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UNIVERSITY OF SAN DIEGO

Hahn School of Nursing and Health Science

DOCTOR OF NURSING PRACTICE

HEALTH DISPARITIES ASSOCIATED WITH PRE-EXISTING CARDIOVASCULAR DISEASE AND TELEMEDICINE INTERVENTIONS DURING COVID-19 PANDEMIC: BEST PRACTICE REVIEW WITH RECOMMENDATIONS

by

Barbara Mae R. Madriaga

A Doctor of Nursing Practice Portfolio presented to the

FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE

UNIVERSITY OF SAN DIEGO

In partial fulfillment of the

requirements for the degree

DOCTOR OF NURSING PRACTICE

April 2021

Joseph Burkard, DNSc, CRNA, AACN Health Policy Fellow, Faculty Advisor

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Acknowledgments

As I sit here, midst COVID-19 pandemic, I have before me several pages of my manuscript bearing research from scientists and researchers from across the globe. I am humbled by the commitment of authors who have contributed to raising awareness and exploring alternative solutions to health equity. Thank you for your dedication. To my family and friends, words alone cannot fully express my gratitude for your kindness, generosity, and patience. A special thank you to my faculty chair, Dr. Joseph Burkard, my professors Dr. Martha Fuller, Dr. Pedro Colio, and Dr. Tanna Thomason, clinical faculty at the University of San Diego, and preceptors throughout the county of San Diego, who have shared their leadership, knowledge, and clinical expertise. My compassion as a healthcare provider has expanded beyond me, and I am deeply appreciative of each of you. Lastly, I would like to acknowledge the DNP class of 2021 for their aspiring resilience, commitment to thrive for excellence and the unfolding friendships throughout this journey.

Opening Statement

Purpose in Pursuing the DNP

The start of my journey began when I volunteered for the Cardiovascular Intensive Care Unit at Lucile Packard Children's Hospital at Stanford. I vividly recall the daily optimism and confidence of a Nurse Practitioner. She demonstrated leadership, dedicated time in education, quality improvement, policies, and the ability to collaboratively work effectively with the interdisciplinary team while pursuing her doctorate. I wanted to fulfill that dream of becoming a Nurse Practitioner and to take on a similar role someday. My compassion for the nursing profession grew through reflection, experiences, mentors, and most especially the kinder spirits of patients whom I had the honor to care for. My goal is to achieve the highest excellence and to continue to evolve with an open mind as a student and teacher. I admire and have deep respect for Nurse Practitioners as they have shown me to lead in knowledge, research, and service to improve healthcare. I welcome this next journey as a DNP.

Documentation of Mastery of DNP Program Outcomes

Final Manuscript

Health Disparities Associated with Pre-existing Cardiovascular Disease and Telemedicine Interventions during COVID-19 Pandemic: Best Practice Review with Recommendations

Barbara Mae Madriaga, RN, BSN, DNP Student

Joseph Burkard, DNSc, CRNA, AACN Health Policy Fellow, Faculty Advisor

University of San Diego

Abstract

Purpose: The purpose of this evidence-based practice Doctor of Nursing Practice (DNP) project was to review research-based evidence brought forth by other researchers and scientists. The first goal was to determine current health care disparities associated with COVID-19 and pre-existing cardiovascular disease. The second goal was to determine current recommendations of COVID-19 and pre-existing cardiovascular disease. The third goal was to determine the use of telemedicine during this pandemic for cardiovascular interventions.

Background: In the United States, heart disease has been the leading cause of death for most racial and ethnic groups. The COVID-19 pandemic has revealed deeply rooted inequities in health care with people of color. The disproportionate COVID-19 impact and pre-existing heart disease amongst racial and ethnic groups create a widening burden, treatment gap, and stricken health outcomes. In light of the current pandemic, patients with chronic cardiovascular disease need to be heartened by telemedicine to strengthen health care delivery and reduce health disparities. There are researchers and scientists within our nation's institutions who have collectively developed guidelines and frameworks to further set recommendations for health equity and telemedicine with a goal for a healthier future.

Methods*:* The Conceptual Framework for action on the social determinants of health was used. Research articles were compiled and categorized between December 1, 2019 to December 1, 2020.

Results: COVID-19 severity is highest amongst those with pre-existing cardiovascular disease. There is a correlation to positive COVID-19 cases and deaths and cardiovascular disease by race and ethnicity. Additionally, significance was found with the use of telemedicine during

this pandemic by cross-sectional analysis. The adherence of those using telemedicine during the pandemic has increased by 35% during the second quarter of 2020.

Evaluation: Health care disparities exhibited a widespread challenge with COVID-19, cardiovascular disease, and telemedicine. This outcome was led by extensive research. Additional research is needed to expand the awareness of the guidelines and frameworks of social determinants and health equity, COVID-19, cardiovascular disease, and telemedicine.

Keywords: Racial Health Disparities, Telemedicine Cardiovascular, COVID-19 Cardiovascular.

Health Disparities Associated with Pre-existing Cardiovascular Disease and Telemedicine Interventions during COVID-19 Pandemic: Best Practice Review with Recommendations

Background

Cardiovascular disease is the leading global cause of death claiming the lives of 17.9 million annually (WHO, 2017). Cardiovascular disease is characterized as a group of disorders of the heart and blood vessels, which include, coronary heart disease, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis, and pulmonary embolism (WHO, 2017). The risk factors associated with cardiovascular disease include behavioral such as unhealthy diet, physical inactivity, tobacco, alcohol use, and underlying determinants such as social, economic, and cultural, globalization, urbanization, population aging, poverty, stress, and hereditary factors (WHO, 2017). The population mostly affected are low to middle-income areas (WHO, 2017). The economic burden cost of cardiovascular disease and prevalence risk continues to rise (American Heart Association, 2011). To further address this issue, the pre-existing cardiovascular disease and risk factors are likely to experience adverse outcomes with COVID-19 (Ganatra et al., 2020).

The novelty COVID-19 virus acts by entering the cell by binding the viral spike protein to membrane ACE-2 mainly located in the lungs and cardiovascular system followed by uncontrolled inflammatory body response thus leading to organ damage (Boukhris et al., 2020). The cardiovascular manifestation of the novel COVID-19 infection includes myocardial injury, myocarditis, acute coronary syndromes, heart failure, cardiogenic shock, stroke, venous thromboembolism, pulmonary embolism, and arrhythmias (Boukhris et al., 2020). Patients with pre-existing cardiovascular disease conditions have a greater risk of COVID-19 severity.

As of February 1, 2021, the COVID-19 mortality rates include 2,249,231 globally, 446,731 in the United States, and 41,330 in California. The daily average of cases and mortality continue to rise (John Hopkins, 2020). The vulnerability of having a pre-existing cardiovascular disease is profound when infected with COVID-19. The data analysis of both John Hopkins and COVID-19 California reveal cases by a high proportion of race and ethnicity, age, and common underlying conditions. Additionally, global initiatives and data thus far have provided insight into underlying health disparities. To better serve the at-risk population, there have been alternatives in cardiovascular disease management. Telemedicine during this pandemic has shown to deliver quality care and reduce costs for patients (Boukhris et al., 2020).

Evidenced-Based Literature Review

Literature Search Methods

A thorough review of the literature was conducted using the research database of the University of San Diego's Copley Library. The electronic databases included PudMed, Medline, CINAHL, Science Direct, and Google Scholar. Peer-reviewed published articles between the years 2019 to 2021 have complied. The key terms included keywords associated with COVID combined with health disparities, cardiovascular disease, and telemedicine. Research studies were then reviewed. Following the electronic database search, further scientific material and publications were sought from organizations such as the American Heart Association, World Health Organization, and The National Academy of Medicine.

Perspectives on Health Equity and Social Determinants of Health

A special publication, "Perspectives on Health Equity and Social Determinants of Health," by the National Academy of Medicine addressed the following objectives: "(1) address the laws, policies, and leadership needed to ensure social justice and health equity for children,

youth and families; (2) highlight institutions such as parenting, the juvenile justice system, the foster care system, and the school system, and the ways these intuitions protect the development of children and youth in the context of social justice and health equity; (3) focus on health disparities resulting from discriminatory practices and policies, and missed opportunities with human capital; and (4) discuss topics and priority areas for the National Academies (National Academy of Medicine, 2015, p. XI)." Supported by the Robert Wood Johnson Foundation, a collaborative priority area is the Culture of Health Program, which allows focusing on cultural factors associated with health inequities. Within this program, there is stakeholder involvement such as those in philanthropy, membership associations, advocacy groups, community organizations, federal and state government, and business leaders. The call to collective action is to build a culture of health movement by empowering the community. The recommendations set forth by these authors are to further promote the evolution of health equity for all with research and policy.

Health Equity Research and Policy

Health equality research and policy focuses on health inequities, social determinants, intersectionality, identifying and implementing opportunities in health equity through lifespan lens of legal and research policy research, character assassination of black males and the consequences for research and public health, promoting positive development, health, and social justice through dismantling genetic determinism, philosophical perspective on social justice discussing the framework for children, youth, and families health policy and research agenda (National Academy of Medicine, 2015, p. xvii).

Nancy Lopez and Vivan L. Gadsden highlight health disparities are complex. When there are health inequalities, there is interference in the quality and identity of civilization (National

Academy of Medicine, 2015, p. 221). Intersectionality raises query and advances social justice by viewing "race and structural racism, class and capitalism, ethnicity and ethnocentrism, color and colorism, sex and gender patriarchy, and sexual orientation and heterosexism, nationality and citizenship and nativism, and disability and ableism" (National Academy of Medicine, 2015, p. 26). Additionally, it emphasizes policies and practices related to power, dominance, and oppression (National Academy of Medicine, 2015, p. 221).

