INCREASING COVID-19 VACCINE UPTAKE IN BLACK AMERICAN COMMUNITIES BY IMPROVING BLACK PATIENT-PHYSICIAN TRUST

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By

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Musculoskeletal injections of therapeutic substances into joints or ligaments constitute nearly 50,000 procedures annually (United States Bone and Joint Initiative, 2014, p. 68). Current methods for performing musculoskeletal injections are inefficient and uncomfortable for both the physician and patient (J. Kent, personal communication, October 13, 2020). The technical portion of this project aims to develop an ergonomic, one-handed syringe capable of injecting and aspirating multiple injectates/aspirates through a single injection site to improve clinical outcomes and experiences associated with musculoskeletal injections. This innovation will come at a time when global confidence in injection-based procedures, namely vaccines, and public trust in doctors have been steadily diminishing. With the United States' COVID-19 vaccine rollout campaign underway, these movements will directly contribute to decreased vaccine uptake, especially in marginalized communities.

Recently, a growing, global trend of vaccine hesitancy has led to the resurgence of numerous vaccine preventable diseases (VPDs) (Paules et al., 2019, p. 2185). In 2019, vaccine hesitancy was named one of the top ten major threats to global health by the World Health Organization (WHO), joining climate change and HIV (World Health Organization, 2019). The global outbreaks of VPDs implies that the public's herd immunity to these illnesses has substantially waned, a concerning sentiment when paired with increased trends of outright vaccine refusal (de Figueiredo et al., 2020, p. 898). While a multitude of reasons exist for these movements, one of the most consistent correlates across the world are the low levels of public trust in physicians (de Figueiredo et al., 2020, p. 906).

Public trust in healthcare professionals has been steadily diminishing over time. Huang et al. (2018) performed a cross sectional analysis of 34,968 survey responses from 23 countries and found that over time, trust in physicians has declined and there is an overall "poor level of public

trust in physicians," (p. 1). Between 1966 and 2012, the United States' public trust in physicians fell by approximately 40 percent, leaving only 34 percent of American adults with a "great confidence" in their healthcare providers (Blendon et al., 2014, p. 1570). A survey conducted by the International Social Survey Programme (ISSP) found the United States ranked 24th in the level of public trust in physicians out of the 29 participating industrialized countries (Blendon et al., 2014, p. 1571). These decreased levels of trust between patients and their physicians have observable impacts.

Birkhäuer et al. (2017), a team of researchers under the psychology department at the University of Basel in Switzerland, analyzed 400 publications and 47 studies in a meta-analysis to determine if the level of a patient's trust in their physician had an effect on their health outcomes (p. 1). The analysis found a small-moderate correlation between trust and actual health outcomes, a moderate correlation between trust and patient self-rated health outcomes, and a large correlation between trust and overall patient satisfaction (Birkhäuer et al., 2017, p. 6). Patients who trust their physicians were more inclined to report, "more beneficial health practices, higher satisfaction and health-related quality of life, [and] better symptom-oriented subjective outcomes" (Birkhäuer et al., 2017, p. 9). In relation to vaccines, Smith et al. (2006) found that surveyed parents who responded that healthcare providers were influential in their vaccination decisions were twice as likely to believe vaccines were safe to be administered (p. 1287). Even among the parents who did not believe vaccines were safe, vaccination rates for their children were approximately 24 percent higher for those who responded their decision was influenced by healthcare providers (Smith et al., 2006, p. 1287). As documented by these findings, physicians and other healthcare professionals are in a unique position in which they can directly and positively influence vaccination rates, further emphasizing the importance of

increasing patient-physician trust. These findings also validate improving public trust in physicians as a potent approach to improving population wide vaccine uptake and can directly combat vaccine hesitancy related to the rollout of the COVID-19 vaccine in the United States. This method would be particularly effective if employed with a focus on improving the patient-physician relationship within communities which historically distrust the American healthcare system, e.g. the Black American community.

