

OCTOBER 2022



HEALTHY HOMES INITIATIVE

3-YEAR STUDY (2019 - 2021)

Making Homes Warmer, Safer, Drier, and Healthier

Chesapeake Housing Mission
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Executive Summary

Chesapeake Housing Mission (CHM) is a Christian mission dedicated to leveraging volunteers to help their neighbors as Jesus would have wanted. Neighbor helping neighbor is our model. Through 2021, we have completed 676 critical home repair projects – although a large number, it only represents 4% of poverty level single family homes in our area. The need is so very great, and resources are needed.

This report discusses the health challenges faced by low income residents living in substandard housing on the Lower Eastern Shore of Maryland and outlines the positive impact of the housing repairs we have performed pertaining to these health challenges. In addition, it presents our future plans to make area homes warmer, safer, drier and healthier.

With this report, our objective is to increase the awareness of the link between population health and the environment where people live, especially their home. Although the link may be intuitive to some, little is published about health initiatives focused on improving the places where people live as a critical issue, especially for the poor. According to studies compiled by the North Carolina Housing Finance Agency, health is so greatly impacted by the conditions of a patient's home that every \$1.00 spent on home repairs saves \$19.00 in Medicare/Medicaid costs.

Our objective is to increase the awareness of the link between population health and the environment where people live, especially their homes.

Our outcomes constitute a compelling case for the need to educate health care workers and homeowners on the impact of housing conditions on health, the importance of establishing linkages to healthy housing resources, and the role of CHM and community leaders in making homes healthier for our citizens living in poverty.

Health Benefits Related to Our Work

- ↓ **87%** Reduction in FALLS
- ↓ **38%** Reduction in Hospital Admissions
- ↓ **53%** Reduction in Hospital Admission Charges
- ↓ **30%** Reduction in Emergency Department Admissions
- ↓ **45%** Reduction in Emergency Department Admission Charges
- ↑ **80%** Improvement in Connection to Community
- ↑ **85%** Improvement in Daily Outlook

Introduction

The four Lower Eastern Shore counties of Maryland, while known for their farms, beaches and rural landscape, are also known for their poverty. Somerset, Dorchester and Wicomico Counties are among the five counties in Maryland with the highest poverty levels. Worcester County is ranked in the top 10. In the four counties, over 31,000 residents live at or below the federal poverty level, and 37,000 are on food stamps.

According to BEACON (Business Economic and Community Outreach Network) of the Franklin P. Perdue School of Business at Salisbury University, the four Lower Eastern Shore counties have over 11,800 single family households living below the poverty level. Low income households usually have one or more severe housing problems, such as leaking roofs, broken heaters, or lack of adequate plumbing. The county in greatest need is Wicomico with over 5,000 single family homes in poverty, followed closely by Worcester and Dorchester.

Significant housing problems can cause family members to have health issues. Leaking roofs allow for water intrusion that can result in mold and respiratory problems over time. Winters without a functioning heater can result in health issues for the elderly and children, especially if the family resorts to the indoor use of oil or gas space heaters. Broken handrails and steps and uneven floors will eventually result in a fall that will send family members to the emergency room.

Safe and healthy homes are needed for all people in our area. This is why CHM repairs homes for low income families at no cost to them. Our mission is to restore hope and dignity to qualified low income homeowners, by repairing their homes as an expression of our love for our neighbors.

The leading cause of injury in adults over the age of 65 is falls.

The elderly are especially challenged with maintaining a safe, healthy home. Often as they look to age at home, they find that they cannot take care of their homes like they did, and that their needs for easier access, lower shelves, and safe bathrooms increase. Lack of easy access in and out of their home can reduce their visits to doctors to the detriment of their health. Increased healthcare costs can mean that they cannot afford these health improving changes. According to the U.S. Centers for Disease Control (CDC), the leading cause of injury in adults over the age of 65 is falls.





