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The Political Determinants of Puerto Rican Health Inequities

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The Political Determinants of Puerto Rican Health Inequities

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in Community Health Sciences

by

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ABSTRACT OF THE DISSERTATION

The Political Determinants of Puerto Rican Health Inequities

by

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Doctor of Philosophy in Community Health Sciences

University of California, Los Angeles, 2022

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Whether living in the United States (US) or the US Commonwealth of Puerto Rico (PR), a colonial territory since 1898, Puerto Ricans experience inequities across an array of health conditions. Several studies have examined common public health explanatory variables, typically within the context of individual-level lifestyle choices, to understand the disparate health outcomes observed among Puerto Ricans living throughout the greater US, which includes individuals living in the 50 states and PR. However, few have assessed the impact of the Puerto Rican political context on health. This is a significant gap in the public health literature, as the health, well-being, and lived experiences of Puerto Ricans are fundamentally shaped by the colonial relationship that exists between the US and PR, regardless of geographic location. When studying Puerto Rican health, the permanence of this colonial context coupled with the persistence of health inequities, calls for special attention to the political determinants of health. These determinants, relating to political

structures such as voting, government, and policies, influence the conditions under which communities live, work, and recreate. ***Therefore, this dissertation investigates how the political determinants of health affect the health outcomes of Puerto Ricans living in the greater US, including individuals living in the States and Puerto Rico***. This is accomplished through three unique investigations, employing distinct methodologies, described across three separate empirical papers. The first two studies examine how these political structures manifest into political perceptions that have the potential to influence health outcomes among the Puerto Rican diaspora living in the States. The third study assesses how the political relationship between the US and PR produces conditions that result in the exclusion of PR from US-based public health systems. Within these three investigations, and throughout this dissertation, a political determinants of health approach is applied to the study of Puerto Rican health inequities to intentionally acknowledge and address the permanence of colonialism in PR and its impact on health. As a result, this dissertation contributes to a body of scholarship that serves to shift our collective gaze away from traditional approaches to public health research and towards addressing the political structures that produce health inequities among Puerto Ricans living in the greater US.

The dissertation of Anna-Michelle Marie McSorley is approved.

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2022

DEDICATION

For my children, Lana Lynn McSorley and Noah Arbor McSorley.

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When I couldn't find the strength within myself, I found it in all of you.

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CHAPTER 1.

INTRODUCTION

Chapter 1. Introduction

1.1. Overview

Puerto Ricans living in the States and the United States (US) Commonwealth of Puerto Rico (PR) experience a disproportionate amount of health inequities [1]–[3]. Previous studies addressing these inequities have followed traditional public health approaches by focusing on individual-level health behaviors or lifestyle choices as the causes of poor health outcomes among Puerto Ricans [2], [4], [5]. Additionally, these individual-level characteristics have been leveraged as points of intervention to improve health outcomes and reduce disparities [6]–[8]. While these efforts have yielded some positive results, health inequities persist within the Puerto Rican community [9]–[12]. To address the persistence of these health inequities, the social determinants of health (SDoH) literature indicates that public health researchers and practitioners need to look outside of the individual to consider the social, political, and economic context of populations [13], [14]. When studying Puerto Rican health inequities, this involves addressing the complexities of the political relationship that exists between the US and PR and the health harming conditions produced by PR's territorial status. For example, as a result of US racial and ethnic classifications, researchers who focus on the Puerto Rican population are limited by the lack of available disaggregated health data for Latinx subgroups in the US [15]. Similarly, because of the ambiguity surrounding PR's territorial status [16], PR is often excluded from many US-based systems, including public health services and resources. Therefore, the goal of this dissertation is to examine how the political relationship between the US and PR gives rise to health inequities for Puerto Ricans living in the greater US, including individuals living in PR and the States. To accomplish this goal, this chapter begins by presenting evidence surrounding existing health inequities, followed by a description of the political context for Puerto Ricans in the greater US.

1.2. Puerto Rican Health Inequities

Puerto Ricans comprise the second largest Latinx subgroup (also known as Hispanic or Latino/a/e/@ [17], [18]) in the US (Figure 1.1) [19]. Whether living in the States or the US Commonwealth of Puerto Rico, an unincorporated territory of the US since 1898, Puerto Ricans experience several health inequities [1], [11], [20]. These inequities are present across a spectrum of health conditions among Puerto Ricans in the States and PR [1], [21]–[23], and extend into systems of care, government distribution of health resources, as well as public health infrastructure [2], [3], [11]. While members of the Puerto Rican community in the greater US, which includes the 50 states, Washington D.C., and PR, share experiences with health inequities, the nature of those inequities do vary by geographic location [20].

Figure 1.1. Puerto Ricans in the Greater United States, including the 50 states, Washington D.C., and the United States Commonwealth of Puerto Rico

Note(s): Representations of geographic regions not to scale; Population estimates secured from US Census Bureau and based on 2019 estimates from the American Community Survey.

1.2.1. *Health Inequities in the United States Commonwealth of Puerto Rico*

In PR, 15.4% of residents are living with a disability, 34% of residents report fair or poor health, and 46% are living below the federal poverty level [11]. When compared to states in the union

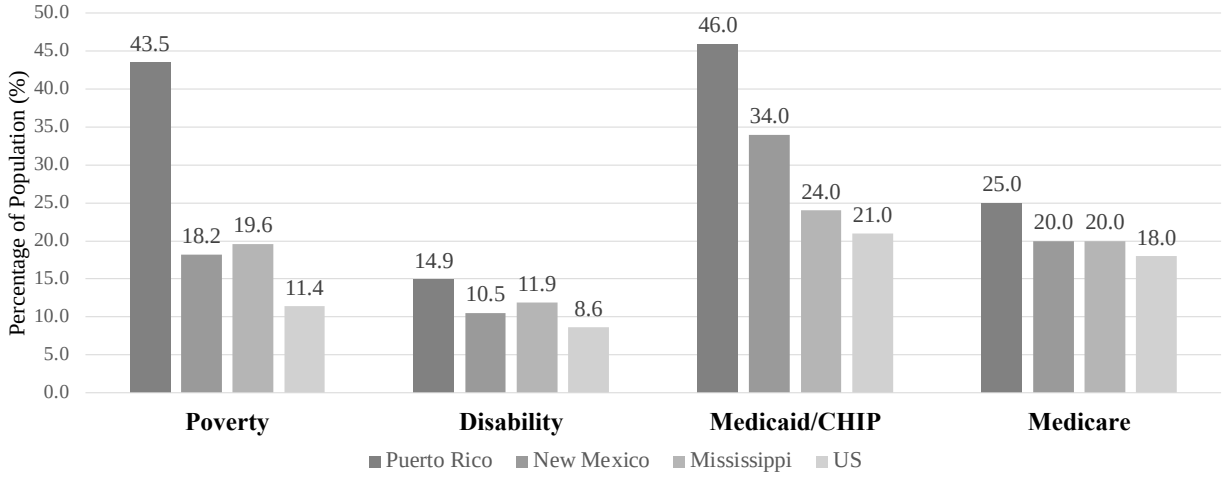
with some of the greatest health disparities and highest Latinx populations, outcomes in PR are consistently worse. Data obtained from the US Census Bureau reveals that PR has a greater share of their population experiencing poverty and disability than Mississippi, the state with the highest poverty level and some of the highest disability levels in the US (Figure 1.2) [24]. These trends are particularly remarkable because Mississippi, which is also within the southeastern region of the US, is known to have some of the highest rates of chronic illness and racial health disparities in the nation [25]. Similar patterns are observed when PR is compared to New Mexico, the state with the greatest share of their population identifying as Latinx (Figure 1.2) [26].

Additionally, data obtained from the Centers for Medicaid and Medicare Services (CMS) indicates that PR also has a greater share of their population enrolled in Medicaid, Child Health Insurance Program (CHIP), and Medicare services than New Mexico or Mississippi (Figure 1.2) [27]. Importantly, although residents of PR are subject to the standard Social Security and Medicare tax rates that fund these programs, funding from the federal government for these public goods is capped, unlike in any of the 50 US states [28], [29]. In 2019, PR's Medicaid expenditures were projected to reach $2.8 billion; however, the US territory was only allotted $367 million in funds [30]. This funding disparity serves to exacerbate poor health outcomes, as 49% of residents rely on Medicaid for healthcare [11], [30] and 53% of community health centers rely on Medicaid funding to provide community services [11]. Moreover, over the course of a decade, 5,000 doctors have left PR for the States leaving Puerto Ricans with significantly fewer health care providers, particularly within specialty areas of medicine [31], [32].

Outside of the healthcare system, the general public health infrastructure is also compromised [33]. For example, when it comes to public health data, it is difficult to identify and access government data sources that provide demographic and health metrics for the population of

PR. In fact, the Centers for Disease Controls and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS) stands as one of the few US government-based population health monitoring systems that include PR [34]. This lack of population-level data inhibits public health researchers and practitioners from being able to gauge the full scope of health inequities experienced across the archipelago, which includes the main island of PR, Vieques, Mona, Culebra, and other islets [35]. However, the data that do exist, point to a disproportionate and inequitable distribution of disease burden [3].

Figure 1.2. Comparing Key Health Indicators in Puerto Rico, New Mexico, Mississippi, and the United States



Note(s): Data obtained from the US Census Bureau and Centers for Medicaid and Medicare Services, 2019.

1.2.2. *Health Inequities among the Puerto Rican Diaspora Living in the United States*

Members of this Puerto Rican diaspora, which includes individuals who migrated from PR to the States and individuals who were born in the States and identify as Puerto Rican, also experience significant health inequities across a number of health conditions [36]. A 2016 report from the Center for Puerto Rican Studies (Centro) describes higher prevalence of diabetes, heart disease, and serious psychological distress among the Puerto Rican diaspora when compared to other Latinx, as well as non-Latinx whites, in the US (Table 1.1) [37]. Moreover, members of the Puerto Rican diaspora have been found to have higher all-cause mortality, when compared to Cubans and

Mexicans living in the US [23], [38]. Differences in health outcomes of Puerto Ricans, as compared to other Latinx subgroups, are important to note because Puerto Ricans are ethnically classified as Latinx within the US context [39]. Notably, trends in the health disparities observed among Puerto Ricans serve as a contradiction to the "Hispanic/Latinx Health Paradox." This is a phenomenon in the Latinx/immigrant health literature, which suggests that despite Latinx exposure to several risk factors known to produce poor health (e.g., low socioeconomic status) they have better health outcomes than other groups in the US exposed to similar conditions [38]. Disaggregated analyses of the Latinx ethnic category reveal that this is not the case for Puerto Ricans living in the States. In fact, Puerto Ricans often have worse health outcomes when compared to other Latinx subgroups [22], [23], [36]–[38]. However, partially as a result of being lumped within the larger Latinx category in the US [40], the extent of these disparities have been underexplored among Puerto Ricans. Given the disparate distribution of disease burden among Puerto Ricans in the States [1], [37] and PR [3], as well as contradictions within existing literature on Latinx health [38], there is a pressing need to identify and address the unique mechanisms driving health disparities for all Puerto Ricans living in the greater US.

Table 1.1. Prevalence of Select Health Conditions among the Puerto Rican Diaspora, Latinx, and Non-Latinx whites in the United States (excluding Puerto Ricans in Puerto Rico)

Health Condition	Puerto Rican Diaspora	Latinx	Non-Latinx White
Diabetes[a]	36.8%	32.3%	19.1%
Heart Disease[a]	32.4%	24.0%	30.6%
Asthma[b]	22.5%	10.2%	12.4%
Serious Psychological Distress[c]	6.8%	4.1%	3.2%

Note(s): a = 65+ age adjusted percentage; b = 18+ age adjusted percentage; c = age 18+ percentage;
Data obtained from Centro Research Brief, 2016

1.3. The Puerto Rican Political Context

Puerto Rican lives, including their health and well-being, are fundamentally shaped by the colonial relationship that exists between the US and PR [11]. Although all 8.9 million Puerto Ricans living within the greater US (Figure 1.1) are US citizens [24], [41], their political rights vary [11]. In the PR, residents are subject to US constitutional law but are denied the right to vote in US elections [35], [42]. Similarly, the residents of PR are denied full federal representation within US Congress and are subject to restrictive policies that impede the equitable distribution of federal resources [28], [35], [43]. Conversely, members of the Puerto Rican diaspora living in the 50 states are entitled to the full rights of US citizenship, under the Constitution of the US [44]. Once in the States, Puerto Ricans can vote for president and live in regions with federal representation. However, members of the Puerto Rican diaspora experience a distinct set of challenges in the States, including voter suppression [45], [46] and underrepresentation within US Congress [47], in addition to US-based systems of racialization and barriers to societal incorporation [48]. Moreover, the rights gained via migration to the States do not erase the historical and generational connections to the legacy of colonialism for the diaspora or individuals still residing within the US Commonwealth of Puerto Rico [11].

1.3.1. *Political Context in the United States Commonwealth of Puerto Rico*

The US Commonwealth of Puerto Rico has been a colonial territory (of the US) since the Spanish-Cuban-Puerto Rican-Philippine-American-War of 1898, when “ownership” of the territory was passed from the Spanish colonizers to the US empire [49]. Today, PR is home to about 3.1 million residents [41]. Since 1917, the residents of PR have been US citizens, entitled to all of the rights reserved for this privileged group within US society [50]. However, in a poll conducted in 2017, only 54% of Americans polled knew that people born in PR are US citizens [51], [52]. This gap in

the fiber of US societal knowledge leads Americans to dismiss or under-invest in the needs of PR, as the territory and its people are often seen as "foreign" [42], [51]. This American perception should not come as a surprise as the US Supreme Court has defined PR as "foreign to the United States in a domestic sense" since the Insular Cases of the early 1900s [53]. Despite these perceptions, Puerto Ricans remain free to travel between the US and PR as a result of their citizenship status. This privileged access to the continental US, along with the poor health conditions in PR, a 15-year debt crisis, and the devastation on infrastructure after Hurricanes Maria and Irma in 2017 [12], have motivated contemporary mass migration to the States [54], [55].

1.3.2. *Political Context for Members of the Puerto Rican Diaspora Living in the States*

Free from the US constitutional restrictions on PR, the 5.8 million members of the US Puerto Rican diaspora gain access to the full rights of US citizenship, including the ability to vote in presidential elections [56], [57]. Members of the Puerto Rican diaspora also enjoy representation by congressional legislators with voting power (as long as they do not live in Washington DC) [58]. However, Puerto Ricans living stateside are often excluded from the full political, economic and social benefits experienced by white US citizens [44], [56]. Although Puerto Ricans living in the States have legally unencumbered access to public goods, they have socially restricted access to full societal incorporation. Indeed, the results of a qualitative investigation conducted with 90 Puerto Ricans living in Orlando, Florida describes the interpersonal manifestations of this exclusion [44]. Participants described their experiences of psychological distress associated with being asked for proof of US residency or being threatened with deportation, despite their status as US citizens [44]. At the neighborhood-level, new members of the Puerto Rican diaspora are more likely to find themselves in racially segregated low-income neighborhoods, which evidence suggests is linked to worse physical health outcomes for this Latinx subgroup [59].

1.3.3. *Migration between the States and Puerto Rico*

While migration from PR has significantly increased since 2017 [54], [55], the Puerto Rican diaspora has long been established within the continental US [60]. In the late 1800s, before US colonial occupation, Puerto Rican revolutionaries filled the streets of New York coordinating liberation efforts to secure freedom from Spanish rule [61]. By 1898, many of those same Puerto Ricans found themselves under the colonial rule of the very country that had promised allyship and refuge. This new political relationship sparked a series of migratory waves to the US from the archipelago of PR. One of the biggest waves occurred in the mid-20th century with the introduction of Operation Bootstrap – a labor program established to channel Puerto Ricans from PR into manufacturing jobs in the continental US [39]. Indeed, in the 1950s, Puerto Ricans migrating from PR to the continental US outnumbered immigrants moving from any other sending country [62]. Today, the Puerto Rican diaspora is highly concentrated in the US states of New York and Florida, where a combined 2 million members of the diaspora reside; this population has grown to reach nearly double the size (5.8 million) of the Puerto Rican population on the archipelago (3.1 million) (Figure 1.1) [63].

1.3.4. *Puerto Ricans in the Greater United States*

Whether living in the States or PR, Puerto Ricans are US citizens with direct and generational ties to US colonial occupation [35], [42]. Most individuals educated within US systems may dismiss colonialism - defined as “the control or governing influence of a nation over a dependent country, territory or people” [64] - as an imperialist phenomenon of the past, better left for discussions within history books. However, colonial practices and imperialist notions are still present in modern society and undergird the fabric of US institutions [65]. This is illustrated by over 120 years of US territorial status for PR [35], [66], [67] and the second-class treatment of Puerto Rican

citizens [56]. The use of the term *"the greater United States"* is employed to call attention to the fact that US territorial control extends beyond the boundaries of the 50 states of the union [49], as is the case with the US Commonwealth of Puerto Rico [35]. Furthermore, acknowledging the presence of Puerto Ricans across the greater US conceptually connects the broader Puerto Rican community and serves as a reminder of the ways in which US colonial involvement has shaped the distribution of the Puerto Rican community across the US and PR [54], [60]. While it may appear that the political context of PR is only relevant to individuals residing in PR, in fact, Puerto Ricans living in the States find themselves *here* because of US colonial involvement in PR. In the words of Laura Gomez, from her 2020 publication *Inventing Latinos*, "We are here because [they] were [and still are] there (p.19) [39]."

1.4. Outlining and Addressing the Limitations of Prior Health Inequities Research

1.4.1. *The Limits of an Individual-Level Focus in Public Health Research and Working Against this Traditional Approach*

Being that colonial practices persist, there is a need to address the health implications of this structural determinant within the US-based public health inequities literature [64]. Failing to address the implications of colonial structures is particularly detrimental to the cause of eliminating health inequities, as it has been well-established that the health needs of communities cannot be fully addressed without understanding the social, political, and economic conditions that produce these outcomes [68]. However, public health continues to be a field highly concerned with studying and intervening upon lifestyle choices contributing to disease (e.g., diet and exercise) [69], [70]. This focus on individual-level behavioral and lifestyle choices can be observed within the Puerto Rican health disparities literature [2]. For example, the abstract of a 2018 article describing the results of a cross-sectional study about health conditions among adults in PR begins

with a statement indicating that "Puerto Rico is experiencing an economic and healthcare crisis." Yet, it concludes with "[a]dults living in Puerto Rico have multiple lifestyle risk factors [71]." Granted, this investigation may not have been well-positioned to address the relationship between distal factors and health outcomes. However, it serves to illustrate a pattern within the discipline; namely, the trend of acknowledging the context while failing to account for these contextual-level factors within conceptual and analytical models [72].

The field's focus on health behaviors and lifestyle choices should come as no surprise considering public health's historical ties to medicine [73], its early adoption of behavioral science theory [6], and strong focus on educational interventions [74]. While individual-level factors, such as health behaviors, do account for variability in health outcomes [75], they are but one piece of a multi-layered puzzle [14]. A failure to acknowledge *and* address the political context serves to maintain the societal conditions that continue to reproduce health inequities for Puerto Ricans, as well as other politically disenfranchised and marginalized groups in the US [76]. Those of us invested in eliminating health inequities must begin to shift our gaze to the political sphere and apply the tools of the public health practitioner and scientist to the examination of political structures that produce (and reproduce) detrimental population health outcomes.

However, as previously mentioned, the idea that our social, political, and economic environments shape our health is not new [77]. In fact, the field of social epidemiology, a subspecialty within public health, has been elaborating upon the relationship between our social environment and health since the 1950s [78], [79]. Therefore, in honor of the theoretical and historical literature that laid the foundation for many of the conceptualizations described in the pages of this dissertation, Chapter 2 reviews the foundational scholarship that shapes our understanding of the relationship between health and the political environment. This is followed

by consideration of the political determinants of health (PDOH) literature. Chapter 2 concludes with the presentation and description of the conceptual model that guides the empirical studies described within Chapters 4-6 of this dissertation.

1.4.2. *Methodological Limitations in Social Determinants of Health Research and the Introduction of New Techniques*

In 2019, an editorial was published in the *American Journal of Public Health* summarizing some of the key research directions for the future of social determinants health research [80]. As it turns out, a visioning process (i.e., planning meetings focused on future directions) conducted by the National Institutes on Minority Health and Health Disparities revealed that there was a need for overcoming methodological challenges associated with establishing connections between distal societal factors and more proximal health outcomes [80]. This is consistent with the sentiments described by numerous scholars, which indicate that traditional public health methods are not sufficient within this body of work, and they are often limited in their ability to draw causal conclusions [77], [81], [82]. Additionally, as analytic approaches become increasingly complicated by multi-level models and interacting variables, the results produced from these analyses become overwhelmingly difficult for public health practitioners and lay audiences to consume [83]. Furthermore, public health data sources are often missing the variables required to address the relationships between social or structural causes of disease and population health outcomes [84]. Unless these issues are addressed, the field will not be able to robustly address the social, structural, and political determinants of health.

To address the data limitations, and advance this field of study, two of the empirical studies within this dissertation leverage data outside of standard public health sources. In fact, Chapters 4 and 5 describe analyses that utilized data from the Collaborative Multiracial Post-election Survey

(CMPS) collected by scholars in the Department of Political Science at the University of California, Los Angeles [85]. Although this survey is primarily focused on political opinion, it is an interdisciplinary and collaborative effort that collects health measures from several racial and ethnic minority groups, including Puerto Ricans living in the US. Therefore, the use of this data source bypasses public health data limitations, and the resulting findings will serve to advance the fields understanding of the relationships between political factors and health.

The empirical study described in Chapter 6 also serves to address methodological limitations of SDoH research by introducing a new methodological technique (i.e., data curation) to the study of structural data inequities in PR. Data curation involves identifying, collecting, and categorizing data from multiple sources to create an organized database of datasets that can be evaluated on several different metrics of data quality [86]. This technique is generally qualitative in nature and akin to the content analysis approaches used in other social sciences disciplines. In a heavily quantitative field of study, with strong ties to biostatistics, it can be challenging to introduce new methodologies, particularly those that are qualitative in nature [87]. However, it is becoming increasingly apparent that understanding the population-level health consequences of structures of oppression and exclusion, such as the legacies of colonialism, requires innovative methodological approaches.

1.4.3. *Limitations of Counting Latinx as a Homogenous Group and the Need for Data Disaggregation within this Diverse Ethnic Category in the United States*

Throughout the history of the nation, there have been significant numbers of Latinx residing in the greater US [39]. As part of US imperial expansion, the US took large portions of land from Mexico after the 1846-1848 US-Mexico War and acquired PR and Cuba from Spain in the Spanish-American-Cuban-Puerto Rican-Filipino-Guamanian War of 1898 [39], [49]. These are two

historical markers for when individuals belonging to Latinx communities "officially" became a part of the US national fabric. However, national demographic and health data systems did not document Hispanic/Latinx ancestorial information until the 1980s [39], [49]. When the US finally began "counting" Latinx, 6.5% of the US population self-identified with this group. Four decades later, Latinx make up over 18% of the US population and, by 2060, it is projected that Latinx will represent 30% of the US population [39], [88].

Despite their size, the struggle for representative data within the Latinx community, including disaggregated data for Latinx subgroups, persists today [86]. Several studies have identified significant coverage gaps among Latinx subgroups, including Puerto Ricans, within US-based population monitoring and health surveillance systems [15], [86]. While data may be available for the aggregate Latinx group, the ability to identify subgroup-specific differences in demographic or health outcomes is compromised. Unfortunately, without clear, consistent and standardized indicators for race, ethnicity and ancestry, population-level health monitoring and surveillance data are unable to establish a baseline understanding of the health disparities experienced across this heterogeneous group [15]. Furthermore, matters surrounding data collection, and establishing baselines of health outcomes among Puerto Ricans, are complicated by the fact that the entire territory of PR is often missing from US-based public health monitoring and surveillance systems.

Throughout this dissertation, efforts are made to highlight communities that are often erased by systems of racial and ethnic categorization in the US. This intentional effort is most prominent in the selection of the target population – Puerto Ricans in the greater US. However, it is also seen in the literature that is described across each chapter of this dissertation, which uplifts the publications that are often found at the margins of public health scholarship. For example,

Chapter 2 incorporates the works of international scholars who are frequently underappreciated in the US scientific literature and who argue for the inclusion of colonialism [64] and territorial status [89] as broader social determinants of health. Additionally, scholarship from those who focus on indigenous health and historical trauma (also underappreciated) informs the conceptual model used to guide this dissertation [90]. On a more practical level, the studies presented in Chapters 4 and 5 work against systems of racial and ethnic categorization by engaging in analyses that embrace the heterogeneity within the Latinx community. Overall, meaningful efforts are made throughout this dissertation to make visible what is often invisible – whether it be communities, concepts, or theoretical perspectives.

1.5. Conclusion

Given the colonial relationship that exists between the US and PR and the persistent and underexplored health inequities experienced by the Puerto Rican community in the greater US, there is a need to focus on the political determinants of health (PDoH) [91]. These determinants play a role in shaping the conditions under which we live, work and recreate because they relate to the societal structures that govern our lives, such as policies, legislators, and political relationships [91], [92]. Therefore, the PDoH have implications for life chances and shape opportunities for health and well-being. Within the context of Puerto Rican health, failure to account for the PDoH ignores the potential health consequences of the historical legacy of colonialism and political disenfranchisement in PR. Therefore, this dissertation examines how the PDoH affect the health outcomes of Puerto Ricans living within the greater US, including individuals living in the States and PR. The following chapter reviews the theoretical literature that preceded the development of the PDoH model, as well as the conceptual framework that guides the empirical investigations within this dissertation.

CHAPTER 2.

LITERATURE REVIEW AND CONCEPTUAL MODEL

Chapter 2. Literature Review and Conceptual Model

2.1. Overview

It has been well-established that social, political, and economic factors shape population health outcomes [68], [77], [82]. However, the influence of political structures, such as governmental institutions or political legislation, remain underexplored [93]. These political determinants of health (PDoH) are particularly relevant for the study of Puerto Rican health inequities. As the oldest colony in the world, Puerto Rico (PR) has endured the legacies of Spanish and United States (US) colonial occupation for more than 500 years [35], [94]. Recently, social science scholars have begun to name and explore the connections between the political determinants produced by this colonial relationship and health outcomes in PR [2], [3], especially after the natural disasters of 2017 [11], [95]. However, the health implications of this political relationship have been understudied among Puerto Ricans living in the greater US [64], [96].

For the purposes of deconstructing the political powers driving health outcomes, the theoretical underpinnings that support and motivate questions about political structures and health must be explored. Therefore, this chapter focuses on a number of instrumental theories as they relate to our understanding of politics - defined here as "the constrained use of social power [97]" - and its implications for the health of the public. Following a review of the theoretical literature, the newly introduced PDoH model is described. The chapter concludes with a presentation and explanation of the conceptual model used to guide the empirical studies within this dissertation, which was heavily informed by the PDoH model. As a final note, in an intentional effort to acknowledge the power and permanence of historical context, this piece has been written with chronology in mind and begins with a brief history on public health and politics.

2.2. Political Structures and Population Health: A Theoretical and Historical Review

2.2.1. *A Brief History of Public Health and Politics*

Historically, politics, policies, governments, and polities have been seen as macro-level, distal factors that could not be related to micro-level, proximal health factors. The health and well-being of individuals, often served by the efforts of clinicians and health practitioners within medical settings, appeared to be separate from the political sphere of society. Outside of health policy, public health and medical research has been largely focused on the individual-level indicators that give rise to poor health outcomes and health disparities, including risky health behaviors and predisposing biological and genetic characteristics [98]. This medicalized, individual-level focus has detracted attention from the societal-level factors that structure people's daily lives and leads many to ignore the macro-level agents driving health inequalities.

However, beginning in the 1950s, the field of epidemiology, a specialization within the field of public health, began to recognize the implications social, political, and economic conditions had for the health of populations [99], [100]. In the year 1950, Albert Yankaur, heralded public health advocate [79], published the first article written explicitly naming social epidemiology as a sub-specialty, which empirically assessed the relationship between residential segregation (societal-level factor) and fetal and infant mortality (health outcome) [78]. In the 1960s and 1970s, social movements (e.g., Civil Rights Movement, Women's Movement, Anti-War Movement) motivated a generation of scientists to question theories of behavioral and biological determinism used to interpret population disease distributions and worked towards defining social determinants of health (i.e., social factors as causes of disease) [101]. These scholars pushed against preconceived notions, established in the early 19th century, that true science was meant to

be apolitical [100], [101]. Further, social epidemiological scholars called upon the field to make connections between the etiology (cause or set of causes) of disease and political structures [102].

2.2.2. *Theoretical Perspectives in Social Epidemiology*

If "epidemiologic theory […] seeks to explain extant and changing population distributions of health, disease, and death, within and across societies, over time, space, and place [102]," a thorough examination of political structures is necessary and essential. This call for political and economic perspectives to population health was answered in 1979, when Lesley Doyal published *The Political Economy of Health.* This text summarizes the tone of the social epidemiologic theoretical literature of the time, which largely focused on the social production of disease [99]. The literature leading up to this publication, and increasingly in the years since, posits that economic and political institutions perpetuate the divide amongst the "haves" and the "have nots." It is, therefore, the differential allocation of resources, at the expense of the disadvantaged for the benefit of the privileged, that gives rise to health inequalities [99]. For those working in health promotion, this broad theoretical framework serves as a guide in identifying pertinent political, economic, historical, and social pressures implicated in forging complex public health problems [103]. By asserting that resources are allocated according to power, the political economy framework provides the foundation for building connections between politics, or "the constrained use of social power [97]," and population health outcomes.

2.2.3. *The Socio-Ecological Model*

Literature on the political economy of health has served to establish the importance of these structural factors; however, it is limited by a top-down approach to the analysis of health outcomes. In the real world, there are factors at multiple-levels of human existence that may account for the differential health outcomes observed at a population-level. Furthermore, each level interacts and

informs the other, in a reciprocal fashion that does not align with a unidirectional top-down approach. Here is where theoretical models such as Bronfenbrenner's Ecological Systems Theory [104], from the discipline of developmental psychology, informs public health and highlights the interconnectedness of the multiple levels of the human environment [105]. In Bronfenbrenner's extensive research with children, he finds that contextual factors at the micro-, meso-, and macro-levels all impact a child's developmental progression [104]. Among others, McLeroy and colleagues [106], extend this idea into public health promotion and intervention work in the form of an ecological model or the socio-ecological model [14], [107].

