An Analysis of the Million Hearts Initiative utilizing the Centers for Disease Control and Prevention Policy Framework

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ABSTRACT: This policy analysis of the Million Hearts Initiative (MHI) intended to examine the extent to which the initiative met the policy process guidelines set forth by the Centers for Disease Control and Prevention (CDC). The three objectives were to identify which CDC policy process domains were met; to identify any gaps in implementing the CDC Policy domains; and finally, to determine if the MHI was successful in preventing 1 million heart attacks and strokes within 5 years. The CDC policy process includes five domains: problem identification, policy analysis, policy and strategy development, policy enactment, and policy implementation (1). Data was collected through the use of key words that subject matter experts utilize when describing cardiovascular disease (CVD) risks and peer-reviewed journal articles. Results showed that not all CDC domains were met and there were also gaps when implementing the MHI.

KEYWORDS: Million Hearts Initiative, Centers for Disease Control and Prevention, heart attacks, strokes, policy analysis, public policy

INTRODUCTION

The National Heart, Lung, and Blood Institute defines cardiovascular disease (CVD) as a "disease that affect[s] the heart or blood vessels", and includes heart attacks and strokes (2). Worldwide, there are approximately 17 million people who die of these diseases each year (3), and more than 2 million Americans who experience a heart attack or a stroke annually (4). Each year in the United States (U.S.), 800,000 individuals die of a heart attack or a stroke and 2,200 people die daily from a CVD (5). The Million Hearts Initiative is a crucial step in making a significant national impact in translating science into daily deliverables, preventing over 100,000 related cardiovascular events, and saving approximately 5.6 billion dollars in direct medical costs (31).

In the U.S., the first and fourth leading causes of death are heart attacks and strokes, respectively (5). In 2011, heart attacks and strokes cost the nation approximately $316.6 billion in healthcare costs and decreased productivity (5). For those who suffer a stroke, it is the leading cause of long-term disability in adults, as approximately 30% of stroke survivors become permanently disabled (6). Although CVD affects millions of people each year, they are preventable and the MHI attempts to reduce both heart attacks and strokes among Americans.

The MHI is the United States' first nation-wide initiative, taking a comprehensive approach to health and the reduction of CVDs. Before 2011, there have been many attempts to help reduce CVDs. During the 20th century, there were a number of hearthealth related declarations. The Victoria Declaration in 1992 asked "governments and the private sector to educate and coordinate public efforts" to slow the rate of heart disease and stroke (7). In 1996, the Catalonia Declaration focused on resources needed to invest in heart-health programs, and in 2001, the Osaka Declaration emphasized the importance of examining factors associated to CVD outside of the health sector (7). The public health sector of the 21st century needed to broaden their partnerships into government, private and public sector education, culture, recreation, and agricultural domain (7), which is what the MHI strived to accomplish. Although these attempts were successful in their own ways, the comprehensive approach that the Million Hearts Initiative utilized was a key factor in making the initiative successful. With how the U.S. healthcare system is structured, it was imperative to include the collaborative efforts of both the private and public sector to outreach to all communities.

The expertise of multiple stakeholders helped closed the gap that was experienced by the 20th century heart-health related policies in order to implement a successful framework. The MHI was selected for analysis because it is a national, public-private partnership with the Center for Medicare and Medicaid Services (CMS), the largest contributor to health care, providing

healthcoverage to approximately 105 million beneficiaries (8). The CMS works to support innovative treatment methods, using new health care models, structures, and interventions, incorporating evidence-based public health (8-9). As the CMS is a federal agency, it aims to use data and analysis to address the desperate need of access to coverage; a better healthcare system; and to improve overall health (8-9).

While there are CVD risk factors that cannot be altered, such as family history and age, there are some that are modifiable, which is addressed by the MHI. One of the major risk factors for both heart attacks and strokes is high blood pressure (BP); this occurs when the pressure in blood vessels increases (10-11.). The second major contributor is high cholesterol, which can build up in the arteries, narrowing the path of blood flow (10-11). The third risk factor is tobacco consumption; this is crucial as tobacco can damage the heart, blood vessels, and increase BP (10-11). Although there are additional causes of heart attacks and strokes such as lifestyle choices and medical condition; high BP, high cholesterol, and tobacco consumption are the three critical risk factors that the MHI addresses.