Our Work THROUGH 2021

Chesapeake Housing Mission has been repairing homes for our neighbors in need on the Lower Eastern Shore of Maryland since 2009, when a group of mission-minded leaders came together after years of doing Appalachian home repairs to found CHM and help our local residents. We are a faith-based non-profit organization, but are not affiliated to any one church. We repair homes for anyone who qualifies. Our vision is for all people in our communities to have a warm, safe, dry and healthy home.

Our work benefits many in our community who are at risk of health issues. In 2021, we repaired 105 homes, our most ever, and served 183 family members. Approximately three quarters of these persons were over 65 years old.

Since our inception, our focus has always been to provide only critical repairs, so that each year we are able to serve as many as possible. We define critical repairs as those that make our clients warmer, safer, drier and/or healthier.

We believe healthier homes translate to a feeling of safety and security for our neighbors, alleviating the stress that comes with the financial burden of home repairs and injuries. People face hard decisions every day, and home repairs are not always a priority. Over time, due to housing conditions, they may face isolation, additional physical and mental health issues.

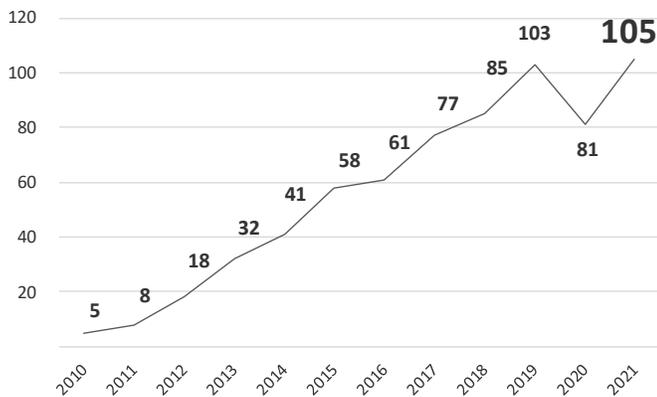
676 Completed Projects

1,119 Family Members Served

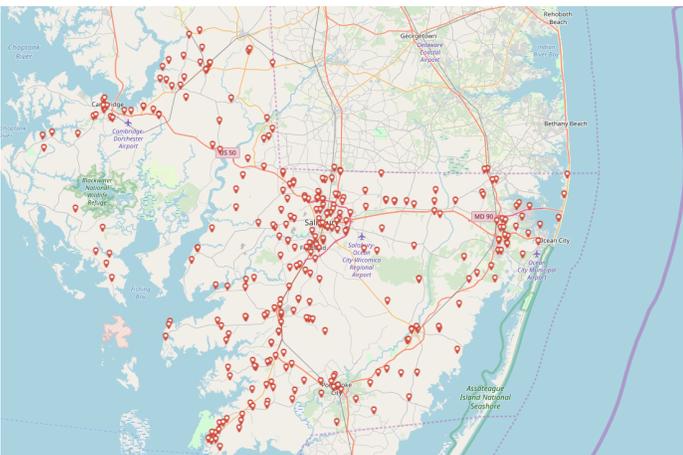
11,366 Volunteers

71,930 Volunteer Hours

Completed Projects



Project Locations



We understand that our work is only one of many factors affecting overall health. Our repairs may improve our clients' physical environment and provide them with hope in their community, a very powerful outcome. But, the reality is that genes and personal choices factor largely into their health status. In addition, a reduction in dollars spent on healthcare frees up dollars for other necessary services.

Through 2021, we completed over 676 home repair projects, making homes healthier for their residents. Although a large number, it only represents 4% of poverty-level single-family homes in our area.

These healthier Home received:

- Wheelchair ramps
- New or repaired floors
- Steps or handrails
- Bathroom grab bars
- Roof Repairs that stopped water leaks that could lead to mold

Outcomes

2019 THROUGH 2021



CHM began capturing outcome data in January 2019, for each client referred to us by our local partnering agencies. The objective was to measure the health impact of the critical home repairs we perform.

