SOCIAL DETERMINANTS OF HEALTH AND ITS IMPACT ON HEALTHCARE EXPENDITURE

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ABSTRACT

The United States' healthcare system is ineffective when addressing the social needs of its patients and has contributed to its staggering 17.9% GDP expenditure on healthcare. In order to address this issue, stakeholders from different disciplines including but not limited to government agencies, healthcare providers, social workers, community organizations, policy-makers, etc. should be considered when attempting to address social determinants of health holistically. Current statistics associated with issues such as food insecurity has contributed to the nation's obesity epidemic in which approximately 40% of the United States' population is medically classified as being obese. The chronic conditions that are comorbid with an individual's high body mass index has been researched and well documented. As a result, health systems and larger payers such as the government have had an additional burden of paying for expensive medical treatments and care for patients.

To address this ongoing problem, the Centers for Medicare and Medicaid Services has implemented a three-track system that takes on differing degrees of complexity to address social determinants of health. The three systems are: awareness, assistance, and alignment. Hospitals have been selected for each pilot program with differing strategies that meet the same goal. Additionally, large associations such as the American Hospital Association have allocated resources in promoting awareness about the impact of social factors on hospitals. Effort has been

made in addressing issues related to housing, transportation, and food insecurity. The goal for these initiatives is to focus on improving the social environment of their respective patients as a means of mitigating the development of later, chronic conditions. The upfront investment from hospitals will be able to save substantial costs for the healthcare system overall.

PUBLIC HEALTH RELEVANCE

These SDOH-related initiatives aim to improve community health as hospitals start to focus on social factors that impact day-to-day life of their patients. With the clout and resources that hospitals have, more resource-intensive programs are able to be funded and developed. These programs will allow for additional access to transportation, food options, and housing which all have been identified to be key factors in determining an individual's health later in life.

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1.0 INTRODUCTION

The current cost of the US healthcare ecosystem has drastically increased due to the focus on curative medicine over preventative medicine. It is estimated that healthcare expenditures have reached 17.9% of the US's total gross domestic product in 2017 or approximately $10,800 spent per person.[1] In response to the increased healthcare spending, the Centers for Medicare and Medicaid Services and hospital systems within the United States have allocated resources towards addressing the social needs of their patients as a way to decrease unnecessary healthcare cost. For example, the Centers for Medicare and Medicaid Services has released its Accountable Health Care Communities model throughout the United States in order to address the gap between health and social care.[3] The goal of this initiative is to emphasize the social needs of the patient that directly impacts their health through screening, community navigation, and etc. in order to mitigate more expensive downstream medical costs. Examples of some factors include housing security, lack of public transportation, food deserts, etc.[3] These aspects don't have an immediate impact, but prolonged exposure has shown to be root causes for severe chronic diseases later in life.

The roles of hospitals regarding improving the social conditions of their patients will be based on each hospital's individual social determinants of health protocol and plan. Hospitals have also begun addressing issues such as housing instability or food insecurity by connecting patients that do not require medical attention to community partners is more efficient way to use

resources while accruing better results. With more competition from neighboring hospitals and pressure from the Center for Medicare and Medicaid Services, hospitals have begun developing their own social determinants of health model to better address the needs of their community. Integrated care management protocols that are formed based on collaborations between healthcare systems, community-based organizations, and public health agencies are starting to develop in order to address the issue of social determinants of health.

2.O LITERATURE REVIEW

PubMed, governmental agencies, and the American Hospital Association were the primary sources of information for the following text. The keywords used for PubMed searches were “((((((("Hospitals"[Mesh]) OR "Academic Medical Centers"[Mesh])) OR ((hospital[Title/Abstract]) OR hospitals[Title/Abstract]))) OR (medical center[Title/Abstract] OR medical centers[Title/Abstract]))”, “((((("community based organizations") OR "community based organization")) OR community partner*)”, and “((cost OR costs))” which resulted in a total of 80 studies. After an initial review, a majority of the studies were discarded due to them being unrelated to the topic at hand. Some exclusion criteria were geographic location, study question, lack of results, and irrelevant content. Overall, 2 studies from Johns Hopkins and Baylor University Medical Center showed promising and relevant results for the topic of interest. Subsequent information was a result of reviewing through governmental agency websites and the American Hospital Association.

