Using Analytic Domains within the Black Population to Understand Disparities in Population Health

A report to the Robert Wood Johnson Foundation
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James S. Jackson holds a number of positions at the University of Michigan. He is the Daniel Katz Distinguished University Professor of Psychology; Professor of Afroamerican and African Studies, Department of Afroamerican and African Studies; and Research Professor within the Institute for Social Research's Research Center for Group Dynamics. He received his PhD from Wayne State University.

As either the P.I. or Co-P.I. on numerous program projects and research grants, his research examines ethnic and racial influences on the social determinants of both physical and mental health across different population groups. He was the P.I. for the landmark National Institute of Mental Health (NIMH)-funded National Survey of Black Americans (NSBA); the NSBA was the first nationally representative survey of black Americans. The NSBA is a panel survey including 4 data collections over the course of 14 years. In addition, he was the P.I. on the National Survey of American Life (NSAL). The NSAL extended the NSBA. Its purpose was to explore inter-and intra-group racial and ethnic differences in psychological distress and rates of mental disorders, as well as the influences of a wide variety of stressors, stress, coping resources, and individual coping and help-seeking strategies among national samples of African Americans, non-Hispanic blacks of Caribbean descent, and non-Hispanic whites. He is currently the Co-Director of a National Institute for Minority Health Disparities (NIMHD) supported P-60 Center, the Center for Integrated Approaches to Health Disparities (CIAHD). As part of CIAHD, he has directed several clinic- and population-based studies focused on understanding mechanisms that explain disparities in physical health and mental health.

James has been a recipient of many awards including the Distinguished Career Contributions to Research Award, Society for the Psychological Study of Ethnic Minority Issues, American Psychological Association, and the James McKeen Cattell Fellow Award for Distinguished Career Contributions in Applied Psychology, the Association for Psychological Sciences. He is the W/E.B. DuBois Fellow of the Americana Academy of Political and Social Science, fellow of the New York Academy of Medicine, an elected member of the National Academy of Medicine, the National Academies of Sciences, and was recently appointed to the National Science Board of the National Science Foundation.

Tod G. Hamilton is an Assistant Professor in the Department of Sociology and a Faculty Associate of the Office of Population Research at Princeton University. His primary research interests lie in social stratification, immigration, and health. His current projects examine the social implications of the rapidly growing black immigrant population in the United States. Between 1960 and 2013, the number of black immigrants in the United States increased from 125,000 to 3,793,000. If this trend continues, black immigrants and their descendants will play a significant role in determining perceptions of social and economic well-being of the country's black population in future decades. The primary aim of this project is to advance the sociological understanding of the primary determinants of racial disparities in health and economic well-being among individuals who reside in the United States. His research is published in *Demography, Journal of Health and Social Behavior*, *Social Science and Medicine, and Social Science Research*.

Mosi Adesina Ifatunji is an Assistant Professor in the Department of Sociology and a Fellow at the Carolina Population Center and the Institute for African American Research at the University of North Carolina at Chapel Hill. His research interests are in race, culture, biology and social stratification. To this end, he employs various comparisons between African Americans and Black immigrants, not only to document important and increasingly dynamic population trends,

but also to isolate the role of sociocultural context and practice in the process of racialization and the manufacture of larger trends in social stratification. He uses this quasi-experimental design, which he calls the 'black ethnic comparative,' to hold 'racialized physical features' (e.g., skin color, hair tenure and craniofacial bone structure) constant while allowing social, political and historical context to vary in important ways. Ultimately, this design holds unique potential for improving our understanding of how race, culture and biology contribute to social meaning and stratification in society. For more information, please visit: www.ifatunji.info.

Krim K. Lacey is an Assistant Professor in the Department of Sociology and African and African American Studies at the University of Michigan-Dearborn. His primary research is on intimate partner violence, particularly focusing on minority and immigrant populations. He has also been engaged in research that addresses the influence of social context and cultural factors on the physical and mental well-being of Caribbeans residing in the United States, Canada and England, and within the Caribbean region.