The socio-ecological model proposed a multilevel approach to public health promotion and outlined five key levels of influence on individual health behavior: (1) intrapersonal, (2) interpersonal, (3) institutional, (4) community, and (5) public policy. Most visual figures of this model depict concentric circles representing different levels of human ecology (e.g., intrapersonal, interpersonal, etc.), which are intended to communicate the interconnectedness of the factors that live within each of the model's domains. At the *intrapersonal* level, factors contributing to health outcomes within the individual are considered, such as predisposing genetic characteristics or individual knowledge and beliefs. At the *interpersonal* level, the social environment is considered, such as family ties and social networks. The *institutional* level considers the role of organizations in health, such as schools or the workplace, where many spend a significant portion of their lives. While the *community* level focuses on relationships between organizations or institutions. Finally, the *public policy* level encompasses the full spectrum of governmental influence as it pertains to the roles of laws and policies in determining health outcomes. As demonstrated by the inclusion of all these levels, a foundational assumption of this model is that individual-level factors cannot account for all the observed variability in health outcomes. Therefore, the socio-ecological model

aligns with social epidemiological efforts to call attention to social and structural factors that determine health, including the political environment.

2.2.4. *Ecosocial Theory*

The political economy of health framework and the socio-ecological model were instrumental in shifting public health thinking. However, these frameworks and models are limited in that they do not describe the specific pathways through which negative health outcomes are perpetuated. In other words, they cannot address the question of how a policy-level factor turns into poor health within the body of an individual. This is where Krieger's Ecosocial Theory [81] and concepts of embodiment [108] seek to fill in a conceptual gap in the literature. In a 1994 publication, Krieger argues that it does not suffice to identify a structural agent as a cause of disease [81]. Epidemiological researchers must go a step beyond this to identify the ways in which structural forces are embodied; referring specifically to the ways in which the material and social world we live in are incorporated into our biology [99]. Attempts to measure the biological markers of environmental stressors have resulted in a body of literature reporting on allostatic load, indicator of 'wear and tear' on the body [109], within populations experiencing systemic stressors [110]. Allostatic load has been used to assess the physical embodiment of place-based exposures [111], early childhood poverty [112], and racial discrimination [113]. This provides evidence for the linkages between environmental factors and human biology and how they work in concert to give rise to differential health outcomes.

While the concept of embodiment is a tremendous contribution to our understanding of the physical manifestations of our social environments, it is but one component of the ecosocial theory [108]. As a leader in the field of social epidemiology, Nancy Krieger has developed a theory that is inclusive of a number of models, theories, and frameworks, including some that have already

been discussed [81]. The fundamental principles of ecological models have been adapted and included as societal and ecosystem levels; (1) individual, (2) household, (3) area, (4) regional, (5) national, and (6) global [108]. These levels are extremely similar to those outlined by the socio-ecological model; however, they also incorporate a global perspective. This is especially pertinent as it relates to the constructs of historical context and generations. For example, when assessing the health outcomes of indigenous populations in the US, it is impossible to separate the historical and generational implications of European colonization and genocide when assessing modern day health outcomes within these communities [114]. This theory honors such histories and encourages researchers to seek methodological means of assessing and quantifying the effects of these constructs. Additionally, this approach seeks to work against a particularly pervasive theme – the predominantly US and Eurocentric perspectives that permeate this literature. Unfortunately, the theoretical and empirical work of social epidemiology has largely ignored non-dominant perspectives, such as those of the global South, as well as immigrant and indigenous communities (to name a few) [102].

2.2.5. *The Social Determinants of Health*

In the 1990s, as the socio-ecological model and the ecosocial model were making their way across the public health literature, another major thread of scholarly and empirical work appears to be pointing towards a paradigm shift in the field [13], [77], [115]. Notable public health institutions, such as the World Health Organization, began to fund research projects with an emphasis on social factors and started to produce reports that acknowledge the need for public health intervention outside of medical and clinical settings [116]. In the US, and more so abroad, the number of articles published that mention the key word “social determinants” climbed steadily across the 1990s and 2000s [77]. A particular language formed as the body of work on the social determinants of health

grew. Scholars and practitioners began to refine and differentiate social determinants as "downstream" and "upstream" [77]. As such, the proximal, individual-level factors, like medical care and personal health behaviors, were characterized as *downstream social determinants of health*. In contrast, the distal economic, political, and cultural factors described by the political economy of health framework, which would be located within the most outer rings of the socio-ecological model, were defined as *upstream social determinants of health*.

This framework exists in stark contrast to the heavily psychological approach of generations past, where the emphasis was primarily on health behavior change at the individual-level [106]. Although the permanence of the behavioral sciences in public health work is still evident today [6], this upstream and downstream approach is intended to encourage the inclusion of proximal and distal factors across the social spectrum. Promisingly, this approach has migrated from the literature into public health training. This change has resulted in new additions to the health workforce that aim to solve public health problems by addressing the barriers to health that exist in the spaces where we live, work and play [117]–[119]. However, more work is needed to increase attention to the structural determinants of health [120], including political structures.

2.2.6. *The Path Forward: Considering the Historical Context and Theoretical Literature*

Public health, population health, and social epidemiology have made great strides in acknowledging the role of social factors in structuring health outcomes since the 1950s, when the first article to mention social epidemiology was published [99]. Since that time, theoretical frameworks such as the political economy of health [121] and the social determinants of health [122] have emerged and matured. In addition, the development of the socio-ecological model [104], [106] and ecosocial theory [81] have advanced efforts to focus public health attention on structural, social, and systemic causes of disease. As the field moves into the 2020s, new literature

at the intersection of politics and health is increasingly emerging and points to an area of research that is primed for scholarly pursuit.

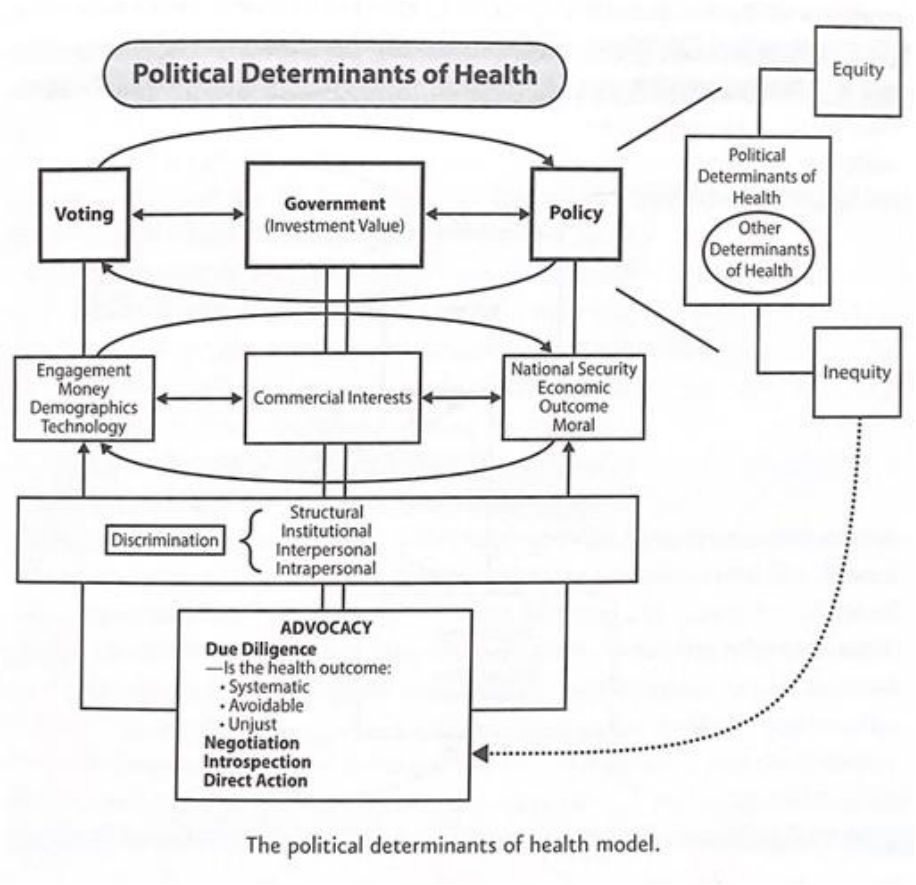
2.3. The Political Determinants of Health

In his 2020 publication, Daniel E. Dawes, states that "[the] [p]olitical determinants of health (PDoH) involve the systemic process of structuring relationships, distributing resources, and administering power, operating simultaneously in ways that mutually reinforce or influence one another to shape opportunities that either advance health equity or exacerbate health inequities (p.44) [92]." These PDoH are derived from systemic processes, within the political sphere of society, that act upon the social determinants of health (e.g., housing, education, health care) and structurally prevent individuals belonging to non-dominant groups (e.g., communities of color) from securing health equity. Three key domains are named: (1) *voting* – as in the voice of the electorate; (2) *government* – the elected decision makers; and (3) *policy* – the codified decisions of the elected representatives (Figure 2.1) [92]. These overarching political structures play significant roles in shaping the nature of differential health outcomes.

One of the most studied political determinants is policy, and health policy more specifically, because of its obvious connection to health issues. For example, the Affordable Care Act (ACA), which was enacted in 2010, extended health insurance coverage to millions of low-income Americans to reduce coverage gaps within this population [123]. One investigation found that, three-years after the ACA was implemented, it had eliminated 43% of health insurance coverage gaps for individuals belonging to low-income groups and had reduced racial disparities in coverage by 23% [124]. This is a strong example of how policy can work to structure health outcomes. Further, many will remember that President Barack Obama was an influential figure in advancing health care reform in the US. In fact, the ACA is often referred to as "Obamacare." This

is an illustration of the role that the government - the executive branch in this case - can play in shaping health outcomes [123]. The third domain, voting, is not commonly studied in the field of public health. However, in his text, Daniel Dawes does point to some studies that link voting and health (pp.50-58) [92]. For example, he cites a study that found that, in 2016, illness or disability was listed by one in ten registered voters (in the US) as the reason they were unable to vote [92]. Similarly, studies have found that individuals who vote are also likely to report better health [125]. However, the structuring effects of voting on health are underexplored [126]. Similarly, structures of government (e.g., democracies, colonial relationships) and policies, outside of the health policy arena, as they related to health inequities, are also under-investigated in public health.

Figure 2.1. The Political Determinants of Health Model (Dawes, 2020, p.49)



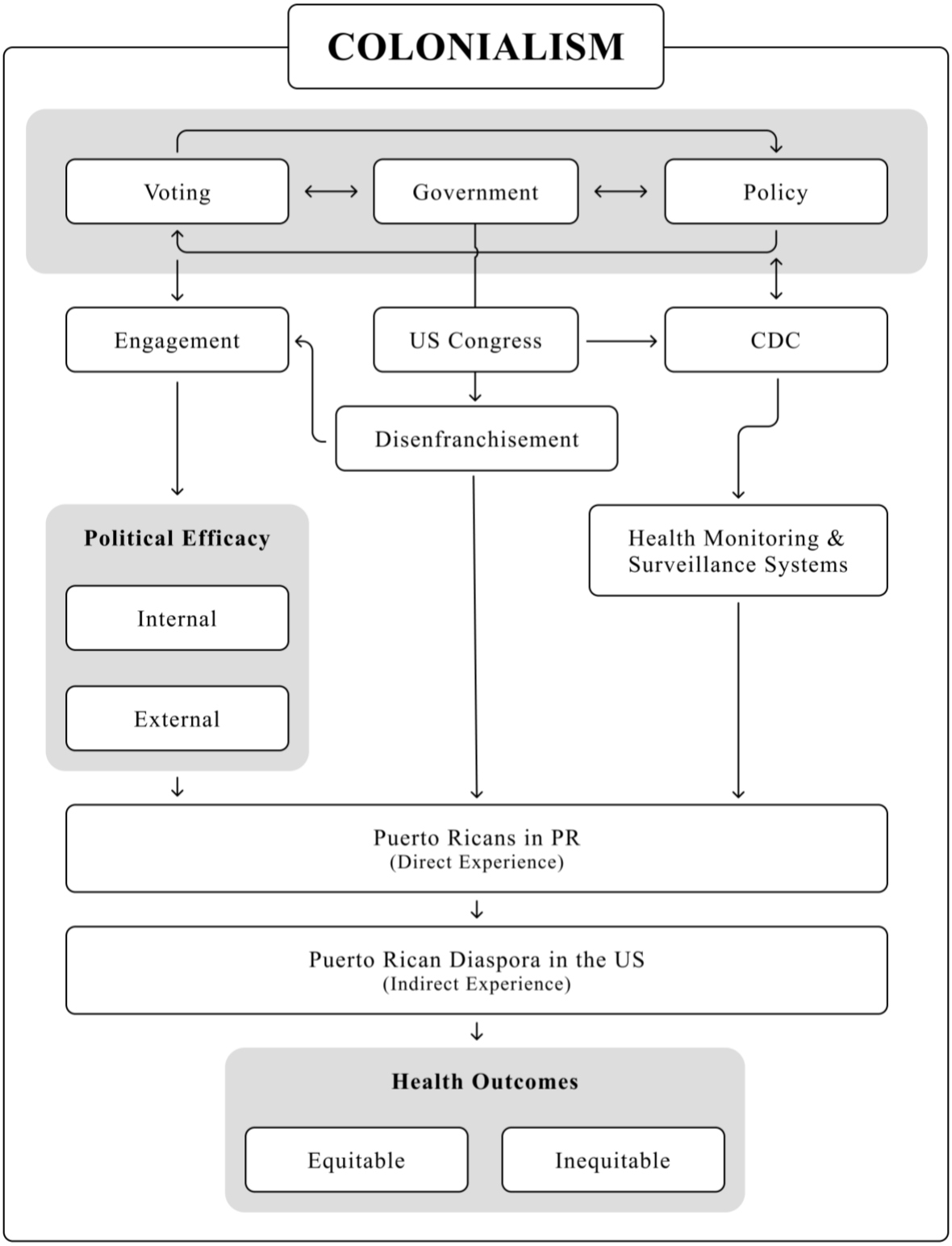
The political determinants of health model.

At its core, the PDoH model was developed with health advocates in mind [92]. Indeed, Dawes gained a great deal of his experience and notoriety through his studies of the policy trajectory of the ACA and the history of advocacy that made the ACA possible [123]. His knowledge of the policy process informed the development of each domain and construct within the model and was designed to support the development of strategies to address racial and ethnic health inequities. Therefore, the PDoH model was used as an organizational framework and was implemented to support the development of the overall conceptual model used to guide the three empirical investigations conducted as part of this dissertation.

2.4. Conceptual Model for the Present Dissertation

Given the nature of the colonial relationship that exists between the US and PR, which produces the unique context under which voting, policy, and government act upon the health and well-being of Puerto Ricans, the conceptual framing provided by the PDoH model emerged as an appropriate fit for this dissertation. However, this model is relatively new within the literature and has not previously been applied to the Puerto Rican context. Therefore, the PDoH model was adapted for the purposes of addressing health inequities among Puerto Ricans living in the greater US. The model was further augmented by the incorporation of additional theoretical concepts and constructs found within the social science literature. This adaptation and augmentation were conducted with the goal of identifying specific, measurable, and testable pathways through which the influence of these political mechanisms could be assessed. To that end, only specific constructs depicted in the original model are included within the conceptual model used to guide this dissertation. This section now turns to the presentation of the conceptual model and the description of the domains and concepts depicted in Figure 2.2.

Figure 2.2. The Political Determinants of Puerto Rican Health Inequities Conceptual Model



2.4.1. *Colonialism and the Political Relationship between the United States and Puerto Rico*

Puerto Rico is a colony of the United States of America [35], [66], [67].

That statement may cause a great deal of discomfort and may be unsettling to read, particularly for those of us educated and socialized within the US context [127]. This is largely because of the great efforts made by anti-imperialists in the US, after the second World War, to place distance between colonial practices and the expansionist ambitions of the young nation in the wake of shifting attitudes towards empire building [49], [65]. However, when PR became a US territory in 1898, the US openly identified as a colonizing power around the globe [49]. In fact, by the 1940s, 12.6% of the nation's population consisted of colonized subjects outside of the formally incorporated states [49]. While the status of many of these colonized subjects and the lands they reside upon (former US territories) have since shifted (e.g., Hawai'i became a state; the Philippines was granted independence), PR remains a colony – denied self-determination under the US Constitution [42], [49], [128].

The legacy of colonialism runs deep and transcends global spaces and time. As a result, there are many definitions of colonialism and several schools of thought surrounding the topic [65], [127], including within the health literature [64], [89], [114]. For the purposes of this dissertation, as informed by the work of decolonization scholars [127], colonialism is defined as the expropriation and extraction of natural resources from the native lands, peoples, plants, and animals for the purposes of building wealth and supporting privilege for the external controlling force. This definition is further refined and applied to the Puerto Rican context by naming the US as the external controlling force or the colonizer, the Puerto Rican archipelago as the colonized territory, and the Puerto Rican people as the colonized subjects.

The influence of this colonial relationship also extends outside of the colonized territory of PR and shapes the composition of the Puerto Rican diaspora in the States. First, the US citizenship status granted to Puerto Ricans provides unencumbered access to the 50 states of the union [56]. Secondly, labor programs and military initiatives were formed to incentivize migration from PR to fill US-based needs for laborers and service members [39], [129]. Third, US capitalist ambitions altered the Puerto Rican economy from one that was agriculturally-based to one more industrially-focused, thus compromising the economic security of the archipelago [35]. This, in turn, forced many Puerto Ricans to leave the archipelago in search of economic opportunities [130]. The list could continue, as the US and PR have a long shared history; however, these three examples are quite illustrative of the point – the Puerto Rican diaspora is shaped by the colonial relationship that exists between the US and PR [131].

Although not commonly discussed as it relates to health inequities for Puerto Ricans living in the greater US, scholars have discussed the implications of colonialism on health within the Indigenous Studies' literature. In 2006, Michelle Sotero published a piece in the *Journal of Health Disparities Research and Practice* in which she presents a conceptual model of historical trauma [90]. Within this article, the author outlines how the subjugation of a population produces displacement [129], violence [66], economic destruction [132], and cultural dispossession [133], all of which have been experienced by the Puerto Rican community and are posited to result in negative health outcomes [90]. Sotero describes these negative health outcomes as the "trauma response," which can manifest in the form of depression and other forms of psychological distress [134] or physical responses that create ideal conditions for chronic diseases to emerge, such as diabetes [135] and hypertension [136]. Again, all these health outcomes have been observed at disproportionate rates within the Puerto Rican population in the greater US.

Scholarship in this area continues to emerge in the social sciences. In 2011, Karina Czyzewski, then at the University of Toronto, published a piece in *The International Indigenous Policy Journal*, arguing that colonialism should be treated as a broader social determinant of health [64]. In 2016, Yin Paradise, a scholar in Australia, published a paper examining the role of colonization and racialization in shaping indigenous health within settler-colonies, such as the US [114]. Most recently, in 2020, scholars in Guam, Hawai'i and California, co-authored a manuscript in which they argue that US territorial status is a social determinant of health for the indigenous people of Guam [89]. Throughout the decades, these scholars have been calling attention to a phenomenon that has been impacting health for centuries – colonialism, in its many shapes and forms. However, this topic is consistently underexplored as it relates to racial and ethnic health disparities, particularly in the US. Therefore, this dissertation intends to make connections between this US colonial history and Puerto Rican health inequities using key domains and constructs within the PDoH model, including government, voting, and policy [92].

2.4.2. *Government*

Based on the PDoH model, government is simply defined as *the elected decision makers [92]*. In the US, this includes the president, senators, and congressional representatives, to name a few. These decision makers are elected by US citizens who vote in US elections. Additionally, these decision makers create laws and implement policies that affect various levels of government and society. Fundamentally, these are the basic ideas behind the ways in which government, voting, and policy are meant to work in concert to support US democracy [92]. However, this does not align with the ways in which Puerto Rican people experience the US government.

Puerto Rico is ruled under the US Constitution and has been federally controlled by the US Congress since 1898 [137]. In 1917, Puerto Ricans in PR were granted US citizenship [49].

Although all Puerto Ricans are US citizens, residents of PR do not have the right to vote in federal elections [49], [57]. Puerto Ricans are also lacking equitable representation in Congress. Since 1902, PR has had congressional authorization for federal representation by a Resident Commissioner who is recognized as a member of the US House of Representatives; however, that representative does not have voting privileges and cannot vote on new federal legislation in the US [138]. In these ways, Puerto Ricans living in PR are politically disenfranchised citizens who do not have representation in Congress or the right to vote in US elections. Conversely, Puerto Ricans who migrate to the States or are born in the States are represented by state and district officials and can vote in federal elections. However, Puerto Ricans in the States, also known as the Puerto Rican diaspora, are connected to experiences of political disenfranchisement through generational ties (i.e., parents and/or grandparents who migrated from PR to the States); as well as the historical legacies of colonialism, including the loss of cultural knowledge and language [90]. As described above, these experiences with historical trauma give rise to a trauma response that can produce detrimental health outcomes [90].

US colonial control and influence over PR also imposes US-based conceptions of race and ethnicity onto the Puerto Rican people [139]. These systems of racialization and ethnic classification place Puerto Ricans below non-Latinx whites and within the larger Latinx category in the US [39]. Therefore, these systems of racial classification leave Puerto Ricans at a disadvantage within a society that locates non-Latinx whites at the top of the racial hierarchy. Indeed, these racial systems are known to produce a disproportionate burden of disease and mortality for individuals belonging to the non-dominant group [140], which includes Puerto Ricans in the US [139]. While this racialization is applied regardless of geographic location, Puerto Ricans in the States experience these racial forces as racial/ethnic minorities living outside of the

archipelago of PR. Therefore, despite the full access to voting rights and political representation enjoyed by the diaspora, they are still seen as second-class citizens [56]. In PR, these systems of racial and ethnic classification often result in the exclusion or erasure of the Puerto Rican people within US-based systems, including US government-funded health programs [11]. Although not addressed within this dissertation, it is also important to note that PR has its own unique systems of racialization, largely informed by both Spanish and US colonial influence, which shape health outcomes within the archipelago [141], [142]. However, this dissertation is intentionally focusing on US-imposed structures and their implications for health. Therefore, the complexities of racial hierarchies in PR are reserved for future exploration.

2.4.3. *Voting*

Through the act of voting, *the voice of the electorate* is meant to inform the selection of the representatives that shape government and policy [92]. However, as aforementioned, voting is complicated for the Puerto Rican community, as there is geographic variability in voting rights for Puerto Ricans [143]. However, the same phenomenon that creates variability in enfranchisement also serves to bind the Puerto Rican community living in the greater US - ancestral ties to the legacy of historical and continued US colonial occupation of PR. For Puerto Ricans living in the greater US, this common exposure influences engagement within the US political system [144], [145]. For Puerto Ricans in PR, the influence on engagement is direct, meaning Puerto Ricans in PR cannot vote in US federal elections. Within the diaspora, Puerto Ricans who were born in the States experience an indirect connection to this history, while Puerto Ricans born in PR have both direct and indirect experiences with political disenfranchisement at the hands of the US government. However, the influence of these variations in exposure to disenfranchisement on the political engagement of the Puerto Rican diaspora is underexplored [146].

From a public health perspective, political engagement has been tied to health outcomes, such that individuals who are more civically engaged are more likely to report better health outcomes [147]. Additionally, scholars have begun to make connections between voter suppression and political disenfranchisement and health, such that exclusion from the voting process is likely to result in poor health outcomes for disenfranchised communities [126], [148]. As presented in the conceptual model, this dissertation explores the role of direct and indirect exposures to political disenfranchisement on political efficacy – the belief that one can influence political outcomes [149]. Notably, political efficacy has been established as a predictor of political engagement [150] and, therefore, is used as a more proximal construct to explore the connections between the influence of political disenfranchisement and health.

2.4.4. *Policy*

Policy is defined as *the codified decisions of the elected representatives* [92]. In PR, residents are subject to US congressional rule, which includes the US-based policies enacted through federal legislation. However, because of PR's status as a territory, there is great ambiguity surrounding the implementation of US congressional mandates in PR [16], [151]. As a product of congressional legislation, this includes programs implemented and maintained under the Centers for Disease Control and Prevention (CDC) [152]. Established in 1946, the CDC is an operating division of the Department of Health and Human Services, which is administered by the Secretary of Health and Human Services - a position that is appointed by the US President and approved by the US Senate [152], [153]. Funding for the Department of Health and Human Services and its divisions, which includes the CDC, is approved by Congress as part of the US federal budget [154]. With the allotted funds, the CDC is tasked with national prevention and control of disease, injury, and disability by providing science-based support to local and state health departments within the US

[152], [155]. As a product of federal legislation and congressional budgetary approval, the CDC represents the codified decisions of the elected representative in action. Therefore, the CDC is a product of US policy that is meant to be inclusive of the entire nation [156].

It stands to reason that, as a territory of the US, PR would be included within the CDC's mandate. In fact, there have been several programs funded by the federal government and implemented by the CDC, that intentionally included PR. For example, the Malaria Control in War Areas program, which is the program that marks the birth of the CDC in the US, included PR [157]. However, because of PR's status [16], the full scope of coverage of PR by the CDC is unknown, particularly when it comes to public health monitoring and surveillance systems. These include population data collection efforts to track and prevent communicable and non-communicable diseases [158], such as the National Health Interview Survey [159] or the National Outbreak Reporting System [160]. Therefore, as part of this dissertation, the CDC's coverage of PR within public health monitoring and surveillance systems will be addressed to determine how US colonial forms of government impact these essential systems in PR.

2.5. Conclusion

Puerto Rican health inequities will persist unless we empirically address the ways in which the colonial relationship between the US and PR manifests into PDoH for the Puerto Rican population living in the greater US. Therefore, the PDoH model has been adapted for the purposes of guiding the three empirical papers included within this dissertation. The next chapter presents an overview of the studies conducted to examine the political determinants of Puerto Rican health inequities.

CHAPTER 3.

OVERVIEW OF THREE EMPIRICAL INVESTIGATIONS TO EXAMINE THE POLITICAL DETERMINANTS OF PUERTO RICAN HEALTH INEQUITIES

Chapter 3. Overview of Three Empirical Investigations to Examine the Political Determinants of Puerto Rican Health Inequities

3.1. Dissertation Overview

Puerto Ricans are an ethnic and racialized minority who experience health disparities across numerous health indicators [161], [162], [22], when compared to other Latinx subgroups and non-Latinx whites living in the United States (US). Additionally, Puerto Ricans have a complex political relationship with the US, marked by colonial subjugation, systemic exclusion, and political disenfranchisement [35], [66], [67]. Given what is known about the structuring role of the political environment on life chances and well-being [102], it is reasonable and appropriate to engage in the process of scientific inquiry to uncover the ways in which political structures give rise to multi-level mechanisms that produce health inequities. For public health researchers interested in solving the puzzle that is the persistence of Puerto Rican health inequities, there is a need to bring attention to the political determinants of health (PDoH).

3.1.1. *Research Question*

How do the political determinants of health affect the health outcomes of Puerto Ricans living in the greater United States? This research question is explored using unique conceptual and empirical research strategies across three separate studies. In this dissertation, this includes examining associations between individual-level political mechanisms and health perceptions among members of the Puerto Rican diaspora as compared to other Latinx and non-Latinx whites (Study 1/Chapter 4); assessing the relationship between political perceptions and health perceptions among members of the Puerto Rican diaspora born in the States as compared to individuals born in PR (Study 2/Chapter 5); and examining the role of US governmental systems and institutions in maintaining population health systems in Puerto Rico (PR) (Study 3/Chapter 6).

Defining the Population of Interest. The Puerto Rican population is distinctly defined within each of the three proposed studies. The entirety of this dissertation is concerned with *Puerto Ricans living in the greater US* - an inclusive term meant to encompass members of the Puerto Rican diaspora living stateside and individuals residing within the archipelago of PR. Defining the Puerto Rican population in this manner is an intentional attempt to conceptualize a set of peoples in a way that honors their shared histories, ancestries, and generational ties to colonial subjugation [93]. However, recognizing that there are geographic differences in political experiences within the Puerto Rican population, each of the papers focuses on a specific subset of the Puerto Rican population in the greater US. *Study 1* focuses on the Puerto Rican diaspora as compared to other Latinx and non-Latinx whites; *Study 2* focus on within-group differences among Puerto Ricans by comparing members of the Puerto Rican diaspora who were born in the States to individuals born in PR; and *Study 3* focuses on the Puerto Rican population in PR.

Data Sources. This dissertation also leverages two distinct data sources. Each were employed to accomplish the study aims and are fully described within the method sections of each study:

(1) *The Collaborative Multiracial Post-election Survey (CMPS)* is conducted every four years by investigators in the Department of Political Science at UCLA and serves as a rare data source that houses both health and political indicators. The 2016 CMPS includes a sample of Puerto Ricans living in the States, as well as other Latinx groups, and non-Latinx whites. The CMPS is used to conduct secondary analyses within Studies 1 and 2.

(2) *The Curated Database of Public Health Monitoring and Surveillance Systems* was built and curated for the purposes of executing the aims outlined in Study 3. This database houses a curated list of systems maintained and supported by the Centers for Disease Control and Prevention (CDC) in the 50 states, Washington D.C., and the territory of PR.

3.2. Study 1 Overview

An Examination of the Association between Political Efficacy and Self-Rated Health: A Subgroup Analysis of Puerto Ricans, Other Latinx, and Non-Latinx whites. Previous investigations have demonstrated associations between political participation (or civic engagement) and health outcomes, such that individuals who are engaged are also more likely to have good health [147]. Political efficacy, or the belief that one can influence political outcomes [149], has been identified as a significant predictor of political participation. However, the relationship between political efficacy and health perceptions has been underexplored. Communities of color in the US, which includes Puerto Ricans and other Latinx subgroups, have disproportionately experienced barriers to political participation [148] and also experience several health inequities [163]. However, the influence of these experiences on health perceptions, by way of political efficacy, have not been explored. *The purpose of this study is to examine the association between political efficacy and self-rated health among several racial/ethnic subgroups*, including individuals who identify as members of the Puerto Rican diaspora, other Latinx, and non-Latinx white in the US by conducting a secondary analysis of quantitative data collected through the 2016 CMPS (Chapter 4).

3.3. Study 2 Overview

The Association between Political Efficacy and Self-Rated Health among Members of the Puerto Rican Diaspora. Given the existing connections between the political context of PR and the experiences of the Puerto Rican diaspora [130], the limited nature of the literature on Puerto Rican health disparities [1], and the current gaps in our understanding of political determinants of health [92], there is a need to study how political factors (e.g., political efficacy) influence health outcomes (e.g., self-rated health) within the Puerto Rican diaspora. Additionally, focusing on the

Puerto Rican diaspora is an important contribution to the Latinx health disparities literature, which has traditionally produced scholarship that ignores the heterogeneity within the Latinx population [164]. Therefore, *the purpose of this study is to assess the association between political efficacy and self-rated health among members of the Puerto Rican diaspora born in the State and individuals born in PR* by conducting stratified secondary quantitative analyses, focusing on the Puerto Rican subsample, using 2016 CMPS data (Chapter 5).