3.O CURRENT IMPACT OF SOCIAL DETERMIANTS OF HEALTH ON POPULATIONS

Differences in the social determinants of health plays a large role in determining the health of the population. The disparities in factors such as wealth, education, housing, etc. play underlying roles in the emergence of long-term chronic diseases for the patient population. One example, the lack of access to nutritious food or being food insecure has helped to create a population where obesity rates have reached almost 40%, affecting over 90 million citizens.[2] The obese population has shown high rates of comorbidities with other chronic conditions such as diabetes, cancers, and heart disease.[2] Not addressing issues such as these has shown to be detrimental to the overall health and economy of the nation. Those affected with these chronic conditions have a lower quality of life and require more medical treatments when compared to the general population. The increased use of medical treatments has equated to roughly an increase of $1,500 in medical costs and totaling approximately $150 billion for obesity related conditions alone.[2] This illustrates the need for more attention on the role that social determinants of health has on health results and potential cost savings.

It is difficult to directly connect the impact of social conditions to an increased incidence of a particular chronic condition due to the resources and time required. However, an analysis conducted by the Blue Cross Blue Shield focused on the impact of social determinants of health on their 24 million constituents.[4] The study looked at the correlation between different factors such as socioeconomic and demographic status, behavioral health, and health systems and their impact on long term chronic conditions. The analysis conducted by Blue Cross Blue Shield and its consultant compared numerous chronic diseases with different external factors such as socioeconomic factors, behavioral changes, and healthcare impact in order to identify the largest

contributor to health. The conclusion from the analysis showed that socioeconomic status and demographics had the largest role in determining whether a patient developed chronic diseases such as diabetes, high blood pressure, cancer, etc.[4] As shown in table 1, when compared to the spectrum of disease outcomes, socioeconomic status dominated the proportion and can explain for 36% to 66% of the variability in health conditions.[4] The study concludes that these social determinants of health are having more of an impact on chronic conditions when compared to behavioral changes and healthcare actions.[4]

The current healthcare structure rewards hospitals for the secondary and tertiary care that they provide for their target and service population. The emergence of social determinants of health has played a huge role in the health outcomes of the community and subsequently, the cost of treating those diseases. This forces payers and providers to consider more preventive initiatives such as those discussed prior in order to mitigate downstream health outcomes as a means of reducing unnecessary hospital costs. The shift from a fee-for-service to a fee-for value model has allowed the incorporation of social determinants of health into the conversation when stakeholders designate programs and treatment plans for their patients. Addressing underlying social conditions such as homelessness, food security, stress management, etc. could be more cost-effective in terms of disease prevention when compared to treating end-stage chronic diseases as a result while possibly leading to better health outcomes.

4.0 CENTERS FOR MEDICARE & MEDICAID SERVCES AND SOCIAL DETERMINANTS OF HEALTH

Being the largest payer, the federal government's Centers for Medicare and Medicaid Services has started to invest resources into addressing the social determinants of health. Their newest effort, The Accountable Health Communities Model initiative is sponsored by the Center for Medicare and Medicaid Research to explore the lack of services between healthcare and social care. Currently, 31 organizations have been designated to participate in the 2017-2022 cycle.[5] The Center of Medicare and Medicaid Services is allocating resources in order to support initiatives that attempt to communicate between healthcare systems with their local community-based organizations. The goals of this initiative are to improve the overall quality regarding patient treatment, avoid unnecessary medical care usage, create a support system between public health and healthcare systems, and decreasing hospital costs.[5] The vision of the Accountable Health Communities Model is to systematically locate and act on health issues related to their beneficiaries. To address this issue, the Centers for Medicare and Medicaid Services created the Health-Related Social Needs Screening Tool as a way to standardize information across sectors, backgrounds, ages, etc.[5] Additionally, the Centers for Medicare and Medicaid Services has developed three tracks, awareness, assistance and alignment to be tested.[5] To summarize, the awareness track focuses on disseminating available information to the community in order to increase awareness of available resources. The assistance track aims at navigation programs to help guide beneficiaries to community organizations that best addresses that issue. In contrast, the alignment track focuses on the community organizations to strengthen them in order to ensure that sufficient services are available in the community.