Patrick H. Tolan, Velma Mcbride Murry, Angela Diaz, and Robert Seidel pinpoint there needs to be more recognition on health equity as it is the most fundamental form of justice. The systematic notion of health disparities exists in the context of socialism and politics (National Academy of Medicine, 2015, p. 223). The framework of health equity has the potential to reduce health disparities with promotion (National Academy of Medicine, 2015, p. 223).

Alford A. Young identifies the consequences of a higher socioeconomic class than those who are men and boys of color. The lingering belief of society is that the condition of the poor is largely due to their lack of morals, culture, and biology (National Academy of Medicine, 2015, p. 224). The American public often views African American males as a danger to society (National Academy of Medicine, 2015, p. 224). The consequences of implicitly by the public and media create various forms of trauma (National Academy of Medicine, 2015, p. 224).

Richard M. Lerner focuses on social justice as a means for all groups to be given fair access and the ability to make changes in governing policies. The modern notion of genetics includes that gene plays a role for racial differences in hierarchy of class. However, the relational developmental system (RDS) metamodel is a new way to look into the diversified evolution and epigenetics of human development (National Academy of Medicine, 2015, p. 225).

Robert Seidel, Patrick H. Tolan, Angela Diaz, and Velma Mcbride Murry discuss the differences in views regarding social justice and health equity between stakeholders and those who are not in academia. The greater the depth of understanding of social justice and health equity, the greater yield to health policy effectiveness (National Academy of Medicine, 2015, p. 226). Individual-centric and community-centric are two philosophical perspectives mentioned. The perspective on individual-centric surround liberalism and freedom wherein the greater opportunity of individual choice leads to opportune justice (National Academy of Medicine, 2015, p. 227). Community-centric is the tie within cultural history and the contribution to society's efficiency on Confucianism, Buddhism, utilitarianism, socialism, and communism (National Academy of Medicine, 2015, p. 227). The purpose is to explore values that will lead towards greater liberty, regulating government, interdependency within the community, and allocating resources (National Academy of Medicine, 2015, p. 227).

A Systems Approach to Health Equity

The systems involved in health equity consists of expulsion and suspension in early education as matters of social justice and health equity, lessons for health equity in military medicine as a window to universal health insurance, and the principles of adolescent and young adult-friendly care contributions to reducing health disparities and increasing health equity.

Shantel E. Meek and Walter S. Gilliam emphasize the issues of expulsion and suspension in early education additionally play a role in social justice and health equity. The underlying question is the long-term consequences and behavior of children being disciplined at an early age. The access to quality education during earlier stages has been proven to greater benefits for children from low-income families, yet children of color who are categorized as low income are less likely to have the opportunity of quality early educational programs (National Academy of

Medicine, 2015, p. 98). When children are disciplined by school expulsion, the finding is losing access to the resources (National Academy of Medicine, 2015, p. 98). The lack of resources then leads to the inability of children to thrive in academia (National Academy of Medicine, 2015, p. 98).

Jeff Hutchinson, Raquel Mack, Tracy Perez Koehlmoos, and Patrick H. Deleon call to attention the universal health care insurance in military personnel includes the Military Health Systems (MHS) controlled by the Department of Defense (DOD) and the Department of Veterans Affairs (VA). The barriers to health care for the veteran population include access to rural populations and the individual perception to care. There continues to be a shortage of providers, which also creates a delay in diagnostics, specialty care, and emergency services. Researchers have indicated the high prevalence of post-traumatic stress disorder (PTSD) in this population (National Academy of Medicine, 2015, p. 118). Mental health in the veteran population is a known disparity due to its cultural stigma. The underutilization of the resources is largely due to the fear of appearing delicate (National Academy of Medicine, 2015, p. 118). With universal healthcare in place, there remain biases. A contributing bias examined is taking advantage of the system whereas this has resulted in the loss of provider compassion (National Academy of Medicine, 2015, p. 120). Another bias is clustering diagnoses to a specific group, which may lead to racial assumptions and military designation, and attributing individuals based on personality and/or behavior (National Academy of Medicine, 2015, p. 120).

Angela Diaz and Ken Peake indicate the molding of lifestyle, behavior, and health patterns start during adolescence and early adulthood. Some principles that contribute to reducing disparities and increasing health equity during this significant period (National Academy of Medicine, 2015, p. 125). Part of the contribution can be lead with example by health

care providers in assisting with encouraging individuals to adopt healthy behaviors. It is shown the lack of healthy behaviors can result in health issues in the future thus contributing to chronic diseases (National Academy of Medicine, 2015, p. 125). In hindsight, we must look at geography, race/ethnicity, and sexual orientation. The social aspect of worsening health care outcomes such as obesity, high risk for infection, pregnancy, abuse, anxiety, and depression includes areas of poverty (National Academy of Medicine, 2015, p. 126). Those living in rural areas struggle with a lack of educational resources, primary health care, and mental health care compared to urban and suburban areas (National Academy of Medicine, 2015, p. 126). In race and ethnicity, those of color face greater health disparities. Those who are African American, American Indian or Alaskan Native, or Latino experience a higher risk for health care outcomes. The African and Latino populations are exposed to violence, peer victimization, substance abuse, terrorism worries, lower rates of safety, and lower health status and psychological and physical quality of life (National Academy of Medicine, 2015, p. 127). Another population affected by health disparities in the lesbian, gay, bisexual, and transgender (LGBT) community. The worsening health outcome of this population contributes to experiencing forms of victimization such as discrimination and harassment. As a result of the population affected, another concern is underinsurance, which then may lead to missed opportunities and unmet needs (National Academy of Medicine, 2015, p. 127).

Advancing Health Equity in Communities of Color

Advancing health equity in communities of color highlight the stories about black men in the media and their consequences for health, challenges, and promise of health equity in Native Hawaiians, fetal alcohol spectrum disorders in African American communities, and the quest for

prevention, and urgent dispatch to call leadership in response to violence in black neighborhoods as a public health crisis.

Karen E. Dill-Shackleford, Srividya Ramasubramanian, and Lawrence M. Drake focus attention on the media in conjunction with black men. Although there had been some progression in education and industrial work, the media continues to portray a negative connotation of black men (National Academy of Medicine, 2015, p. 232). The consequences of this effect lead to prejudice and lack of support (National Academy of Medicine, 2015, p. 232). There is research indicating the deficiencies of black men are due to being incompetent or lack of motivation instead of views of discrimination or lack of access to high-quality education, employment, and health care (National Academy of Medicine, 2015, p. 232). The fostering of having a voice such as the Black Lives Matter (BLM) movement plots greater exposure to the awareness of injustice (National Academy of Medicine, 2015, p. 232). The unification of the message lessens the burden of adverse health conditions in blacks and racial minorities. The prejudice and discriminations have significantly led to greater anxiety, depression, and chronic conditions. The falsification of stories being portrayed creates aggression within the demographic but also encountering aggression towards the specific demographic (National Academy of Medicine, 2015, p. 233).

Noreen Mokuau, Patrick H. Deleon, Joseph Kaewe'aimoku Kaholokula, Sade Soares, Joann U. Tsark, and Coti-lynee puamana Haia stress the impact of Native Hawaiians during colonization. This has led to cultural suppression and oppression, and generational injustice and discrimination (National Academy of Medicine, 2015, p. 234). Due to socioeconomic elements, there is poorer health within the Native Hawaiians. It is imperative to set out programs within the population to create solutions by training, establishing a health care system that is sensitive to the

culture, and seeking out policy plans that are fundamental within the culture and belief of Native Hawaiians (National Academy of Medicine, 2015, p. 235).

Carl C. Bell articulates the risk for fetal alcohol spectrum disorders (FASD) within women who are unaware of the pregnancy. There is a higher link in the African American community of access to alcohol due to the proximity of liquor stores. The health risk associated with FASD includes impaired growth, potential disorders involving speech and language, learning, ADHD, and intellectual deficiencies (National Academy of Medicine, 2015, p. 235). The exacerbation of FASD and environmental factors such as violence during childhood puts an individual at higher risk for disparities (National Academy of Medicine, 2015, p. 235).

Sharon Toomer and Raquel Mack vocalize violence in a black neighborhood is an ongoing public health crisis. Violence within the community causes psychological and generational trauma thus prolonging the grieving process. The black community experiences a greater risk for this due to the surrounding homicide within the community. It is imperative for immediate response to end violence. Violence is non-discriminatory; however, what is happening in these neighborhoods and the lack of awareness of the trauma is discriminatory (National Academy of Medicine, 2015, p. 238).

Nursing Education, Research, and Policy

The understanding of the research behind health disparities from the National Science of Academy has marked the significance for providers to be properly educated on the social determinants of health (SDH). Mahony and Jones (2013) provided acumen on SDH since the Patient Protection and Affordable Care Act (ACA) in the United States. The ACA's major focus is on preventative medicine thus having all citizens in America have a primary care provider (Mahony & Jones, 2013). The collective effort creates access to healthcare services thereby

improving health promotion and disease prevention. Providers are aware many factors contribute to the health of an individual. The Health Resources and Services Administration (HRSA) put a call to action on utilizing the (SDH) framework to diversify the nursing workforce (Mahony & Jones, 2013). A spoke person from the HRSA summit defined SDH as integration in policies (Mahony & Jones, 2013). The Center for Disease (CDC) defines SDH as beyond health behaviors and related to poverty, unequal access to healthcare, lack of education, stigma, and racism (Mahony & Jones, 2013). The WHO describes the key components to SDH are poverty, economic inequality, social status, stress, education and care in early life, social exclusion, employment, and job security, social support, and food security (Mahony & Jones, 2013). The Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives Healthy People 2020 emphasized finding the root cause of the disease, achieving equity, and aim towards national prosperity and security (Mahony & Jones, 2013). The discussion of the future of nursing consists of practicing with full extent and education, achieving higher levels of education, full practice with physicians in healthcare redesign, and effective workforce planning and policymaking. The health outcomes rely heavily on integrating skill and understanding, influencing public policy, and education. (Mahony & Jones, 2013).

