1     |
| SALAZAR                                          | 7     |  | MALDONADO | 2     |  | SERRANO | 1     |
| TORRES                                           | 6     |  | RODRIGUEZ | 2     |  | SÁNCHEZ | 1     |
| SANTIAGO                                         | 3     |  | CASTRO    | 1     |  |         |       |
| BUSTAMANTE                                       | 2     |  | GONZÁLEZ  | 1     |  |         |       |

## Castilla-La-Mancha

| Castilla-La-Mancha Surnames: 1783-1985 Gypsy Census |       |  |           |       |  |           |       |
|-----------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                             | Count |  | Surname   | Count |  | Surname   | Count |
| MALLA                                               | 56    |  | CASTELLÓN | 14    |  | HEREDIA   | 6     |
| MONTOYA                                             | 44    |  | NAVARRO   | 14    |  | ESCUDERO  | 5     |
| GONZÁLEZ                                            | 43    |  | VARGAS    | 11    |  | RODRIGUEZ | 4     |
| BUSTAMANTE                                          | 21    |  | TORRES    | 9     |  | CAMPOS    | 3     |
| SALAZAR                                             | 21    |  | BERMÚDEZ  | 8     |  | CASTRO    | 3     |
| MALDONADO                                           | 18    |  | MORENO    | 7     |  | GARCÍA    | 3     |

## Cataluna

| Cataluna Surnames: 1783-1985 Gypsy Census |       |  |           |       |  |            |       |
|-------------------------------------------|-------|--|-----------|-------|--|------------|-------|
| Surname                                   | Count |  | Surname   | Count |  | Surname    | Count |
| BAUTISTA                                  | 60    |  | ROMERO    | 14    |  | GÓMEZ      | 3     |
| ESCUDER                                   | 32    |  | GARCÍA    | 12    |  | BUSTAMANTE | 1     |
| MALLA                                     | 26    |  | MONTOYA   | 9     |  | CARMONA    | 1     |
| REYES                                     | 20    |  | CASTRO    | 7     |  | CONTRERAS  | 1     |
| CASTELLÓN                                 | 19    |  | CARBONELL | 4     |  | GONZÁLEZ   | 1     |
| ESCUDERO                                  | 16    |  | RODRIGUEZ | 4     |  | SALAZAR    | 1     |

## Exforzados

| Exforzados Surnames: 1783-1985 Gypsy Census |       |  |           |       |  |          |       |
|---------------------------------------------|-------|--|-----------|-------|--|----------|-------|
| Surname                                     | Count |  | Surname   | Count |  | Surname  | Count |
| BUSTAMANTE                                  | 4     |  | SERRANO   | 2     |  | GONZÁLEZ | 1     |
| MALLA                                       | 4     |  | BAUTISTA  | 1     |  | MONJE    | 1     |
| ESCUDERO                                    | 3     |  | CARBONELL | 1     |  | SALAZAR  | 1     |
| GÓMEZ                                       | 2     |  | CRUZ      | 1     |  | VARGAS   | 1     |
| NÚÑEZ                                       | 2     |  | GARCÍA    | 1     |  |          |       |

## Extremadura

| Extremadura Surnames: 1783-1985 Gypsy Census |       |  |           |       |  |          |       |
|----------------------------------------------|-------|--|-----------|-------|--|----------|-------|
| Surname                                      | Count |  | Surname   | Count |  | Surname  | Count |
| SALAZAR                                      | 15    |  | CAMPOS    | 5     |  | TORRES   | 3     |
| MALLA                                        | 14    |  | HEREDIA   | 5     |  | VARGAS   | 3     |
| FLORES                                       | 12    |  | RODRIGUEZ | 5     |  | CRUZ     | 2     |
| NAVARRO                                      | 7     |  | MALDONADO | 4     |  | ESCUDERO | 2     |
| BAUTISTA                                     | 6     |  | SANTIAGO  | 3     |  | FAJARDO  | 2     |
|                                              |       |  |           |       |  | REYES    | 1     |
|                                              |       |  |           |       |  |          |       |

