

COLLABORATIVE HEALTH MODEL™ PILOT STUDY

KIPPAX PLACE APARTMENT COMMUNITY

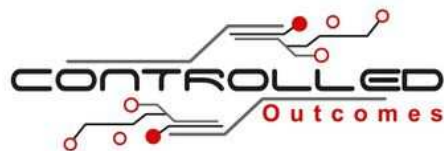
PREPARED FOR:

COMMUNITY HOUSING PARTNERS



COMMUNITY
HOUSING PARTNERS

Prepared by



Controlled Outcomes
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September 2018

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Controlled Outcomes is who we are because of who you are, because in order for a community to improve its health, residents must often face the challenge of change, change in the aspect of physical, social, organization and even political environments to reduce the factors that contribute to health problems and at the same time the community must look for new elements to improve the quality of life for all residents. We are who we are because we care about the health of our communities and the ability for all residents to have access to quality healthcare, no matter their race, creed or ethical background. We are who we are because often we are the only one standing in the room when others are fearful of or in denial about the future of our communities. We are who we are because we are more than just the data surrounding the communities, we are the residents, when they lack a strong voice to stand for right when they feel like the forgotten community, we are the beacon, the stable existence of hope. We are who we are because bottom line, we care about tomorrow and the health of our communities. We are...Controlled Outcomes.

1 Background

In 2013, then Smarttech Healthcare System began with a working agreement with The Camden Coalition (Camden, NJ), who studied the high rates of Emergency Department (ED) use and hospitalization among what they would term super-utilizers. Super-utilizers are diverse—not only in lacking health insurance and financial resources to manage their potential chronic condition, but lacking a basic understanding of the complex health care system, insurance guidelines, lack of transportation, coupled with the lack of a regular, coordinated medical and social support services—the very thing they need for stable health. Using data collected, the Camden Coalition developed hotspotters that mapped ED visits from data on patient addresses, which would, in the end, tell the story of wasteful, disorganized services and patients who utilized the ED for head colds, viral infections, ear infections, and sore throats. Counting for 80 percent of hospital cost, 20 percent of the patients accounted for 90 percent of the costs. This new data showed the Camden Coalition that change in the community's DNA could occur if they figure out how to deliver more related services that were easier for patients to use. The Camden Coalition was formed with the goal of improving the care of Camden's vulnerable populations, implementing a care model aimed at increasing coordination of services for Camden's super-utilizers. The heart of the Camden Coalition care model is a patient management program that improves the transition of super-utilizers back to outpatient care from hospital care, ensuring they continue to get the healthcare and mental health services they require—reducing the return to the hospital.

The second concept was the model created by the Methodist LeBonheur Healthcare System (Memphis, TN), which developed an innovative community, faith-based health model, with partnerships among local hospitals, church congregations, and community health centers. The objective was to spotlight that with the engagement of faith communities in collaborative partnerships health providers can not only build capacity in local communities but also map viable health assets. Working from the principles of the International Religious Health Assets Programme, this holistic health care approach was accomplished by the Congregational Health Networks (CHN), which employed “health navigators” which aligned congregations to participate in the program.

Through these volunteer liaisons, individuals and families within the CHN are connected to additional healthcare guidance and support. Working with the network means each congregation commits by entering into a “covenant” with the hospital. CHN has a coalition of nearly 400 congregations to promote public health to local communities.

Armed with a deeper understanding of the changing landscape in healthcare especially those services that impact the low-wealth, underserved, high-risk populations. Smarttech Healthcare began working with the Virginia Department of Health Crater District and their CDC-1422 grant program in the attempts to guide the community in the development of community-based prevention strategies to promote positive change by aligning multiple partners that collaborate to create lasting change in and for the population served. Smarttech Healthcare was the lead agency in aligning the technology with the grant and implementing the same in the community to promote and track change.

In 2016, Smarttech Healthcare transformed from the single application of technology to an organization that with additional collaboration, taking the preeminent practices from the Camden Coalition and Methodist Healthcare to establish the Collaborative Health Model™. Focusing on faith, health care, and the community, introducing statistics and multi-sector, equity-focused

place-based amenities to propel the alteration of community's DNA to support the healthy sustainable revolution. The new approach proposed Controlled Outcomes. With the innovative concentration on the collaboration of health care, faith, and community, Controlled Outcomes established numerous Memorandums of Agreements with community partners, faith-based groups with one single goal - the transformation the DNA of a community in despondency.

Overarching goals of the Collaborative Health Model™ and the work that is performed by the partners is to prevent re-admission, better management of charity care by the local hospitals, and improve health care scores. By navigating to more appropriate care levels, to move beyond necessary requirements for community health needs assessment that also provides high standards of care to vulnerable populations while remaining solvent in the challenges of health care reform. The approach used to ensure that residents of Hopewell received the quality of care was a hybrid of case management and patient advocates or navigators. With a dedicated nursing team, social workers and telehealth physicians Controlled Outcomes would be able to monitor the daily health outcomes of each resident under their mission.

Controlled Outcomes is a General member of Patient-Centered Primary Care Collaborative, several of the team members are members of the National Association of Healthcare Advocacy Consultants, Professional Patient Advocate Institute, as well as holders of the Commission for Case Manager Certifications.

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2 Executive Summary

The purpose of the pilot study was to determine the status of the residents of 100 South Kippax Street, known as Kippax Place Apartment (KPA), in Hopewell, Virginia. This report identifies environmental concerns potentially affecting health, healthcare findings for the community of residents, healthcare challenges, and consequences to address health concerns.

2.1 Purpose

The American health-care system is both exhilarating and exasperating. Being staffed by exceptional people who have chosen careers to provide care, comfort and cure to others, who are well educated, well trained, and have the best science and technology at their disposal, one's expectations should be tempered. It is the access to care, often with costs that are prohibited for the individual that makes the reality far from what one would expect. In addition, when care can be provided, at reduced, or no cost, often things go wrong for the individual seeking medical attention. A study from the Institute of Medicine stated that up to 98,000 of the 33 million people hospitalized each year die or succumb to infections because of the mismanagement of care. It is estimated that five to ten times as many patients are injured through mismanaged care. These figures do not extend beyond acute care, nor do they include the waste of time, money, and other resources. The total damage is undoubtedly astronomical. It is also demonstrably avoidable (Spear, 2010).

With the increased sophistication of medical science and the consequent complexity of medical treatment, require more sophisticated approaches to management. Even in a controlled environment, the management of care can break down catastrophically. Then there is the world outside the walls of the hospital, which is where most chronic care management occurs, such as the treatment for asthma, diabetes, heart disease, hypertension, and depression. These conditions create situations, where it becomes harder to put together the pieces of expertise into an active holistic system (Spear, 2010).

While primary preventive care allows people without significant illnesses to remain healthy, those with diseases that cannot be cured have to have management options to improve their quality of life, all while avoiding expensive, and often-ineffective acute (hospital) care.

In reality, our health-care system often undermines primary care and is therefore hard on patients and providers alike. Patients have trouble gaining access to practice in many areas, and primary-care doctors work long hours for far less pay than a specialist such as dermatologists and plastic surgeons. Part of the cost of poor-quality health care is the toll that working in broken systems takes on doctors, nurses, pharmacists, technicians, aides, administrators, and other.

Controlled Outcomes and the Collaborative Health Model™ is a non-institutional, non-profit collective of healthcare professionals with the focus of fostering community health among vulnerable populations in the Greater Hopewell, Virginia Area.

The goal of the Collaborative Health Model™ is to (1) switch from managing functions in isolation to regulating the provision of care as a coherent, integrated start-to-finish process. (2) Switch from making do when problems are discovered to designing work, to attack the issues immediately, involving those impacted by the issues, to work on solving the problem, all the while improving their quality of life.

Controlled Outcomes recognizes that poor health is not evenly distributed within the Tri-Cities area: African Americans, Hispanics, low wealth and the under/unemployed populations influence

the public health environment, more than the majority of the population. To overcome these disparities, society and especially those working in healthcare, must recognize and adopt the socio-political determinants of health. In deep dive examinations of areas such as environmental pollution, inadequate public investment in education, the scarcity of affordable housing, coupled with the scarcity of access to primary care must take place to overcome the insufficient situations that this vulnerable population faces.

As medical professionals and para-professionals, we must be committed to supporting – through direct action, public outreach, and political advocacy – underserved communities who are struggling to remove the structural barriers to improved community health status.

Using the tagline – "we are the health department on steroids", Controlled Outcomes understands that quality healthcare is more than access to healthy food and healthcare services, but realizes that communities must have the following to exist:

- Economic justice - Low wealth is the most significant risk factor for adverse health alterations. A community that cannot afford healthy food, or that lacks access to quality healthcare or safe, good jobs and housing, will never indeed be healthy.
- Community engagement and enfranchisement - Knowing the rights of the members of the community, as well as identifying, articulating and being empowered to advocate for their group interests, as well as their own personal interests are elements of a healthy community.
- Education - Residents of all ages are provided access to lifelong learning opportunities that allow them the ability to embrace the world around them and advance themselves and the communities they live in economically, spiritually and socially, this is a quality of a health community.
- Safety - Healthy communities have high Popsicle index ratings and do not struggle with issues such as domestic violence, gang violence, or drug-related crimes. Controlled Outcomes believes that communities must be empowered to work together to secure their ability to live together without fear.
- Advocacy - Often, low wealth community health is the product of public policies that are reactionary, rather than evidence-based, and which result in the structural oppression of specific subsets of the population. Controlled Outcomes promotes evidence-based solutions to public health challenges.

2.2 Approach to Collaborative Health Model™

Health care analysis is unique, in structure, management style, and its overall unpredictability because of the human nature of the mission. As such, traditional methods of project management do not fit well when incorporated into healthcare models. As such, Controlled Outcomes used a hybrid agile model to guide the project. The Agile Life Cycle looks at the same operational elements of a traditional model but aided Controlled Outcomes with the unpredictability elements.

The key elements of this model are:

- Define - Stakeholder analysis; requirements gathering & elicitation; problem definition; question design; expected benefits

- Identify - Data extraction; data integration; data transformation
- Explore - Explore data breadth & depth; find data relationships; document dataset culture; generate descriptive statistics
- Analyze - Statistical analysis; identify enrichment options
- Present - Data visualization; results presentation; ROI calculation; documentation
- Operationalization - Embed into the workflow; end-user training; maintenance; returning and improvement

Time is the all-encompassing concern that must be addressed when you work to modify health care in a community. Health care is not a vehicle that can be modified in one or two years, to see sustainable change, time invested should be open-ended. Notwithstanding the financial burden, this approach must have, at least three to five years to truly measure the ability for modifying a community's health DNA.

2.3 Overview of the Collaborative Health Model™ Analysis Process

2.3.1 Conduct the Analysis

Beginning with a comprehensive health assessment of the residents, a community-based assessment, detailed examination of fire/rescue calls, Emergency Department (ED) visits, admission information for local hospitals, claims data from hospitals and CMS, environmental assessments, as well as consults with primary care physician for the residents was conducted over a one-year period to start the process to changing the community DNA.

This pilot study looked to eliminate the opinions or anecdotal observations that are often false flags of information regarding a community and its residents; instead, the study focused on the analytic data available, both from human intervention and electronic data sources. The analysis was a four-step process:

1. Develop the tool.
2. Collect the data.
3. Analyze the data.
4. Develop recommendations.

2.3.2 Community-Claims Analysis (C²A)

This step consisted of the primary area of analysis:

1. Perform a Community-Claims Analysis (C²A). The C²A is the systematic collection and study of health and demographic data, claims data, study findings and other contextual information to identify and understand the specific health issue to be addressed. It examines the status of the health issues from both the standpoint of the individual being interviewed, as well as claims data for the individual. Internal of the personal interview is an understanding of the social, economic, and health context in which the health issues exists, with the goal of developing health and behavior change programs for the community. A complete C²A focuses on four elements:

- The dilemma, its gravity, and its origins.

- The individuals affected by the dilemma (conceivable audiences).
 - The extensive milieu in which the dilemma occurs.
 - Components are constraining or enabling behavior modification.
2. The C²A also defines the population, which in turn establishes the treatment and programs management requirements to meet the needs of the population. Health care indicators were used to gain a quantitative measure in an organized effort to assemble and disseminate a group of data that together would tell a story about the community and progress of the residents. Data Scientists, epidemiologists, physicians, nurses along with other stakeholders, validate the process for determining the indicators, as well as the indexes.
 3. At the start of the program, Controlled Outcomes conducted a building-wide collection of health assessments on the residents occupying the complex. At the time, 80 residents were living in the building. The data collected was transferred to the C²A for analysis. 53.75% of the building was captured, completing the assessment, with the remaining population declining the invitation to be a part of the pilot study.

2.3.3 Data Analysis

In this step, data collected undergoes additional organization and analysis. This step consisted of two validation processes:

1. Validate the data. After the individual health assessments were conducted, requests were made to (1) the attending physicians/primary care providers for each consenting resident and (2) CMS claims data repository. Healthcare records were uploaded to an analytics platform to build a comprehensive analysis of current health conditions across the community. This data would be used later to compare the KPA community to the City of Hopewell and the Commonwealth of Virginia health conditions.
2. Align data with resident input. Using the analytic platform, the information from resident assessments was analyzed against information received from both the PCP and CMS. During this crosswalk, the data was aligned with various key points to determine trends and establish benchmarks in the community that needed to be addressed immediately by the teams.

3 Community DNA – Connect, Grow, Serve

In the field of science, DNA is a molecule that carries the genetic instructions used in the growth, development, functioning, and reproduction of all known living organisms and many viruses. DNA stores biological information. The DNA backbone is resistant to cleavage, and both strands of the double-stranded structure store the same biological information. This information is replicated as and when the two strands separate.

In a Strategy+Business article, Gary Neilson, Bruce A. Pasternack, and Decio Mendes state that the four DNA bases for a community are its structure, decision rights, motivating factors, and information (Neilson, Pasternack, & Mendes, 2003). A community's ability to be innovative can also be described as being part of the community's DNA. Paraphrasing from the book, *Corporate Culture: The Ultimate Strategic Asset*, Eric Flamholtz, and Yvonne Randle state that community's culture is "transmitted to generations of residents" via that community's DNA, and that the DNA of the culture of the community is established "during its initial stages" reflecting the "personal and professional values" of the founders. Researchers also state that a community's DNA can be "changed through the arrival of new people with innovative thinking (Flamholtz & Randle, 2011)."

A community is not different from a human being; it is a living, breathing body. It grows changes and responds to a variety of outside factors. Every community, no matter the proportions, stage, or form has a distinct DNA, the internal genetic code that carries all the data about how the community will look and function. In a 1997 book, Gareth Morgan defined the community DNA metaphor as the "visions, values, and a sense of purpose that bind a community together" to permit individuals to "comprehend and engross the task and encounter of the entire initiative (Morgan, 1998)". Every community has its unique character that is expressed in its people, and the culture of the community's the social order. It is not unsuitable to recommend the representation that a community, like every living thing, has a genetic code, or a DNA structure.

In a healthy body, cells are tightly connected forming flesh, bones, and blood, and enclosed in an envelope of skin that creates a distinct whole, identifiable as a human being. Every cell is cognizant of neighboring cells and functions not as an independent unit but as a part of an integrated ensemble. In a healthy community, the same holds true, individuals similar in age, religion, backgrounds, and lifestyles are connected to one another. Internal of KPA there exists an identifiable commonality among the residents, functional cells and bad cells, a fabric of the community that in this case needs the development of new growth to continue its existence, as well as to squeeze out the bad cells, or if nothing better to convert them into functional cells.

For a community to remain healthy, it must maintain the correct functional relationships between public-private partnerships, schools, retail and commercial businesses, governmental agencies and so forth. No single entity can expand, close down unilaterally, or be underdeveloped at the expense of the other community members without risk to the continued health of the whole community. A healthy community is one in which finely tuned mechanisms exist for recognizing the needs of every individual, and group, and for responding appropriately to those needs. In other words, a community in which social interaction and a sense of communal are very well developed where individuals monitor the wellbeing of their neighbors and acquaintances, and where individuals take responsibility for each other.

4 Healthcare Divide

Dr. Martin Luther King Jr. claimed, “segregation is the adultery of illicit intercourse between injustice and immorality.” Dr. King and his language during conversation in the 1960s was far more eloquent than our government officials of then and now. In American today, our society is plagued with a two-party system of healthcare – a divide has grown vast and deep when one looks at the current condition our communities are facing when we address the health care needs of our citizens. The ultimate goal should be to end the de facto segregation of health care we have now under private insurers and replace it with health care for all Americans, no matter race, home address, or the type of insurance one carries.

Slow to respond, the United States is behind other industrialized nations with health measures – partly because citizens of individual races, ethnicities, and incomes experience more mediocre versions of United States health care than others. One reason the United States ranks so poorly globally is that health outcomes for specific racial, ethnic, and socioeconomic groups fare so poorly domestically. African-Americans, Latinos and the economically disadvantaged experience poorer health care access and lower quality of care than Caucasian Americans. In addition, in most measures, that gap is growing. A 2014 Robert Wood Johnson Foundation report found that one's health care is directly related to who you are. The two most significant factors that influence a resident's chances of receiving specific healthcare is race and ethnicity. A third is the quality of one's health insurance. The foundation estimates a 30 to 40 percent difference in health outcomes between people of color and Caucasian Americans. This leads not only to poor health outcomes but also to increased cost associated with lost productivity, estimated at \$60 billion, among our society.

Further this with studies (National Healthcare Disparities Report, 2014) showing that Latinos and low-wealth individuals have a higher level of difficulty in getting the care they need, compared to Caucasian Americans and high-income earners.

In low-wealth communities, residents undergo limb amputation resulting from diabetes complications are ten times more likely than residents in affluent areas. The rate of hospitalization from diabetes complications for African American resident is three times higher than Caucasians, and for Latinos, the rate is two times higher than Caucasian Americans.

African American women have a 50 percent greater risk of dying from breast cancer than Caucasian women, with screening and treatment inequities stemming from race and economic status. Only 60 percent of low wealth women are screened for compared to 80 percent of high-wealth women. But even when the playing fields are leveled, Caucasian women from the same economic stratum as African Americans and Latino women have higher screening rates.

Heart attack, heart disease, and stroke data bears the similar outcomes. Over 25 percent of the African American population has elevated blood pressure compared to 10 percent of Caucasian Americans, notwithstanding the fact that African Americans are screened for high cholesterol at a rate of 10 percent less than Caucasian Americans. The outcomes from this lack of care, means higher rates of heart failure and strokes in the African American communities.

As mentioned earlier, the quality and overall availability of health insurance plays a significant role in the quality and access to medical care in this country. Lack of health insurance notwithstanding, other factors contribute to the disparity of health in this country. Hospital and medical professionals' conscious and unconscious bias, the existence of food deserts in our communities and the community-wide lack of quality healthcare.

When confronted with issues such as these that are multifaceted, the solutions must also be multifaceted. To this end, there needs to be creative solutions, at the community level and not the wait and see mentality that has gotten us to the point in healthcare for the low-wealth populations.

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5 Integrating Health, Housing, and Support

While age-friendly communities, also called “communities for a lifetime”, have expanded recently, they generally have not focused on low-wealth populations. Especially when it comes to the lack of attention to social determinants of health as it relates to our low-wealth communities. Because of the lack of economic power, stemming from poor income, poor education and being in poor housing conditions, we have a void when caring for those individuals in pockets of our communities. Not until recently did several large-scale redevelopment and housing authorities take notice that health has a direct relationship to housing. The example often given is the individual who spend more on healthcare needs and then is unable to provide from their basic needs, such as rent and food. It is a cycle that once started is difficult to break. In order to be success in managing the concept of health and housing, the approach must take a case management theory as well as rental subsidies. By providing on-site healthcare, social services, and community-based activities, there then exists the potential for residents to stay healthy in their homes and avoid hospitalization and nursing home admissions. However, this concept does not come without a cost. And organizations across the country that provide affordable housing do so on restricted budgets that often don't have line items for such services as part-time social workers, nurses, care partners or other professionals to be on site seven days a week. Enter the concept of pay for performance. Pay for performance motivates providers of services to take the whole-person approach that includes addressing the social determinants of health.

Controlled Outcomes has built programs that address the goals of the concept of pay for performance, these include the promotion of optimal health and social services by increasing access to health and social services, and reducing health care cost associated with ED use and other high-cost health services. Improving the access to long-term supports and services, at the same time delaying inasmuch as possible nursing home admissions. And improving resident quality of life. In applying this model, Controlled Outcomes has successfully reached the first milestone in the pay for performance concept. The next step is the measuring of the impact that the new programs has provided the residents and approaching local healthcare providers and insurance companies to solicit a review of the outcomes and propose the pay for performance program for the residents of the KPA.

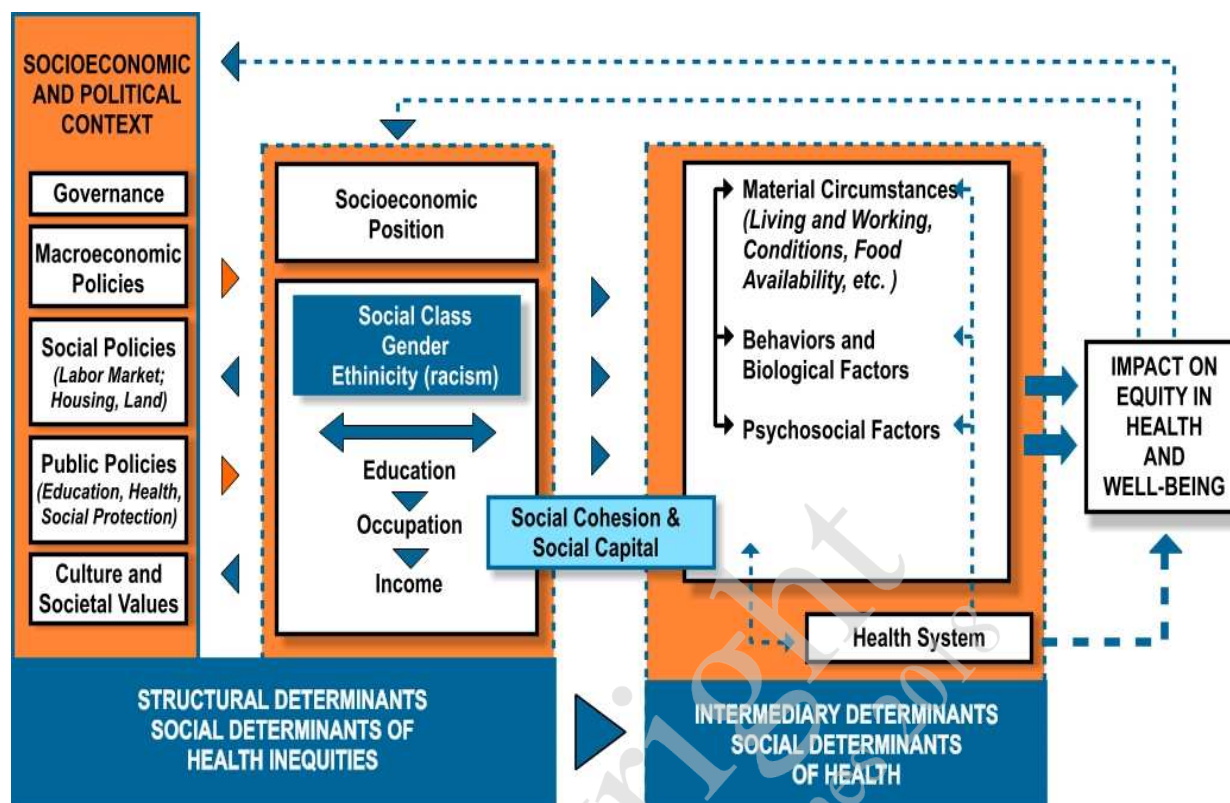


Figure 1: Determinants of Healthcare

In order for any type of pay for performance program to be successful at KPA, there must be a change to the DNA of the community. Controlled Outcomes looks to focus on two concepts – improvements to the length of life and quality of life. Controlled Outcomes worked on the factors that are bronze in color to drive both of the elements mentioned above for the residents of KPA. With enhancements being made to the housing condition for the residents by Community Housing Partners, bringing a circa 1970 multistory apartment building that had been neglected by both the City of Hopewell and Hopewell Redevelopment and Housing Authority, not out of malice, but because of shrinking budgets that all but prohibited the agency from making much-needed augmentations to the building, the primary phase of refining health outcomes was proceeding.

The immediate action plan was to address nine critical elements – air and water quality; community safety; family and social support; education; quality of care; access to care; alcohol and drug use; diet and exercise and finally tobacco use. Basically, taking a page from lifestyle medicine, that looks to prevent and treat chronic disorders caused by lifestyle factors such as nutrition, physical inactivity and stress, using an evidence-based approach which focuses on whole food, plant-based diets, regular physical activity, adequate sleep, stress management, avoidance of risky substance use, and other non-drug modalities with the goal of reversing the current chronic conditions that present with so many of the residents of KPA.

The primary goal that Controlled Outcomes looked to attenuate was based on the current pandemic – Type 2 diabetes, from both prevention and managing aspect. Teaming with care

partners in the immediate area, we aligned ourselves to work with professionals in addressing the six highest health-related factors impacting the KPA residents – cancer, osteoporosis, obesity, type 2 diabetes, heart disease and hypertension.

Some element of the current lifestyle that the residents from KPA face can often be tied back to an organic element impacting their community. Air, water, soil, and crime all play a part in the lifestyle of the residents. When we control certain aspect of the environment, as well as the lifestyle of the individual we can start to see improvements in the quality of life.

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6 High Demand - Special Needs Populations

The increasing older population growth has implications for the US health care system and for those who provide services such as housing to these special needs, high demand population. Adults older than 65 years account for one-third of the population at KPA, many who often experience progressively declining health and many comorbidities. Dealing with the full range of health status in older adult residents is challenging for any service provider without proper training. In most cases, the average Resident Services Coordinator will only provide non-clinical case management and referral service to the residents, which includes securing and coordinating a range of social services and transportation services, where transportation is available, as needed by individual residents. The lack of clinical case management puts the Resident Service Coordinator at a severe disadvantage to gauging and evaluating the progressing clinical needs of the residents and engaging with the appropriate clinical team members to provide higher level care to the KPA high demand, special need population.

To accurately assess and manage an older adult resident across the living continuum, Controlled Outcomes recognized pathophysiological changes that occur with aging. The course of aging varies from individual to individual and is related to each person's unique constellation of genetic, social, psychological, and economic factors. Controlled Outcomes clinical team has a clear understanding of the differences between age-related changes and changes that may be pathological in nature.

In examining the residents at KPA, Controlled Outcomes' clinical team has noted among the KPA residents include the following issues which warrant the classification of high demands, special needs population.

Changes occur in the hypothalamus, reticular formation, and sensory organs. The hypothalamus regulates body temperature less efficiently, making older residents susceptible to temperature extremes, which may result in hypothermia more easily. Sleep disorders are common and result from alterations in the sleep-wake cycle, circadian rhythm, and homeostatic factors affecting sleep regulation. Sensory organs become less efficient. Visual acuity is altered; elasticity of the lens of the eyes is altered, causing an inability to accommodate adequately visually. The visual field narrows, making peripheral vision more difficult. The pupil becomes less responsive to light because the pupil sphincter hardens while pupil size and rods decrease. Consequently, the threshold for light perception increases, making night vision difficult. Hearing loss becomes progressive as a result of age-related changes to the inner ear. Degeneration of the vestibular structures contributes to a loss of equilibrium and balance. Tactile sensation is reduced, with older persons less able to sense pressure, pain, and temperature.

Heart disease is the leader in cause of death in the United States, it is the second leading cause of death in the Commonwealth of Virginia and 18th leading cause of death in the City of Hopewell, accounting for more than 40% of deaths in patients older than 65 years (Go, Mozaffarian, & Roger, 2016). Aging alters the cardiovascular system both physiologically and structurally. Degenerative changes affect the anatomical, histological, physiological, and electrophysiological performance of the heart. Myocytes are progressively lost, and myocardial collagen is increased. Thus, the heart muscle loses efficiency and contractile strength and cardiac output decreases.

Age-related changes in structure and function, along with the presence of chronic disease, affect the respiratory function of the lungs which is then less able to defend against illness. Structural changes in the chest make it difficult for some residents to ventilate. Consequently, these residents often use accessory muscles to breathe. There is blunting of a cough and laryngeal reflexes. The number of cilia in the lungs decreases, the bronchial mucous gland hypertrophies, and the ability to expel pooled mucous and debris declines. Pooling of secretions along with decreased immunoglobulin A (IgA) levels put residents at higher risk for developing pneumonia (Nagappan & Parkin, 2003).

The aging process alters the gastrointestinal tract at all points. Residents report decreased feelings of hunger and increased feelings of satiety, suggesting that satiety hormones increase with advancing age while the hunger hormone, ghrelin, decreases. Residents frequently report altered swallowing caused by oropharyngeal dysmotility. Decreased esophageal motility can be attributed to degenerative muscular changes. Age-related changes in the stomach include gastric mucosa atrophy, decreased gastric acid and digestive enzyme secretion, and reduced motility (Grassi, Petraccia, & Mennuni, 2011).

The kidney is impacted by several changes - both structural and functional both caused by reduced renal blood flow and a progressive decrease in glomerular filtration rate (GFR). By age 80 years, renal blood flow decreases 50% because of the combined effects of decreased renal tubular mass and atrophied arterioles. Also, residents present with a higher likelihood of dehydration because of their inability to compensate for a nonrenal loss of sodium and water. The GFR decreases by approximately 45% by age 85 years. A decreased GFR can affect the older adult resident's ability to metabolize medications cleared by the kidneys and affects medication half-life. Bladder changes occur with age and contribute to the development of urinary frequency, urgency, and nocturia. Bladder muscles weaken and bladder capacity decreases, making bladder emptying more difficult. More substantial amounts of urine are retained, and the urination reflex is delayed, resulting in stress incontinence.

Aging affects the musculoskeletal system, with changes beginning at age 30 years. A musculoskeletal phenomenon associated with aging is senile sarcopenia, the loss of muscle mass. Senile sarcopenia is a primary cause of muscle weakness and reduced locomotor activity. Neuropathic processes; nutritional, hormonal, and immunological factors; and decreased physical activity contribute to the development of senile sarcopenia.