Health Disparities of COVID-19 and Cardiovascular Disease

The Journal of the American Medical Association (JAMA) highlights the racial and ethnic health disparities of COVID-19. The Kaiser Family Foundation and Epic Health Research Network gathered data from the Epic Health record system and disclosed there are higher COVID-19 death rates amongst the Hispanic, Black, and Asian populations (Lopez, L., et al., 2021, pg. 8). The outcomes are associated with the lower economic status and greater exposure from the demands of working remotely (Lopez, L., et al., 2021, pg. 8). With the exposure, the

greater risk for hospitalization then becomes greater with associated chronic medical comorbidities. There is greater prevalence in minority groups and worsening outcomes of those with underlying hypertension, diabetes, and obesity (Lopez, L., et al., 2021, pg. 8). The lack of access to health care for minority groups creates a greater illness burden as the disease process of COVID-19 progresses. Then we take into account the Hispanic population who have lost health care coverage during the pandemic. Additionally, immigrants avoid the hospital due to panic of deportation (Lopez, L., et al., 2021, pg. 8). An analysis of hospitalized patients was included, and the findings show equitably in hospital access may be beneficial in showing no differences in mortality amongst race and ethnicity. The study also supported the correlation to socialism rather than genetics and ancestry (Lopez, L., et al., 2021, pg. 8). The minority groups often lack health insurance, have greater chronic conditions, live in low-income and violent areas, require funding from health institutions, and lack health literacy (Lopez, L., et al., 2021, pg. 8). The pandemic has significantly reinforced our current socioeconomic state. The disparities which have surfaced include lack of access to health care, cultural inequity, and social determinants of health (Lopez, L., et al., 2021, pg. 9).

The American Heart Association on bridging the gap of cardiovascular health disparities include frameworks to action. The special report, "Eliminating Disparities in Cardiovascular Health" by Geroge A. Mensah (2005), highlights the striking effect of race, ethnicity, gender, socioeconomic status, educational level, and geography. The framework of action consists of strategic imperatives, focal areas, and major public health settings (Mensah, G., 2005, ph. 1333). The Strategic imperatives include accelerating health impact in disparate populations, advancing policy and systems change, forming strategic multidisciplinary partnerships, expanding community-based participatory research and research translation, collecting healthcare data by

race, ethnicity, and disparities, and ensuring diversity in clinical and public health workforce (Mensah, G., 2005, ph. 1333). The focal areas include access to health care, quality of health care delivered, patient references, healthcare utilization, and adherence, culture, lifestyles, and personal behaviors, regulation, policies and system of care, geographic and environmental influences, income and educational levels, prejudice, discrimination and bias, psychosocial stressors, biology, genomics, and gene-environment interactions. The major public health settings include communities, cities, counties, regions and states, schools and colleges, worksites of small and large businesses, hospital clinics, doctors' offices, and emergency departments, faith-based settings (churches, synagogues, mosques), and centers for training health professionals. The elimination of disparities can be attainable with the involvement of public health practitioners, policy lawmakers, and the general public (Mensah, G., 2005, ph. 1333).

COVID-19 and Pre-existing Cardiovascular Disease

A suspected case of pre-existing cardiovascular disease and COVID-19 has led to greater adverse outcomes such as mortality. "Impact of COVID-19 on the Cardiovascular System: A Review" was conducted by Matsushita, K., et. al. (2020). The prevalence in previous studies includes retrospective cases of 144 patients with Severe Acute Respiratory Syndrome (SARS) and cardiac disease, diabetes, and cancer. The meta-analysis of 12 studies with 637 patients with Middle Eastern Respiratory Syndrome (MERS)includes findings of 50% of the patients having hypertension, and diabetes, and 30%haveg cardiovascular disease. The factors with cardiovascular disease could be due to age advancement, impaired immune system, increase levels of ACE2, or predisposition to COVID-19 (Matsushita, K., et. al., pg. 4). The cohort study of 191 patients who were hospitalized with COVID-19 and didn't survive had a higher incidence of hypertension, diabetes, coronary artery disease (Matsushita, K., et. al., pg. 4). The immune

system disrupts the pathways to the cardiovascular system and other systems within the human body (Matsushita, K., et. al., pg. 4). It is reported other epidemics associated with cardiovascular disease have led to further complications with pre-existing cardiovascular disease (Figure 1). Myocardial infarction, decompensated heart failure, mixed shock, arrhythmia, and venous thromboembolism are further complications as a result of COVID-19. Boukhris et al., 2020 included further manifestation of COVID-19 with cardiovascular disease (Figure 2).

The American Journal of Preventative Cardiology published an article, "Continuity of Care and Outpatient Management for Patients with and at High Risk for Cardiovascular Disease during the COVID-19 Pandemic: A Scientific Statement from the American Society for Preventative Cardiology" (Khera, A., 2020). The recommendations include angiotensin-converting enzyme inhibitors and angiotensin receptor blocks should be continued by the patient. It is imperative to continue to encourage patient visits via telehealth rather than delaying or canceling appointments. The provider should ensure education is provided regarding any cardiac manifestation of symptoms and to delay seeking a provider. There should be strategies in place regarding any barriers to medication prescriptions during the pandemic. A multidisciplinary team should be involved in guidelines to improve cardiovascular care and to encourage lifestyle adherence and prevention. Providers should continue to promote physical exercise and a healthy diet. Cardiac rehabilitation adaptation should be considered to ensure continuity of care (Khera, A., 2020, pg. 8).

Telemedicine

Part of continuity of care is gaining access either in-person or through telemedicine. "Telemedicine Across the Globe-Position Paper from the COVID-19 Pandemic Health System Resilience Program International Consortium," by Bhaskar, S., et. al. (2020), identifies the gaps

and shifts in telemedicine frameworks during the pandemic. For decades, it has been the goal to streamline the collaboration and sharing of resources during outbreaks. During the pandemic, telemedicine acts as a preventative measure to care for chronic conditions, especially in the vulnerable population. Between the implementation of telemedicine in regions and countries, the Gladhart and WHO/PAHO models were used (Bhaskar, S., et. al., 2020, pg. 3-5). The consortium put out recommendations for each region including Central Asia, China, Singapore, Bangladesh, India, Africa, Latin America, the Caribbean, Australia, New Zealand, Canada, the USA, UK, Italy, and Spain. For this research, the recommendation for the USA includes the disparities in health care insurance results in different levels of access. In turn, there is a disproportion, and the need to ensure there is coverage for immunocompromised, disadvantage, immobile, chronic conditions. Also, there is a need to ensure the privacy and security of all platforms (Bhaskar, S., et. al., 2020, pg. 5).

Telemedicine literature is important during a pandemic. The World Health Organization (WHO) states it is an essential service to the pandemic (Jumeronrnvong, et. al., 2020, pg. 1) The incorporation of telemedicine in medical school will allow the next generations of providers to prepare them for future pandemics (Jumeronrnvong, et. al., 2020, pg. 1). The telehealth platform can improve both the patient care experience and provider experience alongside reduce costs of health care. Globally, we currently face a provider shortage. Other areas where telemedicine is being used are rural, urban, and military (Jumeronrnvong, et. al., 2020, pg. 2). The COVID-19 pandemic has allowed electronic health care records to have capabilities with telemedicine thus allowing continuity of care. The evolvement and the proper training can assist with offsetting any concerns with the quality of care, privacy and security, patient and provider connection, and malpractice (Jumeronrnvong, et. al., 2020, pg. 3).

"Use and Content of Primary Care Office-Based vs. Telemedicine Care Visits during the COVID-19 Pandemic in the US," written by Alexander, G.C., et. al (2020), quantified the delivery of primary care during COVID-Crossross sectional data from the IQVIA National Disease and Therapeutic Index was completed in the US (Alexander, G.C., et. al., 2020, pg. 1). The findings include that primary care visits decreased by 21.4% during the first and second quarter of 2020 (Alexander, G.C., et. al., 2020, pg. 1). During this time, the pandemic had just begun, and a worldwide lockdown. Telemedicine then increased visits by 4.1% (4.8 million visits) in the first quarter of 2020, and 35.3% (35.0 million visits) in the second quarter of 2020 (Alexander, G.C., et. al., 2020, pg. 1).

Methodology

The purpose of this project was to investigate health disparities with pre-existing cardiovascular disease and COVID-19, assess the current practice of cardiovascular disease management and COVID-19, identify current provider knowledge-based, and develop best practice reviews and recommendations for health care providers utilizing telemedicine. The aim was to explore the origin of health disparities and the correlation to pre-existing cardiovascular disease and COVID-19 during this global pandemic.

Conceptual Framework

The Conceptual Framework for action on the social determinants of health services empirical work to help guide better understanding of determinants and policymaking related to health disparities. The causative factors of population health and health inequalities are found in the low-income and underserved areas. The challenges we face today include policies for health equity in different sectors, core tasks, and scientific traditions. Additionally, there is a gap in policies when it comes to education (World Health Organization, 2010). As shown in Figure 3.,

the CSDH conceptual framework focuses on the social, economic, and political mechanisms within the socioeconomic system. The populations within the framework include income, education, occupation, gender, race, and ethnicity. This reflects the social determinants of health and the social hierarchy. The differences in exposure and individual vulnerability can lead to differences in health conditions (World Health Organization, 2010, pg. 49). Additionally, figure 4. shows the National Institute on Minority Health and Health Disparities Research Framework.