In 2011, the CDC and the CMS recognized the public health importance of preventing and reducing the occurrence of heart attack and strokes and the MHI was introduced (8). The MHI was implemented in the U.S. in 2012; it was a 5-year national initiative to prevent 1 million strokes and heart attacks by 2017 (8). This paper analyzed the MHI using the CDC policy analysis framework. The CDC's policy analysis framework was used over other health protection agency's because the CDC is known as a federal and public health agency of the United States and the Million Hearts Initiative takes place in all 54 States. The policy analysis framework was used to identify if CDC policy domains were met; to identify any gaps in policy domains; and to determine if the MHI was successful in reducing CVD risks specifically associated with heart attacks and strokes.

METHODS

A scoping study modification was adopted for data collection. Data was collected in five stages: identifying the research question; identifying relevant studies; selecting studies; charting the data; and summarizing the results (12). The methodology of a scoping review differs from the traditional systematic reviews. Scoping reviews provide an overview of research evidence that is available to help answer broad questions. The methodology is utilized when conducting research on complex topics in a given field. A few benefits of using the scoping methodology are: identification of knowledge gaps; clarification on key concepts; and the key characteristics related to a topic (12). For this paper, the parameters used were set by the Million Hearts Initiative itself, as the initiative only focused on heart attacks and strokes.

Relevant studies were identified by using electronic databases; references from published articles; and organizations such as American Heart Association, World Heart Federation, and Heart Failure Society of America. These associations were researched as they are well-established and respected organizations in the United States, which focus on heart-health related topics. The following electronic databases were used: PubMed, PsycINFO, SAGE Research Methods, Google Scholar, and Web of Science. These databases were chosen for the ease of accessibility to full-length articles. Abstracts were not assumed to be a full representation of the article (12). If the study's applicability was not clear, the entire article was read before deciding on whether or not the article would be included. The following key words were used in electronic database searches: "Million Hearts Initiative, MHI implementation, hearthealth policies, CVD, CVD statistics, heart attacks, and strokes". Studies published between 2005 and 2018 were used to identify the most relevant data, within the past 10 years. Any studies used previous to 2009 were chosen because the information emphasized the long-standing and continuous public health burden of heart attacks and strokes.

The initial search of citations included generalized studies: studies obtained from the use of all-inclusive key words like cardiovascular disease contributed to background information. A total of 30 out of 150 sources were selected to be included, as the selected 30 had relevant information during the time the research was conducted. Sources were chosen for background information on CVD risks; appropriate statistics to emphasize the public health significance of heart attacks and strokes; and for information regarding the implementation of the MHI and the CDC policy domains.

A charting approach was maintained using the Microsoft Excel program. The charting approach was organized according to each source, the author(s), and publication year; study type; aims of the study; and important results or statistics. These were cataloged into a workbook. The methodology of each study was not noted in-depth as this research was not an analysis of study designs (12).

The last stage consisted of summarizing and reporting the results. A scoping study does not assess the quality of evidence; rather, it portrays where significant gaps are in research, by examining available data. Due to the complexity of healthcare in the United States and the number of public health factors that affect one's health, such as living conditions; socioeconomic status; language-barriers; and citizenship status; the scoping study was a beneficial and convenient methodology to determine the gaps present in the Million Hearts Initiative.

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RESULTS

CDC Policy Process Domains

The domains of the CDC policy process often overlap, but can be applied to any public health policy implemented (see figure 1 in appendix). The first domain is to identify the problem, which includes interpreting the relevant research to a problem; pinpointing the key populations, and characteristics of that population; determining whether there is enough research, or if there are gaps in the data; and reporting the issue in a brief (1). The second domain is to analyze the policy, which consists of conducting a literature review; identifying feasible and evidence-based policy options; engaging stakeholders; identifying the economic and financial factors; and prioritizing the available policy options (1). The third domain is to strategize and to develop the policy by determining what is required for implementation. This includes drafting a policy with stakeholders; understanding the laws and the regulations, as well as knowing what resources are available (1). The fourth domain is to pass the policy, which includes tracking the policy enactment; regulations and procedures; and publishing guidelines and recommendations (1). The fifth domain is to implement the policy, that is, by translating the policy into public health practice. This includes using resources to train the appropriate personnel to implement the policy and assess and evaluate the policy implementation (1).