3.4. Study 3 Overview

Data Gaps in Health Monitoring and Surveillance Systems: The Case of the United States Commonwealth of Puerto Rico. Strategies to change the political mechanisms that structure life chances and opportunities for health among Puerto Ricans must interrogate the societal structures that produce differential outcomes. Therefore, in Study 3, the role of government in producing Puerto Rican health inequities is assessed through the examination of the CDC-supported health monitoring and surveillance systems. These systems are responsible for tracking disease and health status within a population [158]. As the nation's leading disease prevention bureau, also considered the "gold standard" across the globe [153], the CDC should be held to the highest standards of public health prevention practices. This involves appropriate and inclusive data coverage of all US citizens, including individuals residing in the US Commonwealth of Puerto Rico. Therefore, *the purpose of this study is to assess the coverage of PR in existing US-based health monitoring and surveillance systems with the goal of identifying the data gaps within government-led systems responsible for tracking health metrics among Puerto Ricans living on the archipelago of PR*, through the process of building and analyzing a curated database of CDC-supported health monitoring and surveillance systems (Chapter 6).

CHAPTER 4.

ASSOCIATION BETWEEN POLITCAL EFFICACY AND SELF-RATED HEALTH: A SUBGORUP ANALYSIS OF PUERTO RICANS, OTHER LATINX, AND NON-LATINX WHITES

Chapter 4. Association between Political Efficacy and Self-Rated Health: A Subgroup Analysis of Puerto Ricans, Other Latinx, and Non-Latinx whites

4.1. Introduction

4.1.1. *Disparities in Self-Rated Health*

In the United States (US), racial and ethnic minorities experience a number of health disparities when compared to whites [165], [166]. Individuals who identify as part of the Latinx community (also referred to as Hispanic or Latino/a/e/@ [17], [18]) have been found to experience a disproportionate number of health disparities [167], including differences in self-rated health (SRH) when compared to non-Latinx whites in the US [168]. Findings in the Latinx health literature are mixed [169], [170], such that there is some variability in SRH outcomes depending on which Latinx group or subgroup is assessed. Among aggregate Latinx groups, there is evidence to support that individuals living in the US who identify as Latinx are more likely to report poor to fair levels of SRH when compared to non-Latinx whites [22], [171]. However, significant differences in SRH have also been observed among Latinx subgroups [172]. For example, studies have demonstrated that individuals who identify as Puerto Rican are more likely to report lower levels of SRH when compared to other Latinx subgroups, including Mexicans and Cubans, and non-Latinx whites in the US [22].

These findings are of particular import as SRH has been identified as a strong independent predictor of mortality [173] and illness among Latinx groups [174]. In this way, variations in SRH are not only reflective of individual health perceptions but may also point to the presence of health disparities across several health outcomes [175]. Moreover, SRH is a commonly collected survey measure and relatively easy to assess [176]. Therefore, SRH serves as a useful indicator to explore the mechanisms that give rise to health differences across racially and ethnically diverse groups.

The utility of SRH has given rise to a wealth of literature assessing relationships between this general indicator of health and social, biological, and psychological factors [176]; however, the associations between political factors and SRH are underexplored. Therefore, this study contributes to the heath disparities and SRH literature by examining the role of political factors in shaping differences in SRH among Latinx subgroups, as compared to non-Latinx whites in the US.

4.1.2. *Racial/Ethnic Health Disparities and the Political Determinants of Health*

As defined by the US Department of Health and Human Services, racial and ethnic health disparities are "a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage…[and] adversely affect[s] groups of people who have systematically experienced greater obstacles to health based on their racial or ethnic group (quote from sub-section titled, *Special Feature on Racial and Ethnic Health Disparities: 30 Years After the Heckler Report*) [165]." These disparities have persisted over time, even as interventions are developed and applied to reduce their prevalence [4], [5]. The social determinants of health (SDoH) literature indicates that disparities in health will persist unless we work to address the societal factors (e.g., limited access to socioeconomic resources within communities of color) that consistently and disproportionately produce detrimental health outcomes for individuals who are socially disadvantaged [80]; including individuals who are racialized as Latinx in the US context [165], [167]. A good amount of the SDoH literature has focused on indicators, such as household income, education, and occupation as they relate to health outcomes [80]. However, to better understand and address racial and ethnic health disparities, particularly those experienced by Latinx groups, public health researchers and practitioners are increasingly calling upon the field to look at more upstream determinants of health, such as the political determinants of health (PDoH) [91].

As defined by Daniel Dawes, in his 2020 publication, the "political determinants of health involve the systemic process of structuring relationships, distributing resources, and administering power, operating simultaneously in ways that mutually reinforce or influence one another to shape opportunities that either advance health equity or exacerbate health inequities (p.44) [92]." As proposed by the PDoH model [92], three key domains include: (1) *voting* - the voice of the electorate; (2) *government* – the elected decision makers; and (3) *policy* – the codified decisions of the elected representatives [92]. Each of these domains act upon several political constructs, including political participation or engagement. Political participation can take many forms, including volunteering for a campaign, casting a vote in an election, or attending a protest [177]. Within communities of color, the ability to engage in these political behaviors has been uniquely shaped by governmental policies designed to exclude [126].

Historically, individuals belonging to racially/ethnically minoritized groups have been disproportionately impacted by restrictive policies meant to suppress political participation within communities of color [178], including voter identification laws [179] and the continued disenfranchisement of individuals who have previously been incarcerated [148]. In recent years, public health researchers have begun to study the impact of voter suppression and political disenfranchisement on population health outcomes, positing that these restrictive policies perpetuate health inequities [126], [148]. Although the specific mechanisms by which these structural influences permeate throughout the various levels of one's social environment to give rise to poor health are not well-understood, the work of scholars who study the health effects of racial oppression provides support for the argument that experiences with disenfranchisement have the potential to be internalized [180]. At the individual-level, this internalization may challenge feelings of self-efficacy or "people's beliefs in their ability to influence events that affect their

lives [181].” Within the public health literature, self-efficacy has been established as a significant predictor of SRH and other health outcomes [182]–[184]. It stands to reason that its variants, namely internal and external political efficacy [149], are also likely to be associated with SRH. Therefore, examining the associations between individual perceptions of SRH and political efficacy may serve to illuminate the pathways by which political determinants influence health inequities.

4.1.3. *Political Efficacy*

Since the 1950s, political efficacy has been examined within the political attitudes literature [185], particularly as it relates to political participation or civic engagement [186], [187]. Political efficacy was derived from the psychological construct of self-efficacy [149] and is defined as “the feeling that individual political action does have, or can have, an impact upon the political process, that is, that it is worthwhile to perform one’s civic duty (p.187) [185].” In essence, political efficacy speaks to one’s perceptions about one’s power to influence political affairs [188]. Over time, the construct has evolved from a unidimensional to a bidimensional construct, to distinguish between internal and external political efficacy. *Internal political efficacy (IPE)* captures perceptions of one’s competence in understanding and participating in the political process [189]. Whereas one’s perceptions about whether political systems or agents are responsive to the demands of citizens, represents the domain of *external political efficacy (EPE)* [190]. These domains have been established as meaningfully different within the political efficacy literature [191] and warrant future exploration as separate domains of the political efficacy construct that may relate to SRH, distinctly.

4.1.4. *Political Efficacy and the Latinx Community in the United States*

Studies that have examined political efficacy within the Latinx community have found some notable differences in the ways in which political efficacy manifests for Latinx subgroups as compared to non-Latinx whites [192], [193]. In 2000, an early study of political efficacy and political participation among Latinx groups, conducted in Chicago, found that individuals who identify as Latinx were more likely to report lower levels of IPE when compared to non-Latinx whites [193]. Additionally, Latinx were more likely to report higher levels of EPE than IPE, suggesting higher levels of confidence in external political forces than in one's individual abilities to influence political outcomes [193]. Nearly a decade later, a study conducted in 2009 found subgroup differences in levels of political efficacy that suggested that all those categorized within the larger Latinx category did not have the same levels of efficacy [192]. Once again looking at the aggregate group, a study conducted in 2015 found that individuals who identified as Latinx reported lower levels of both IPE and EPE when compared to other racial/ethnic groups in the US [194]. Overall, the literature on political efficacy among Latinx subgroups is limited and studies engaging this political construct as a correlate of health are not found within the Latinx health disparities space. Further, as aforementioned, there is some evidence to support that political efficacy is associated with SRH [188]. Therefore, there exists some potential for illuminating our understandings of health disparities by exploring perceptions of IPE and EPE among and within the Latinx population.

4.1.5. *Examining the Heterogeneity within the Larger Latinx Category*

A structurally limiting factor in the advancement of the Latinx health disparities literature, is the fact that Latinx subgroups are often nested within the larger "Hispanic" category [195]. In the US, government forms and data tracking systems, including national health surveys, routinely overlook

ethnic nuances and lump subgroups (e.g., Puerto Ricans) into this homogenous, governmentally defined, and socially constructed "Hispanic" category [196]. This limits the availability of the disaggregated data that are necessary to produce peer-reviewed publications or public health reports that focus on Latinx subgroups living in the States, resulting in the suppression of health outcomes for communities like the Puerto Rican diaspora [1]. In essence, this serves to systematically obscure the disparities that are unique to this population and compromises our ability to study and understand the specific mechanisms that might be operating to give rise to subgroup specific health disparities [164]. To work against this practice, this study examines trends in political efficacy and SRH among a Puerto Rican subgroup, in addition to other Latinx, and compares them to the outcomes observed among non-Latinx whites.

4.2. The Present Study

Despite decades of research, racial and ethnic disparities in health outcomes persist [165]. Several studies have identified differences in health outcomes that are attributable to the SDoH [80], including empirically observed differences in SRH among and within the Latinx community [22]. Increasingly, public health researchers are looking to political determinants to explain and address racial and ethnic health disparities [91]. However, investigations examining the associations between political factors and health outcomes are rare [92]. The present study seeks to fill this gap in the literature by examining the association between political efficacy and SRH among several racial/ethnic subgroups, including individuals who identify as Puerto Rican and other Latinx as compared to individuals who identify as non-Latinx whites in the US (Figure 4.1). This is accomplished through the execution of three study aims.

4.2.1. *Specific Aims*

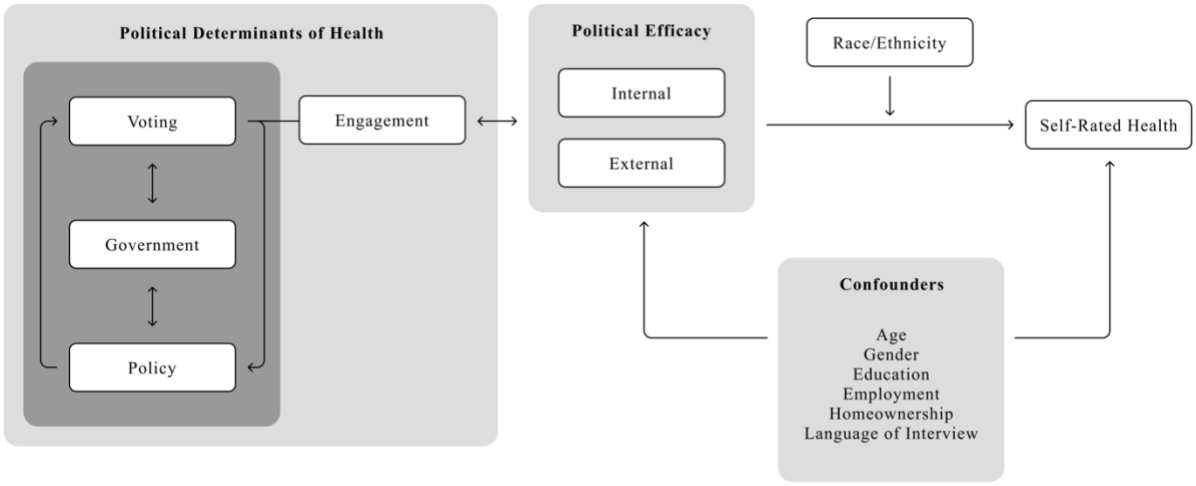
First, this study examines the association between political efficacy and self-rated health. While some studies have observed a link between political participation (or civic engagement) and health outcomes [125], [197], [198], far fewer have examined the association between political efficacy and health. However, there is some evidence to suggest a positive association between political efficacy and SRH [188]. One study, which assessed community resilience and health, determined that political efficacy was significantly associated with SRH and was an important indicator of community health, within adjusted models that controlled for several indicators of neighborhood deprivation [188]. However, this study was conducted using data from England's 2007 and 2009 Citizenship Surveys and may not be reflective of the patterns that may be observed within the US context. Given the potential public health import of this construct and its contributions to understanding the ways in which political factors influence health disparities in the US, this study aims to examine the association between political efficacy and SRH using a diverse US-based sample from the 2016 Collaborative Multiracial Post-election Survey. Based on past studies, a significant positive association between SRH and political efficacy is expected among the aggregate group included in this study.

Second, this study aims to determine whether the relationship between political efficacy (internal and external) and self-rated health is modified by racial/ethnic subgroup. In 2019, the Latinx population made up 18% of the US population and hit a record high of 60.6 million people [88]. Despite their size, little is known about the relationship between political factors and SRH within this community. This is problematic as racial/ethnic minorities, including members of the Latinx community, are more likely to experience political disenfranchisement [148], voter suppression [179], and political exclusion [56]. Latinx subgroups are also more likely to report

lower levels of SRH [22]. Therefore, whether the relationship between political efficacy and SRH is modified by race/ethnicity is assessed. Given the discriminatory political context experienced by racial and ethnic minorities in the US [126], subgroup-specific variations in this relationship are expected; whereby the association will differ for Latinx subgroups when compared to non-Latinx whites.

Third, this study assesses within-group patterns in the association between political efficacy and self-rated health with a focus on Puerto Rican, other Latinx, and non-Latinx white subgroups. In addition to determining whether racial/ethnic subgroup modifies the relationship between political efficacy and SRH, subgroup specific associations are assessed. Within this aim, patterns observed among the Puerto Rican diaspora are of particular interest. Notably, Puerto Ricans born in the US have been observed to have lower levels of internal and external political efficacy, as well as lower levels of political trust, when compared to other racial/ethnic minorities and non-Latinx whites [193], [199]. Similarly, Puerto Ricans have lower levels of voter turnout, a political participation indicator closely linked to political efficacy, when compared to non-Latinx whites and other Latinx subgroups [192]. For Puerto Ricans living in the States, issues surrounding US politics, voting, political efficacy, and political trust are complicated by the territorial relationship that exists between the US and PR. Indeed, Puerto Ricans are a unique group within the Latinx category because, whether they are migrants or were born in the States, they are all US citizens [56]. This is not the case for any other Latinx subgroup (e.g., Mexican, Cuban). Therefore, it is hypothesized that the levels of political efficacy observed among individuals who identify as Puerto Rican will be distinct from the patterns observed among other Latinx groups and non-Latinx whites. By extension, the relationship between political efficacy and SRH is also anticipated to differ from those observed among the other subgroups of interest.

Figure 4.1. Conceptual Model of the Association between Political Efficacy and Self-Rated Health with Racial/Ethnic Subgroup as an Effect Modifier



4.3. Method

4.3.1. *Data Source*

This study leveraged existing cross-sectional data collected within a diverse sample of voluntary respondents as part of the 2016 Collaborative Multiracial Post-election Survey (CMPS). The CMPS is a cooperative and user-content driven survey that takes place every four-years, following a presidential election season. In line with the intentions of the collaborative model, academics and political scientists across the US are invited to add items to the questionnaire. In exchange, collaborators make a financial contribution to cover the costs of survey activities. The CMPS has adapted this unique model to successfully execute a "multiracial, multiethnic, multilingual, post-election online survey on race, ethnicity, and politics in the US (p.173) [85]." The main goal of the survey was to assess attitudes about the 2016 election; however, the survey also includes measures of political efficacy and general health. Additionally, the survey was administered in several languages, including English and Spanish. Recruitment was conducted using a random-recruit-to-web approach and included registered and non-registered voters. Registered voters within the final sample were identified using national voter registration email lists, while non-

registered voters were randomly selected from email lists that were secured from online panel vendors. Of the 17,621 eligible respondents, 10,145 respondents completed the questionnaires (57.6% completion rate) from December 3, 2016 to February 15, 2017. Post-survey evaluation results revealed that the sampling methods used by the CMPS team yielded a geographically representative sample [85]. Similarly, subgroup demographic characteristics were consistent with other national surveys. For additional details regarding the CMPS protocol, refer to the peer-reviewed article published by the survey leadership team titled, "Best Practices in Collecting Online Data with Asian, Black, Latino, and White Respondents: Evidence from the 2016 Collaborative Multiracial Post-election Survey" [85].

4.3.2. *Measures*

Dependent Variable. Self-rated health (SRH) is a widely used and well-established survey measure administered to subjectively assess general health status [170]. The item asks respondents, "How would you rate your overall physical health at the present time?" Responses were coded as: (1) Poor, (2) Fair, (3) Good, (4) Very Good, or (5) Excellent. This single-item measure has been validated for use across various demographics, including Latinx populations and has been demonstrated to be a highly effective predictor of objective health indicators, such as morbidity and mortality [170]. To account for the full range of health perceptions reported by survey respondents, all five-levels of this variable were retained for the analyses conducted in this study.

Independent Variables. The primary independent variable of interest is political efficacy [149], which is measured by several items to capture internal and external domains of the construct. To measure *internal political efficacy (IPE)*, a single item was used: "Sometimes politics and government seem so complicated that a person like me can't really understand what's going on." Similarly, a single-item was used to measure *external political efficacy (EPE)* : "Public officials

don't care much what people like me think [85], [188]." Response options for both items range from (5) Strongly disagree, which indicates high levels of political efficacy, to (1) Strongly agree, which indicates low levels of political efficacy. For ease of interpretation, the response options for both political efficacy measures were relabeled: (1) Extremely Low, (2) Low, (3) Neutral, (4) High, (5) Extremely High. For both IPE and EPE, all five-levels of the categorical variable were also retained within the dataset and used in the analyses.

Effect Modifier/Stratification Variable. Race/ethnicity were captured by two items in the survey. These items were recoded to create one race/ethnicity or subgroup variable that included three categories: (0) non-Latinx white; (1) other Latinx; and (2) Puerto Rican.

Covariates. The covariates included were age, gender, education, employment, homeownership, and language of interview. The covariates represent socioeconomic (education, homeownership, employment) and demographic characteristics that are known to influence or be associated with health outcomes and/or political factors [150], [200]–[202]. Each covariate was coded as a categorical variable. Coding decisions for each covariate were informed by the sample distribution, as well as the standard coding practices within the public health and political science literatures:

Age. This variable included seven categories that were informed by the coding scheme utilized to define age cohorts within a well-cited study of political orientation across the lifespan [203]. The reference category was (0) 18-25 years, followed by (1) 26-33 years, (2) 34-41 years, (3) 42-49 years, (4) 50-57 years, (5) 58-65 years, and (6) 66+ years.

Gender. The original item in the survey questionnaire included three options (male, female and other). However, due to low endorsement of the "other" option, this item was recoded as a dummy variable: (0) Male and (1) Female. This variable was included as a covariate, as gender differences in SRH and political efficacy have previously been observed [204].

Education. The survey included six response options regarding educational attainment; however, several response options were endorsed by a limited number of survey participants who identified as Puerto Rican. Therefore, the item responses were recoded into three categories that best represented the sample distribution: (0) Grades 1-8, Some High School, High School Graduate or GED; (1) Some college or 2-year college degree; and (2) 4-year college graduate or post-graduate education.

Employment. This variable originally included six categories. However, informed by the sample distribution, the items were reduced to represent a more general grouping of employment categories: (0) Unemployed = Currently unemployed, full-time student, homemaker; (1) Employed = Full-time, Part-time; and (2) Retired.

Homeownership. Household income is traditionally used as a key indicator of socioeconomic status [200]. However, due to missingness in household income data, homeownership was used instead. Indeed, homeownership has been linked to household income and wealth accumulation [205]. The survey questionnaire asked respondents, "Do you currently own the home you live in, rent, or live with someone else?" The response options were recoded to include (0) Rent or live with someone else and (1) Homeowner.

Language of interview. The survey was offered in English and Spanish. For each respondent, the language in which the interview was completed was noted. Within this dataset, the variable was coded as (0) English and (1) Spanish. This variable was included based on the recommendations of previous investigations using SRH among Latinx groups [170]. Indeed, variations in the predictive validity of SRH have been observed depending on the language of interview, such that individuals completing the measure in Spanish are more likely to report poor health than individuals completing the measure in English [206].

4.3.3. *Data Analysis*

To examine the association between both domains of political efficacy and SRH for the full sample (Aim 1), chi-squared tests of independence were performed between IPE and SRH, as well as EPE and SRH. To determine whether the relationship between IPE and SRH and EPE and SRH were modified by racial/ethnic subgroup (Aim 2), ordinal logistic regression analyses were performed. Within the regression analyses, SRH was entered into all unadjusted and adjusted models as a five-category health outcome; and IPE and EPE were each entered in separate models as five-category exposure variables. Additionally, racial/ethnic subgroup was entered into unadjusted and adjusted models as an effect modifier to test whether the relationships between IPE and SRH and EPE and SRH were modified by subgroup. Finally, to assess within-group patterns in the association between political efficacy (IPE an EPE) and SRH (Aim 3), stratified unadjusted and adjusted models were also tested among Puerto Ricans, other Latinx, and non-Latinx whites. All covariates listed in the conceptual model (Figure 4.1) and described in the measures section above were included in the adjusted models. Additionally, the analyses were all conducted using Stata SE 15.1. Notably, as this study leverages de-identified survey data for the purposes of conducting secondary quantitative analyses, it is not considered human subjects research and is exempt from review by the University of California, Los Angeles (UCLA) Institutional Review Board.

4.4. Results

4.4.1. *Sample Characteristics*

The study sample for this cross-sectional analysis consisted of 3,761 respondents. This included 484 Puerto Ricans (12.87% of the total sample), 2,250 individuals who identified with another Latinx subgroup (59.82% of the total sample), and 1,027 non-Latinx whites (27.31% of the total sample). As seen in Table 4.1, across all subgroups, most respondents were female (66.45%),

completed the survey in English (90.80%), were employed (53.79%), and had obtained a high school degree or greater (92.53%). However, there were significant subgroup differences across all demographic and socioeconomic variables listed in Table 4.1. When assessing the age distribution by subgroup, individuals categorized as other Latinx emerged as the youngest group, with over 50% of other Latinx respondents reporting that they were under 33-years of age. When assessing education levels, non-Latinx whites were among the most educated. In this sample, about 44% of non-Latinx whites had a 4-year degree or more. When assessing homeownership, Puerto Ricans had the lowest share of respondents represented in the homeowner category. In this sample, only about 35% of respondents who identified as Puerto Rican reported being homeowners. Additional subgroup differences are detailed in Table 4.1.

4.4.2. *Group Differences in Self-Rated Health and Political Efficacy*

Table 4.2 presents group differences for the key independent and dependent variables of interest in this study. While most respondents reported "good" (32.25%) to "very good" (32.97%) *self-rated health (SRH)* in the full sample, a chi-squared test of independence revealed significant subgroup differences in SRH (X^2 (8, N=3,761) = 19.95, p<0.05). In general, non-Latinx whites reported better levels of SRH, with 53.36% of respondents in this group reporting "very good" to "excellent" health. They were followed by the other Latinx group, with 50.27% of respondents in this group reporting "very good" to "excellent" health. Conversely, individuals who identified as Puerto Rican had a greater share of respondents within the lower SRH categories, with 20.66% of respondents reporting "fair" to "poor" health. Overall, Puerto Ricans reported worse SRH when compared to the other Latinx and non-Latinx white subgroups.

When examining trends for *internal political efficacy (IPE)*, there were no significant differences between groups when comparing Puerto Ricans and other Latinx to non-Latinx whites

(Table 4.2). However, a chi-squared test of independence did reveal significant group differences in *external political efficacy (EPE)* (X^2 (8, N=3,761) = 27.43, p<0.01). Notably, more than half of respondents who identified as Puerto Rican reported "low" (30.58%) to "extremely low" (20.04%) levels of EPE. Puerto Ricans were followed by individuals in the other Latinx subgroup, with 17.73% of respondents reporting "extremely low" EPE, and non-Latinx whites, with 17.43% reporting this same category of EPE (Table 4.2). In general, Puerto Ricans had lower levels of EPE when compared to the other Latinx and non-Latinx white subgroups.

4.4.3. *Associations between Self-Rated Health and Political Efficacy by Subgroup*

Table 4.3a presents the bivariate associations between IPE and SRH. Table 4.3b presents the results from bivariate tests between EPE and SRH. Results are stratified by subgroup and presented for Puerto Ricans, other Latinx, non-Latinx whites, as well as the full sample (Aims 1 & 3).

For the full sample, a significant positive association between *IPE and SRH* was observed (X^2 (16, N=3,761) = 75.40, p<0.01). Results for the full sample indicate that, in general, better perceptions of IPE are related to better perceptions of SRH. Similarly, within-group analyses revealed significant positive associations between IPE and SRH among other Latinx (X^2 (16, N=2,250) = 53.24, p<0.001) and non-Latinx white subgroups (X^2 (16, N=1,027) = 28.46, p<0.05). However, a significant inverse association was observed among Puerto Ricans, such that worse perceptions of IPE were related to better perceptions of SRH (X^2 (16, N=484) = 28.86, p<0.05) (Table 4.3a). Again, while higher levels of IPE were indicative of better SRH among other Latinx and non-Latinx whites, the inverse was true among Puerto Ricans. Indeed, better IPE was associated with worse SRH among individuals in the Puerto Rican subgroup.

As seen in Table 4.3b, results also indicated that there was a significant positive association between *EPE and SRH* among the full sample (X^2 (16, N=3,761) = 112.29, p<0.001). In the full

sample, individuals who endorsed the "high efficacy" category also had the greatest share of respondents reporting "excellent" SRH (Table 3b). Bivariate analyses also revealed significant associations between EPE and SRH among other Latinx (X^2 (16, N=2,250) = 73.04, p<0.001) and non-Latinx whites (X^2 (16, N=1,027) = 32.86, p<0.01). Among non-Latinx whites, individuals who endorsed the "highest efficacy" category had better SRH when compared to individuals who endorsed lower levels of EPE. Similarly, among other Latinx, individuals who endorsed the "high efficacy" category had a greater share of respondents who reported "excellent" SRH. However, the association between EPE and SRH was not significant among Puerto Ricans (Table 4.3b). Overall, the relationship between EPE and SRH was significant for individuals who were categorized as other Latinx or non-Latinx white; however, it was not significant among Puerto Ricans in this sample.

4.4.4. *Race/Ethnicity as an Effect Modifier*

To determine whether the association between political efficacy and SRH was modified by race/ethnicity, the subgroup variable was interacted with each domain of political efficacy (IPE and EPE) (Aim 2). The results of unadjusted and adjusted models testing effect modification on the relationship between IPE and SRH are presented in Table 4.4. The results of effect modification for the relationship between EPE and SRH are presented in Table 4.5.

As presented in Table 4.4, Model 1 revealed that IPE was a significant correlate of SRH within the full sample (Wald X^2 (4) = 12.76, p<0.05); such that individuals with "extremely high" levels of IPE had a 33.8% increase in the odds of reporting higher levels of SRH (OR=1.338, *SE*=0.179). Additionally, regression results confirmed the presence of significant group differences in SRH, within unadjusted models (Model 1, Table 4.4). Compared to non-Latinx whites, individuals who identified as Puerto Rican had a 23.4% decrease in the odds of reporting

higher levels of SRH (OR=0.766, *SE*=0.076). However, when controlling for covariates, the significant group differences in SRH disappeared, as did the significant main effect between IPE and SRH in the full sample. As seen in the fully adjusted model, differences in SRH are explained by differences in age, education, employment, and homeownership (Model 2, Table 4.4). However, when examining the effect of the interaction term (IPE*Subgroup), race/ethnicity is determined to be a significant modifier of the relationship between IPE and SRH within Model 3 (Wald X^2 (8) = 17.62, p<0.05) and the fully adjusted Model 4 (Wald X^2 (8) = 15.67, p<0.05). As seen in Model 4 within Table 4.4, when compared to non-Latinx whites with "extremely low" IPE, Puerto Ricans with "extremely high" IPE had a 76.4% decrease in the odds of reporting higher levels of SRH (OR=0.236, *SE*=0.130).

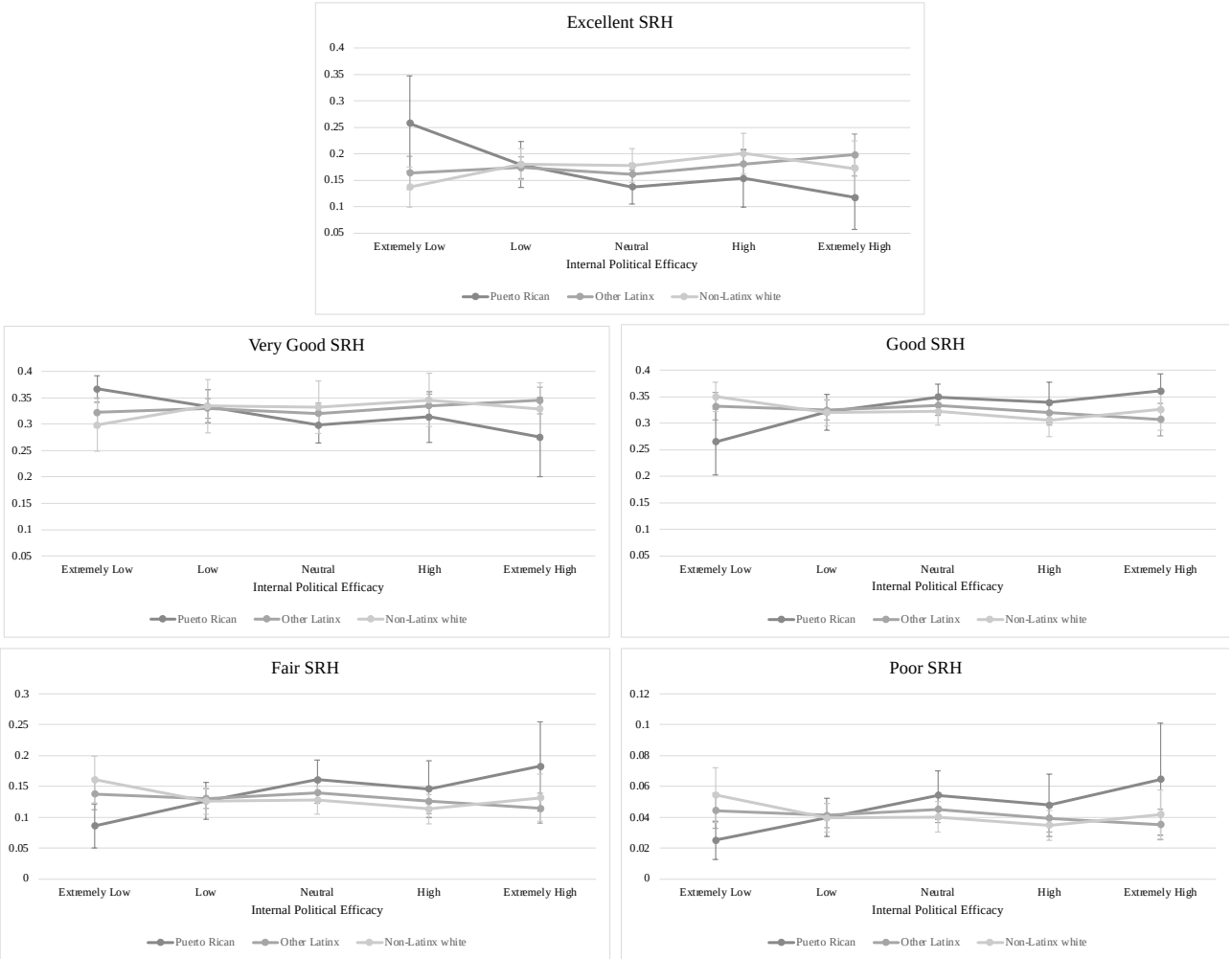
As presented in Table 4.5, Model 1 yielded initial evidence of a significant main effect between SRH and EPE for the full sample (Wald X^2 (4) = 16.91, p<0.01); specifically, individuals who reported "high" EPE had a 39.6% increase in the odds of reporting higher levels of SRH (OR=1.396, *SE*=0.156). Additionally, Model 1 also indicated that there were significant group differences (p<0.01), such that Puerto Ricans with "high" EPE had a 22.9% decrease in the odds of reporting better levels of SRH, when compared to non-Latinx whites with "low" EPE (OR=0.771, *SE*=0.077). Subsequent models, including all covariates and the interaction term (EPE*Subgroup), did not yield significant associations (Table 4.5, Models 2-4).