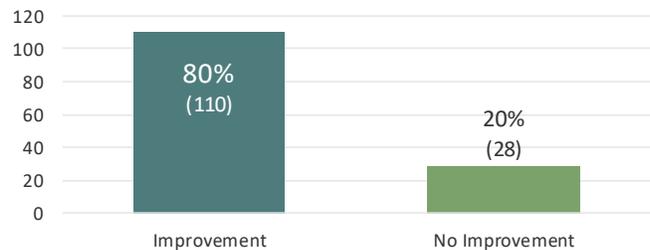
Prior to performing the work and then again 6 months after the service date, each client was asked a series of questions concerning falls, hospital and emergency department visits, and their daily outlook. TidalHealth partnered with us to identify the impact of our work.

We have completed our 3-year study. Our findings indicate that our 2019, 2020, and 2021 clients contacted 6 months after the project was completed, reduced falls from 339 to 43, a 87.32% reduction. The majority of these clients also expressed an improvement in their sense of connection to the community and their daily outlook.

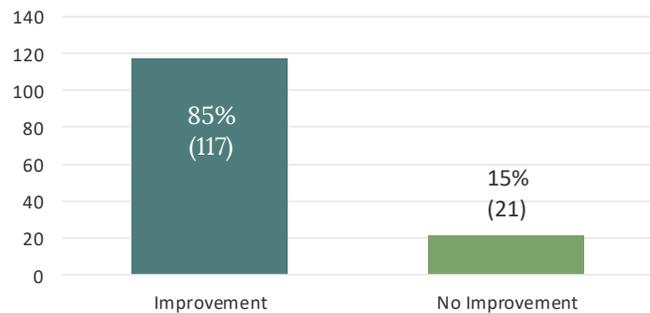


Client Fall Reduction = 87%
(from 339 to 43)

80% Improvement in Connection to Community



85% Improvement in Daily Outlook



Outcomes (continued)

Of the 289 client projects CHM performed between 2019 and 2021, information for 216 of these was given to TidalHealth for analysis. Using CRISP (see report sources for more information), TidalHealth was able to match 141 clients to the Maryland health information database. The data analysis performed reflects hospital utilization and charges for 6 months prior to and 6 months after CHM service dates.

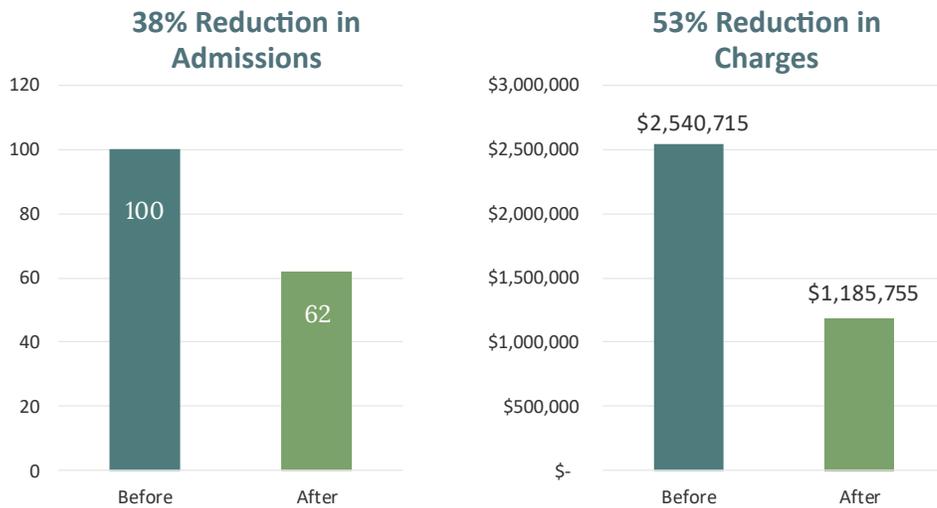
The approximate cost to CHM for home repairs for the 141 clients matched was \$440,000. Given that TidalHealth found hospital admission and emergency department savings totaling \$1,409,840 after CHM performed work, this translates to an amazing 220% return for dollars invested!