Did the MHI meet the CDC policy process domains? First

Domain: Problem Identification

The MHI met the criteria of the first domain, by identifying the problem. The public health issue is clearly defined, focusing on the seriousness of CVD risks for heart attacks and strokes (8). The causes of CVD, age, gender, and race and ethnicity are all addressed. According to the CDC (14), the risk of heart disease increases with age. It was the leading cause of death in both women and men in 2013 and was the leading cause of death for non-Hispanic whites, non-Hispanic blacks, and American Indians in the U.S. in 2013. Additionally, it was the second leading cause of death in 2013 for Hispanics, Asian Americans and Pacific Islanders (14). Cardiovascular diseases are also an important public health issue due to healthcare costs. In 2010, strokes cost the U.S. an estimated $53.9 billion, which included healthcare costs and decreased productivity. If there had been no changes or attempts to prevent stroke occurrence, it was estimated that the stroke prevalence would have increased by 25% and it would cost the economy nearly triple the amount for stroke-survivors (6).

Second Domain: Policy Analysis

The second domain which was to analyze the policy was met; however, the policy options that the CDC and the CMS contemplated to invest their time and resources were not available. The detailed cost of implementation was also not readily available to the public. Key words were used in search functions such as "Million Hearts Initiative Implementation Costs", "Million Hearts Initiative Finances", "Million Hearts Initiative (State name) Budget", and other-related phrases. As the MHI is a national initiative, the cost break-down per state was not found; however, some of the overall budgets were available. The budgetary pressures exacerbated any other obstacles. The Department of Health and Human Services targeted more than $200 million in "new and refocused" investments to achieve the goals of the MHI (15). The CDC contributed $40 million for chronic disease prevention programs; $2 million to the Pharmacy Outreach Project which supported BP checks; $4.2 million which amplified the Community Transformation Grant Program; and $100 million to communities to focus on smoking cessation programs (15). The CMS contributed $85 million as Medicaid Incentives, supporting prevention programs for Medicaid beneficiaries (15).

Third Domain: Strategy and Policy Development

The third domain to strategize and to develop the policy was met; however, the drafts of the MHI were not available. Because the MHI is a nationwide collaboration between medical and public health, the stakeholders played an important role. All stakeholders committed to the MHI must work under the 2010 Patient Protection and Affordable Care Act (ACA), both of which provide health communities with opportunities to emphasize the importance of clinical and population-based prevention methods (16). The key provisions are found under Title IV: Prevention of Chronic Disease and Improving Public Health. This Act promotes "prevention, wellness, public health, and provides unprecedented funding commitment to these areas" (17). The MHI relies on Title IV as the Act itself relies on small businesses, state and local governments to provide the most effective ways to improve wellness in communities (17). Under the ACA, many clinical and community prevention programs were established to prevent chronic diseases (16).

Stakeholders had different roles (see table 1 in appendix). Table 1 is not inclusive of every stakeholder, as each State had unique stakeholders catering to the State's needs. A major alliance group of MHI was patient-interaction and patient-education, using federal pharmacists (18) and nurse practitioners (19). Stakeholders targeted the MHI's risk factors, now known as the ABCS: "Aspirin for those at risk of heart attack and stroke; Blood pressure control; Cholesterol management; and Smoking cessation" (10). A few stakeholders who targeted the ABCS by implementing programs and projects were the American College of Cardiology

(20), the American Academy of Family Physicians (21), the American Medical Association (22) and the YMCA of America (22). Important insurance companies invested were UnitedHealthcare, American's Health Insurance Plans, Kaiser Permanente, and Medicaid and Medicare (22). The support of medical insurance companies was and is crucial to the MHI as health insurances involved would provide some benefits to those covered. The United States' expansive health insurance system could bridge together to facilitate access to care; improve health outcomes; and improve productivity. A unique but crucial stakeholder was Deloitte, a cross-sector firm, which covers both the private and the public sectors. The company guided agencies to rethink and to restructure their operations to succeed on a large-scale transformation (23). Each State may have had different stakeholders as they had the freedom to adapt the initiative to the State's needs.

Fourth Domain: Policy Enactment

The fourth domain was to implement the approved policy. Under the ACA, the Medicare Shared Savings Program was established. The program encouraged providers and suppliers to collaborate and to work only with accountable care organizations, which was defined in 2011, as an organization that received its share of savings based on the quality measures of the ABCS (16). Along with this program, the Physician Quality Reporting System (PQRS) is a reporting program that is specifically used by Medicare providers. PQRS offers incentive payments to providers who report quality data on Medicare patients (16). In 2012, the PQRS reporting measures were altered to accommodate the MHI goals and in 2015, a law was introduced to penalize providers when accurate data was failed to be reported (16). The involvement of Medicare helped track and monitor the policy enactment, which enforced the fourth domain.