The geriatric resident population has several special considerations directly tied to age-related changes and conditions. The care team must consider how polypharmacy, nutrition, and pain management affect the care of this vulnerable patient population. Polypharmacy, literally meaning "many pharmacies," has a variety of descriptions, with no definition consensus in the literature. Some studies define polypharmacy as the use of four or more medications or up to seven or more medications, while others define polypharmacy as the use of one or more medications. Polypharmacy occurs with inappropriate or unnecessary prescribing, resulting in adverse outcomes. Polypharmacy can happen in any age group; however, it is most prevalent in the geriatric population. Often, polypharmacy is recognized by:

- use of multiple medications,
- multiple prescribers,
- use of several filling pharmacies,

- too many forms of medications,
- use of over-the-counter medications, numerous dosing schedules, and
- appropriate medications for which the patient must take too many pills

Because of the multiple comorbidities associated with aging, the KPA population is most susceptible to the associated adverse health outcomes of polypharmacy (Budnitz, Lovegrove, Shehab, & Richards, 2011; Hajjar, Cafiero, & Hanlon, 2007; Takane, Balignasy, & Nigg, 2013).

The prevalence of malnutrition in KPA residents is estimated to be as high as 19%. Malnutrition is associated with numerous factors, including cognitive and functional status decline, infections, malignancy, pressure ulcers, recent orthopedic surgery, and cerebrovascular accidents. The lack of adequate food intake is a primary contributing factor to malnutrition and is a risk factor for geriatric mortality. Nutritional status is influenced by lack of appetite associated with underlying medical conditions, treatments, and medications.

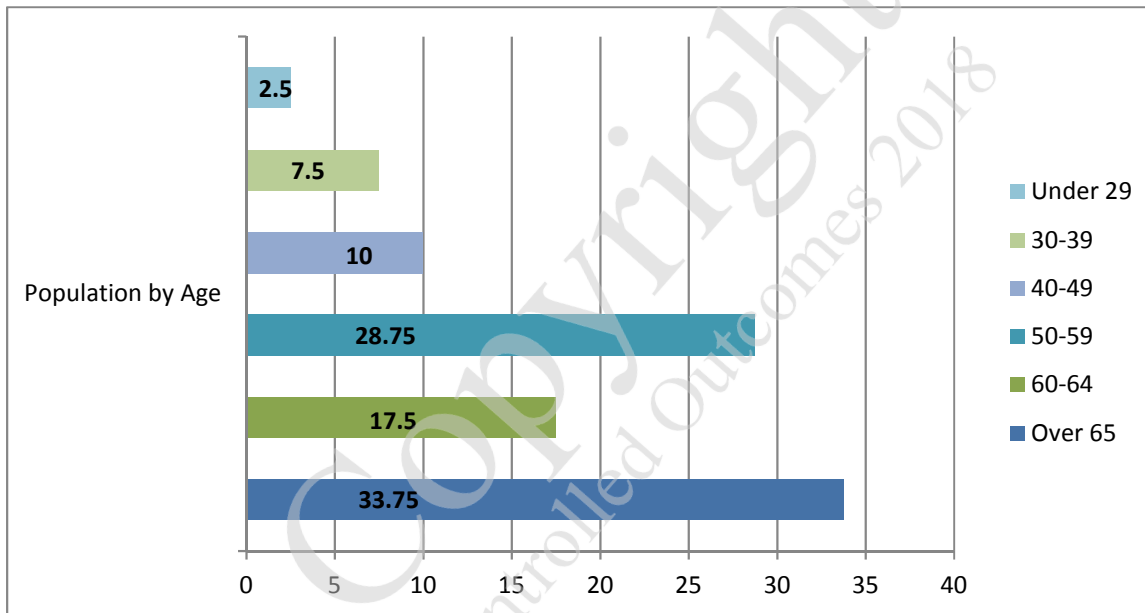


Figure 2: Kippax Place Apartment Age Distribution

7 Community-based Asset Map

In order to understand the Kippax community, Controlled Outcomes utilized research from the African International Religious Health Assets Programme (ARHAP/IRHAP), a partnership between both academia and faith-based organizations, such as Rollins School of Public Health, Wake Forest, University of Capetown, Emory, University of KwaZulu Natal and Wits, German Institute for Medical Mission and the Vesper Society, ARHAP, all in collaboration with the World Health Organization (WHO), which undertook the documentation of religious and health assets via a process called PIRHANA (Participatory Inquiry into Religious Health Assets, Networks and Agency). Under the leadership of Rev. Dr. Gary Gunderson (member of the IRHAP working group; VP of the Faith Health Division, Wake Forest Baptist Health) FaithHealthNC participants applied the tools and mapping process refined in South Africa and Memphis for use across North Carolina. Controlled Outcomes process replicated the model used in mapping the Kippax community.

Controlled Outcomes approach used the PIRHANA model, conducted workshops to "call out" specific assets of both a tangible nature (church buildings, health departments, physicians, dentists, and pharmacies) and intangible nature (grocery stores, recreational centers, government entities, and public access areas). Controlled Outcomes was interested in what contributes to health and healing understood in the more holistic African context, involving the general well-being of the community, body, mind, and spirit.

Using the PIRHANA model, Controlled Outcomes mapped the assets of the religious organizations and formed a network and relationships that Controlled Outcomes could then utilize as social capital in the community.

Controlled Outcomes focused on the strengths of the community, enhancing the communities' collective ability to prevent illness, help individuals self-manage chronic conditions and improve overall health on a community level. Building on the foundation of what the community has, rather than focusing on things that it may not have. Leaders at all levels of faith groups were engaged as allies in health care and public health initiatives to rebuilding a healthy, responsive community. This process captured more creative, yet realistic ideas about leveraging health assets from governmental entities, and faith community partners.

Churches, city parks, community centers, grocery stores, allied health professionals, farmers markets, fitness centers, pharmacies, emergency services, public libraries, public schools, recreation centers, social clubs and social service locations were identified during the asset mapping workshop.

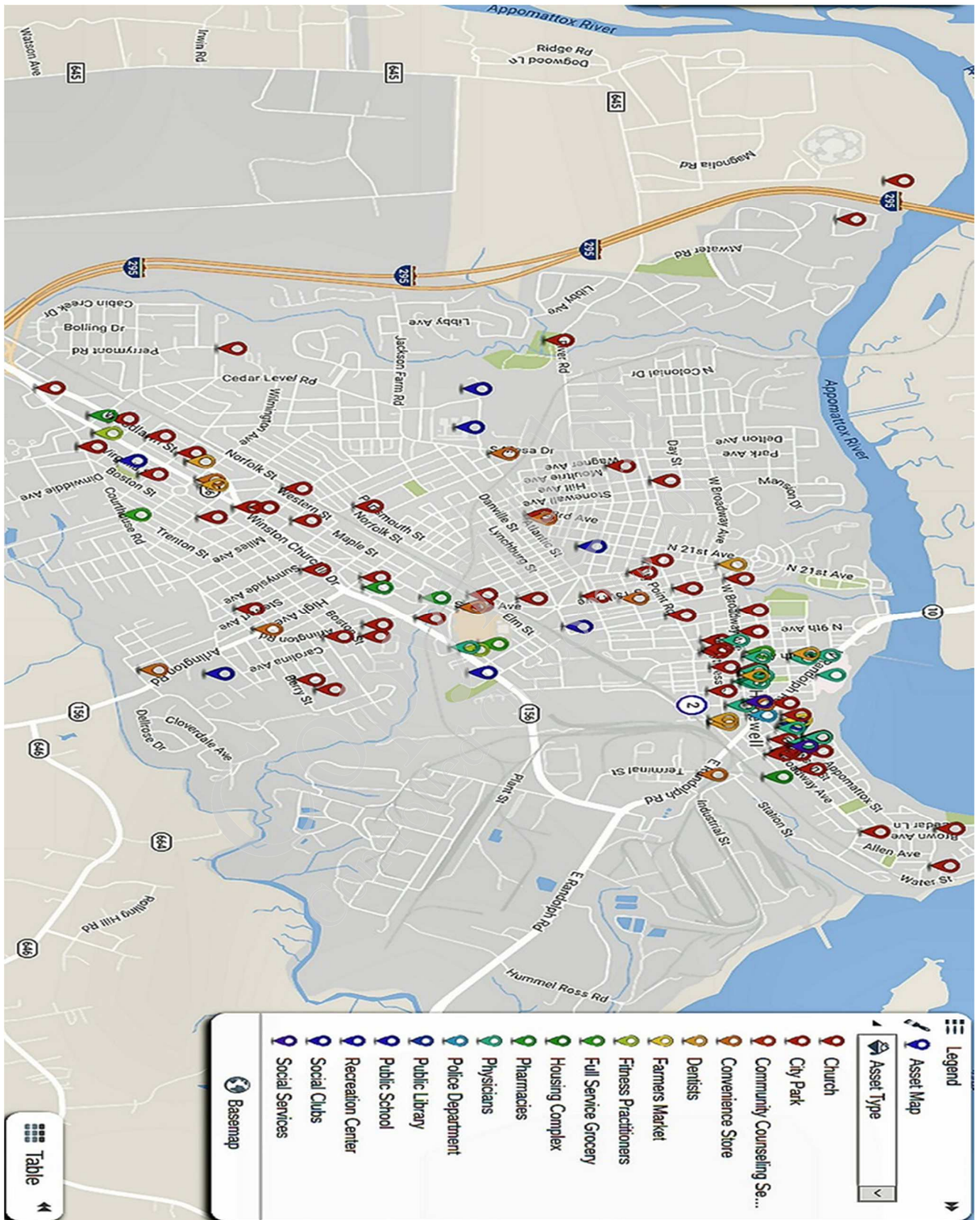


Figure 3: Asset Map Results

8 Change-readiness Analysis

In the transtheoretical model, behavior change is conceptualized as a process that unfolds over time and involves a progression through a series of five stages: precontemplation, contemplation, preparation, action, and maintenance. Although the steps were initially and extensively applied to change health behaviors, this model has also proven useful in conceptualizing and guiding the change in other areas of life. To start the process of change and change-readiness, consultants commonly tout a change management assessment as the foundational step in the change management process (Norcross, Krebs, & Prochaska, 2011).

With the assistance of Virginia Commonwealth University – College of Humanities and Science, Department of Psychology, Controlled Outcomes utilized the Change-Readiness assessment instrument designed by Kriegel and Brandt. The goal of the process was to examine the potential scope, depth, and readiness for change among the residents of KPA. As well, during the process, we intended to discover additional areas of concern, as it relates to change with the residents. Noting that at the time of our assessment, several of the residents were undergoing radical change with the renovation of apartments, moves, power outages, and other factors that could potentially impact the resident's state of mind. Our examination took into consideration the following:

- The scope of the change
- Number of residents affected
- Type of difference (health care, lifestyle)
- Amount of difference from where we are today
- Capacity for change (and how much change is already taking place)
- Resident's predisposition toward the change

Controlled Outcomes used individual personal interviews with each resident willing to respond to the assessment study.

8.1 What is the Readiness Assessment data used for?

Specifically, the Change Readiness tool provided information that allowed Controlled Outcomes to produce a change management strategy that would fit the unique attributes of the Kippax community. This includes:

- Assessing the risks and identifying potential obstacles
- Determining if any special tactics are necessary to support this change
- Customizing communication plans, operational plans, and sponsorship/partnership
- What specific data should be collected from the residents?

Resident data gathering was conducted in a context that promoted positive change management framework. In collecting this data, three areas of data collection were important:

- The resident's perception of their readiness for change
- The resident's personal preparation for change in general

- The resident's assessment of the change itself and how they perceive the personal impact of that change

As with any change and the readiness to change, the question from residents: "WIIFM?" (What's in it for me?). Residents first assess change from the perspective of personal impact before relating to the broader effects on the community.

Examples of statements often heard during the interview process, giving evidence that the residents held concerns about further change impacting them personally included:

- *How will Controlled Outcomes support my personal goals?*
- *Will future changes improve my health and wellness position?*
- *Will these changes afford me the ability to learn new skills and behaviors to improve my health?*
- *Will the change result in a more enjoyable lifestyle in the community?*

8.2 Pulling it all together

When conducted with the right change management framework, the assessment was useful in planning the overall community strategy for improving health and wellness for the residents of KPA. Allowing Controlled Outcomes to make informed decisions about our approach to managing change. It should be noted that the assessment process was only viewed as planning and not as the bulk of the change management effort. This was merely a tool to help Controlled Outcomes prepare for change.

8.3 Resident Results

The assessment instrument measured seven traits:

Resourcefulness — The ability to make the most out of any situation, utilizing the resources available to make plans and contingencies. Having the ability to see solutions in more ways than one, all with the goal of achieving your positive outcome without seeking help. People low in resourcefulness find it difficult to overcome obstacles they encounter, often becoming stuck in situations, seeing no end in sight.

Optimism — To the pessimist only problems and obstacles exist, the optimist sees opportunities and possibilities. This trait cannot be taught; it must be caught. Optimists see change as an opportunity and are very confident about it.

Adventurousness — The need to take risks, to pursue the unknown, to walk the path less taken. Since change always involves both risk and the unknown, Adventurous people usually perform well during organizational shake-ups.

Drive — Combines physical energy and mental desire to create passion. It is the fuel that maximizes all the other traits. If you have the drive, nothing appears impossible. If you do not, change is exhausting.

Adaptability — The ability to be at ease with shifting expectations. Resilience is the capacity to rebound from adversity quickly with a minimum of trauma.

Confidence — Confidence provides us with the insight that we can handle most any situation. There exist a direct correlation between levels of confidence and receptivity to change. When we are more confident in our ability to handle a new task, we are more receptive and more positive about it.

Tolerance for Ambiguity — With change comes uncertainty. No matter how carefully you plan, there are always some elements of indefiniteness. Without a healthy tolerance for ambiguity, change is not only uncomfortable; it is downright scary.

The optimal range for all traits in the assessment is 22-25, with scores over 26 showing evidence of critical issues in change management issues in some individuals. For example, individuals who scored over 26 in resourcefulness, present with an inability in obvious solutions, thus creating more work than necessary. Very high optimism scorers (over 26) may lack critical-thinking skills. High scorers in adventurousness show a tendency toward recklessness. Scoring too high (over 26) in adaptability indicates a lack of commitment or stick-to-it-ness. For those scoring over 26 in confidence indicate a cocky, know-it-all attitude and a lack of receptivity to feedback and individuals scoring high intolerance for ambiguity often have difficulty finishing tasks and making decisions.

For the residents at KPA, the average scores for each of the seven traits are indicated below:

| Resourcefulness | Optimism | Adventurousness | Drive | Adaptability | Confidence | Tolerance for Ambiguity |
|-----------------|----------|-----------------|-------|--------------|------------|-------------------------|
| 20 | 19 | 14 | 20 | 16 | 21 | 15 |

Figure 4: Change Average Readiness Scores

What do these findings say about the residents at KPA? To start, it provides a snapshot that of those individuals who completed the assessment are limited in the mindset of change, as indicated by the very low ranking of adaptability. It has been stated before that the community feels as if they are the lost community in the City of Hopewell; this could be a factor in the lower than expected scores in specific areas. The results do have a positive outcome, showing that the residents of KPA are resourceful, have a high drive or passion, and are confident in their being. On the reverse, the residents of KPA are not adventurousness, nor do they present with a level of tolerance for ambiguity.

In the end, our assessment provided Controlled Outcomes with a clear path forward when working with the residents of KPA. The analysis demonstrated that residents of KPA optimally progress from no or limited change behavior to a positive path of change when Controlled Outcomes programs introduced the residents to the use of consciousness raising, self-liberation, and dramatic relief/emotional arousal. Over the first year of the program, Controlled Outcomes used processes such as counterconditioning, stimulus control, and reinforcement management to elicit change among the residents, with positive outcomes.

9 Perception of Coordination

Information about current healthcare providers level of care and the attitude with a thorough understanding of the needs and expectations of the residents at Kippax Place was conducted to align enhanced healthcare services for the community. The attempt here was to assess the resident's perception and satisfaction of their primary health care services with the following objectives:

- To evaluate the awareness of the residents' current health care providers services and their utilization.
- To assess the resident's satisfaction levels regarding their current healthcare service providers.

Using the methodology found in a study of perception and satisfaction conducted by Patro, Kumar, Goswami, Nogkynrih, & Pandav, 2008, adjusting for modifications to focus only on the residents of the Kippax Place community, a cross-sectional survey from January 2016 to April 2016. A student of social work conducted the surveys, by asking each resident entering the building if they were returning from a physician visit, allowing those residents who wished to opt-out of the study to do so. Surveys were conducted Monday through Friday, during regular business hours.

A total of 46 exit surveys were collected (n=76). The refusal rate was approximately 40%. In the exit surveys, 54% of the respondents listed private practitioners as their preferred choice of healthcare service providers, 5% of the respondents listed community health care centers and 41% of the respondent's listed private hospitals as their preferred choice of health care services.

The level of satisfaction was assessed by categorizing their response into satisfied or very satisfied and dissatisfied or very dissatisfied, across six components of primary health care.

The domains where the satisfaction level was rated as very satisfied only included consultant time. Satisfaction levels of the most respondents were high where the question regarding the behavior of doctor/health staff and competence of doctor/health staff. There was a high level of dissatisfaction with the distance from home, physical examination and relief of symptoms.

| Level of Satisfaction | Very Satisfied (%) | Satisfied (%) | Very dissatisfied (%) | Dissatisfied (%) |
|-----------------------------------|--------------------|---------------|-----------------------|------------------|
| Distance from home | 16.6 | 18.1 | 41.3 | 24 |
| Consultation time | 28.2 | 29.7 | 22.6 | 19.5 |
| Behavior of doctor/health staff | 16.6 | 61 | 17.2 | 5.2 |
| Competence of doctor/health staff | 17.2 | 63.1 | 15.8 | 3.9 |
| Physical examination | 16.6 | 17.2 | 49 | 17.2 |
| Relief of symptoms | 6.5 | 26 | 39.9 | 27.6 |

Figure 5: Level of Satisfaction

According to the Leapfrog Hospital Survey, one of the most critical outcomes in the measurement of health care services is patient satisfaction. For example, John Randolph Medical Center ranks high in patient satisfaction, patient safety, event management and use of antibiotics in the hospital, according to the 2017 Leapfrog Hospital Survey (The Leapfrog Group, 2017).

When data such as patient satisfaction is used systematically, results provide indicators for addressing changes in service providers or the development of alternatives in health care.

The quality of healthcare today for seniors is only as good as the collaborative team developed to provide such care. In the case of several residents in KPA, the transition from the acute to the chronic stage in the disease process introduces a new phase of quality of service. And while community-based interprofessional teams can offer the necessary levels of expertise to their patients, it is essential to know that this blending of healthcare providers often confuses the patient in understanding who is doing what and from whom they draw the most benefit, which in turn relates to patient satisfaction levels being bias toward one provider over another, or even a family member or non-professional healthcare provider.

A few factors impacted this survey of satisfaction among the KPA residents. The majority of participants were females, which hold a trend that has been seen across the country with males in American society not participating in healthcare until an extreme need for such services arises (United States Centers for Disease Control and Prevention, 2014). Additionally, the awareness and accessibility of other health facilities were limited among the respondents. Also, the ability of the patient to adequately represent themselves in the complex healthcare system, which not only involves the actual visit to their physician but in understanding the convoluted billing and insurance process.

This survey attempted to assess patient satisfaction by examining the exit results of physician visits from the residents of KPA, however in order to truly gauge the satisfaction levels of any medical advice or treatment a more detailed examination of the coordination of care model must be made, and a survey to address all areas of the model should be done. Please note the coordination of care model illustration below.

The coordination of care model is any activity that ensures patient's needs and preferences for health services and information sharing across people, function, and sites are met over time. Often patients involved in complex coordination of care will experience failures in coordination at points of transition, such shortcomings are not accounted for inpatient satisfaction surveys because they are shielded from the patients involved.

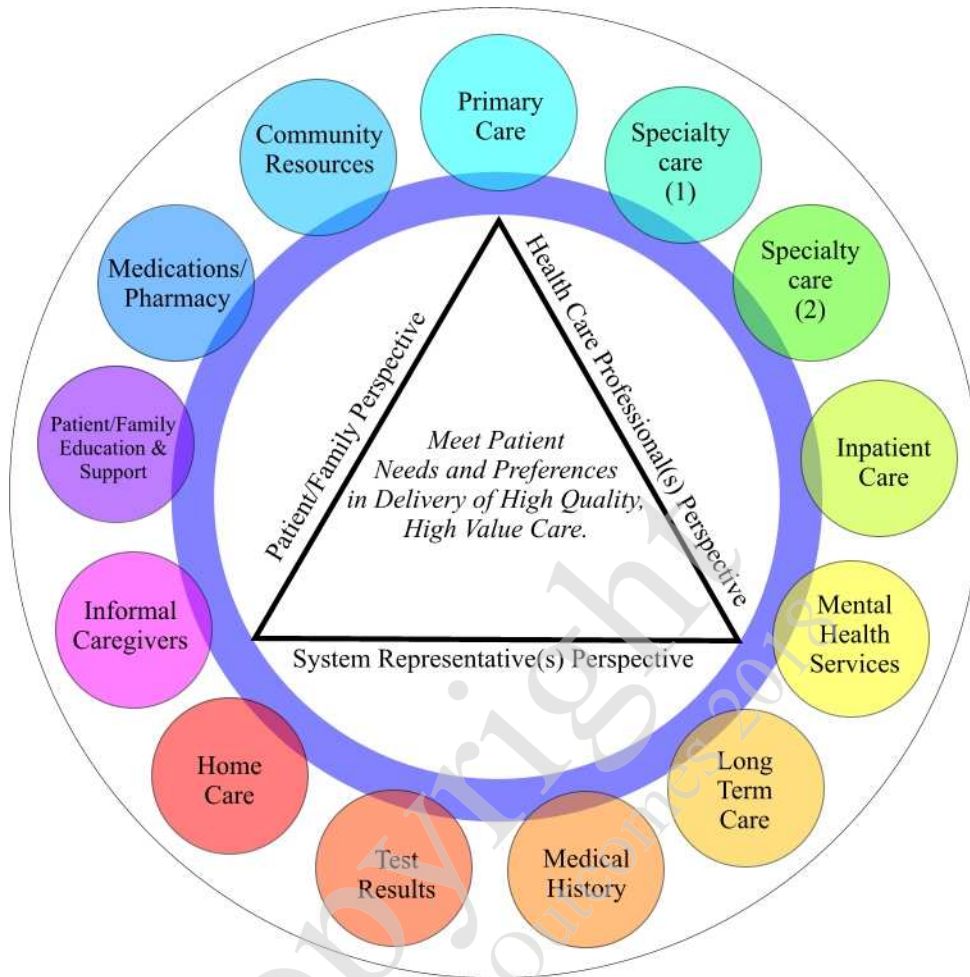


Figure 6: Coordination of Care Model

As a result of data provided from the surveys, Controlled Outcomes piloted a service model that introduced the residents of KPA to a healthcare provider that focuses on the concierge model of healthcare, by addressing preventative care over the traditional level of care models, working in concert with Controlled Outcomes in keeping residents out of the ED and increasing the time that the practice doctors spend with each patient from the traditional 13 minutes, to on average 28 minutes per patient. In the case of this single source practice, each doctor is only assigned, 400 patients. Additionally the practice provides such services as transportation, the ability for patients to have prescriptions filled on site, specialized services, to include a mental health option, case management services for patients with multiple chronic illnesses – which include home visits by a community-based nurse and most important to the patient is direct communication with their primary care physician, by having the physician's company cell phone number, making the physician available to the resident 24/7.

10 Planned and Implemented Services

Based off health surveys, focus groups with residents and staff evaluation of the community, Controlled Outcomes planned/implemented offerings for the community covered a wide array of topics. Foremost was the ability to meet the unserved need of healthy food options for the community. This chart outlines the planned services and those services that were implemented services by Controlled Outcomes and our partners, by the end of the pilot study.

| Planned, as of 2016 | Implemented, as of 2016-17 |
|--|---|
| <p>Food Desert</p> <ul style="list-style-type: none"> • Delivery of healthy food boxes to the residents • Fresh fruit and vegetables • Van service to local grocery store • Home delivery service from local grocery store | <ul style="list-style-type: none"> • Delivery of healthy food boxes to the residents |
| <p>Navigation/Care Coordination/Primary Care Connection Management</p> <ul style="list-style-type: none"> • Outreach and triage • Emergency Department Management • Hospital Admission/Readmission • Person-centered, consumer-directed case management/care coordination • Biopsychosocial healthcare management, or Interdisciplinary Team approach • Life coaching • Collaboration between providers and clients • Social work | <ul style="list-style-type: none"> • One health navigator who visits the community weekly. • Community Health worker on site • Social service staff visits the community weekly • On-site nurse who provides in-service coordination with the residents and PCP, as needed • Coordination with John Randolph Hospital Care Navigators • Coordinated care program with Emergency Department • Coordinated care program with hospital admissions |
| <p>Physical Health</p> <ul style="list-style-type: none"> • Outreach and triage • Management of chronic conditions • Physical Therapy and Occupational Therapy • Health Screening | <ul style="list-style-type: none"> • Clinical staff provide some health screening and assessment; post-hospital visits • Health Fairs • Registered Nurse on site |
| <p>Mental Health</p> <ul style="list-style-type: none"> • Outreach and triage • Counseling, duration limited | <ul style="list-style-type: none"> • 1 LCSW onsite visits, crisis intervention, and referrals to partner agencies |
| <p>Dental Health</p> <ul style="list-style-type: none"> • Outreach and triage | <ul style="list-style-type: none"> • Working with potential dental insurance partners to try to align a partner with the residents. • Referred residents who needed tooth extraction to a local clinic. |
| <p>Medication Management</p> <ul style="list-style-type: none"> • Set-up and reminders | <ul style="list-style-type: none"> • A medication adherence program was offered with the use of a nursing team, |

| | |
|---|--|
| <ul style="list-style-type: none"> • Prescription education • Poly-pharmacy review | <p>which does reviews and advises residents on filling prescriptions.</p> <ul style="list-style-type: none"> • Collaborated with Home Town Drugs to provide prescription medication monitoring and purchasing by residents. |
| <p>Preventive/Holistic Health</p> <ul style="list-style-type: none"> • Health Fairs • Flu Shot clinics • Herbal Programs | <ul style="list-style-type: none"> • Health fairs every six months run by local partners • Flu clinics by partner Rite Aid Pharmacies |
| <p>Education</p> <ul style="list-style-type: none"> • Monthly Lunch and Learns • Partner Organizations • Government Organizations | <ul style="list-style-type: none"> • Monthly Lunch and Learns • Partner Organizations • Government Organizations |

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11 Water Quality and Health Implications

The U.S. Environmental Protection Agency (EPA) public drinking water standards are proper guidance for assessing water quality. Drinking water has two criteria - Primary: contaminants that can adversely affect health and are legally enforceable for public water systems, and Secondary - pollutants that may cause bad taste, foul odor, or staining.

While Virginia has not had a significant public drinking water crisis, the supplier to which the KPA water supply is derived from has had issues in the past. In spring, 2015, Virginia American Water Company, announced mandatory water restrictions after an estimated 600 gallons of diesel fuel spilling into the Appomattox River.

While not directly related to the water supply of the City of Hopewell, the industrial emergency that occurred in 1985 still may have a limited impact on the drinking water supplied to the city. In 1985 saw the city's exposure to Kepone, a grayish-white powder that was manufactured 1/2 mile away from the KPA. The chemical often found its way into the sewer systems of the city of Hopewell, as well as the Appomattox and James River, the source of drinking water for the City of Hopewell. Kepone is a stubborn chemical that does not degrade easily and has a half-life that is measured in decades. It is noted that Kepone trace levels can still be found in fish in the Appomattox and James Rivers as a result of the chemical being buried in river sediment.

Outside of the issues that surround the current city water system, the overall quality of the water is sufficient for the most part for the residents of the city and KPA. In a recent test of the water system conducted by Virginia Tech University at the bequest of Controlled Outcomes, the water supplied to KPA met the current EPA standards in all areas except one – sodium levels. In the case of water being provided to KPA, the level of sodium was nearly three times the recommended level, as set by the EPA.

While sodium and chloride, or common table salt dissolve naturally in groundwater as a result of chemical breakdowns underground, it is higher levels of sodium and chloride existing in household water that are the result of manmade sources such as road salt, industrial wastes, sewage, fertilizers, or water softeners. In coastal areas, sodium and chloride can also enter groundwater via salt-water intrusion into freshwater aquifers. In high enough concentrations, salt-water intrusion can render groundwater unsuitable for drinking, or cooking. In the case of water being supplied to KPA, higher concentrations of sodium can be attributed to manmade elements – in particular – industrial wastes.

(NOTE: This is a researcher's hypothesis and not an official stance of Controlled Outcomes, as to the source of this high concentration of sodium in the City of Hopewell water supply. Controlled Outcomes does stand by its researcher's statement, but only as a potential hypothesis.)

Sodium is not regulated as primary (health-related) contaminants in public water systems by the EPA. While sodium is considered an essential mineral, with a recommendation that healthy adults consume at least 500 milligrams (mg) per day from water and food combined, the EPA does provide guidance that drinking water should not have levels of sodium exceeding 20 milligrams per liter (mg/L) for individuals on reduced/restricted sodium diets. When an individual with high blood pressure consumes a high level of sodium from drinking water and food, outcomes such as damage to the heart and arteries or other organs can occur.

In the case of KPA, a high percentage of the residents present with high blood pressure, cardiac issues, renal issues, and Osteoporosis. In 2009, EPA added sodium to the Contaminant Candidate List as a research priority, to reexamine existing guidance.

Additional health concerns present when levels of sodium in public drinking water reach higher than recommended levels, they include:

Osteoporosis - which causes bones to more easily break, has been associated with high sodium intake. Older populations, such as those at KPA are at a higher risk of osteoporosis, with bones naturally become thinner with age, with reduced levels of calcium. Having a high sodium intake can cause calcium losses through the urine, which can lead to bone demineralization. Research shows that individuals with high blood pressure excrete more calcium in the urine presents a higher risk of osteoporosis (Devine, 1995).

Stomach Cancer - Epidemiological evidence has shown that there is a link between high sodium intake and stomach cancer. It has been reported that a high sodium intake damages the lining of the stomach, which may increase the risk of infection with *Helicobacter pylori*, a bacterium strongly associated with the development of stomach cancer. Sodium has also been found to increase the growth and action of *H. pylori* and therefore increase the risk of cancer (Beevers, 2004; Lambert & Hainaut, 2007).

Meniere's disease - Meniere's is a rare and progressive condition associated with fluctuating hearing loss, vertigo, and tinnitus. Sodium also causes fluid retention, which can increase the pressure on the ear and cause Meniere's disease (Beard, 2008; NHS, 2007).

Edema - Edema or fluid retention is more likely to occur in older populations who have a high-salt diet. Lower sodium intake will aid in reducing fluid retention and benefit individuals already presenting with congenital heart disease, hepatic cirrhosis or nephrotic syndrome (du Cailar, Ribstein, & Mimran, 2002; He, Marciniak, & Visagie, 2009).