## Madrid

| Madrid Surnames: 1783-1985 Gypsy Census |       |  |           |       |  |            |       |
|-----------------------------------------|-------|--|-----------|-------|--|------------|-------|
| Surname                                 | Count |  | Surname   | Count |  | Surname    | Count |
| MONJE                                   | 18    |  | GÓMEZ     | 4     |  | MORENO     | 2     |
| GONZÁLEZ                                | 10    |  | CAMACHO   | 3     |  | BUSTAMANTE | 1     |
| GARCÍA                                  | 8     |  | MALDONADO | 3     |  | CAMPOS     | 1     |
| SALAZAR                                 | 7     |  | SERRANO   | 3     |  | CRUZ       | 1     |
|                                         |       |  |           |       |  | VARGAS     | 1     |

## Murcia

| Murcia Surnames: 1783-1985 Gypsy Census |       |  |           |       |  |           |       |
|-----------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                 | Count |  | Surname   | Count |  | Surname   | Count |
| MONTOYA                                 | 89    |  | MORENO    | 8     |  | PEÑA      | 2     |
| VARGAS                                  | 71    |  | TORRES    | 7     |  | REYES     | 2     |
| SALAZAR                                 | 39    |  | CAMPOS    | 5     |  | CARRILLO  | 1     |
| NAVARRO                                 | 38    |  | SERRANO   | 5     |  | GONZÁLEZ  | 1     |
| HEREDIA                                 | 31    |  | MUÑOZ     | 4     |  | MALDONADO | 1     |
| CASTRO                                  | 24    |  | ESCUDERO  | 3     |  | MALLA     | 1     |
| BERMÚDEZ                                | 20    |  | GARCÉS    | 3     |  | RODRIGUEZ | 1     |
| BAUTISTA                                | 15    |  | CARRASCO  | 2     |  | SOTO      | 1     |
| GARCÍA                                  | 13    |  | CASTELLÓN | 2     |  | SÁNCHEZ   | 1     |
| BUSTAMANTE                              | 10    |  |           |       |  |           |       |

## Navarra

| Navarra Surnames: 1783-1985 Gypsy Census |       |
|------------------------------------------|-------|
| Surname                                  | Count |
| BAUTISTA                                 | 5     |

## Portugal

| Portugal Surnames: 1783-1985 Gypsy Census |       |  |         |
|-------------------------------------------|-------|--|---------|
| Surname                                   | Count |  | Surname |
| CARRASCO                                  | 2     |  | REYES   |
| RODRIGUEZ                                 | 2     |  | ROMERO  |
| HEREDIA                                   | 1     |  | VARGAS  |
| RAMOS                                     | 1     |  |         |

## Presidios-N-Africa

| Presidios-N-Africa Surnames: 1783-1985 Gypsy Census |       |           |       |
|-----------------------------------------------------|-------|-----------|-------|
| Surname                                             | Count | Surname   | Count |
| TORRES                                              | 2     | MALDONADO | 1     |
| CARRASCO                                            | 1     | MORENO    | 1     |
| FLORES                                              | 1     | MORÓN     | 1     |
| GONZÁLEZ                                            | 1     | REYES     | 1     |
| HEREDIA                                             | 1     | VARGAS    | 1     |

## Valencia

| Valencia Surnames: 1783-1985 Gypsy Census |       |           |       |           |       |           |       |
|-------------------------------------------|-------|-----------|-------|-----------|-------|-----------|-------|
| Surname                                   | Count | Surname   | Count | Surname   | Count | Surname   | Count |
| VARGAS                                    | 68    | SALAZAR   | 34    | CARBONELL | 4     | ESCUDER   | 1     |
| MALLA                                     | 44    | CASTELLÓN | 27    | BAUTISTA  | 2     | MORENO    | 1     |
| ESCUDERO                                  | 40    | BERMÚDEZ  | 11    | GARCÉS    | 2     | NAVARRO   | 1     |
| MONTOYA                                   | 36    | TORRES    | 8     | HEREDIA   | 2     | REYES     | 1     |
| BUSTAMANTE                                | 35    | CAMPOS    | 4     | CARRILLO  | 1     | RODRIGUEZ | 1     |