4.1 HEALTH RELATED SOCIAL NEEDS SCREENING TOOL

The Health-Related Social Needs (HRSN) Screening Tool was developed to focus on 10 screening objectives over a span of 5 domains that directly tie in order to analyze the patient's social needs.[6] The HRSN Screening Tool was designed in order to address the broadest set of social needs across multiple backgrounds in order to allow healthcare and community organizations to adequately address the issue at hand in a collaborative way. The 5 main domains of focus include: housing instability, food insecurity, transportation needs, utility needs, and interpersonal safety.[6] The 5 domains were developed into a 10-item questionnaire that is universal, quick, and succinct that allows providers or caregivers to identify potential needs for the individual during their appointments.[6]

4.2 CMS SDOH MODEL TRACKS

As stated above, CMS's Accountable Health Communities Model focuses on using a three-track system when working with health and community partners. Each subsequent track will build upon the prior in terms of additional responsibilities. The initial track, Awareness will focus primarily on screening and referrals with their target population and community. Organizations that were accepted into this track will primarily focus their resources on understanding available community services, screening of Medicare and Medicaid patients, and referrals when necessary.[7] Information that is gathered regarding the ability of the community programs to address specific social issues within the target population will be available for the community. Initial funding will be provided to assist in screening medical beneficiaries at

designated hospitals that are a part of the program. A total of 12 locations have been accepted to partake in this track of the Accountable Health Communities Model.[7]

Secondly, the Assistance track includes the goals and objectives of the previous track but will include patient navigation between the healthcare and public sector. The primary focus of this cohort of participants will be to collect and analyze data regarding the efficacy of a planned community navigation channel.[7] The role of this component is to effectively assist in guiding beneficiaries through the referral process and proposing plans in order to overcome certain barriers to access. This will address underlying social determinants of health issues that healthcare is inadequately addressing and offers guidance to community partners.[7] Presumably, this method of addressing health factors would be able to decrease overall healthcare costs while improving the health outcomes later on in the patient's life. Likewise, 12 organizations have been selected to pilot this methodology.[7]

The last track, Alignment encompasses all of the goals initially set forth in the previous two models but will include partner alignment through a "backbone organization".[7] The role of this position is to work collectively between community-based organizations and hospital centers in order to collectively improve quality across the board. The "backbone organization" will also facilitate the transfer of data across the sectors to identify and address any needs that Medicare and Medicaid beneficiaries should need in a specific geographic location. This information will be able to better inform the community and CMS regarding factors associated to population health and the ways that can alleviate them.[7] The analysis will improve the understanding regarding the gap of services that a community has and creates a network of organizations that will be able to directly communicate with one another.

4.3 ACA AND FEDERAL INTEREST IN POPULATION HEALTH

A large healthcare reform called the Patient Protection and Affordable Care Act (ACA) was implemented under the Obama Administration in 2010. The ACA is evidence of the federal government's interest in community health as it allocated additional resources to help fund and create more federally qualified health centers. Additionally, the ACA imposed an additional criterion for non-profit hospitals by mandating a community health needs assessment of their target population. These actions show progress towards improving community health from the federal government as there is a larger emphasis on primary care over specialty care. The added requirement of the community health needs assessment also allows hospitals to have a better understanding of the underlying health issues as well as services that the community requires.

Federally qualified health centers (FQHC) are important stakeholders when addressing the health of underserved communities. To be certified as an FQHC healthcare systems must receive grant funding under Section 330 which is a policy found in the Public Health Service Act or receive approval from the Secretary of Health and Human Services.[8,9] Facilities must provide comprehensive services, meet requirements set forth by the Secretary of Health and Human services, and is not affiliated with rural health clinics.[8] Additionally, FQHCs are required to serve an underserved population and have a board governed primarily from patients.[8,9] Due to the ACA, more resources and funding were given to FQHCs and increased the number of participants. This provision is a result of federal interest in addressing community health is primary care will be expanded to a larger population. This will help eliminate expensive, chronic downstream outcomes if conditions are treated sooner.[9]