Kidney disease - High blood pressure is linked to increased levels of protein in the urine, which is a significant risk factor for the decline of kidney function. Coupled with water retention, an increase in blood pressure as a result of high sodium diets, one can expect an accelerated rate of deterioration of renal function. A high sodium diet also increases the risk of kidney stones through the same mechanism as it increases the risk of osteoporosis. A diet designed to reduce blood pressure has been found to be associated with a marked decrease in kidney stone risk (Taylor, Fung, & Curham, 2009).

Unilever conducted a study to determine the length of time the average individuals spend taking a shower or bath in their lifetime. The estimate came out to be 62 days over the course of one lifetime. While the absorption rate of bath water with high concentrations of sodium is low, it is the other harmful effects of bathing in high levels of sodium water that makes this an essential element of this report. When water with high concentrations of sodium is exposed to open sores or cuts, it can allow *Mycobacterium* to be absorbed into the body. *Mycobacterium* has been known to cause severe diseases in humans, including tuberculosis and leprosy.

Given that water is essential to human life and that in our everyday being we cook, clean, bathe or drink the water that is supplied to us from our municipal water supply system, having access to water that is safe is paramount. And while this report cannot directly correlate the high levels of sodium in the water supply in the City of Hopewell to the increased number of individuals, not only living in KPA, but in the city overall, presenting with cardiac and renal issues that the EPA

itself has stated can be attributed to high sodium levels in water and food, it does demand additional research to determine what remedies, if any exist that can assist individuals living with high blood pressure and renal issues in having access to healthy low sodium water supplies.

11.1 Outcomes

| Test (units) | Water Quality Sample Results | Maximum Recommended Level or Range |
|--|------------------------------|------------------------------------|
| Iron (mg/L) | 0.086 | 0.3 |
| Manganese (mg/L) | 0.004 | 0.05 |
| Arsenic (mg/L) | ND | 0.01 |
| Hardness (mg/L) | 111.2 | 180 |
| Sulfate (mg/L) | 91.7 | 250 |
| Fluoride (mg/L) | 0.72 | 2 |
| Total Dissolved Solids (mg/L) | 356 | 500 |
| pH | 7.2 | 6.5 to 8.5 |
| Sodium (mg/L) | 59.79** | 20 |
| Nitrate-N (mg/L) | 0.168 | 10 |
| Total Coliform Bacteria Data: | | |
| Presence/Absence | ABSENT | ABSENT |
| Most Probable Number Count (MPN/100mL) | ND | |
| E.coli Bacteria Data: | | |
| Presence/Absence | ABSENT | ABSENT |
| Most Probable Number Count (MPN/100mL) | ND | |
| First Draw Data: | | |
| Copper (mg/L) | 0.227 | 1.3 |
| Lead (mg/L) | 0.006 | 0.015 |
| Flush Data: | | |
| Copper (mg/L) | 0.138 | 1.3 |
| Lead (mg/L) | 0.002 | 0.015 |

Figure 7: Water Sample Results

12 Noise Levels and Health Implications

Noise is defined as unwanted sound. Effects of noise depend on the level presented. High levels of noise produce mechanical changes in an individual, increased skin temperature, eardrums rupturing, the eyeball and internal organs vibrating. As well as producing physiological (biological) changes in an individual, to include high blood pressure and stress. Even at its lowest level, noise can have a psychological (subjective) change to an individual, to include annoyance and complaints (Kryter, 1970)

With regular exposure to noise comes potential consequences to an individual's health. Heightened levels of environmental noise can lead to hearing impairment, hypertension, ischemic heart disease, and sleep disturbance. Research has also found the overexposure to high levels of noise can lead to immune system changes and congenital disabilities (Passchier-Vermeer & Passchier, 2000). Noise studies have determined that noise exposure above 67-70 dB(A) has a limited correlation to hypertension, cardiovascular disease, increased frequency of headaches, fatigue, stomach ulcers, and vertigo. While other studies show that long-term night exposure to noise levels of 50 dB(A) may increase the risk of a myocardial infarction due to the elevated cortisol production. Railway noise has been noted to cause constrictions of arterial blood flow, which can lead some to have elevated blood pressure (Croy, Smith, & Waye, 2013).

From the mental health standpoint, noise exposure also has been known to induce aggression and other anti-social behaviors (Kryter K. D., 1994). Causal relationships have been discovered between noise and psychological effects such as annoyance, psychiatric disorders, and impact on psychosocial well-being, to include personality changes and violent reactions (Croy, Smith, & Waye, 2013; Stansfield & Matheson, 2003).

The situation impacting the residents of KPA is not from significant road noise, heavy industrial equipment, although this could have a potential impact to the health of the residents since several major industrial plants sit within one mile of the KPA community. The primary factor for noise is railway noise generated from one of the three active railways sitting directly behind the KPA community.

Furthermore, railway noise is not limited to the immediate area of the operation of the equipment, in fact, the sound that travels, to include the whistle blast to warning of an approaching train can be heard for miles in all directions. The illustration in Figure 8 shows the range to which railway noise travels. In this example, the localized or highest decibels are indicated in red, coming from the localized position of the train, noted as a black rectangle. This is seen as ground zero for the operation of the equipment. The yellow coloring indicates slightly reduced decibels of noise (52.6 dBA to 65.4 dBA) from the operations, but at the same time an increase in the distance to which the sound has traveled, and blue indicates the lowest decibels readings from the operation of the railway. In some cases depending on terrain, railway noise can be heard up to 4 miles from the active train operations, at a 45.3 dBA level.



Figure 8: Railway Noise Pattern

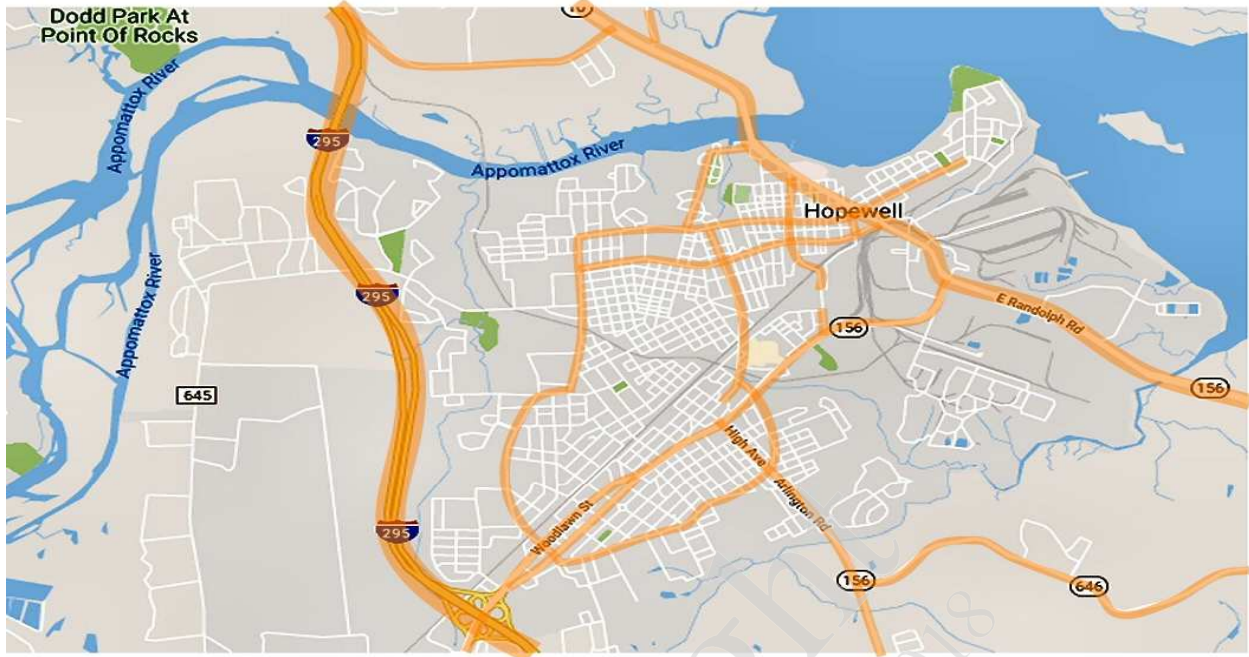


Figure 9: Federal Transportation Administration Noise Map

The above illustration shows the Federal Transportation Administration noise map based on active traffic for Hopewell Virginia. According to the illustration, Hopewell sits in a zone that produces noise levels between 40.01-60 dBA at 100 feet.

KPA residents sit only 150 feet from four active railway tracks, which according to the most recent railway schedule has a heavy daily activity, which includes trains idling outside of the yard house, producing not only active noise but also increased air pollutants from diesel exhaust.



Figure 10: Kippax Place Apartment/Active Railway Map

A sample of the railway schedule can be found below.

| F Series: Florence Division Locals Train Schedule | | | | |
|--|-----------------|------------------------|------------------|---|
| Symbol | Based In | Works as far as | Frequency | Notes |
| F705 | Hopewell, VA | Richmond, VA | Mon-Fri | Brings F723 back to Acca yard late evenings |
| F723 | Richmond, VA | Hopewell, VA | Mon-Fri | Acca to Hopewell morning local job |
| F749 | Richmond, VA | Hopewell, VA | Sa-Su | Acca to Hopewell turn job, weekend symbol |

Figure 11: Hopewell Train Schedule

12.1 Outcome

Low wealth residents in Hopewell Virginia share the fence with several industrial plants and railroad lines that intersect the city at several points. With decades of toxic emissions from industries – as well as lung-penetrating diesel particles spewed by truck and rail lines running next door to neighborhoods, which may be taking a toll on resident's health. KPA sits within a zone that is equal to less than 50 yards (150 feet) from an active railway track. In correlating the distance from the building to the active railway track, the illustration below shows how the ambient sound dissipates from a sitting freight/diesel train that is often parked behind KPA.

In the case of the KPA community, the noise levels produced the following average levels over a seven-day period. These readings were samples taken from the right corner of the exterior of the building, on the southern exposure.

Over a seven-day period from January 22, 2017 to January 28, 2017, 20,160 samples were taken of noise levels at KPA. The sampling produced 2,880 samples daily, with samples being taken every 30 seconds. The samples yielded an average reading level of 55.0 dBA for the seven-day period.

Over the period of the study, researchers found high sound levels of the following days and times: Sundays at 2056: level 65.3 dBA; Monday at 1410: level 65.2 dBA; Tuesday at 1902: level 64.5 dBA; Wednesday at 1957: level 67.8 dBA; Thursday at 1613: level 67 dBA; Friday at 1739: level 72.4 dBA; Saturday at 0836: level 68 dBA. Unfortunately, due to security concerns railway officials would not release to Controlled Outcomes the actual timing of the arriving trains, so that a collation could be determined with the high noise level, train timing, and point of day.

| <u>Day/Time</u> | <u>6am</u> | <u>10am</u> | <u>2pm</u> | <u>6pm</u> | <u>10pm</u> | <u>2am</u> |
|------------------------|-------------------|--------------------|-------------------|-------------------|--------------------|-------------------|
| Sunday | 56.4 | 53.9 | 54.4 | 53.5 | 54.9 | 56.1 |
| Monday | 54.3 | 55.6 | 55.4 | 55.1 | 56.0 | 55.3 |
| Tuesday | 54.8 | 54.4 | 54.4 | 56.1 | 52.9 | 56.3 |
| Wednesday | 54.2 | 52.6 | 52.6 | 53.4 | 55.0 | 55.1 |
| Thursday | 57.9 | 59.1 | 59.3 | 59.2 | 59.9 | 59.8 |
| Friday | 60.1 | 58.3 | 60.4 | 60.6 | 60.2 | 57.6 |
| Saturday | 60.1 | 61.6 | 65.4 | 52.5 | 56.2 | 60.4 |

Figure 12: Kippax Exterior Noise Levels

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13 Soil Quality and Health Implications

Soils play a significant role in several functions (e.g., its importance on the cycling of water) that sustains the human population. Through ingestion (either deliberate or involuntary), inhalation and dermal absorption, the mineral, chemical and biological components of soil can either be directly beneficial or detrimental to human health. Specific examples include: geohelminth infection and the supply of mineral nutrients and potentially harmful elements (PHEs) via soil ingestion; cancers caused by the inhalation of fibrous mineral; Uranium and Thorium decay in soil; skin contact of the soil, to include dermal absorption causing tetanus, *Necator americanus* (Hookworm) and nonfilarial elephantiasis (podoconiosis). While a direct correlation to soil and human health is limited in research, it has been noted that soil does play a vital role in our health. Several pathogenic viruses have been known to survive in soil and are often the cause illnesses such as hepatitis, aseptic meningitis, polio, smallpox, and gastroenteritis (Brevik, E.C. & Burgess, L.C. (2014).

13.1 Ingestion

The ingestion of soil occurs either involuntarily or deliberately. For the former, all members of an exposed population will ingest at least small quantities of soil, from hand to mouth activity, whereby soil adheres to the skin of fingers and then inadvertently ingested. As well, most outdoor activity could result in airborne ingestion. Soil also makes up a noted level of house dust that provides another source of exposure. The rates of soil ingestion are estimated using tracer elements such as Aluminum, Silicon, and Titanium, or the insoluble acid residue (AIR) content of the soil. While attempts have been made to study soil ingestion by adults, with Stanek, et al. (1997) reporting an average adult soil ingestion rate of 10 mgd. The medical implications of soil ingestion are diverse to include possible death from high levels of soil intake. One consequence of soil ingestion is that the amounts and balance of mineral nutrients within the individual will be an effect. Clays entering the alimentary tract will first encounter the acidity of the stomach giving up the elements that they hold by cation exchange. In addition, iron hydroxides will undergo some solubility. Consequently, essential amounts of mineral nutrients such as Calcium, Copper, Iron, Manganese, Magnesium, and Zinc can be supplied directly to individuals via ingested soil (Abrahams, 2002). Gelfand, Zarate, & Knepsheid, (1975) noted five cases of life-threatening hyperkalaemia caused by the absorption of large amounts of K from soils enriched in the element.

13.2 Inhalation

Wagner (1980) notes the bulk of mineral dust that is inhaled by humans are trapped and subsequently ingested, passed through the gastrointestinal tract. Nevertheless, some inhaled mineral dust is retained in the lungs where they can cause damage to humans via irritation with the production of bronchitis, scarring with the creation of fibrosis (pneumoconiosis) and cancers. The reaction of the lungs to mineral dust depends on the dosage and nature of the dust inhaled. Research conducted by Brady & Weil, (1999) state that long-term epidemiological studies suggest that deaths from inhaling fine fugitive dust exceed the number of deaths from highway fatalities.

13.3 Dermal Absorption

Hookworm disease has been called one of the greatest silent scourges of mankind. While in the soil, the survival of hookworm larvae is favored in a damp, sandy, or friable environment with decaying vegetation and a temperature range of 75.2-89.6° F. Non-filarial endemic

elephantiasis, a disease renamed by Price (1988) as podoconiosis, is characterized by an asymmetrical swelling of the feet and lower limbs. The condition has curable preelephantiasic and incurable elephantiasic stages, but once established podoconiosis persists until death from some other cause.

The contamination of soils with potentially toxic materials such as dioxins, pesticides, PHEs, polynuclear aromatic hydrocarbons (PAHs) and petroleum products containing PAHs, has prompted the examination and formulation of dermal risk assessment methodologies. Qiao, et al. (1997) noted that volatile organic chemicals (VOCs) volatilization and percutaneous absorption are competing processes. Near-skin VOCs will be partially occluded by outer layers of soil particles, inhibiting evaporation and increasing the fraction available for dermal absorption. The dermal pathway can contribute a significant or even predominant portion of the risks attributable to contaminated soils.

13.4 Outcomes

Some impacts of soil on human health are obvious and dramatic, while other problems that soil poses to the health of humans can be more subtle, to the extent that it is difficult to fully establish the importance of soil to a particular health problem. Tempting as it is to show a relationship between health problems and soil, the connection has been made in the past, with various health related diseases that have impacted the human body. Frequently this results in producing a large number of significant correlation coefficients that can lead to the development of disease hypotheses. Correlation does not always mean causation, which often involves many problems, can be associated with this type of broad-scope analysis. As examples, despite the issues noted above, the appraisal of health and soils remain to be surveyed and characterized in detail. Remediation of contaminated and potentially hazardous soils has evolved into an important industry that will continue to be developed, mainly since brownfield sites are increasingly being identified as locations for future human habitation.

Regarding soil sampling conducted at KPA, the following are the results from two samples taken from the location. Figure 22 shows the location of each soil sample taken, with corresponding lab test results for each sample.



Figure 13: Soil Sample Site Image

| Analysis | P (lb./A) | K (lb./A) | Ca (lb./A) | Mg (lb./A) | Zn (ppm) | Mn (ppm) | Cu (ppm) | Fe (ppm) | B (ppm) | S.Salts (ppm) |
|----------|--------------|--------------|---------------|---------------|-------------|-------------|-------------|-------------|------------|------------------|
| Results | 62 | 239 | 957 | 122 | 2.8 | 6.4 | 0.5 | 20.8 | 0.2 | 64 |
| Rating | H | H | M- | M+ | SUFF | SUFF | SUFF | SUFF | SUFF | L |

| Analysis | Soil pH | Buffer Index | Est.-CEC (meq/100g) | Acidity (%) | Base Sat. (%) | Ca Sat. (%) | Mg Sat. (%) | K Sat. (%) | Organic Matter (%) |
|----------|------------|-----------------|------------------------|----------------|---------------------|-------------------|-------------------|---------------|--------------------------|
| Results | 5.5 | 5.83 | 6.6 | 51.4 | 48.6 | 36.3 | 7.6 | 4.7 | 5.1 |

Figure 14: Soil Sample Test Results – Sample 1

| Analysis | P (lb./A) | K (lb./A) | Ca (lb./A) | Mg (lb./A) | Zn (ppm) | Mn (ppm) | Cu (ppm) | Fe (ppm) | B (ppm) | S.Salts (ppm) |
|----------|--------------|--------------|---------------|---------------|-------------|-------------|-------------|-------------|------------|------------------|
| Results | 5 | 51 | 1876 | 352 | 10.3 | 13.3 | 1.7 | 42.5 | 0.3 | 51 |
| Rating | L | L | H | VH | SUFF | SUFF | SUFF | SUFF | SUFF | L |

| Analysis | Soil pH | Buffer Index | Est.-CEC (meq/100g) | Acidity (%) | Base Sat. (%) | Ca Sat. (%) | Mg Sat. (%) | K Sat. (%) | Organic Matter (%) |
|----------|------------|-----------------|------------------------|----------------|---------------------|-------------------|-------------------|---------------|--------------------------|
| Results | 6.4 | 6.32 | 6.7 | 7.1 | 92.9 | 70.2 | 21.7 | 1.0 | 2.2 |

Figure 15: Soil Sample Test Results – Sample 2

Lab test results section shows soil nutrients as a rating. The scale is interpreted as follows:
L=Low, M=Medium, H=High, VH=Very High, EH=Excessively High (soluble salt test only),
DEF=Deficient, or SUFF=Sufficient, and sometimes a "+" or "-."

P = phosphorus

K = potassium

Ca = calcium

Mg = magnesium

Zn = zinc

Mn = manganese

Cu = copper

Fe = iron

B = boron

SS = soluble salts

lb./A = pounds per acre

Ppm = parts per million

meq = milliequivalent

G = gram

pH = acidity

Sat. = saturation

N = nitrogen

P2O5 = phosphate

K2O = potash

% = percent

Est-CEC = estimated cation exchange capacity

AG = agricultural limestone (dolomitic or calcitic)

Figure 16: Report Symbols and Abbreviations for Soil Sample Chart

In testing KPA soil, four minerals tested high or very high and should be considered a concern to the health and wellness of the residents, as high levels of these minerals in the human body can have an adverse impact on an individual's overall health.

Phosphorus tested **HIGH**. High levels of phosphorus in the human body can lead to hyperphosphatemia, a disorder while rare, except for those individuals presenting with kidney dysfunction. Hyperphosphatemia has also been known to present in individuals with Diabetic ketoacidosis (Bohn, Myer, & O'Connor, 2002; Makino, Uchino, Morimatsu, & Bellomo, 2005; Pham-Huy, He, & Pham-Huy, 2008; Li, Ma, Jan van der Kuijp, Yuan, & Huang, 2014).

Potassium tested **HIGH**. High levels of potassium in the human body can lead to hyperkalemia; the level of potassium in the blood is too high. A high potassium level has many causes, including kidney disorders, drugs that affect kidney function, and consumption of too much supplemental potassium. Usually, hyperkalemia must be severe before it causes symptoms, mainly abnormal heart rhythms (Bohn, Myer, & O'Connor, 2002; Makino, Uchino, Morimatsu, & Bellomo, 2005; Pham-Huy, He, & Pham-Huy, 2008; Li, Ma, Jan van der Kuijp, Yuan, & Huang, 2014).

Calcium tested **HIGH**. High levels of calcium in the human body can lead to hypercalcemia. Severe hypercalcemia often causes brain dysfunction with confusion, emotional disturbance, delirium, hallucinations, and coma. Muscle weakness may occur, and abnormal heart rhythms and death can follow. Long-term or severe hypercalcemia commonly results in kidney stones containing calcium. Less frequently, kidney failure develops, but it is usually resolved with treatment. However, if enough calcium accumulates within the kidney, the damage is irreversible (Bohn, Myer, & O'Connor, 2002; Makino, Uchino, Morimatsu, & Bellomo, 2005; Pham-Huy, He, & Pham-Huy, 2008; Li, Ma, Jan van der Kuijp, Yuan, & Huang, 2014).

Magnesium tested **VERY HIGH**. High levels of magnesium in the human body can lead to hypomagnesemia; the level of magnesium in blood is too high. Hypomagnesemia is uncommon. It usually develops only when people with kidney failure are given magnesium salts or take drugs that contain magnesium (such as some antacids or laxatives). Hypomagnesemia may cause muscle weakness, low blood pressure, impaired breathing, and when severe, the heart can stop beating (Bohn, Myer, & O'Connor, 2002; Makino, Uchino, Morimatsu, & Bellomo, 2005; Pham-Huy, He, & Pham-Huy, 2008; Li, Ma, Jan van der Kuijp, Yuan, & Huang, 2014).

Causation cannot be derived from the soil samples presented in this report as having a bearing on the direct health and well-being of the residents of KPA. To do so requires a more comprehensive study of the resident's conditions, pre and post rental at KPA and soil sampling over an extended period. However, preventive measures can be developed to minimize the exposure of at least the four minerals presented above. It is recommended that erosion control effects be installed to reduce the wind energy and water runoff that can lead to increase inhalation and dermal exposure from the soil around KPA.

14 Air Quality and Health Implications

Fine particulate matter (2.5 microns or smaller in size (PM_{2.5})), increases the risk of hospitalization among the elderly, even when the exposure is for a short time. When inhaled by the elderly these particles infiltrate the very depths of the lungs' bronchioles, causing chronic breathing problems, as well as cardiovascular problems in older adults with weakening lung functions. When the body cannot receive enough oxygen because of this weakened state, the individual may present with ischemic issues that impact the heart and the brain.

Additional impact on the body by having small particles infiltrate the lungs are that the body produces responses to fight the invasion of particles. With weakened antibody responses, the body produces an inflammatory response, that is often exaggerated. Studies note that in individuals with increased releases of cytokines, a decrease in the functionality of the lungs and heart takes place.

When you combine all of the potential impacts the elderly body may have as a result of being overcome by the effects of pollution, noting the possible correlation of chronic conditions with air quality, it is critical that we focus on reducing air pollution or the exposure to short-term poor air quality. Research exists to show a relationship between exposure to air pollution and an increase in levels of asthma in both the young and old, as well as higher levels of mortality.

When we look at environmental relationships and explore the link between health outcomes and residential segregation, we start to uncover a pattern of low wealth communities established around potential environmental hazards. For instance, Lopez, 2002 studied the relationship between outdoor air pollution and residential segregation in 44 urban areas. He found that African Americans were more likely than Caucasians to be living in census tracts with higher concentrations of air toxins.

Morello-Frosch & Jesdale, 2006 examined the links between exposure to toxins in the air, cancer risk, and racial residential segregation in 309 metropolitan areas in the United States. Like Lopez, 2002, Morello-Frosch & Jesdale, 2006 used the 1990 census in their analysis. Morello-Frosch and Jesdale found that as racial and ethnic residential segregation increased, so did the cancer risk associated with exposure to ambient air toxins. That is, the estimated cancer risk associated with air toxins were higher in census tracts in metropolitan areas that were hyper-segregated.

A twelve-year study conducted with Medicare beneficiaries across the United States looked at the level of particular small exposure (PM 2.5 levels of less than 12 μ g per cubic meter) for each enrollee (60,925,443 persons). The outcome of this study death rates among African Americans, men, and overall those who were Medicaid beneficiaries was increased when compared to the population as a whole in the United States (Di, et al., 2017).

A 2008 study (Downey & Hawkins, 2008) found that there exists a graphical difference when African Americans live on the wrong side of the fence line. In communities that contain locally unwanted land uses and industries deposit pollutants outside of the factory gates, the exposure rate is more significant for the neighborhoods with income levels less than \$10,000, as compared to communities with incomes levels higher than \$50,000. For residents bordering these industrial communities, residents receive little or no protection from toxins and other pollutants.

An example of this type of unknown, unwanted exposure can be seen with the 16-month exposure to Kepone in Hopewell. From 1974 to 1975, Life Science Products produced Kepone,

a highly toxic pesticide, that in the end would create the most costly chemical disaster in the United States. For the residents of Hopewell, life was endured by dust from production and nearly one metric ton of Kepone laying on the ground in a 300-foot radius to the makeshift production site, located .4 miles away from KPA. This exposure while undocumented for the general public produced body tremors, vision problems, weight loss, abnormal sperm motility and mental health changes in employees of the factory (Reich, M. R., Spong, J. K., 1983) Studies have not been conducted to glean the impact this chemical had on those in the general public, with the exception of studies done on family members of the employees. While in this example, even having a buffer zone that could potentially protect the population from widespread exposure, this case illustrates the worst event possible for a city. It could be correlated that the potential lack of a buffer area for the residents could be linked to increased chronic illnesses for the KPA residents.

The need for an industrial buffer zone to limit the exposure of fine dust particles reaching the KPA community is paramount. Had the City of Hopewell, Hopewell Redevelopment and Housing Authority, the US Department of Housing and Urban Development or Virginia Department of Housing developed a buffer zone concept, KPA would probably not be located at its current site.

An example of a buffer zone is shown below.

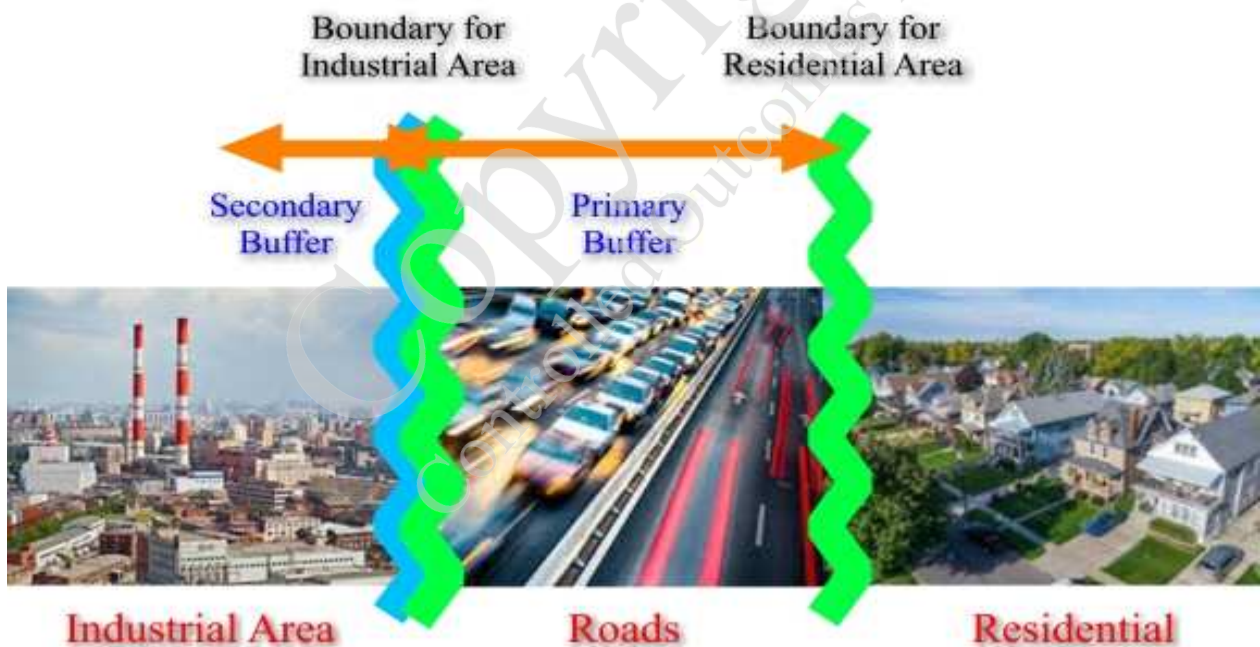


Figure 17: Buffer Area Example

Present-day urban air contamination comprises of substances - sometimes in the hundreds. The presentation of an industrial complex nearby only adds to the potential list of airborne substances (Chen & Goldberg, 2009). Exposure to numerous different particles is associated with an elevated risk for infection (bacterial, fungal, viral, and protozoa). To understand the impact that air quality has in the KPA community, Controlled Outcomes conducted an air quality study at

KPA. The study was not as protracted and only focused on PM2.5 level, the results of the local research can postulate that there is significant evidence of adverse effects related to exposure to PM2.5 at concentrations above current national standards. Based on the results, one could potentially find causation that the impact of local air quality at KPA may lead to increased chronic illnesses among the residents, or at least prolonged the effects of such chronic illnesses.

14.1 Outcome

Links have been developed between short-term elevations of ambient air pollution causing in specific population subgroups, a multitude of acute health events, such as the elderly and those who are impaired with physiologically (e.g., congestive heart failure, diabetes, and cardiovascular disease) (Chen & Goldberg, 2009).

The same links can be made with long-term exposure to air pollution and chronic illnesses, even a decreased life expectancy. In the study conducted by Controlled Outcomes examining air quality at KPA, several critical indicators were brought into play. The average length of residency by tenants of the complex was a mean of 7.6 years, with a low of 2 years and a high of 23 years. Studies have shown that any exposure over time of less than 12 µg per cubic meter as destructive to one's long-term health (Brook, Rajagopalan, & Pope, 2010).