4.4.5. *Predictive Probabilities for Models including Race/Ethnicity as an Effect Modifier*

For ease of interpretation, predictive probabilities were generated from the ordinal logistic regression models that demonstrated race/ethnicity significantly modified the relationship between IPE and SRH. Figure 4.2 visually depicts the predicted probability of SRH at each of the five-levels of IPE by subgroup. Additionally, because all five categories of the outcome variable were

retained in the analysis, five graphs are presented for each level of SRH. The graphs illustrate the inverse nature of the relationship observed between IPE and SRH among Puerto Ricans. This trend was significantly different from what was observed among other Latinx and non-Latinx whites. As seen in Figure 4.2, Puerto Ricans with poor SRH reported better IPE and Puerto Ricans with excellent SRH reported worse IPE. Lastly, since racial/ethnic subgroup did not significantly modify the relationship between EPE and SRH, predictive probabilities were not generated for interaction models that included EPE as the exposure variable.

Figure 4.2. Predictive Probabilities of Self-Rated Health (SRH) across all Five-Levels of Internal Political Efficacy (IPE) for Puerto Ricans, Other Latinx, and Non-Latinx whites



Note(s): The scale presented on the Y-axis for fair and poor self-rated health (SRH) differ from good, very good, and excellent.

4.4.6. *Stratified Ordinal Logistic Regression Results for Subgroup Specific Differences among Puerto Ricans, Other Latinx, and Non-Latinx whites*

To examine subgroup specific differences in the association between IPE and SRH and EPE and SRH, with a particular interest in the Puerto Rican subgroup, stratified ordinal logistic regressions were conducted (Aim 3): Table 4.6 presents results for the Puerto Rican diaspora; Table 4.7 presents results for other Latinx; and Table 4.8 presents results for non-Latinx whites.

Stratified analyses facilitated within-group interpretations of the association between IPE and SRH. As presented in Table 4.6, Model 2 demonstrates a significant main effect of IPE on SRH within the Puerto Rican subgroup, when controlling for all covariates (Wald X^2 (4) = 10.93, p<0.05). As seen in Model 2, when compared to Puerto Ricans with "extremely low" IPE, Puerto Ricans with "extremely high" IPE had a 57.2% decrease in the odds of reporting higher levels of SRH (OR=0.428, *SE*=0.167) (Table 4.6). This within-group result serves to highlight and confirm the inverse relationship observed among Puerto Ricans within bivariate analyses (Table 4.3a) and clarifies the group differences detected within interaction models (Table 4.4).

As seen in Table 4.7, a significant main effect of IPE on SRH was not detected within Model 1 or the fully adjusted Model 2 for individuals who were categorized as part of the other Latinx subgroup. However, as seen in Table 4.8, Model 1 demonstrates that there was a significant main effect of IPE on SRH among individuals in the non-Latinx white subgroup (Wald X^2 (4) = 12.38, p<0.05); such that non-Latinx whites with "extremely high" IPE had a 85.9% increase in the odds of reporting higher levels of SRH when compared to non-Latinx whites who reported "extremely low" IPE (OR=1.859, *SE*=0.467). However, this main effect did not hold across all levels of IPE, among non-Latinx whites, when controlling for all covariates (Table 4.8, Model 2). Indeed, there were significant within-group differences in the relationship between IPE and SRH.

Stratified models assessing the main effect of EPE on SRH were also examined. As seen in the bivariate results (Table 4.3b), tests of the main effect of EPE on SRH continued to produce non-significant associations among Puerto Ricans (Table 4.6, Models 3 & 4). However, as seen in Table 4.7, Models 3 and 4 produced significant associations among those in the other Latinx group. As seen in Model 4, in Table 4.7, EPE was found to be a significant correlate of SRH (Wald X^2 (4) = 10.05, p<0.05). Indeed, compared to individuals in the other Latinx subgroup who reported "extremely low" levels of EPE, other Latinx with "high" EPE had a 36.4% increase in the odds of reporting higher levels of SRH (OR=1.364, *SE*=0.206). Conversely, among non-Latinx whites, adjusted models including EPE as the exposure were not significant (Table 4.8, Model 4). Overall, significant within-group differences were observed in the association between EPE and SRH.

4.5. Discussion

In the US, racial and ethnic health disparities persist, despite efforts to reduce them [207]. These disparities are observed across many indicators of health [165], [167], including self-rated health (SRH) [22]. As one of the most commonly used health outcomes in public health survey research [176], SRH stands as an accessible and powerful tool for the purposes of studying the mechanisms that are driving racial and ethnic health disparities. As a result, several studies have identified disparities in SRH across numerous racially and ethnically minoritized groups, including individuals who identify as part of the Latinx community [22], [171], [175]. However, the political mechanisms contributing to these differences have been underexplored [91]. As a variant of self-efficacy, political efficacy [191] may be a potentially meaningful factor impacting health outcomes [188]. Therefore, informed by the political determinants of health (PDOH) model [92] and guided by the recommendations made within the social determinants of health (SDoH) literature [80], this study represents one of the first attempts to examine the association(s) between two-domains of

political efficacy (internal and external) and self-rated health (SRH) among Latinx and non-Latinx white subgroups. Furthermore, given the existing differences in health outcomes and political exposures experienced among Latinx groups [126], this study examined the potential moderating effects of race/ethnicity and assessed within-group variations for three key subgroups: Puerto Ricans, other Latinx, and non-Latinx whites.

4.5.1. *Key Findings*

As hypothesized, there was a significant positive association between internal political efficacy (IPE) and SRH among all Latinx and non-Latinx whites included in the sample. Findings suggest that, as perceptions of positive IPE increase, perceptions of positive SRH also increase. While these preliminary results cannot be used to establish a causal link between IPE and SRH, they do present evidence of an existing association between these two constructs. Given what is known about the power of self-efficacy in improving health outcomes [182]–[184], it stands to reason that this association may be indicative of the influence IPE may have on perceptions of health. Although primarily descriptive, this evidence is promising as it begins to illuminate the potential pathways that connect larger political forces, such as government entities and policies, to individual-level political attitudes and their links to health perceptions. This descriptive evidence of an association between IPE and SRH, also provides additional support for the important role of civic education in promoting the health of the public [208]. Not only does civic education hold the promise of producing an engaged electorate and a healthy democracy [209], but it may also serve to produce better health outcomes. Future studies should aim to expand upon this investigation by including additional indicators of political perceptions and attitudes, such as political trust [199], to garner a more well-rounded understanding of political perceptions and how they may influence health outcomes.

The most remarkable finding in this investigation was the inverse relationship observed among Puerto Ricans, such that lower levels of IPE were associated with higher level of SRH. Among Puerto Ricans, feeling less confident in one's ability to influence politics was associated with better health and vice versa. While these findings may appear paradoxical, the differences observed may point to the nuanced nature of the ways in which politically oppressed communities experience these constructs. In the case of Puerto Ricans living in the States, particularly individuals who were born in PR and migrated to the US, there is a strong narrative of resilience (i.e., the tendency to focus on the positive despite challenges) that is ascribed to the collective Puerto Rican identity [210]. In recent decades, but particularly since the events of Hurricanes Maria and Irma in 2017, Puerto Ricans living on the archipelago have been consistently labeled as resilient and able to "bounce forward" in the presence of adversity [210]. It may be that this collective identity has spilled over to individuals living within the diaspora, particularly as migration from PR increases, and serves to reduce the potential impact of negative political feelings on health and well-being. In this way, resilience emerges as a protective factor for a community consistently experiencing direct or historical political repression [188], [210], [211].

However, this argument does not quite fit individuals who report high political efficacy and worse health. In this case, it may be that Puerto Ricans with high political efficacy have a heightened awareness of the discrimination that is perpetuated against their community and these perceptions of discrimination may be producing detrimental health outcomes. Indeed, empirical evidence exists demonstrating that perceived discrimination does negatively influence health among Puerto Ricans [212]. As this was outside the scope of the current investigation, future studies should aim to assess the effects of resilience and, perhaps, awareness of discrimination on the relationship between political efficacy and health among Puerto Ricans.

Finally, although race/ethnicity significantly modified the relationship between IPE and SRH, significant differences in the association between IPE and SRH were not observed among the other Latinx subgroup when compared to non-Latinx whites. Indeed, non-Latinx whites and the other Latinx subgroups exhibited a positive association that was consist with the results observed for the full sample. As anticipated, higher IPE was associated with better SRH for these subgroups. However, the results observed among the other Latinx subgroup should be interpreted with caution as this group consists of all other Latinx subgroups included within the Collaborative Multiracial Post-election Survey (CMPS). As highlighted by the inverse relationship between IPE and SRH that was observed among Puerto Ricans, Latinx subgroups are not all alike. By aggregating all other Latinx subgroups into one category, this study replicates a practice commonly employed in health disparities research and intentionally illustrates the pitfalls of this homogenous categorization in the study of Latinx health [40]. Future investigations should aim to examine differences in the association between IPE and SRH across a disaggregated array of Latinx subgroups. Unfortunately, this investigation was limited by sample sizes, particularly among Latinx subgroups from Central and South America. However, future studies could consider merging datasets from multiple CMPS survey years to increase sample size and power for the purposes of examining differences across Latinx subgroups.

4.5.2. *Strengths*

To my knowledge, this study represents one of the first attempts to understand the association between political efficacy and SRH among Latinx subgroups as compared to non-Latinx whites. In this way, this study serves to contribute to a line of emerging PDoH scholarship that is attempting to understand the impact of political factors on health disparities among racial and ethnic minorities. Additionally, this study both critiques and deviates from traditional approaches

to Latinx health disparities work. Namely, the analyses both uplifted a specific Latinx subgroup (Puerto Ricans,) while also presenting the pitfalls of aggregating Latinx subgroups (other Latinx).

4.5.3. *Limitations*

While this study has many strengths, there are also several limitations. Notably, the data utilized in this study (CMPS) were collected as part of a cross-sectional survey. This indicates that the observations are limited by a snapshot in time and the temporal relationship between political efficacy and SRH cannot be established. Despite its limitations, secondary analysis is a cost-effective way to go about establishing preliminary findings to inform future research. However, future efforts should be made to replicate theses analyses to determine whether these results could be observed within another sample of Puerto Ricans or other Latinx subgroups living in the US.

4.5.4. *Future Directions*

While future work in this area is needed, it should be acknowledged that attempts to understand the PDoH among Latinx subgroups are compromised by the challenges associated with identifying datasets that include political measures, health outcomes, and a robust sample of Latinx subgroups in the US (e.g., Puerto Ricans, Cubans, Dominicans, etc.). In this case, the utilization of a transdisciplinary data source, the CMPS, allowed this investigator to present early evidence highlighting the relationship between political efficacy and health within an understudied group. As a result, this paper stands as an example of the types of questions that can be addressed when public health research is transdisciplinary. However, future analyses should aim to include additional health indicators beyond SRH, such as measures of psychological health and chronic disease. Furthermore, public health data sources should strive to measure political factors, such as political efficacy and civic engagement, to address the ever-present influence of the PDoH, particularly among historically disenfranchised groups.

4.6. Results Tables

Table 4.1. Sample Characteristics by Subgroup and across the Full Sample (Col%)

Sample Characteristics	Puerto Rican *(n=484)*	Other Latinx *(n=2,250)*	Non-Latinx white *(n=1,027)*	Full Sample *(n=3,761)*
Age **				
18-25 years	15.70	25.82	11.59	20.63
26-33 years	20.66	25.02	15.00	21.72
34-41 years	19.63	18.53	13.73	17.36
42-49 years	16.32	12.53	10.71	12.52
50-57 years	16.53	9.24	15.48	11.89
58-65 years	7.85	5.51	14.61	8.30
66+ years	3.31	3.33	18.89	7.58
Sex *				
Male	29.55	32.67	37.39	33.55
Female	70.45	67.33	62.61	66.45
Education **				
High School/GED or Less	33.88	34.18	26.58	32.07
Some College/2yr Degree	38.84	33.73	29.21	33.16
4yr Degree or More	27.27	32.09	44.21	34.78
Employment **				
Unemployed	35.95	40.49	24.73	35.60
Employed	54.13	53.78	53.65	53.79
Retired	9.92	5.73	21.62	10.61
Homeownership **				
Rent/Live with someone	64.67	61.29	40.12	55.94
Homeowner	35.33	38.71	59.88	44.06
Lanuage of Interview **				
English	95.25	85.64	100	90.80
Spanish	4.75	14.36	–	9.20

Note(s): Chi-squared tests of independence revealed significant group differences where indicated; *p<0.01, **p<0.001.

Table 4.2. Differences in Self-Rated Health (SRH), Internal Political Efficacy (IPE), and External Political Efficacy (EPE) by Subgroup and across the Full Sample (Col %)

Key Indicators of Interest	Puerto Ricans *(n=484)*	Other Latinx *(n=2,250)*	Non-Latinx White *(n=1,027)*	Full Sample *(n=3,761)*
Self-Rated Health ▲				
Poor	4.96	4.80	2.63	4.23
Fair	15.70	12.53	13.15	13.11
Good	34.50	32.40	30.87	32.25
Very Good	28.93	32.36	36.22	32.97
Excellent	15.91	17.91	17.14	17.44
Internal Political Efficacy				
Extremely Low	12.81	11.56	12.07	11.86
Low	30.37	32.71	31.16	31.99
Neutral	33.68	28.71	26.68	28.80
High	15.29	17.42	20.45	17.97
Extremely High	7.85	9.60	9.64	9.39
External Political Efficacy *				
Extremely Low	20.04	17.73	17.43	17.95
Low	30.58	31.87	31.55	31.61
Neutral	36.78	36.13	32.04	35.10
High	9.30	10.71	16.16	12.02
Extremely High	3.31	3.56	2.82	3.32

Note(s): Chi-squared tests of independence revealed significant group differences where indicated; ▲ $p<0.05$, *$p<0.01$.

Table 4.3a. Association Between Internal Political Efficacy (IPE) and Self-Rated Health (SRH) for Puerto Ricans, Other Latinx, Non-Latinx whites, and Full Sample (Row %)

		Self-Rated Health				
Internal Political Efficacy		% Poor	% Fair	% Good	% Very Good	% Excellent
Puerto Rican *(n=484)*	Extremely Low	4.84	14.52	24.19	25.81	30.65
	Low	4.08	17.01	29.93	31.29	17.69
	Neutral	3.68	15.34	44.17	28.22	8.59
	High	5.41	14.86	33.78	28.38	17.57
	Extremely High	13.16	15.79	28.95	28.95	13.16
		Significant, $p<0.05$				
Other Latinx *(n=2,250)*	Extremely Low	8.46	15.77	26.15	28.85	20.77
	Low	3.40	13.86	31.79	34.92	16.03
	Neutral	4.80	10.53	37.77	33.13	13.78
	High	4.80	12.24	31.89	30.10	21.68
	Extremely High	6.48	10.65	26.85	29.63	26.39
		Significant, $p<0.001$				
Non-Latinx white *(n=1027)*	Extremely Low	4.03	19.35	36.29	25.81	14.52
	Low	1.56	15.00	29.69	37.81	15.94
	Neutral	2.92	10.95	34.31	35.04	16.79
	High	1.43	9.52	29.52	40.48	19.05
	Extremely High	6.06	13.13	21.21	38.38	21.21
		Significant, $p<0.05$				
Full Sample *(n=3,761)*	Extremely Low	6.73	16.59	28.70	27.58	20.40
	Low	2.99	14.55	31.01	35.25	16.21
	Neutral	4.16	11.36	37.86	32.87	13.76
	High	3.40	11.69	31.36	33.14	20.41
	Extremely High	7.08	11.90	25.50	32.01	23.51
		Significant, $p<0.001$				

Note(s): Chi-squared tests of independence were conducted to assess the relationship between internal political efficacy and self-rated health for each subgroup and among the full sample.

Table 4.3b. Association Between External Political Efficacy (EPE) and Self-Rated Health (SRH) for Puerto Ricans, Other Latinx, Non-Latinx whites, and Full Sample (Row %)

		Self-Rated Health				
External Political Efficacy		% Poor	% Fair	% Good	% Very Good	% Excellent
Puerto Rican *(n=484)*	Extremely Low	7.22	19.59	32.99	19.59	20.62
	Low	3.38	12.84	32.43	35.81	15.54
	Neutral	4.49	16.29	38.20	29.78	11.24
	High	2.22	15.56	35.56	26.67	20.00
	Extremely High	18.75	12.50	18.75	18.75	31.25
		Not Significant				
Other Latinx *(n=2,250)*	Extremely Low	6.27	15.79	28.57	27.57	21.80
	Low	3.77	12.69	33.33	34.59	15.62
	Neutral	3.69	12.18	36.04	31.86	16.24
	High	4.56	9.13	25.31	38.17	22.82
	Extremely High	18.75	8.75	27.50	23.75	21.25
		Significant, $p<0.001$				
Non-Latinx white *(n=1027)*	Extremely Low	3.35	14.53	28.49	31.28	22.35
	Low	1.85	16.05	27.78	38.58	15.74
	Neutral	3.34	12.77	35.26	36.17	12.46
	High	1.20	9.04	30.72	38.55	20.48
	Extremely High	6.90	–	31.03	27.59	34.48
		Significant, $p<0.01$				
Full Sample *(n=3,761)*	Extremely Low	5.63	16.00	29.19	27.41	21.78
	Low	3.20	13.62	31.71	35.83	15.64
	Neutral	3.71	12.88	36.14	32.65	14.62
	High	3.10	9.73	28.32	37.17	21.68
	Extremely High	16.00	7.20	27.20	24.00	25.60
		Significant, $p<0.001$				

Note(s): Chi-squared tests of independence were conducted to assess the relationship between external political efficacy and self-rated health for each subgroup and among the full sample.

Table 4.4. Ordinal Logistic Regression Models for Internal Political Efficacy (IPE) as the Exposure and Self-Rated Health (SRH) as the Outcome in the Full Sample

	Model 1		Model 2		Model 3		Model 4	
	Unadjusted IPE ◆		Adjusted IPE		Unadjusted Interaction ◇		Adjusted Interaction ◇	
	OR	*SE*	OR	*SE*	OR	*SE*	OR	*SE*
Internal Political Efficacy (IPE)								
Extremely Low (Ref.)	–	–	–	–	–	–	–	–
Low	1.127	(0.116)	1.080	(0.111)	1.530 ▲	(0.291)	1.397	(0.267)
Neutral	1.014	(0.105)	0.971	(0.101)	1.538 ▲	(0.299)	1.376	(0.269)
High	1.299 ▲	(0.147)	1.136	(0.130)	1.956 **	(0.397)	1.601 ▲	(0.329)
Extremely High	1.338 ▲	(0.179)	1.108	(0.150)	1.797 ▲	(0.444)	1.324	(0.331)
Subgroups								
Non-Latinx white (Ref.)	–	–	–	–	–	–	–	–
Other Latinx	0.924	(0.062)	0.973	(0.072)	1.294	(0.259)	1.244	(0.252)
Puerto Rican	0.766 *	(0.076)	0.905	(0.093)	2.036 ▲	(0.598)	2.247 *	(0.666)
IPE Interactions (IPE x Subgroup)								
Extremely Low x white (Ref.)	–	–	–	–	–	–	–	–
Low **x** Other Latinx	–	–	–	–	0.716	(0.167)	0.771	(0.180)
Low **x** Puerto Rican	–	–	–	–	0.421 *	(0.145)	0.443 ▲	(0.154)
Neutral **x** Other Latinx	–	–	–	–	0.646	(0.154)	0.712	(0.170)
Neutral **x** Puerto Rican	–	–	–	–	0.298 **	(0.102)	0.324 **	(0.111)
High **x** Other Latinx	–	–	–	–	0.634	(0.160)	0.706	(0.179)
High **x** Puerto Rican	–	–	–	–	0.309 *	(0.118)	0.319 *	(0.123)
Extremely High **x** Other Latinx	–	–	–	–	0.811	(0.245)	0.959	(0.291)
Extremely High **x** Puerto Rican	–	–	–	–	0.236 *	(0.108)	0.280 **	(0.130)
Age								
18-25 years (Ref.)	–	–	–	–	–	–	–	–
26-33 years	–	–	0.840	(0.079)	–	–	0.845	(0.079)
34-41 years	–	–	0.710 **	(0.072)	–	–	0.705 **	(0.072)
42-49 years	–	–	0.605 **	(0.069)	–	–	0.605 **	(0.069)
50-57 years	–	–	0.562 **	(0.066)	–	–	0.563 **	(0.066)
58-65 years	–	–	0.670 *	(0.092)	–	–	0.660 *	(0.091)
66+ years	–	–	0.882	(0.153)	–	–	0.878	(0.153)
Gender								
Male (Ref.)	–	–	–	–	–	–	–	–
Female	–	–	1.055	(0.067)	–	–	1.051	(0.068)
Education								
High School/GED or Less (Ref.)	–	–	–	–	–	–	–	–
Some College/2 year Degree	–	–	1.164 ▲	(0.088)	–	–	1.175 ▲	(0.089)
4 year Degree or More	–	–	1.794 **	(0.145)			1.799 **	(0.145)
Employment								
Unemployed (Ref.)	–	–	–	–	–	–	–	–
Employed	–	–	1.580 **	(0.113)	–	–	1.566 **	(0.112)
Retired	–	–	0.935	(0.136)	–	–	0.925	(0.135)
Homeownership								
Rent/Live with someone (Ref.)	–	–	–	–	–	–	–	–
Homeowner	–	–	1.651 **	(0.114)	–	–	1.654 **	0.115
Language of Interview +								
English (Ref.)	–	–	–	–	–	–	–	–
Spanish	–	–	1.478 **	(0.160)	–	–	1.479 **	(0.160)
N	3,761		3,761		3,761		3,761	
AIC	10796.500		10577.670		10794.860		10577.950	
BIC	10858.820		10721.010		10907.040		10771.150	
Log Likelihood	-5388.250		-5265.833		-5379.429		-5257.974	
df	10		23		18		31	

Notes: OR=Odds Ratio; SE=Standard Error; ▲ p<0.05, *p<0.01, **p<0.001; ◆ = Wald Test indicated internal political efficacy was a significant predictor of self-rated health in the model; ◇ = Wald test indicated internal political efficacy by subgroup interaction term was a significant predictor of self-rated health within the model; + = All non-Latinx whites completed the interview in English.

Table 4.5. Ordinal Logistic Regression Models for External Political Efficacy (EPE) as the Exposure and Self-Rated Health (SRH) as the Outcome in the Full Sample

	Model 1		Model 2		Model 3		Model 4	
	Unadjusted EPE ◆		Adjusted EPE		Unadjusted Interaction		Adjusted Interaction	
	OR	*SE*	OR	*SE*	OR	*SE*	OR	*SE*
External Political Efficacy (EPE)								
Extremely Low (Ref.)	–	–	–	–	–	–	–	–
Low	1.032	(0.092)	0.967	(0.086)	0.911	(0.155)	0.891	(0.152)
Neutral	0.935	(0.081)	0.926	(0.081)	0.783	(0.132)	0.853	(0.144)
High	1.396 *	(0.156)	1.242	(0.140)	1.209	(0.235)	1.040	(0.204)
Extremely High	0.981	(0.187)	0.969	(0.185)	1.756	(0.656)	1.768	(0.654)
Subgroups								
Non-Latinx white (Ref.)	–	–	–	–	–	–	–	–
Other Latinx	0.937	(0.064)	0.983	(0.073)	0.830	(0.138)	0.921	(0.156)
Puerto Rican	0.771 *	(0.077)	0.910	(0.094)	0.601 ▲	(0.142)	0.755	(0.179)
EPE Interactions (EPE x Subgroup)								
Extremely Low x white (Ref.)	–	–	–	–	–	–	–	–
Low **x** Other Latinx	–	–	–	–	1.115	(0.229)	1.043	(0.216)
Low **x** Puerto Rican	–	–	–	–	1.583	(0.467)	1.534	(0.455)
Neutral **x** Other Latinx	–	–	–	–	1.265	(0.257)	1.120	(0.228)
Neutral **x** Puerto Rican	–	–	–	–	1.293	(0.372)	1.098	(0.317)
High **x** Other Latinx	–	–	–	–	1.241	(0.305)	1.312	(0.324)
High **x** Puerto Rican	–	–	–	–	1.142	(0.440)	1.255	(0.480)
Extremely High **x** Other Latinx	–	–	–	–	0.418 ▲	(0.186)	0.404 ▲	(0.179)
Extremely High **x** Puerto Rican	–	–	–	–	0.739	(0.500)	0.694	(0.475)
Age								
18-25 years (Ref.)	–	–	–	–	–	–	–	–
26-33 years	–	–	0.837	(0.079)	–	–	0.835	(0.078)
34-41 years	–	–	0.704 **	(0.072)	–	–	0.697 **	(0.071)
42-49 years	–	–	0.607 **	(0.070)	–	–	0.600 **	(0.068)
50-57 years	–	–	0.554 **	(0.065)	–	–	0.554 **	(0.065)
58-65 years	–	–	0.666 *	(0.092)	–	–	0.665 *	(0.092)
66+ years	–	–	0.876	(0.152)	–	–	0.882	(0.154)
Gender								
Male (Ref.)	–	–	–	–	–	–	–	–
Female	–	–	1.052	(0.068)	–	–	1.055	(0.068)
Education								
High School/GED or Less (Ref.)	–	–	–	–	–	–	–	–
Some College/2 year Degree	–	–	1.167 ▲	(0.088)	–	–	1.169 ▲	(0.089)
4 year Degree or More	–	–	1.790 **	(0.144)	–	–	1.801 **	(0.145)
Employment								
Unemployed (Ref.)	–	–	–	–	–	–	–	–
Employed	–	–	1.570 **	(0.112)	–	–	1.577 **	(0.113)
Retired	–	–	0.929	(0.135)	–	–	0.936	(0.137)
Homeownership								
Rent/Live with someone else (Ref.)	–	–	–	–	–	–	–	–
Homeowner	–	–	1.661 **	(0.115)	–	–	1.651 **	(0.114)
Language of Interview +								
English (Ref.)	–	–	–	–	–	–	–	–
Spanish	–	–	1.482 **	(0.160)	–	–	1.502 **	(0.163)
N	3,761		3,761		3,761		3,761	
AIC	10792.330		10572.820		10797.440		10577.560	
BIC	10854.650		10716.17		10909.620		10770.760	
Log Likelihood	-5386.164		-5263.411		-5380.718		-5257.778	
df	10		23		18		31	

Notes: OR=Odds Ratio; SE=Standard Error; ▲ p<0.05, *p<0.01, **p<0.001; ◆ = Wald Test indicated external political efficacy was a significant predictor of self-rated health in the model; + = All non-Latinx whites completed the interview in English.

Table 4.6. Ordinal Logistic Regression Models for External Political Efficacy (EPE) and Internal Political Efficacy (IPE) as the Exposures and Self-Rated Health (SRH) as the Outcome among Puerto Ricans

	Model 1		Model 2		Model 3		Model 4	
	Unadjusted IPE		Adjusted IPE ◆		Unadjusted EPE		Adjusted EPE	
	OR	*SE*	OR	*SE*	OR	*SE*	OR	*SE*
Internal Political Efficacy (IPE)								
Extremely Low (Ref.)	–	–	–	–	–	–	–	–
Low	0.653	(0.187)	0.671	(0.194)	–	–	–	–
Neutral	0.468 *	(0.131)	0.489 *	(0.133)	–	–	–	–
High	0.614	(0.198)	0.504 ▲	(0.169)	–	–	–	–
Extremely High	0.428 ▲	(0.167)	0.347 *	(0.138)	–	–	–	–
External Political Efficacy (EPE)								
Extremely Low (Ref.)	–	–	–	–	–	–	–	–
Low	–	–	–	–	1.434	(0.345)	1.352	(0.328)
Neutral	–	–	–	–	1.016	(0.236)	0.959	(0.224)
High	–	–	–	–	1.375	(0.454)	1.175	(0.391)
Extremely High	–	–	–	–	1.277	(0.715)	1.282	(0.761)
Age								
18-25 years (Ref.)	–	–	–	–	–	–	–	–
26-33 years	–	–	0.873	(0.245)	–	–	0.838	(0.237)
34-41 years	–	–	0.993	(0.287)	–	–	0.968	(0.283)
42-49 years	–	–	0.489 ▲	(0.152)	–	–	0.481	(0.150)
50-57 years	–	–	0.615	(0.191)	–	–	0.582	(0.180)
58-65 years	–	–	0.528	(0.222)	–	–	0.581	(0.242)
66+ years	–	–	0.761	(0.458)	–	–	0.880	(0.527)
Gender								
Male (Ref.)	–	–	–	–	–	–	–	–
Female	–	–	0.607 *	(0.458)	–	–	0.652 ▲	(0.126)
Education								
High School/GED or Less (Ref.)	–	–	–	–	–	–	–	–
Some College/2 year Degree	–	–	1.218	(0.251)	–	–	1.097	(0.223)
4 year Degree or More	–	–	2.093 *	(0.497)	–	–	1.880*	(0.444)
Employment								
Unemployed (Ref.)	–	–	–	–	–	–	–	–
Employed	–	–	1.622 *	(0.318)	–	–	1.703 *	(0.332)
Retired	–	–	0.862	(0.340)	–	–	0.821	(0.319)
Homeownership								
Rent/Live with someone (Ref.)	–	–	–	–	–	–	–	–
Homeowner	–	–	1.254	(0.241)	–	–	1.232	(0.236)
Language of Interview								
English (Ref.)	–	–	–	–	–	–	–	–
Spanish	–	–	1.715	(0.702)	–	–	1.636	(0.667)
N	484		484		484		484	
AIC	1418.268		1400.504		1423.274		1408.324	
BIC	1451.725		1488.328		1456.731		1496.148	
Log Likelihood	-701.134		-679.252		-703.637		-683.1621	
df	8		21		8		21	

Notes: OR=Odds Ratio; SE=Standard Error; ▲ p<0.05, *p<0.01; ◆ = Wald Test indicated that internal/external political efficacy was a significant correlate of self-rated health within the model.