## Chapter 6: Appendix E - Surnames: 1783-1785 merged w Genie Milgrom's DB

### Andalucia

| Andalucia Surnames: 1783-1785 merged with Genie Milgrom's Database |       |  |           |       |  |           |       |
|--------------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                            | Count |  | Surname   | Count |  | Surname   | Count |
| BAUTISTA                                                           | 1     |  | CRUZ      | 10    |  | MORENO    | 61    |
| CAMACHO                                                            | 1     |  | ESCUDERO  | 3     |  | MUÑOZ     | 13    |
| CAMPOS                                                             | 23    |  | FAJARDO   | 18    |  | NAVARRO   | 2     |
| CARMONA                                                            | 16    |  | FLORES    | 19    |  | NÚÑEZ     | 13    |
| CARRASCO                                                           | 3     |  | GALVEZ    | 1     |  | RAMOS     | 5     |
| CARRILLO                                                           | 17    |  | HEREDIA   | 91    |  | REYES     | 40    |
| CASTRO                                                             | 18    |  | MALDONADO | 31    |  | RODRIGUEZ | 34    |
| CONTRERAS                                                          | 8     |  | MONTOYA   | 36    |  | ROMERO    | 14    |
|                                                                    |       |  |           |       |  | SALAZAR   | 16    |
|                                                                    |       |  |           |       |  | SÁNCHEZ   | 2     |
|                                                                    |       |  |           |       |  | SANTIAGO  | 91    |
|                                                                    |       |  |           |       |  | SERRANO   | 7     |
|                                                                    |       |  |           |       |  | SOTO      | 22    |
|                                                                    |       |  |           |       |  | TORRES    | 37    |
|                                                                    |       |  |           |       |  | VALENCIA  | 1     |
|                                                                    |       |  |           |       |  | VARGAS    | 50    |

### Aragon

| Andalucia Surnames: 1783-1785 merged with Genie Milgrom's Database |       |  |           |       |  |          |       |
|--------------------------------------------------------------------|-------|--|-----------|-------|--|----------|-------|
| Surname                                                            | Count |  | Surname   | Count |  | Surname  | Count |
| BAUTISTA                                                           | 8     |  | MALDONADO | 5     |  | SANTIAGO | 1     |
| CAMPOS                                                             | 2     |  | MONTOYA   | 6     |  | SERRANO  | 3     |
| ESCUDERO                                                           | 11    |  | MORENO    | 1     |  | SOTO     | 1     |
| FLORES                                                             | 8     |  | RODRIGUEZ | 1     |  | TORRES   | 2     |
| HEREDIA                                                            | 4     |  | SALAZAR   | 8     |  | VARGAS   | 5     |

### Asturias

| Asturias Surnames: 1783-1785 merged with Genie Milgrom's Database |       |
|-------------------------------------------------------------------|-------|
| Surname                                                           | Count |
| SALAZAR                                                           | 2     |

### Cantabria

| Cantabria Surnames: 1783-1785 merged with Genie Milgrom's Database |       |
|--------------------------------------------------------------------|-------|
| Surname                                                            | Count |
| SALAZAR                                                            | 4     |
| ESCUDERO                                                           | 1     |

### Castilla-y-León

| Castilla-y-León Surnames: 1783-1785 merged with Genie Milgrom's Database |       |  |           |       |  |         |       |
|--------------------------------------------------------------------------|-------|--|-----------|-------|--|---------|-------|
| Surname                                                                  | Count |  | Surname   | Count |  | Surname | Count |
| MALLA                                                                    | 7     |  | HEREDIA   | 2     |  | MUÑOZ   | 1     |
| SALAZAR                                                                  | 7     |  | MALDONADO | 2     |  | SERRANO | 1     |
| TORRES                                                                   | 6     |  | RODRIGUEZ | 2     |  | SÁNCHEZ | 1     |
| SANTIAGO                                                                 | 3     |  | CASTRO    | 1     |  |         |       |