Black Americans are particularly wary of receiving the COVID-19 vaccine. A 2020 survey by the National Foundation for Infectious Diseases found that 68 percent of older Black adults, ages 60 and older, planned on getting the COVID-19 vaccine, while only 38 percent of younger Black adults, between the ages 18 and 44, planned on getting it despite members of the Black community being disproportionally more susceptible to contract, become hospitalized with, or die of COVID-19 (Blow, 2021; Callaghan et al., 2021, p. 5; Centers for Disease Control and Prevention, 2020a; Ellis, 2021; Hawkins et al., 2020, p. 130). This skepticism of government distributed medical treatment is well-founded since Black Americans suffered generations of medical abuse and still experience significantly inferior medical outcomes (Kennedy et al., 2007, p. 56–58). As this demographic is most heavily affected by the pandemic, it is essential to increase this community's vaccine uptake, yet chronic distrust of the American government and healthcare system makes it difficult to develop a trusting patient-physician relationship. To overcome the widespread vaccine hesitancy of Black Americans, public health organizations (PHOs) must bridge this gap by partnering with trusted Black community institutions.

A further exploration of the reasons behind global, and American, decreases in vaccine uptake and public trust in physicians will elucidate a potential solution to these concerning trends. This tightly-coupled STS research project proposes the optimal way to increase COVID-

19 vaccine uptake in Black American communities is through a partnership between public health organizations and Black churches, modeled by an adapted handoff model, a derivation of Actor Network Theory (ANT) (Hurtado-de-Mendoza et al., 2015, p. 330). The findings of these analyses will provide guidance to physicians, public health officials, and policymakers on how to effectively improve the Black patient-physician relationship and subsequently, decrease COVID-19 vaccine hesitancy among Black Americans.

INCREASING GLOBAL VACCINE HESITANCY

Vaccine hesitancy presents a substantial threat to global health. Since 2000, there has been a worldwide resurgence of vaccine preventable diseases (VPDs), such as measles (Paules et al., 2019, p. 2185). Reported measles cases globally increased by 30 percent from 2016 to 2017, prompting the WHO to release a statement explaining, "because of gaps in vaccination coverage, measles outbreaks occurred in all regions… there were an estimated 110,000 deaths related to the disease," (World Health Organization, 2018). A 2016 review of VPDs in the United States found that, "vaccine refusal has been associated with outbreaks of invasive *Haemophilus influenzae* type b disease, varicella, pneumococcal disease, measles, and pertussis," (Phadke et al., 2016, p. 2). In 2019, the United States experienced the greatest number of measles cases since its elimination in 2000 with the director of the Centers for Disease Control and Prevention (CDC), Robert Redfield, stressing the importance of "[assuring] patients about the efficacy and safety of the measles vaccine," (Centers for Disease Control and Prevention, 2019). These trends of VPD resurgences suggest a global waning of individual immunity, and subsequently, herd immunity.

Herd immunity is the phenomenon that occurs when most of a population is protected against an infectious disease, thereby offering indirect protection to those who are not immune.

Populations that are unable to stay above the herd immunity threshold become susceptible to epidemiological outbreaks which can be seen on a smaller scale by the 2015 Disneyland measles outbreak (Centers for Disease Control and Prevention, 2015). A mathematical model analyzing the trends of periodic mumps outbreaks in Scotland found that of the four scenarios simulated; those being (1) no vaccinations, (2) vaccinated individuals immune for life, (3) vaccinated individuals at risk of waning immunity, and (4) introduction of measures to increase immunity (e.g. a 3rd vaccination dose); only the second scenario is capable of preventing reoccurring largescale mumps outbreaks (Hamami et al., 2017, p. 5). The longevity of a vaccine's efficacy is variable and dependent on the disease against which it protects. Waning immunity occurs naturally over time when individuals are not frequently exposed to the disease they are immunized against (Heffernan & Keeling, 2009, p. 1). As an individual's immunity wanes, they become a part of the population which relies on herd immunity for protection. This phenomenon emphasizes the importance of vaccinating younger demographics in order for a population to stay above the herd immunity threshold. Hamami et al. (2017) also concluded "that the more 'unprotected' individuals (who were either never vaccinated or lost their immunity), the shorter the period between two high peaks of epidemic outbreak," showing the compounding, public harm associated with decreased vaccine uptake (p. 9). The severity of vaccine hesitancy only becomes more apparent when considering the growing evidence of global trends of vaccination delays and refusals.

