

What is the difference between herpes type one and type two?

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By Rich Mancuso



This question has come up so often it would be impossible to keep track of how often it's been asked, and it's almost as often as people misusing the word [strain](#) instead of **type {1}** to describe their herpes. Which is a lot!!!

Before we answer this question it's important to mention a few misconceptions that people have about herpes, especially when they hear the word herpes out loud. Many people are under the assumption that herpes on **the mouth is not so bad** but **the herpes down below** is the one to fear. Nothing could be farther from the truth. The reason is because they are basically the same. So when it comes to herpes simplex, herpes is herpes.

So, what's the diff?

While it's true that there are some slight variations; genetically speaking these viruses are basically viral twins. HSV-1 and HSV-2 are nearly identical.

- They share 85% of the same matching base pairs of genes. Both HSV-1 and HSV-2 encode the same number of proteins.

- Share an identical life cycle.
- Infect the same cell types (mucosal epithelium), and are essentially the same.

However, even though they can both infect the same mucosal tissues in our bodies (anywhere on your body), in a person already infected with HSV-1, HSV-2 may have a difficult, but not impossible time resurfacing. This is especially true since most people are already infected with HSV-1 by the time they hit grade school, whereas HSV-2 is acquired later in life during sexual maturity. HSV-2 adapted the ability to infect the genital area more aggressively in order to infect a host already infected with HSV-1. This was to out-compete the immune response already established against HSV-1. It's what viruses do, they compete for survival. In the end, saying one is better than the other is silly. Herpes is herpes, regardless of its type and its location.

It's true that your personal experience with the virus ultimately depends upon your immune system's response to the very first exposure and any reoccurring episodes of symptoms. However, how HSV-1 and 2 behave can actually be measured by science.^{2}

- HSV-1 replicates much **faster** (in 18 to 20 hours) but produces a less amount of virus than HSV-2 does.
- HSV-2 is much **slower** to replicate (in 48 to 60 hours) but releases much more virus than HSV-1 can, and does more cell damage.

This is due to the competition between HSV-2 and HSV-1, (not a preference for specific regions of the body), and how HSV-2 has adapted the ability to infect another person that already has HSV-1. In the end, looking at these two viruses side by side, they are basically twins. So, whether you have Type 1 or Type 2, it doesn't really matter; your immune response to the virus does.^{3}

It is also important to note that most of the population that has been **exposed** ^{4} to herpes simplex, will not always react or see extreme symptoms. Some may never see symptoms or outbreaks at all.^{5} Most people that have a favorable immune system response may notice **something** but write it off as a pimple or just a weird rash, and will never give it a second thought...

Monkeys, Apes and Chimps, Oh My

Some scientists believe that at one time, the herpes simplex virus was a single virus. Somewhere throughout its lifetime, the virus split in two; HSV-1 into the family branch of hominids and HSV-2 into the family branch of chimps, but much later, the virus made its way back into the homo sapiens family branch.

However, there is some new science to suggest that HSV-1 was specific to the family branch; leading up to Homo sapiens), and HSV-2 was specific to the family branch; leading up to chimps. This would infer that HSV-2 was introduced to the family branch of homo sapiens from chimps much later.

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The Two Viruses That We've Had For Millions of Years

Somewhere between 3 and 1.4 million years ago, HSV-2 jumped the species barrier from African apes back into human ancestors. Probably due to the wild animal instincts of biting and butchery, thanks a million guys...

- *"The researchers compared the HSV-1 and HSV-2 gene sequences to the family tree of simplex viruses from eight monkey and ape host species. Using advanced models of molecular evolution, the scientists were able to more accurately estimate ancient viral divergence times. This approach allowed them to determine when HSV-1 and HSV-2 were introduced into humans with far more precision than standard models that do not account for natural selection over the course of viral evolution.*
- *The genetics of human and primate herpes viruses were examined to assess their similarity. It became clear that HSV-1 has been present in humans far longer than HSV-2, prompting the researchers to further investigate the origins of HSV-2 in humans.*
- *The viral family tree showed that HSV-2 was far more genetically similar to the herpes virus found in chimpanzees. This level of divergence indicated that humans must have acquired HSV-2 from an ancestor of modern chimpanzees about 1.6 million years ago, prior to the rise of modern humans roughly 200,000 years ago."*