The federal government has also added additional requirements for hospitals seeking not-for-profit status after the passage of the ACA. The newly amended policy, section 501(r)(3)(A)

states that hospital systems must conduct a community health needs assessment (CHNA) every 3 years of their target population to better address the needs of their community.[10] Hospitals will also have to develop a strategic plan to address potential social barriers as well in order to improve overall health outcomes for their community. Additionally, 501(r)(3)(B) discusses the mandatory services and actions that a CHNA must have. These requirements include gathering community stakeholder input, define and analyze the goals of the community health needs assessment, document the results of the CHNA, and report the findings to the public.[10] Initially, the hospital system must assess their target community in order to focus their efforts.[10] Examples include looking at social determinants of health that affect access or health outcomes in the community, looking at health disparities, analyzing prevention methodologies, and others. The next step of a CHNA will require the hospital system to seek input from content experts and community stakeholders, governmental agencies, and academia to further support the strategic planning process.[10] The official version of the CHNA will need to be documented and reviewed prior to its implementation and partnerships with key stakeholders. This planning process improves communication between both the private and public sector and allows greater partnerships in addressing social determinants of health factors. This initiative has influenced more hospital systems to address and understand the health needs of their community.[10]

5.0 EXAMPLES

5.1 UNIVERSITY OF ILLINOIS HOSPITAL

Housing instability has been a predominate social determinant of health as families and individuals are unable to afford their rent. This makes it difficult for families to justify seeking preventative health or medical care when issues are still mild and treatable. Within the subset of individuals classified as housing instable, there has been a noticeable increase in usage of medical services such as emergency department utilization.[11] This population has been documented to have a higher prevalence of chronic diseases such as diabetes and heart disease. Unfortunately, this issue will become even more taxing on the current healthcare infrastructure as this population continues to age and conditions worsen.[11]

The American Hospital Association has developed 6 steps that should be incorporated for hospitals to properly address housing needs of their patients.[12] The methodology includes:

1. Target key problems and opportunities
    a. Looking at community information through hospital community health needs assessments
    b. Reviewing epidemiological and health data to understand trends within the community
    c. Discuss with direct stakeholders such as nurses and physicians
2. Build a community network
    a. Have undivided support from employees on the front line all the way to the executive level when partnering with community organizations

    b. Involve government entities, academic institutions, housing authorities, and property owners when addressing this issue.
3. Explore different methodologies
    a. Explore best in practice strategies
    b. Adapt from current practices rather than a complete overhaul
4. Determine financial constraints
    a. Determine the program's costs and benefits
    b. Develop your organization's funding strategy
5. Elevate social determinants of health understanding
    a. Focus on gaining stakeholder buy-in within the hospital system and community
    b. Plan out a communication strategy to target your vulnerable population
6. Evaluate and modify
    a. Collect and analyze data around your initiative
    b. Modify your program based upon your findings to better target your population

An example of this strategy can be seen from the University of Illinois Hospital as it strives to promote community health within its jurisdiction. The University of Illinois Hospital, a 495-bed hospital is part of the overall University of Illinois's conglomerate of 7 health science schools and 22 hospital clinics.[12] Their patients come from mainly the Chicago area and those residing in Cook County where costs and access have become huge determinants for their population seeking medical care.[12] Their analysis showed that a specific subset of individuals have been high-utilizers of their emergency department due to issues surrounding housing instability. The University of Illinois Hospital has concluded that a total of roughly 200 of their

homeless patients can cost their hospital system anywhere from $51,000 to $533,000 annually per patient.[12]

To address this issue, the University of Illinois Hospital partnered with the Center for Housing and Health to improve the homeless situation within the community. The project, "Better Health" was created based on prior studies done in Cook County that showed a strong correlation between supportive housing programs and decreased health care utilization.[12] Patients were screened and referred by the University of Illinois Hospital's physicians with a total sample size of 25-27 participants being provided supportive housing.[12] The screening and referral process is done through a panel of experts including: social worker, physicians, etc. when determining the best candidates. The next step includes contacting and following-up with the participants and building the trust between the medical staff and patient. After a strong relationship has been made between the patient and the University of Illinois Hospital's staff, the individual will be relocated into intermediate housing until case and social workers identify long-term housing options.

When looking at the results, there was a significant decrease in cost associated with the high-utilizer sample group. There was a 42-67% decrease in healthcare costs from the participants that were enrolled and given housing.[12] Additionally, this population has decreased their unnecessary emergency department usage and increased their routine, annual check-ups in order to address possible chronic conditions while they are still manageable.[12] This has eliminated a substantial amount of unnecessary medical inefficiencies while improving the health of a vulnerable group of individuals within the community. This initiative has then expanded on their community partners to include other non-profits and government agencies to address the overall problem of chronic homelessness.