Hedwig (Hedy) Lee is a Professor of Sociology at Washington University in St. Louis. She received her BS in Policy Analysis from Cornell University in 2003 and her PhD in Sociology from the University of North Carolina at Chapel Hill in 2009. After receiving her PhD, she was a Robert Wood Johnson Foundation Health & Society Scholar at the University of Michigan, School of Public Health from 2009 to 2011. She also holds a courtesy joint appointment at the George Warren Brown School of Social Work at Washington University in St. Louis and is an Affiliate Professor at the University of Washington Department of Sociology in Seattle. She is broadly interested in the social determinants and consequences of population health and health disparities. Her recent work examines the impact of chronic stress on health and health disparities.

Jane A. Rafferty, ABD Sociology, University of Michigan is a Research Area Specialist Senior at the University of Michigan's Institute for Social Research. She has extensive experience in designing, planning, and carrying out studies broadly assessing racial and ethnic disparities in physical and mental health. Collectively, this research seeks to understand the varying social and biological pathways linking the social environment, forms of stress, coping behaviors to health status. In addition, she has interests in comparative and historical analyses of the meanings of racial and ethnic categories.

EXECUTIVE SUMMARY

Across multiple disciplines within the health and social sciences, researchers have long documented health disparities among Blacks and Whites in the United States (U.S.). The mechanisms, however, underlying these disparities are not fully understood. The Black population, conceptually and analytically, is most often treated as a monolithic group. In this report, we make the case for the validity and utility of disaggregating the Black population by a set of analytic domains for better understanding health disparities.

Our argument has a two-pronged starting point. First, we direct attention to critical analytic domains that are useful for comparative analysis within the Black population. This includes *skin color* (e.g., light, medium and dark), *internal migration* (e.g., when and where respondents have lived within the U.S.), *birthplace* (e.g., in what international region or country was the respondent born) and *immigrant generational status* (e.g., whether or not the respondent's parents and or grandparents were born in the U.S.). We define each of the four domains, discuss how investigators have operationalized or measured these domains and point to selected studies that provide evidence that health varies within each of these population domains among U.S. Blacks.

Second, we identify a set of principal causes of health statuses and health disparities common within the vast literature on health and health disparities. These include *resources, health behavior, environmental exposure, and biology*. In identifying principal causes of health statuses and analytic domains for disaggregation, we document the extent to which variation in any given domain is associated with variation in each of the principal causes. That is, in order for our proposed population domains to provide additional insights into the principal causes of racial health disparities, we not only show that health statuses vary within each domain but also that there is variation on each of the principal causes within each population domain.

Recommendations for how investigators, policy makers, and health-related funding agencies, might collect data on the proposed analytic domains within the Black population conclude the report. **Skin color:** Our review of existing studies reveals an association between skin color and health. Moreover, variation in skin color is associated with variation in resources, health behaviors and environmental exposures. Future studies should therefore collect data on skin color among U.S. Blacks. There are important things that researchers should consider when evaluating which operational definition to adopt. Our general recommendation is that studies include both objective and subjective measures of skin color. **Internal migration:** We highlight significant variation across the principal causes by internal migration status, including lifetime and recent moves, among Blacks in the U.S. Given this heterogeneity, we recommend surveys attempting to understand the causes of health disparities among Blacks include a standard set of questions assessing internal migration. **Birthplace:** Our review reveals associations between nativity and health by place of birth. Therefore, we recommend that data collections should include questions that assess the following: the country of birth; the state, city or town of birth; the year of migration to the U.S.; age of migration to the U.S.; and reason for migration to the U.S. Similar to internal migration, researchers should include a question or set of questions designed to ascertain the specific reasons and potential selection mechanisms for immigration to the U.S. (e.g., family reunification, education, employment, political asylum). **Immigrant generational status:** Our review identifies important variation in health by immigrant generational status. We recommend that future surveys collect information on generational status, and, in addition, design studies that include representative samples across three family generations to understand better this dimension of health among Blacks.