The World Health Organization made a goal to strengthen the design and implement policies which include the health system and service, treat those with non-communicable diseases, and prevent and control further outbreaks in vulnerable areas (WHO, 2020. The Global Humanitarian Response Plan to combat COVID-19 have prioritized the containment spread of COVID-19 and to decrease mortality and morbidity, and protect those in need (WHO, 2020). The Strategic Preparedness and Response Plan was put in place to establish national support, prepare and respond to operations, expand research and innovation (WHO, 2020). The known noncommunicable disease is cardiovascular, chronic respiratory disease, diabetes, cancer, and mental health, which predispose the vulnerable population to become severely ill with COVID-19. To best coordinate, a working group was set compromise of members with further objectives to work collaboratively with other countries (WHO, 2020).

Results

The data analysis of both John Hopkins, CDC, and COVID-19 California reveal correlated data to COVID-19 and cardiovascular disease, COVID-19 hospitalizations, common conditions associated with COVID-19, and the link to mortality by race and ethnicity. As seen in Figure 1, the identified results correlated with cardiovascular disease and COVID-19 in California. Cardiovascular disease is highest in Los Angeles County followed by San Diego

County then Orange County. Between January 2021 to February 2021, COVID hospitalizations began to drop (Figure 2). With the decrease in hospitalization, there is also a decrease in health care spending. Hypertension, Diabetes, and Cardiac disease are the leading cause of underlying conditions associated with COVID deaths (Figure 3). COVID-19 cases and mortality by race and ethnicity is greater in the Latino population compared to White, Asian, African American, Multi-race, American Indian or Alaska Native, Native Hawaiian, and Pacific Islander (Figure 4). The data is evident and in correlation with health disparities of COVID-19 and pre-existing cardiovascular disease.

Cost/Benefit Analysis

The mean expenditure for heart disease is $4,938. Per Health System Tracker Kaiser Family Foundation analysis COVID-19 treatment with major complications or comorbidity $20,292 (2021). The cost-benefit analysis sums to $37.92, and the return of investment is 3,692%.

Discussion

The findings of the authors highlight some of the many challenges of health disparities, COVID-19, pre-existing cardiovascular disease, and telemedicine. The data analysis indicates the correlation of the findings. The COVID-19 pandemic is revealing the current status of health inequities. The factors which put the greatest risk to health disparities, COVID-19 and pre-existing cardiovascular disease affect those people of color. Despite the longstanding research of racial health disparities, there is ongoing racism and discrimination in the lives of the perception of people and the experiences they hold towards health care. Socioeconomically, people who are affected are likely to live in crowded conditions, work in areas with less space and more employee density, have to go to work due to the expense of paying bills, take public transit, and

lack of resources. Additionally, they are likely to have chronic pre-existing conditions due to a lack of access to health care. Telemedicine use has increased tremendously due to the limitations of office visits, and it provides continuous care especially for those with underlying conditions.

Implications

Telemedicine during this pandemic has shown to deliver quality care and reduce costs for patients with cardiovascular disease. Utilizing telemedicine to decrease the risk for cardiovascular disease to prevent COVID-19 severity creates an impact on our future. Further recommendations include bridging the gap between health care and telehealth policies to aim towards equity, access to care, the standard of care, patient choice, confidentiality, and direction (State of Reform, 2021). Additional research is needed to expand the awareness of guidelines and frameworks of social determinants healthy equity, COVID-19, cardiovascular disease, and telemedicine.

Conclusions

Researchers and scientists from across the globe have provided imperative knowledge on health disparities, COVID-19, cardiovascular disease, and telemedicine. Those with pre-existing cardiovascular disease have a higher risk for COVID-19. Gaining insight on health disparities will help us discover the trends of COVID-19 and cardiovascular disease globally. The literature supports telemedicine during this pandemic has created a huge impact in management of diseases, and to further expand policies. In addition, it has elaborated on health disparities associated with cardiovascular disease and its link to COVID-19. Addressing the gaps in health care allows more opportunity for growth. Telemedicine should continue to be in place during a pandemic as this serves an outlet for those who are at higher risk for cardiovascular disease and COVID-19.

References

American Heart Association. (2011). *Cardiovascular Disease: A Costly Burden for America Projections Through 2035*. Retrieved from https://healthmetrics.heart.org/wp-content/uploads/2017/10/Cardiovascular-Disease-A-Costly-Burden.pdf

Boukhris, M., Hillani, A., Moroni, F., Annabi, M. S., Addad, F., Ribeiro, M. H., Mansour, S., Zhao, X., Ybarra, L. F., Abbate, A., Vilca, L. M., & Azzalini, L. (2020). *Cardiovascular Implications of the COVID-19 Pandemic: A Global Perspective*. The Canadian journal of cardiology, 36(7), 1068–1080. https://doi.org/10.1016/j.cjca.2020.05.018

California All. (2020). *Tracking COVID-19 in California*. Retrieved from https://covid19.ca.gov/state-dashboard/

California Department of Public Health. (2021). COVID-19 Race and Ethnicity Data. Retrieved from https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/Race-Ethnicity.aspx?TSPD_101_R0=087ed344cfab2000bda9fef3518f32bc48da5bca79e11a5600013dd48b52086793e28476e766eb3008fedd394514300080e148ca5aef7372949eef2cd551f6f69d16902b14d4d7b488521d66f0399a3f0a75b04c8c0891075d86d86db1bfb6c6

Center for Disease Control and Prevention. (2020). Estimated County- Level Prevalence of Selected Underlying Medical Conditions Associated with Increased Risk for Severe COVID-19 illness- United States, 2018. Retrieved from https://stacks.cdc.gov/view/cdc/90519

County of San Diego Health and Human Services Agency (2021). COVID-19 Watch. Retrieved

https://www.sandiegocounty.gov/content/dam/sdc/hhsa/programs/phs/Epidemiology/COVID-19%20Watch.pdf

Ganatra, S., Dani, S. S., Shah, S., Asnani, A., Neilan, T. G., Lenihan, D., Ky, B., Barac, A., Hayek, S. S., Leja, M., Herrmann, J., Thavendiranathan, P., Fradley, M., Bang, V., Shreyder, K., Parikh, R., Patel, R., Singh, A., Brar, S., Guha, A., … Resnic, F. S. (2020). *Management of Cardiovascular Disease During Coronavirus Disease (COVID-19) Pandemic*. *Trends in cardiovascular medicine*, *30*(6), 315–325. https://doi.org/10.1016/j.tcm.2020.05.004

John Hopkins. (2020). *COVID-19 Dashboard by the Center for Systems Science and Engineering*. Retrieved from https://coronavirus.jhu.edu/map.html

Jumreornvong, O., Yang, E., Race, J., & Appel, J. (2020). Telemedicine and Medical Education in the Age of COVID-19. *Academic medicine: journal of the Association of American Medical Colleges*, *95*(12), 1838–1843. https://doi.org/10.1097/ACM.0000000000003711

Khera, A., Baum, S. J., Gluckman, T. J., Gulati, M., Martin, S. S., Michos, E. D., Navar, A. M., Taub, P. R., Toth, P. P., Virani, S. S., Wong, N. D., & Shapiro, M. D. (2020). Continuity of care and outpatient management for patients with and at high risk for cardiovascular disease during the COVID-19 pandemic: A scientific statement from the American Society for Preventive Cardiology. *American journal of preventive cardiology*, *1*, 100009. https://doi.org/10.1016/j.ajpc.2020.100009

Kaiser Family Foundation (2021). New Analysis Finds Inpatient Coronavirus Treatment Costs Could Top $20K for Patients with Employer Coverage. Retrieved from https://www.kff.org/health-costs/press-release/new-analysis-finds-inpatient-coronavirus-treatment-costs-could-top-20k-for-patients-with-employer-coverage/

Mahony, D., & Jones, E. J. (2013). Social determinants of health in nursing education, research, and health policy. *Nursing science quarterly*, *26*(3), 280–284. https://doi.org/10.1177/0894318413489186

Matsushita, K., Marchandot, B., Jesel, L., Ohlmann, P., & Morel, O. (2020). Impact of COVID-19 on the Cardiovascular System: A Review. *Journal of clinical medicine*, *9*(5), 1407. https://doi.org/10.3390/jcm9051407

Mensah, G., (2005) Eliminating Disparities in Cardiovascular Health: Six Strategic Imperatives and Framework for Action. Retrieved from https://www.ahajournals.org/doi/10.1161/01.cir.0000158134.24860.91

National Academy of Medicine (2015). *Perspectives on Health Equity*. Retrieved from https://nam.edu/perspectives-on-health-equity-and-social-determinants-of-health/

National Institute on Minority Health and Health Disparities. (2018). The 2020-2024 NIH Minority Health and Health Disparities Strategic Plan. Retrieved from https://www.nimhd.nih.gov/about/overview/strategic-plan.html

Prabhakaran, D., Perel, P., Roy, A., Singh, K., Raspail, L., Faria-Neto, J. R., Gidding, S. S., Ojji, D., Hakim, F., Newby, L. K., Stępińska, J., Lam, C., Jobe, M., Kraus, S., Chuquiure-Valenzuela, E., Piñeiro, D., Khaw, K. T., Bahiru, E., Banerjee, A., Narula, J., … Sliwa, K. (2020). Management of Cardiovascular Disease Patients With Confirmed or Suspected

COVID-19 in Limited Resource Settings. *Global heart*, *15*(1), 44. https://doi.org/10.5334/gh.823

RTI International. (2017, February 14). Cardiovascular disease costs will exceed $1 trillion by 2035: Nearly half of Americans will develop pre-existing cardiovascular disease conditions, analysis shows. *ScienceDaily*. Retrieved February 7, 2021, from www.sciencedaily.com/releases/2017/02/170214162750.htm

State of Reform. (2021). California DHCS releases telehealth policy proposals for post COVID-19. Retrieved from https://stateofreform.com/featured/2021/02/california-dhcs-releases-telehealth-policy-proposals-for-post-covid-19/