Fifth Domain: Policy Implementation

The fifth domain may have been met, but it was difficult to determine the policy's success, as data for the initiative will not be available until 2019. However, in order to translate the policy into practice, the MHI implemented what is referred to as the 4 ABCS, which target reducing the primary risk factors associated with CVD (5, 8).

The ABCS infrastructure were set by the CMS and the CDC, but each State was allowed to improvise according to the State's needs. For example, the Department of Health and Human Services of San Diego (SD), California, developed a county-wide prevention initiative, called "Live Well" (8). This initiative focused on poor dieting, tobacco use, and physical inactivity at the community, professional, private, local, and state level to prevent CVD (8). The top 10 health-care systems in SD met monthly to collaborate; SD County generated one of the most effective population health programs that were used as models in other U.S. communities (8).

Nationally, the CDC and the CMS used benchmarks for success (see table 2 in appendix). The baseline represents the percentage of Americans who fit the ABCS categorization, before the initiative's implementation. The 2017 column represents the initiative's goals. The first three indicators, at baseline, represented the percentage of Americans who were being treated for their cardiovascular risk factor(s). All indicators had the goal of reaching 65% of Americans being treated accurately. Smoking prevalence had a baseline of 19% of smokers with a CVD. The MHI goal by 2017 was to reduce the 19% to 17% of Americans who smoked. For the last two indicators, at baseline, there was an average consumption of sodium and artificial trans-fat measured. By 2017, the goal of MHI was to reduce the intake of the two (24-25). Although the success of the MHI is implied as the MHI was extended for another 5 years, this was based on the initial results, analysis, and feedback of MHI 2017 (26). Current research has shown that during the first two years of the MHI, approximately 115,000 CVD events were prevented compared to the estimated occurrence of CVD events had no changes been made (4).

DISCUSSION

Of the five CDC domains – problem identification, policy analysis, strategy and policy development, policy enactment, and policy implementation – there were three areas that could be improved, and one domain that showed a critical gap in implementation. The first objective was to identify which CDC policy process domains were met. From the research gathered from the scoping methodology in 2018, the first objective was accomplished because the research available at the time helped to determine that two domains were met, two domains could be strengthened, and one domain could have negatively affected a successful implementation.

The policy analysis domain had no information publicly available on the options that the CDC and the CMS were assessing and prioritizing. It is difficult to conclude that the MHI was the most feasible and economic-friendly initiative, without this data. Additionally, although the MHI was expensive to implement, the breakdown of the implementation cost at a local level was unavailable. This information is difficult to find because the MHI was implemented in all 50 States and the United States have different governing bodies that have power to distribute funds as necessary. This may change State to State, city by city. The structure of power among the governing bodies in the United States may be an inevitable and weakening aspect of the initiative.

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It would be extremely challenging to determine the costs associated and funding received at the local levels of every State, every city, and every organization that participates in the MHI. The Million Hearts Initiative did not meet the strategy and policy development domain; the policy drafts and stakeholder feedback are both unavailable. It would be beneficial to conduct a future analysis of the MHI implementation to be aware of any stakeholders against participating in the initiative and their concerns. This information could be valuable to meet the needs of stakeholders, while simultaneously strengthening policies for the success of the initiative.

The fifth CDC domain, policy implementation, was deemed successful, even though the MHI's goal of preventing 1 million heart attacks and strokes was not met. The original research in 2018 focused on the initial five years of the Million Hearts Initiative, 2012-2016. At this point, data was only available for the first two years of the initiative. A final report was released in June 2020 for the estimates of the number of heart attacks, strokes, and related cardiovascular events that were prevented during these five years. The Nationwide Emergency Department Sample (NEDS) is a set of hospital-owned data bases that collects information from emergency departments around the United States (31). Comparing cardiovascular disease event rates from 2006 to 2016, data collected from NEDS was used to trend Million Hearts event rates 5 years before the initiative and during the initiative period (see Figure 2 in appendix). Data concluded that although the initial five years of the MHI did not meet its projected goal of preventing 1 million heart attacks and strokes (31), the data favors the positive and significant impact the initiative has made during the five years. There was a reduction in almost 500,000 hospitalizations that occurred predominantly in the older age population for cardiovascular events, prevented approximately 135,000 heart attacks, strokes, and acute cardiovascular events, and an estimated $5.6 billion was averted medical costs (31).