De Figueiredo et al. (2020) analyzed the results of 290 surveys; taken across 149 countries from 2015 – 2019, obtained through collaboration with Gallup International, the European Commission, the Philippines Survey and Research Center, and Wellcome; using a multinomial logit Gaussian process model to identify key spatial and temporal vaccine-related

trends (p. 901). This meta-study found overall confidence in the importance, safety, and effectiveness of vaccines fell in Afghanistan, Azerbaijan, Indonesia, Nigeria, Pakistan, the Philippines, Serbia, and South Korea (de Figueiredo et al., 2020, p. 898). Notably, while confidence remained low compared to other continents, much of Europe showed increased vaccine confidence over the four year period (de Figueiredo et al., 2020, p. 906).

A multiplicity of factors influences decisions regarding vaccine uptake. The largest barrier to the dissemination of vaccines is a lack of availability which leads to more than two million deaths each year in less wealthy countries (Chokshi & Kesselheim, 2008, p. 750). However, the scope of this research paper focuses on vaccine delay and refusal in areas where vaccines are relatively accessible. In this regard, the trends of public perception toward vaccinations of individual countries can be understood through examination of specific religious movements and/or misinformation campaigns, however, the most consistent patterns of vaccine uptakes observed across the de Figueiredo et al. (2020) study show that males and/or having fewer years of education are associated with decreased vaccine uptake, while positive-information seeking behaviors and/or trust in healthcare workers are associated with increased vaccine uptake (p. 906). Two of these four trends, excluding sex and positive-information seeking behaviors, elucidate potential avenues by which the vaccination uptake of a population can be improved. These approaches are increasing education accessibility and increasing public trust in physicians. Over the course of the last few decades, the percentage of the world enrolling in secondary schooling has drastically improved, but the quality of relationship between a patient and their physician has not, making this trend a prime therapeutic target to increase vaccination uptake (UNESCO Institute for Statistics, 2020).

UNDERSTANDING PATIENT-PHYSICIAN TRUST

Kvalnes (2017), a contemporary Norwegian moral philosopher, defines trust as a function of ability, benevolence, and integrity (p. 80). The Actor Network Theory (Hurtado-de-Mendoza et al., 2015, p. 330), a conceptual framework employed to analyze and understand relationships between entities with agency, is used to illustrate this concept as seen in Figure 1 on page 7. Exploring each of these factors individually will elucidate which component has the most impact on trust between patients and their physicians.

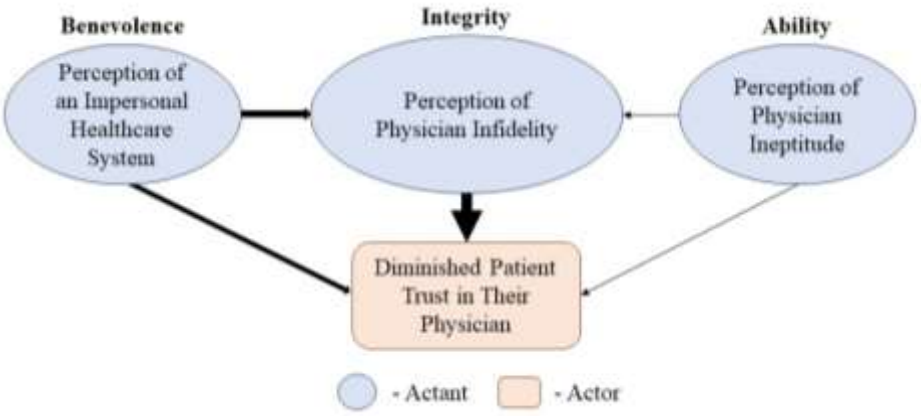

Figure 1: Analyzing Patient-Physician Trust Factors. An ANT network relating patient perceptions to patient-physician trust. The thickness of an arrow represents its relative magnitude of influence (Diskin, 2021a).