County of San Diego Health and Human Services Agency. (2021). COVID-19 Watch. Retrieved https://www.sandiegocounty.gov/content/dam/sdc/hhsa/programs/phs/Epidemiology/COVID-19%20Watch.pdf

World Health Organization. (2010). *A Conceptual Framework for Action on the Social Determinants of Health*. Retrieved from https://www.who.int/sdhconference/resources/ConceptualframeworkforactiononSDH_eng.pdf

World Health Organization. (2017). *Cardiovascular Diseases (CVDs)*. Retrieved from https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)

World Health Organization (2020). COVID-19 and NCDs: Conceptual Framework for the WHO NCD/WIN Technical Working Group. Retrieved from https://www.who.int/publications/m/item/conceptual-framework-for-the-who-working-group-on-covid-19-and-ncds

Concluding Essay:

Reflections on Growth in Advanced Practice Nursing Role

The Doctor of Nursing Family Nurse Practitioner program has allowed me to achieve the skills and knowledge to become part of the demands and complexity of the ever-changing healthcare environment. The preparation has led to interprofessional, collaboration, comprehend systems and outcomes, healthcare policy, and leadership wisdom. The experiences at the clinic setting have given me in-depth knowledge and understanding of shared decision-making to meet the needs of the patient and their families. Additionally, I have an appreciation for innovation to improve healthcare. I have become more proficient in articulative communication with patient encounters. I have learned and participated in policy processes for future generations to come as it will further promote more resources for the underserved populations. The Advanced Practice Nursing role is unique of its kind as it is a reminder to humanity.

Appendix A

IRB Approval

Date: 4-4-2021

IRB #: IRB-2021-121
Title: The Health Disparities with COVID-19 Risk Associated with Pre-existing Cardiovascular Disease and Telemedicine Interventions for Cardiovascular Disease during COVID-19 Pandemic: Best Practice Review with Recommendations.
Creation Date: 12-1-2020
End Date:
Status: Approved
Principal Investigator: Barbara Mae Madriaga
Review Board: USD IRB
Sponsor:

Study History

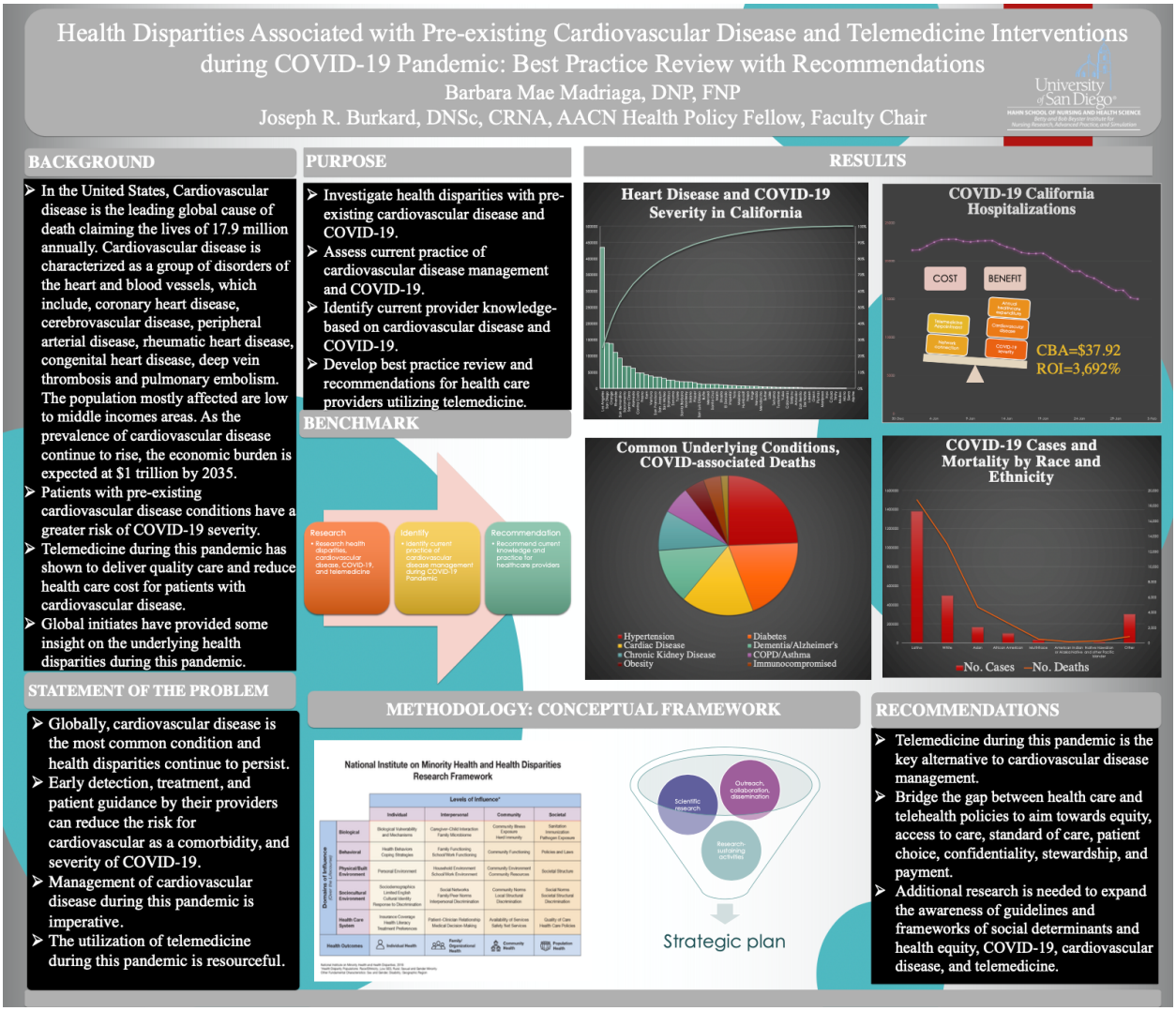
Submission Type Initial	Review Type Exempt	Decision No Human Subjects Research

Key Study Contacts

Member Joseph Burkard	Role Co-Principal Investigator	Contact jburkard@sandiego.edu
Member Barbara Mae Madriaga	Role Principal Investigator	Contact bmadriaga@sandiego.edu
Member Joseph Burkard	Role Primary Contact	Contact jburkard@sandiego.edu

Appendix B

Poster Presentation



Appendix C

DNP Program Outcomes Exemplars

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
DNP Essential I: Scientific Underpinnings for Practice **NONPF: Scientific Foundation Competencies** *The scientific foundation of nursing practice has expanded and includes a focus on both the natural and social sciences including human biology, genomics, science of therapeutics, psychosocial sciences, as well as the science of complex organizational structures. In addition, philosophical, ethical, and historical issues inherent in the development of science create a context for the application of the natural and social sciences.*	**2.** Synthesize nursing and other scientific and ethical theories and concepts to create a foundation for advanced nursing practice.	**Fall 2018** • Utilized the Iowa Model as an evidence-based model framework (DNPC 611). • Investigated the foundations of epidemiology evidence-based practice in primary prevention of hypertension within an adult population (DNPC 625). • Discuss the role and essentials of Doctor of Nursing Practice in healthcare (DNPC 630). **Spring 2019** • Applied ethical theories into palliative and hospice policy brief (DNPC 648). **Summer 2019** • Skillfully narrated and reflected on clinical involvement (DNPC 610) **Fall 2019** • Acquired principles and knowledge of Primary Care (NPTC 602)

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
		• Applied theoretical knowledge of primary care to inpatient internal medicine (NPTC 602) **Spring 2020** • Applied theoretical knowledge of primary care to specialty orthopedics clinic and internal medicine clinic (NPTC 604) • Constructed drive diagram model for Patient Flow from Emergency Department to Inpatient Acute Care Unit (DNPC 626) • Selected the Plan-Do-Study-Act Model for Evidence-Based Practice of The Eighth Joint National Committee on Hypertension in the Underserved Adult Internal Medicine Clinic: A Guideline for Healthcare Providers (DNPC 686) **Summer 2020** • Applied theoretical knowledge of primary care to underserved primary care clinic (NPTC 605 & 608) **Fall 2020** • Used Conceptual Framework to guide EBP project "Health Disparities

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
		Associated with Pre-existing Cardiovascular Disease and Telemedicine Interventions during COVID-19 Pandemic: Best Practice Review with Recommendations" (DNPC 630). **Spring 2021** • Applied theoretical knowledge of primary care to family medicine clinic (NPTC 609)
DNP Essential II: Organizational & System Leadership for Quality Improvement and Systems Thinking **NONPF: Leadership Competencies/Health Delivery System Competencies** *Advanced nursing practice includes an organizational and systems leadership component that emphasizes practice, ongoing improvement of health outcomes, and ensuring patient safety. Nurses should be prepared with sophisticated expertise in assessing organizations, identifying system's issues, and facilitating organization-wide changes in practice*	**5.** Design, implement, and evaluate ethical health care delivery systems and information systems that meet societal needs and ensure accountability for quality outcomes.	**Fall 2018** • Incorporated an open-ended health screening tool to promote wellness in women's clinics as part of evidence-based implementation (DNPC 611). **Spring 2019** • Designed and submitted a proposed legislative bill to the American Nurses Association on Gun Violence. (DNPC 648). • Applied strategic planning management principles during case study presentations (DNPC 626). **Summer 2019**

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
delivery. This also requires political skills, systems thinking, and the business and financial acumen needed for the analysis of the practice quality and costs.		• Developed a technologically advanced business proposal to implement newly device medical speech recognition for advance care providers to improve staff productivity and efficacy, and contribute to cost-effectiveness (DNPC 653) • Applied the principles of health care finance, SWOT analysis, needs assessment tool, strategic planning to develop a medical speech recognition device (DNPC 653). **Fall 2019** • Reviewed charting differentials and coding for inpatient internal medicine (NPTC 602) **Spring 2020** • Explored treatment options at orthopedic specialty clinic and internal medicine clinic within varying insurance plans (NPTC 604) • Explored the benefits of discounted medication prices with GoodRx for the underserved population at internal medicine clinic (NPTC 604).