The initial years of the Million Hearts Initiative showed areas that needed to be better understood, which required more data to be collected and analyzed. Stakeholders such as CMS believe that it will take additional years to truly understand the compounded benefits that the targeted interventions of using the ABCs in the MHI. In the meantime, the MHI has been extended as a national initiative, again co-led by the CSM and CDC, to prevent 1 million heart attacks and strokes by 2022 (31).

CONCLUSION

The initial years of the Million Hearts Initiative did not focus on the implementation of physical activity and cardiac rehabilitation (CR). In the U.S., less than 60% of CVD patients are referred to CR and of those, only 20% of the patients receive CR (28). Given the low use of CR and the scientific evidence supporting the potential benefits (29), the MHI 2017 introduced the Million Hearts Cardiac Rehabilitation Collaborative (MHCRC) in 2015, but it was not utilized to the program's fullest extent (28). The MHCRC is a secondary prevention program to improve cardiovascular health after a heart attack and/or stroke (27). The lack of CR use was a gap in the MHI 2017, and therefore, the MHI 2022 chose to prioritize the MHCRC to reach their goal of increasing CR participation from 20% to 70% by 2022; it is estimated that an improvement of CR participation to 70% would reduce deaths by 25,000 patients and 180,000 fewer hospitalizations each year (27). Although the MHI 2022 is not a separate policy, but rather a continuation of the first 5 years, it is an amendment that evidence shows would be beneficial.

There will always be gaps in knowledge and limitations in research; however, further policy research in the following areas would be beneficial to reduce heart attacks and strokes. First, a cost benefit analysis on a state and national level in whether the benefits outweigh the costs to target CVD risks associated with heart attacks and strokes. Long-term studies should be conducted to ensure funds are being allocated appropriately to receive the maximum public health benefits. Secondly, future research should analyze the results of the MHI of 2011-2016 to the MHI of 2017-2022. This would capture any areas that need to be further developed in order to maintain the initiative's effectiveness. Using the data collected in the initial Million Hearts Initiative, the MHI 2022 focuses on cholesterol management; self-measured blood pressure monitoring; and Coronavirus-19 (COVID-19). In addition to these three priority topics, clinical tools are available for hypertension control, tobacco cessation, and cardiac rehabilitation, as this was an area that needed to be further addressed (31). With the detrimental and life-altering consequences of COVID-19, cardiovascular health is a top public health priority. The Million Hearts Initiative 2022 targets to combat critical heart-related health issues, which does not discriminate and can affect anyone's life.

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Appendices – Abbreviation List

ABCS = Aspirin, Blood pressure control, Cholesterol management, Smoking cessation

ACA = Affordable Care Act

BP = Blood pressure

CDC = Centers of Disease Control and Prevention

CMS = Center for Medicare and Medicaid Services

CR = Cardiac rehabilitation

CVS = Cardiovascular Disease

MHCRC = Million Hearts Cardiac Rehabilitation Collaborative

MHI = Million Hearts Initiative

NEDS = National Emergency Department Sample

PQRS = Physician Quality Reporting System

SD = San Diego

U.S. = United States

Appendices - Figures

Figure 1. The CDC policy process consisting of the 5 domains for policy evaluation (1)