5.2 CALVERTHEALTH MEDICAL CENTER

A second social determinant of health that the American Hospital Association has allocated resources towards is the transportation options within a community. Communities that have better transportation options such as walkable streets, bike lanes, and public transportation have shown to improve the community's health through more exercise, lower rates of obesity, less pollution/litter, lower rates of injury associated with automobile accidents, and better access to healthy food options. Some statistics regarding this issue are that nationally, 3.6 million individuals living in the United States are unable to seek medical care simply due to transportation barriers and that transportation is the third most prominent issue for healthcare access. The main transportation obstacles include:

1. Physical infrastructure of the built environment
    a. Conditions of the roads and sidewalks
    b. The state of the public transit system within that city
    c. Availability of public transportation within a reasonable distance
2. Costs associated with travel and transportation
    a. Public transportation costs
    b. Expenses related to vehicle ownership
3. Access or ownership of a vehicle
    a. Owning a transportation vehicle
    b. Knowing someone that has access to a vehicle
4. Distance between facilities and residence

    a. The length of time it would take to travel to a facility, such has a primary care hospital
    b. Inconvenient time and travel factors
5. Local and state policies set in place for transportation
    a. Access to driver's license
    b. Changes in transportation budgets

In response, hospitals also can become a key stakeholder when addressing transportation issues within their community. Multiple strategies and initiatives can be implemented as a means to increase a patient's access to necessary medical assistance to delay further disease development. Numerous strategies have been proposed by the American Hospital Association in order to mitigate upfront transportation issues to decrease expensive, chronic diseases later down the road.[13]

1. Have a better understanding of the community's transportation capabilities. A proposed toolkit from the CDC, "Transportation Impact Assessment Toolkit" has been cited from numerous stakeholders when addressing and analyzing a community's transportation capabilities.
2. Incorporate initiatives surrounding transportation with the host organization's own mission and goals. This will require financial investment from the hospital system to fund specific programs within the community that will increase the means of transportation.
3. Create a network of partners to address issues related to transportation. This includes government organizations, social programs, hospital systems, transportation authorities, etc. to plan future initiatives while informing the public and more importantly policy makers about key transportation issues.

4. Provide different transportation options to patients in order to decrease the percentage of missed appointments or prescription refills. This can be done through collaborations with volunteer and/or community-based organizations that specialize in this issue.
5. Implement screening protocols that flag and identify patients when key questions related to transportation are answered. This will improve the hospitals understanding about the impact of transportation has on their patients and the health of the community overall. This will require initial investments such as surveys, health impact assessments, community health needs assessment, and screening tools such as the "Social Needs Screening Toolkit".
6. Increase the awareness of transportation issues and support future efforts in improving the built environment within the community. This can be seen as advances the access of healthcare for remote communities such as the use of telehealth, implementing mobile clinics, incorporating prescription refills during appointments, etc.

CalvertHealth Medical Center from Maryland has a large market share (77%) of Calvert County's population of 90,000 inhabitants.[13] In additional to the main facility, Calvert Health Medical Center has 4 satellite facilities within the community. Calvert County is a rural community with a limited number of highways developed which affects the ease of transportation for its residents. Through a joint community health needs assessment, it was concluded that the community's transportation issue is one of the top 3 issues that need to be addressed.[13] 4% of the people living in Calvert County do not own their own vehicle and is predominately seen in people in lower socioeconomic statuses.[13]

To address this, CalvertHealth Medical Center implemented several programs to help improve the lack of transportation for their constituents. Collaborations with data analytic

vendors have revealed specific regions of Calvert County that have an undue burden associated with transportation. A mobile health unit was developed and implemented in areas revealed to be the most burdened by transportation difficulties.[13] This initiative will be able to increase the access to preventative and primary care physicians for residents that have been identified to have transportation issues. An upfront investment of $300,000 was required to implement the Mobile Health Center into action to help with preventative care and screenings.[13] The mobile unit is capable of basic diabetes, blood pressure, cholesterol, and cancer screenings.[13] An additional program, MAP/TAP, Medication and Transportation Assistance Program helps to address potential transportation barriers that have increased the number of "no-show" appointments.