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
		Summer 2020 • Explored the limitation of insurance plans and resources available to an underserved community in primary care setting clinic (NPTC 605 & NPTC 608) • Explored the benefits of integrated medicine associated with primary care (NPTC 605 & NPTC 608) **Fall 2020** • Learned how to manage complex and chronic disease processes in private practice internal medicine clinic (NPTC 608) **Spring 2021** • Learned how to apply theoretical knowledge to family medicine clinic (NPTC 609)
DNP Essential III: Clinical Scholarship & Analytical Methods for Evidence-Based Practice	**4.** Incorporate research into practice through critical appraisal of existing evidence, evaluating practice outcomes,	**Fall 2018** • Researched and Analyzed an evidence-based paper on "Health

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
NONPF: Quality Competencies/Practice Inquiry Competencies *Scholarship and research are the hallmarks of doctoral education. Although basic research is viewed as the first and most essential form of scholarly activity, an enlarged perspective of scholarship has emerged through alternative paradigms that involve more than the discovery of new knowledge. These paradigms recognize: (2) the scholarship of discovery and integration "reflects the investigative and synthesizing traditions of academic life;" (2) scholars give meaning to isolated facts and making connections across disciplines through the scholarship of integration; and (3) the scholar applies knowledge to solve a problem via the scholarship of application that involves the translation of research into practice and dissemination and integration of new knowledge.*	and developing evidence-based practice guidelines.	Screening and Health Promotion for Ovarian Cancer." (DNPC 611) • Incorporated pathophysiology on topics such as screening and treatment for iron deficiency anemia in women, evaluation of the effect of cranberry juice on symptoms associated with urinary tract infections, risk factors on peptic ulcers, and an association between sickle cell disease and oral hygiene during ground rounds. (APNC 520) **Spring 2019** • Synthesized and disseminated evidence-based research on "Turmeric," as part of Complementary and Alternative Medicine project (APNC 523)
DNP Essential IV: Information Systems/Technology & Patient Care Technology for Improvement & Transformation of Health Care	**7.** Incorporate ethical regulatory, and legal guidelines in the delivery of health care and the selection, use, and evaluation of information systems and patient care technology.	**Fall 2018** • Attained Protection of Human Subjects in Research Certification with CITI. (DNPC 625)

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
NONPF: Technology & Information Literacy Competencies *DNP graduates are distinguished by their abilities to use information systems/technology to support and improve patient care and health care systems, and provide leadership within health care systems and/or academic settings. Knowledge and skills related to information systems/technology and patient care technology prepare the DNP graduates to apply new knowledge, manage individual and aggregate level information, and assess the efficacy of patient care technology appropriate to a specialized area of practice along with the design, selection, and use of information systems/technology to evaluate programs of care, outcomes of care, and care systems. Information systems/technology provide a mechanism to apply budget and productivity tools, practice information systems and decision supports, and web-based learning or intervention tools to support and improve patient care.*		**Spring 2019** • Construct data analysis paper on Prescription Medicine in children under the age of 18. (HCIN 540) **Fall 2019** • Obtained University of San Diego IRB approval for DNP Evidence-Based Project (DNPC 630). • Gained support by the University of San Diego IRB department and lead faculty **Spring 2021** • Data analysis completed for Evidence-Based Project
DNP Essential V: Health Care Policy for Advocacy in Health Care	**3.** Demonstrate leadership in collaborative efforts to develop and implement policies to improve health care delivery and	**Spring 2019**

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
NONPF: Policy Competencies *Health care policy, whether created through governmental actions, institutional decision-making, or organizational standards, creates a framework that can facilitate or impede the delivery of health care services or the ability of the provider to engage in practice to address health care needs. Engagement in the process of policy development is central to creating a health care system that meets the needs of its constituents. Political activism and the commitment to policy development are central elements of DNP practice.*	outcomes at all levels of professional practice (institutional, local, state, regional, national, and/or international).	• Delivered health policy presentation on Gun Violence and Mental Health Awareness (DNPC 648) • Developed policy brief on Gun Violence and Mental Health Awareness. (DNPC 648) • Developed health policy analysis scholarly paper on Gun Violence and Mental Health Awareness. (DNPC 648) • Engage in the California Association of Nurse Practitioners (CNAP) annual conference as a student member. • Submitted a proposed policy bill on SB890 to obtain full practice Nurse Practitioner authority in California (DNPC 648) **Fall 2019** • Case presentation on Down Syndrome investigating current research, assessment, clinical findings, and genetic labs (DNPC 622) **Spring 2021** • Poster Presentation of DNP project to University of San Diego

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
DNP Essential VI: Interprofessional Collaboration for Improving Patient & Population Health Outcomes **NONPF: Leadership Competencies** *Today's complex, multi-tiered health care environment depends on the contributions of highly skilled and knowledgeable individuals from multiple professions. To accomplish the IOM mandate for safe, timely, effective, efficient, equitable, and patient-centered care in this environment, health care professionals must function as highly collaborative teams. DNPs have advanced preparation in the interprofessional dimension of health care that enables them to facilitate collaborative team functioning and overcome impediments to interprofessional practice. DNP graduates have preparation in methods of effective team leadership and are prepared to play a central role in establishing interprofessional teams, participating in the work of the team, and assuming leadership of the team when appropriate.*	**1.** Demonstrate advanced levels of clinical practice within defined ethical, legal, and regulatory parameters in designing, implementing, and evaluating evidence-based, culturally competent therapeutic interventions for individuals or aggregates. **3.** Demonstrate leadership in collaborative efforts to develop and implement policies to improve health care delivery and outcomes at all levels of professional practice (institutional, local, state, regional, national, and/or international).	**Spring 2019** • Disseminated evidence-based literature review on Health Screening and Health Promotion for Ovarian Cancer (DNPC 611) **Fall 2019** • Conducted Evidence-Based literature review on hypertension guidelines in internal medicine clinic • Explored genomics and epigenetics in identifying its relationship to chronic diseases (DNPC 622) • Completed genogram to understand and analyze the process of genetics and the relationship to family dynamics including risk factors (DNPC 622) • Participated in genetic interviewing with a patient to understand the factors of their genetics and the effects if any on their current lifestyle (DNPC 622) • Learned how to provide pain management control on orthopedics floor in inpatient internal medicine (NPTC 602) • Learned how to provide nutrition counseling for diabetic patients in internal medicine clinic (NPTC 602)

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
		Spring 2020 • Explored ways for proactive education in diet and exercise to decrease cardiovascular risk at internal medicine clinic (NPTC 602) • Learned how to apply JNC 8 guidelines to clinical practice (NPTC 604) **Fall 2020** • Gathered Evidenced-based literature review on COVID-19, cardiovascular disease, and telemedicine **Summer 2020** • Participated in integrated medicine program and utilized PHQ9 and GAD7 to screen for anxiety and depression (NPTC 605) **Fall 2020** • Learned how to use MMSE at private practice internal medicine clinic (NPTC 608)
DNP Essential VII: Clinical Prevention & Population Health for Improving Nation's Health	**6.** Employ a population health focus in the design, implementation, and evaluation of health care delivery systems that address	**Fall 2018** • Developed a primary screening tool for primary prevention of

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
NONPF: Leadership Competencies *Consistent with national calls for action and with the longstanding focus on health promotion and disease prevention in nursing, the DNP graduate has a foundation in clinical prevention and population health. This foundation enables DNP graduates to analyze epidemiological, biostatistical, occupational, and environmental data in the development, implementation, and evaluation of clinical prevention and population.*	primary secondary, and tertiary levels of prevention.	hypertension in adults in a clinic setting (DNPC 625) • Distinguish environmental and lifestyle risk factors associated with hypertension. (DNPC 626) **Spring 2019** • Completed literature view on palliative care for ovarian cancer • Discussed health care gaps in palliative care (DNPC 648).
DNP Essential VIII: Advanced Nursing Practice **NONPF: Independent Practice/Ethics Competencies** *The increased knowledge and sophistication of health carhaveas resulted in the growth of specialization in nursito to ensure competence in these highly complex areas of practice. The reality of the growth of specialization in nursing practice is that no individual can master all advanced roles and the*	**1.** Demonstrate advanced levels of clinical practice within defined ethical, legal, and regulatory parameters in designing, implementing, and evaluating evidence-based, culturally competent therapeutic interventions for individuals or aggregates.	**Fall 2018** • Synthesized and critiqued literature view on ovarian cancer (DNPC 611). **Spring 2019** • Delivered presentation on Palliative Care and Hospice Education and Training Act (DNPC 648). **Fall 2019** • Completed 162 hours for NPTC 602 as student hospitalist role in acute can are setting

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
requisite knowledge for enacting these roles. DNP programs provide preparation within distinct specialties that require expertise, advanced knowledge, and mastery in one are ofarearsing practice. A DNP graduate is prepared to practice in an area of specialization within the larger domain of nursing.		• Performed physical assessment and obtained detailed history during clinical lab (DNPC 521) • Utilized critical thinking knowledge to rule in and out differential diagnoses (DNPC 521) • Differentiate role between primary care and inpatient care setting (NPTC 602) • Gained knowledge on the roles and responsibility of a Nurse Practitioner (NPTC 602) **Spring 2020** • Completed 108 hours for NPTC 604 in specialty orthopedic clinic and internal medicine clinic (NPTC 604). • Completed history and physical examinations in internal medicine clinic and orthopedic clinic (NPTC 604) • Proficient in orthopedic maneuvers (NPTC 604). • Proficient in complex cases at internal medicine clinic (NPTC 604). • Proficient in diabetes management (NPTC 604).