See Appendix A for more details.

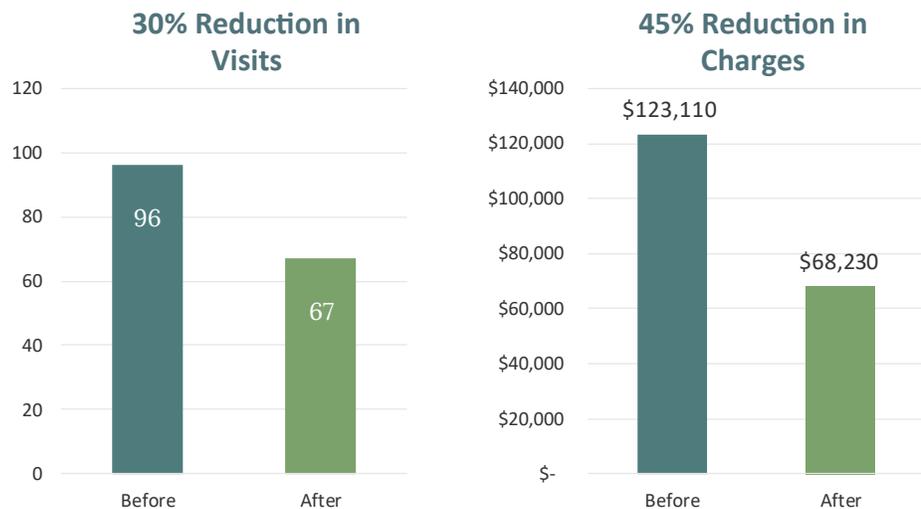
220%

Return on Investment

HOSPITAL



EMERGENCY DEPARTMENT



What the Research Says

Many organizations have begun to investigate the correlation between unhealthy, unsafe homes and health care costs. Healthcare organizations are looking beyond the doctor's office and the hospital at their communities to see what are the Social Determinants of Health (SDOHs). Researchers want to identify and address conditions in the places where people live, learn, work, and play that affect health risks and outcomes. One important area is home.



The National Academy of Medicine says that “medical care is estimated to account for only 10- 20% of the modifiable contributors to healthy outcomes for a population. The other 80 - 90% are sometimes broadly called the SDOH: health-related behaviors, socioeconomic factors, and environmental factors.”

One of the first organizations to look at whether home repairs reduce health costs was Johns Hopkins. In 2018 they completed a study of 250 elderly people on Medicare and Medicaid, where they teamed a nurse, an occupational therapist and a handyworker to address the home environment. They used the strengths of the older adults themselves to improve safety and independence. The resulting program was titled “CAPABLE”, Community Aging in Place - Advancing Better Living for Elders. People with functional limitations and chronic conditions are more than four times more likely than the general population to be among the 5 percent costliest users of health services. Roughly \$3,000 in program costs yielded more than \$20,000 in savings in medical costs, driven by reductions in both inpatient and outpatient expenditures. Participants had difficulty with an average of 3.9 out of 8.0 Activities of Daily Living (ADLs) at baseline, compared to 2.0 after five months. Symptoms of depression, as well as the ability to grocery shop and manage medications also improved.

CAPABLE is already eligible for Medicare and Medicaid coverage in some states, and when scaled nationally, could save Medicare an estimate of \$6.8 billion annually. It has been funded by the National Institutes of Health, the Centers for Medicare and Medicaid Services, the Robert Wood Johnson Foundation, the John A. Hartford Foundation, the Weinberg Foundation, and the Rita & Alex Hillman Foundation. It was implemented by Habitat for Humanity in six new areas across the United States.

There has been work sponsored by Medicaid in North Carolina to repair homes for low-income homeowners and track their medical costs. In a study done with Medicaid and WARM (Wilmington Area Rebuilding Ministry), they found that “health is so greatly impacted by the condition of a patient’s home that every \$1.00 spent on home repairs saves \$19.00 in Medicare/ Medicaid costs, according to studies compiled by the North Carolina Housing Finance Agency.