## Castilla-La-Mancha

| Castilla-La-Mancha Surnames: 1783-1785 merged with Genie Milgrom's Database |       |  |           |       |  |         |       |
|-----------------------------------------------------------------------------|-------|--|-----------|-------|--|---------|-------|
| Surname                                                                     | Count |  | Surname   | Count |  | Surname | Count |
| CAMPOS                                                                      | 3     |  | MALDONADO | 18    |  | SALAZAR | 21    |
| CASTRO                                                                      | 3     |  | MONTOYA   | 44    |  | SERRANO | 2     |
| CRUZ                                                                        | 1     |  | MORENO    | 7     |  | SOTO    | 2     |
| ESCUDERO                                                                    | 5     |  | NAVARRO   | 14    |  | TORRES  | 9     |
| FLORES                                                                      | 2     |  | RODRIGUEZ | 4     |  | VARGAS  | 11    |
| HEREDIA                                                                     | 6     |  |           |       |  |         |       |

## Cataluna

| Surnames: 1783-1785 merged with Genie Milgrom’s Database |       |  |           |       |  |           |       |
|----------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                  | Count |  | Surname   | Count |  | Surname   | Count |
| BAUTISTA                                                 | 60    |  | CONTRERAS | 1     |  | RODRIGUEZ | 4     |
| CARBONELL                                                | 4     |  | ESCUDERO  | 16    |  | ROMERO    | 14    |
| CARMONA                                                  | 1     |  | MONTOYA   | 9     |  | SALAZAR   | 1     |
| CASTRO                                                   | 7     |  | REYES     | 20    |  |           |       |

## Exforzados

| Exforzados Surnames: 1783-1785 merged with Genie Milgrom’s Database |  |       |  |         |       |
|---------------------------------------------------------------------|--|-------|--|---------|-------|
| Surname                                                             |  | Count |  | Surname | Count |
| BAUTISTA                                                            |  | 1     |  | NÚÑEZ   | 2     |
| CARBONELL                                                           |  | 1     |  | SALAZAR | 1     |
| CRUZ                                                                |  | 1     |  | SERRANO | 2     |
| ESCUDERO                                                            |  | 3     |  | VARGAS  | 1     |

## Extremadura

| Extremadura Surnames: 1783-1785 merged with Genie Milgrom’s Database |       |  |           |       |  |           |       |
|----------------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                              | Count |  | Surname   | Count |  | Surname   | Count |
| BAUTISTA                                                             | 6     |  | HEREDIA   | 5     |  | RODRIGUEZ | 5     |
| CAMPOS                                                               | 5     |  | MALDONADO | 4     |  | SALAZAR   | 15    |
| CRUZ                                                                 | 2     |  | MONTOYA   | 2     |  | SANTIAGO  | 3     |
| ESCUDERO                                                             | 2     |  | MORENO    | 2     |  | TORRES    | 3     |
| FAJARDO                                                              | 2     |  | NAVARRO   | 7     |  | VARGAS    | 3     |
| FLORES                                                               | 12    |  | REYES     | 1     |  |           |       |

## Madrid

| Madrid Surnames: 1783-1785 merged with Genie Milgrom's Database |       |  |          |       |  |         |       |
|-----------------------------------------------------------------|-------|--|----------|-------|--|---------|-------|
| Surname                                                         | Count |  | Surname  | Count |  | Surname | Count |
| CAMACHO                                                         | 3     |  | MORENO   | 2     |  | SERRANO | 3     |
| CAMPOS                                                          | 1     |  | NAVARRO  | 1     |  | TORRES  | 1     |
| CRUZ                                                            | 1     |  | SALAZAR  | 7     |  | VARGAS  | 1     |
| MALDONADO                                                       | 3     |  | SANTIAGO | 1     |  |         |       |

## Murcia

| Murcia Surnames: 1783-1785 merged with Genie Milgrom's Database |       |  |           |       |  |           |       |
|-----------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                         | Count |  | Surname   | Count |  | Surname   | Count |
| BAUTISTA                                                        | 15    |  | ESCUDERO  | 3     |  | MUÑOZ     | 4     |
| CAMPOS                                                          | 5     |  | HEREDIA   | 31    |  | NAVARRO   | 38    |
| CARRASCO                                                        | 2     |  | MALDONADO | 1     |  | REYES     | 2     |
| CARRILLO                                                        | 1     |  | MONTOYA   | 89    |  | RODRIGUEZ | 1     |
| CASTRO                                                          | 24    |  | MORENO    | 8     |  | SALAZAR   | 39    |
|                                                                 |       |  |           |       |  | VARGAS    | 71    |