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
		Summer 2020 • Completed 108 clinic hours at integrated primary care clinic for underserved population • Proficient in PHQ-9 and GAD scale (DNPC 605). • Proficient in time management (NPTC 605). • Participated in integrated medicine program (NPTC 605). • Attended educational meetings and collaborate d with the pharmacist of Scripps and psychiatric MD at UCSD on weekly basis regarding cases. **Fall 2020** • Proficient in complex cases at private practice internal medicine clinic (NPTC 608) • Applied pathophysiology extensively at private practice internal medicine clinic (NPTC 608) • Proficient in documentation listing H&P, diagnosis, and plan of care

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
		Spring 2021 • Proficient in H&P,, diagnosis and plan a of care at family medicine clinic

Appendix D

Certificates or Documentation of any Additional Certifications

CITI PROGRAM

Completion Date 08-Sep-2018
Expiration Date 07-Sep-2021
Record ID 28578962

This is to certify that:

Barbara Mae Madriaga

Has completed the following CITI Program course:

Not valid for renewal of certification through CME.

Human Subjects Research - Biomed
(Curriculum Group)
Biomedical Research - Basic/Refresher
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

University of San Diego

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w3f87515b-c2f9-44d0-bc92-ccff4006bdec-28578962

Figure 1

Cardiovascular Complication Following COVID-19

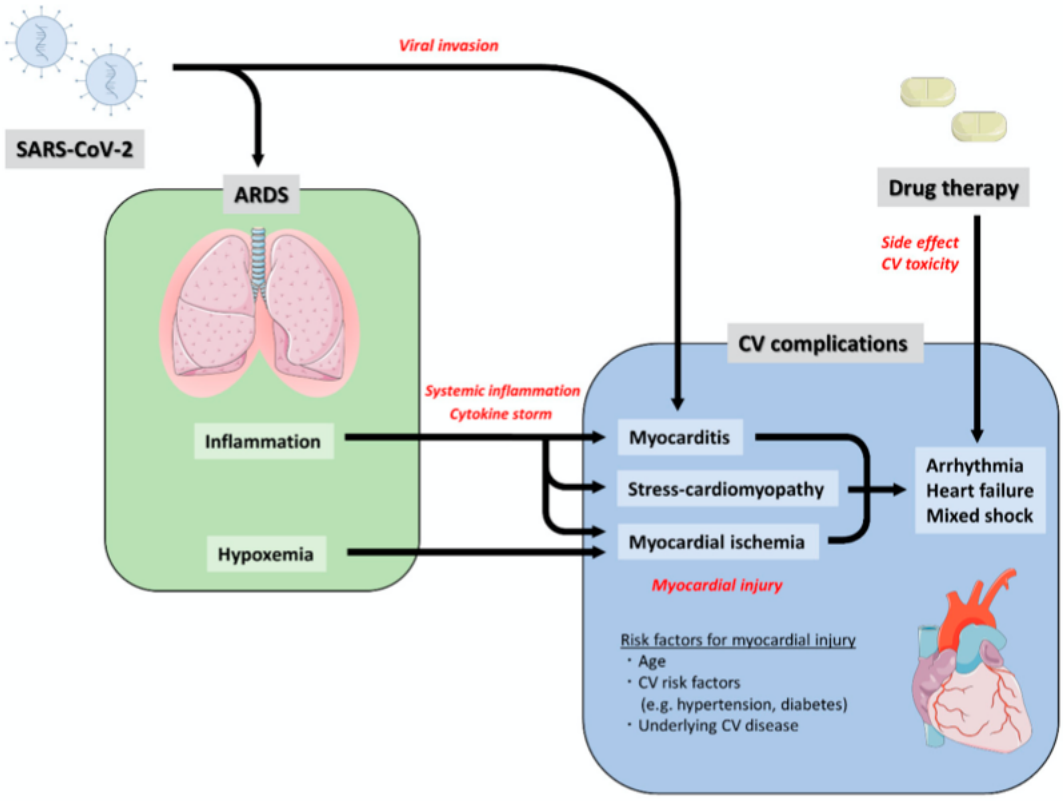


Figure 2

Cardiovascular Manifestation Associated with COVID-19 Infection

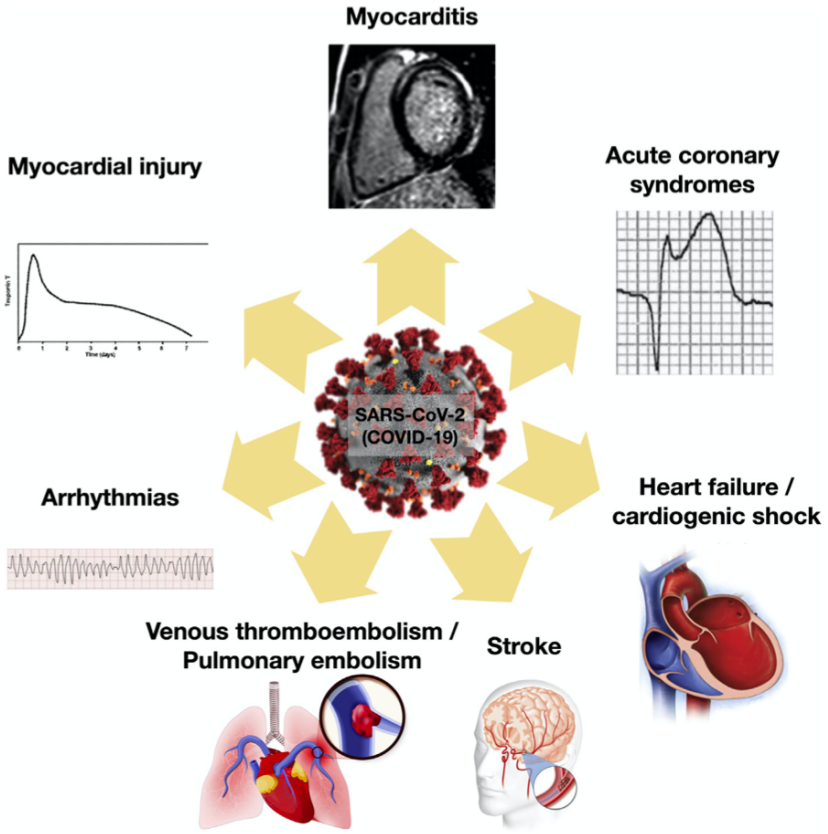


Figure 3

CSDH Conceptual Framework

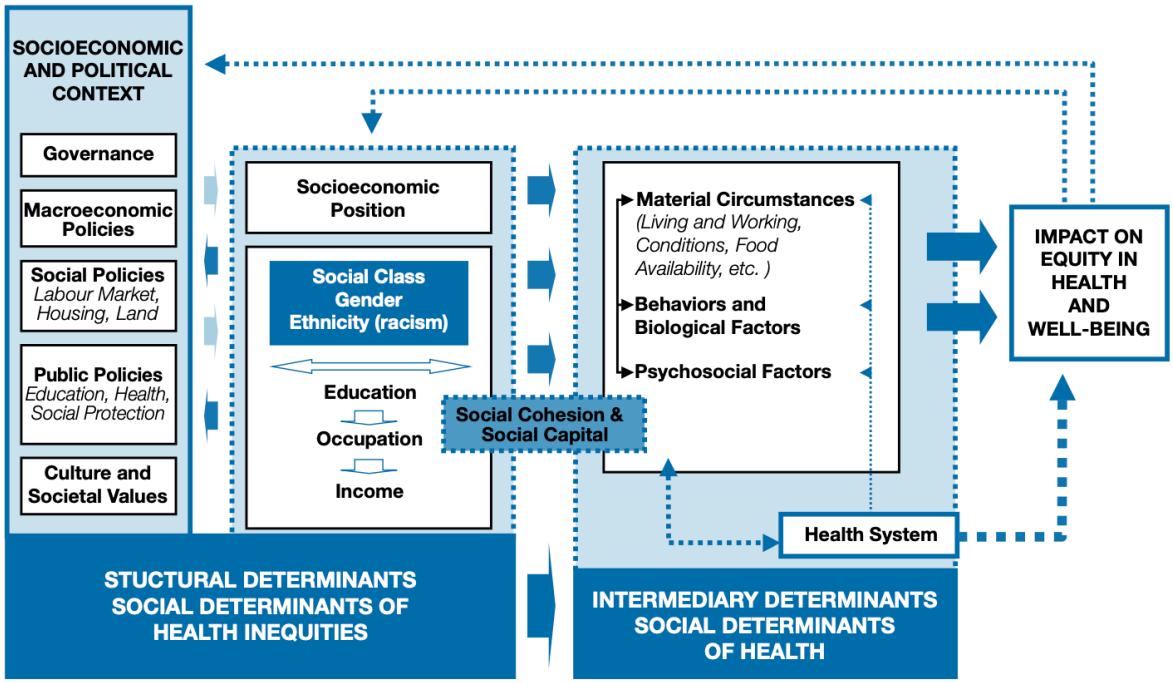


Figure 4

National Institute on Minority Health and Health Disparities Research Framework

		Levels of Influence*			
		Individual	**Interpersonal**	**Community**	**Societal**
Domains of Influence *(Over the Lifecourse)*	**Biological**	Biological Vulnerability and Mechanisms	Caregiver–Child Interaction Family Microbiome	Community Illness Exposure Herd Immunity	Sanitation Immunization Pathogen Exposure
	Behavioral	Health Behaviors Coping Strategies	Family Functioning School/Work Functioning	Community Functioning	Policies and Laws
	Physical/Built Environment	Personal Environment	Household Environment School/Work Environment	Community Environment Community Resources	Societal Structure
	Sociocultural Environment	Sociodemographics Limited English Cultural Identity Response to Discrimination	Social Networks Family/Peer Norms Interpersonal Discrimination	Community Norms Local Structural Discrimination	Social Norms Societal Structural Discrimination
	Health Care System	Insurance Coverage Health Literacy Treatment Preferences	Patient–Clinician Relationship Medical Decision-Making	Availability of Services Safety Net Services	Quality of Care Health Care Policies
Health Outcomes		**Individual Health**	**Family/ Organizational Health**	**Community Health**	**Population Health**