INTRODUCTION

Across multiple disciplines within the health and social sciences, researchers have examined the existence and causes of population health disparities; some of the more perplexing and consequential of these investigations concern disparities in health statuses between 'racialized population groups' (e.g., between Blacks and Whites). Indeed, by the end of the twentieth century, the major federal grant-making institutions began increasing investments in both basic and applied research on racial disparities in health. The studies resulting from these investments have produced detailed descriptive comparisons between different racialized populations, but there continues to be little agreement on the mechanisms behind these disparities. That is, while most scientists agree on the existence of a wide range of racial disparities in health, questions regarding how and why these disparities exist, persist, and grow, remain unanswered. In this report, we propose the use of specific analytic population domains within the U.S. Black population to explore the mechanisms that produce racial disparities in population health.

Those interested in population health have worked to identify the social, behavioral and biological factors shaping the health status of human population groups (e.g., Diez Roux 2012; Jackson and Knight 2006; Link and Phelan 1995; Phelan et al. 2004; Phelan, Link and Tehranifar 2010; Schulz et al. 2005; Williams 1997). Identified principal causes of health and health disparities include: *resources* (e.g., individual and area-level measures of socioeconomic status [SES]), *environmental exposures* (e.g., toxins and sources of stress including discrimination), *health behaviors* (e.g., exercise and diet) and *biology* (e.g., genetics and biomarkers). We propose that comparative analyses across subgroups within the U.S. Black population may provide insight into longstanding debates on the relative contribution of different principal causes in explaining racial disparities in health. The Black population includes rich variation across a wide range of dimensions. We propose greater focus on four specific analytic domains: *skin color* (e.g., light, medium and dark), *internal migration* (e.g., when and where respondents have lived within the U.S.), *birthplace* (e.g., in what international region or country was the respondent born) and *immigrant generational status* (e.g., whether or not the respondent's parents and/or grandparents were born in the U.S.).

In the sections that follow, we make the case for the validity and utility of disaggregating the Black population by these analytic domains. We begin by providing a detailed description of the population domains or subgroups we think are particularly useful in adjudicating the relative importance of each of the principal causes of population health. We define each of the four domains, discuss how investigators have operationalized or measured these domains and point to selected studies that provide evidence that health varies within each of these population domains

among U.S. Blacks. After clarifying the four analytic domains, we then show the extent to which variation in any given domain is associated with variation in each of the principal causes. That is, in order for our proposed population domains to provide additional insights into the principal causes of racial health disparities, we not only show that health status varies within each domain but also that there is variation on each of the principal causes within each population domain. We conclude the report with data collection recommendations for investigators, policy makers, and health-related funding agencies in the proposed analytic domains within the Black population.

UNDERSTUDIED ANALYTIC DOMAINS WITHIN THE BLACK POPULATION

In this section, we provide detailed conceptual definitions for each of the analytic population domains, review measurement approaches, and discuss the distribution of each domain within the Black population. We also point to studies that have examined associations between these population domains and selected health outcomes.

Skin Color

Interest in the role of skin color in shaping the lived experience of the Black population has been rapidly increasing in recent decades. Although there are some early exceptions (see Johnson 1934), the social scientific study of skin color variation within the Black population began in 1979-80 with the fielding of the National Study of Black Americans (NSBA) at the University of Michigan (Jackson and Gurin 1987; Jackson, Caldwell and Sellers 2012). Previously, studies used this terminology to refer to different racialized populations (e.g., "Blacks" versus "Whites"). Today, scholars use skin color (i.e., skin shade or skin tone) to refer to the level of skin pigmentation of any given person or group, with special attention to variation within any given racialized population.

Broadly, investigators have operationalized skin color in two ways: continuously and categorically. The most popular continuous measure of skin color is the reflectance meter, which infers skin color by passing light through the epidermis of various parts of the body, but usually under the upper volar arm (the underside of the upper arm) or the forehead (e.g., Borrell et al. 2006; Boyle 1970). Most categorical studies (both self- and observer-reported) of skin color include hues of white, brown or black. Categorical measures of skin color generally include either self- or interviewer-reports. There is no current standardized set of skin color categories, but one of the most frequently used measures divides a population into five categories: very light, light, medium, dark, and very dark (Jackson, Caldwell, and Sellers 2012).