## Navarra

| Navarra Surnames: 1783-1785 merged with Genie Milgrom's Database |       |
|------------------------------------------------------------------|-------|
| Surname                                                          | Count |
| BAUTISTA                                                         | 5     |

## Portugal

| Portugal Surnames: 1783-1785 merged with Genie Milgrom's Database |       |  |         |       |  |         |       |
|-------------------------------------------------------------------|-------|--|---------|-------|--|---------|-------|
| Surname                                                           | Count |  | Surname | Count |  | Surname | Count |
| CARRASCO                                                          | 2     |  | RAMOS   | 1     |  | ROMERO  | 1     |
| RODRIGUEZ                                                         | 2     |  | REYES   | 1     |  | VARGAS  | 1     |
| HEREDIA                                                           | 1     |  |         |       |  |         |       |

## Presidios-N-Africa

| Presidios-N-Africa Surnames: 1783-1785 merged with Genie Milgrom's Database |       |  |           |       |
|-----------------------------------------------------------------------------|-------|--|-----------|-------|
| Surname                                                                     | Count |  | Surname   | Count |
| TORRES                                                                      | 2     |  | MALDONADO | 1     |
| CARRASCO                                                                    | 1     |  | MORENO    | 1     |
| FLORES                                                                      | 1     |  | REYES     | 1     |
| HEREDIA                                                                     | 1     |  | VARGAS    | 1     |

## Valencia

| Valencia Surnames: 1783-1785 merged with Genie Milgrom's Database |       |  |           |       |  |           |       |
|-------------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                           | Count |  | Surname   | Count |  | Surname   | Count |
| VARGAS                                                            | 68    |  | CAMPOS    | 4     |  | MORENO    | 1     |
| ESCUDERO                                                          | 40    |  | CARBONELL | 4     |  | NAVARRO   | 1     |
| MONTOYA                                                           | 36    |  | BAUTISTA  | 2     |  | REYES     | 1     |
| SALAZAR                                                           | 34    |  | HEREDIA   | 2     |  | RODRIGUEZ | 1     |
| TORRES                                                            | 8     |  | CARRILLO  | 1     |  |           |       |

## Chapter 6: Appendix F - Surnames: 1783-1785 w extracted Gypsy/Sephardic surnames

### Andalucia

| Andalucia Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |           |       |  |           |       |
|--------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                      | Count |  | Surname   | Count |  | Surname   | Count |
| HEREDIA                                                      | 91    |  | MALDONADO | 31    |  | SALAZAR   | 16    |
| SANTIAGO                                                     | 91    |  | CAMPOS    | 23    |  | ROMERO    | 14    |
| MORENO                                                       | 61    |  | SOTO      | 22    |  | MUÑOZ     | 13    |
| VARGAS                                                       | 50    |  | FLORES    | 19    |  | NÚÑEZ     | 13    |
| REYES                                                        | 40    |  | CASTRO    | 18    |  | CRUZ      | 10    |
| TORRES                                                       | 37    |  | FAJARDO   | 18    |  | CONTRERAS | 8     |
| MONTOYA                                                      | 36    |  | CARRILLO  | 17    |  | SERRANO   | 7     |
| RODRIGUEZ                                                    | 34    |  | CARMONA   | 16    |  | RAMOS     | 5     |
|                                                              |       |  |           |       |  | VALENCIA  | 1     |