Ability refers to the technical competence of the physician which plays an active role in developing patient-physician trust. In essence, a physician who is perceived as more capable is generally seen as more trustworthy (Jacobs et al., 2006, p. 646). Interestingly enough, the same ISSP survey which found the United States to rank 25th out of 29 countries with regard to public trust in healthcare providers, also ranked the United States as 3rd overall for patient satisfaction with their treatment (Blendon et al., 2014, p. 1571). This discrepancy between public trust of and public satisfaction with physicians implies the cause of the growing distrust does not primarily stem from physician ineptitude.

Benevolence refers to the interpersonal skills of the doctor, i.e., their ability to communicate effectively and form relationships with their patients. In an interview conducted by Sweeny (2018) for *Medical Economics,* Stephen Post, director of the Center for Medical Humanities, Compassionate Care, and Bioethics at State University of New York at Stony Brook, speculates that the cause of the erosion of trust is the perceived impersonality of the modern medical system. He uses the amount of time physicians spend with their patients as a metric for measuring impersonality, citing how there is "very little time for clinicians to establish meaningful rapport with patients," (Sweeny, 2018, No Time for Trust, para. 2) Studies have shown that the average time physicians spent with patients has been between 16-20 minutes for the past three decades (Rabin, 2014, Rushed Doctors Listen Less, para. 5). However, the number of visits lasting 15 minutes or less dropped by 20 percent between 1992 and 2010 (Rabin, 2014). With the observed influence personal healthcare providers have in the decision-making of their patients, it is clear that physicians and patients can form meaningful relationships within these time frames (Lin et al., 2020, p. 5; Smith et al., 2006, p. 1287). Rather than limited time, the source of the perception of an impersonal healthcare system is caused by inaccessibility. Nearly 11 percent of Americans are uninsured and a disproportionate number of these people are minorities (Kennedy et al., 2007, p. 58; Tolbert et al., 2020). People who fall under this categorization often rely on large public hospitals for medical care, where the constantly rotating staff and high capacity is antithetical to developing a personal relationship with a healthcare provider (Kennedy et al., 2007, p. 58). While benevolence clearly exists, it is a privilege afforded only to those who are in a position to form lasting relationships with their healthcare provider, effectively excluding members of minority communities from the associated benefits.

Finally, integrity refers to the fidelity of physicians. In the words of the medical professionals, Thom et al. (2004), at its core, "trust is the acceptance of a vulnerable situation in which the truster believes that the trustee will act in the truster's best interests" (p. 125). From this perspective, distrust is bred from a patient's skepticism of the motives of their physicians. Increased access to medical information contributes to this distrust since patients arrive to their own conclusions regarding their health, second guessing physicians if their opinion differs (Sweeny, 2018, Eroding Trust, para. 4). Physicians are often viewed as a monolith, where a patient's negative experience with a healthcare professional potentially damages their perception of all healthcare professionals (Sweeny, 2018, Eroding Trust, para. 5). Continuing with this line of argument, Blendon et al. (2014) wrote that one of the most prevalent grievances the public has with the healthcare system are the perpetually rising costs (p. 1572). Historically, one of the causes of this trend is the adoption of new, medical innovations by physicians who then use these advancements to justify raising procedural costs (Sarewitz & Woodhouse, 2003, p. 68). These practices, combined with the previously mentioned perceptions of physician ineptitude and impersonality, reinforce the perception of physician infidelity. As seen in Figure 1 on page 7, this patient perception seems to be the chief cause of the erosion of trust and subsequently, the increasing numbers of vaccine hesitancy, especially in the United States.

COVID-19 Vaccine Hesitancy in the United States

Despite the devastating effects of the COVID-19 virus, vaccine hesitancy is increasing in the United States. Lin et al. (2020) reviewed 126 studies and surveys related to public confidence and receptivity for COVID-19 vaccines and found that the intended COVID-19 vaccine acceptance survey results fell from 72 percent in early April, 2020 to 48 percent by mid-October (Lin et al., 2020, p. 4). Across all the analyzed studies and surveys, the most commonly cited