With respect to the Black population, our analysis of the 2001-2003 National Survey of American Life (NSAL) suggests that 4 percent of the lack population is very dark, 24 percent

dark, 47 percent medium, 16 percent light, and 8 percent very light. In terms of the association between skin color and Black population health, a number of studies show that health varies significantly among Blacks by skin color (e.g., Armstead et al. 2014; Boyle 1970; Dressler 1990; Gravlee and Dressler 2005; Harburg et al. 1978; Klag et al. 1991; Monk 2015; Wassink, Perriera and Harris 2016).

Internal Migration

Despite the long history of internal migration among Blacks in the U.S. (e.g., Lieberson 1980), few studies (beyond historical accounts of the Great Migration) have documented differences in life outcomes between U.S. resident migrants and non-migrants. Internal migration – or "domestic migration" – refers to residential migration within a country. That is, while some may never leave their neighborhood or state of their birth, others may relocate multiple times over their life course. While there are a number of ways to identify internal migrations, most studies define internal migrants as individuals who resided in a different state other than their state of birth at the time of a survey (e.g., Butcher 1994, Hamilton 2014). However, some studies have also focused on moves to different regions in the U.S. (e.g., Lemann 2011; Lieberson 1980; Tolnay 2003) or whether respondents have moved from their current residence within the past year or five years, regardless of destination (e.g., Hamilton 2015; Model 2008). Studies of the 2001-2014 American Community Surveys (ACS) suggest that approximately 36 percent of Blacks currently reside in a state that is different from their state of birth (Hamilton 2015). Research shows that internal migration status is an important correlate of health and mortality within the Black population (Hamilton 2015; Wingate, Swaminathan, and Alexander 2009).

Birthplace

Although interest in the experience of foreign-born Blacks dates back to the beginning of the twentieth century (e.g., Reid 1939), studying the foreign-born Black population has only recently become a viable subfield of investigation. Studies have operationalized birthplace in at least three ways: whether or not the respondent was born in the U.S. (e.g., native versus immigrant), the geopolitical region within which the respondent was born (e.g., the Caribbean, Africa, South America, Europe or North America), or the country within which the respondent was born (e.g., Jamaica, Nigeria, Colombia, France or the U.S.). Since 1960, there has been an exponential increase in the size of the foreign-born Black population. Between 1960 and 2014, the number of Black immigrants in the U.S. increased from approximately 125,000 to approximately 3,793,000 (Kent 2007). Foreign-born Blacks now account for about 9 percent of the overall Black population, three times as much as in 1980 (Anderson 2015). There has also

been great diversification in terms of both the region and country of birth of the Black population. While early waves of Black immigrants hailed mostly from the Caribbean, today Black immigrants also tend to emigrate from sub-Saharan Africa (Kent 2007). While Caribbean immigration increased by 33 percent between 2000 and 2014, African immigration increased by a remarkable 137 percent (Anderson 2015). All estimates show that throughout the life-course, Black immigrants have health and mortality profiles that are different from those of U.S.-born Blacks (Green 2012; Hamilton and Hummer 2011; Read, Emerson and Tarlov 2005; Singh and Siahpush 2002;).

Immigrant Generational Status

Immigrant generational status refers to whether both the respondent and their parents or grandparents were born in a particular country. Prior studies have used four categories of immigrant generational status. These are: a) first generation (or those born outside of the U.S.); b) 1.5 generation (or those that were born outside of the U.S., but migrated to the U.S. before the age of 16[1]); c) second generation (or those with at least one foreign-born parent); or d) third or more generation (those with both parents born in the U.S. but at least one foreign-born grandparent). According to our analysis of the March files of the Current Population Survey (CPS), 8-10 percent of the total Black population has at least one foreign-born parent (second generation Black immigrants). Moreover, among all U.S.-born Black individuals under the age of 20, 16 percent have at least one foreign-born parent. We know much less about the other generational distinctions, as most major population surveys do not include relevant questions. However, existing studies show that health and health behaviors vary widely among Blacks by immigrant generational status (Acevedo-Garcia et. al. 2010; Acevedo-Garcia et al. 2005).