The Controlled Outcomes study concluded the following, which Controlled Outcomes understands are beyond the scope of Community Housing Partners ability to correct, but warrants a need for Controlled Outcomes to disclose under our due diligence, and to hopefully bring about potential areas to mitigate this state of affairs in a positive method for the residents.

The KPA sits within 1 mile of several major industrial chemical plants, two of which have been listed for several years as the worst offenders of the Clean Air Act and in violation of the Commonwealth DEQ regulations on air quality emissions. The KPA community, much like the Davisville Public Housing community are in what is termed "the sacrifice zone." Sacrifice Zone is defined as areas that had been contaminated with industrial waste products, in which the residents are expected to forgo their fundamental right to a safe and healthy environment. To fully understand the issue of chronic illness and air quality, Controlled Outcomes deployed two air monitoring system modeled after the Village Green Project. Starting on January 15, 2017, air samples were measured at four-minute intervals round the clock for seven days a week for 11 months (115,200 readings), to estimate the air quality, outside the apartment complex. The tests included the following datasets:

- Particle concentration
- Particle Count
- Particle per liter (Estimated Mass)
- Temperature
- Wind direction
- Wind speed

For the overall purpose of this report, this study only focused on the particle counts (ppL). This was done to align the research as mentioned with the United States Environmental Protection Agency Air Quality Index, as well as with the Village Green Project, both which were used as a

general point of reference to indicate potential health concerns as a result of the readings presented by the system.

| | Particle Concentration | | Particle Count | | Particle Per Liter | | Temperature | | Wind Direction | Wind Speed | |
|-------------|------------------------|-----|----------------|-----|--------------------|-----|-------------|-----|----------------|------------|---------|
| | High | Low | High | Low | High | Low | High | Low | | High | Low |
| Air Quality | 68.1 | 0.1 | 2452 | 652 | 1670 | 22 | 84 | 24f | North | 6.4 mph | 4.0 mph |

Figure 18: Air Quality

| Particle Counts (ppL) | Estimated Mass ($\mu\text{g}/\text{m}^3$) | Rating | Description |
|-----------------------|---|-------------------|--|
| 8001 - 16000 | 321 - 640 | Very High | This level of particles is unsafe and warrants more serious long-term health effects if sustained. |
| 4001 - 8000 | 161 - 320 | High | Air pollution levels are dangerous and everyone may experience coughing, itchy eyes or other symptoms. This level of particles may significantly trigger asthma and allergy symptoms. Work to decrease values as soon as possible or consider wearing a mask. |
| 2001 - 4000 | 81 - 160 | Elevated | Air pollution is unacceptably high and problematic for all persons due to significant particulate loading in the air. Brief exposures to this level often occur from cleaning, such as vacuuming a carpet. If this level is sustained during the nighttime, consider investing in an air filter for the bedroom. |
| 1001 - 2000 | 41 - 80 | Slightly Elevated | Air quality is problematic for vulnerable populations (elderly, respiration-compromised individuals or children). This level of pollution warrants taking steps to try to reduce: turn on your kitchen hood vent; consider opening or closing a window as appropriate, etc. |
| 501 - 1000 | 21 - 40 | Moderate | Air quality poses a slightly elevated risk of asthma, allergy, and arrhythmia symptoms. Frequently seen moderate levels of particulates are often caused by human behavior (cooking, candle burning, etc.). |
| 0 - 500 | 0 - 20 | Good | Air quality is considered good and there is little risk of particulates causing harm to your health. |

Figure 19: Measurement Scales

As a factor of the study, the wind direction was measured, and it was noted that during the study period, the predominant wind directions influencing the residents of KPA were north, northwest,

and north-northwest. Each of these wind directions moved high to medium-high concentrations of chemical vapors from the industrial plants directly over KPA.

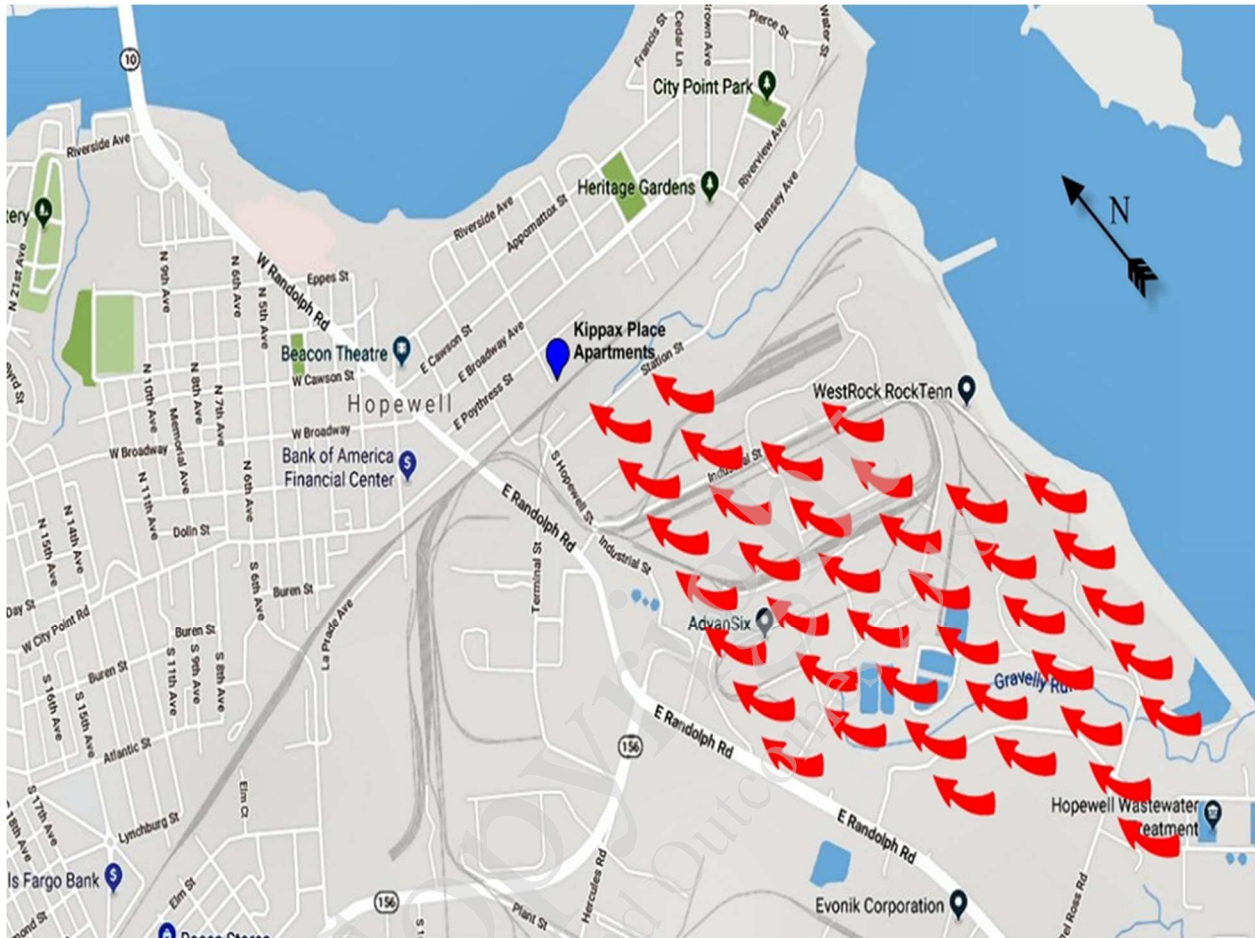


Figure 20: Wind Pattern

Roughly one mile (as the crow flies) from KPA sits several industrial plants that operate around the clock producing the below noted chemicals, each having its own potential airborne hazard to humans, some with cancer risk when inhaled over long terms.

| Chemical Name | Potential Airborne Human Hazard | Potential Cancer Risk | Affected Human Organs |
|----------------------|--|------------------------------|---|
| Caprolactam | Acute (short-term) exposure may result in irritation and burning of the eyes, nose, throat, and skin. Headaches, malaise, confusion, and nervous irritation after inhalation. Chronic (long-term) exposure may cause peeling of the hands and some eye, nose, and throat irritation. | Group 4 | Eyes, nose, throat, skin, CNS |
| Ammonium Sulfate | It can cause severe irritation and inflammation of the respiratory tract if inhaled. Contact with the skin or eyes | Group 3 | Lungs, skin, eyes, gastrointestinal tract |

| | | | |
|---------------|---|---------|--|
| | will cause irritation, redness, itching, and pain. It may also be a neurotoxin, meaning it can cause confusion and behavioral changes. | | |
| Cyclohexanone | Irritation-Eye, Nose, Throat, Skin; Cumulative liver and kidney damage; Narcosis | Group 3 | Eyes, skin, respiratory system, Central Nervous System, liver, kidneys |
| Cyclohexanol | Irritation-Eye, Nose, Throat, Skin; Cumulative liver and kidney damage; Narcosis | Group 3 | Eyes, respiratory system, skin |
| Sulfuric Acid | Irritation of the upper and lower respiratory tract; Marked eye, nose, throat, bronchial, and skin irritation; Pulmonary fibrosis, bronchiectasis, and emphysema; Dental erosion; Pulmonary edema | Group 1 | Lung, Teeth, Eyes, Nose, Skin |
| Ammonia | Exposure to elevated levels of ammonia can also cause hoarseness, violent coughing, painful breathing, impaired vision/blindness, dyspnea, and cyanosis. Temporary blindness, pulmonary edema, marked eyes, skin and respiratory irritation | Group 3 | Eyes, skin, lungs |
| Hydroxylamine | Irritation-Eye, Nose, Throat, Skin; Methemoglobinemia; Hemolytic anemia; Narcosis | Group 3 | Eyes, skin, respiratory system, blood, Central Nervous System |

Figure 21: Known Locally Manufactured Chemicals

15 Popsicle Index

How does our community impact our overall well-being? The theory known as nature vs. nurture can be addressed in understanding how our environment influences our health, be it positive or negatively. Our viewpoint here is the influences of learning and other impacts an individual gleams from their environment. For centuries the argument on whether an individual's strengths and weaknesses are in relation to their results of nature or nurture has, and somewhat continues to rage on between scholars and lay people alike (Lynch, 2016).

With selected physical traits, physical and mental health disorders have a tendency to run in families, it has been noted in research that while the illnesses of your parents, grandparents, siblings, and other biological family members have is not always a guarantee you will inherit them, but your chances are higher. Environmental factors, however, do play a significant role on whether or not you develop the health problems that run in your family.

To help understand how the environment or the community affects our wellbeing, former Assistant Secretary of Housing and Urban development, Catherine Austin Fitts, developed a quality-of-life index based on one question: what percentage of the people in your community believe that they can leave their home, go to the nearest store to buy a popsicle, and return home alone safely? An example, if you feel that 50% of your neighbors believe a child in your neighborhood would be safe, then your Popsicle Index is 50%. The Popsicle Index is based on gut-level feelings of the people who have intimate knowledge of a place, rather than data.

The Popsicle Index is more than a measurement of safety; it is about the environment to which the KPA resident live, work and play and the influence it has on the health and well-being of the residents. It is about the ability of the KPA residents to modify their environment so that it supports the needs and wants, without sacrificing the resources and security of the community.

In communities with low Popsicle Index scores, residents are less likely to engage in the "walkability model", where the residents walking habits, motivations for walking, their interactions with neighbors, and their perceptions of crime in their neighborhoods are based on how safe the resident believes the community is, which then impacts the health of the resident – for the lack of the ability to exercise by walking internal of the community, leads to sedentary lifestyle (Zuniga-Teran, Orr, Gimblett, Chalfoun, Guertin, & Marsh, 2017).

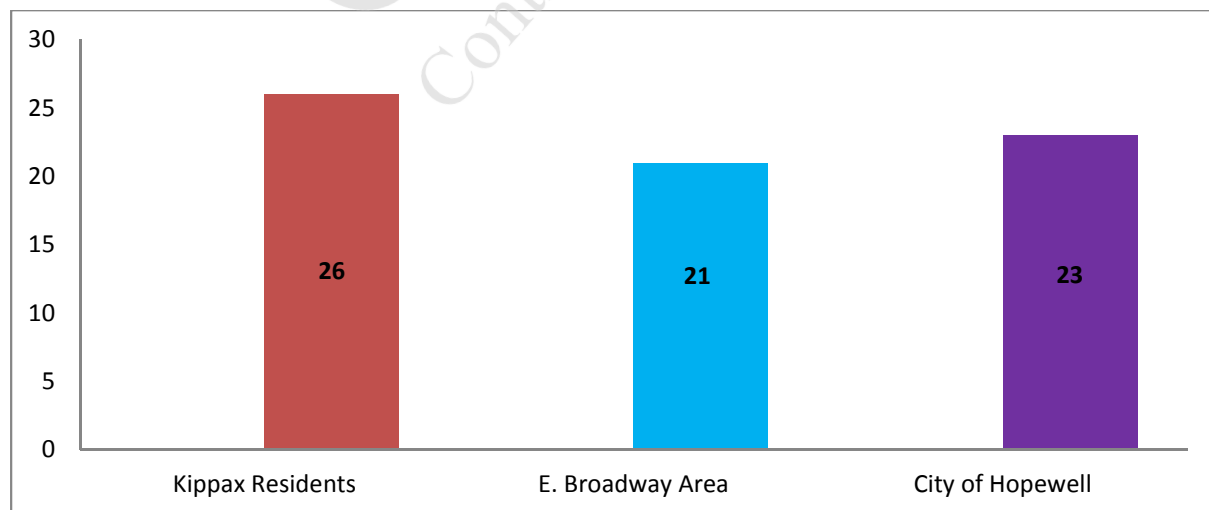


Figure 22: Popsicle Index for City of Hopewell

15.1 Outcomes

In a survey conducted by Virginia State College – College of Humanities and Social Science – The Department of Sociology and Criminal Justice on behalf of Controlled Outcomes, the residents of KPA were asked, "do you believe you can leave your home, go to the nearest place to buy a product and return home safely?" The overall response was 26% (Virginia State University School of Sociology, 2017). Analysis: KPA has a Popsicle Index of 26%.

The KPA residents further reported the lowest levels of mental well-being and the highest perceptions of crime in their neighborhood. Many of those surveyed blamed the lack of neighborhood maintenance, incivilities — such as trash, litter, or graffiti — and the notion that for at least KPA, they are the forgotten community.

According to Neighborhood Scout, the City of Hopewell is ranked 84 out of 100 as the most unsafe cities in America. Drilling down to the Kippax neighborhood, the area is ranked 59 out of 100 most hazardous in the country. The chances of a resident of the Kippax neighborhood becoming a victim of crime are 1 in 214.

The map below shows the level of poverty based on the reduced Richmond MSA, focusing on Hopewell. Poverty and crime have a nuanced relationship. Having less wealth puts a strain on individuals. This added stressor of living in poverty leads some individuals to committing crimes to be able to support themselves.



Figure 23: Poverty Level by City

The figure below shows violent crimes in both the Kippax neighborhood, as well as two adjacent communities in Hopewell, Virginia.

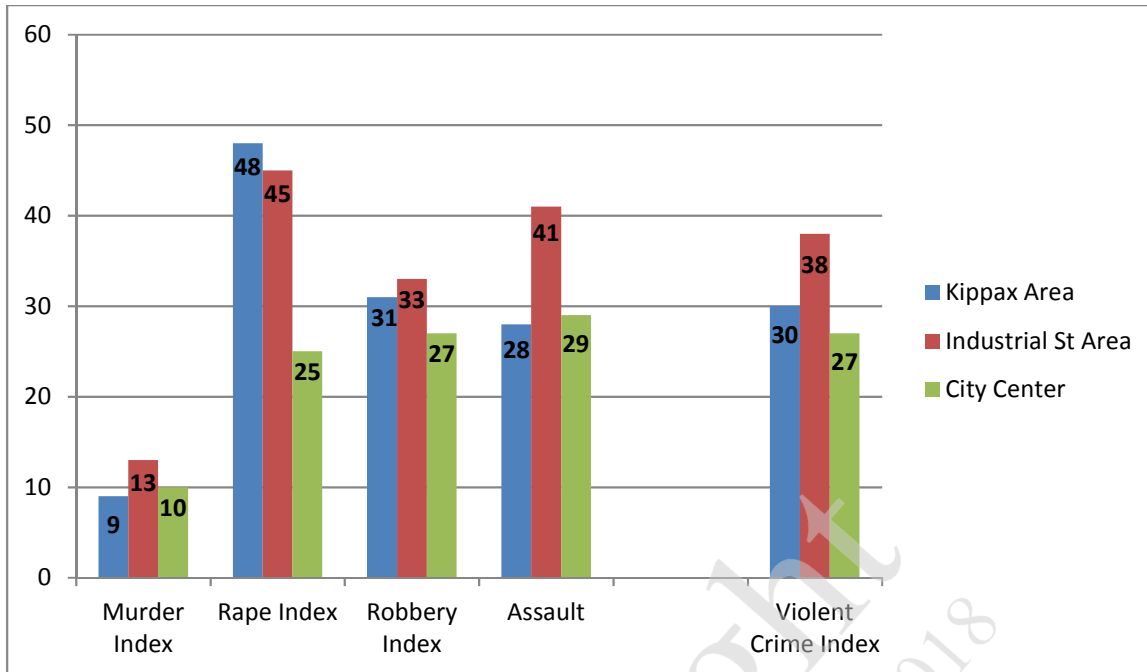


Figure 24: Violent Crime Index by Type

Figure 25, on the preceding page shows property crimes in both the Kippax neighborhood, as well as two adjacent communities in Hopewell, Virginia.

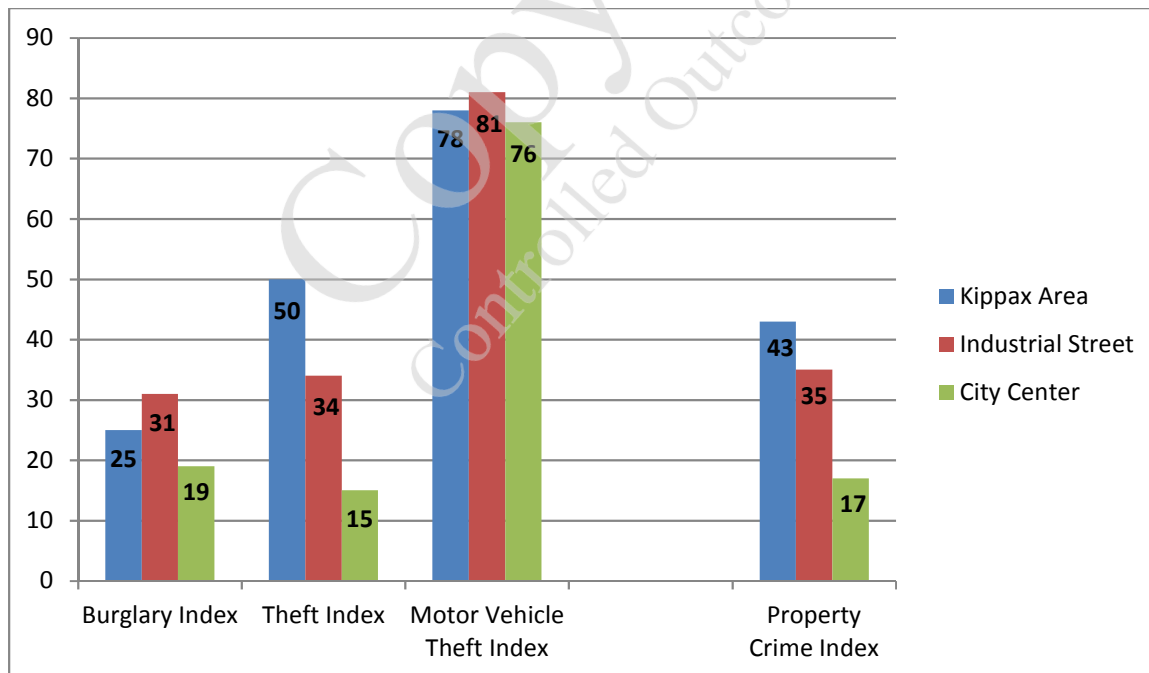


Figure 25: Property Crime Index by Type

16 Food Insecurity

Specifically, food insecurity is defined as the state that access to adequate food is limited by a lack of money and other resources at times during the year (Afulani, Herman, Coleman-Jensen, & Harrison, 2015).

By contrast, a food desert is defined as an area where populations live more than one mile from a supermarket or large grocery store (Ver Ploeg et al. 2012).

In a survey conducted at KPA, residents were asked about current food insecurities they faced living in the community. The results of this one month survey follows.

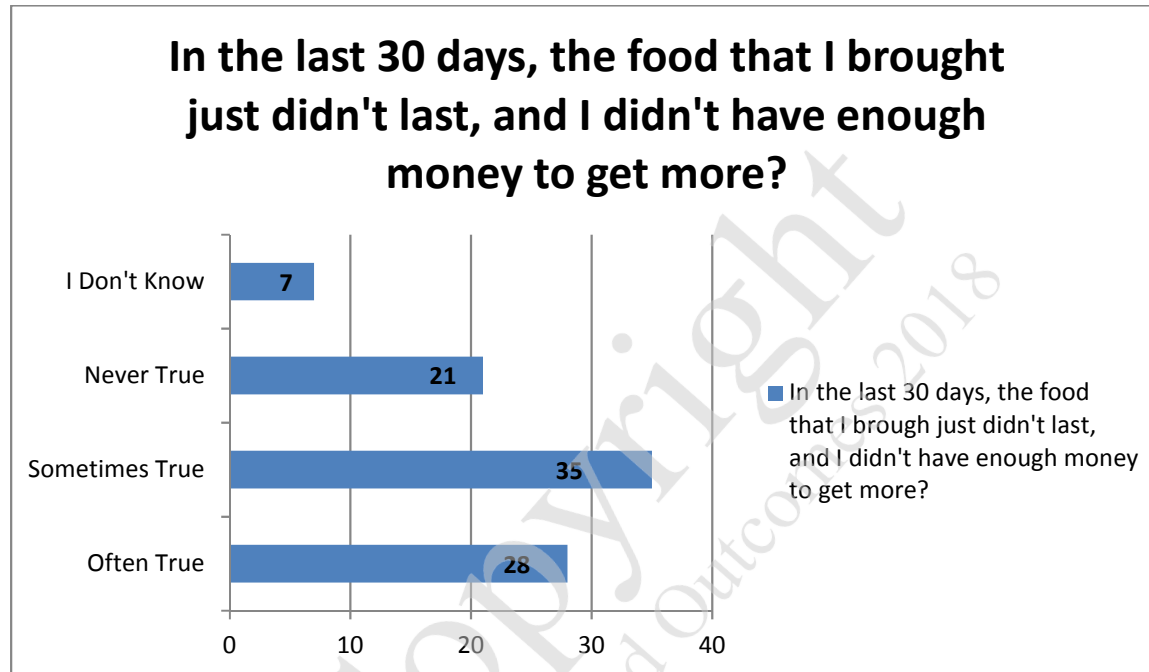


Figure 26: Food Not Lasting 30 days

It should be noted here, that one of the major contributors to the resident's inability to have enough food to last one month, could be the amount of SNAP benefits paid to a single resident in the City of Hopewell. According to the income versus benefit, the average SNAP allowance for the resident is only \$16.

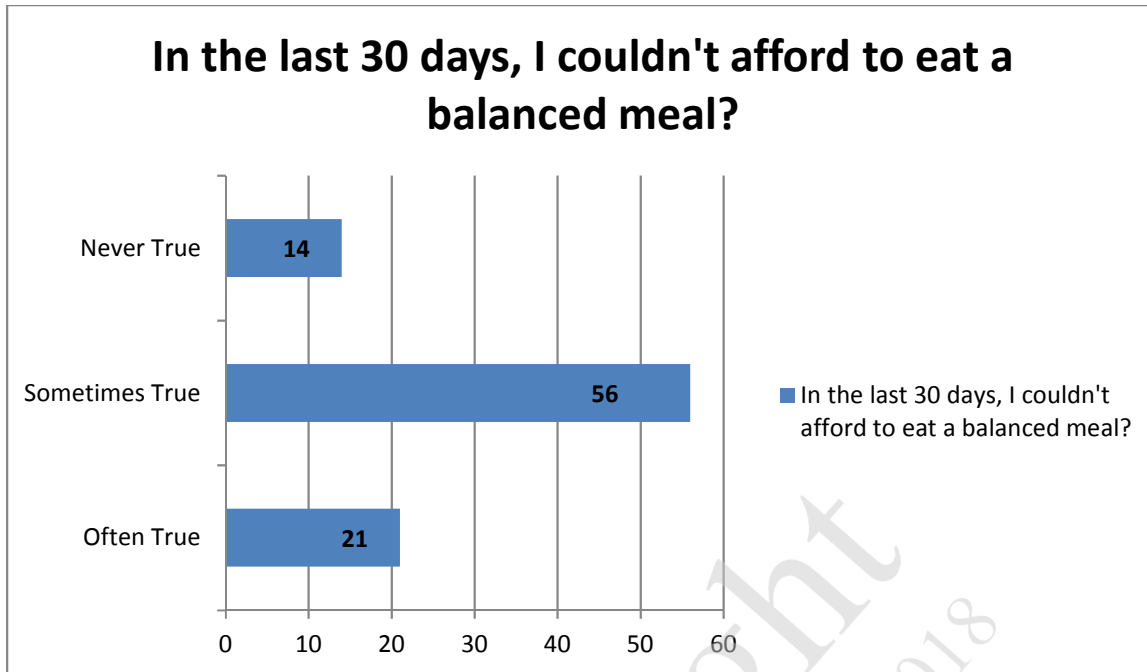


Figure 27: Balanced Meals

One of the first things that Controlled Outcomes accomplished was the distribution of food boxes that contained 20 lbs. of food, each month. Residents were given menus for the boxes, which included a family box, produce box, and meat box. Orders were taken the first week of the month, with box delivery to the resident's door the following week.

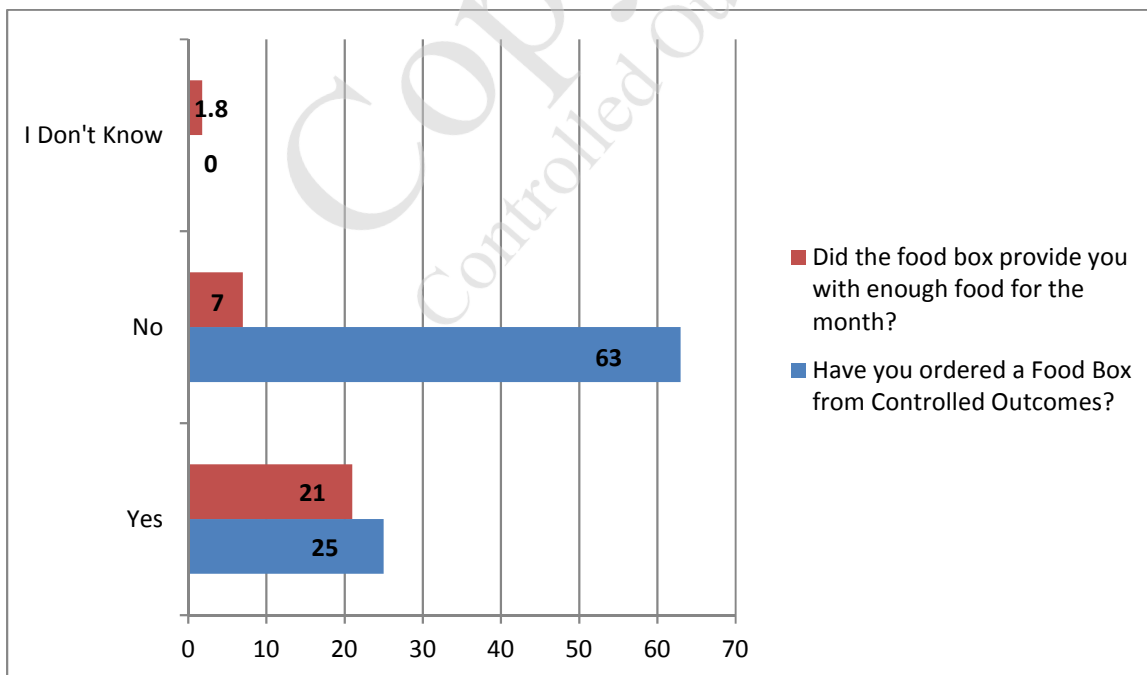


Figure 28: Controlled Outcomes Food Box

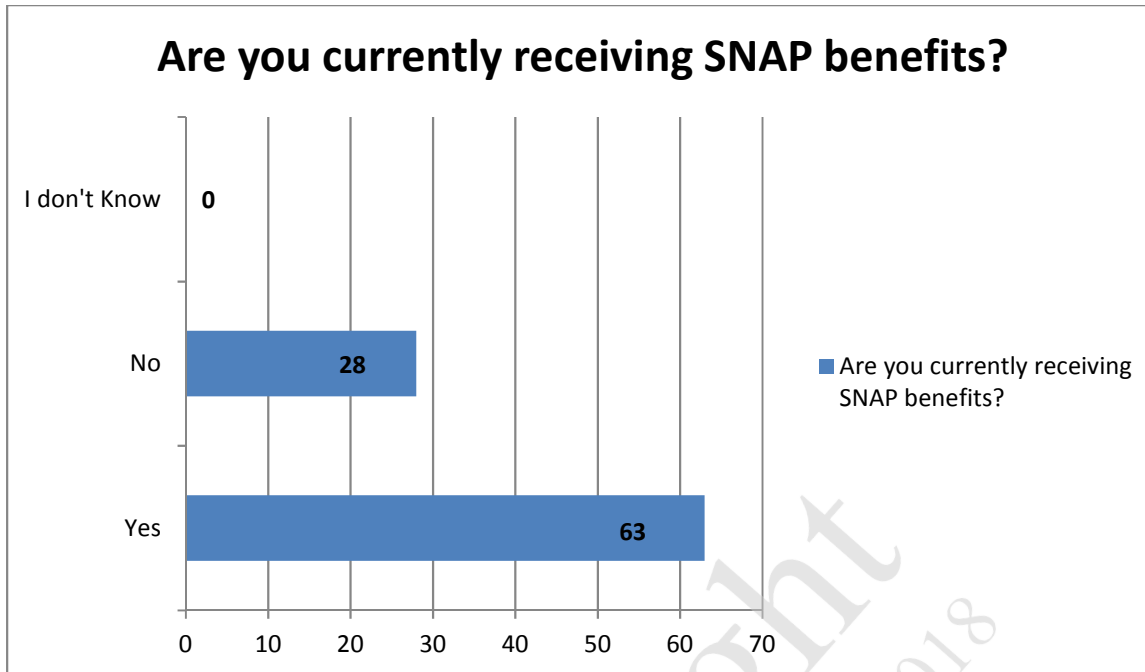


Figure 29: SNAP Benefits Participates

Based on current income guidelines, all of the residents at KPA are eligible to receive at least the minimum SNAP benefit, yet the residents who responded NO to the survey question did not have the desire to apply for the benefits.