concerns by respondents referenced the potential side effects, safety, and effectiveness of receiving the vaccine (Lin et al., 2020, p. 4). Furthermore, certain demographic characteristics had significant correlations with vaccine hesitancy. It was found that individuals with lower income, who were uninsured, without a college education, living in rural areas, and/or members of larger households were less likely to get vaccinated (Lin et al., 2020, p. 4). Notably, these groups also tend to find healthcare inaccessible, for reasons of finance and/or availability (Kennedy et al., 2007, p. 58; Statz & Evers, 2020, p. 1; Tolbert et al., 2020, Key Facts About The Uninsured Population, para. 2). This unifying characteristic explains the low rates of vaccine uptake within these demographics as numerous studies identified a doctor's recommendation as being key in generating vaccine confidence, motivating 62 percent of Americans (Lin et al., 2020, p. 5). This value is eight points higher than if only the Food and Drug Administration (FDA) had endorsed vaccine safety (Ipsos; 2021; Washington, DC, September 29, 2020; para. 4). While this number is impressive, a one particular demographic is understandably still skeptical when it comes to a physician's recommendation.

HOW CAN BLACK AMERICAN COVID-19 VACCINE UPTAKE BE INCREASED?

Notably, Black Americans were found to be 41 percent less likely to pursue a vaccine compared to White Americans (Callaghan et al., 2021, p. 3). This hesitancy is despite the number of African American deaths attributed to COVID-19 being nearly double their share of the total United States' population (Centers for Disease Control and Prevention, 2020b). The suspected reasons behind the Black community's increased susceptibility to COVID-19 are higher predispositions to chronic disease and greater exposure to viral infection (Modlin, 2020, paras. 5-6). Compared to other groups, Black Americans have higher rates of diabetes, obesity, hypertension, and asthma. Many of these conditions have been identified as risk factors for more

severe COVID-19 infections and poorer treatment outcomes. Additionally, a 2019 survey conducted by the United States Bureau of Labor Statistics determined that only 19.7 percent of Black Americans could work from home compared to 29.9 percent of White Americans (U.S. Bureau of Labor Statistics, 2019). The increased COVID-19 exposure risk which stems from this discrepancy is further exacerbated since, despite Black people making up one in nine workers in the United States' labor force, they make up approximately one in six "front-line-industry" workers (Rabouin, 2020, para. 2). As the population that is most threatened by the pandemic, it is critical to understand the reasoning behind Black American vaccine hesitancy and actively work to increase communal vaccination uptake.

PHYSICIAN INFIDELTY: THE SUBSTANTIATED MISTRUST OF THE AMERICAN HEALTHCARE SYSTEM

The chronic distrust of the healthcare system by Black Americans stems from a dark history of human right violations and inferior health outcomes (Kennedy et al., 2007, p. 56–58). The United States' healthcare system has a notorious legacy of exploiting Black bodies, without consent, for its own advancement, as well as to "scientifically" justify oppressive institutions and systems (Wells & Gowda, 2020, p. 1). This history of medical abuse dates back to the early 19th century, where over 90 percent of the Black American population were enslaved and subjected to abusive, involuntary medical experimentation for profit (Bachynski, 2018, para. 5). With no regulations existing to protect the rights or health of the enslaved and the common perception that Black people were not truly human, "western" medicine for African Americans was associated with cruel punishment, the loss of critical and intimate bodily functions, and dehumanizing public acts (Wells & Gowda, 2020, p. 1). The medical mistreatment of Black people in America continues well beyond the 19th century. The most notorious case of medical