All of this research and study lead to a common conclusion: investment in improving living conditions of the poor will lead to significant and long lasting improvements in their health.

Home Environment Impacts Health

There is a significant amount of data in the literature about health issues that can shed light on the connection between home repair needs and family health impacts. For instance, the CDC says that falls are the leading cause of injury related illness among senior citizens. Approximately one in four US residents aged 65 and older report falling each year. Dilapidated floors, inadequate or broken railings and stairs, and high tub walls may cause falls, especially as homeowners age-in-place.

HUD (U.S. Department of Housing and Urban Development) started a Healthy Housing initiative in 1999 which has targeted low-income housing problems. In their strategic plan, they state that the health and economic burden of housing-related hazards is substantial. Unintentional injury is the leading cause of death and disability among children younger than 15 years of age, with over 2,800 child and adolescent deaths occurring each year due to injuries in the home. The elderly are also at an elevated risk for residential injuries; each year, 35-40% of adults 65 and older fall at least once. It is estimated that falls account for 33% of injury-related medical expenditures and cost Americans more than \$38 billion annually. Research in 2017 showed that asthma cases in the U.S. linked to dampness and mold cost approximately \$3.5 billion annually.

Indoor air pollution, excessive mold, and contaminants in old carpet may create or worsen respiratory conditions such as COPD and asthma. Research by the Robert Wood Johnson Foundation found that 40% of asthma diagnosed in childhood is caused by conditions in their homes, such as poor indoor air

quality caused by mold, mildew, and inadequate ventilation.

High housing-related costs place a particular economic burden on low-income families, forcing trade-offs between food, heating and other basic needs. One study found that low-income people with difficulty paying rent, mortgage or utility bills were less likely to have a usual source of medical care and more likely to postpone treatment and use the emergency room for treatment.

Since low-income homeowners are deciding what basic needs to pay for, any home repairs needed to make the environment better for them and their family are often not funded. Thus, they are caught in a web of not being able to afford home repairs that could make their lives healthier, and the resultant short term and long term health costs continue to mount.

Through the NC Department of Health and Human Services (NCDHHS), Medicaid is launching the Healthy Opportunities Pilot program, which will pay for certain non-clinical services that are proven to impact health. The five-year program will take a whole-person centered approach that addresses medical and non-medical drivers of health.

Data from the pilot program will be collected and analyzed to transform Medicaid and address fundamental drivers of health because, “research shows up to 80% of a person’s health is determined by social and environmental factors and the behaviors that emerge as a result.”

Robert Wood Johnson Foundation

Healthy homes promote good physical and mental health. Good health depends on having homes that are safe and free from physical hazards. In contrast, poor quality and inadequate housing contributes to health problems such as chronic diseases and injuries, and can have harmful effects on childhood development. Poor indoor air quality, lead paint, and other hazards often coexist in homes, placing children families at great risk for multiple health problems.

- ⇒ **Lead poisoning irreversibly affects brain and nervous system development, resulting in lower intelligence and reading disabilities.**
- ⇒ **Substandard housing such as water leaks, poor ventilation, dirty carpets and pest infestation can lead to an increase in mold, mites and other allergens associated with poor health.**
- ⇒ **Cold indoor conditions have been associated with poorer health, including an increased risk of cardiovascular disease. Extreme low and high temperatures have been associated with increased mortality, especially among vulnerable populations such as the elderly.**

What is a healthy home?

Housing conditions can and should support good health. But, what makes a healthy home environment according to the CDC?

DRY: Damp houses provide a nurturing environment for mites, roaches, rodents, and molds, all of which are associated with asthma.

CLEAN: Clean homes help reduce pest infestations and exposure to contaminants.