### Aragon

| Aragon Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |           |       |  |
|-----------------------------------------------------------|-------|--|-----------|-------|--|
| Surname                                                   | Count |  | Surname   | Count |  |
| ESCUADERO                                                 | 11    |  | MALDONADO | 5     |  |
| BAUTISTA                                                  | 8     |  | VARGAS    | 5     |  |
| FLORES                                                    | 8     |  | HEREDIA   | 4     |  |
| SALAZAR                                                   | 8     |  | SERRANO   | 3     |  |
| MONTOYA                                                   | 6     |  | CAMPOS    | 2     |  |
|                                                           |       |  | TORRES    | 2     |  |
|                                                           |       |  | MORENO    | 1     |  |
|                                                           |       |  | RODRIGUEZ | 1     |  |
|                                                           |       |  | SANTIAGO  | 1     |  |
|                                                           |       |  | SOTO      | 1     |  |

### Asturias

| Asturias Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |
|-------------------------------------------------------------|-------|
| Surname                                                     | Count |
| SALAZAR                                                     | 2     |

### Cantabria

| Cantabria Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |
|--------------------------------------------------------------|-------|
| Surname                                                      | Count |
| SALAZAR                                                      | 4     |
| ESCUADERO                                                    | 1     |

### Castilla-y-León

| Castilla-y-León Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |           |
|--------------------------------------------------------------------|-------|--|-----------|
| Surname                                                            | Count |  | Surname   |
| SALAZAR                                                            | 7     |  | RODRIGUEZ |
| TORRES                                                             | 6     |  | CASTRO    |
| SANTIAGO                                                           | 3     |  | MUÑOZ     |
| HEREDIA                                                            | 2     |  | SERRANO   |
| MALDONADO                                                          | 2     |  | SÁNCHEZ   |
|                                                                    |       |  | Count     |
|                                                                    |       |  | 2         |
|                                                                    |       |  | 1         |
|                                                                    |       |  | 1         |
|                                                                    |       |  | 1         |
|                                                                    |       |  | 1         |

## Castilla-La-Mancha

| Castilla-La-Mancha Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |           |       |  |         |       |
|-----------------------------------------------------------------------|-------|--|-----------|-------|--|---------|-------|
| Surname                                                               | Count |  | Surname   | Count |  | Surname | Count |
| MONTOYA                                                               | 44    |  | MORENO    | 7     |  | FLORES  | 2     |
| SALAZAR                                                               | 21    |  | HEREDIA   | 6     |  | SERRANO | 2     |
| MALDONADO                                                             | 18    |  | ESCUDERO  | 5     |  | SOTO    | 2     |
| NAVARRO                                                               | 14    |  | RODRIGUEZ | 4     |  | CRUZ    | 1     |
| VARGAS                                                                | 11    |  | CAMPOS    | 3     |  |         |       |
| TORRES                                                                | 9     |  | CASTRO    | 3     |  |         |       |

## Cataluna

| Cataluna Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |           |       |  |           |       |
|-------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                     | Count |  | Surname   | Count |  | Surname   | Count |
| BAUTISTA                                                    | 60    |  | MONTOYA   | 9     |  | CARMONA   | 1     |
| REYES                                                       | 20    |  | CASTRO    | 7     |  | CONTRERAS | 1     |
| ESCUDERO                                                    | 16    |  | CARBONELL | 4     |  | SALAZAR   | 1     |
| ROMERO                                                      | 14    |  | RODRIGUEZ | 4     |  |           |       |

## Exforzados

| Exforzados Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |          |       |  |           |       |
|---------------------------------------------------------------|-------|--|----------|-------|--|-----------|-------|
| Surname                                                       | Count |  | Surname  | Count |  | Surname   | Count |
| ESCUDERO                                                      | 3     |  | SERRANO  | 2     |  | CARBONELL | 1     |
| NÚÑEZ                                                         | 2     |  | BAUTISTA | 1     |  | CRUZ      | 1     |
|                                                               |       |  |          |       |  | VARGAS    | 1     |

## Extremadura

| Extremadura Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |           |       |  |          |       |
|----------------------------------------------------------------|-------|--|-----------|-------|--|----------|-------|
| Surname                                                        | Count |  | Surname   | Count |  | Surname  | Count |
| SALAZAR                                                        | 15    |  | RODRIGUEZ | 5     |  | ESCUDERO | 2     |
| FLORES                                                         | 12    |  | MALDONADO | 4     |  | FAJARDO  | 2     |
| NAVARRO                                                        | 7     |  | SANTIAGO  | 3     |  | MONTOYA  | 2     |
| BAUTISTA                                                       | 6     |  | TORRES    | 3     |  | MORENO   | 2     |
| CAMPOS                                                         | 5     |  | VARGAS    | 3     |  | REYES    | 1     |
| HEREDIA                                                        | 5     |  | CRUZ      | 2     |  |          |       |