racism, which has become a symbol for many Black people of their mistreatment by the medical establishment, is the Tuskegee Syphilis experiment (Kennedy et al., 2007, p. 56; Wells & Gowda, 2020, p. 2). In this 40 year-long (1932-1972) study, 400 impoverished Black men were promised free medical care, meals, and burial insurance to participate in a study researching "bad blood," a local, colloquial term which was used to refer to numerous forms of bloodborne illness (Wells & Gowda, 2020, p. 2). The researchers behind the study hoped to document the full progression of the disease, never informing the participants they even had syphilis, nor administering any authentic treatment, despite penicillin being a known cure to the ailment since the 1940s (Kennedy et al., 2007, p. 56; Wells & Gowda, 2020, p. 2). Even throughout the 1990s, unethical medical experiments on Black people continued. In one experiment, the parents of African American children were financially incentivized to give permission for their child to participate in an overnight study aimed at discovering a genetic etiology of aggression. The experiment consisted of withholding all medications (including those for asthma), withholding water, hourly blood draws, and the administration of fenfluramine, which was suspected to be related to aggressive behaviors (Scharff et al., 2010, p. 2). In addition to several other cited human subject violations, the participant pool was strictly restricted to the recruitment of Black children (Scharff et al., 2010, p. 2). Another study, conducted from 1993-1995 by the Kennedy Krieger Institute, worked with local landlords to identify specific improvements to reduce lead levels within homes (Moisse, 2011, para. 5). The Institute paid the property owners to set up various treatments ranging from paint removal to new windows and floors. To test the efficacy of these improvements, over 100 poor Black families, specifically those with young children, were identified and financially enticed to move into these apartments (Pollak, 2002, p. 99). Researchers would periodically sample the children's blood to test the lead levels, effectively

using them as “canaries in the mines” (Moisse, 2011, para. 7). These abuses have become deeply ingrained in the collective consciousness of the Black community, devastating the perceived integrity of healthcare professionals. A 2006 qualitive study aimed at understanding what patient-physician trust means to African Americans disturbingly found that a substantial portion of the participants expected to be experimented on during routine medical care (Jacobs et al., 2006, p. 645). This distrust is only accentuated by the disparity of health outcomes for Black Americans.

LACKING BENEVOLENCE: THE BLACK PATIENT-PHYSCIAN RELATIONSHIP

Black Americans notoriously have inferior health outcomes compared to members of other racial groups. The average lifespan of a Black American compared to a White American is four years lower, with Black mortality rates being almost 20 percent higher (Penner et al., 2014, p. 1). According to the 2010 national healthcare quality and disparities reports, Black people received around 40 percent worse care than White people based on the study’s core metrics (Agency for Healthcare Research and Quality, 2011, p. 1). Additionally, members of the Black community also run higher risks of having unmet healthcare needs (Huang et al., 2018, p. 2). For instance, Black women are less likely to develop breast cancer than White women, yet have a 40 percent higher death rate from the disease (Penner et al., 2014, p. 2). An analysis of over 1,000,000 clinical visits regarding children’s respiratory infections concluded that Black children were significantly less likely to receive antibiotic prescriptions than White children from the same clinician (Gerber et al., 2013, p. 680). A 2013 review of 800,000 discharge reports related to critical lower limb ischemia, i.e. inadequate blood supply, found that being black, *independent* of all other variables, increased the likelihood of amputation, as opposed to revascularization, by 78 percent (Durazzo et al., 2013, p. 619). These disparities exist across all socioeconomic

statuses and even within identical healthcare systems (e.g. military hospitals) (Penner et al., 2014, p. 2; Smedley et al., 2003, p. 56). These findings provide a quantitative justification for Black American's distrust of the modern American healthcare system. While the reasoning behind these statistics are inevitably multifaceted, many argue that these are a result of physicians' implicit racial bias and a lack of opportunity within Black communities to develop a long-term relationship with healthcare providers.

Many Black Americans feel as though receiving healthcare is often a humiliating and degrading experience. Reports based on surveys found that Black people often describe perceiving bias, prejudice, and stereotyping from healthcare providers, which contributes to feelings of mistrust and discomfort (Smedley et al., 2003, p. 12). Conversely, numerous studies determined Black patients perceived better medical care, improved communication, and more respectful treatment when seeing healthcare providers of the same racial identity, suggesting the issue primarily stems from a lack of cultural competency from non-Black physicians (Wells & Gowda, 2020, p. 2). Kennedy et al. (2007), speculates many of these negative perceptions come from unsavory exchanges between Black patients and non-Black physicians who feel uncomfortable treating/interacting with Black people (p. 57). Physicians with higher levels of implicit bias tend to speak faster, use more anxiety-related words, have shorter visits, and be less patient-oriented with Black, as opposed to White, patients (Penner et al., 2014, p. 5). Some of this discomfort is attributed to White intergroup anxiety, which is a psychological phenomenon in which a lack of positive experiences with an outgroup, e.g. Black people, leads to high levels of anxiety when interacting with them and a desire to avoid doing so (Plant & Devine, 2003, p. 790). Intergroup interaction is a precursor to individuation, an effective approach to overcoming

implicit bias that enables people to focus on the qualities of an individual rather than on those of the group with which they identify (Burgess et al., 2007, p. 883).