PEST-FREE: Recent studies show a causal relationship between exposure to mice and cockroaches and asthma episodes in children. Yet, inappropriate treatment for pest infestations can exacerbate health problems, since pesticide residues in homes pose risks for neurological damage and cancer.

VENTILATED: Studies show that increasing the fresh air supply in a home improves respiratory health.

SAFE: The majority of injuries among children and adults occur in the home. Falls are the most frequent cause of residential injuries to children, followed by injuries from objects in the home, burns, and poisonings.

CONTAMINANT-FREE: Chemical exposures include lead, radon, pesticides, volatile organic compounds, and environmental tobacco smoke. Exposures to asbestos particles, radon gas, carbon monoxide, and secondhand tobacco smoke are far higher indoors than outside.

MAINTAINED: Poorly maintained homes are at risk for moisture and pest problems. Deteriorated lead-based paint in older housing is the primary cause of lead poisoning, which affects some 535,000 U.S. children annually.

THERMALLY CONTROLLED: Tenants and homeowners are at risk for various health problems related to prolonged exposure to excessive heat or cold when their homes do not maintain adequate temperatures.



Working to Achieve Health Equity

Health Equity is defined by the CDC as, “The opportunity to attain one’s full health potential and no one is disadvantaged from achieving this potential because of their social position or other socially determined circumstance.” Many attribute the responsibility of “health” and “health equity” to healthcare systems and healthcare providers. While these institutions have an important role in attaining the vision of health equity as stated by the CDC, so much of what creates inequity in health is outside of the realm of the healthcare system.

This is the impetus behind the *Healthy Homes Initiative* (HHI) initiated by CHM. As you can see by the results demonstrated through the outcome measures shared in this report, health outcomes can be directly impacted by actions unrelated to healthcare interventions. A focus on social conditions in a community has a much greater impact on the overall health of the residents of the community.

Of those key social determinants, CHM’s mission is to, “To provide critical housing repair services through Christian Mission to low -income families living in the Chesapeake Region...” Our focus is to address critical housing issues that may have a direct impact on a person’s ability to have a healthy, sustainable life in their home. This isn’t something that CHM can achieve in a vacuum; rather, it requires a close partnership between the healthcare system and community organizations to create the right focus for a community.

The Institute for Healthcare Improvement (IHI) has developed a vision for achieving such community results. IHI suggests that individual health within communities can be improved through the intentional partnerships between healthcare organizations and communities. The common goal: making our community healthier and more resilient, through improved social conditions and safer living environments. CHM has begun this meaningful work throughout the lower Eastern Shore, and we are leading the way for others by establishing these partnerships and sharing our results for others to see.



Future Plans

CHM is working with TidalHealth, and the four county Health Departments operating as a multi-county Health Advisory Board. Client slips and falls before and after the repairs will continue to be tracked, as well as emergency room visits and hospital admissions. Related health costs will also be compiled. Our four phase program is ongoing and currently underway.

PHASE 1

Develop an awareness program for Health Workers in the four county area, including printed materials and videos. The primary purpose of this is to increase awareness for those who have direct contact with those at risk, and provide contact numbers and resources to provide assistance. Increased education of what to look for to eliminate causes of slips, trips and falls is key to increasing awareness. In addition, making poverty level residents aware of housing repair services will be key to creating healthier home environments.

PHASE 2

Have CHM recognized as a partner and critical resource in Community Health Needs Assessments conducted in our service areas, especially when it comes to poverty level housing.

PHASE 3

Reach out to foundations and other potential funders to obtain larger grants to provide critical home repair services. With only 4% of the poverty level homes repaired by CHM in 12 years, we need to ramp up our local resources to attack this problem. In addition, implement a media campaign to solicit more volunteers to support a growing demand for critical home repairs.

PHASE 4

Work with local leaders and donors to encourage the formation of more non-profits that will focus on making the homes of our low income level owners healthy. A variety of skills are in short supply for the people who need this help, such as plumbing, roofing, and electrical, at a reasonable price. If we are going to help reduce the level of low income housing in our area, we need more resources focused on the problem.