National Institute on Minority Health and Health Disparities, 2018
*Health Disparity Populations: Race/Ethnicity, Low SES, Rural, Sexual and Gender Minority
Other Fundamental Characteristics: Sex and Gender, Disability, Geographic Region

Table 1

Heart Disease and COVID-19 Severity in California

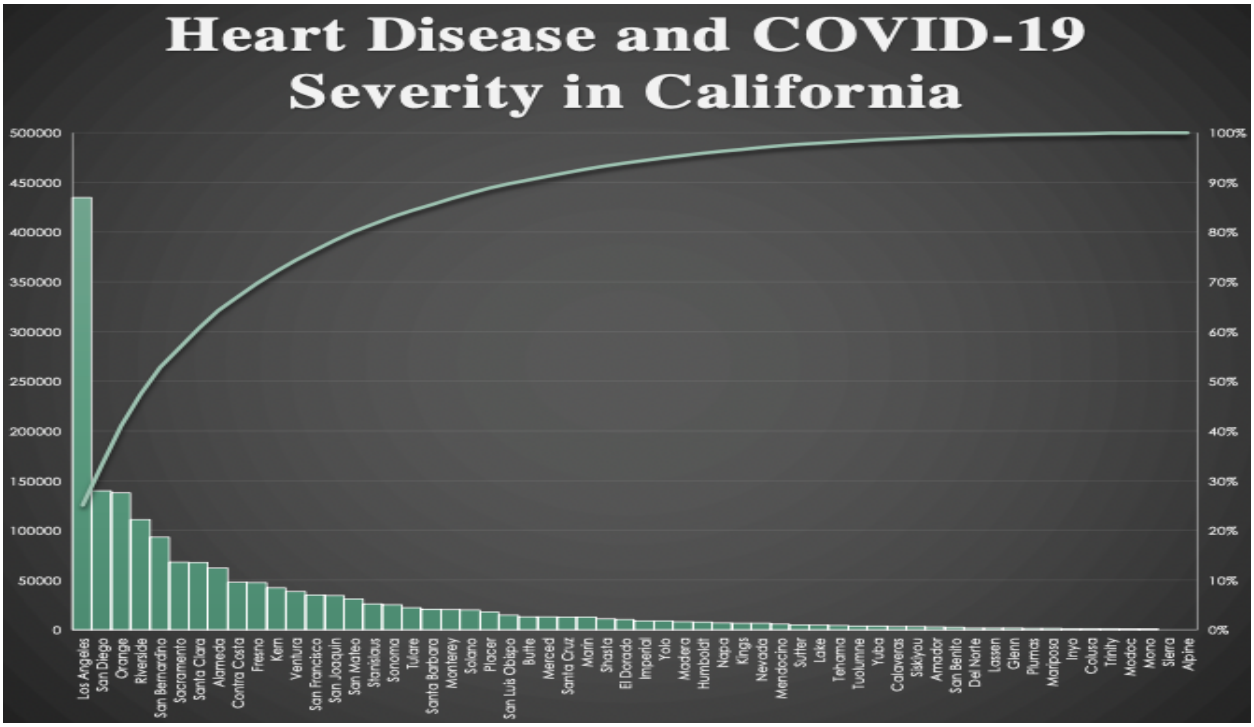


Table 2

COVID Hospitalizations

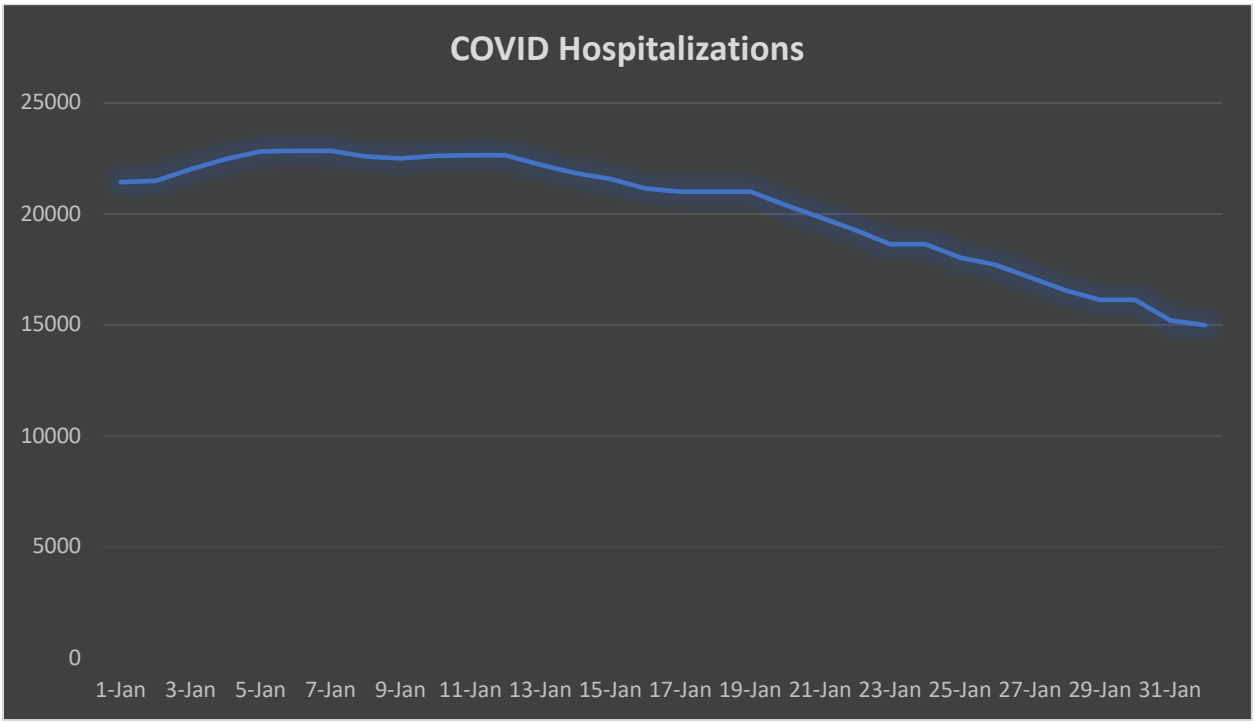


Table 3

Common Underlying Conditions, COVID-associated Deaths

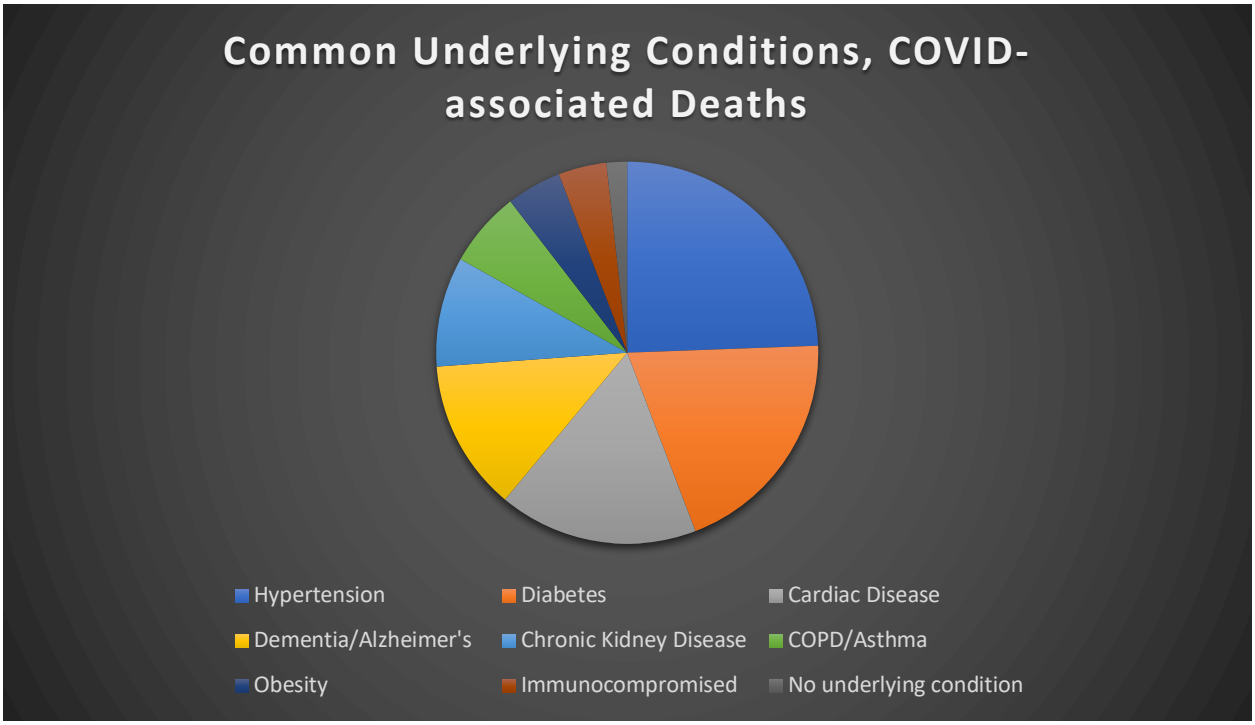


Table 4

COVID-19 Cases and Mortality by Race and Ethnicity