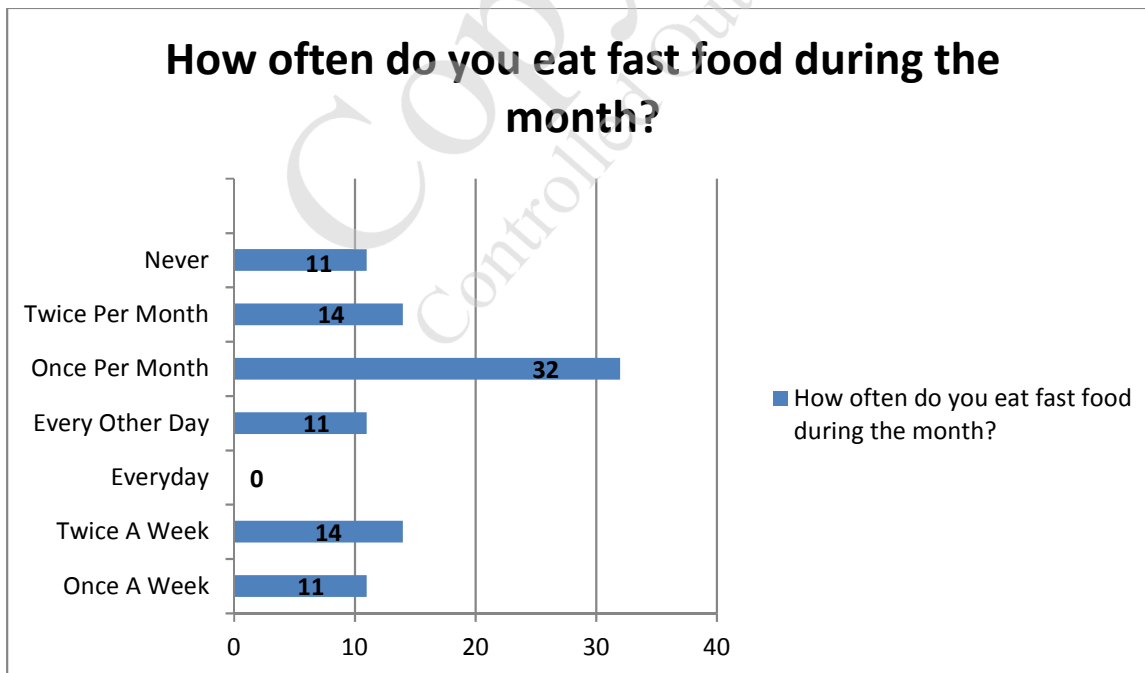


Figure 30: Fast Food Purchases

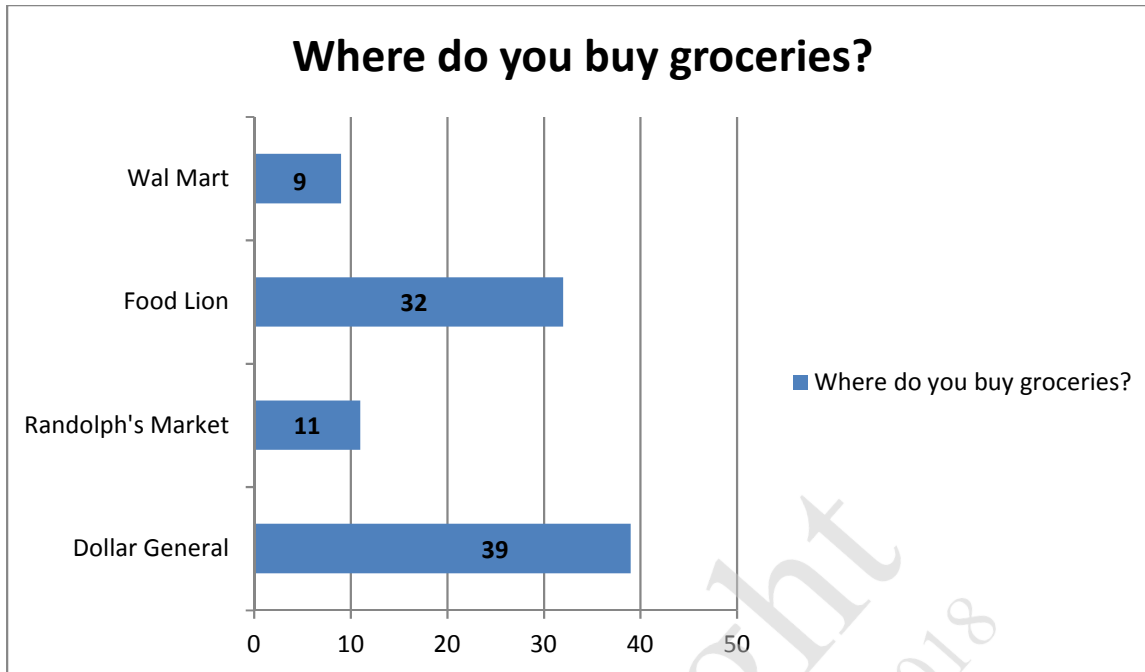


Figure 31: Food Purchases

It was important to know the means to which the residents of the KPA went in order to escape the food desert that exists in the community. Of the 91 responses to the question of Where do you buy groceries? The majority of purchases made were within 0.2 miles of the building, at a local Dollar General store that does not offer fresh meat, fruits of vegetables, selling only processed or frozen foods. While this may seem like a good place to purchase groceries, it is not. Randolph Market, while the next closest grocery store is located 0.7 miles away and offers some fresh meats, vegetables, fruits and a wider selection of staple items, but is higher priced, as this is a small family run business. Food Lion is located 4.5 miles away from the community and offers an expanded selection of vegetables, fruits, meats, and other staple items. Moreover, Wal Mart is located 8.3 miles away from the community, offering a big box solution to both groceries and soft line products.

By the conclusion of the first year of the program, 23 residents now receive Meals on Wheels, an increase of 13% over participation levels from 2016. Couple this with when in operation, an average of 15 residents would participate in the healthy food box program sponsored by Controlled Outcomes.

17 Transportation

Research has noted a critical element for healthcare is the ability to arrive and depart from your medical appointments. As well as distance plays a defining role in achieving the end goal of receiving medical attention. The element of transportation seems to hit more impoverished people in underdeveloped urban areas the most, with limited options, transportation, even when the doctor or hospital is close can still pose a problem (Arcury, Preisser, Gesler, & Powers, 2005). The City of Hopewell and the dominance of low-income neighborhoods, especially KPA is hit particularly hard by shoddy transportation infrastructure—buses having shorter operating hours, poor route management and overall unreliable. Moreover, the problem of transportation is only complicated when individuals who are disabled, obese, or chronically ill, riding public transportation can be a difficult undertaking.

To fully understand the potential impact that poor transportation may have on the residents of KPA, a January 2017 survey was conducted. Reaching 67 residents at the community, the key points of the survey are as follows:

- KPA residents find themselves without a way home after an emergency trip to the hospital or miss a doctor's appointment merely because they don't have a way to get there or back.
- One-fourth of residents indicated that it was difficult to find transportation to their doctor's offices, instead opting for a closer ED visit.
- Residents from KPA, who took public transportation to the medical appointments were twice as likely to miss appointments as residents who took private transportation.
- 25 percent of residents having to reschedule their appointments due to lack of transportation.
- Residents reported issues with missed filling prescriptions more than twice as often as residents without that same problem.

These consequences lead to poorer management of chronic illness and thus poorer health outcomes.

In some situations, residents without transportation access may wait for a medical emergency to be able to see a doctor. In these cases, residents wait until they are short of breath, in pain, or just not feeling well, will call Hopewell Fire and Rescue because there is no other way to get care. These actions among the residents create a domino effect. Failure to make medical appointments means, resident questions and concerns cannot be addressed, changes to their health cannot be updated, health history and life changes go unnoted by the doctor, and monitoring of medication cannot be updated or changed as needed. This domino effect is not only a cause for concern among resident with a somewhat healthy outlook but is a serious concern for residents presenting with diabetes and other chronic diseases that require ongoing active care.

While not an issue that can be addressed at the community or even internal of the local area is the existing problems with the overutilization of the nonemergency medical transportation that impact transportation for the KPA, as well as low wealth Virginians across the state. Because of the single broker system, Virginia's low wealth population that depends on Medicaid

transportation services are faced with missed service calls, late pick up, no return trips, and an overall failure to respond by the service provider.

Nonemergency medical transportation services notwithstanding, the KPA residents are also faced with additional transportation issues. Basic transportation needs for regular shopping and personal care trips. It has already been stated that the City of Hopewell is a food desert, couple this with the fact that most services essential (pharmacy, personal care, and sundries) are not in walking distance for residents at KPA and are often not on the limited run public transportation system.

17.1 Benefit of Accessing Consistent Healthcare

Providing transportation options to the residents of the KPA can have immediate and long-term outcomes for the residents. With improved transportation options comes greater access to healthcare, which means better rapport with medical providers, a possible better understanding of their health and the types of care they require, which overall increases the relationship the resident has with their healthcare provider.

A recent partner added to the KPA community is JenCare. JenCare uses the medical homes model of care for its patients, our residents. This model focuses on the ability of the healthcare team to provide the physical, mental healthcare needs, to include prevention, wellness, acute, and chronic care. The model is only successful when you can ensure that patients are making their scheduled healthcare appointments. Jencare assures this is taking place by providing nonemergency medical transportation to their patients.

By providing transportation services, Jencare can:

- Engage in a more robust understanding of the patient and what the most impactful interventions are for that patient
- Sets a standard for a comprehensive approach to health and healthcare.

The Jencare and Controlled Outcomes models have the unique mindset that places a premium on spending more time with patients and getting to know them in a very comprehensive way. This methodology, known as the patient-centered model, understands the complexity of the factors that impact health, and recognizes that health is more than healthcare, it understands the environment in which the patient lives; understanding the patient's family responsibilities and dependents; and exploring the patient's mobility options (e.g., driver's license, ownership of motor vehicle, current insurance, access to rides by others, access to public transportation).

Average distance to selected personal care services for KPA residents is shown on the chart below.

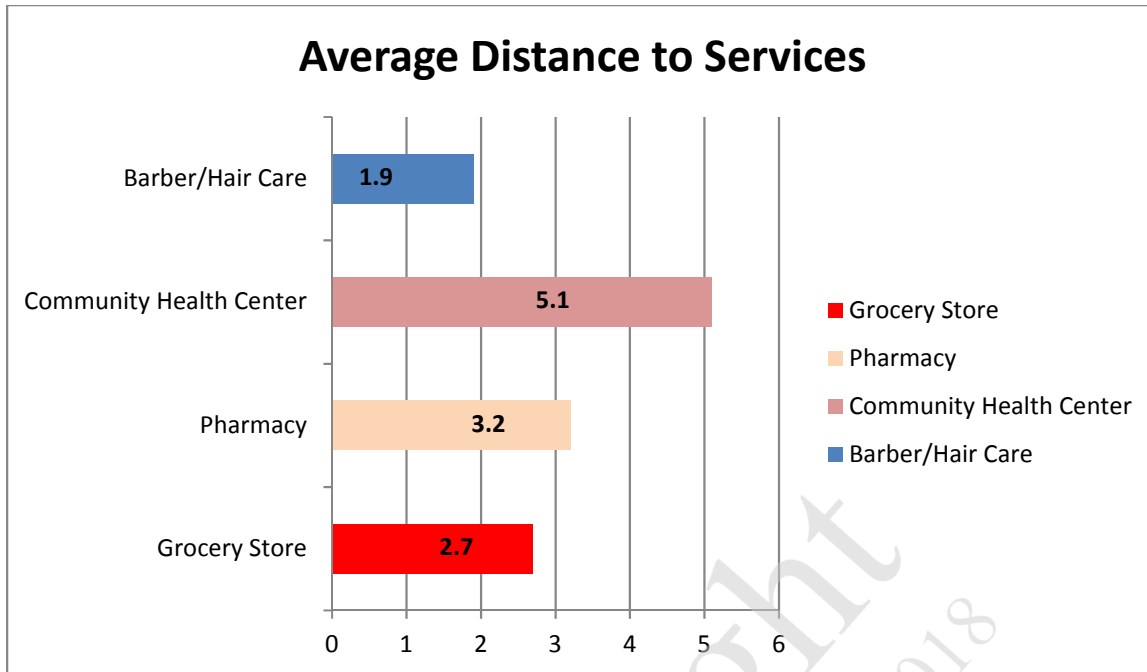


Figure 32: Distance to Personal Care Services

The map below shows the 30 and 60-minute walking zones from the KPA community. The darker bronze represents the 30-minute walk and the lighter bronze represents the 60-minute walk.

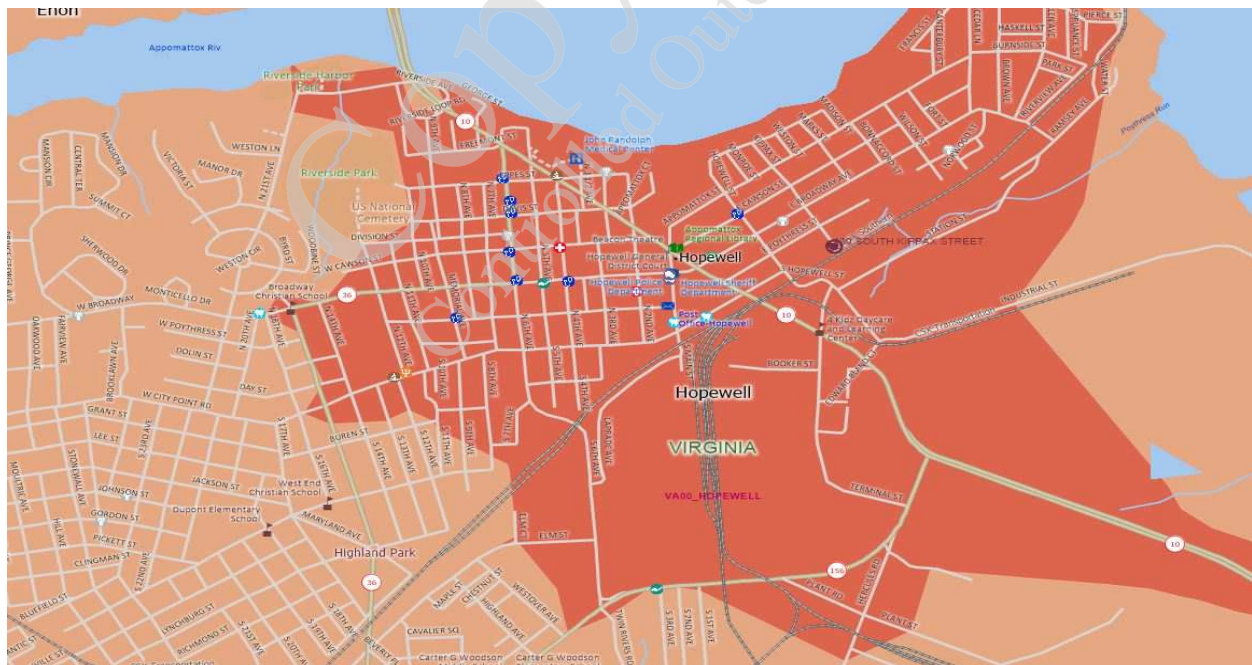


Figure 33: Distance Range for Personal Services

Primary mode of Transportation

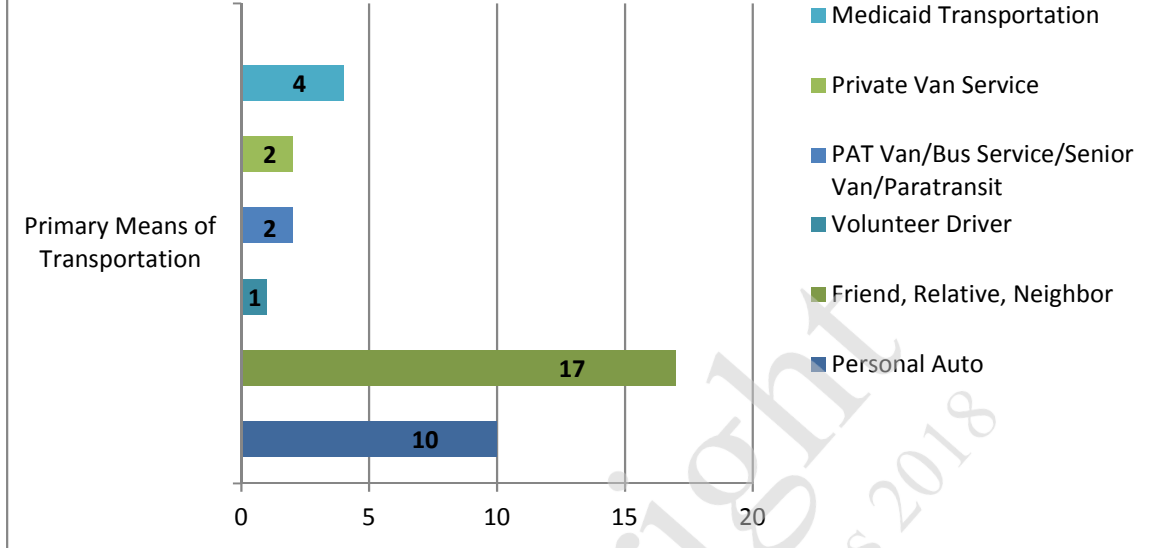


Figure 34: Primary Means of Transportation

18 The State of Community Health

While it has been established that poor housing is often associated with adverse health outcomes the question of what specific health outcomes are associated with which aspects of poor health needs further elaboration. Controlled Outcomes selected data from a set of health-related results (health status, functional fitness, mental health, health behaviors, use of health system and need for long-term care services). While causation cannot be directly established, the findings should encourage Community Housing Partners to consider the impact of the home environment as part of an attempt to improve the health of older adults.

In examining life expectancy among residents of the United States, Virginia, Hopewell and KPA, those residents residing at KPA has the worst life expectancy than any other resident in the city. Reference Figure 35. KPA residents live on average to age 65.5; this is 10.45 years shorter than residents living in the City of Hopewell. This is not surprising, in a study conducted by VCU, similar results of low income versus high-income life expectancy showed similar results for the City of Richmond, VA. With higher life expectancy in high income areas of the City of Richmond, in comparison to low life expectancies in low wealth neighborhoods.

When one factor in the top eight causes of death in the City of Hopewell, each of the eight can have positive outcomes when appropriately managed once the onset of the condition occurs, or with preventative measures put into place prior to, the disease can be slowed, if not treated to submission for some of the residents in question. Overall it is preventative care that is critical to the successful modification of KPA health DNA, which is going to increase the life expectancy of the residents. This cannot be done with hands-off monitoring, what is needed is direct hands-on resident care, from a team of professionals dedicated to the preventative care of the community.

Another factor in the potential to increase life expectancy among the residents of KPA is the modification of diet and quality of life. At current, the City of Hopewell holds the status of being a food desert and 90%, if not more of the residents of KPA living in what can be termed a condition of food insecurity. The community needs to incorporate a change management practice to drive healthy eating, active living in order to modify the current situations facing the residents of the building.

A small change to the resident's diet and shopping habits could potentially add 14 additional years to their lifespan, according to a study by the Jean Mayer USDA Human Nutrition Research Center at Tufts University on Aging.

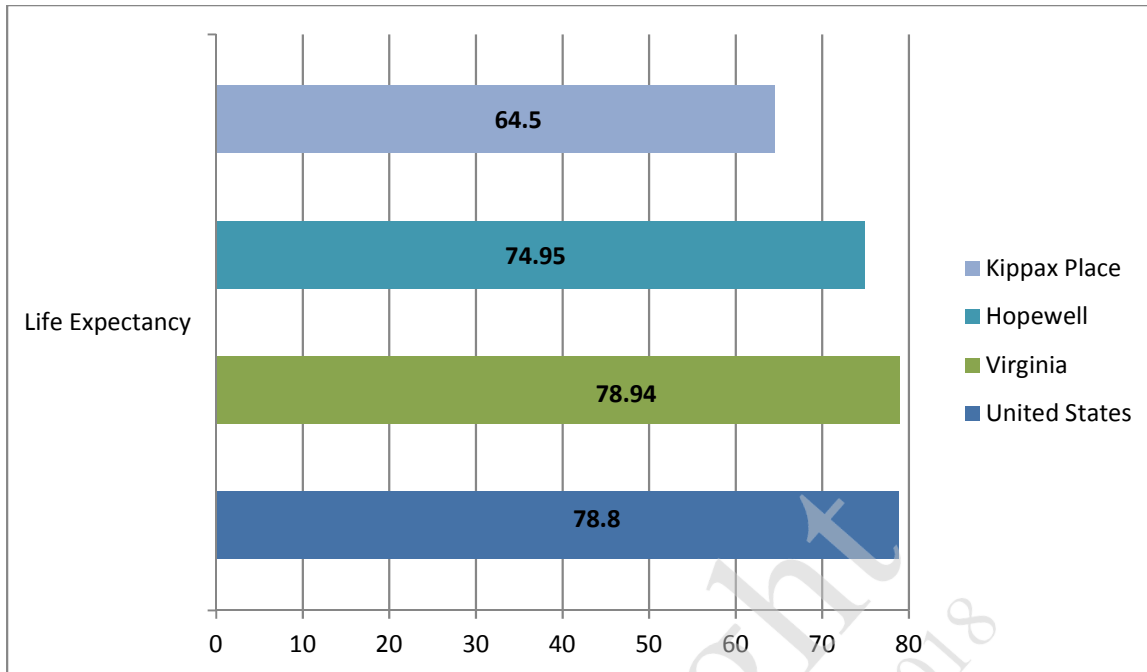


Figure 35: Life Expectancy

In examining the population of Hopewell, Virginia and the United States, the rate of deaths per selected illnesses, Hopewell residents have a higher than average rate of death from cancer, heart disease, stroke, lung disease, diabetes, kidney disease, liver disease and hypertension. This information has been drilled down to include the cause of deaths occurring at KPA over the past ten years. Noted below and over the following charts are the rates of death by illness.