PRINCIPAL CAUSES OF HEALTH AND VARIATION BY ANALYTIC DOMAIN

In the prior section we described a set of analytic population domains, citing studies documenting that population health varies within each domain. In this section, we describe principal causes of health and ill health (i.e., resources, health behaviors, environmental exposures, and biology) and suggest how each of these principal causes may vary within the proposed population domains. We argue that the combined links between our population domains and health outcomes, and between these domains and each of the principal causes, provides a research framework that will advance understandings of the principal causes of population health disparities in the U.S. After briefly reviewing the literature and providing some preliminary

[1] Note that there is variation in this cutoff with a range from ages 12 to 18.

evidence regarding the connections between the proposed population domains and the principal causes of population health, we conclude with recommendations for the collection of data on under-studied sub-groups within the Black population.

Resources

Research reveals an inverse association between SES (e.g., education, wealth and income) and population health and mortality. These associations remain even as the major disease risks have changed over time (e.g., tuberculosis and poor sanitation). In an attempt to explain these patterns, Link and Phelan (1995) advanced the argument that SES is a fundamental cause of social disparities in health and mortality. According to Phelan and colleagues (2012: 30), "...an important reason that SES is related to multiple disease outcomes through multiple pathways that change over time is that individuals and groups deploy resources to avoid risks and adopt protective strategies. Key resources such as knowledge, money, power, prestige, and beneficial social connections can be used no matter what the risk and protective factors are in a given circumstance." Link and Phelan propose four key empirical criteria demonstrating that SES is a fundamental cause of health inequalities:

(1) evidence that SES influences multiple disease outcomes;
(2) evidence that SES is related to multiple risk factors for disease and death;
(3) evidence that the deployment of resources plays a critical role in the association between SES and health/mortality; and,
(4) evidence that the association between SES and health/mortality is reproduced over time via the replacement of intervening mechanisms (Phelan et al. 2004).

Research has consistently found support for each of these criteria (e.g., Dutton 1978; House and Williams 2000; Illsley and Mullen 1985; Lantz et al. 1998; Link et al. 1998; Link et al. 2008; Ruberman et al. 1984; Rosen 1979; Turner, Wheaton, and Lloyd 1995). Consequently, understanding variation in resources associated with social and economic status among U.S. Blacks could provide valuable insights into the principal causes of health disparities *within* the U.S. Black population, while also contributing to larger debates concerning the relative importance of resources in explaining racial health disparities.

Resources by skin color

Every U.S. census that contains data on earnings shows that U.S.-born Blacks have lower earnings and levels of educational attainment than U.S.-born Whites. The earnings disparity between U.S.-born Blacks and Whites remains even after adjusting for educational attainment and work experience (Darity et al. 2001). While the implications of these disparities are far-reaching,

focusing exclusively on intergroup disparities between racialized populations (e.g., Blacks and Whites) ignores the fact that some subgroups within the Black population may face greater labor market penalties than others. One racialized characteristic that varies widely within the Black population is skin color. Indeed, various measures of skin color (e.g., categorical or continuous; noted in previous sections) have allowed researchers to observe the association between skin color and SES.

Studies link skin color to variation in several key economic resources including, but not limited to, educational attainment (Keith and Herring 1991; Seltzer and Smith 1991) and income (Goldsmith, Hamilton, and Darity 2006; Monk 2015). Goldsmith, Hamilton, and Darity (2006, 2007) have found that light-skinned Black men have higher adjusted earnings than that of darker skinned Black men. Indeed, Goldsmith and colleagues (2007) found that the earnings of the lightest skinned Black men were similar to those of White men. These findings held even when the study authors compared Blacks with similar occupations. Similarly, Monk (2014) shows that lighter skinned individuals achieve higher levels of educational attainment than their darker skinned counterparts do. Moreover, Goldsmith, Hamilton, and Darity (2007) show that, even after adjusting for retrospective high school performance, labor market experience, health status, and self-esteem, lighter skin Blacks have higher adjusted earnings at the same levels of education, relative to darker skinned Blacks, pointing to an independent association between skin color and SES.