Within 6 weeks of implementing the mobile unit, 330 patients were seen that would not have received preventative care and/or annual follow-ups.[13] Additionally, there were over 1700 referrals for patients that required transportation assistance through the MAP/TAP program.[13] After program evaluation, there was a 9% decrease in the readmission rates after the implementation of the program.[13]

5.3 PROMEDICA

A third social determinant of health that the American Hospital Association has focused on is related to food insecurity. As of 2015, over 15 million households in the United States were defined to be food insecure at any point during that year.[14] There are detrimental side effects related to food insecurity that places an additional financial burden on hospital systems. The United States Department of Agriculture has developed 4 levels of food security ranging from high food security where households have no issues with food options to very low food security

where financial capabilities affects the number of meals the family will have.[14] Being food insecure will affect both an individual's mental and physical state. Living in a chronic, stressful environment where an individual's next meal is uncertain leads to unhealthy behavioral health complication such as anxiety and depression.

Additionally, a lack of healthy food options will increase the likelihood of obesity and the plethora of other comorbid diseases associated with unhealthy eating. Both these factors place considerable strain on a hospital's finances as later, end-stage chronic diseases requires substantially more resources. Unfortunately, there is a constant cycle related to food insecurity that traps households into an endless loop of chronic disease development. Households that are food insecure will seek assistance from their friends and families to address their lack of access to food, but it is not a permanent solution. As this issue progresses chronic diseases will develop that impacts the family's ability to receive income and afford potential healthcare options to treat these conditions. This then puts a huge strain on a family's decision to spend their resources on food or medical care.

An example of a hospital that has taken great strides in addressing food insecurity within their community is ProMedica in Toledo, Ohio.[14] Through a community health needs assessment, it was declared that food insecurity was a top priority for their patients living in Ohio and Michigan. The issue is more severe in Ohio as approximately 1/6 of its residents have been recorded to be food insecure.[14] In response, ProMedica developed a network of stakeholders with local organizations and academic institutions to promote awareness on this topic matter. An interesting organization that has played a key role in the success of ProMedica's initiative is the Hollywood Casino Toledo. Unserved food from the casino are collected and handed off to a local foodbank to distribute to soup kitchens and homeless shelters within Ohio.

A screening process is needed to conclude whether an individual is food insecure. If the patient is flagged due to their response their physician will refer them to a food pharmacy where they will be able to gather healthy, nutritious foods. Patients will be able to receive supplies for 2-3 days per month over the course of 1 month.[14] During this time nutritional counseling will be offered to the patients and they will be offered guidance on addressing their food insecurity. Patients will have access to case workers to address any financial or social barriers that are preventing them from accessing food. The time frame for each patient is approximately 6 months in which they will receive the services stated above before a second screening process is conducted to determine the food insecurity status of each patient.[14] Currently, more than half of ProMedica's patients are screened in order to identify any food insecurity issues with over 57,000 of their patients fully screened.[14]

The largest impact has been seen in chronic patients as they attempt to manage the intake of nutritious, healthy foods. Overall, ProMedica concluded that there has been a 3% decrease in the unitization of their emergency departments, 53% decrease in readmission rates, and 4% increase in primary care appointments.[14] This data shows strong, preliminary results that addressing a social factor such as the availability of food can improve the medical efficiencies within the system. There is a higher usage of preventative and primary medicine which is significantly cheaper in terms of medical costs when compared to treatment options associated with chronic diseases.[14]

5.4 JOHNS HOPKINS

One of Johns Hopkins target community resides in East Baltimore with a population of approximately 200,000 inhabitants. Due to barriers to healthcare access and other social determinants of health factors, these 200,000 residents have a life expectancy that is estimated to be 20 years shorter when compared to more well-off communities.[15] To address this issue, Johns Hopkins developed "The Johns Hopkins Community Health Partnership" to improve care coordination for the 200,000 inhabitants in East Baltimore. The program emphasizes on 2 main priorities: increased use of preventative interventions for the target community and a more developed care management protocol for hospitals and/or ambulatory settings.[15] The study was conducted to review and analyze the results from their prior work in addressing community health.