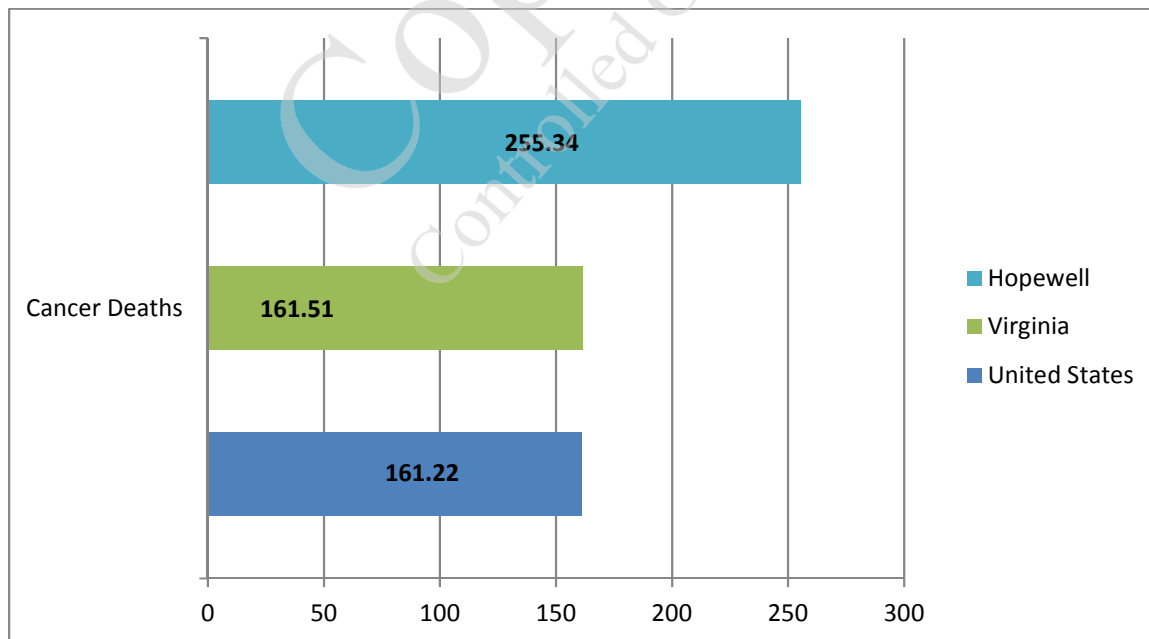


Figure 36: Cancer Deaths

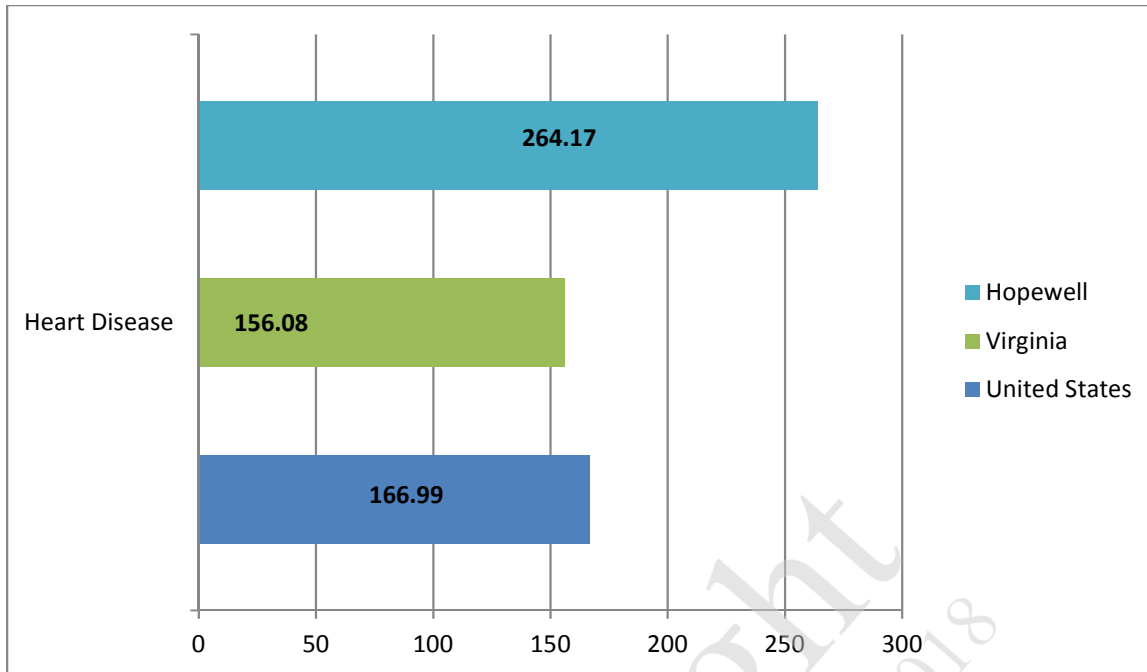


Figure 37: Heart Disease Deaths

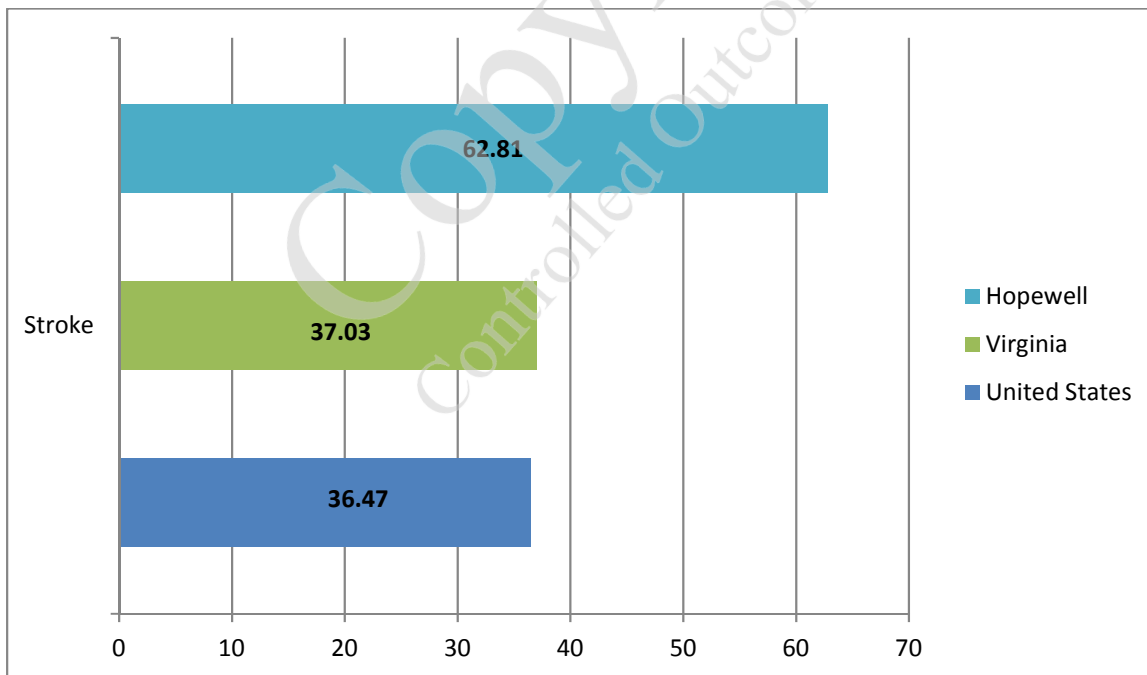


Figure 38: Stroke Deaths

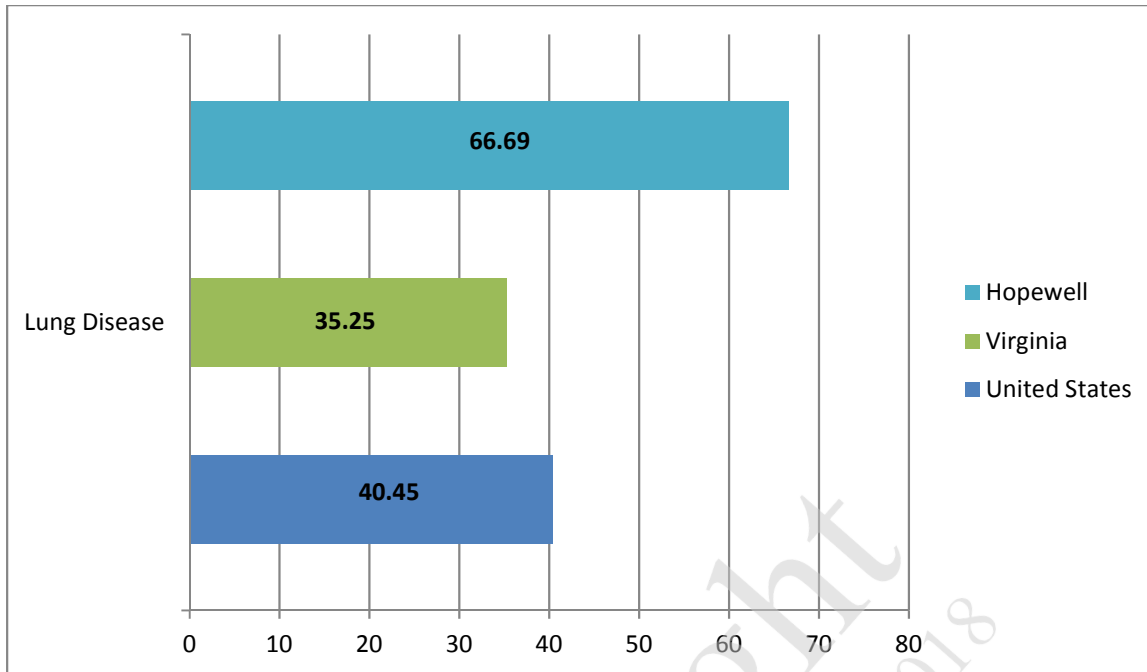


Figure 39: Lung Disease Deaths

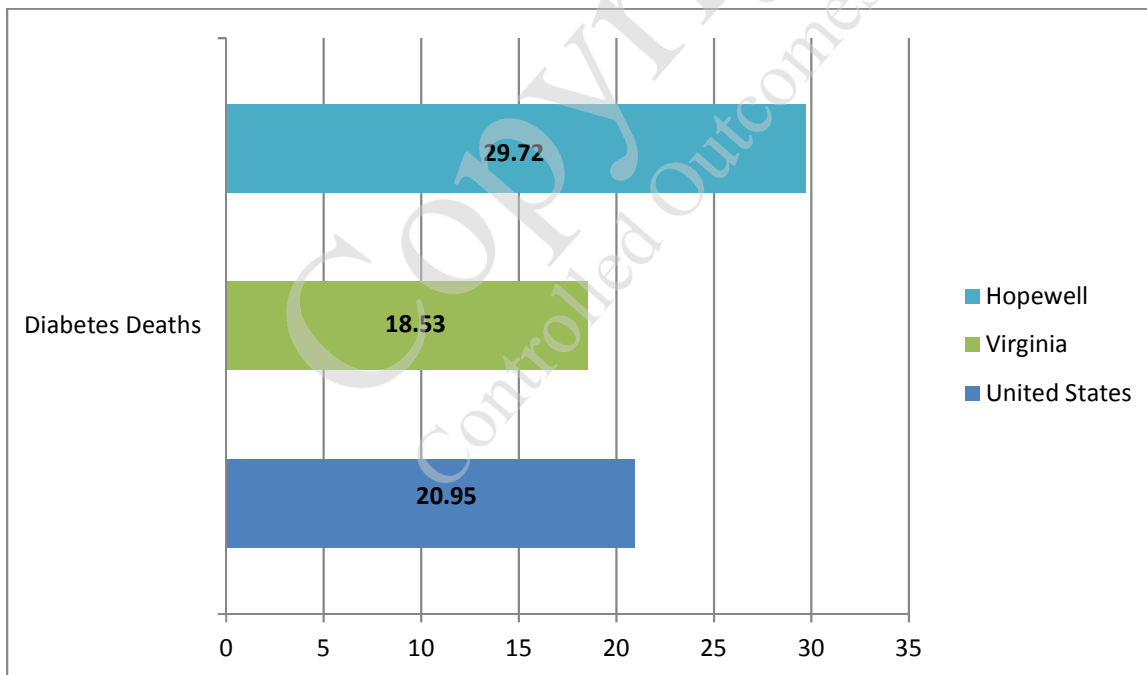


Figure 40: Diabetes-Related Deaths

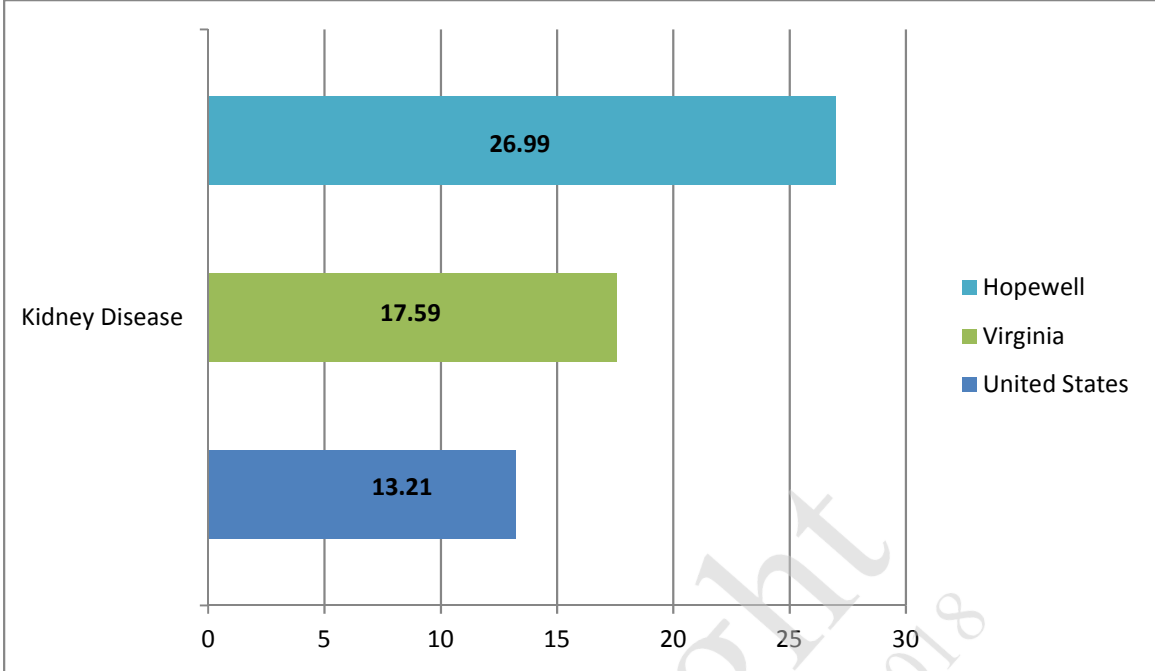


Figure 41: Kidney Disease-Related Deaths

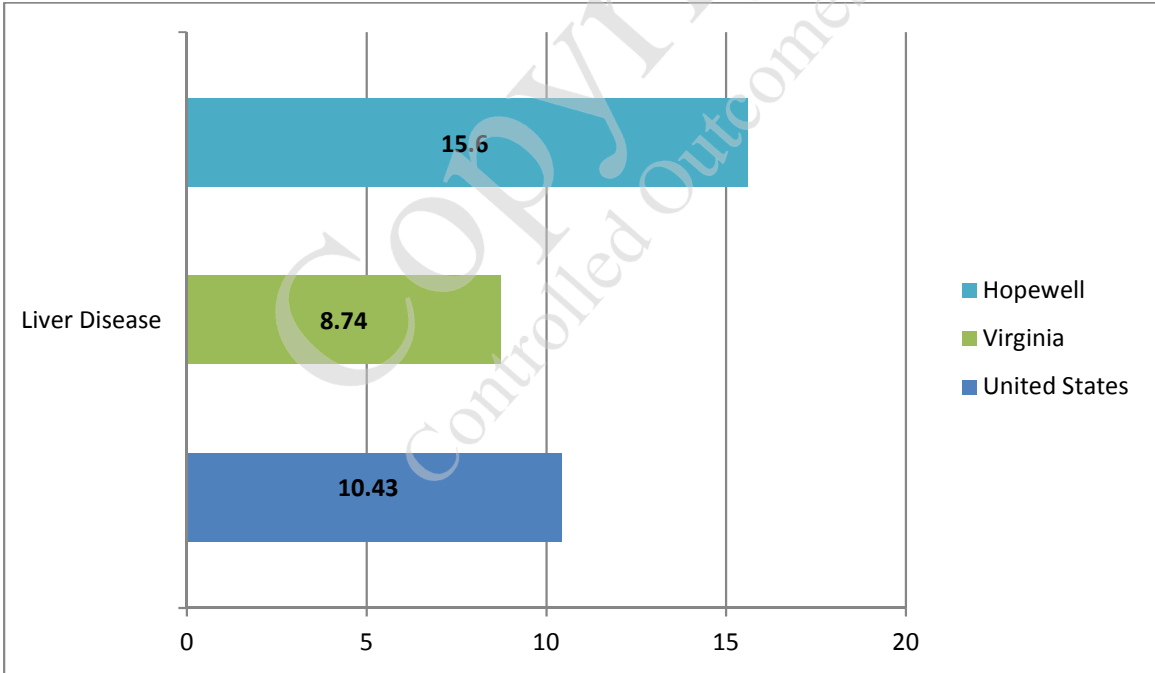


Figure 42: Liver Disease Related Deaths

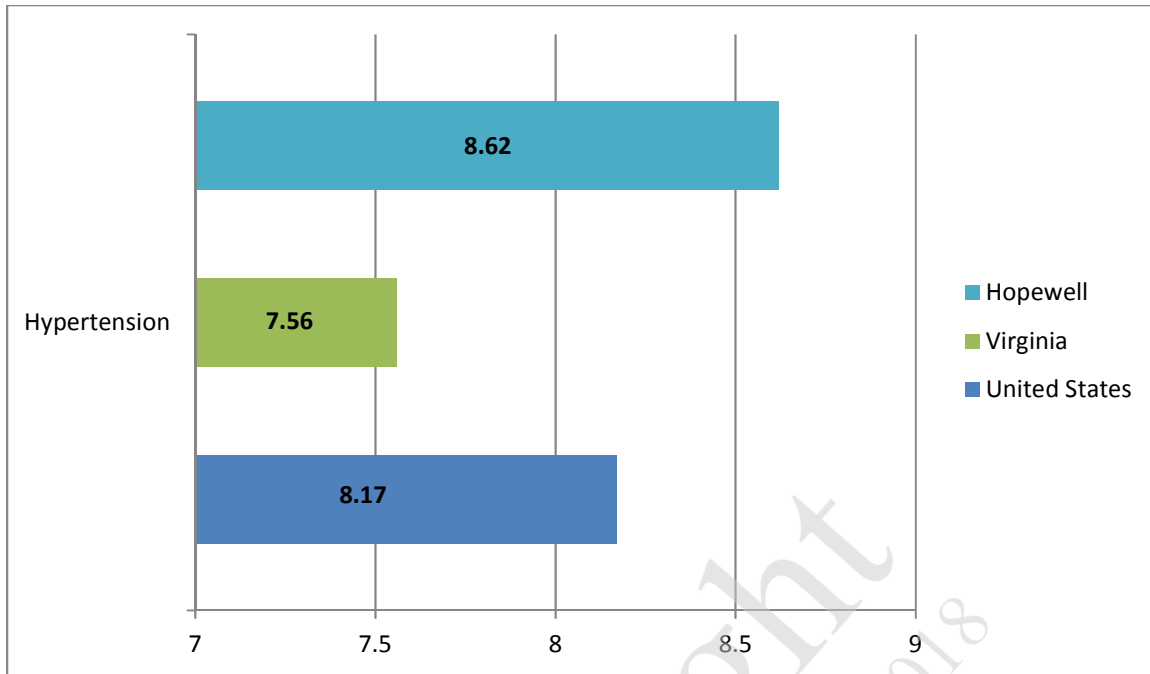


Figure 43: Hypertension Related Deaths

For several years the below image represented an all too familiar scene at KPA, with first responders being used as transportation to the local hospital when residents become ill. This was a primary concern of Controlled Outcomes and was immediately addressed in the first six months of service at KPA.



Drilling down the following figures examines the ED visits, and EMT/Fire calls for the Kippax residents, noting the rate prior to the pilot study and at the termination of the pilot study.

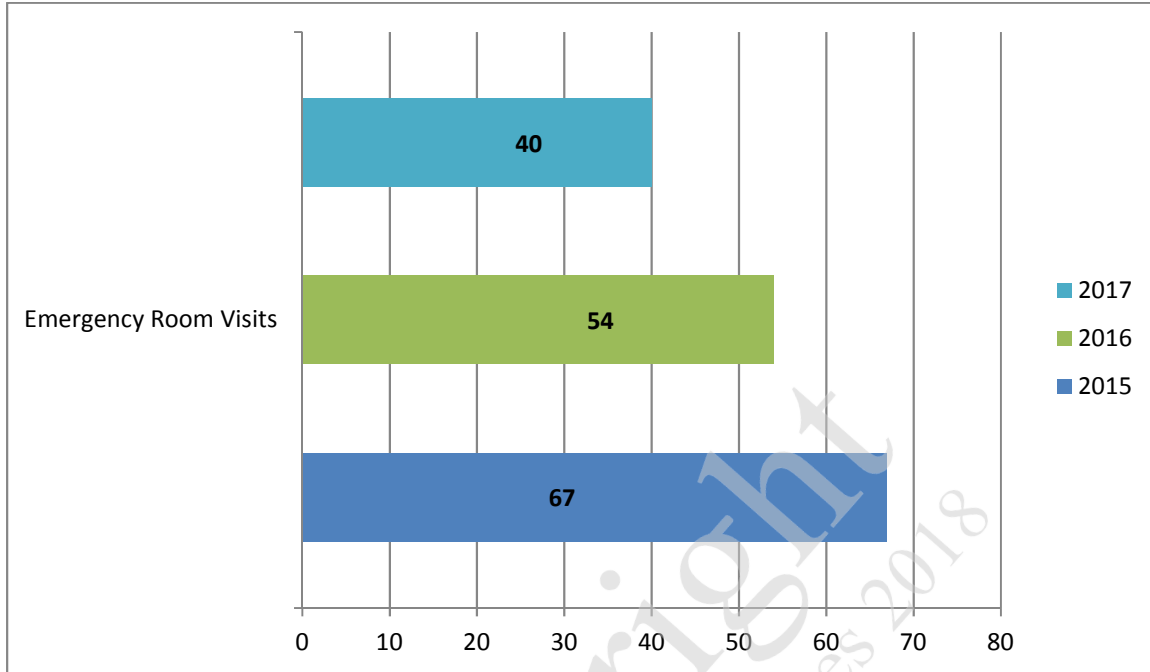


Figure 44: Emergency Department Visits by Kippax Place Residents

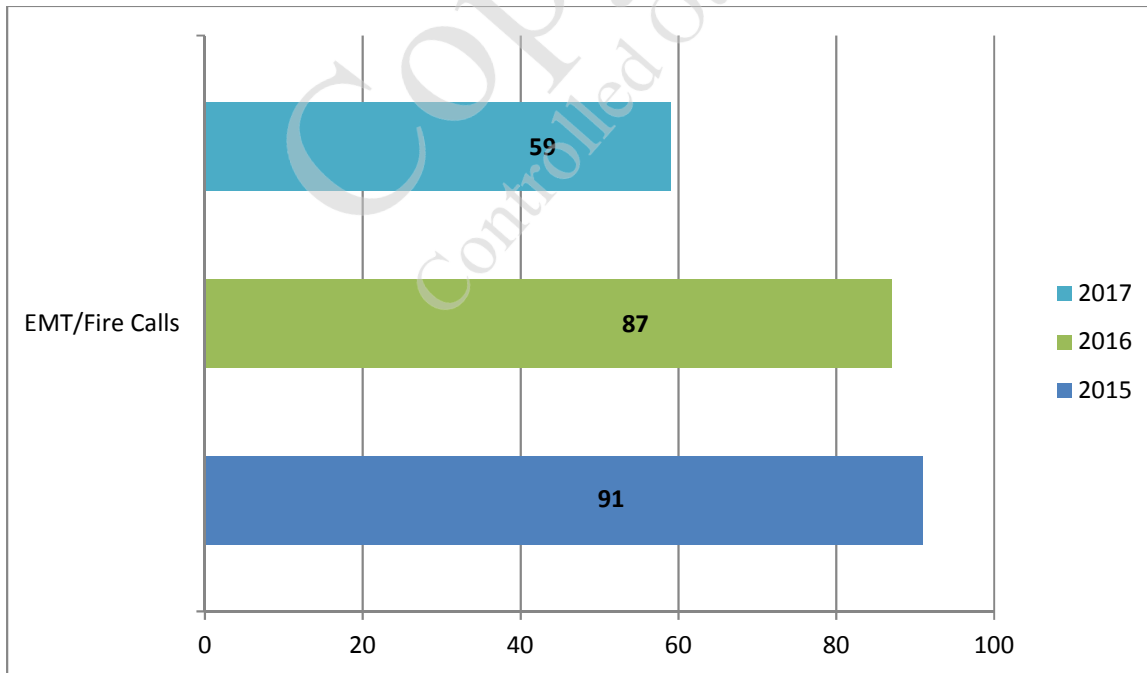


Figure 45: EMT/Fire Calls for Kippax Place Residents

As noted previously, heart disease, stroke, and cancer (lung, breast, and colorectal) are leading causes of death for residents residing at KPA. Available data points out those death rates from diabetes for the female residents of the complex are twice the rate for Caucasian women of comparable age. Men at the building have a two times higher rate of prostate cancer than Caucasian men and the leading cause of death among African American men at the complex is lung cancer. The prevalence of self-reported hypertension was higher for African American residents than Caucasian, along with incidence for diabetes.

Our study found that selected risk factors and preventive health behaviors – sedentary lifestyles, obesity, smoking, high blood pressure and cholesterol levels among the population of the building was a leading cause of poor health and lead to higher than usual chronic illnesses among the residents. The finding indicated that African American residents were more likely than Caucasians to report sedentary lifestyles in the previous month. African Americans were more likely to report that they were overweight than Caucasians in the building. The prevalence of self-reported overweight was highest for women reporting 51.5% as being overweight. African Americans in the building did report higher levels in having their blood pressure checked regularly over Caucasians; however, African Americans were less likely than Caucasians to have their cholesterol levels checked. In all strata, African American women were more likely to report having had a recent Pap smear. Among women, fifty years and older African Americans were less likely than Caucasians in the building to report that they had been screened for breast cancer within the two years before the interviews. However, the prevalence of breast cancer was highest among African American elderly women in the building.

Overall when examining the life expectancy of the current Kippax population, among African American men living in the complex, their life expectancy is the shortest of any other group in the building and the city of Hopewell. African Americans are disproportionately treated at healthcare facilities with the fewest technological resources; the least experienced clinicians serve predominately African American patient populations. Compared to Caucasians, African Americans residents are less often referred to specialists, less likely to receive preventive care such as flu vaccines and mammography, and are admitted less often than Caucasians for similar complaints of chest pains. No single cause explains these disparities, but five stand out (Department of Health and Human Services, 2016; DiJulio, 2015; Dimick, 2013; Downey & Hawkins, 2008; Fiscella, 2000; Hilmers, Hilmers, & Dave, 2012; Krieger & Higgins, 2006; Olshansky, 2012; Popescu, Cram, & Vauhan-Sarrazin, 2011; Williams & Collins, 2001).

1. Unintended race discrimination
2. Social determinants of health
3. Housing disparities
4. Health behaviors
5. Criminal law enforcement

While limited research may doubt bias in the health care system is a cause of health disparities, the difference in African Americans and caucasian health outcomes are indisputable:

1. Excess death – The quality and quantity of healthcare for African Americans have been known to be unjust and avoidable difference from the rest of the US population, especially if you are also in the category of low-wealth (Satcher, 2005).
2. Preventable hospitalization. If healthcare was provided upfront, African Americans would have over a half million fewer preventable hospitalization as compared to Caucasians, in a study conducted between 2004 and 2007 (Hanlon & Hinkle, 2011).

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19 Dental Health

It is no secret; a healthy body begins with a healthy mouth. However, there is a significant problem for older American - quality dental care. With Medicare, the dominant provider of health insurance for those over 65 years of age, the lack of dental coverage often means the start of significant health conditions that have their roots with poor oral health. Certain oral diseases such as tooth decay, gum disease, and loss of teeth can be linked to pneumonia and diabetes-related complications.

Medicare has excluded dental care from covered benefits, even with the direct connection between oral health and physical health. Moreover, the lack of regular preventive dental exams means missed opportunities for detecting the onset of certain conditions, including some cancers. It is the lack of daily oral care among seniors, those on Medicaid and Medicare that constitutes an epidemic that has almost universally overlooked (Saint Louis, 2013).

Bacteria from the mouth can quickly get into the bloodstream and cause infection and inflammation wherever it spreads. The shortlist of common and serious health problems caused by inadequate oral health, many to which the residents of KPA are currently suffering from include:

Cardiovascular Disease - poor oral health increases the risk for heart disease. With inflamed gums increased levels of bacterium that causes periodontal disease can occur. The same bacteria once in the bloodstream can cause the arteries to build up plaque and harden. Increased plaque build-up, can lead to hypertension and increase the risk for strokes. Endocarditis can also develop, which is an often-fatal condition that occurs when the lining of the heart becomes infected (Joshy, Arora, Korda, Chalmers, & Banks, 2016).

Dementia - Poor oral health can affect the brain. Substances that are released from gums inflamed by infection can kill brain cells and lead to memory loss. Dementia and possibly even Alzheimer's disease can result from gingivitis when the bacterium in the mouth spreads to the nerve channels or enters the bloodstream (Zenthofer, A., Baumgart, D., Cabrera, T.; Rammelsberg, P., Schroder, J., Corcodel, N., Hassel, AJ, 2017).

Respiratory Infections - Bacteria from poor oral health can lead to respiratory infections, pneumonia, acute bronchitis and in some cases COPD when the bacterium from infected teeth and swollen gums enter the lungs or travel there through the bloodstream (Adachi, Ishihara, & Okuda, 2007).

Diabetes - Infected gums lead to periodontal disease, which in turn can make diabetes in some patients more difficult to control. Moreover, because individuals with gum disease often leading to higher than normal blood sugar levels, puts individuals at a higher risk for developing diabetes. (Nylund, K., Meurman, J., Heikkinen, A., Furuholm, J. Ortiz, F., Ruokonen, H., 2017).

Cancer - Smoking or using tobacco products can lead to oral and throat cancers, as well as additional types of types of cancer being linked to gum disease. The risk for kidney cancer, pancreatic cancer, and blood cancers are much higher for people who have poor oral health (Michaud, Kelsey, Papathanasiou, Genco, & Giovannucci, 2016).

Kidney Disease - Periodontal disease can lead to chronic kidney disease, which impacts the kidneys, heart, bones, and blood pressure. People with gum disease generally have weaker

immune systems and are more likely to acquire infections (Nylund, K., Meurman, J., Heikkinen, A., Furuholm, J. Ortiz, F., Ruokonen, H., 2017)

Rheumatoid Arthritis - According to the National Rheumatoid Arthritis Society, people with gum disease were four times more likely to have Rheumatoid Arthritis. Both disorders have inflammation in common. The oral bacteria from gingivitis can increase inflammation throughout the body. This makes the risk of developing rheumatoid arthritis, a painful and debilitating inflammatory disease, much higher (Choi, et al., 2016).

A survey conducted at KPA, asking the question of the most recent dental visit by the residents in the past year. More than half of Medicare-eligible reported they went without a dental visit in the past 12 months, with lower-wealth residents much less likely than higher-income ones to have received dental care. Overall, only 1 percent of residents reported having any dental insurance.

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20 Kippax Place Resident Outcomes

20.1 Resident Profiles

With the introduction of Controlled Outcomes to the residents of the community, teams were dispatched throughout the building to start analyzing the health conditions of those residents who were willing to participate in the health assessment.

The residents who live at KPA are a diverse group, in terms of race, age and income, as well as health and disability status. Resident range in age from 15 to 93, with an average age of 58.2. The majority of the residents are African American (78.7%), with 21.3% being Caucasian. While all residents have low incomes as a condition of rental eligibility, 86.1% of those surveyed said they have income less than \$15,782.00. The average length of residence was 7.6 years (median of 10.4 years), with a range from 24 months to 23 years.

20.2 Health Survey Analysis

Nearly three-fourths of health survey respondents – 73% - stated they have a mental health diagnosis (e.g., depression, bipolar disorder, schizophrenia). These residents further stated that their overall health was poor, they presented with increased problems of mobility, the lack of the ability to manage self-care and daily activities, as compared to residents who did not state that they had a mental health diagnosis. Additional residents presenting with a self-reported mental health diagnosis tended to be more food insecure, had higher use of the ED, had higher rates of hospitalization, and higher frequency to call 911, when compared to residents who did not have a mental health diagnosis.

20.3 Profile of Health Survey

When residents reported health status during the health screenings, the following conditions were noted as primary concerns among the residents.

| | % of Residents Surveyed |
|---|--------------------------------|
| Diabetes | 21.7 |
| High blood pressure/hypertension | 53.7 |
| Heart trouble or heart disease | 22.4 |
| Liver disease | 10.1 |
| Severe vision problems | 17.1 |
| Depression | 36.8 |
| Schizophrenia, bipolar disorder, other MI | 15.4 |
| Sleep disorder/sleep apnea | 27.9 |
| Dementia (such as Alzheimer's Disease) | .2 |
| Severe dental health problems | 14.2 |
| Asthma | 20.8 |
| COPD, emphysema, chronic bronchitis | 16.4 |
| Kidney Problem | 11.2 |
| Acid Reflux | 28.5 |
| Severe hearing problems | 8.3 |
| Anxiety | 36.9 |
| Post-traumatic stress disorder (PTSD) | 21.0 |
| Addiction to alcohol or drugs | 0.4 |

20.4 Self-rated Health

When asked what their general health condition was, residents participating in health surveys reported the following.

| | % of Residents Surveyed |
|-------------------|--------------------------------|
| Fair or poor | 59.2 |
| Good or excellent | 40.8 |

20.5 Self-reported Activities

When asked what type of physical activities the resident has been involved in, the outcomes from this self-report are as noted below.

| | % of Residents Surveyed |
|---|--------------------------------|
| Engaged in physical activities, past 30 days | 18.6 |
| Engaged in physical activities, past 6 months | 16.4 |
| Has not engaged in physical activities | 65.8 |

20.6 Medication Adherence

Medication adherence is critical in the success of any healthcare plan. Failure to adhere to your regimen can mean a loss of improvement and additional healthcare issues. When asked how your medication regimen influences your health, a strong indicator here is whether the resident who self-reports maintains their regimen.

| | % of Residents Surveyed |
|-------------------------------------|--------------------------------|
| Take medication, on schedule | 52.4 |
| Low adherence to medication regimen | 47.6 |
| Need help with medication regimen | 15.3 |

20.7 Resident Claims Analysis

Based on claims analysis, resident with Controlled Outcomes contacts were older than those who did not have Controlled Outcomes contacts. Women were about 1.7 times more likely to have a Controlled Outcomes contact compared to men. Residents who used Controlled Outcomes were more likely to present with chronic conditions such as diabetes, hypertension, and obesity.

The top five medical diagnoses based on claims were asthma, chronic bronchitis, diabetes, hypertension, and obesity, and the top mental health diagnoses were affected disorder, bipolar disorder, depression, schizophrenia, paranoid state, and psychological disorder. The top diagnoses reported by survey respondents were hypertension, depression, sleep disorder, anxiety, acid reflux, heart disease, severe dental problems, diabetes, severe vision problems, and post-traumatic stress disorder.

Controlled Outcomes and partners used a shared modified electronic health record system to track resident services and contact. Because the number of Controlled Outcomes contact ranged from 0 to over 100, the analyses compare residents who had 10 or more contacts with Controlled Outcomes (high utilizers) and those with one to ten contacts (low utilizers) to those with no contacts. Among residents who completed health assessments, 34% were high utilizers, 25% were low, and 41% had no contact with Controlled Outcomes. High utilizer had more contact than low utilizers on advocacy, benefits, case management, information and referral, healthcare services, mental health, monitoring, and transportation.

Controlled Outcomes successfully engaged with residents whose health needs were greater both before the program were implemented and over time.

Based on claims analyses, ED visits went down among Controlled Outcomes users from 67 (2015) to 26 (2017). Couple this with a decrease in EMT/Fire/Rescue calls to KPA community, which saw a decline in the period of November 2015 to October 2017 of 65%.

Based on claims data, hospital readmission rates for KPA residents declined to a level of 29% for the period of October 2016 to September 2017. Adding the component of medication compliance among the KPA residents to a level of 48%, since November 2016.

20.8 Health Survey Respondents' Self-Reported Diagnoses

As noted in the profile of health survey results, self-reported conditions varied from claim data on the same conditions. This could be because residents are not fully aware of their medical condition, or are disconnected from proper medical care.

| Self-reported Condition | % of Residents |
|-------------------------|----------------|
| Hypertension | 53.7 |
| Depression | 36.8 |
| Anxiety | 32.7 |
| Acid Reflux | 28.7 |
| Sleep disorder/apnea | 27.9 |
| Heart disease | 22.4 |
| Diabetes | 21.7 |

| | |
|-----------------------|------|
| PTSD | 18.0 |
| Asthma | 16.5 |
| Severe vision problem | 15.4 |

20.9 Health Survey Diagnoses Based on Claims Data

The difference in diagnoses in medical conditions between survey respondents and claims analyses – could be due to residents’ uncertainty about their medical conditions.

| Claims Data Condition | % of Residents |
|------------------------|----------------|
| Asthma | 9.1 |
| Chronic bronchitis | 4.8 |
| Diabetes | 20.3 |
| Hypertension | 40.2 |
| Obesity | 9.7 |
| Affective disorder | 18.1 |
| Bipolar | 3.4 |
| Depression | 11.7 |
| Schizophrenia | 5.5 |
| Paranoid states | 1.8 |
| Psychological disorder | 8.5 |

When examining claim data, a difference between what the resident noted as potential health issues versus claim data submitted to insurance carriers for the resident. While still having an impact as noted from claim data, mental illnesses only accounted for 49% of the populations at KPA. Here it is the issue of what the resident thinks is wrong with them versus the actual diagnosis from their PCP, as reported to the claims data.

20.10 Social Integration

Odd as it is, the level of social interaction among residents at KPA is low. One would think with this being a single high-rise building, with a community room, that the point of feeling isolated would be limited. Yet this is not the case. This high level of social isolation plays a role in one’s health, as having limited or no exposure to others in the community, both at KPA, and the great

community (Hopewell) impacts physical health, as well as mental health. When this question was asked, many of the residents asked if it pertained to the building or society as a whole. We redirected them to answer from the standpoint of the KPA community. Couple this with the thought process that many of the residents do not think there are enough activities for them to participate in, at the building.

| | % of Residents Surveyed |
|-------------------------|--------------------------------|
| High level of isolation | 51.7 |
| Low level of isolation | 45.1 |
| No response | 3.2 |

20.11 Coordinated Care Long Term Care

Access to long-term services and supports which includes services ranging from personal care assistance, and housekeeping, can support aging in place and delay admission to a nursing facility, residential care, or adult foster home.