The inconsistent interaction between Black patients and non-Black physicians is a product of the lack of accessibility to healthcare which plagues many Black communities. The constantly rising cost of healthcare makes it increasingly harder to find and secure an affordable primary care doctor, especially for the uninsured (Galewitz, 2012, 'Unmet Needs' Increase for Privately Insured, para. 7; Kennedy et al., 2007, p. 58). In order to improve the benevolence of the Black patient-physician relationship, accessibility to healthcare professionals must be expanded so that underserved members of the Black community may experience the physician consistency integral to forming a trusting relationship.

FROM THE STEEPLE TO THE PEOPLE

The results of this tightly-coupled STS research paper suggest that the improvement of Black public trust in healthcare professionals would significantly increase COVID-19 vaccine uptake within the Black American community. The long history of the medical mistreatment of Black people consistently undermines any budding perception of integrity and benevolence in patient-physician relationships. A substantial chasm has grown between the two groups, such that a general information campaign will not suffice in reducing Black vaccine hesitancy. Instead, public health officials should partner with the integral Black community loci, churches. These institutions offer a well-established platform which directly connects to the target audience and the oppurtunity to improve the Black patient-physician relationship on a community scale, which will lead to an increase in COVID-19 vaccination uptake for Black Americans as seen on Figure 2 on page 16.

As the, arguably, only fully autonomous, Black social establishment, churches have historically taken on the role of attending to the full needs of its members (Levin, 1984, p. 478). Even at their inception, Black churches have always been centers for community mobilization. Prior to the civil war, these communal spaces were often used as stops for the Underground Railroad and as meeting places to plan slave revolts (Johnson, 2007, p. 7). During the Civil Rights Movement, churches had larger mobilizing potential than any other black institution due to their devoted constituency, nationwide institutional network, and access to organizational resources, all of which are would be invaluable in the battle against COVID-19 vaccine hesitancy (Johnson, 2007, p. 8). Brown and Brown (2003) explain that being a part of the black church cultivates social capital, which refers the development/increase of trust, connections, and mutual obligation to those with similar views from the intragroup sharing of beneficial information and opportunities (p. 618). Even secular Black organizations, such as the NAACP and fraternities, pay homage to this critical community center by incorporating Christian values into their constitutions, showcasing the widespread influence of the church (Johnson, 2007, p. 9). As the generational institution focused on attending to the needs of all its members, the Black church has cultivated a reputation of infallible integrity among many Black Americans. In a partnership between PHOs and Black churches, this hard-earned trust will prop the critically damaged reputations of healthcare professionals and grant physicians an invaluable platform from which to directly combat COVID-19 hesitancy in Black communities.

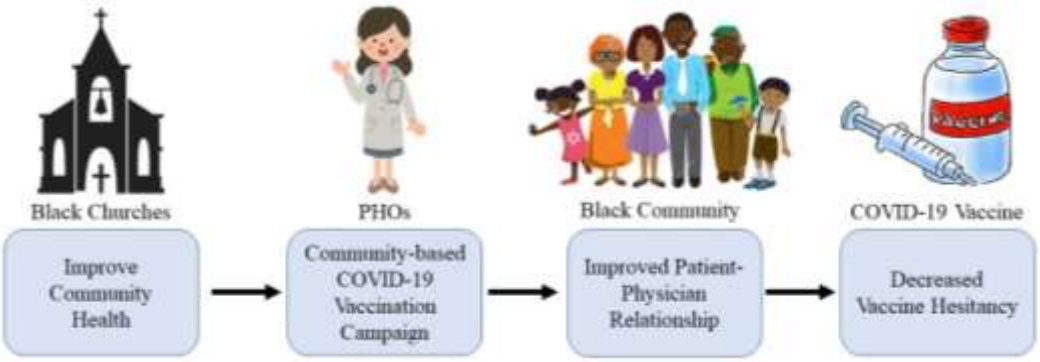

Figure 2: Proposed Partnership. An adapted Handoff model which outlines how a partnership between Black churches and public health organizations ends in a mutually beneficial result (Diskin, 2021b).