Table 4.7. Ordinal Logistic Regression Models for External Political Efficacy (EPE) and Internal Political Efficacy (IPE) as the Exposures and Self-Rated Health (SRH) as the Outcome among Other Latinx

	Model 1		Model 2		Model 3		Model 4	
	Unadjusted IPE		Adjusted IPE		Unadjusted EPE ◆		Adjusted EPE ◆	
	OR	*SE*	OR	*SE*	OR	*SE*	OR	*SE*
Internal Political Efficacy (IPE)								
Extremely Low (Ref.)	–	–	–	–	–	–	–	–
Low	1.094	(0.147)	1.070	(0.144)	–	–	–	–
Neutral	0.992	(0.135)	0.977	(0.133)	–	–	–	–
High	1.235	(0.184)	1.126	(0.169)	–	–	–	–
Extremely High	1.447 ▲	(0.250)	1.266	(0.222)	–	–	–	–
External Political Efficacy (EPE)								
Extremely Low (Ref.)	–	–	–	–	–	–	–	–
Low	–	–	–	–	1.015	(0.117)	0.931	(0.108)
Neutral	–	–	–	–	0.991	(0.111)	0.959	(0.109)
High	–	–	–	–	1.490 *	(0.223)	1.364 ▲	(0.206)
Extremely High	–	–	–	–	0.739	(0.177)	0.745	(0.180)
Age								
18-25 years (Ref.)	–	–	–	–	–	–	–	–
26-33 years	–	–	0.864	(0.096)	–	–	0.854	(0.095)
34-41 years	–	–	0.738 *	(0.091)	–	–	0.727 *	(0.090)
42-49 years	–	–	0.671 *	(0.095)	–	–	0.666 *	(0.095)
50-57 years	–	–	0.607 **	(0.094)	–	–	0.595 **	(0.093)
58-65 years	–	–	0.620 *	(0.119)	–	–	0.618 *	(0.119)
66+ years	–	–	1.726	(0.490)	–	–	1.731 ▲	(0.492)
Gender								
Male (Ref.)	–	–	–	–	–	–	–	–
Female	–	–	1.001	(0.084)	–	–	0.999	(0.084)
Education								
High School/GED or Less (Ref.)	–	–	–	–	–	–	–	–
Some College/2 year Degree	–	–	1.240 ▲	(0.119)	–	–	1.245 ▲	(0.119)
4 year Degree or More	–	–	1.622 **	(0.162)	–	–	1.645 **	(0.168)
Employment								
Unemployed (Ref.)	–	–	–	–	–	–	–	–
Employed	–	–	1.677 **	(0.149)	–	–	1.664 **	(0.147)
Retired	–	–	0.711	(0.162)	–	–	0.707	(0.161)
Homeownership								
Rent/Live with someone (Ref.)	–	–	–	–	–	–	–	–
Homeowner	–	–	1.599 **	(0.141)	–	–	1.610 **	(0.142)
Language of Interview								
English (Ref.)	–	–	–	–	–	–	–	–
Spanish	–	–	1.458 **	(0.165)	–	–	1.480 **	(0.168)
N	2,250		2,250		2,250		2,250	
AIC	6506.332		6385.097		6502.617		6378.892	
BIC	6552.081		6505.189		6548.366		6498.984	
Log Likelihood	-3245.166		-3171.548		-3243.308		-3168.446	
df	8		21		8		21	

Notes: OR=Odds Ratio; SE=Standard Error; ▲ p<0.05, *p<0.01, **p<0.001; ◆ = Wald Test indicated internal/external political efficacy was a significant correlate of self-rated health within the model.

Table 4.8. Ordinal Logistic Regression Models for External Political Efficacy (EPE) and Internal Political Efficacy (IPE) as the Exposures and Self-Rated Health (SRH) as the Outcome among Non-Latinx whites

	Model 1		Model 2		Model 3		Model 4	
	Unadjusted IPE ◆		Adjusted IPE		Unadjusted EPE ◆		Adjusted EPE	
	OR	*SE*	OR	*SE*	OR	*SE*	OR	*SE*
Internal Political Efficacy (IPE)								
Extremely Low (Ref.)	–	–	–	–	–	–	–	–
Low	1.566 ▲	(0.303)	1.440	(0.283)	–	–	–	–
Neutral	1.572 ▲	(0.311)	1.457	(0.294)	–	–	–	–
High	2.027 **	(0.419)	1.739 *	(0.372)	–	–	–	–
Extremely High	1.859 *	(0.467)	1.495	(0.389)	–	–	–	–
External Political Efficacy (EPE)								
Extremely Low (Ref.)	–	–	–	–	–	–	–	–
Low	–	–	–	–	0.907	(0.156)	0.835	(0.146)
Neutral	–	–	–	–	0.774	(0.132)	0.783	(0.136)
High	–	–	–	–	1.220	(0.241)	0.972	(0.196)
Extremely High	–	–	–	–	1.808	(0.687)	1.605	(0.611)
Age								
18-25 years (Ref.)	–	–	–	–	–	–	–	–
26-33 years	–	–	0.738	(0.170)	–	–	0.735	(0.169)
34-41 years	–	–	0.477 *	(0.112)	–	–	0.477 *	(0.112)
42-49 years	–	–	0.448 *	(0.114)	–	–	0.451 *	(0.115)
50-57 years	–	–	0.420 **	(0.103)	–	–	0.425 **	(0.104)
58-65 years	–	–	0.576 ▲	(0.148)	–	–	0.582 ▲	(0.150)
66+ years	–	–	0.514 ▲	(0.146)	–	–	0.506 ▲	(0.145)
Gender								
Male (Ref.)	–	–	–	–	–	–	–	–
Female	–	–	1.388 *	(0.173)	–	–	1.368 *	(0.169)
Education								
High School/GED or Less (Ref.)	–	–	–	–	–	–	–	–
Some College/2 year Degree	–	–	1.122	(0.180)	–	–	1.148	(0.185)
4 year Degree or More	–	–	2.117 **	(0.343)	–	–	2.188 **	(0.354)
Employment								
Unemployed (Ref.)	–	–	–	–	–	–	–	–
Employed	–	–	1.270	(0.203)	–	–	1.303	(0.209)
Retired	–	–	0.992	(0.238)	–	–	1.053	(0.252)
Homeownership								
Rent/Live with someone else (Ref.)	–	–	–	–	–	–	–	–
Homeowner	–	–	2.127 **	(0.301)	–	–	2.079 **	(0.294)
N	1,027		1,027		1,027		1,027	
AIC	2869.634		2797.281		2870.899		2798.180	
BIC	2909.109		2895.969		2910.275		2896.867	
Log Likelihood	-1426.817		-1378.64		-1427.450		-1379.090	
df	8		20		8		20	

Notes: OR=Odds Ratio; SE=Standard Error; ▲ p<0.05, *p<0.01, **p<0.001; ◆ = Wald Test indicated internal/external political efficacy was a significant correlate of self-rated health within the model; Language of interview was not a relevant variable to this subgroup because all non-Latinx whites completed the survey in English; therefore, it was not included as a covariate within the models presented for non-Latinx whites.

CHAPTER 5.

THE ASSOCIATION BETWEEN POLITICAL EFFICACY AND SELF-RATED HEALTH AMONG MEMBERS OF THE PUERTO RICAN DIASPORA

Chapter 5. The Association between Political Efficacy and Self-Rated Health among Members of the Puerto Rican Diaspora

5.1. Introduction

5.1.1. *Health Disparities within the Puerto Rican Diaspora*

There are over 5.6 million Puerto Ricans living in the continental United States (US) [63]. Commonly referred to as the Puerto Rican diaspora, this community constitutes the second largest Latinx (also known as Hispanic or Latino/a/e/@ [17], [18]) subgroup in the US [63]. Despite their numbers, the Puerto Rican diaspora has received limited attention within the Latinx health disparities literature [1]. However, existing evidence points to significant disparities across a number of health conditions [36]. For instance, a 2016 report from the Center for Puerto Rican Studies describes higher prevalence of diabetes, heart disease, and serious psychological distress among the Puerto Rican diaspora when compared to other Latinx subgroups, as well as non-Latinx whites, in the US [37]. Members of the Puerto Rican diaspora also have higher all-cause mortality as compared to the rates observed among Cubans and Mexicans living in the States [23], [38]. Additionally, when examining self-rated health (SRH) among subgroups within the Latinx category, significant differences have been observed when comparing individuals who identify as Puerto Rican to individuals who identify as Mexican, Cuban, or Dominican and live in the US [172]. However, the factors driving differences in SRH among Puerto Ricans in the States are unclear and underexplored [22]. As Puerto Ricans are the second largest Latinx subgroup in the continental US [63], experience a disparate distribution of disease burden [37], and receive limited attention within the Latinx health literature [1], there is a pressing need to examine, identify, and address the unique mechanisms driving health disparities among members of the Puerto Rican diaspora.

5.1.2. *Migration from Puerto Rico and the Puerto Rican Diaspora*

For centuries, Puerto Ricans have been participating in a back-and-forth migratory exchange between the US and Puerto Rico (PR) [130]. Once PR became a territory of the US after the Spanish-American War of 1898 [128], migration from PR to the States increased [130]. As decades passed, this movement became structurally supported by instrumental US congressional legislation [213]. For example, limited US citizenship status was granted to all Puerto Ricans as part of the Jones Act of 1917 [43], which allowed Puerto Ricans to travel without restrictions from PR to the States. Currently, the Puerto Rican diaspora is composed of members who have recently arrived in the States (e.g., movement post-Hurricanes Maria and Irma in 2017) [54], while others have been established for generations (e.g., migration from US-PR Farm Labor Program, established in 1947) [129], [214]. There are also individuals who consistently live their lives between these two spaces (i.e., moving back-and-forth between the States and PR and living in each place for extended periods of time) [130]. Then, of course, there are individuals who are born in the US and continue to identify with their Puerto Rican heritage [214], [215]. These direct and indirect generational ties to the Puerto Rican migration experience links the Puerto Rican diaspora to PR (the place), as well as its socio-political context—a context that is shaped by PR's status as a territory of the US. Therefore, understanding the political context of PR is key to understanding the ways in which the lives of the Puerto Rican diaspora, including their health and well-being, are determined by the political conditions that are produced by US involvement in PR.

5.1.3. *Puerto Ricans and Political Disenfranchisement*

One way in which this political relationship manifests is through political disenfranchisement [148]. Although all Puerto Ricans are US citizens, their political rights vary [11]. In PR, residents are subject to US constitutional law but are denied the right to vote in US elections [11]. In this

way, PR's status is less that of a commonwealth and more that of a colony that is denied representation and self-determination [42]. Indeed, years of US colonial neglect have produced poor economic and health conditions, with little that can be done by politically disenfranchised peoples [11]. This socio-political context, characterized by a colonial relationship with the US [11], an ongoing 15-year economic crisis [132], and congressionally-granted access to US citizenship [56], has driven a steep increase in migration to the States [55], [130]. Once within the States, members of the US Puerto Rican diaspora gain access to the full rights of US citizenship, including the right to vote and the potential to access opportunities for upward social mobility (e.g., employment). However, rights gained via the migration process do not erase the direct and historical connections to the legacy of political disenfranchisement for the diaspora [36], [216]. At the individual-level, this history of disenfranchisement has the potential to be internalized [180] or embodied [111]. Embodiment and historical trauma scholars have indicated that these social exposures to oppression cause trauma that manifests in the form of negative physiological and psychological health outcomes [90], [111], [217]. In the case of Puerto Ricans with direct and indirect connections to political disenfranchisement [56], it is reasonable to assume that this structural exclusion may leave members of the diaspora feeling powerless, particularly individuals who have lived under colonial subjugation in PR. This can challenge one's confidence in their ability to influence the forces that control one's life, also known as *self-efficacy*.

5.1.4. *Self-Efficacy and Health*

Self-efficacy is a concept developed and defined by renowned clinical psychologist, Albert Bandura, and refers to "people's beliefs in their ability to influence events that affect their lives (p.1) [181]." Self-efficacy regulates human functioning in several ways, including behavioral selection processes, which means that "beliefs of personal efficacy shape the course of lives by

influencing the selection of activities and environments (p.2) [181].” Additionally, in a reciprocal fashion, the environment and experiences also impact one’s confidence in their ability to shape their lives and control their environment. Therefore, within the Puerto Rican context, it is reasonable to assume that experiences with political disenfranchisement may impact self-efficacy. Given the strong connection to PR that exists among the Puerto Rican diaspora, partly maintained by the consistent waves of migration to the States, feelings of self-efficacy for members of the Puerto Rican diaspora are also likely to be shaped by the political context in PR. This is particularly relevant among members of the diaspora who were born in PR, as their rights are directly restricted by US colonial policies. Importantly, these challenges to self-efficacy may also have implications for health and well-being [182].

There is a rich interdisciplinary literature regarding the health significance of self-efficacy [182]. For example, a study conducted among patients with coronary heart disease revealed that lower levels of cardiac self-efficacy (i.e., an individual’s confidence in their ability to attend to their cardiac health) were associated with poor health status [184]. Among Puerto Ricans living in the continental US, a cross-sectional survey of patients with Type-2 diabetes revealed that higher levels of self-efficacy were protective against barriers to health care access [5]. Moreover, a meta-analysis conducted in 2016 assessed the results from 204 experimental tests and demonstrated that interventions that modified attitudes, norms, and self-efficacy are most effective in promoting health behavior change [183]. The findings from this meta-analysis provide experimental support for the predictive strength of self-efficacy in determining health outcomes [183]. Given the predictive strength of self-efficacy and the unique political exposures that are directly and indirectly experienced by members of the Puerto Rican diaspora, an exploration of the role of

political efficacy in shaping health is warranted [149], [188]. However, the construct of political efficacy has not previously been examined when studying Puerto Rican health inequities.

5.1.5. *Political Efficacy*

Derived from the construct of self-efficacy [149], *political efficacy* speaks to the feeling that one has the power to influence political affairs [188]. The construct of political efficacy has been examined in the political attitudes literature since the 1950s and has evolved, across time, from a unidimensional to a bidimensional construct, which includes the domains of internal and external political efficacy [189]. *Internal political efficacy (IPE)* refers to feelings about one's competence in understanding and participating in the political process, while *external political efficacy (EPE)* speaks to one's feelings that political systems or agents are responsive to the demands of citizens [189]. For Puerto Ricans, a historical connection to political disenfranchisement [11], [188], [189] is likely to have an impact on internal and external political efficacy. Notably, political efficacy is associated with several forms of political participation, including voting, a key behavior that influences government and policy [149]. In this way, political efficacy may act across several political determinants of health [92].

This is of particular public health import, as some literature suggests that individuals with higher levels of political efficacy are likely healthier than individuals reporting lower levels of political efficacy [188]. Additionally, a multi-level analysis conducted using the World Value Survey determined that individuals who participated in voting activities were more likely to report higher levels of self-rated health (SRH) [147]. Similarly, another study found that higher levels of voter participation among adults in California was linked to better health status and lower levels of psychological distress [125]. Collectively, these findings suggest that confidence in one's abilities to influence the political process, which are associated with political participation, are also

likely to be associated with health outcomes. However, more evidence is needed regarding the nature of the relationship between political efficacy and health, particularly for the Puerto Rican diaspora.

5.2. The Present Study

Given the existing connections between the political context of PR and the experiences of the Puerto Rican diaspora [130], the limited research on Puerto Rican health disparities [1], and the current gaps in our understanding of the ways in which political determinants shape population health [92], there is a need to clarify how political factors (e.g., IPE and EPE) influence health outcomes within the Puerto Rican diaspora. Additionally, focusing on the Puerto Rican diaspora is an important contribution to the Latinx health disparities literature, which has traditionally produced scholarship that ignores the heterogeneity within the Latinx population [164]. Therefore, the purpose of the present study is to examine the association between political perceptions and health outcomes among members of the Puerto Rican diaspora who were born in PR and migrated to the States as separate from the associations among individuals who were born in the States.

5.2.1. *Specific Aims*

First, the present study aims to assess sociodemographic, political, and health-related characteristics among members of the Puerto Rican diaspora who were born in Puerto Rico and migrated to the States as separate from members who were born in the States. As a Latinx subgroup in the US that is commonly aggregated into the larger Latinx group within the health disparities literature, there is a need to build a body of work that presents disaggregated, within-group outcomes for the Puerto Rican diaspora [15], [86]. Similarly, as the field of public health becomes increasingly aware of the role politics plays in shaping health and well-being, there is an emerging need to examine political characteristics alongside health outcomes within the public

health literature [218], [219]. This is particularly relevant for members of the Puerto Rican diaspora, who have unique political experiences in the US as a result of the colonial relationship that exists between the US and PR [56]. Therefore, this study aims to build upon the baseline sociodemographic, political, and health-related data that are needed to support public health research and practice within this, often forgotten, racially and ethnically minoritized group [1].

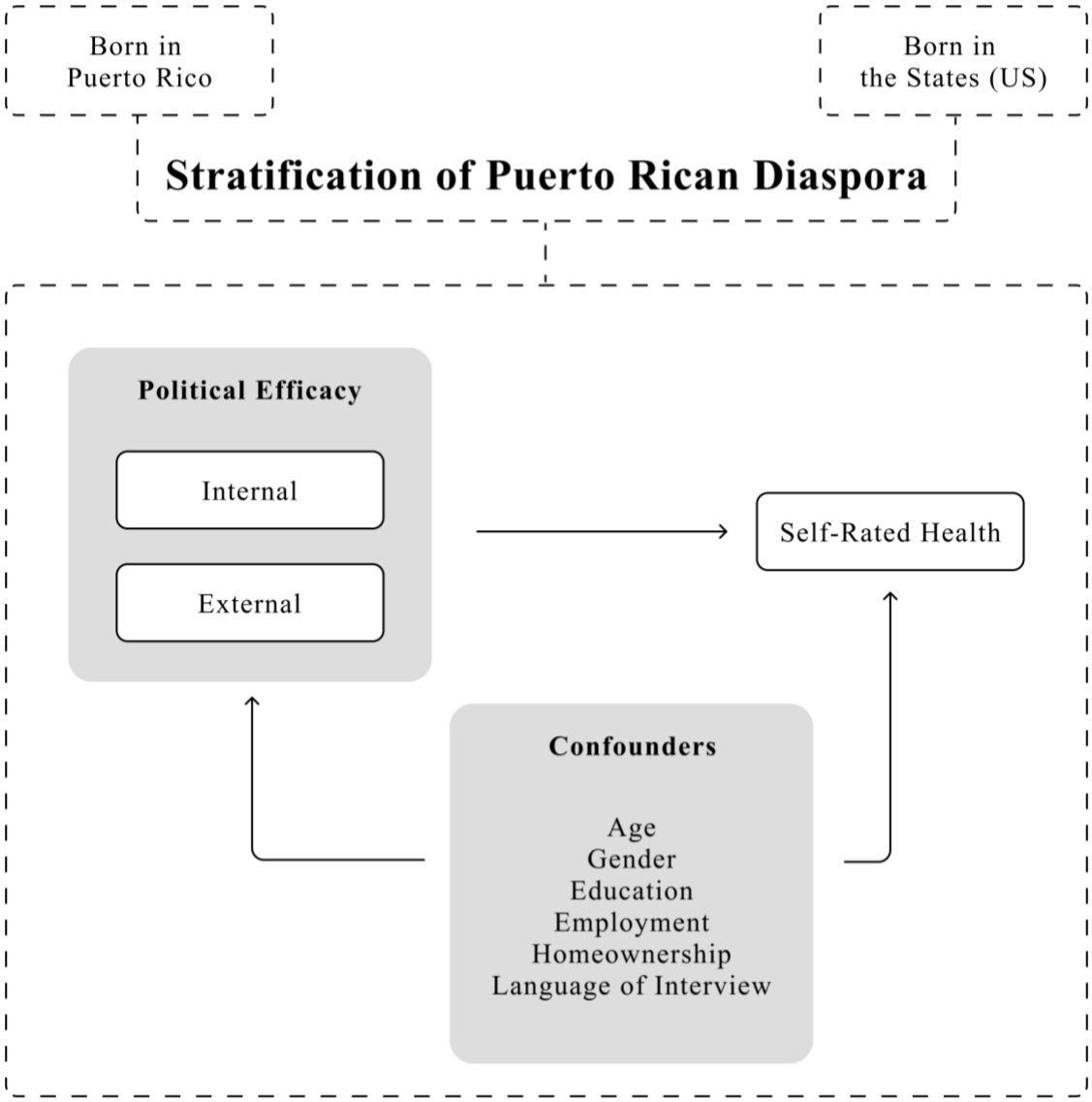
Secondly, this study aims to examine the relationship between both domains of political efficacy, internal and external, and self-rated health among members of the diaspora born in Puerto Rico and the States. Considering the variability in political exposures experienced by members of the Puerto Rican diaspora [56], there is a need to begin to assess the nature of the associations that exist between political indicators and health, especially considering the growing evidence that political forces within one's environment have implications for health outcomes [219]. Currently, there is a significant gap in the literature as it pertains to political determinants [92], particularly among members of the Puerto Rican diaspora. Therefore, this study leverages data from a secondary data source to examine the associations between both domains of political efficacy (IPE and EPE) and self-rated health (SRH), a commonly used measure of general health and well-being in population health research [176].

Based on the findings of previous studies in public health [183] and political science [149], which have examined the constructs of self-efficacy and its variants (i.e., internal and external political efficacy), it is anticipated that political efficacy will be significantly associated with health. Additionally, while previous investigations have found significantly positive associations between these constructs [149], [183], to my knowledge, the nature of this relationship has not previously been examined among the Puerto Rican diaspora. Therefore, it is difficult to predict the direction of the association between political efficacy and SRH for this population. However,

based on the differing exposures to political disenfranchisement, group differences between Puerto Ricans born in PR and individuals born in the States are expected. Importantly, members of the Puerto Rican diaspora who were born in PR gained the right to vote, whereas individuals born in the States did not experience this change. Therefore, it is anticipated that the magnitude of the association between political efficacy (IPE and EPE) and SRH would be stronger among individuals born in PR than it would be among members of the diaspora born in the States.

Lastly, this study aims to assess the relationship between political efficacy and self-rated health when accounting for key sociodemographic characteristics also known to be associated with political efficacy and self-rated health. There is a longstanding literature on the social determinants of health (SDoH) [13], [77] that indicates that the social environment influences life chances, such that individuals who are socially disadvantaged are likely to have worse health [13], [84]. The political determinants of health (PDoH), which involve the influence of political institutions and structures on population health, fall into this category of scholarship. However, they are slightly more structural in nature, in that the political determinants have the power to influence SDoH [92]. Therefore, it is likely that a construct like political efficacy, which is influenced by structural political forces, is also likely to be impacted by the SDoH. Similarly, existing literature has already linked socioeconomic factors, which often act as proxies for SDoH, to health outcomes, including SRH [169]. To isolate the effects of political efficacy on health, the associations between IPE and SRH and EPE and SRH are also assessed under conditions that account for the indicators of several SDoH. Based on the literature on self-efficacy and health [182], [183], [220], it is anticipated that any significant associations between both domains of political efficacy and SRH that emerge will remain significant when controlling for sociodemographic characteristics.

Figure 5.1. Conceptual Model of the Association between Political Efficacy and Self-Rated Health Stratified by Site of Birth for members of the Puerto Rican Diaspora



5.3. Method

5.3.1. *Data Source*

This study leveraged existing cross-sectional data collected within a diverse sample of voluntary respondents as part of the 2016 Collaborative Multiracial Post-election Survey (CMPS). The CMPS is a cooperative and user-content driven survey that takes place every four-years, following a presidential election season. In line with the intentions of the collaborative model, academics

and political scientists across the United States are invited to add items to the questionnaire. In exchange, collaborators make a financial contribution to cover the costs of survey activities. The CMPS has adapted this unique model to successfully execute a "multiracial, multiethnic, multilingual, post-election online survey on race, ethnicity, and politics in the US (p.173) [85]." The main goal of the survey was to assess attitudes about the 2016 election among racial and ethnic minorities in the US. However, the survey also included measures of general health status and political efficacy, the key outcome and exposure variables used within this study.

Recruitment was conducted using a random-recruit-to-web approach and included registered and non-registered voters. Registered voters within the final sample were identified using national voter registration email lists, while non-registered voters were randomly selected from email lists that were secured from online panel vendors. Of the 17,621 eligible respondents, 10,145 respondents completed the questionnaires (57.6% completion rate) from December 3, 2016 to February 15, 2017. Post-survey evaluation results revealed that the sampling methods used by the CMPS team yielded a geographically representative sample [85]. Similarly, subgroup demographic characteristics were consistent with other national surveys. For additional details regarding the CMPS protocol, refer to the peer-reviewed article published by the survey leadership team titled, "Best Practices in Collecting Online Data with Asian, Black, Latino, and White Respondents: Evidence from the 2016 Collaborative Multiracial Post-election Survey" [85].

The 2016 CMPS was an ideal dataset for this study because it collected detailed Latinx ethnicity information, which allowed for the identification of a Puerto Rican diaspora subsample. It also included a specific item regarding site of birth, which allowed for the identification of members in the diaspora who were born in PR as separate from individuals who were born in the States. Additionally, the survey questionnaire was administered in several languages, including

English and Spanish. This is an important feature that facilitates participation amongst Spanish-speaking members of the Puerto Rican diaspora. These important data source elements supported the successful execution of each of the aims of this study.

Exclusionary Criteria. Overall, the 2016 CMPS collected data from 491 respondents who identified as Puerto Rican. Of the 491 respondents, five were removed from the analytic sample because of missing data on key variables of interest and/or covariates included within the conceptual model (Figure 5.1). Additionally, respondents who identified as Puerto Rican but were born in a country outside of the US or the US Commonwealth of Puerto Rico (n=2) were excluded from the analytic sample. The application of these exclusionary criteria, through data cleaning and coding processes, resulted in the loss of 7 respondents (i.e., 1.2% of the original 2016 CMPS Puerto Rican subsample was excluded). Therefore, the final analytic sample included 484 respondents who identified as members of the Puerto Rican diaspora.

5.3.2. *Measures*

Dependent Variable. *Self-rated health (SRH)* is a widely used and well-established survey measure administered to subjectively assess general health status [170]. The item asks respondents, "How would you rate your overall physical health at the present time?" Responses were coded as: (1) Poor, (2) Fair, (3) Good, (4) Very Good, or (5) Excellent. This single-item measure has been validated for use across various demographics, including Latinx populations and has been demonstrated to be a highly effective predictor of objective health indicators, such as morbidity and mortality [170]. To account for the full range of health perceptions reported by survey respondents, all five-levels of this variable were retained for the analyses conducted in this study.

Independent Variables. The primary independent variable of interest is political efficacy [149], which is measured by several items to capture internal and external domains of the construct. To

measure *internal political efficacy (IPE)*, a single item was used: "Sometimes politics and government seem so complicated that a person like me can't really understand what's going on." Similarly, a single-item was used to measure *external political efficacy (EPE)* : "Public officials don't care much what people like me think [85], [188]." Response options for both items range from (5) Strongly disagree, which indicates high levels of political efficacy, to (1) Strongly agree, which indicates low levels of political efficacy. For ease of interpretation, the response options for both political efficacy measures were re-labeled: (1) Extremely Low, (2) Low, (3) Neutral, (4) High, (5) Extremely High. For both IPE and EPE, all five-levels of the categorical variable were also retained within the dataset and used in the analyses.

Stratification Variable. *Site of birth* was determined by leveraging the data captured by the question, "Were you born in the United States, on the island of Puerto Rico, or another country?" The item was coded as (0) born in the United States, (1) born in Puerto Rico, and (2) born in another country. The response option for (2) born in another country was dropped, as detailed in the exclusion criteria, which resulted in the creation of the dummy variable that was used to stratify all analyses by site of birth.

Covariates. The covariates included were age, gender, education, employment, homeownership, and language of interview. The covariates represent socioeconomic (education, homeownership, employment) and demographic characteristics that are known to influence or be associated with health outcomes and/or political factors [150], [200]–[202]. Each covariate was coded as a categorical variable. Coding decisions for each covariate were informed by the sample distribution, as well as the standard coding practices within the public health and political science literatures:

> *Age.* This variable included seven categories that were informed by the coding scheme utilized to define age cohorts within a well-cited study of political orientation across the

lifespan [203]. The reference category was (0) 18-25 years, followed by (1) 26-33 years, (2) 34-41 years, (3) 42-49 years, (4) 50-57 years, (5) 58-65 years, and (6) 66+ years.

Gender. The original item in the survey questionnaire included three options (male, female and other). However, due to low endorsement of the "other" option, this item was recoded as a dummy variable: (0) Male and (1) Female. This variable was included as a covariate, as gender differences in SRH and political efficacy have previously been observed [204].

Education. The survey included six response options regarding educational attainment; however, several response options were endorsed by a limited number of survey participants who identified as Puerto Rican. Therefore, the item responses were recoded into three categories that best represented the sample distribution: (0) Grades 1-8, Some High School, High School Graduate or GED; (1) Some college or 2-year college degree; and (2) 4-year college graduate or post-graduate education.

Employment. This variable originally included six categories. However, informed by the sample distribution, the items were reduced to represent a more general grouping of employment categories: (0) Unemployed = Currently unemployed, full-time student, homemaker; (1) Employed = Full-time, Part-time; and (2) Retired.

Homeownership. Household income is traditionally used as a key indicator of socioeconomic status [200]. However, due to missingness in household income data, homeownership was used instead. Indeed, homeownership has been linked to household income and wealth accumulation [205]. The survey questionnaire asked respondents, "Do you currently own the home you live in, rent, or live with someone else?" The response options were recoded to include (0) Rent or live with someone else and (1) Homeowner.

Language of interview. The survey was offered in English and Spanish. For each respondent, the language in which the interview was completed was noted. Within this dataset, the variable was coded as (0) English and (1) Spanish. This variable was included based on the recommendations of previous investigations using SRH among Latinx groups [170]. Indeed, variations in the predictive validity of SRH have been observed depending on the language of interview, such that individuals completing the measure in Spanish are more likely to report poor health than individuals completing the measure in English [206].

5.3.3. *Data Analysis*

All analyses were stratified by site of birth to describe trends among members of the Puerto Rican diaspora born in PR as separate from individuals who were born in the States. To assess sociodemographic, political, and health-related characteristics among members of the Puerto Rican diaspora, descriptive statistics were produced (Aim 1). To examine the association between political efficacy (both IPE and EPE) and SRH among members of the Puerto Rican diaspora born in the States separately from individuals born in PR, stratified chi-squared tests of independence and ordinal logistic regression analyses were conducted (Aim 2). To assess the relationship between political efficacy (both IPE and EPE) and SRH when accounting for key sociodemographic characteristics also known to be associated with political efficacy and SRH, unadjusted and adjusted ordinal logistic regression analyses were performed (Aim 3). Within adjusted models, all covariates identified in the conceptual model were included (Figure 5.1). Analyses were conducted using Stata SE 15.1. Notably, as this study leverages de-identified survey data for the purposes of conducting secondary quantitative analyses, it is not considered human subjects research and is exempt from review by the University of California, Los Angeles (UCLA) Institutional Review Board.