An explanation from Dr. William Halford

Herpes is a disease manifestation that may occur at a variety of anatomic locations (e.g., mouth, eye, brain, cuticles, genitalia, buttocks, peripheral ganglia, intestines, or liver) [8-12]. The causative agents of herpetic disease are two serotypes of herpes simplex virus, HSV-1 and HSV-2, which are nearly identical viruses that encode ~75 equivalent proteins from co-linear genomes. The ~75 proteins encoded by HSV-1 and HSV-2 differ enough in their amino acid usage (epitope signatures) that the adaptive immune response to HSV-1 only partially cross-protects against HSV-2.

HSV-2 spreads faster than HSV-1 and differs enough in amino acid sequence to allow HSV-2 to superinfect HSV-1-positive individuals. HSV-2 is predominantly sexually transmitted, and thus primarily causes genital herpes. In contrast, HSV-1 is more adept at establishing infections anywhere in the body and causes a wider variety of diseases (e.g., ocular herpes, whitlow, encephalitis). Unlike past generations, young adults today are often HSV-1 seronegative when they reach adulthood; hence, HSV-1 now causes >50% of cases of genital herpes in young

women [13, 14]. Doctors have long been trained to believe HSV-1 infections predominantly occur "above the belt," but recent epidemiological data tells a different story.

About 4 billion people worldwide (it's 2019-estimates are probably closer to 5 billion), are infected with HSV-1 and/or HSV-2 [15, 16]. Every week, more than 1 million people are newly infected with HSV-1 or HSV-2 during their interactions with 4 billion carriers who often shed infectious HSV-1 or HSV-2 in the absence of symptoms [17-20].

Like many viral diseases [21], only a subset of HSV infections progress to high-level disease. About 80% of HSV infections produce no visible symptoms, and about 10% of HSV infections resolve within the first month of primary infection. The 2 - 3% of HSV-infected persons who progress to a lifetime of herpetic disease represent about ~100 million people who suffer with a chronic disease and the fear of transmitting their infection to others. Recurrent herpetic disease afflicts more people than reside in Germany, the most populous country in Europe.

Does having one type of herpes protect you from getting the other?

According to the science and the data, if you already have a pre-existing infection of HSV-2 and have never been exposed to HSV-1, the chances of you catching HSV-1 are highly improbable. In fact, some scientists have even said **"It is not possible."** However, according to the data, the opposite of this scenario seems to be true. If you have a pre-existing infection of HSV-1 and have never been exposed to HSV-2, the risk of catching HSV-2 will be present. This can also apply to being exposed to another strain of HSV-2 or HSV-1. [Info on strains here.](#)

Still, I think it's important to emphasize that this answer may never be 100% absolute within the population of seropositive individuals. An example of this (where the probability could exist), would be an individual becoming exposed to the opposite type or strain of herpes, when they have an autoimmune issue or are severely immunocompromised. But I digress...

HSV-2 provides almost complete protection from acquiring HSV-1

- *There are conflicting data concerning whether prior infections with HSV-1 or HSV-2 confer protection against acquisition of the other type. Some studies have suggested that prior infection with HSV-1 may provide partial protection against infection with HSV-2 [22-25], whereas others have suggested that prior HSV-1 infection has no effect on acquisition of HSV-2 [26, 27]. Data are consistent, however, concerning the effect of prior HSV-1 infection on the expression of disease resulting from HSV-2 infection. Strong evidence indicates that prior HSV-1 infection increases the likelihood that an infection with HSV-2 will be subclinical [22, 27, 28]. Some data also suggest that prior infection with HSV-2 can prevent infection with HSV-1 [26, 29]. [Original source](#)*

I realize that this is a great deal of scientific information to absorb so - I will officially apologize for your current headache. I hope that this information has helped you understand the differences and the similarities between HSV-1 and HSV2, and with any luck, I hope it helped you understand your diagnosis a little bit better.

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An explanation from Dr. William Halford

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"How did you get herpes? It's really quite simple. You're a human being and you're alive. Welcome to the planet."



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