There already exists a precedent for Black churches to host health promotion activities. In 1996, the pastors of 18 Black churches were asked by the Los Angeles Mammography Promotion (LAMP) team to participate in a three year long health promotion program aimed at increasing mammography screenings among Black women (Markens et al., 2002, p. 805). Afterwards, the pastors were interviewed for their thoughts on the partnership and the program. The study provides many valuable lessons which will be essential to implement in the effective partnership between health organizations and Black churches.

The first takeaway from the study is that most pastors were eager to participate since they saw the program as an opportunity to improve the quality of life within their community. This finding implies that many Black churches would be open to a partnership with healthcare experts if it would benefit their congregation. However, many pastors were adamant in stating that if the program relies on them, then it would not be implemented (Markens et al., 2002, p. 809). Across the group of participants, a common theme of already being overburdened in the role was apparent. Subsequently, the success of a partnership between Black churches and PHOs will be almost entirely dependent on the work of participating physicians. This setup provides an opportunity for healthcare workers to showcase their fidelity to the Black community. While no

number of good deeds can erase the past, physicians clearly working for the benefit of others while receiving no benefit of their own is a step toward improving the perceived integrity of physicians by Black Americans and decreasing vaccine hesitancy as seen in Figure 2 on page 16.

Another valuable lesson learned from the LAMP study directly addresses Black American skepticism of healthcare professionals. While still enthusiastic about the program, many pastors explicitly expressed suspicion of working with outsiders, given the dark history of medical racism in the United States (Markens et al., 2002, p. 809). To try and improve relations, the LAMP team suggests actively and intentionally trying to form trusting relationships by running the program with volunteers within the church as well as actually attending church services. Additionally, they recommend organizing with respected community leaders to give the program legitimacy in the eyes of the local residents (Markens et al., 2002, p. 809). This level of personal interaction enables healthcare workers to develop a benevolent relationship with Black individuals and facilitates individuation. Trusting relationships will begin to develop between members of the community and the PHOs, improving the perceived benevolence of physicians and decreasing downstream vaccine hesitancy.

After vaccine hesitancy in the local Black community declines, public health officials should move to open vaccination clinics at the partnered churches and continue working with the community to vaccinate as many people as possible.

SHORT-TERM IMMUNITY AND LONG-TERM IMPROVED HEALTH OUTCOMES

The objective of this tightly-coupled STS project proposes to increase COVID-19 vaccine uptake in Black communities through a partnership between public health organizations and Black churches. This project's analysis vaccine hesitancy, public perception of physicians, the components of trust in healthcare, and the ingrained distrust of the American healthcare

system by Black Americans validates this approach. The immediate benefits of this union for POHs include access to a trusted platform which is directly tuned into the target audience and the opportunity to improve a Black community's public trust in physicians. For the churches and community, increased access to healthcare improves the overall quality of life in the area. This solution primarily aims to provide herd immunity for the American demographic which is most devestated by the pandemic. With its successful implementation, the United States will be one step closer to achieving total herd immunity against COVID-19. A secondary benefit of the improved public trust in physicians is long-term improvements of health outcomes for Black Americans.

Many may argue that merely partnering with Black institutions for public health projects is by no means sufficient to heal the grevious wound left in the Black collective unconsious by over 400 years of abuse. This point is absolutely correct. The scope of this research is limited only to the short term distribution of the COVID-19 vaccine to Black communities, however, it lays the foundation for future collaborations which is the first step in the right direction on a very long road. Through these partnerships, mutual acknowledgment and learning will occur and eventually lead to trusting Black patient-physician relationships. It is unclear if this type of partnership can be applied to other maraglinized groups to help improve vaccine uptake/health outcomes. Further research should be conducted on whether this approach is unique to Black churches or if similar avenues can be taken to reach other groups with high rates of vaccine hesitancy.

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