5.4. Results

5.4.1. *Sample Characteristics*

Table 5.1 provides details about the sample characteristics for the 484 respondents included in this study. Of the 484 respondents included, 360 (about 74% of the analytic sample) were born in the States and 124 (about 26% of the analytic sample) were born in PR. Within the full analytic sample, the majority of respondents were under the age of 65 (96.69%), with individuals in the 26 to 33-year age band representing the largest age category (22.78%). However, there were significant group differences in age by site of birth, such that members of the Puerto Rican diaspora who were born in PR did have a greater share of respondents in the older age categories as compared to individuals born in the States. Additionally, most respondents in the full analytic sample were employed (54.13%). However, there were significant group differences in employment by site of birth, such that members of the Puerto Rican diaspora born in PR had a greater share of individuals who were retired (18.55%) when compared to individuals born in the States (6.94%). Finally, most respondents completed the survey in English (95.25%). However, there were significant group differences, such that members of the diaspora born in PR had a greater share of respondents who completed the survey in Spanish (15.32%). Overall, the statistically significant differences in age, employment, and language of interview observed indicate that there were differences in the social characteristics of members of the Puerto Rican diaspora who were born in the States as compared to individuals who were born in PR. Additional sample characteristics are available in Table 5.1.

5.4.2. *Examining Political and Health-Related Characteristics by Site of Birth*

Stratified univariate analyses of SRH, IPE, and EPE were conducted to accomplish the aim of assessing political and health-related characteristics among members of the Puerto Rican diaspora (Aim 1). Additionally, bivariate analyses were conducted to determine whether there were

significant group differences (by site of birth) across key variables of interest. Results revealed that there were no significant differences in SRH, IPE, or EPE when comparing members of the Puerto Rican diaspora born in the States to individuals born in PR. The results of the univariate and bivariate analyses for these variables are presented in Table 5.2.

5.4.3. *Associations Between Political Efficacy and Self-Rated Health by Site of Birth*

The stratified associations between both domains of political efficacy (IPE and EPE) and SRH were examined among members of the Puerto Rican diaspora by site of birth using chi-squared tests of independence to determine whether there were significant differences (Aim 2). Table 5.3a presents the stratified results for the associations between IPE and SRH. As seen in Table 5.3a, results revealed that there was a significant inverse association between IPE and SRH among the full sample (X^2 (16, N=484) = 28.86, p<0.05), such that higher levels of IPE were indicative of lower levels of SRH. However, there were also significant differences in the results by site of birth. Among Puerto Ricans who were born in the States, the association between IPE and SRH remained significant (X^2 (16, N=360) = 29.93, p<0.05). Puerto Ricans born in the States who reported lower levels of IPE were more likely to report higher levels of SRH. However, the association between IPE and SRH was not significant among individuals born in PR.

Table 5.3b shows the stratified results for the associations between EPE and SRH. As seen in Table 5.3b, when assessing the full sample, the association between EPE and SRH was not statistically significant. This was also the case among Puerto Ricans born in PR. However, among Puerto Ricans born in the States, results revealed a significant inverse association between EPE and SRH such that individuals with lower levels of EPE were more likely to report higher levels of SRH (X^2 (16, N=360) = 34.38, p<0.01). These results are counter to the hypotheses outlined at the onset of the investigation, as it was anticipated that the magnitude of the relationship between

IPE and SRH and EPE and SRH would be stronger among members of the diaspora who were born in PR. However, the results revealed that IPE and EPE were not significantly associated with SRH for individuals born in PR.

5.4.4. ***Stratified Regression Analyses of Political Efficacy and Self-Rated Health by Site of Birth***

Stratified ordinal logistic regression analyses assessing the relationship between IPE and SRH (Table 5.4) and EPE and SRH (Table 5.5) were conducted to examine the associations when controlling for all potential confounders (Aim 3). Models were stratified by site of birth to examine patterns among members of the Puerto Rican diaspora born in the States as separate from individuals who were born in PR and migrated to the States.

Results revealed that, within the unadjusted model (Model 1, Table 5.4), IPE was a marginally significant correlate of SRH among Puerto Ricans born in the States (Wald X^2 (4) = 9.43, p=0.0512). Within Model 2, the adjusted model, IPE continued to be a significant correlate of SRH among Puerto Ricans born in the States (Wald X^2 (4) = 9.82, p<0.05). Model 2 demonstrates that Puerto Ricans born in the States who had "extremely high" IPE had 0.283 the odds (*SE*=0.132) of having higher SRH when compared to Puerto Ricans born in the States with "extremely low" IPE, when controlling for all covariates. Similarly, as seen in Model 2 within Table 5.4, Puerto Ricans born in the States with "neutral" IPE had 0.409 the odds (*SE*=0.143) of having higher SRH as compared to individuals with "extremely low" IPE, when controlling for all covariates. On the other hand, IPE was not a significant correlate of SRH among Puerto Ricans born in PR in both the unadjusted and adjusted models (Models 3 & 4, Table 5.4). Additionally, as presented in Table 5.5, across unadjusted and adjusted models (Models 1-4), EPE was not identified as a significant correlate of SRH for Puerto Ricans born in the States or members of the diaspora who were born in PR.

5.5. Discussion

Given the unique socio-political context experienced by members of the Puerto Rican diaspora [11], the examination of political variables as they relate to health outcomes is especially salient [92]. As a community with connections to colonial subjugation and political disenfranchisement, there is a need to address the ways in which these external political forces manifest into individual-level perceptions that may shape the health and well-being of the Puerto Rican diaspora [43], [148]. However, health inequities within the Puerto Rican diaspora are understudied [1] and, in the instances when they are address, within-group analyses are not typically conducted. Therefore, this study assessed the relationship between political efficacy, including internal political efficacy (IPE) and external political efficacy (EPE), and self-rated health (SRH) among members of the Puerto Rian diaspora who were born in the States as separate from individuals born in PR. Additionally, patterns across socio-demographic, political, and health-related characteristics were examined to highlight any existing within-group differences among members of the Puerto Rican diaspora. The examination of within-group differences was executed to account for the differential levels of exposure to political disenfranchisement and colonial subjugation experienced by members of the Puerto Ricans diaspora by site of birth. Individuals born in PR who migrate to the States have a direct connection to government-based exclusion under a colonial system [11], [16], while individuals born in the States have historical, indirect ties to this exposure [215]. Therefore, it was anticipated that there would be differences in the association between political efficacy and SRH based on site of birth, as well as differences in socio-demographic, political, and health-related characteristics within the diaspora. Overall, the results of this study do provide some support for the argument that political efficacy and SRH are related, although the findings are unexpected.

5.5.1. *Key Findings*

There were some significant group differences between members of the Puerto Rican diaspora born in the States and individuals born in Puerto Rico. Members of the Puerto Rican diaspora born in the States had a greater share of people who were employed, whereas individuals born in PR had a greater share of respondents who were retired. These differences in employment aligned with the significant differences observed across the age distribution, as the group who was born in the PR had a greater share of people in the older age categories who are more likely to be retired. There were also significant differences across language, such that a greater share of Puerto Ricans born in PR completed the survey in Spanish as compared to Puerto Ricans born in the States. These differences point to the importance of considering place of origin when engaging with the Puerto Rican diaspora, particularly when it comes to language [221]. Additionally, these results are consistent with previous research describing language shifts and losses experienced by Puerto Ricans as a result of the existing colonial relationship with the US [222].

Although the Puerto Rican diaspora has a greater share of individuals with higher-levels of English proficiency, as compared to other Latinx groups [222], Puerto Ricans born in PR still have a strong connection to the Spanish language [221]. Many within the Puerto Rican community see the use of the Spanish language as an act of resistance against US imposed English-language policies in PR [223]. While the availability of materials in Spanish may not be required for the purposes of ensuring comprehension or accessibility for the majority of Puerto Ricans living in the States, presenting the language option may serve to honor the importance of Spanish as part of the Puerto Rican cultural identity. Previous work on colonialism and health points to the loss of language as a trauma that is experienced by colonized subjects that contributes to poor health outcomes within these communities [90]. Therefore, sensitivity to language when developing

materials for the Puerto Rican diaspora may present an opportunity for an anti-colonial practice that honors the historical context of this population [36].

As expected, there was a significant association between IPE and SRH among members of the Puerto Rican diaspora who were born in the States. Interestingly, Puerto Ricans born in the States who endorsed the highest level of IPE were more likely to report worse SRH. This inverse association is distinct from what has been observed within previous investigations, such that the association between these two variables is typically positive – better political efficacy is linked to better health [188]. Similarly, within studies of self-efficacy and health, better self-efficacy is typically indicative of better health outcomes [183], [184]; a trend that has also previously been observed among members of the Puerto Rican diaspora [184]. The results of this study suggest that political perceptions may have counter-intuitive implications for health among members of the Puerto Rican diaspora who were born in the States.

When taking a closer look at the results, there are a few potential explanations for the significant inverse associations observed. First, members of the Puerto Rican diaspora born in the States have spent their entire lives within the stateside political context. It may be that that this life-long political exposure increases the awareness of US-based political exclusion among members of the diaspora in the States to the point where it has negative consequences for health outcomes. The political exclusion perpetrated against racial and ethnic minorities in the US [148], coupled with an awareness of Puerto Rican exclusion and second class citizenship [57] in the States and the territory, may increase levels of perceived discrimination [224]. Indeed, perceived discrimination has been linked to negative health outcomes among members of the Puerto Rican diaspora [212]. Therefore, future investigations should also include measures of perceived discrimination when replicating studies of this nature, as there appear to be significant differences

in the association between IPE and SRH among members of the diaspora born in the States that have yet to be explained.

Conversely, a significant association between IPE and SRH was not detected among members of the diaspora born in Puerto Rico. This is counter to the hypothesis that was outlined at the onset of the investigation. It was not only anticipated that the relationship would be significant but, also, that the magnitude of the association would be greater because individuals with a direct birth connection to PR would have had direct exposure to politically restrictive colonial structures [11], [43]. However, among the members of the diaspora who were born in PR and migrated to the States, it may be that the history of political disenfranchisement is so ingrained within the collective consciousness that individuals do not allow political perceptions to cloud their perceptions of their health and well-being. This line of thinking is consistent with the resilience literature, which indicates that individuals who commonly experience adversity may cope through engaging in activities that bring about positive outcomes and focus on the good in spite of challenges [210]. These tendencies towards resilience have been observed among members of the Puerto Rican diaspora and across the broader Puerto Rican community, which includes individuals in PR. Similarly, support for the positive effects of group or collective consciousness in overcoming adversity, among racial and ethnic minority groups in the US, has been found [225].

However, this potential explanation for the observed non-significant associations among individuals born in PR further complicates the results observed among members of the diaspora who were born in the States. For individuals with a life-long connection to the States, there were significant associations between IPE and SRH, indicating that the political context may be shaping health outcomes via political efficacy. Therefore, future investigations should seek to identify the differential mechanisms that produce detrimental health outcomes within the diaspora by site of

birth. As suggested, potential avenues for future exploration include the role of resilience[211], [226], among individuals born in PR, and perceived discrimination [212], among individuals born in the States. Importantly, the paradoxical results observed among Puerto Ricans born in the States and the non-significant results among individuals born in PR not only emphasizes the need for Latinx subgroup analyses but, also, within-group analysis among understudied populations.

5.5.2. *Strengths*

This study works to increase the availability of Latinx health literature that focuses on the heterogeneity within the Latinx category. Similarly, this study introduces a summary of key political, health, and demographic characteristics for a community that is traditionally underrepresented within the health disparities literature. To my knowledge, this study represents one of the first attempts to understand the association between two-domains of political efficacy (IPE and EPE) and SRH among members of the Puerto Rican diaspora. While these are some of the strengths of this study, there are also several limitations.

5.5.3. *Limitations*

First, this study was meant to explore associations and does not establish causal links between political efficacy and SRH. Similarly, the data utilized in this study were collected as part of a cross-sectional survey, which means the observations are limited by a snapshot in time. Therefore, the temporal relationship between political efficacy and SRH cannot be established. However, this design is a cost-effective way to go about establishing preliminary findings to inform future research. Therefore, efforts should be made to replicate theses analyses to determine whether these results could be observed within another sample of Puerto Ricans living in the States. Another limitation of this investigation is the limited health outcomes included. Future analyses should aim to include additional health indicators beyond SRH, such as measures of psychological health and

chronic disease, to improve upon the robustness of the conclusions that can be drawn about health. Additionally, limitations within the predictive strength of SRH have been identified among Spanish-speaking Latinx populations [168], [170]. Although not a major concern within this study, as most respondents completed the questionnaire in English, this could be a concern in future studies that include a greater share of Puerto Ricans who speak Spanish. This is particularly relevant for future studies that might seek to include a greater share of members of the diaspora who were born in PR.

5.5.4. *Future Directions*

While future work in this area is needed, I would like to acknowledge that attempts to understand the political determinants of health, as they shape health inequities within the Puerto Rican community, are compromised by the challenges associated with identifying datasets that include political measures, health outcomes, and a robust sample of Puerto Ricans in the US. In this case, the utilization of a transdisciplinary data source, the Collaborative Multiracial Post-election Survey (CMPS), allowed this investigator to present early evidence highlighting the relationship between political efficacy and health within an understudied group. As a result, this paper stands as an example of the types of questions that can be addressed when public health research is transdisciplinary. Furthermore, public health data sources should strive to include measure of political factors, such as political efficacy and political participation, to address the ever-present influence of the political determinants of health, particularly among historically disenfranchised groups like members of the Puerto Rican community.

5.6. Results Tables

Table 5.1. Sample Characteristics among members of the Puerto Rican Diaspora Born in the States and Puerto Rico, as well as among the Full Sample (Col %)

	Puerto Rican Diaspora		
Sample Characteristics	Born in States *(n=360)*	Born in Puerto Rico *(n=124)*	Full Sample *(n=484)*
Age **			
18-25 years	16.67	12.90	15.70
26-33 years	22.78	14.52	20.66
34-41 years	19.44	20.16	19.63
42-49 years	18.06	11.29	16.32
50-57 years	15.28	20.16	16.53
58-65 years	6.11	12.90	7.85
66+ years	1.67	8.06	3.31
Sex			
Male	30.00	28.23	29.55
Female	70.00	71.77	70.45
Education			
High School/GED or Less	33.33	35.48	33.88
Some College/2yr Degree	38.33	40.32	38.84
4yr Degree or More	28.33	24.19	27.27
Employment **			
Unemployed	37.78	30.65	35.95
Employed	55.28	50.81	54.13
Retired	6.94	18.55	9.92
Homeownership			
Rent/Live with someone	66.67	58.87	64.67
Homeowner	33.33	41.13	35.33
Lanuage of Interview **			
English	98.89	84.68	95.25
Spanish	1.11	15.32	4.75

Note(s): Chi-squared tests of independence revealed significant group differences where indicated; **p<0.001.

Table 5.2. Differences in Self-Rated Health (SRH), Internal Political Efficacy (IPE), and External Political Efficacy (EPE) among Members of the Puerto Rican Diaspora Born in the States and in Puerto Rico, as well as among the Full Sample (Col %)

	Puerto Rican Diaspora		
Key Indicators of Interest	Born in States *(n=360)*	Born in Puerto Rico *(n=124)*	Full Sample *(n=484)*
Self-Rated Health			
Poor	6.11	1.61	4.96
Fair	15.28	16.94	15.70
Good	35.56	31.45	34.50
Very Good	27.22	33.87	28.93
Excellent	15.83	16.13	15.91
Internal Political Efficacy			
Extremely Low	11.39	16.94	12.81
Low	30.28	30.65	30.37
Neutral	34.72	30.65	33.68
High	15.56	14.52	15.29
Extremely High	8.06	7.26	7.85
External Political Efficacy			
Extremely Low	20.56	18.55	20.04
Low	31.11	29.03	30.58
Neutral	35.00	41.94	36.78
High	10.00	7.26	9.30
Extremely High	3.33	3.23	3.31

Note(s): Chi-squared tests of independence yielded no significant group differences.

Table 5.3a. Association Between Internal Political Efficacy (IPE) and Self-Rated Health (SRH) among Members of the Puerto Rican Diaspora Born in the States, Born in Puerto Rico, and among the Full Sample (Row %)

		Self-Rated Health				
Internal Political Efficacy		% Poor	% Fair	% Good	% Very Good	% Excellent
Born in States *(n=360)*	Extremely Low	7.32	12.20	21.94	24.39	34.15
	Low	4.59	18.35	30.28	28.44	18.35
	Neutral	4.80	15.20	45.60	25.60	8.08
	High	5.36	14.29	33.93	28.57	17.86
	Extremely High	17.24	10.34	34.48	31.03	6.90
		Significant, $p<0.05$				
Born in Puerto Rico *(n=124)*	Extremely Low	0.00	19.05	28.57	28.57	23.81
	Low	2.63	13.16	28.95	39.47	15.79
	Neutral	0.00	15.79	39.47	36.84	7.89
	High	5.56	16.67	33.33	27.78	16.67
	Extremely High	0.00	33.33	11.11	22.22	33.33
		Not Significant				
Full Sample *(n=484)*	Extremely Low	4.84	14.52	24.19	25.81	30.65
	Low	4.08	17.01	29.93	31.29	17.69
	Neutral	3.68	15.34	44.17	28.22	8.59
	High	5.41	14.86	33.78	28.38	17.57
	Extremely High	13.16	15.79	28.95	28.95	13.16
		Significant, $p<0.05$				

Note(s): Chi-squared tests of independence revealed significant associations where indicated.

Table 5.3b. Association Between External Political Efficacy and Self-Rated Health among Members of the Puerto Rican Diaspora Born in the States, Born in Puerto Rico, and among the Full Sample (Row %)

		Self-Rated Health				
External Political Efficacy		% Poor	% Fair	% Good	% Very Good	% Excellent
Born in States *(n=360)*	Extremely Low	9.46	18.92	33.78	17.57	20.27
	Low	2.68	10.71	33.93	37.50	15.18
	Neutral	6.35	16.67	40.48	26.19	10.32
	High	2.78	16.67	36.11	25.00	19.44
	Extremely High	25.00	16.67	8.33	8.33	41.67
		Significant, $p<0.01$				
Born in Puerto Rico *(n=124)*	Extremely Low	0.00	21.74	30.43	26.09	21.74
	Low	5.56	19.44	27.78	30.56	16.67
	Neutral	0.00	15.38	32.69	38.46	13.46
	High	0.00	11.11	33.33	33.33	22.22
	Extremely High	0.00	0.00	50.00	50.00	0.00
		Not Significant				
Full Sample *(n=484)*	Extremely Low	7.22	19.59	32.99	19.59	20.62
	Low	3.38	12.84	32.43	35.81	15.54
	Neutral	4.49	16.29	38.20	29.78	11.24
	High	2.22	15.56	35.56	26.67	20.00
	Extremely High	18.75	12.50	18.75	18.75	31.25
		Not Significant				

Note(s): Chi-squared tests of independence revealed significant associations where indicated.

Table 5.4. Unadjusted and Adjusted Ordinal Logistic Regression Models for Internal Political Efficacy (IPE) as the Exposure and Self-Rated Health (SRH) as the Outcome among Members of the Puerto Rican Diaspora by Site of Birth

	Born in the States				Born in Puerto Rico			
	Model 1		Model 2		Model 3		Model 4	
	Unadjusted IPE		Adjusted IPE ◆		Unadjusted IPE		Adjusted IPE	
	OR	*SE*	OR	*SE*	OR	*SE*	OR	*SE*
Internal Political Efficacy (IPE)								
Extremely Low (Ref.)	–	–	–	–	–	–	–	–
Low	0.550	(0.193)	0.578	(0.207)	0.953	(0.477)	0.850	(0.445)
Neutral	0.396 *	(0.136)	0.409 *	(0.143)	0.693	(0.343)	0.626	(0.324)
High	0.568	(0.221)	0.454	(0.183)	0.676	(0.404)	0.555	(0.360)
Extremely High	0.326 ▲	(0.150)	0.283 *	(0.132)	1.046	(0.843)	0.536	(0.462)
Age								
18-25 years (Ref.)	–	–	–	–	–	–	–	–
26-33 years	–	–	0.946	(0.297)	–	–	0.618	(0.413)
34-41 years	–	–	0.894	(0.296)	–	–	1.185	(0.756)
42-49 years	–	–	0.603	(0.213)	–	–	0.224 ▲	(0.162)
50-57 years	–	–	0.804	(0.298)	–	–	0.262 ▲	(0.164)
58-65 years	–	–	0.745	(0.404)	–	–	0.240	(0.183)
66+ years	–	–	0.828	(0.789)	–	–	0.292	(0.273)
Gender								
Male (Ref.)	–	–	–	–	–	–	–	–
Female	–	–	0.630 ▲	(0.143)	–	–	0.588	(0.241)
Education								
High School/GED or Less (Ref.)	–	–	–	–	–	–	–	–
Some College/2 year Degree	–	–	1.502	(0.361)	–	–	0.709	(0.302)
4 year Degree or More	–	–	2.427 **	(0.663)	–	–	1.518	(0.794)
Employment								
Unemployed (Ref.)	–	–	–	–	–	–	–	–
Employed	–	–	1.607 ▲	(0.363)	–	–	1.464	(0.626)
Retired	–	–	0.615	(0.311)	–	–	1.264	(0.872)
Homeownership								
Rent/Live with someone (Ref.)	–	–	–	–	–	–	–	–
Homeowner	–	–	1.116	(0.251)	–	–	1.886	(0.785)
Language of Interview								
English (Ref.)	–	–	–	–	–	–	–	–
Spanish	–	–	4.042	(3.680)	–	–	0.931	(0.469)
N	360		360		124		124	
AIC	1065.987		1058.907		360.058		362.768	
BIC	1097.075		1140.515		382.6201		421.994	
Log Likelihood	-524.993		-508.4535		-172.029		-160.384	
df	8		21		8		21	

Notes: OR=Odds Ratio; SE=Standard Error; ▲ p<0.05, *p<0.01, **p<0.001; ◆ = Wald Test indicated that internal political efficacy was a significant predictor of self-rated health within the model.

Table 5.5. Unadjusted and Adjusted Ordinal Logistic Regression Models for External Political Efficacy (EPE) as the Exposure and Self-Rated Health (SRH) as the Outcome among Members of the Puerto Rican Diaspora by Site of Birth

	Born in the States				Born in Puerto Rico			
	Model 1		Model 2		Model 3		Model 4	
	Unadjusted EPE		Adjusted EPE		Unadjusted EPE		Adjusted EPE	
	OR	*SE*	OR	*SE*	OR	*SE*	OR	*SE*
External Political Efficacy (EPE)								
Extremely Low (Ref.)	–	–	–	–	–	–	–	–
Low	1.694	(0.467)	1.567	(0.436)	0.823	(0.411)	0.762	(0.401)
Neutral	0.971	(0.263)	0.953	(0.257)	1.051	(0.483)	0.939	(0.458)
High	1.401	(0.523)	1.139	(0.429)	1.400	(1.001)	1.539	(1.179)
Extremely High	1.310	(0.958)	1.152	(0.883)	1.027	(0.911)	0.949	(0.963)
Age								
18-25 years (Ref.)	–	–	–	–	–	–	–	–
26-33 years	–	–	0.899	(0.283)	–	–	0.673	(0.462)
34-41 years	–	–	0.857	(0.285)	–	–	1.208	(0.791)
42-49 years	–	–	0.573	(0.204)	–	–	0.205	(0.153)
50-57 years	–	–	0.737	(0.273)	–	–	0.288	(0.187)
58-65 years	–	–	0.763	(0.406)	–	–	0.242	(0.189)
66+ years	–	–	0.780	(0.743)	–	–	0.292	(0.273)
Gender								
Male (Ref.)	–	–	–	–	–	–	–	–
Female	–	–	0.670	(0.152)	–	–	0.656	(0.263)
Education								
High School/GED or Less (Ref.)	–	–	–	–	–	–	–	–
Some College/2 year Degree	–	–	1.319	(0.312)	–	–	0.6427	(0.270)
4 year Degree or More	–	–	2.132 *	(0.578)	–	–	1.355	(0.717)
Employment								
Unemployed (Ref.)	–	–	–	–	–	–	–	–
Employed	–	–	1.699 ▲	(0.381)	–	–	1.465	(0.627)
Retired	–	–	0.603	(0.298)	–	–	1.293	(0.901)
Homeownership								
Rent/Live with someone (Ref.)	–	–	–	–	–	–	–	–
Homeowner	–	–	1.111	(0.246)	–	–	1.952	(0.829)
Language of Interview								
English (Ref.)	–	–	–	–	–	–	–	–
Spanish	–	–	3.608	3.362	–	–	0.877	(0.445)
N	360		360		124		124	
AIC	1068.484		1063.913		360.492		363.393	
BIC	1099.573		1145.521		383.055		422.619	
Log Likelihood	-526.2419		-510.957		-172.246		-160.697	
df	8		21		8		21	

Notes: OR=Odds Ratio; SE=Standard Error; ▲ p<0.05, *p<0.01, **p<0.001

CHAPTER 6.

DATA GAPS IN HEALTH MONITORING AND SURVEILLANCE SYSTEMS: THE CASE OF THE UNITED STATES COMMONWEALTH OF PUERTO RICO

Chapter 6. Data Gaps in Health Monitoring and Surveillance Systems: The Case of the United States Commonwealth of Puerto Rico

6.1. Introduction

An integral part of preserving the health of any population is the maintenance of population-level health monitoring and surveillance systems [227], [228]. In Puerto Rico (PR), there are over 3.1 million United States (US) citizens in need of the vital public health infrastructure that maintains these data [33], [41]. In fact, a 2017 report detailing an assessment of PR's health care infrastructure indicated that there were major gaps within public health data systems [33]. As a colonial power in the region [42], [229], the US federal government plays a role in protecting and promoting the health of all individuals residing in the US Commonwealth of Puerto Rico [11], [230], a US territory under the rule of the US Constitution since 1898 [50]. However, despite the status of Puerto Ricans as US citizens, there is great variability in the availability of health data for Puerto Ricans residing in PR from US-based health monitoring and surveillance systems [33] (See Figure 6.1 for a contemporary example of the harm caused by data gaps in PR).

6.1.1. *Public Health Monitoring and Surveillance*

Public health surveillance data are collected for the purposes of tracking disease and health status within a population [227], [228]. The collection of these data is considered an essential public health function [231]. National-level health monitoring and surveillance systems maintain important population-level health informatics [228], such as vital records (e.g., birth, death and marriage records) [232], population-based surveys (e.g., National Health Interview Survey) [233], and registries (e.g., US Cancer Registry) [234], [235]. These systems promote and preserve population health by informing evidence-based policy priorities (e.g., the Affordable Care Act (ACA)), resource allocation decisions (e.g., government funding for health disparities research),

and disease-outbreak management (e.g., COVID-19 global pandemic response) [227], [234]. Additionally, these systems contribute to the pool of available data for health scientists to study health trends and promote scientific contributions to the evidence-base that is necessary for population health advancements. Traditionally, the responsibility for developing these health monitoring and surveillance systems falls under the purview of governmental entities invested in minimizing the spread of disease for the purposes of maintaining national security and economic stability [92]. In the US, the Centers for Disease Control and Prevention (CDC) are charged with the oversight of many of these systems [236].

6.1.2. *Centers for Disease Control and Prevention*

In the United States, the CDC acts as the nation's health protection bureau, safeguarding against health threats, both foreign and domestic [156]. As an entity of the US government, the CDC is mandated to execute congressional legislation pertaining to matters of the public's health across the US [152]. As a territory of the US, under congressional rule, one might conclude that the CDC's public health responsibility extends to PR. In fact, the CDC has a long-running historical involvement in the territory. When the CDC was established in 1946, it was involved in a major campaign to prevent the spread of Malaria in the southeastern continental US and across the Caribbean territories, which included PR [157]. Despite the CDC's historical involvement in PR, there is ambiguity surrounding US-sponsored health data coverage for this population. Similarly, little is known about the types of systems or the extent of coverage that is provided by the CDC for PR. Further, recent reviews of existing US-based health monitoring and surveillance systems reveal gaps and opportunities for improvement within our coverage of the Hispanic/Latino/a/x population overall, especially those subgroups categorized under this ethnic identity, which includes Puerto Ricans [15], [86].

Figure 6.1. Why Data Matter? A Contemporary Example of Public Health Informatics Failure in the United States Commonwealth of Puerto Rico

The structure of public health informatics systems reflects the governmental context under which they are developed, deployed and maintained [158]. As a self-governing unincorporated US territory, PR is treated as both foreign and domestic within US government structures [11], including CDC-supported health monitoring and surveillance systems. This results in variable US-based data coverage for the 3.1 million US citizens living within the archipelago [24]. Additionally, this presents significant issues for a territory that relies on the US to support its health infrastructure, particularly when catastrophic national events require PR to leverage these systems.

In 2017, after the devastation of Hurricanes Maria and Irma, one of the major barriers to disaster recovery in PR was the limited availability of population-level demographic and health data [33], [237]. Standard vital statistics, such as mortality data, were not reliably available in the weeks and months after the hurricanes [237]. Access to these types of national-level data is particularly important when assessing need and allocating resources after a natural disaster; as evidenced by the underestimation of the death count within the US government [237]–[239] and the under-disbursement of hurricane relief funds to the territory [240]–[242]. Using the existing health informatics infrastructure, namely death certificate data, the US government declared the official death count at 64 souls [237]–[239]. These reports raised major public concerns surrounding the accuracy of the death count in PR and prompted several empirical investigations.

In a survey-based assessment of hurricane-related all-cause mortality, investigators at Harvard T.H. Chan School of Public Health reported that there were an estimated 5,740 excess deaths in PR after Hurricanes Maria and Irma [237]. This large discrepancy in death estimates led the government of PR to commission investigators at the Milken Institute School of Public Health at George Washington University to conduct an independent investigation [239]. Researchers revealed that, in the 6-months after the hurricane, there were an estimated 2,975 excess deaths in PR, which were likely attributable to the effects of the hurricanes. These results were derived using a rigorous time-series analysis which incorporated data collected from the PR Vital Statistics Systems, as well as the US Census Bureau [239].

Regardless of which is to be considered the true estimation, both investigations reveal mortality estimations that far surpass that of the 64 deaths declared by the US federal government. This points to the disconnect that is present between the federal controlling party and the local PR government. Further, the examples of Hurricanes Maria an Irma illuminate the need to improve our understanding of the status of US-based public health monitoring and surveillance systems in PR. While the government of PR is responsible for the health of its people, similar to the public health responsibilities held by a comparable US state, US federal public health standards and funding guidelines heavily drive the operations and standards within territorial and state governments [227]. Therefore, the US federal government, including agencies like the CDC, have a role to play in ensuring the quality and appropriateness of these crucial and fundamental public health systems in PR.