Approximately 80,000 participants were screened throughout the lifespan of this study.[15] Of the 80,000, 27,000 enrollees were Medicare beneficiaries and the remaining participants were from Medicaid.[15] Both cohorts had their respective comparison group to compare and analyze differences in their efforts. Data was collected through claims outcomes that were used to analyze both acute care interventions as well as their community interventions. The results of the initial study showed that there were 26,114 health-related episodes for the Medicare cohort and as a result of their acute care intervention an estimated $29.2 million was saved when compared to the control group.[15] In comparison, a similar analysis was conducted for the Medicaid population and it revealed that there were savings reaching almost $60 million.[15] Per beneficiary savings were $1115 and $4295 respectively. Their second initiative, the community intervention had similar degrees of potential cost savings. For the Medicare population there was an estimated $24.4 million in savings in healthcare costs with $113.3 million in savings for the Medicaid

cohort.[15] The results from Johns Hopkins showed significant differences for all 3 interventions excluding the Medicaid community intervention. Despite this, these findings show significant cost-savings for the healthcare system with reductions in hospitalizations and ED visits.

5.5 BAYLOR UNIVERSITY MEDICAL CENTER

Baylor University Medical Center has had issues with over utilization of emergency departments. Data has shown that nationally, approximately 19% or 49 million Americans do not have health insurance.[16] These rates are higher for young adults (28.3-30%) due to cost and/or their own philosophical belief that they will not need medical care due to their youth.[16] Additionally, there is also a higher rate of uninsured citizens (31.5-36.4%) if they are in lower socioeconomic classes due to the inability to afford healthcare premiums and payments.[16] As a result, there is an increase use of emergency departments from uninsured individuals as a way of seeking medical care when their symptoms become urgent. To address this issue, Baylor University Medical Center has developed their Project Access Dallas (PAD) which is a community focused partnership that offers increased access and preventive interventions for the uninsured population. Improving access to preventative and primary care will help eliminate the overutilization of their emergency departments that will ultimately save healthcare expenditures. PAD includes partnerships with faith-based, governmental, and social support organizations in addition to their academic affiliations.

Several inclusion criteria were considered when recruiting participants and includes their residence, insurance coverage, and income level. A sample size of 17 patients per month was introduced into the study and participants were initially screened and interviewed by either a

community or hospital partner.[16] Based on the results of the interview process, participants will be split into self-care or self-help groups with the prior group having mandatory meetings with community health workers. All participants were given access to primary and specialty care physicians with an annual stipend for pharmaceuticals.

There were 265 total PAD participants and 309 controls for the premise of this study.[16] The results showed promising outcomes in terms of cost and health. In terms of cost, PAD participants consumed $445.6 and $313.3 of direct and indirect costs when compared to the control group's values of $1188 and $692.1 respectively.[16] Additionally, PAD enrollees had lower number of days spend in hospitals (.37 and 1.07) and total number of hospital visits (.93 and 1.44) when compared to the control group.[16] This approach was effective in addressing the community's overutilization of the emergency department which increased access for participants and saved costs for the hospital.

6.0 DISCUSSION

The current progress done in addressing social determinants of health has been effective, but preliminary in addressing the needs of the community. More resources and staff will be needed to effectively determine the relationship between social determinants of health interventions, health outcomes, and cost-savings. Some limitations were discovered when reviewing the topic of this study. One major limitation of this review was the limited source of public data available due to the recent interest in social determinants of health from hospitals and the federal government. Additionally, it is difficult to reveal potential health outcomes from the programs discussed prior due to the longevity of the programs. Acute care improvements will be

available for surveillance, but long-term chronic disease improvements will require a great deal of financial investment and personnel. The results have primarily focused on cost savings and improved access, but it is difficult to state whether or not the health of the community has improved.

7.0 CONCLUSION

The federal government and hospitals have taken a strong proactive approach in addressing the root causes of the social determinants of health. Innovative strategies and support from stakeholders from different sectors have shown to be overwhelmingly impactful in addressing the social needs of their constituents. The difficulty with this however is that there is a lack of concrete evidence as a majority of these initiatives are current and the goal, better health outcomes, will require years of constant monitoring before there is a noticeable change in the community's health. Regardless, there has been some short-term outcomes associated with the studies described above that have demonstrated meaningful results in terms of an improvement in the community's health and decreased medical expenditures. More time and resources will be required to effectively monitor and gauge the impact of SDOH initiatives from the federal government and healthcare providers on their constituents.

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