Resources by internal migration and birthplace

Other important population domains within the U.S. Black population are internal migration and birthplace. Few studies have attempted to understand the degree to which the decision to move is correlated with SES among U.S.-born and foreign-born Blacks. To address this issue, Table 1 displays disparities in a range of social and demographic measures including earnings and education, according to internal migration status, country of birth, and generational status.

Table 1. Social and Demographic Differences among Blacks by Internal Migration Status, Country of Birth, and Generational Status.

Panel 1. Men

	Internal Migration			Country of Birth					Generational Status		
	All Black Natives	Movers	Non-movers	All Foreign-born Blacks	*Spanish-Speaking Caribean*	*English-Speaking Caribbean*	*Haiti*	Sub-Saharna Africa	Third/Higher	Second	First
Weekly Earnings	827	954.8	757.3	863.7	704.1	925.1	721.2	887.4	638.4	781.5	662.7
	(809.7)	(961.2)	(704.1)	(887.4)	(625.1)	(867.9)	(752.0)	(950.3)	(805.2)	(595.7)	(1137.8)
In the labor Force	0.843	0.868	0.83	0.909	0.898	0.904	0.901	0.917	0.726	0.796	0.748
	(0.4)	(0.3)	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)
Employed	0.86	0.886	0.847	0.903	0.912	0.886	0.883	0.919	0.916	0.902	0.923
	(0.3)	(0.3)	(0.4)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)
Married	0.417	0.486	0.382	0.595	0.531	0.587	0.603	0.611	0.337	0.322	0.48
	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
South	0.596	0.587	0.601	0.426	0.38	0.372	0.555	0.423	0.593	0.363	0.365
	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
Northeast	0.128	0.101	0.142	0.382	0.538	0.553	0.414	0.24	0.131	0.407	0.478
	(0.3)	(0.3)	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)	(0.4)	(0.3)	(0.5)	(0.5)
Midwest	0.18	0.161	0.189	0.0988	0.0314	0.0296	0.02	0.189	0.192	0.094	0.0692
	(0.4)	(0.4)	(0.4)	(0.3)	(0.2)	(0.2)	(0.1)	(0.4)	(0.4)	(0.3)	(0.3)
West	0.0959	0.151	0.0681	0.0928	0.0505	0.046	0.011	0.148	0.0841	0.136	0.0882
	(0.3)	(0.4)	(0.3)	(0.3)	(0.2)	(0.2)	(0.1)	(0.4)	(0.3)	(0.3)	(0.3)
Education	12.88	13.32	12.65	13.18	12.11	12.94	12.57	13.88	12.89	13.74	12.69
	(2.1)	(2.2)	(2.1)	(3.0)	(3.0)	(2.6)	(3.1)	(3.0)	(1.7)	(1.7)	(2.2)
Experience	23.82	24.64	23.4	23.95	25.84	26.13	25.62	21.66	24.19	16.62	23.63
	(11.3)	(11.3)	(11.4)	(11.0)	(11.6)	(11.2)	(11.3)	(10.4)	(11.2)	(10.0)	(11.0)
Observations[6]	239,313	80,078	159,235	40,925	1,394	13,251	6,532	16,139	83,742	1,929	10,862