6.1.3. *Puerto Rican Language Context*

Puerto Rico is often referred to as the oldest colony in the world [35], [94]. Before US occupation, PR had been under Spanish rule - beginning when Cristóbal Colón arrived on the shores of El Borinquen (indigenous Taíno name for PR) in the 1400s [35]. Hundreds of years of Spanish occupation played a significant role in shaping the Puerto Rican cultural context, including language [35]. Therefore, despite its status as a US territory, Spanish remains the dominant language spoken by most of the population [243]. Similarly, although English and Spanish have both been established as the official governmental languages of PR, Puerto Ricans continue to resist US imposed attempts to assert English-language dominance [221]. In fact, the PR Department of Health continues to engage with the public in Spanish through their programming and public facing communications [244]. However, when engaging with US-based public health infrastructure, public health practitioners and researchers are required to operate within English-language systems, with little to minimal Spanish-language accommodations [245]. This presents a language barrier to collecting health monitoring and surveillance data, from the community and practitioners. However, the extent of Spanish-language coverage gaps within CDC-supported health monitoring and surveillance systems is unknown and has yet to be quantified.

6.2. The Present Study

Despite being a US territory since 1898, little is understood about CDC-supported coverage of population-based health monitoring and surveillance systems for Puerto Ricans within the US Commonwealth of Puerto Rico. However, to my knowledge, no comprehensive review assessing the coverage of PR within these CDC-supported systems exists. Therefore, the purpose of this study is to assess the coverage of PR in existing health monitoring and surveillance systems, under the CDC, for the purpose of detailing existing gaps in US government-led monitoring and

surveillance systems in the territory. This is accomplished by quantifying the inclusion of PR within CDC-supported public health monitoring and surveillance systems and comparing the coverage of PR to the coverage of all 50 states in the union. This study also assesses whether these systems were appropriately adapted for the Puerto Rican context, specifically, by identifying whether data collection instruments and systems were available in Spanish.

6.2.1. *Specific Aims*

First, to what extent do CDC-supported health monitoring and surveillance systems include the United States Commonwealth of Puerto Rico? As a self-governing unincorporated US territory, local and federal governmental responsibilities for health monitoring and surveillance systems are opaque [11]. In many instances, this leads to data coverage gaps [33], [237]. Given this context, and the importance of these systems for the maintenance of population health, it is necessary to establish a baseline understanding of which systems include PR and which systems do not. Additionally, a comprehensive assessment by system type is also important for assessing appropriate coverage [15]. For example, case-based surveillance is essential in tracking communicable diseases, such as Human Immunodeficiency Virus, whereas population-based surveys play a key role in assessing population characteristics related to health, such as health risk behaviors. Each of these system types are essential to public health monitoring and surveillance efforts. By assessing overall coverage and coverage by system type, this study works to reveal the true scale of gaps in coverage, allowing public health practitioners in the US and the territory to begin developing strategies for providing health monitoring and surveillance where it does not exist. As the leaders in public health monitoring efforts, nationally and globally, CDC-supported health monitoring and surveillance systems emerge as a natural starting point for this assessment of coverage [246]. Furthermore, as a federal entity, the CDC is regularly charged with the

execution of congressional health mandates for the US population [152], which includes individuals residing in the US Commonwealth of Puerto Rico. Given the complexities of the existing political relationship between the US and PR [11], as well as the compromised health informatics infrastructure in the territory [33], it is anticipated that there will be significant coverage gaps (i.e., PR is not included) across all health monitoring and surveillance system types.

Second, to what extent are CDC-supported health monitoring and surveillance systems appropriately tailored for the Puerto Rican language context? While PR is a part of the greater US, its complex colonial history has produced a distinct national identity, characterized, in part, by the Spanish language [11]. Therefore, once the extent to which CDC-supported health monitoring and surveillance systems include PR is established, the separate matter of determining whether these systems are appropriately tailored for use within the Puerto Rican context is addressed. More specifically, whether the systems and/or data collection instruments are available in Spanish is highly relevant for the utility of these data in PR and, potentially, influences the ability to collect crucial surveillance data [247]. It is anticipated that, of the systems that include PR, few CDC-supported health monitoring and surveillance systems will be tailored to the needs of the Puerto Rican participants (e.g., surveys in Spanish) or public health practitioners (e.g., case-based reporting forms in Spanish) who engage with these systems.

6.3. Method

6.3.1. *Data Curation*

This study employed the process of **data curation**, which involves identifying, collecting, and categorizing data from multiple sources [86]. This methodological approach was informed by the works of previous investigators who (1) assessed the availability of sociodemographic and health data for Latinx populations in the US [86] and (2) quantified the availability of key demographic

variables within CDC-supported health monitoring and surveillance systems, such as race, ethnicity, and place of birth [15]. Data curation is becoming increasingly relevant to the health sciences, particularly as the volume of health data, as well as the application of large-scale automated health data collection processes continues to grow [248]. Additionally, as sources of health information become more expansive and diverse, centralizing, and categorizing these data ensures their preservation, availability, and utility for public health scholarship and practice. The data curation approach also allows for the identification of gaps within data sources and systems based on key contextual characteristics. Therefore, this technique is ideal for the purposes of quantifying and describing the extent to which PR is included within CDC-supported public health monitoring and surveillance systems.

6.3.2. *Curated Database Used in the Present Study*

The data used in this study consisted of a curated database, compiled by the lead author (AMM), which houses ***93 active CDC-supported health monitoring and surveillance systems***. CDC-supported systems were identified using government administered health informatics platforms from the US Department of Health and Human Services [249], CDC, and PR Department of Public Health websites [250], as well as online data tools like CDC Wonder [251] and the Surveillance Resource Center A-Z Index [252]. Data systems within the curated database were also identified through the review of CDC-sponsored reports, peer-reviewed publications, fact sheets and other health data communication materials available on the CDC's website. Web-based searches and documents were selected as the primary source of information for this data curation project because online sources are the primary research tool being used by communities and public health practitioners to engage with public data [253]. From August 2021 to March 2022, the lead author identified and compiled a list of 141 CDC-supported health monitoring and surveillance systems

from web-based sources into a Microsoft Excel spreadsheet. This list was reduced to include the 93 curated systems used for the analyses after applying the study inclusion and exclusion criteria.

Database Inclusion and Exclusion Criteria. Only active CDC-supported health monitoring and surveillance systems - defined as those under the CDC's umbrella of surveillance programs, funded and/or managed by the CDC, and maintained for repeated and ongoing monitoring and surveillance - were included within the curated database. Key indicators of an active system; include (a) a webpage with a timestamp indicating that a review of the information was conducted anytime between 2016 and 2022; and/or (b) reports and other communications highlighting plans for future data collection, system improvement or maintenance; and/or (c) a longstanding history of data collection and system maintenance. Systems that were listed as discontinued, archived, or replaced by the CDC, on or before March 2022, were excluded from the curated database. Mirroring previous investigations of this nature, data systems that were inconsistently collected (e.g., one-off survey or system with no regularity), solely monitored environmental factors (e.g., air quality), as well as those collected for the purposes of monitoring populations outside of the greater US (e.g., global health surveys), were also excluded [15]. These inclusion and exclusion criteria were also sensitive to the pressures applied to the public health infrastructure during the global pandemic, beginning in the winter of 2020. Hence, for example, the generous time band selected for defining timely website updates within this curation.

6.4. Measures

6.4.1. *Dependent Variables*

Coverage of Puerto Rico and the 50 states. As part of the data curation process, systems were assessed across several key characteristics to accomplish the study aims. To assess the extent to which CDC-supported health monitoring and surveillance systems included PR (Aim 1), web-

based CDC documentation and data (e.g., summary statistics, reports detailing coverage areas, summary descriptions about the surveillance systems on the CDC website, publications, etc.) were reviewed to locate any information about PR in each system. Coverage of PR was coded as a dummy variable (Yes = PR was included; No = PR was not included). For the purposes of calibrating territorial inclusion within CDC-supported health monitoring and surveillance systems to the level of stateside inclusion, coverage of all 50 states was also coded (Yes = all 50 states were included; No = all 50 states were not included). Descriptive fields were also included in the database to qualitatively assess the extent of coverage of the 50 states and/or PR.

Availability of Data Collection Instrument in Spanish. Health monitoring and surveillance systems are only effective if they are capturing the data they proport to track [231]. In PR, a predominantly Spanish-speaking territory, the ability to effectively capture these public health data relies heavily on the availability of data collection tools in Spanish. Therefore, whether data collection instruments were available in Spanish was included as a key characteristic of interest and coded as a dummy variable (Yes = data collection instrument available in Spanish; No = not available in Spanish). For probability-based surveys, the dummy variable was coded to track whether the survey was offered in Spanish. This included the availability of Spanish interviewers and/or translated questionnaires. For case-based surveillance systems, administrative systems, and registries, this same dummy variable captured the availability of case reporting forms or public health data entry platforms in Spanish. For multiple-source systems, some of the data sources that inform these systems were collected in Spanish, while others were only collected in English. Given this nuanced complication, the availability of data collection instruments in Spanish was not coded for multiple-source systems.

6.4.2. *Independent Variables*

Health Monitoring and Surveillance System Categorization. All identified systems were organized into five categories [15] (Figure 6.2):

(1) *Case-based surveillance* includes all systems that collect information from local, state, or national health agencies about persons diagnosed with diseases or conditions (cases) that pose a serious public health threat (e.g., National Respiratory and Enteric Virus Surveillance System) [254], [255]. Case-based reporting can include confirmatory data produced by laboratory results (i.e., laboratory-based surveillance), as well as reports of symptoms, risk factors, and relevant demographic characteristics.

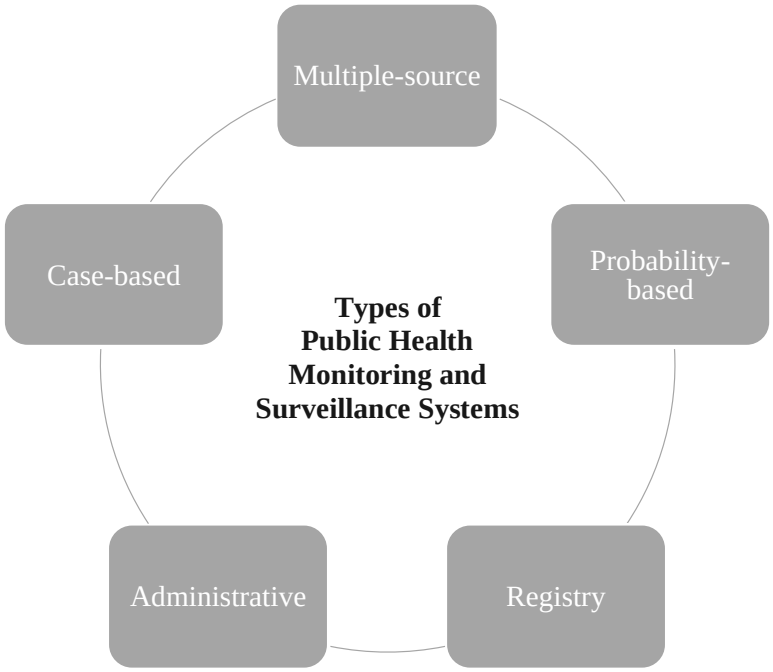
(2) *Probability-based surveys* are defined as the periodic collection of health information from a probability-based sample meant to be representative of the population of interest (e.g., Behavioral Risk Factor Surveillance System) [15], [256].

(3) *Registries* represent "databases of identifiable persons containing a clearly defined set of health and demographic data collected for a specific public health purpose [257]," such as tracking birth defects, chronic diseases, and traumatic injuries (e.g., National Program of Cancer Registries) [235], [258].

(4) *Administrative* systems collect procedural data, usually based on hospital encounters or health care systems operations, intended to support administrative processes (e.g., National Healthcare Safety Network) [259], [260].

(5) *Multiple-source systems* are informed by several sources of data provided by any combination of the previous four categories described (e.g. US Influenza Surveillance System) [15], [261].

Figure 6.2. Types of Public Health Monitoring and Surveillance Systems



Year Health Monitoring and Surveillance Systems were Established. Although the CDC has been monitoring health since the institution's inception, the scope of health surveillance has widened over the decades [152]. Therefore, each system in this database was coded to identify the year in which it was established in the US. Similarly, CDC-supported surveillance efforts in PR have also shifted over time. Of the systems that did include PR, attempts were made to code the year each system was established in PR, separately. However, these data were extremely difficult to locate and were only secured for a handful of systems.

6.5. Results

Table 6.1 provides summary statistics for the key characteristics coded, across all 93 CDC-supported health monitoring and surveillance systems, to assess coverage of PR as compared to the 50 states (Aim 1). As seen in Table 6.1, of the 93 systems included in the curated database, nearly 42% (39/93) were case-based surveillance systems, about 18% (17/93) were probability-based surveys, nearly 14% (13/93) were registries, nearly 13% (12/93) were administrative data

systems, and 13% (12/93) were multiple-source surveillance systems. Overall, about 66% (61/93) of the systems provided coverage of all 50 states in the US. By comparison, PR was only included in about 43% (40/93) of all CDC-supported monitoring and surveillance systems included in the curated database. In other words, PR was excluded from most CDC-supported systems (57% of systems). Puerto Rico was excluded from 67% (26/39) of case-based systems, 53% (9/17) of probability-based surveys, 54% (7/13) of registries, 58% (7/12) of administrative data systems, and 33% (4/12) of multiple-source systems.

Table 6.1 also includes descriptive statistics about the availability of data collection instruments in Spanish (Aim 2). For this variable, multiple-source systems (n=12) were counted as not coded (NC) because they are dependent upon multiple data inputs that vary in their availability of Spanish language instruments. On a similar note, across the 93 systems included in the database, the availability of Spanish language instruments could not be determined from web-based sources in 6% (6/93) of the systems reviewed. Therefore, it was determined that only 24% (22/93) of the systems in the curated database included a data collection instrument in Spanish. Notably, all the probability-based surveys that provided coverage across all 50 states used data collection measures in Spanish (e.g., questionnaire, Spanish-speaking interviewer) (Table 6.1). However, as seen in Table 6.2, of the 40 systems that covered PR, only 40% (16/40) provided data collection instruments in Spanish (Table 6.2).

As seen in Table 6.2, of the 40 systems that included PR, 33% (13/40) were case-based surveillance systems, 20% (8/40) were probability-based surveys, 15% (6/40) were registries, 12% (5/40) were administrative data systems, and 20% (8/40) were multiple-source surveillance systems. Table 6.3 provides a complete list of CDC-supported systems that included PR (n=40), along with the year in which the system was established in the US and the uniform resource locator

(URL) for each system. For comparative purposes, whether all 50 states were covered is also listed for each system. Unfortunately, during the curation process, it was not possible to locate the year each system was established in PR from web-based sources. Therefore, the data for this variable were missing for nearly 70% of the systems in PR. However, among the 13 systems for which the data were obtained, the year established in the US did not match the year they were established in PR in 46% (6/13) of the systems. In the US Commonwealth of Puerto Rico: the Behavioral Risk Factor Surveillance System was established in 1996 (US=1984); the National Antimicrobial Resistance Monitoring System (NARMS) was established in 2016 (US=1996); the National Healthcare Safety Network was established in 2009 (US=2005); the National Program of Cancer Registries was established in 1997 (US=1992); the Pregnancy Risk Assessment Monitoring System (PRAMS) was established in 2016 (US=1987); and US Cancer Statistics surveillance was established in 2005 (US=2001) (Table 6.3).

6.6. Discussion

Public health monitoring and surveillance systems are essential for maintaining the health of populations [262]. In the case of PR, the unique political relationship between the US and the territory [53] creates ambiguity surrounding governmental responsibilities for health infrastructure, particularly as it pertains to responsibilities for monitoring population health metrics [263]. As a global leader in population health, the CDC sets the standards for many public health monitoring and surveillance systems in the US and around the globe [246]. Importantly, the CDC, as an institution, and PR, as a territory [53], are both under the direct control of congressional legislation and subject to congressional mandates [264]. Despite the CDC's national and international influence [246], as well as its congressional linkages to the US Commonwealth of Puerto Rico [264], there is a gap in the literature as it pertains to the coverage of PR within existing

CDC-supported health monitoring and surveillance systems. Therefore, this study set out to assess the coverage of the US Commonwealth of Puerto Rico in existing health monitoring and surveillance systems, under the CDC organizational umbrella, for the purposes of detailing existing gaps in US government-led monitoring and surveillance systems in the territory.

6.6.1. *Key Findings*

Through the data curation process, it was uncovered that PR was only included in about 43% of the CDC-supported systems assessed within this study. As a comparison, 66% of the systems covered all 50 states, with the remaining 34% of systems providing partial coverage of the contiguous US. Notably, 83% of the systems that provided coverage of all 50 states, also included PR. However, PR was still *excluded* from 57% of CDC-supported systems assessed in this data curation study. While there are some gaps in coverage within the 50 states of the union, as hypothesized at the onset of this investigation, the gaps in coverage of PR far surpass those experienced within the States. Additionally, while it is promising that systems that include all 50 states are more likely to include PR, it is unreasonable to use this as a metric of successful and equitable coverage of PR. Public health monitoring and surveillance within PR is independently important and should not depend upon the successful coverage of all 50 states within the union.

Additionally, these results point to real consequences for the health and well-being of the Puerto Rican population residing in the US Commonwealth of Puerto Rico. Importantly, these data sources are used by US legislators and policy makers to make decisions about the programmatic needs of the nation, including financial resource allocation to address the public's health [231]. As a US territory, PR is bound to comply with US congressional mandates; however, the territory is largely excluded from the data sources most likely to augment congressional capacity to make evidence-based decisions. This is another avenue by which the US federal government can make

decisions for PR without the representation of the Puerto Rican people; thereby, extending the reach of political disenfranchisement, into the public health domain, via the gap in coverage within health monitoring and surveillance systems. For the purposes of addressing the public health needs of the US citizens in PR, as well as supporting a more just governmental relationship between the US and PR, efforts should be made to strengthen the CDC-supported systems that are responsible for executing the essential public health function of surveillance.

A representative and just surveillance system in PR must also be responsive to the cultural context. As a former Spanish colony in the Caribbean, PR's primary language is Spanish [11]. However, as a current territory of the US, PR has been forced to work within systems that are designed in English [265]. Therefore, this study also aimed to determine whether this English-dominance extended into the CDC-support health monitoring and surveillance system that provided coverage in PR. Results revealed that, of the 40 systems that included PR, only 40% of the systems provided data collection instruments in Spanish. This indicates that, although some CDC-supported systems do include PR within their surveillance efforts, the systems are not adapted to the language needs of the population. However, there seems to be some consideration for the language needs of the population within probability-based surveys. For example, 88% of the CDC-supported surveys that are conducted in PR are available in Spanish. This indicates that the questionnaires and/or survey procedures have been adapted to collect data from the Spanish-speaking members of the Puerto Rican population; a strength of the probability-based surveys conducted by the CDC.

However, this language accommodation does not appear to be present for public health practitioners or health care providers in PR who engage with CDC-supported systems. For example, the Maternity Practices in Infant Nutrition and Care Survey (mPINC) [266], is the one

probability-based survey that is not provided in Spanish. This survey is conducted across maternity hospitals in PR and is completed by health care providers. Similarly, the results of this study reveal that most CDC-supported case-based reporting forms and electronic data entry systems, used by public health professionals in PR, are only available in English. By not providing these data collection instruments in Spanish, the CDC has established the need for bilingual health care providers and public health practitioners who have a high command of both English and Spanish. Aside from setting culturally insensitive linguistic expectations, the need for bilingual health professionals increases the burden on an already compromised health care workforce [267]. Furthermore, the CDC's English-dominant application of public health monitoring and surveillance systems, requires the educational system in PR to educate their health care providers in a language that is not their own – English [268]. Given the linguistic context in PR, the CDC must increase efforts to provide data collection instruments for its health monitoring and surveillance systems in Spanish.

6.6.2. *Strengths*

This study represents one of the first attempts to quantify and describe the coverage of PR within CDC-supported health monitoring and surveillance systems. This was accomplished using an innovative data collection and analysis method – data curation. Not commonly seen in the public health literature, data curation is an ideal method for centralizing information about essential public health data sources [86]. Therefore, by employing this method, this study accomplishes the aim of establishing a baseline understanding of the CDC's coverage of PR, while also providing a curated list of data sources that include health outcomes for the Puerto Rican population. This curated list acts as a practical tool for public health practitioners serving this community and can

also direct researchers to the data sources needed to address questions surrounding Puerto Rican health inequities.

6.6.3. *Limitations*

While there are many strengths to highlight, this study also has limitations. The most significant limitation of this study is that the curated database was solely informed by online data sources. This means that information from other useful sources, such as phone calls or emails with CDC staff, did not inform the development of the curated list. This limits the richness of the information that could be collected and relies heavily on timely and accurate CDC website updates. Additionally, the list developed in this study likely excludes monitoring and surveillance systems that are CDC-supported but do not have a public-facing online presence. Although limiting, the decision to focus on online sources was informed by multiple contextual factors.

First, this study was conducted during the global COVID-19 pandemic, specifically during the period in which the cases of the Delta- and Omicron-variants spiked in the US. As a result, the CDC experienced staffing limitations and it was determined that reaching out to CDC representatives would result in low response rates and place unnecessary burden on staff time. Secondly, most public health practitioners and community members interact with CDC systems through web-based applications and information sources. Therefore, it is reasonable to expect that the data, reports, and methodological documentation available on the CDC's website are accurate, up-to-date, and comprehensively communicate the coverage of each health monitoring and surveillance system assessed.

Furthermore, the decision to focus on CDC-supported systems was based on this institution's role as a federal public health agency [152], as such, it was determined that CDC-supported systems would be a good place to start when assessing gaps in coverage. Additionally,

the CDC has a long-standing history of implementing public health interventions in PR [157]. However, this means that health monitoring and surveillance systems outside of the CDC's control were not included in this study. Future investigations should also look to other US government-based health agencies, such as the National Institutes of Health or other branches of Health and Human Services for a more wholistic assessment of coverage.

Lastly, a single researcher (AMM) conducted the data curation process. While the first author conducted several reviews of the data to confirm accuracy and completeness, future data curation projects should aim to have at least one external reviewer confirm the data. Importantly, a second reviewer could have provided support when challenges with online sources were encountered. For example, it was extremely time consuming for one reviewer to identify all key variables of interest within the curated database because information on CDC websites is not standardized. An additional reviewer could have helped locate information and ensure accuracy. However, the process would have also been facilitated by streamline health informatics practices [158]. Namely, the CDC's online presence would benefit from developing standard protocols for the presentation of online public health data and resources. This would make data more accessible to public health researchers and practitioners.

6.6.4. *Future Directions*

Future studies should aim to build upon the curated list that has been compiled for this study to include other government-led monitoring and surveillance systems from similar federal institutions that may include PR within their coverage area. Additionally, efforts should be made to review the health monitoring and surveillance systems that are maintained by the government of PR, particularly the PR Department of Public Health, to determine the full scope of coverage of the Puerto Rican population. This will help to identify and fill the gaps in the existing public health

surveillance infrastructure. Moreover, future efforts would benefit from conducting interviews with public health practitioners in PR, and at the CDC, to determine the full scope of coverage across all health monitoring and surveillance systems in PR. These types of investigations would improve our understanding of the existing health informatics infrastructure and, ideally, serve to fill the gaps created by PR's unique political context.

6.7. Results Tables

Table 6.1. Summary Statistics for all Curated CDC-Supported Health Monitoring and Surveillance Systems

		Data System Type				
Outcomes of Interest	Total (n=93) No. (%)	Case-based (n=39) No. (%)	Probability-based (n=17) No. (%)	Registry (n=13) No. (%)	Administrative (n=12) No. (%)	Multiple Source (n=12) No. (%)
Coverage in all 50 states						
Yes	61 (66)	24 (62)	11 (65)	7 (54)	10 (83)	9 (75)
No	32 (34)	15 (38)	6 (35)	6 (46)	2 (17)	3 (25)
Coverage in Puerto Rico						
Yes	40 (43)	13 (33)	8 (47)	6 (46)	5 (42)	8 (67)
No	53 (57)	26 (67)	9 (53)	7 (54)	7 (58)	4 (33)
Instrument in Spanish						
Yes	22 (24)	6 (15)	11 (65)	4 (31)	1 (8)	–
No	53 (57)	31 (80)	4 (23)	8 (62)	10 (84)	–
Don't Know	6 (6)	2 (5)	2 (12)	1 (7)	1 (8)	–
Not Coded	12 (13)	–	–	–	–	12 (100)

Note(s): Don't Know is used when information was not located; Not Coded indicates it was not appropriate to code this variable for the system type.

Table 6.2. Summary Statistics for CDC-Supported Health Monitoring and Surveillance Systems in Puerto Rico

		Data System Type				
Outcomes of Interest	Total (n=40) No. (%)	Case-based (n=13) No. (%)	Probability-based (n=8) No. (%)	Registry (n=6) No. (%)	Administrative (n=5) No. (%)	Multiple Source (n=8) No. (%)
Coverage in all 50 states						
Yes	33 (83)	12 (92)	4 (50)	5 (83)	5 (100)	7 (88)
No	7 (7)	1 (8)	4 (50)	1 (17)	0 (0)	1 (12)
Instrument in Spanish						
Yes	16 (40)	4 (31)	7 (88)	4 (67)	1 (20)	0 (0)
No	13 (33)	7 (54)	1 (12)	2 (33)	3 (60)	0 (0)
Don't Know	3 (7)	2 (15)	–	–	1 (20)	–
Not Coded	8 (20)	–	–	–	–	8 (100)

Note(s): Don't Know is used when information was not located; Not Coded indicates it was not appropriate to code this variable for the system type.

Table 6.3. CDC-supported Health Monitoring and Surveillance Systems in Puerto Rico, 2022

CDC-Supported Monitoring & Surveillance Systems in Puerto Rico	Year Established in US	Coverage in all 50 states	Data Instrument in Spanish	URL Extension
Case-Based				
Fatality Assessment and Control Evaluation (FACE)	1982	No	DK	niosh/face/brochure.html
National Molecular Subtyping Network for Foodborne Disease Surveillance (PulseNet)	1996	Yes	Yes	pulsenet/about/index.html
National Antimicrobial Resistance Monitoring System (NARMS)	1996*	Yes	No	narms/index.html
National Arboviral Surveillance System (ArboNET)	2000	Yes	No	mosquitoes/mosquitocontrol/professionals/ArboNET.html
National HIV Surveillance System	1981*	Yes	Yes	hiv/statistics/index.html
National Malaria Surveillance System	1940s*	Yes	Yes	malaria/report.html
National Notifiable Disease Surveillance System (NNDSS)	1878	Yes	DK	nndss/data-statistics/index.html
National Outbreak Reporting System (NORS)	2009*	Yes	No	https://www.cdc.gov/nors/
National Polio Surveillance System	1950s	Yes	No	vaccines/pubs/surv-manual/chpt12-polio.html
National Tuberculosis Surveillance System (NTSS)	1953	Yes	No	tb/statistics
SEDRIC: System for Enteric Disease Response, Investigation, and Coordination	2011*	Yes	No	foodsafety/outbreaks/investigatingoutbreaks/sedric.html
Vaccine Adverse Event Reporting System (VAERS)	1990	Yes	Yes	vaccinesafety/ensuringsafety/monitoring/vaers/index.html
Viral Hepatitis Surveillance Program	1989	Yes	No	hepatitis/statistics/surveillanceguidelines.htm
Probability-based Survey				
Behavioral Risk Factor Surveillance System (BRFSS)	1984*	Yes	Yes	brfss/index.html
Disability and Health Data System (DHDS)	2012	Yes	Yes	ncbddd/disabilityandhealth/dhds/overview.html
Maternity Practices in Infant Nutrition and Care Survey (mPINC)	2007*	Yes	No	breastfeeding/data/mpinc/methods.html
Medical Monitoring Project (MMP)	2005	No	Yes	hiv/statistics/systems/mmp/index.html
National HIV Behavioral Surveillance System (NHBS)	2003	No	Yes	hiv/statistics/systems/nhbs/index.html
National Immunization Survey (NIS)	1994	Yes	Yes	vaccines/imz-managers/nis/about.html
Pregnancy Risk Assessment Monitoring System (PRAMS)	1987*	No	Yes	prams/prams-data/researchers.htm#data
Youth Risk Behavior Surveillance (YRBS)	1991*	No	Yes	healthyyouth/data/yrbs/overview.htm
Registry				
Immunization Information System (IIS)	1995	Yes	No	vaccines/programs/iis/about.html
National Death Index	1979*	Yes	Yes	nchs/ndi/index.htm
National Program of Cancer Registries	1992*	No	No	cancer/npcr/about.htm
National Vital Statistics System (NVSS)-Birth data	1974	Yes	Yes	nchs/nvss/about_nvss.htm
National Vital Statistics System (NVSS)-Fetal Death	1974	Yes	Yes	nchs/nvss/mortality_methods.htm
National Vital Statistics System (NVSS)-Mortality data	1974	Yes	Yes	nchs/nvss/fetal_death.htm
Administrative				
National Assisted Reproductive Technology Surveillance System (ART)	2006	Yes	No	art/nass/index.html
National Healthcare Safety Network (NHSN)	2005*	Yes	No	nhsn/about-nhsn/index.html
National Poison Data System (NPDS)	2000	Yes	Yes	nceh/hsb/chemicals/pdfs/npds.pdf
Sealant Efficiency Assessment for Locals and States (SEALS)	DK	Yes	No	oralhealth/dental_sealant_program/seals.htm
US Outpatient Influenza-Like Illness Surveillance Network	DK	Yes	DK	flu/weekly/overview.htm
Multiple-source				
Asthma Surveillance	1999	Yes	NC	asthma/asthmadata.htm
Chronic Kidney Disease Surveillance System	2006	Yes	NC	https://nccd.cdc.gov/ckd/
National Electronic Disease Surveillance System (NEDSS) Base System (NBS)	2001	No	NC	nbs/overview/index.html
National Oral Health Surveillance System (NOHSS)	1994	Yes	NC	oralhealthdata/overview/nohss.html
National Violent Death Reporting System (NVDRS)	2002	Yes	NC	violenceprevention/datasources/nvdrs/faqs.html
US Cancer Statistics (USCS)	2001*	Yes	NC	cancer/uscs/index.htm
US Diabetes Surveillance System (USDSS)	1980s	Yes	NC	diabetes/data/index.html
US Influenza Surveillance System	1956	Yes	NC	flu/weekly/overview.htm

Note(s): DK=don't know is used for cases where information was not located; NC=not coded, indicates that it was not appropriate to code this variable for the system type; * = data for the year in which a particular system was established in Puerto Rico are available; URL Extensions should be entered after the following: https://www.cdc.gov/; except where otherwise noted.

CHAPTER 7.