Most of the approximately 80 residents in KPA are eligible for Medicaid-financed long-term service and support (LTSS). At the start of the Controlled Outcomes program (Fall 2016), 63 Medicaid-eligible residents in the building. Of these 63 Medicaid eligible residents, two were receiving LTSS – usually an aide who assist with meal preparation and personal care. As of July 2017, 74 Medicaid-eligible residents lived in KPA; yet the number of residents receiving Medicaid-financed LTSS stood at two.

20.12 Primary Care Analysis

Forty-six percent of Controlled Outcomes users reported they had access to a primary care clinic, compared to 21% who did not use Controlled Outcomes.

Three percent of residents got a flu vaccine in 2016 compared to one percent in 2014. Residents who had some Controlled Outcomes contact were more likely to have a flu vaccination. Controlled Outcomes has collaborated with Rite Aid to offer on-site flu shots during the upcoming flu seasons.

Thirty-seven percent of residents who had some Controlled Outcomes contact reported more preventative screening (e.g. blood pressure checks, colorectal exam, and mammography) compared to 14% residents with no Controlled Outcomes contact.

20.13 Healthcare Visits in the last 6 months

| | % of Residents Surveyed |
|------------------------------------|--------------------------------|
| Has a primary care provider | 45.7 |
| Two or more doctor visits | 36.1 |
| Emergency Department at least once | 50.7 |
| Overnight stay at least once | 32.2 |

20.14 Treatment Options

Researchers wanted to understand the thought process of the residents when they become ill and what they do about it. Based on known knowledge that KPA was a group of potential “super-utilizer”, researchers were not surprised to see that 78.3% of the population would call 911 (EMT) or go to the ED when they were not feeling well, as opposed to 21.3% calling their PCP or 36.2% going to a urgent care facility.

| | % of Residents Surveyed |
|---|--------------------------------|
| Wait until Nurse Mary comes to the building | 6.0 |
| PCP office visit | 21.3 |
| Take medication prescribed by a doctor or other care provider | 72.2 |
| Take over the counter medication | 60.5 |
| Call 911 or got to the hospital | 78.3 |
| Call a friend, neighbor or relative | 56.4 |
| Use meditation, prayer or other ways of feeling better | 47.6 |
| Go to Urgent Care | 36.2 |

| | |
|---------------------|------|
| Wait to feel better | 61.4 |
|---------------------|------|

20.15 Service Requests by Residents

Over the course of the pilot study, Controlled Outcomes tracked the request made by the residents at KPA for staff assistance. Benefits/insurance access was paramount among this population. In the case of benefits/insurance, it should be noted that the majority of those request were for income verification to support the needs of the Property Management request.

| Most frequently used | Least often used |
|---------------------------|------------------|
| Benefits/insurance access | Legal assistance |
| Information and referral | Lease education |
| Healthcare services | Employment |
| Mental health services | Fair housing |
| Monitoring services | |

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21 Kippax Place Recommendations

21.1 Continued Research

A focused scientific research effort on improving the healthcare outcomes of individuals is not evolutions that can be developed and concluded in one, two, or even three years' time. Researches of this nature requires at least five years, and in some cases even more time to develop the appropriate pilot studies that will impact the individual presenting with chronic illness. In Virginia, as well as in many other states, research on health outcomes only become an issue when cost containment can no longer be managed, when the press highlights the negatives of a community, as it relates to health of the population in general. Then and usually for a brief time span does the healthcare outcomes of a community become a focal point. Interdisciplinary research on community health is needed that addresses and integrates cognitive, biological, and social-cultural traditions, contributions, and methods.

21.2 Resident Advocates/Case Managers

A definite need exists for more directed focus to be paid to the residents of KPA, for those with chronic illness or disability, because of their increased exposure with health systems, those who have difficulty accessing the system, often falling through the cracks of the myriad of the health system giants. Additional grant funding or pay for performance funding should be provided to develop, evaluate, and support contract-based advocacy-clinical case management programs designed to meet the specific needs of the residents of KPA.

Healthcare Advocates/Case Managers provide another set of ears that can ease resident's healthcare journey. In this era of complex healthcare systems, changes in provider relationships and insurance requirements, there exist a great need for such a professional, especially in communities such as KPA. In the case of the KPA community, Controlled Outcomes employed a Certified Medical Assistant, who then received advanced training as a Community Health Worker. The individual aids the KPA residents in navigating the health care system, including dealing with clinicians, understanding their condition and treatment options, and even helping with health insurance issues. On rare occasions, this may also mean a visit with the resident to the doctor's office or arriving at the hospital during an emergency visit or hospital stay.

In addition to Resident Advocates/Cases Managers, Patient navigators would be recommended to address the cultural barriers that limit residents from trusting or using the health care system. Collaborating with community organizations, leaders, and churches to bring health care to all patients, especially those who cannot miss work or obtain transportation.

Controlled Outcomes has established several partnerships with local church groups to offer patient navigators to the residents of Kippax, as well as John Randolph Hospital has aligned themselves with Controlled Outcomes to conduct warm handoffs of discharging patients from their corps of patient navigators to Controlled Outcomes Community Health Workers (CHW), who are Certified Nursing Assistants with advanced training in the overall healthcare treatment process.

21.3 Consumer-Driven Services

There are many names for Consumer-Driven services. Depending on the state of residency, it may be called; Participant-direction, consumer-direction, or self-direction, no matter the name, they are all the same - providing the individual with choice and control over long-term services in their homes. With consumer-driven services, age-qualified individuals and those presenting

with documented disabilities, selecting the services they need, determine who will deliver the services, and manage the budget to pay for those services. With the assistance of Controlled Outcomes, we can conduct the screening process for the participants, which include scheduling with Hopewell Department of Social Services to start the interview process with the participants. Once approved, the participant then hires whomever they would like to provide them with services, including family members and friends. At this point, the participant is considered the employer; they are responsible for scheduling, training and can dismiss the Home Care Worker at any time. Controlled Outcomes with the assistance of our internal Community Health Worker and on-site Registered Nurse can provide training of the individual that the participant hires. Controlled Outcomes has partners in the industry that use the Financial Management Service (FMS) model, which handles payroll processing, taxes, budget management, and other financial aspects of employing Home Care Workers. It is strongly recommended that this program continue to provide services beyond the reach of the Resident Service Department at KPA.

21.4 Inclusive Community

Traditional housing no longer meets the needs of the aging in place population. Changes in our society such as economic, technology and demographics mean a population that outlives the previous generations and does so healthier, all the while looking for alternatives to their current housing to better suit their more active lifestyles. As a result, many seniors are mis-housed, ill-housed, or even unhoused merely because they lack, or feel they lack, appropriate housing options specifically for them.

Imagine residents who actively cooperate in planning events from beginning to end, with one goal in mind – to recreate an old fashion neighborhood that supports friendly cooperation and socialization.

Introducing the inclusive community approach, a concept that draws on ideas of cooperative living, in which several unrelated people share a tradition housing unit, where they can choose how much they want to participate in community activities. Inclusive communities do not impose a new way of life on its residents, like many intentional communities which have charismatic leaders to hold the community together, instead the inclusive community provides for the wants and needs of each resident, as they determine what they want and need.

One element that would not only introduce the inclusive community approach to KPA community but would build on a grassroots methodology to synergize cooperative living would be quarterly community dinners. Such dinners not only provide the physiological sustenance, it is where KPA community can also get emotional sustenance as well. Controlled Outcomes looks to partner more deeply with FeddMore to potentially provide this service in the future.

By allowing residents to become acquainted, discover mutual interests, and share experience, shared facilities, and activities contribute significantly to the formation of a tight-knit community.

21.5 Patient-Centered Medical Home (PCMH)

Controlled Outcomes has developed a model of health care that incorporates a team-based approach to medical care for the residents of KPA. Based on the current chronic conditions that many of the residents present in the complex, it is critical that a follow-up health care delivery model be installed to best tackle the current needs of the residents of the complex. There should be a strong partnership among practitioners, and residents ensure that decisions respect residents'

wants, needs, and preferences and those residents have the education and support they need to make decisions and participate in their care. There are several laws and Executive Orders, to include the Fair Housing Act protects individuals presenting with common characteristic such as chronic illnesses to include cancer, cerebral palsy, diabetes, epilepsy, Human Immunodeficiency Virus (HIV) infection, multiple sclerosis, muscular dystrophy, major depressive disorder, bipolar disorder, post-traumatic stress disorder, obsessive-compulsive disorder, and schizophrenia. All of this prohibits Community Housing Partners to engage in the knowledge of and acting as an agent for such partnerships that would be required under the PCMH model. Instead, Controlled Outcomes needs to continue to be that agent of record to align the care teams that are accountable for a resident's physical and mental health care needs, including prevention and wellness, acute care, and chronic care. This care would be organized across all elements of the broader health care system, including specialty care, hospitals, home health care, community services, and supports. Providing the residents of KPA access to services with shorter waiting times, "after hours" care, 24/7 electronic or telephone access, and secure communication through health IT innovations. Overall Controlled Outcomes and its partner clinicians and staff enhance quality improvement to ensure that residents make informed decisions about their health.

21.6 Security

CHP has incorporated several new security methods to aid in the safety of the residents of KPA, adding additional elements to the current profile of measures will only add to the increased security of the community.

While the community has deployed security cameras, often the individuals tasked with observing the cameras are not present, and after hours, the absence of personnel adds to the disengagement of dynamic security. By installing a remote security video surveillance system, the off-site options allows on-site personnel to attend to their main work focus, leaving security to off-site professionals who along with the presence of 24 hour a day monitored camera systems, is often enough to deter criminals, and when crimes do occur, video surveillance footage help ensure that the police have all of the necessary evidence and important investigation-details they need. The same cameras systems can be used to help protect valuable equipment, and to control access to common areas.

21.7 Dental Services

While the best course of action would be to find a grant or alternative funding source that would cover the annual premium for each of the residents in the KPA community, to which the resident would then be able to afford their dental care, this option is not sustainable. Alternatively, the development of a pilot program that will place oral health coordinators in community provided grants could be secured. These auxiliary dental workers will identify residents at risk and coordinate care with community providers before there is a need for emergent treatment. Prevention is the key.

Controlled Outcomes estimate that the added costs of expanding dental coverage would be at least partially offset by lower hospital and ED costs related to care for residents with untreated dental disease, as well as lower costs of care for those whose cancer or other diseases were detected early during oral exams.

Controlled Outcomes partnered with Humana to offer a series of enhanced coverages to the residents of KPA, such as Coordinated Care (Medicaid/Medicare), Dental and Vision coverages.

Each of these enhancements looked to improve the health and well-being of the residents who wished to participate in the program, with NO additional costs to the residents for coverage.

21.8 Improved Water Quality

Treatment methods to remove sodium from drinking water should start at the source, with the public utility charged with providing safe drinking water to the citizens of the City of Hopewell. Short of this option, other avenues of treatment that can be explored for the residents of KPA include reverse osmosis and distillation. Reverse osmosis (RO) devices reduce many dissolved contaminants in water, including sodium. The average commercial 20,000 gallon per day (GPD) system, with high-efficiency option, chemical pump outlet and 500-gallon atmospheric tank with UV disinfection, repressurization pump, and tank level float switch can cost \$28,000.00.

21.9 Noise Remediation

The Federal Railroad Administration has recently started issuing Quiet Zones, where train horn restrictions can be put in place to reduce railway noise near residential and commercial areas. Quiet Zone qualification is only available in locations where there have been no 'relevant collisions.' In order to be considered, a community must prove that the noise is having detrimental effects on the community. Communities must also take action to improve railway safety through other means such as crossing signs and arms or local education programs. Becoming an approved Quiet Zone requires a large community effort, which is not always feasible.

An immediate recommendation to the abatement of railway noise for the residents of KPA is to deploy a system that will block the high-frequency noise. Soundproof curtains are one of the easiest ways to combat railway noise, these curtain can create a transmission loss of 35 decibels, making them the ideal defense against railway noise.

Acoustic curtains are soundproof curtains that blocks outside noise, solving noise problems at minimal expense and without disrupting the comforts of home. Acoustic curtains do more than simply absorb sound, selected styles that use a dense, flexible sound-blocking core actually deflects sound waves, directing them away from the living environment. As added benefits to selected acoustic curtains will also blocks more than 99% of outside light, as well as insulating properties, lowering your home's heating and cooling costs.

The average cost to deploy acoustic curtains for the residents of KPA is \$41,790.00.

The deployment of a noise barrier, which is an exterior structure designed to protect inhabitants of sensitive land use areas from noise. Utilized as the most effective methods to mitigate roadway, railway, and industrial noise sources. The acoustical science of noise barrier design is based upon treating a railway as a line source. Several different materials may be used for sound barriers. These materials can include masonry, earthwork (such earth berm), steel, concrete, wood, plastics, insulating wool, or composites. Land abatement and aesthetics play a role in the cost of noise barriers. To deploy a noise barrier for the KPA community, the estimated cost is \$190,000.00 for a 100' x 5' wall.

21.10 Soil Remediation

Causation cannot be derived from the soil samples presented in this report as having a bearing on the direct health and well-being of the residents of KPA. To do so requires more comprehensive study into the resident's conditions, pre and post rental at KPA and soil sampling over an extended period. However, preventive measures can be developed to minimize the exposure of

at least the four minerals presented in this report. It is recommended that erosion control effects be installed to reduce the wind energy and water runoff that can lead to increase inhalation and dermal exposure from the soil around KPA.

Controlled Outcomes recommends the utilization of vegetation barriers to control the soil erosion that takes place from both wind energy and water runoff. Vegetation establishment as an erosion-control measure has been used for many years, and has improved with increasing understanding of the processes involved. The design of erosion-control measures should integrate the results of site investigation with the predicted ground conditions after vegetation establishment (including soil properties, species choice and contaminant mobility) as well as current and future climate pressures. Specific considerations in selecting suitable species for vegetation establishment include the use of stress-tolerant species (with reference to climate and soil quality) with a naturally high production yield, which can provide a quick and efficient ground cover. General approaches may combine the addition of soil amendments, the seeding of a grass/legume mixture and the planting of trees, but the exact methodologies will depend on the specific site conditions (Greater Golden Horseshoe Area Conservation Authorities, 2006).

21.11 Air Quality Remediation

When we think of air pollution we often only think about smog, or that haze hanging in the air. The truth is, air pollution inside our homes is at much high levels than outside. Our inside air is often polluted by lead (in house dust), formaldehyde, fire-retardants, radon, even volatile chemicals from fragrances used in conventional cleaners. Some pollutants are tracked into the home to include microscopic dust mites -- a major allergen -- plus mold and heaps of pet dander, a community allergen. With long-term exposure to high levels of indoor pollutants, an individual's health may be impacted, later in life.

- Community Housing Partners has already started to address air quality, with the removal of carpet from resident's apartments. This will allow residents to avoid having to purchase expensive HEPA filter vacuum system and instead be able to mop up the dust that vacuuming leaves behind. You can skip the soaps and cleaners and just use plain water to capture any lingering dust or allergens.
- The installation of apartment controlled air condition systems; each resident can not only control their own heating and cooling, but also keep a healthy level of humidity. Dust mites and mold love moisture. Keeping humidity around 30%-50% helps keep them and other allergens under control. While a dehumidifier would be another advantage to controlling air quality, it is understood that the cost may outweigh the benefit of providing such devices to each apartment.
- Educate resident on moving towards an organic or green lifestyle. Conducting lunch and learns that promote topics such as the use of cleaning compounds, synthetic fragrances and conventional laundry detergents, fabric softeners, dryer sheets, and air fresheners in solid, spray, and oil form currently in use in the community and the harmful effect such product have, especially for residents suffering from asthma and other breathing condition. Classes can be delivered to the residents to promote a healthy lifestyle without causing harm to the environment and each other, with the promotion of the use of organic household products.

- Reward residents for making the switch to organic compounds to clean and maintain their apartments.
- Offer incentives such as free product samples to encourage residents to purchase organic over standard products.

The goal - organic living is more than a way of life; it has come to mean a return to a simpler way of life, without giving up our televisions and cell phones, but learning to detoxify our lives.

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22 Glossary of Terms

Table 1 provides a list of terms used in the assembly of this report.

Table 1: Glossary of Terms

| Term | Definition |
|-----------------------------|---|
| Accessible care | Patients are able to access services with shorter waiting times, “after hours” care, 24/7 electronic or telephone access, and strong communication through health IT innovations. |
| Agile Life Cycle | Seeks alternatives to traditional project management. Agile approaches help teams respond to unpredictability through incremental, iterative work cadences and empirical feedback. |
| Asset Mapping | Asset Mapping is a tool that relies on a core belief of asset-based community development; namely, that good things exist in communities and that those things can be highlighted and encouraged — these are assets suited to advancing those communities. |
| Community | A small or large social unit (a group of people) who have something in common, such as norms, religion, values, or identity. Often – but not always – communities share a sense of place that is situated in a given geographical area (e.g. a country, village, town, or neighborhood). Durable relations that extend beyond immediate genealogical ties also define a sense of community. People tend to define those social ties as important to their identity, practice, and roles in social institutions like family, home, work, government, society, or humanity, at large. |
| Community DNA | A community is a living, breathing body. It grows changes and responds to a variety of outside factors. Every community, no matter the size, age, or type has a distinctive DNA, the internal genetic code that carries all the information about how the community will look and function. A clearly articulated DNA is important to a community – this is not only the services or housing that residents are offered, this is the overarching purpose of what communities provide to its residents that make them want to become community champions. |
| Community Psychology | Studies the individuals’ contexts within communities and the wider society, and the relationships of the individual to communities and society. Community psychologists seek to understand the quality of life of individuals within groups, organizations and institutions, communities, and society. Their aim is to enhance quality of life through collaborative research and action. |
| Comprehensive care | A team of care providers is wholly accountable for a patient’s physical and mental health care needs, including prevention and wellness, acute care, and chronic care. |
| Coordinated care | Care is organized across all elements of the broader health care system, |

| Term | Definition |
|-----------------------------------|---|
| | including specialty care, hospitals, home health care, community services and supports. |
| Fenceline Community | A neighborhood that is immediately adjacent to a company and is directly affected by the noise, odors, chemical emissions, traffic, parking, and operations of the company. These groups of people are vulnerable communities who fear that it may jeopardize jobs and economic survival to organize to reduce their exposure to hazardous waste. Additionally, residents in fenceline communities are often unable to relocate. This is because the large industries that have established themselves adjacent to the residential communities often produce effects that dramatically lower the property value of the homes in the communities. Therefore, residents are unable to sell their homes for a value that would be high enough for them to purchase property elsewhere. |
| Guerilla | Unconventional method of warfare characterized by surprise attacks, staying hidden, and hit and run tactics. The point is to counter the forces of a larger more powerful opponent and exploit its disadvantages. |
| Guerilla Healthcare | Is both the method and application of simple and everyday skills to provide self-care, community support and alternative health care approach in the age of the complicated healthcare delivery model. |
| Health | The state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. |
| Healthcare | The maintenance and improvement of physical, mental and spiritual health, especially through the provisions of medical services. A mythical beast often associated with the care of humans. Often appears only to those who already have the necessary means to adequately take care of or pay for things. |
| Healthcare Hotspotting | A data-driven process for the timely identification of extreme patterns in a defined region of the health care system. It is used to guide targeted intervention and follow-up to better address patient needs, improve care quality, and reduce cost. |
| Healthcare Quality of Life | Quality of life is often regarded in terms of how a certain ailment affects a patient on an individual level. This may be a debilitating weakness that is not life-threatening; life-threatening illness that is not terminal; terminal illness; the predictable, natural decline in the health of an elder; an unforeseen mental/physical decline of a loved one; or chronic, end-stage disease processes. Researchers at the University of Toronto's Quality of Life Research Unit define quality of life as "The degree to which a person enjoys the important possibilities of his or her life" |

| Term | Definition |
|--|--|
| | (UofT). Their Quality of Life Model is based on the categories “being”, “belonging”, and “becoming”; respectively who one is, how one is not connected to one’s environment, and whether one achieves one’s personal goals, hopes, and aspirations. Experience sampling studies show substantial between-person variability in within-person associations between somatic symptoms and quality of life. Hecht and Shiel measure quality of life as “the patient’s ability to enjoy normal life activities” since life quality is strongly related to wellbeing without suffering from sickness and treatment. |
| Healthy Housing | A home where the physical, mental and socioeconomic environment supports household members in making healthy choices, achieving educational and economic success, and engaging in robust social and cultural networks. It is housing in a neighborhood connected to good employment and business opportunities in the region. It is a home free from toxins and threats from the built environment such as unsafe streets, violence, poor air quality, industrial chemical exposures, allergens, mold, or pests. It does not impose cost burdens that divert household income away from healthy food, medical care, or educational opportunities. It is located in healthy and well-resourced neighborhoods. |
| Housing Issues that Impact Health | Neighborhood stability, affordability, quality, residential racial segregation, and housing tailored to the needs of vulnerable populations. |
| Hyper-segregated | A form of racial segregation that consists of the geographical grouping of racial groups. |
| Inclusive Community | A community without boundaries where people take care of each other regardless of their differences. A community that does everything that it can to respect all its citizens, gives them full access to resources, and promote equal treatment and opportunity. A community that works to eliminate all forms of discrimination, that engages all its citizens in decision-making process that affect their lives, that values diversity and responds quickly to racist and other discriminating incidents. |
| Medical Homes | The medical home is best described as a model or philosophy of primary care that is patient-centered, comprehensive, team-based, coordinated, accessible, and focused on quality and safety. It has become a widely accepted model for how primary care should be organized and delivered throughout the health care system, and is a philosophy of healthcare delivery that encourages providers and care teams to meet patients where they are, from the simplest to the most complex conditions. It is a place where patients are treated with respect, dignity, and compassion, and enable strong and trusting relationships with providers and staff. Above all, the medical home is not a final destination instead, it is a model for achieving primary care excellence |

| Term | Definition |
|---------------------------------------|--|
| | so that care is received in the right place, at the right time, and in the manner that best suits a patient's needs. |
| Micro markets | A micro market is an unattended, self-service store with coolers and open shelves that has a variety of food and drinks, including more fresh and healthy options such as salads, sandwiches, yogurt, fruit, veggie snacks, new age beverages, teas. |
| Mismanagement of care | Poor medical care in the management of patients suffering from chronic illnesses that lead to complications which at the most severe level can lead to death. |
| Patient-centered | A partnership among practitioners, patients, and their families ensures that decisions respect patients' wants, needs, and preferences, and that patients have the education and support they need to make decisions and participate in their own care. |
| Patient-Centered Medical Home | The Patient-Centered Medical Home (PCMH) is a care delivery model whereby patient treatment is coordinated through their primary care physician to ensure they receive the necessary care when and where they need it, in a manner they can understand. The objective is to have a centralized setting that facilitates partnerships between individual patients, and their personal physicians, and when appropriate, the patient's family. Care is facilitated by registries, information technology, health information exchange and other means to assure that patients get the indicated care when and where they need and want it in a culturally and linguistically appropriate manner. |
| Patient-Centered Medical Homes | The medical home is best described as a model or philosophy of primary care that is patient-centered, comprehensive, team-based, coordinated, accessible, and focused on quality and safety. It has become a widely accepted model for how primary care should be organized and delivered throughout the health care system, and is a philosophy of healthcare delivery that encourages providers and care teams to meet patients where they are, from the simplest to the most complex conditions. |
| Permanent Supportive Housing | Affordable housing with services for high demand, special needs residents. |
| Popsicle Index | Quality of life measurement coined by Catherine Austin Fitts, as the percentage of people – in a community who believe that an individual in their community can safely leave home, walk to the nearest possible location to buy a popsicle, and walk back home. |
| Sacrifice Zone | Are often “fenceline communities” of low-income and people of color, or “hot spots” of chemical pollution where residents live immediately adjacent to heavily polluting industries or military bases. |

| Term | Definition |
|--|--|
| Special Needs, High Demand Population | The economically disadvantaged, racial and ethnic minorities, the uninsured, low-income elderly, and those with other chronic health conditions, including severe mental illness. |
| Super-Utilizer | Individuals whose complex physical, behavioral, and social needs are not well met through the current fragmented health care system, who are among the top 1 percent based on their health care expenses, not including trauma victims or patients who require regular, expensive care such as chemotherapy. |
| Tapeworm Economy | The economy with two classes of players, the insiders, & the outsiders. The insiders are constantly subsidized at the expense of the outsiders, like a tapeworm, a parasite that eats through the body. The parasites engineers the economy to drain it for the insiders benefit, consolidating wealth and economic power by liquidating wealth, people, environment, and economic productivity, all to fatten the Tapeworm. |
| Care Coordination | The deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient's care to facilitate the appropriate delivery of health care services. Organizing care involves the marshaling of personnel and other resources needed to carry out all required patient care activities and is often managed by the exchange of information among participants responsible for different aspects of care. |
| Wind Direction | The direction from which the wind is blowing. An example of wide direction means a NW wind is a wind that would carry a balloon toward the southeast. |
| International Agency for Research on Cancer (IARC) Carcinogenic Risk Groups | <p>Ranking of Carcinogenic risk of chemicals by grouping.</p> <p>Group 1 – Carcinogenic to humans</p> <p>Group 2A – Probably carcinogenic to humans</p> <p>Group 2B – Possibly carcinogenic to humans</p> <p>Group 3 – Not classifiable as to its carcinogenicity to humans</p> <p>Group 4 – Probably not carcinogenic to humans</p> |
| Locally Unwanted Land Use | A land use that creates externality costs on those living within close proximity. These costs include potential health hazards, poor aesthetics, or reduction in home values. Such facilities with such hazards need to |

| Term | Definition |
|------------------------------|---|
| | be created for the greater benefits that they offer society. |
| Buffer Area | A zonal area that lies between two or more other areas, but depending on the type of buffer area, the reason for it may be to protect the environment, protect residential and commercial zones from industrial accidents or natural disasters. |
| Village Green Project | The Village Green Project is a community-based activity to demonstrate the capabilities of new real-time monitoring technology for residents and citizen scientists to learn about local air quality. The goal of the project is to provide the public and communities with information previously not available about their local air quality and engage communities in air pollution awareness. |

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23 Sample Health Assessment Forms

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Authorization for Release of Information

1. Authorization

I authorize _____ (healthcare provider) to use and disclose the protected health information described below to Controlled Outcomes and Dr. Brian Jackson.

2. Effective Period

This authorization for release of information covers the period of healthcare from:

_____ to _____

OR

all past, present and future periods.

3. Extent of Authorization

I authorize the release of my complete health record (including records relating to mental healthcare, communicable disease, HIV or AIDS, and treatment of alcohol or drug abuse).

OR

I authorize the release of my complete health record with the exception of the following information:

- Mental health records
- Communicable diseases (including HIV and AIDS)
- Alcohol/drug treatment
- Other (please specify) _____

4. This medical information may be used by the person I authorize to receive this information for medical treatment or consultation, billing or claims payment, or other purposes as I may direct.
5. This authorization shall be in force and effect until **31 OCT 2017** (date), at which time this authorization expires.
6. I understand that I have the right to revoke this authorization, in writing, at any time. I understand that a revocation is not effective to the extent that any person or entity has already acted in reliance on my authorization of if my authorization was obtained as a condition of obtaining insurance coverage and the insurer has a legal right to contest a claim.
7. I understand that my treatment, payment, enrollment, or eligibility for benefits will not be conditioned on whether I sign this authorization.
8. I understand that information used or disclosed pursuant to this authorization may be disclosed by the recipient and may no longer be protected by federal or state law.

Signature of patient or personal representative

Date

Printed Name of patient or personal representative

Witness

Date



Decline Services

I _____ decline the services of Controlled Outcomes and do not wish to participate in the Hopewell Model of Healthcare Program at this time. I understand I may revoke this decline decision at any time, and would then be required to complete the Client Intake documentation and health screening.

Signature of resident or personal representative

Date

Printed Name of resident or personal representative

Witness

Date

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Photograph and Video Release Form

I hereby grant permission to the rights of my image, likeness and sound of my voice as recorded on audio or video tape without payment or any other consideration. I understand that my image may be edited, copied, exhibited, published or distributed and waive the right to inspect or approve the finished product wherein my likeness appears. Additionally, I waive any rights to royalties or other compensation arising or related to the use of my image or recording. I also understand that this material may be used in diverse educational settings within an unrestricted geographic area.

Photographic, audio, or video recordings may be used for the following purposes:

- Conference presentations
- Educational presentations or courses
- Informational presentations
- On-line educational courses
- Educational videos
- Newspaper
- Television media
- Radio media

By signing this release, I understand this permission signifies that photographic or video recording of me may be electronically displayed via the Internet or in the public setting.

I will be consulted about the use of the photographs or video recordings for any purpose other than those listed above.

There is no time limit on the validity of this release nor are there any geographic limitations on where these materials may be distributed.

This release applies to photographic, audio or video recording.

By signing this form, I acknowledge that I have completely read and fully understand the above release and agree to be bound thereby. I hereby release any and all claims against any person or organization utilizing this material for any purpose.

Full Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Phone: _____ Email: _____

EXECUTED this _____ day of _____, 20_____.

Signature of patient or personal representative

Date

Printed Name of patient or personal representative

Witness

Date



Waiver, Release and Hold Harmless Agreement

In consideration of permission granted by Controlled Outcomes allowing me to participate in the Hopewell Model of Healthcare and the SYNC Capstone project (the "Activity"), which will occur from September 26, 2016 to October 31, 2017. I acknowledge that I am over the age of eighteen (18) and represent, covenant, and agree, on behalf of myself and my heirs, assigns, and any other person claiming by, under or through me, as follows:

1. I acknowledge that participating in the Activity involves certain risks (some of which I may not fully appreciate) and that injuries, death, property damage or other harm could occur to me or others. I accept and voluntarily incur all risks of any injuries, damages, or harm which arise during or result from my participation in the Activity, including any associated travel, regardless of whether or not caused in whole or in part by the negligence or other fault of Controlled Outcomes, The Board of Director, and/or its or their departments, directors, affiliates, employees, volunteers, officers, agents or insurers ("Released Parties").
2. I waive all claims against any of the Released Parties for any injuries, damages, losses or claims, whether known and unknown, which arise during or result from my participation in the Activity, regardless of whether or not caused in whole or part by the negligence or other fault of any of the Released Parties. I release and forever discharge the Related Parties from all such claims.
3. I agree to indemnify and hold the Released Parties harmless from all losses, liabilities, damages, cost or expenses (including but not limited to reasonable attorneys' fees and other litigation costs and expenses) incurred by any of the Related Parties as a result of any claims or suits that I (or anyone claiming by, under or through me) may bring against any of the Released Parties to recover any losses, liabilities, costs, damages, or expense which arise during or result from my participation in the Activity, regardless of whether or not caused in whole or part by the negligence or other fault of any of the Related Parties.
4. I have carefully read and reviewed this Waiver, Release and Hold Harmless Agreement. I understand it fully, and I execute it voluntarily.