Figure 1. Million Hearts® cardiovascular disease† event rates, by age group‡ and sex—United States, 2006–2016¶
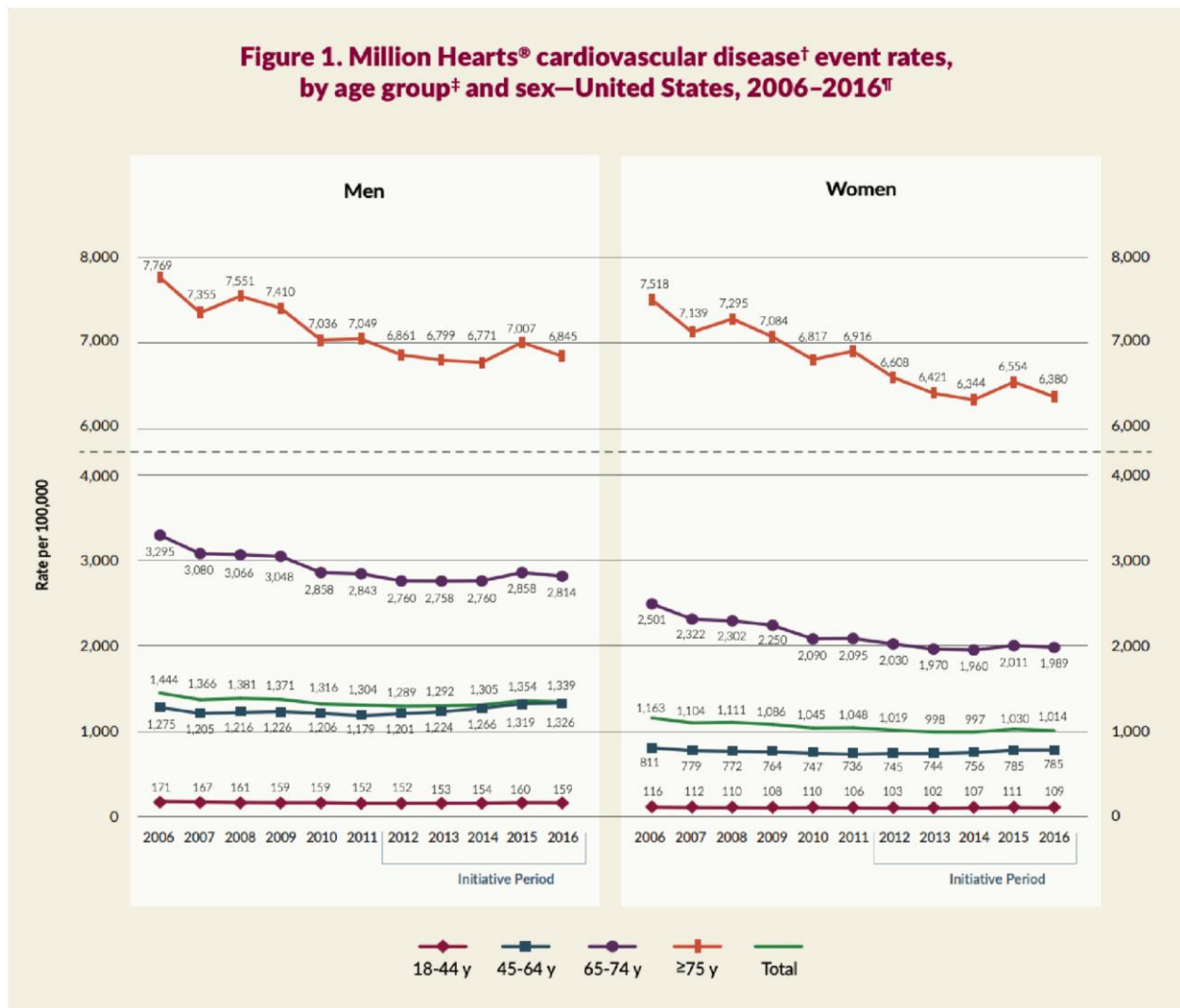
Figure 2. Million Hearts Initiative 2006-2016 Final Estimates of Cardiovascular Disease Events (31) Appendices – Tables

Table 1. Million Hearts Initiative stakeholder categories

Stakeholder Categorization	Stakeholders
Patient-Interaction and Patient-Education	• Federal pharmacists (18) Nurse practitioners (19) • Samford McWhorter School of Pharmacy (22)
Advocacy Groups and General Education	• Men's Health Network (29) • Administration on Aging (22) • Indian Health Services (22)
Programs for ABCS	• American College of Cardiology (20) • American Academy of Family Physicians (21) • American Medical Association (22) • YMCA of America (22) • American Cancer Society (16) • American Diabetes Association (16)
Insurance Companies	• UnitedHealthcare (22) • American's Health Insurance Plans (22) • Kaiser Permanente (22) • Medicaid and Medicare (22)
Evaluations	• Medstar Health System (22) • National Committee for Quality Assurance (22) • Physician Quality Reporting System (16)

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Table 2. Million Hearts Initiative benchmarks for success

Indicator	Baseline	2017
Aspirin use for people at high risk	47%	65%
Blood pressure control	46%	65%
Effective treatment of high cholesterol (LDL-C)	33%	65%
Smoking prevalence	19%	17%
Sodium intake (average)	3.5g/day	20% reduction
Artificial trans-fat consumption (average)	1% of calories/day	50% reduction