DISCUSSION

Chapter 7. Discussion

7.1. Overview

Puerto Rican lives, including their health and opportunities for well-being, are shaped by the colonial relationship that exists between the United States (US) and Puerto Rico (PR) [11]. However, the political determinants of health (PDoH) that are produced as a result of this colonial relationship have historically been underexplored [95], particularly among Puerto Ricans living in the greater US. This is concerning, as it has been well-established that the poor social, political, and economic conditions experienced by racially and ethnically minoritized populations in the US disproportionately produce poor health outcomes among these groups [68]. Whether living in the US Commonwealth of Puerto Rico or the States, Puerto Ricans are a racially and ethnically minoritized Latinx subgroup that is burdened by an inequitable distribution of disease [1]–[3], which is likely augmented by experiences with US-based colonial subjugation [90], [133] and political disenfranchisement [56], [126]. Consequently, this dissertation sought out to understand, identify, and examine the political mechanisms that may be driving health inequities among Puerto Ricans living in the greater US.

Results from the three empirical studies conducted as part of this dissertation produced key findings and important lessons learned that enhance our knowledge of the political determinants of Puerto Rican health inequities. While Study 1 and Study 2 provided evidence that there are meaningful associations between individual-level political perceptions and heath among members of the Puerto Rican diaspora, Study 3 yielded significant findings that provide evidence of the exclusion of PR (the place) from US-based government health data systems. Key findings and implications of each study are discussed in the following sections.

7.2. Key Findings for Study 1

An Examination of the Association between Political Efficacy and Self-Rated Health: A Subgroup Analysis of Puerto Ricans, Other Latinx, and Non-Latinx whites. Previous studies have found that there is a positive association between self-efficacy and health across many diverse groups, including Puerto Ricans living in the US [5]. Generally, individuals with higher levels of self-efficacy are more likely to report having better health [182]–[184]. This makes intuitive sense, as the construct of self-efficacy speaks to one's confidence in their ability to control outcomes within one's life [181]; in many cases, having more confidence leads to taking actions that are better for one's health. As a variant of self-efficacy, political efficacy speaks more specifically to one's confidence in their ability to control political outcomes [149]. Notably, internal political efficacy (IPE) speaks to one's confidence in one's ability to engage in political behaviors, such as voting; whereas external political efficacy (EPE) speaks to one's confidence in political forces outside oneself, such as governmental institutions [190]. In Study 1, IPE and EPE were of particular interest, as they may serve to illuminate the pathways by which larger political structures and experiences (e.g., restrictions on voting rights) operate at the individual-level to produce disparate health outcomes.

In the US, racially and ethnically minoritized populations are disproportionately impacted by political disenfranchisement, such as restrictions on voting rights or prohibitive voter ID laws, which may have implications for the health of these communities [126]. Similarly, racial/ethnic minorities in the US, including Latinx populations, experience a disproportionate burden of disease [140]. However, the relationship between political determinants, such as political efficacy, and health outcomes are underexplored within the health disparities literature [91], particularly among Latinx communities. Given the political disenfranchisement that is experienced by racial and

ethnic minorities in the US [148], as well as the preexisting health literature that has established connections between self-efficacy and health [182], the first study of this dissertation sought to assess the association between political efficacy and self-rated health (SRH).

Additionally, given the gaps that exist within the Latinx health disparities literature, particularly as it pertains to the PDoH, Study 1 examined the associations between IPE and SRH and EPE and SRH among Latinx subgroups, with a particular emphasis on the Puerto Rican diaspora, as compared to non-Latinx whites. Among Puerto Ricans living in the States, the unique ties to the colonial relationship that exists between the US and PR may manifest in the form of distinct relationships between political efficacy and health as compared to other Latinx and non-Latinx whites. Considering the unique political context experienced by each group assessed, it was anticipated that there would be significant group differences in the ways in which the associations between both domains of political efficacy and SRH are expressed. Lastly, understanding that racial and ethnic health disparities persist in the US [165], with Puerto Ricans experiencing worse SRH when compared to other Latinx groups and non-Latinx whites [22], it was anticipated that this trend would also be detected within the results produced by Study 1.

7.2.1. *Key Finding #1*

In general, higher levels of internal and external political efficacy are associated with better self-rated health. Descriptive findings revealed that, in general, better IPE was significantly associated with better SRH, among an aggregate group of Puerto Ricans, other Latinx, and non-Latinx whites. Similarly, better EPE was significantly associated with better SRH. These findings are consistent with other studies that have examined the association between self-efficacy and health [183], such that having more confidence in one's ability to control life's outcomes has been found to produce better health outcomes. However, by establishing a significant relationship

between two domains of political efficacy and SRH, the results of Study 1 add an important nuance to our understanding of self-efficacy and health - the potential significance of political perceptions. As one of the first studies to explore this relationship, it provides some evidence to suggest that future investigations of this nature are needed to better understand the ways in which the political context may manifest into individual-level characteristics that influence individual-level health outcomes. Further, because political efficacy is anchored in the foundational literature on self-efficacy [181], IPE and EPE serve as accessible concepts for public health practitioners and researchers, which places the political domain of our social environment in conversation with the literature on health.

While these results are not able to support an argument of a causal nature, they do indicate that there is merit to the exploration of the association between political constructs and health outcomes [92]. Importantly, the results found in Study 1 begin to build upon the evidence that is needed to identify the pathways that lead from structural PDoH to proximal embodied health outcomes. Future work in this space should also look to additional health indicators that are commonly used in the embodiment literature, such as elevated cortisol levels or blood pressure, which have been linked to experiences with structural barriers and discrimination [108], [111]. To further expand upon this work, future studies should also aim to include additional measures of political efficacy, such a government efficacy [190].

7.2.2. *Key Finding #2*

Socioeconomic characteristics continue to be strong correlates of self-rated health. Given disproportionate experiences with political disenfranchisement and health inequities within racially and ethnically minoritized populations in the US, and particularly among Latinx subgroups, it was anticipated that the significant relationships observed between both domains of

political efficacy and SRH would remain significant when controlling for other social factors. However, while initial results provided some evidence of a significant association between both domains of political efficacy and SRH, when controlling for age, gender, education, employment, homeownership, and language of interview, the associations were no longer significant. In fact, several of these sociodemographic and socioeconomic characteristics were better at explaining the differences observed in SRH than either IPE or EPE. For example, individuals with a four-year college degree or more had significantly better SRH compared to individuals with a high school education or less. Similarly, individuals who were employed, as well as individuals who owned their own home, had better SRH when compared to individuals who were unemployed or rented/lived with someone else, respectively. These results point to the power and permanence of the social determinants of health (SDoH) in shaping health outcomes [13], [77]. Indeed, education, employment, and homeownership are commonly used as proximal measures to establish the impact of the social environment on health [10], [169], [201]. In this way, these results are consistent with the broader literature that has been published on SDoH, specifically the effects of socioeconomic status on health [68], [134], [201].

However, these results may also indicate that political efficacy may not necessarily be the strongest proximal construct to use when trying to capture the structuring influence of the political environment on health. Therefore, other indicators should be considered. For instance, the results of a cross-national study on political trust and mental health outcomes within the COVID-19 context published in 2022, did find that political trust was a strong predictor of mental well-being [269]. Researchers concluded that high levels of political trust were protective against poor mental health outcomes among a cross-national sample of 13,000 older adults in 66 different countries [269]. Considering this evidence, political trust may serve as a more fitting construct to capture

the individual-level manifestation of the political context. Future investigations should aim to identify different measures of political perception, such as political trust, and assess their potential influence on health. This is especially relevant among Puerto Ricans and other Latinx groups in the US who experience high rates of political disenfranchisement [148] and numerous health inequities [163].

7.2.3. *Key Finding #3*

Puerto Ricans have worse self-rated health when compared to other Latinx and non-Latinx whites. As expected, Puerto Ricans represented the group with the worst SRH when compared to other Latinx and non-Latinx subgroups. In fact, results revealed that 1 in 5 Puerto Ricans reported poor or fair health – representing the subgroup with the greatest share of respondents reporting these lower levels of SRH when compared to other Latinx and non-Latinx whites. These results are consistent with previous investigations assessing SRH among the Puerto Rican diaspora as compared to other Latinx groups and non-Latinx whites [22], [270]; they also provide support for the importance of subgroup analysis within the health disparities literature. Much of the existing evidence on Latinx health disparities generalizes findings based on analyses conducted with an aggregate group of individuals who are categorized as Latinx [86]. This practice obscures the true disparities that exist within the extraordinarily heterogeneous Latinx category [164], including among members of the Puerto Rican diaspora. However, the results from Study 1 work against this practice and contribute to the body of evidence demonstrating the presence of significant health disparities within the Puerto Rican diaspora.

The prevalence of poor SRH among Puerto Ricans is especially concerning as there is evidence to suggest that measures of SRH may underestimate the gap in health outcomes among individuals belonging to socially disadvantaged groups [271]. This indicates that differences

observed in SRH may underestimate the true difference in health among Puerto Rican and Latinx groups and, potentially, influence the magnitude of the associations observed between SRH and political efficacy. Conversely, previous investigations have established a bias in SRH when delivered in Spanish, such that respondents inaccurately endorse worse SRH as an artifact of the item's translation from English to Spanish [170]. Unfortunately, Study 1 was limited by the health variables available within the secondary dataset used for these analyses, which partially contributed to the selection of SRH as the primary outcome of interest for this study. Additionally, SRH was deemed an appropriate measure of health for this study because the majority of Puerto Rican and Latinx respondents completed the survey in English [206]. However, given the mixed findings on SRH use for this population [176], [206], [271], future efforts to replicate these analyses could benefit from the addition of a more robust collection of health indicators, such as psychological distress as well as measures of chronic disease [271].

7.2.4. *Key Finding #4*

The impact of internal political efficacy on self-rated health varies across racial/ethnic subgroups. Racially and ethnically minoritized populations in the US are systematically treated differently [140]. Within the political domain of society, racial/ethnic minorities, including Latinx subgroups, are disproportionately impacted by political exclusion, such as voter ID laws that restrict access to voting [126]. Within the health domain of society, racial/ethnic minorities experience inequities in morbidity and mortality [165]. Therefore, it stands to reason, that racial/ethnic minorities would have distinct patterns in the relationship between constructs from the political domain (i.e., IPE) and the health domain (i.e., SRH), as systemic racialization is consistently acting upon all subsets of our social environment [140]. This logic is supported by the results found in Study 1, which confirmed that the impact of IPE on SRH does vary by racial/ethnic

subgroup. However, the most remarkable outcomes were observed among Puerto Ricans, particularly when compared to non-Latinx whites.

While significant differences in the association between IPE and SRH were not observed between the other Latinx and non-Latinx white subgroups, there were significant differences observed between Puerto Ricans and non-Latinx whites. Study 1 results revealed that members of the Puerto Rican diaspora with extremely high IPE had worse SRH than non-Latinx whites with extremely low IPE. This indicates that, while higher levels of IPE are protective of health among non-Latinx whites, the inverse is true among Puerto Ricans. These results emerge as a meaningful contribution to the study of health disparities, as no previous investigation has examined the racial and ethnic differences in the relationship between IPE and SRH. Among Puerto Ricans, these findings present early evidence that there may be something unique about the way in which the political context acts upon the Puerto Rican diaspora living in the States. Considering the Puerto Rican diasporas proximity to experiences with colonial subjugation, future investigations should further explore within-group differences stemming from these experiences that may be contributing to these paradoxical findings. Study 2 of this dissertation represents the first attempt to begin to understand within-group variations in this relationship among members of the Puerto Rican diaspora.

7.3. Key Findings for Study 2

The Association between Political Efficacy and Self-Rated Health among Members of the Puerto Rican Diaspora. After uncovering distinct patterns in the associations between political efficacy and SRH among Puerto Ricans, as compared to other Latinx and non-Latinx whites, there was a need to focus on within-group differences. Therefore, Study 2 sought out to examine the associations between political efficacy (IPE and EPE) and SRH among members of the Puerto

Rican diaspora. Given that members of the Puerto Rican diaspora have unique experiences with political disenfranchisement [56], a political condition produced by the US colonial occupation of PR [35], [67], it was expected that the differences observed within this subgroup were somehow related to direct and indirect experiences with this political context. As described in the previous chapters, Puerto Ricans living in PR do not have the right to vote in federal elections, whereas members of the Puerto Rican diaspora who are living in the States have full voting rights [56]. To operationalize the differences in this exposure among members of the Puerto Rican diaspora, stratified within-group analyses were conducted to assess the nature of the relationship between political efficacy (IPE and EPE) and SRH for Puerto Ricans who were born in PR and migrated to the States and Puerto Ricans who were born in the States. This decision was driven by the logic that individuals born in PR gained rights by moving to the States and individuals born in the States always had these rights. While there is a lack of prior research in this area on which to base a hypothesis, given that Puerto Ricans born in PR experience a change in status when they move to the States, it was anticipated that this group would have a stronger connection between political efficacy and SRH than Puerto Ricans born in the States. However, the results of Study 2 tell a different story.

7.3.1. *Key Finding #1*

For members of the Puerto Rican diaspora born in the States, better internal political efficacy was associated with worse self-rated health. The results from Study 2 of this dissertation confirmed the presence of a significant inverse relationship between IPE and SRH, as observed in Study 1. However, this inverse association was only significant among members of the diaspora born in the States. This is counter to what had been hypothesized at the onset of Study 2. It was anticipated that the magnitude of the relationship between IPE and SRH would be greater among

Puerto Ricans born in PR because of their direct connection to experiences with colonial subjugation and restrictions on voting rights in PR [56]. However, when accounting for sociodemographic and socioeconomic differences, it turns out Puerto Ricans born in the States were the only group with a significant association, such that individuals with extremely high IPE had worse SRH. This contributes an additional layer of nuance to the results observed in Study 1, as the original findings indicated that this was a significant trend among *all* members of the diaspora. In this way, the results do provide some evidence to support the idea that members of the diaspora do experience some differences in this association based on site of birth (PR or US); although, not as expected.

At first glance, these findings are counter intuitive – better political efficacy does not equal better health for members of the diaspora born in the States. However, by examining the results more closely and carefully considering the extant literature some potential explanations for the observed findings emerged. For the ordinal logistic regression analyses conducted among this group, all five categories of IPE were retained as well as all five categories of SRH. This means, that all five levels of the independent variable (IPE) were regressed upon all five levels of the outcome (SRH) in an effort to detect meaningful trends across all available categories. As noted above, it was individuals who reported extremely high IPE that demonstrated a significant inverse relationship with SRH. This indicates that, perhaps, there is some type of threshold effect for this variable [272], such that individuals within the most extreme levels of IPE behave differently than individuals with more moderate levels among Puerto Ricans born in the States. Future efforts to improve upon this work should consider testing for threshold effects of IPE on SRH.

The extant literature also contributes to potential interpretations of these results. For example, in the political science literature, a strong positive relationship between IPE and political

knowledge has been established, such that individuals who have more knowledge are more likely to have confidence in their individual ability to influence political affairs (i.e., higher IPE) [273]. Similarly, political socialization, relating to the political context under which one is raised, also plays a role in shaping one's political efficacy [191]. Therefore, it may be that members of the Puerto Rican diaspora who were born in the States are more familiar with the political system in the US as a result of having been socialized as enfranchised citizens within the US-based political system [56]. Thinking about how this applies to the findings in Study 2, it is possible that extremely high IPE, resulting from high political knowledge and US-based political socialization, produces a heightened awareness of the injustices that are acting upon the lives of the members of the Puerto Rican diaspora who were born in the States. This heightened awareness may, in turn, be detrimental to perceptions of one's health, particularly if higher confidence in one's political abilities is the result of processes that elevate perceptions of discrimination and systemic injustice. Consequentially, perceived discrimination has been linked to poor health outcomes among members of the Puerto Rican diaspora [212]. However, future studies should aim to further examine the complexities behind these relationships, including potential links between political knowledge, perceived discrimination, and political efficacy as they related to health outcomes.

7.3.2. *Key Finding #2*

External political efficacy is not significantly associated with self-rated health among members of the Puerto Rican diaspora born in the States nor among individuals born in Puerto Rico. Typically, non-significance is not discussed in the concluding remarks of a study. However, in this case, there is something notable about the fact that external political efficacy (EPE) was not significantly associated with SRH among members of the Puerto Rican diaspora born in the States nor among individuals who were born in PR and later migrated to the States. These results are

particularly interesting because Study 2 confirms the general findings observed in Study 1, that EPE is not significantly associated with SRH among all members of the Puerto Rican diaspora included in the studies. However, it was anticipated that EPE would somehow be associated with SRH because this construct was meant to represent the individual-level manifestation of the external forces that exclude Puerto Ricans from the political systems in the US and act upon health, particularly among Puerto Ricans born in PR. As a people with direct connections to colonial subjugation [133], theories of historical trauma [90] would suggest that political exclusion in PR could be internalized and lead to lower levels of confidence in one's ability to control life's outcomes. This could result in worse health outcomes for Puerto Ricans. However, there may be other factors at play here among the Puerto Rican community.

In the wake of constant struggle, the Puerto Rican community has often been described as "resilient" – demonstrating their ability to overcome adversity and persevere in spite of challenges [226]. Despite mega-storms, earthquakes, and a decades-long economic recession, Puerto Ricans in PR persevere. For many residents of PR, perseverance and survival is defined by the act of utilizing one's US citizenship status to gain access to the economic opportunities available in the States [56]. In fact, after the devastation of Hurricane's Maria and Irma, hundreds of thousands of Puerto Ricans migrated to the States [274]. This is but one example of the many waves of Puerto Rican migrants who have become part of the Puerto Rican diasporic community in the States [130]. This migratory history is part of what binds the Puerto Rican community in the States to those in PR, and a piece of what links the Puerto Rican diaspora to the colonial history of PR. However, this colonial history does not appear to be influencing the association between EPE and SRH as expected. The results of Study 2 (and Study 1) would suggest that Puerto Ricans who migrate from PR do have lower EPE, perhaps as a result of their colonial context [11], but they do not appear to

allow those perceptions to influence their health, perhaps due to their resilience [226]. Future investigations should seek to test whether resilience does indeed play a role in shaping the relationship between EPE and SRH.

Thus far, this discussion has focused on the Puerto Rican diaspora. Study 1 compared members of the Puerto Rican diaspora to other Latinx and non-Latinx whites and established that there are significant differences in SRH, with members of the Puerto Rican diaspora reporting the worst SRH outcomes. Similarly, significant differences in the association between IPE and SRH were also established. In this way, Study 1 serves to establish baseline evidence that supports the value of within-group exploration of these associations for the Puerto Rican diaspora. Study 2 establishes that there are significant differences among members of the Puerto Rican diaspora born in the States and individuals born in PR, when examining the association between SRH and political efficacy. Study 3 shifts the focus away from individual-level outcomes among the Puerto Rican diaspora and expands the lens to include structural-level outcomes in PR (the place). In this way, this dissertation honors its commitment to attend to a more inclusive definition of the Puerto Rican community by examining health outcomes across the greater US, which includes PR.

7.4. Key Findings for Study 3

Data Gaps in Health Monitoring and Surveillance Systems: The Case of the United States Commonwealth of Puerto Rico. Public health monitoring ad surveillance systems are an essential function of public health infrastructure [230]. Probability-based surveys, such as the National Health Interview Survey (NHIS) [159], and cased-based reporting systems, such as the National Outbreak Reporting System (NORS) [160], are integral examples of systems that improve capacity to assess and respond to population health needs [158]. In the US, the Centers for Disease Control and Prevention (CDC) is mandated by Congress to support local and state agencies in establishing

and maintaining comprehensive public health monitoring and surveillance systems [152]. As a territory of the US, PR has been included in several CDC-supported population health programs throughout history, including the Malaria Control in War Areas program that started the CDC in the 1940s [157]. However, because of PR's ambiguous political status, the full extent of coverage of PR within CDC-supported public health monitoring and surveillance systems is unknown. However, what is known is that PR's public health data infrastructure is highly compromised [33]. Therefore, this study sought out to quantify and qualify the extent to which PR is included within CDC-supported health monitoring and surveillance systems. This was accomplished through the application of *data curation* – a method used to identify, compile and collect data sources for the purposes of applying evaluation criteria [86]. In Study 3, it was anticipated that PR would be underrepresented within CDC-supported health monitoring and surveillances systems.

7.4.1. *Key Finding #1*

Puerto Rico is missing from more than half of CDC-supported public health monitoring and surveillance systems. This study confirms that there are significant coverage gaps within CDC-support public health monitoring and surveillance systems when it comes to PR. Of the 93 systems that were identified and assessed as part of this data curation study, PR was missing from 57% of the systems. For comparative purposes, coverage of all 50 states was also included as an evaluation criterion. In this case, only 34% of the CDC-supported public health monitoring and surveillance systems did not include all 50 states. While these data demonstrate that there are also coverage gaps within the 50 states, those experienced in PR far surpass those of the states. Furthermore, of the systems that include all 50 states, PR is still only covered by 54% of those systems. Overall, PR is consistently missing from these essential public health systems.

These findings represent the first set of results that successfully quantify the existing gaps in the CDC's coverage of PR within public health monitoring and surveillance systems. However, these findings are consistent with previous reports that describe PR's limited health data infrastructure and point to the need for serious improvements [33]. As the agency responsible for the health of the nation [156], the CDCs resources should fully extend to the US territory of PR. However, involvement in the territory has been highly variable, thus far. As neither a state nor an independent nation, PR's status as US territory continues to determine the nature of governmental infrastructure, usually at the cost of the well-being of individuals residing in PR. Efforts must be made by US-based institutions, including the CDC, to improve coverage of PR within these essential public health monitoring and surveillance systems.

7.4.2. *Key Finding #2*

The Spanish-language option is not provided. PR has two official national languages – English and Spanish. However, for the majority of people living in PR, the preferred language is Spanish [221]. This is a fact that US-based systems have historically ignored [265]. Unfortunately, the results of this study demonstrate that CDC-supported public health monitoring and surveillance systems are no exception to this historical trend. In fact, of the 93 public health monitoring and surveillance systems assessed as part of this study, only 24% had a data collection instrument (e.g., case-based reporting forms, survey questionnaires) available in Spanish. Good news is, of the 22 systems with a Spanish-language data collection instruments, 73% covered PR as part of their monitoring efforts. However, of the 40 CDC-supported systems that include PR, only 40% have a data collection instrument available in Spanish. This points to some significant disparities in the availability of these essential materials in the primary language spoken by most of the residents of

PR [221]. Once again, these results demonstrate the ways in which US imposed systems neglect the needs of the Puerto Rican population.

The historical practice of imposing the language of the US colonizer onto the colonized [265], [268] continues to be exercised today because the Spanish-language option is not provided. On the ground, this can have serious public health implications. Importantly, the public health workforce must be proficient in English to engage with CDC-supported public health monitoring and surveillance systems. This places a unique language burden onto the public health workforce of PR that requires bilingual education in PR [268]. This burden is not present for those working within the 50 states. Additionally, the lack of Spanish-language reporting instruments may also influence reporting practices, such that providers in PR may be less inclined to engage with these systems. In the States, studies have demonstrated that communities with limited English proficiency are less likely to engage with health care systems [275], [276]. This might extend to public health professionals in PR and their engagement with US-based health infrastructure. Future investigations should aim to assess how these language barriers further compromise CDC-based public health monitoring and surveillance efforts in PR.

7.5. Key Findings Overall

The findings from Studies 1-3 confirm that Puerto Ricans in the greater US experience individual- and structural-level health inequities. As seen in Study 1 of this dissertation, members of the Puerto Rican diaspora have worse SRH when compared to other Latinx groups and non-Latinx whites. This is consistent with previous investigations on SRH that have examined differences between Puerto Ricans, other Latinx subgroups, and non-Latinx whites [22]. However, this study adds to the health inequities literature by identifying a significant association between IPE and SRH and establishing that this relationship is indeed modified by racial/ethnic subgroup (e.g., whether one

identifies as Puerto Rican, other Latinx, or non-Latinx white). This suggests that there is something unique about this association, particularly among members of the Puerto Ricans diaspora, that might be the result of the colonial political context that shapes the Puerto Rican communities' social reality [151].

Study 2 demonstrates that, within the Puerto Rican diaspora, individuals who were born in the States are driving the significant inverse association that exits between IPE and SRH, such that higher levels of IPE are related to lower levels of SRH. These results indicate that there is something about the political context in the States that is impacting US-born Puerto Rican's political perceptions and its association to health. It may be that highly politically efficacious members of the Puerto Rican diaspora born the States are extremely knowledgeable about the injustices within their social reality, which may include racial and ethnic discrimination in the US and PR, and that awareness causes undue stress and produces negative health outcomes [212]. However, future investigations are needed to replicate these findings and determine whether these results are indicative of the true experiences within the Puerto Rican diaspora. For members of the diaspora born in PR, there were no significant findings when examining the associations between both domains of political efficacy (IPE and EPE) and SRH. However, these null findings may speak to the resilience of the Puerto Rican community living in the US Commonwealth of Puerto Rico [210]; a resilience that is embodied and carried over from PR to the States throughout generations of migration [130].

Despite Puerto Rican resilience, the lived experiences of Puerto Ricans residing in PR are still characterized by the colonial neglect that is perpetuated by US governmental systems [11]. This reality is confirmed by the results of Study 3, within this dissertation, which quantifies and qualifies the systemic exclusion of PR from US-supported health monitoring and surveillance

systems, specifically those supported by the CDC. The findings within Study 3 reveal that the health data gaps in PR are real. In fact, PR is missing from more than half of the CDC-supported systems assessed in Study 3. These results clearly illuminate the ways in which PR's ambiguous political status, as a colony of the US [16], leads to gaps in the provision of essential public health monitoring services [158]. These gaps result in a lack of public health data, which contribute to an underestimation of the true extent of health inequities in PR [86]. Taken together, the results of these three empirical investigations provide early evidence of the ways in which the health of Puerto Ricans living in the greater US is compromised by the political determinants of health.

7.6. Limitations

While the studies within this dissertation contribute to our understanding of the political determinants of Puerto Rican health inequities, there are several limitations of this work. Primarily, the analyses conducted in Studies 1 and 2 are only able to establish associations and cannot be interpreted to draw causal conclusions. However, the significant associations observed between IPE and SRH begin to shed light on potential pathways that lead from political determinants to health outcome among members of the Puerto Rican diaspora. Similarly, Studies 1 and 2 leverage cross-sectional secondary data to conduct quantitative analyses. As a result, temporality cannot be established, and it is not possible to determine whether political efficacy is acting upon health outcomes or whether the relationship functions in a reciprocal fashion. Therefore, the findings should be interpreted with causation. While the Collaborative Multiracial Post-election Survey (CMPS) was identified as an ideal data source because of the presence of political variables, health variables, and a substantive Puerto Rican sample, the results from Studies 1 and 2 were obtained from analyses of only one wave of the survey from 2016. Therefore, the results are limited by the political context of the 2016 election. Future investigations should aim to merge data from the

2012 and 2020 iterations of the survey to increase the sample size and strengthen the conclusions that can be drawn from the results.

The data utilized in Study 3 were specifically collected and generated for the purposes of accomplishing the aims of said study in this dissertation. The data curation process was used to identify CDC-supported health monitoring and surveillance systems and assess these systems across several evaluation criteria. This generated a database of 93 public health monitoring and surveillance systems, including probability-based surveys and case-based reporting systems. However, these data were limited as a function of the study protocol. First, the data were collected and evaluated by one reviewer (the author of this dissertation). Therefore, there are databases that may have been missed as a function of only having one reviewer. Additionally, the databases included in this review were obtained from web-based data sources that are sponsored and supported by the CDC. Therefore, any databases that did not have a public-facing online presence were excluded from the data curation process. However, the decision to use web-based sources was driven largely by the COVID-19 pandemic. Understanding that the CDC was the lead organization involved in the nation's COVID-19 response, it was deemed inappropriate to place undue burden onto the staff at the CDC by reaching out for additional information about these health monitoring and surveillance systems.

7.7. Strengths and Contributions

Despite these limitations, the empirical investigations within this dissertation make significant contributions to the health inequities literature. As previously established, the PDoH have been understudied in the health inequities literature [91], [92], particularly among Puerto Ricans [3]. Given the colonial political context that connects this population to the US [11], [151], this emerged as a huge gap in the Puerto Rican health inequities literature, which this dissertation

sought to address. Notably, the studies within this dissertation represent the first attempts to apply and adapt the PDoH model to the study of Puerto Rican health inequities [92]. Within this dissertation, the model has proven to be utilitarian in drawing connections between abstract political concepts and concrete health outcomes and may continue to serve as a useful tool as public health researchers and practitioners increasingly engage with the PDoH model as an orienting framework [92].

Additionally, studying the influence of political factors on health has traditionally been challenging because of the lack of public health data sources that include measures of political constructs, such as political efficacy or civic engagement [277]. Therefore, by incorporating the use of an interdisciplinary data source from political science, the CMPS, this dissertation was able to begin addressing some of the ways in which political phenomenon are related to health outcomes. As a field, public health has traditionally been interdisciplinary [278], and this dissertation serves as a strong example of the continued benefits of this approach to addressing public health issues. Furthermore, as our understanding of the structural and social determinants of health expands, so too does the need for interdisciplinary collaborations [279].

While on the topic of interdisciplinary approaches, it is important to note that this dissertation also employs the use of a data technique from the social science literature that is not often leverages in public health research and practice – data curation. This technique involves identifying, collecting, and categorizing data from multiple sources [86]. This is a meaningful contribution to the advancement of health disparities work, particularly as the volume of health data increases, as it allows for disparate sources of data to be centralized and curated for a particular public health purpose. In this dissertation, this technique was leveraged to identify gaps in health data coverage of PR. However, future investigations could also employ data curation to make data

more accessible to public health practitioners [15], [86]. Often, data sources are difficult to find for racially and ethnically minoritized communities, such as Puerto Ricans. Therefore, creating curated datasets can support investigators in assessing the health of populations that are traditionally underserved [15].

7.8. Future Directions and Implications

Moving forward, reducing the burden of disease experienced by the Puerto Rican population residing in the greater US calls for critical engagement with the structural and political forces that allow health inequities to persist. For US-based public health researchers and practitioners, this involves the application of contextually informed approaches that acknowledge Puerto Rico's status as the oldest colony in the world [35], [94]. Within public health data systems, this includes providing the Spanish-language option in all public health monitoring and surveillance systems, to acknowledge and respect the Spanish-language preferences of the Puerto Rican people [221], [223]. Additionally, when collecting and analyzing health data for US-based populations, a contextually informed approach would call for the collection of ethnic subgroup data and the execution of in-depth subgroup analyses that recognize the heterogeneity that exists within the Latinx category [164]. Importantly, the application of contextually informed theories and frameworks, such as the PDoH model [92], the SDoH framework [13], and ecosocial theory [98], would all serve to illuminate the pathways that lead from exclusionary political structures to Puerto Rican health inequities. Moreover, acknowledging the ancestral ties and histories shared among Puerto Ricans living in the greater US, may not only serve to highlight potential pathways to health inequities, as this dissertation has attempted to demonstrate, but may also serve to present solutions to the public health issues experienced by the Puerto Rican community.

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