## Madrid

| Madrid Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |         |       |  |          |       |
|-----------------------------------------------------------|-------|--|---------|-------|--|----------|-------|
| Surname                                                   | Count |  | Surname | Count |  | Surname  | Count |
| SALAZAR                                                   | 7     |  | SERRANO | 3     |  | CRUZ     | 1     |
| CAMACHO                                                   | 3     |  | MORENO  | 2     |  | NAVARRO  | 1     |
| MALDONADO                                                 | 3     |  | CAMPOS  | 1     |  | SANTIAGO | 1     |
|                                                           |       |  |         |       |  |          |       |

## Murcia

| Murcia Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |          |       |  |           |       |
|-----------------------------------------------------------|-------|--|----------|-------|--|-----------|-------|
| Surname                                                   | Count |  | Surname  | Count |  | Surname   | Count |
| MONTOYA                                                   | 89    |  | CASTRO   | 24    |  | SERRANO   | 5     |
| VARGAS                                                    | 71    |  | BAUTISTA | 15    |  | MUÑOZ     | 4     |
| SALAZAR                                                   | 39    |  | MORENO   | 8     |  | ESCUDERO  | 3     |
| NAVARRO                                                   | 38    |  | TORRES   | 7     |  | CARRASCO  | 2     |
| HEREDIA                                                   | 31    |  | CAMPOS   | 5     |  | REYES     | 2     |
|                                                           |       |  |          |       |  | CARRILLO  | 1     |
|                                                           |       |  |          |       |  | MALDONADO | 1     |
|                                                           |       |  |          |       |  | RODRIGUEZ | 1     |
|                                                           |       |  |          |       |  | SOTO      | 1     |
|                                                           |       |  |          |       |  | SÁNCHEZ   | 1     |

## Navarra

| Navarra Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |
|------------------------------------------------------------|-------|
| Surname                                                    | Count |
| BAUTISTA                                                   | 5     |

## Portugal

| Portugal Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |         |       |  |         |       |
|-------------------------------------------------------------|-------|--|---------|-------|--|---------|-------|
| Surname                                                     | Count |  | Surname | Count |  | Surname | Count |
| CARRASCO                                                    | 2     |  | RAMOS   | 1     |  | ROMERO  | 1     |
| RODRIGUEZ                                                   | 2     |  | REYES   | 1     |  | VARGAS  | 1     |
| HEREDIA                                                     | 1     |  |         |       |  |         |       |

## Presidios-N-Africa

| Presidios-N-Africa Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |         |       |  |           |       |
|-----------------------------------------------------------------------|-------|--|---------|-------|--|-----------|-------|
| Surname                                                               | Count |  | Surname | Count |  | Surname   | Count |
| TORRES                                                                | 2     |  | FLORES  | 1     |  | MALDONADO | 1     |
| CARRASCO                                                              | 1     |  | HEREDIA | 1     |  | MORENO    | 1     |
|                                                                       |       |  |         |       |  | VARGAS    | 1     |

## Valencia

| Valencia Surnames: 1783-1785 with extracted Gypsy/Sephardic |       |  |           |       |  |           |       |
|-------------------------------------------------------------|-------|--|-----------|-------|--|-----------|-------|
| Surname                                                     | Count |  | Surname   | Count |  | Surname   | Count |
| VARGAS                                                      | 68    |  | CAMPOS    | 4     |  | MORENO    | 1     |
| ESCUDERO                                                    | 40    |  | CARBONELL | 4     |  | NAVARRO   | 1     |
| MONTOYA                                                     | 36    |  | BAUTISTA  | 2     |  | REYES     | 1     |
| SALAZAR                                                     | 34    |  | HEREDIA   | 2     |  | RODRIGUEZ | 1     |
| TORRES                                                      | 8     |  | CARRILLO  | 1     |  |           |       |