August 18, 2022: Chesapeake Housing Mission, TidalHealth and the Wicomico and Somerset County Health Departments sign a Memorandum of Understanding to form a partnership to improve housing and health through the Healthy Homes Initiative.



October 6, 2021: Chesapeake Housing Mission, Atlantic General Hospital and the Worcester County Health Department sign a Memorandum of Understanding to form a partnership to improve housing and health through the Healthy Homes Initiative.

Appendix A

Outcome Data 2019 through 2021

CHM Survey

	Total Projects	FALLS			CONNECTION TO COMMUNITY			DAILY OUTLOOK			
		Total Clients Surveyed	6 Months Prior to Project	6 Months After Project	% Reduction	Total Clients Surveyed	Noticed Improvement	% Improvement	Total Clients Surveyed	Noticed Improvement	% Improvement
2019	103	44	130	6	95.38%	47	29	61.70%	47	40	85.11%
2020	81	55	56	0	100.00%	39	34	87.18%	42	37	88.10%
2021	105	68	153	37	75.82%	52	47	90.38%	49	40	81.63%
TOTALS	289	167	339	43	87.32%	138	110	79.71%	138	117	84.78%

CRISP Analysis

	Total Projects	Total Clients provided to TidalHealth for Utilization and Cost Analysis	Total Clients Matched by TidalHealth and Included on Panel for Analysis (CRISP)	HOSPITAL ADMISSIONS			HOSPITAL ADMISSION CHARGES			
				6 Months Prior to Project	6 Months After Project	% Reduction	6 Months Prior to Project	6 Months After Project	Savings	% Reduction
2019	103	47	44	18	16	11.11%	450,613	281,138	169,475	37.61%
2020	81	72	36	33	16	51.52%	939,653	347,651	592,002	63.00%
2021	105	97	61	49	30	38.78%	1,150,449	556,966	593,483	51.59%
TOTALS	289	216	141	100	62	38.00%	2,540,715	1,185,755	1,354,960	53.33%

	Total Projects	Total Clients provided to TidalHealth for Utilization and Cost Analysis	Total Clients Matched by TidalHealth and Included on Panel for Analysis (CRISP)	EMERGENCY DEPARTMENT VISITS			EMERGENCY DEPARTMENT CHARGES			
				6 Months Prior to Project	6 Months After Project	% Reduction	6 Months Prior to Project	6 Months After Project	Savings	% Reduction
2019	103	47	44	31	20	35.48%	35,362	18,805	16,557	46.82%
2020	81	72	36	25	18	28.00%	34,586	16,968	17,618	50.94%
2021	105	97	61	40	29	27.50%	53,162	32,457	20,705	38.95%
TOTALS	289	216	141	96	67	30.21%	123,110	68,230	54,880	44.58%

Return on Investment

	Total Projects	Total Clients provided to TidalHealth for Utilization and Cost Analysis	Total Clients Matched by TidalHealth and Included on Panel for Analysis (CRISP)	RETURN ON INVESTMENT			ROI
				Average Cost of Project to CHM	Total Cost to CHM for Matched Clients	Hospital and Emergency Department Savings	
2019	103	47	44	2,000	88,000	186,032	111%
2020	81	72	36	3,000	108,000	609,620	464%
2021	105	97	61	4,000	244,000	614,188	152%
TOTALS	289	216	141		440,000	1,409,840	220%

Sources

BEACON (Business Economic and Community Outreach Network) of the Franklin P. Perdue School of Business at Salisbury University, Salisbury MD.

TidalHealth, Salisbury MD.

CRISP: Chesapeake Regional Information System for our Patients, or CRISP, is a regional health information exchange (HIE) serving Maryland and the District of Columbia. They are a not-for-profit organization advised by a wide range of stakeholders who are responsible for healthcare throughout the region.

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Chesapeake Housing Mission

HEALTHY HOMES INITIATIVE

3-Year Study: 2019 - 2021