EXECUTED this _____ day of _____, 20_____.

Signature of patient or personal representative

Date

Printed Name of patient or personal representative

Witness

Date



HEALTH ASSESSMENT FORM

Date _____

Client Name: _____

Age: _____ Race: _____ Client DOB: _____

| | |
|----------------|--|
| Height | |
| Weight | |
| BMI | |
| Temperature | |
| Pulse | |
| Respiration | |
| Blood Pressure | |

Prescription Lenses

Yes
No

Hospitalization/Surgeries in last ten years:

Family History:

Immunizations up to date

Yes
No

In the last five years, have you had the following:

| Screening Type | Yes | No | Date |
|-----------------------------|--------------------------|--------------------------|------|
| Cardiovascular Screening | <input type="checkbox"/> | <input type="checkbox"/> | |
| Tuberculosis Screening | <input type="checkbox"/> | <input type="checkbox"/> | |
| Clinical Breast Examination | <input type="checkbox"/> | <input type="checkbox"/> | |
| Testicular Examination | <input type="checkbox"/> | <input type="checkbox"/> | |
| PAP | <input type="checkbox"/> | <input type="checkbox"/> | |
| Prostate | <input type="checkbox"/> | <input type="checkbox"/> | |
| Vision | <input type="checkbox"/> | <input type="checkbox"/> | |
| Colorectal | <input type="checkbox"/> | <input type="checkbox"/> | |
| Cholesterol | <input type="checkbox"/> | <input type="checkbox"/> | |
| Mental Health | <input type="checkbox"/> | <input type="checkbox"/> | |
| Dental | <input type="checkbox"/> | <input type="checkbox"/> | |

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CARE MANAGEMENT ENROLLMENT INTAKE

Intake Staff: _____ Date: _____

Client Name: _____ DOB: _____

INSURANCE

Primary Insurance Type:

| | | | | | | | |
|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Medicare | Medicaid – Aged, Blind & Disabled | Medicaid – Works | Medicaid – Medically Needy | Medicaid – Other | Private | None | Other _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Secondary Insurance Type:

| | | | | | | | |
|--------------------------|--|--------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Medicare | Medicaid – Aged, Blind & Disabled | Medicaid – Works | Medicaid – Medically Needy | Medicaid – Other | Private | None | Other _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Primary Insurance ID # _____

Secondary Insurance ID # _____

Pharmacy Name: _____ City: _____

MEDICAL/HEALTH NEEDS

Would you say that in general your health is?

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Excellent | Very Good | Good | Fair | Poor |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

of days _____

MENTAL HEALTH & ADDICTION

MENTAL HEALTH/SUBSTANCE ABUSE CONDITIONS (PHQ-4 AND NIDA Substance Abuse Screen)

Over the last 2 weeks, how often have you been bothered by the following problems?

| | Not At All | Several Days | More than half of the days | Nearly Every Day | Prefer not to say |
|---|--------------------------|--------------------------|-------------------------------|--------------------------|--------------------------|
| Feeling nervous, anxious, or on edge | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Not being able to stop or control worrying | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Little interest or pleasure in doing things | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Feeling down, depressed, or hopeless | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Now thinking about your mental health, which includes stress, depression, and emotional problems, for how many days during the past 30 days was your mental health not good?

of days _____

In the past year, how many times have you used any of the following?

| | Never | Once or twice | Monthly | Weekly | Daily or Almost Daily | Prefer not to say |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Alcohol (Men >5 drinks/day, Women >4 drinks/day) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Tobacco products (cigarettes, cigar, chews, etc.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Recreational drugs (marijuana, cocaine, heroin, etc.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Prescription drugs (for reasons other than prescribed) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Comments:

SBQ-R SUICIDE SCREEN

Have you ever thought about or attempted to kill yourself (check ONE answer only)?

| | | | | | |
|--------------------------|-------------------------------------|--|---|---|---|
| Never | It was just a brief passing thought | I have had a plan at least to kill myself but did not try to do it | I have had a plan at least once to kill myself and really wanted to die | I have attempted to kill myself but did not want to die | I have attempted to kill myself and really hoped to die |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

How often have you thought about killing yourself in the past year (check ONE answer only)?

| | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|------------------------------|
| Never | Rarely (1 time) | Sometimes (2 times) | Often (3 - 4 times) | Very Often (5 or more times) |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Have you ever told someone that you were going to commit suicide, or than you might do it (check ONE answer only)?

| | | | | |
|--------------------------|--|--|--|---|
| No | Yes at one time but did not really want to die | Yes at one time and really wanted to die | Yes more than once but did not want to do it | Yes more than once but really wanted to do it |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

How likely is it that you will attempt suicide someday (check ONE answer only)?

| | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Never | No chance at all | Rather unlikely | Unlikely | Likely | Rather Likely | Very Likely |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

FOOD AND NUTRITION

Do you follow a special diet?

| | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Yes | No | Not Sure | Prefer Not to Say |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

In the past three months, have you gained or lost more than 10 pounds without trying?

| | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Yes | No | Not Sure | Prefer Not to Say |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Do you have trouble affording food on a regular basis?

| | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Yes | No | Not Sure | Prefer Not to Say |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Based on the following statement, which answers, do you agree with?

In the last year, I worried that I would run out of food before I had the money to buy more:

Often True

Sometimes True

Never True

Not Sure/Prefer Not to Say

In last year, we ran out of the food we brought, and we did not have money to buy more:

Often True

Sometimes True

Never True

Not Sure/Prefer Not to Say

SHOPPING NEEDS

Where do you grocery shop?

| | |
|------------------------------|--------------------------|
| Food Lion | <input type="checkbox"/> |
| Randolph Market | <input type="checkbox"/> |
| Dollar General | <input type="checkbox"/> |
| Save-A-Lot | <input type="checkbox"/> |
| S & N Supermarket | <input type="checkbox"/> |
| Oriental Food Market | <input type="checkbox"/> |
| Five Forks Food Mart | <input type="checkbox"/> |
| Crafty's Drive Buy Food Mart | <input type="checkbox"/> |
| N & Y Corner Store | <input type="checkbox"/> |
| Community Food Mart | <input type="checkbox"/> |
| Red Barn Food Store | <input type="checkbox"/> |
| Little Convenience Store | <input type="checkbox"/> |
| Miller's Neighborhood Market | <input type="checkbox"/> |
| Fort Lee Commissary | <input type="checkbox"/> |
| Broadway Express | <input type="checkbox"/> |
| Other _____ | <input type="checkbox"/> |

FAMILY, PERSONAL & PEER SUPPORT

During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

of days _____

Are you LIMITED in any way in any activities because of any impairment or health problems?

Yes

No

Not Sure

Prefer Not to Say

What is the MAJOR impairment or health problem that limits your activities? (CHECK ONLY ONE)

- | | |
|--|---|
| <input type="checkbox"/> Arthritis/rheumatism | <input type="checkbox"/> Hearing problems |
| <input type="checkbox"/> Back or neck problems | <input type="checkbox"/> Heart problems |
| <input type="checkbox"/> Cancer | <input type="checkbox"/> Hypertension (High Blood Pressure) |
| <input type="checkbox"/> Depression/anxiety/emotional problems | <input type="checkbox"/> Lung/breathing problem |
| <input type="checkbox"/> Diabetes | <input type="checkbox"/> Stroke |
| <input type="checkbox"/> Eye/vision injury | <input type="checkbox"/> Walking problems |
| <input type="checkbox"/> Fractures, bone/joint injury | <input type="checkbox"/> Other Impairment/problems |
| <input type="checkbox"/> Not Sure | <input type="checkbox"/> _____ Prefer Not to Say |

For HOW LONG have your activities been limited because of your major impairment or problem?

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Days | Weeks | Months | Years | Not Sure | Prefer Not to Say |
| _____ | _____ | _____ | _____ | | |

Do you need the help of other people with your PERSONAL CARE needs, such as eating, bathing, dressing, or getting around the house?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Yes | No | Not Sure | Prefer Not to Say |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Do you need the help of other people in handling your ROUTINE needs, such as household chores, doing necessary business, shopping, or getting around for other purposes?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Yes | No | Not Sure | Prefer Not to Say |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Are you receiving any of the following support services? (Check ALL that apply)

- | | |
|---|---|
| <input type="checkbox"/> Visiting Nurse | <input type="checkbox"/> Social Worker |
| <input type="checkbox"/> Home Health Aid | <input type="checkbox"/> Adult Daycare |
| <input type="checkbox"/> Speech Therapy | <input type="checkbox"/> Home Delivered Meals |
| <input type="checkbox"/> Physical Therapy | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Occupational Therapy | <input type="checkbox"/> None of the above services |
| <input type="checkbox"/> Prefer Not to Say | <input type="checkbox"/> |

If any of the above are checked, please list the agency/provider for each:

What is your Religious Preference?

- | | |
|--|---|
| <input type="checkbox"/> Agnostic | <input type="checkbox"/> Mormon |
| <input type="checkbox"/> Apostolic | <input type="checkbox"/> Muslim |
| <input type="checkbox"/> Atheist | <input type="checkbox"/> Non-denominational Christian |
| <input type="checkbox"/> Baptist | <input type="checkbox"/> Presbyterian |
| <input type="checkbox"/> Buddhist | <input type="checkbox"/> Pentecostal |
| <input type="checkbox"/> Catholic | <input type="checkbox"/> Roman Catholic |
| <input type="checkbox"/> Christian Scientist | <input type="checkbox"/> Sikh |
| <input type="checkbox"/> Episcopal | <input type="checkbox"/> Spiritual, but not religious |
| <input type="checkbox"/> Hindu | <input type="checkbox"/> Prefer not to say |
| <input type="checkbox"/> Jehovah's Witness | <input type="checkbox"/> None |
| <input type="checkbox"/> Jewish | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Lutheran | |
| <input type="checkbox"/> Methodist | |

How often do you attend church services?

- | | | | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------------------------|--------------------------|--------------------------|--------------------------|
| Major Holidays | Every Sunday | Every other Sunday | Once per Month | Once Per Quarter | Once every six months | Never | Not Sure | Prefer not to Say |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

What Church do you attend?

Name _____

City _____

Comments:

HOUSING & ENVIRONMENT

Do you plan to move out of The Summit/Kippax?

Yes

No

Not Sure

Prefer not to say

Do you plan to move out of Hopewell, Virginia?

Yes

No

Not Sure

Prefer not to say

When do you plan on moving?

Comments:

EDUCATION & EMPLOYMENT: BENEFITS & ENTITLEMENTS

Do you have a source of income and/or entitlements?

Yes

No

Prefer not to Say

What is your source of income? (Check ALL that Apply)

- | | |
|--|---|
| <input type="checkbox"/> Work "on the books" earned income | <input type="checkbox"/> Pension/Retirement |
| <input type="checkbox"/> Work "off the books" under the table income | <input type="checkbox"/> Sex Work/Trade |
| <input type="checkbox"/> Supplemental Security Income (SSI) | <input type="checkbox"/> Drug Trade |
| <input type="checkbox"/> Social Security Disability Insurance (SSDI/SSA) | <input type="checkbox"/> Recycling/Scrapping |
| <input type="checkbox"/> SNAP/Food Stamps | <input type="checkbox"/> Panhandling |
| <input type="checkbox"/> Unemployment | <input type="checkbox"/> Veteran's Administration (VA) Benefits |
| <input type="checkbox"/> Plasma Center Donations | <input type="checkbox"/> No Income |
| <input type="checkbox"/> Family/Friends/Church Gifts | <input type="checkbox"/> Other: _____ |

LEGAL

Do you have a Power of Attorney?

Yes

No

Not Sure

Prefer Not to Say

Do you have any current charges (or a trial) pending?

Yes

No

Not Sure

Prefer Not to Say

Are you on probation/parole?

Yes

No

Not Sure

Prefer Not to Say

Do you have any felony convictions?

Yes

No

Not Sure

Prefer Not to Say

IDENTIFICATION

Do you have a state identification card (license, nondriver's ID, etc.)?

Yes

No

Not Sure

Prefer Not to Say

Do you have a Social Security card?

Yes

No

Not Sure

Prefer Not to Say

Do you have a Birth Certificate or Passport?

Yes

No

Not Sure

Prefer Not to Say

Where were you born? _____

TRANSPORTATION

How do you get around, including getting to your medical appointments? (Check All that Apply)

- | | |
|---|---|
| <input type="checkbox"/> I drive a car | <input type="checkbox"/> I walk, ride a bike, or ride a scooter |
| <input type="checkbox"/> My friends or family drive me | <input type="checkbox"/> I cannot get around easily |
| <input type="checkbox"/> I take public transportation or a taxi | <input type="checkbox"/> I take medical transportation (i.e. Logisticare) |
| <input type="checkbox"/> Prefer not to say | |
| <input type="checkbox"/> Other _____ | |

Comments:

MEDICATION & MEDICAL SUPPLIES

Current Durable Medical Equipment: Check ALL that apply

- | | |
|---|---|
| <input type="checkbox"/> Apnea Monitor | <input type="checkbox"/> Nebulizer |
| <input type="checkbox"/> Bath bench/shower chair | <input type="checkbox"/> Oxygen |
| <input type="checkbox"/> Bedside commode | <input type="checkbox"/> Peak flow |
| <input type="checkbox"/> Blood pressure equipment | <input type="checkbox"/> Scales |
| <input type="checkbox"/> Cane | <input type="checkbox"/> Trach supplies |
| <input type="checkbox"/> CPAP/BiPAP | <input type="checkbox"/> Walker |
| <input type="checkbox"/> Feeding pump | <input type="checkbox"/> Wheelchair |
| <input type="checkbox"/> Glucometer | <input type="checkbox"/> None |
| <input type="checkbox"/> Grab bars | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Hospital bed | |

Durable Medical Equipment Needed: Check ALL that apply

- | | |
|---|---|
| <input type="checkbox"/> Apnea Monitor | <input type="checkbox"/> Nebulizer |
| <input type="checkbox"/> Bath bench/shower chair | <input type="checkbox"/> Oxygen |
| <input type="checkbox"/> Bedside commode | <input type="checkbox"/> Peak flow |
| <input type="checkbox"/> Blood pressure equipment | <input type="checkbox"/> Scales |
| <input type="checkbox"/> Cane | <input type="checkbox"/> Trach supplies |
| <input type="checkbox"/> CPAP/BiPAP | <input type="checkbox"/> Walker |
| <input type="checkbox"/> Feeding pump | <input type="checkbox"/> Wheelchair |
| <input type="checkbox"/> Glucometer | <input type="checkbox"/> None |
| <input type="checkbox"/> Grab bars | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Hospital bed | |

PAIN NEEDS

Are you currently taking any medications for pain management (e.g. Percocet, OxyContin, Vicodin, etc.)?

- Yes No Not Sure Prefer Not to Say

Are you currently seeing a pain specialist for treatment?

- Yes No Not Sure Prefer Not to Say

If yes, specify provider: _____

How bad is your pain?

| | | | | | | | | | | |
|-------------|---------------|---|---|-------------------|---|---|-----------------|---|---|----|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| No Symptoms | Mild Symptoms | | | Moderate Symptoms | | | Severe Symptoms | | | |

Where is your pain? _____

HEALTH BEHAVIORS

Health Care facilities most often used by family: _____

Family's perception of this community: _____

Family's association transactions with the community:

- a. What community services does the family usually utilize? _____
- b. Who in the family uses these community services? _____
- c. Frequency of community service utilization: _____
- d. Family's perception of the agency from whom it receives assistance: _____

Family attitude towards:

- a. Health: _____
- _____
- b. Illness: _____
- _____

Health Care Facilities:

- a. Usual Source of health care: _____
- b. Frequency of visit to the health care facility: _____
- c. Member of the family who usually utilizes health care services: _____
- _____
- d. Means of financing health care: _____
- e. Barriers to obtaining health care: _____

Dental Health Practices:

- a. Usual Source of dental care: _____
- b. Frequency of visit to the dental care facility: _____
- c. Member of the family who usually utilizes dental services: _____

- d. Means of financing dental care: _____
- e. Barriers to obtaining dental care: _____

MEDICATIONS

Are you allergic to any medications?

Yes

No

Not Sure

Prefer Not to Say

If yes, specify medications: _____

Current Medications:

Use Medication Reconciliation Sheet.



Please make sure that the Medication Reconciliation Sheet is completed and now complete the CPCQ Questionnaire.



CHANGE-READINESS ASSESSMENT

Client Name: _____

Change-Readiness Scale: 1 = Not Like Me

6 = Exactly Like Me

| | | | | | | |
|--|---|---|---|---|---|---|
| 1. I prefer the familiar to the unknown | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. I rarely second guess myself | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. I'm unlikely to change plans once they are set | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. I can't wait for the day to get started | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. I believe in not getting your hopes too high | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. If something's broken, I try to find a way to fix it | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. I get impatient when there are no clear answers | 1 | 2 | 3 | 4 | 5 | 6 |
| 8. I'm inclined to establish routines and stay with them | 1 | 2 | 3 | 4 | 5 | 6 |
| 9. I can make any situation work for me | 1 | 2 | 3 | 4 | 5 | 6 |
| 10. When something important doesn't work out, it take me time to adjust | 1 | 2 | 3 | 4 | 5 | 6 |
| 11. I have a hard time relaxing and doing nothing | 1 | 2 | 3 | 4 | 5 | 6 |
| 12. If something can go wrong, it usually does | 1 | 2 | 3 | 4 | 5 | 6 |
| 13. When I get stuck, I'm inclined to improvise solutions | 1 | 2 | 3 | 4 | 5 | 6 |
| 14. I get frustrated when I can't get a grip on something | 1 | 2 | 3 | 4 | 5 | 6 |
| 15. I prefer work that is similar and in my comfort zone | 1 | 2 | 3 | 4 | 5 | 6 |
| 16. I can handle anything that comes along | 1 | 2 | 3 | 4 | 5 | 6 |
| 17. Once I've made up my mind, I don't easily change it | 1 | 2 | 3 | 4 | 5 | 6 |
| 18. I push myself to the max | 1 | 2 | 3 | 4 | 5 | 6 |
| 19. My tendency is to focus on what can go wrong | 1 | 2 | 3 | 4 | 5 | 6 |
| 20. When people need solutions to problems, they call me | 1 | 2 | 3 | 4 | 5 | 6 |
| 21. When an issue is unclear, my impulse is to clarify it right away | 1 | 2 | 3 | 4 | 5 | 6 |
| 22. It pays to stay with the tried and true | 1 | 2 | 3 | 4 | 5 | 6 |

| | | | | | | |
|--|---|---|---|---|---|---|
| | | | | | | |
| 23. I focus on my strengths, not my weaknesses | 1 | 2 | 3 | 4 | 5 | 6 |
| 24. I find it hard to give on something even if it's not working out | 1 | 2 | 3 | 4 | 5 | 6 |
| 25. I'm restless and full of energy | 1 | 2 | 3 | 4 | 5 | 6 |
| 26. Things rarely work out the way you want them to | 1 | 2 | 3 | 4 | 5 | 6 |
| 27. My strength is to find ways around obstacles | 1 | 2 | 3 | 4 | 5 | 6 |
| 28. I can't stand to leave things unfinished | 1 | 2 | 3 | 4 | 5 | 6 |
| 29. I prefer the main highway to the backroads | 1 | 2 | 3 | 4 | 5 | 6 |
| 30. My faith in my abilities is unshakable | 1 | 2 | 3 | 4 | 5 | 6 |
| 31. When in Rome, do as the Romans do | 1 | 2 | 3 | 4 | 5 | 6 |
| 32. I'm a vigorous and passionate person | 1 | 2 | 3 | 4 | 5 | 6 |
| 33. I'm more likely to see problems than opportunities | 1 | 2 | 3 | 4 | 5 | 6 |
| 34. I look in unusual places to find solutions | 1 | 2 | 3 | 4 | 5 | 6 |
| 35. I don't perform well when there are vague expectations and goals | 1 | 2 | 3 | 4 | 5 | 6 |

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The Seven Traits of Change-Readiness Scorecard

Add the scores for the questions in each category as indicated below. Note that in some cases the total must be subtracted from 35 to get the score for that trait.

| Optimism | | | Confidence | | |
|----------|-------|--------------------|------------|-------|-------|
| 5. | _____ | | 2. | _____ | |
| 12. | _____ | | 9. | _____ | |
| 19. | _____ | | 16. | _____ | |
| 26. | _____ | | 23. | _____ | |
| 33. | _____ | | 30. | _____ | |
| | | Total | | _____ | |
| | _____ | 35 – Total = Score | | _____ | Score |

| Resourcefulness | | | Adaptability | | |
|-----------------|-------|-------|--------------|-------|--------------------|
| 6. | _____ | | 3. | _____ | |
| 13. | _____ | | 10. | _____ | |
| 20. | _____ | | 17. | _____ | |
| 27. | _____ | | 24. | _____ | |
| 34. | _____ | | 31. | _____ | |
| | | | | _____ | Total |
| | _____ | Score | | _____ | 35 – Total = Score |

| Adventurousness | | | Tolerance for Ambiguity | | |
|-----------------|-------|--------------------|-------------------------|-------|--------------------|
| 1. | _____ | | 7. | _____ | |
| 8. | _____ | | 14. | _____ | |
| 15. | _____ | | 21. | _____ | |
| 22. | _____ | | 28. | _____ | |
| 29. | _____ | | 35. | _____ | |
| | | Total | | _____ | Total |
| | _____ | 35 – Total = Score | | _____ | 35 – Total = Score |

| Passion/Drive | | |
|---------------|-------|-------|
| 4. | _____ | |
| 11. | _____ | |
| 18. | _____ | |
| 25. | _____ | |
| 32. | _____ | |
| | | |
| | _____ | Score |



CLIENT PERCEPTION OF COORDINATION QUESTIONNAIRE

Interviewer: _____ Date: _____

Client Name: _____

Health Service (General): Questions 1-11 relate to the care you received for your health from any doctor or service provider in the last 3 months.

| Question | Never | Rarely | Sometime | Mostly | Always | Prefer Not to Say |
|---|-------|--------|----------|--------|--------|-------------------|
| 1. How often did you get the service you though you needed? | | | | | | |
| 2. How often did you have to wait too long to obtain a service/appointment? | | | | | | |
| 3. In the past 3 months, how often did you seem to receive the medicines you though you needed? | | | | | | |
| 4. How often were the results of test discussed with you (e.g. blood test)? | | | | | | |
| 5. In the past 3 months, how often did you feel the care you received was well coordinated? | | | | | | |
| 6. How often were you happy with the quality of care you received? | | | | | | |
| 7. In the past 3 months, how often have service providers responded appropriately to changes in your needs? | | | | | | |
| 8. How often did you seem to get conflicting advice from service providers? | | | | | | |
| 9. In past 3 months, how often have you felt like complaining about any of your care? | | | | | | |
| 10. How well did you feel you understood your conditions? | | | | | | |
| 11. Overall, how satisfied are you with the care, you have received in the past 3 months? | | | | | | |

Primary Care Practitioner: Question 12-15 relate to the care you have received from your Primary Care Provider (PCP) in the last 3 months.

| Question | Never | Rarely | Sometime | Mostly | Always | Prefer Not to Say |
|--|-------|--------|----------|--------|--------|-------------------|
| 12. How often did you and your PCP agree about your care needs? | | | | | | |
| 13. How often did your PCP seem to be communicating with your other providers? | | | | | | |

| | | | | | | |
|---|--|--|--|--|--|--|
| 14. How often did your PCP involve you when making decisions about your care? | | | | | | |
| 15. How often did your PCP talk with you about your future care? | | | | | | |

Main Carer: Questions 16-17 relate to the care you have received from your main carer (the individual primarily responsible for your care at home)

| Question | No Carer | Spouse | Parent | Child | Friend/Other | Prefer Not to Say |
|--|----------|--------|----------|--------|--------------|-------------------|
| 16. Who is your main carer? | | | | | | |
| | Never | Rarely | Sometime | Mostly | Always | Prefer Not to Say |
| 17. In the past 3 months, how often do you think your main carer was satisfied with the care you received? | | | | | | |
| | | | | | | |

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MEDICATION RECONCILIATION FORM

Client Name: _____

Source of Information

Patient
 Caregiver
 Rx Bottle
 EMS
 PCP
 _____ Other

Allergies and Adverse Drug Reactions _____

Active Medication List

| Medication Name | Dose | Route | Frequency |
|-----------------|------|-------|-----------|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 12. | | | |
| 13. | | | |
| 14. | | | |
| 15. | | | |
| 16. | | | |
| 17. | | | |
| 18. | | | |
| 19. | | | |
| 20. | | | |

OTC Medications, Herbal, Etc.

| Medication Name | Dose | Route | Frequency |
|-----------------|------|-------|-----------|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |

**Transportation Needs Questionnaire
For Residents of Kippax Apartment**

Controlled Outcomes is working to identify ways of improving transportation options for Kippax Apartment residents. You have been randomly selected to complete the following questionnaire. Your input is important to us even if all people in your household drive or have never used local transportation services. If at any time you are uncomfortable or do not wish to disclose information, you are free to leave questions blank or discontinue the survey.

Before you begin, please tell us if are you answering the survey for someone who is unable to complete the survey for themselves. Yes ____ No ____

1. How old are you and the other members of your household? (Please check each the space that best describes you and write the number of people the fit each category for the other members of your household)

| | <u>You</u> | <u>Others</u> |
|---------------------------|------------|---------------|
| 0-17 years of age | ____ | ____ |
| 18-35 years of age | ____ | ____ |
| 36-59 years of age | ____ | ____ |
| 60-69 years of age | ____ | ____ |
| 70-79 years of age | ____ | ____ |
| More than 80 years of age | ____ | ____ |

2. Are you a caregiver for a person over age 60 or with a disability?

Yes ____ No ____

3. Do you have a disability or other health concern that prevents you from driving?

Yes ____ No ____

4. What is your primary means of transportation? (Please check all that apply.)

____ Personal automobile

____ Friend, relative, or neighbor

____ Volunteer driver

____ "PAT" van/bus service/Senior center van/Paratransit

____ Private van service

Medicaid transportation

Other

5. If you don't drive a car, why not? (Please check all that apply.)

Can't drive due to a medical/physical condition

Can't afford a car

Can't afford gas/insurance

Lost driver's license

No need, everything I need I can access without a car

Other

6. Are you aware that the City of Hopewell Transportation Services bus is open to those who have completed a transportation form with the City of Hopewell and with a 24-hour advance request?

Yes No

7. Do you ride PAT or use the City of Hopewell transportation service? Yes No

8. If you do not use PAT or use the City of Hopewell transportation service regularly, why not? (Please check all that apply.)

No service where I am or where I want to go

Poor connections or transfers

I don't know how to ride the bus

Limited hours of operation

I don't feel safe on the bus

I can't afford it

I don't know about it

I don't need it

Other

9. What times would you MOST want to use the transportation service (such as a cab or bus)? *(Please check all that apply.)*

- | | |
|--|--|
| <input type="checkbox"/> 6 am to 9 am | <input type="checkbox"/> 4 pm to 7 pm |
| <input type="checkbox"/> 9 am to 12 noon | <input type="checkbox"/> 7 pm to 10 pm |
| <input type="checkbox"/> 12 noon to 4 pm | <input type="checkbox"/> 10 pm to 6 am |

10. What days of the week would you be most likely to travel locally using a transportation service (such as a cab or bus)? *(Please check all that apply)*

- | | |
|------------------------------------|-----------------------------------|
| <input type="checkbox"/> Monday | <input type="checkbox"/> Friday |
| <input type="checkbox"/> Tuesday | <input type="checkbox"/> Saturday |
| <input type="checkbox"/> Wednesday | <input type="checkbox"/> Sunday |
| <input type="checkbox"/> Thursday | |

11. Do you need any of the following kinds of assistance when you travel locally? *(Please check all that apply)*

- Assistance getting into and out of a vehicle
 - Escort to accompany you
 - Help loading and unloading packages
 - Door-to-door service
 - Wheelchair, lift or ramp
 - Space for a fold-up wheelchair
 - Other
-

12. In an average week, how many vehicle trips (include a round trip as two trips) do you take? *(Please check one that most applies)*

- | | |
|---------------------------------|---------------------------------------|
| <input type="checkbox"/> None | <input type="checkbox"/> 11-15 |
| <input type="checkbox"/> 1-5 | <input type="checkbox"/> 16-20 |
| <input type="checkbox"/> 6 – 10 | <input type="checkbox"/> More than 20 |

13. How important would each of the following characteristics be in your decision to use a transportation service (such as a cab or bus)? *(Please circle the number that most applies)*

(1-Not Important, 2- Somewhat Important, 3- Important, 4- Very Important)

| | Not Important | | Very Important | |
|---------------------------|---------------|---|----------------|---|
| Service from home to work | 1 | 2 | 3 | 4 |
| Flexibility | 1 | 2 | 3 | 4 |
| Evening service | 1 | 2 | 3 | 4 |
| Late-night service | 1 | 2 | 3 | 4 |
| Weekend service | 1 | 2 | 3 | 4 |
| Guaranteed ride home | 1 | 2 | 3 | 4 |
| Very few stops | 1 | 2 | 3 | 4 |
| Clear fare structure | 1 | 2 | 3 | 4 |
| Easy to arrange | 1 | 2 | 3 | 4 |
| Same day scheduling | 1 | 2 | 3 | 4 |
| Wheelchair accessible | 1 | 2 | 3 | 4 |
| Other _____ | _____ | | | |

15. How much would you pay a transportation service (such as a cab or bus) each way? *(Please check one that most applies)*

____ Less than \$3.00

____ \$3.01 - \$5.00

____ \$5.01 - \$7.00

____ More than \$7.01

____ Other _____

16. If you had access to a transportation service (such as a cab or bus), which of the following would be most accurate? (Please check one that applies most)

I make more trips

I would make fewer trips

I would make the same number of trips

17. Do you think that there is community support for a transportation service for Kippax Apartments residents?

Yes No Please explain:

19. Please add any additional comments you may have about public transportation for residents of Kippax Apartments.

Thank you for your assistance!

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