Panel 2. Women

	Internal Migration			Country of Birth					Generational Status		
	All Black Natives	Movers	Non-movers	All Foreign-born Blacks	*Spanish-Speaking Caribean*	*English-Speaking Caribbean*	*Haiti*	Sub-Saharna Africa	Third/Higher	Second	First
Weekly Earnings	694.9	804.9	642.9	720.3	556	783.2	618.6	701.3	802.2	931.1	810.6
	(640.1)	(754.6)	(570.9)	(684.6)	(527.5)	(674.9)	(612.3)	(683.0)	(977.1)	(895.0)	(927.0)
In the labor Force	0.819	0.827	0.815	0.824	0.776	0.858	0.831	0.8	0.743	0.799	0.869
	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.3)
Employed	0.886	0.898	0.881	0.898	0.87	0.912	0.877	0.895	0.886	0.874	0.915
	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)
Married	0.322	0.374	0.298	0.508	0.419	0.445	0.506	0.583	0.428	0.297	0.525
	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
South	0.61	0.619	0.606	0.416	0.333	0.351	0.546	0.425	0.592	0.326	0.384
	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
Northeast	0.128	0.103	0.14	0.426	0.608	0.593	0.427	0.244	0.121	0.424	0.429
	(0.3)	(0.3)	(0.3)	(0.5)	(0.5)	(0.5)	(0.5)	(0.4)	(0.3)	(0.5)	(0.5)
Midwest	0.181	0.161	0.191	0.0794	0.0217	0.0233	0.017	0.179	0.189	0.076	0.0887
	(0.4)	(0.4)	(0.4)	(0.3)	(0.1)	(0.2)	(0.1)	(0.4)	(0.4)	(0.3)	(0.3)
West	0.0804	0.117	0.0635	0.079	0.0381	0.0325	0.0098	0.152	0.097	0.174	0.0983
	(0.3)	(0.3)	(0.2)	(0.3)	(0.2)	(0.2)	(0.1)	(0.4)	(0.3)	(0.4)	(0.3)
Education	13.3	13.7	13.12	12.99	12.29	13.39	12.23	13.02	12.63	13.5	12.85
	(2.2)	(2.2)	(2.1)	(3.1)	(3.1)	(2.5)	(3.2)	(3.5)	(1.7)	(1.7)	(2.3)
Experience	23.35	24.41	22.87	24.03	25.61	25.74	25.77	21.11	24.34	16.11	22.96
	(11.4)	(11.5)	(11.3)	(11.3)	(11.7)	(11.1)	(11.7)	(10.7)	(11.1)	(10.0)	(10.7)
Observations	316,490	98,786	217,704	47,447	1,716	18,612	7,765	15,243	62,269	1,455	9,616

Source: Data from the 2001-2014 waves of the American Community Survey are used to generate estimates for internal migration and country of birth. Data from the 2001-2014 waves of the Current Population Survey are used to produce estimates for generational status. ***Notes:*** Internal migrants are defined as individuals who have moved across states since birth.

Data from the 2001-2014 waves of the ACS, Panel 1 of Table 1, reveals considerable variation among Black men in weekly earnings. While Columns 1 and 4 reveal that Black immigrants earn an average of $36.7 more per week than African Americans (collectively), amounting for about $1,908.4 dollars more per year, the earnings of African American movers ($954.8) are considerably greater than the earnings of Black immigrants ($863.7). This weekly earnings disparity means that African American men who are movers earn $4,737.2 more in annual earnings compared to Black immigrant men.

Panel 2 of Table 1 reveals that Black immigrant women earn $25.4 dollars more per week than African American women do (collectively). Similar to men, African American women who are movers have weekly earnings that are $162 more than African American women who are non-movers and $84.6 dollars more than Black immigrants. This difference amounts to a $4,399.2 annual earnings disparity between African American female movers and Black immigrant women.

In addition, Table 1 displays earnings differences for Black immigrants from four primary sending regions. Among both immigrant men and women, immigrants from the English-speaking Caribbean have the highest earnings while immigrants from Haiti and the Spanish-speaking Caribbean have the lowest earnings. Panel 1 of Table 1, shows that African American men and women on average have weekly earnings of $827 and $694.9, respectively. Among men, individuals from the Spanish-speaking Caribbean and Haiti have weekly earnings that are below the average of African American men. Black immigrant men for the English-speaking Caribbean and Sub-Saharan Africa have higher weekly earnings than do African American men. Panel 2 of Table 1 shows a similar pattern of earnings for Black immigrant women. That is, women from Haiti and the Spanish-speaking Caribbean, have earnings that are below the mean for African American women while the other subgroups have earnings that are above the mean for African American women.

Resources by immigrant generational status

Access to resources that promote good health also varies among Blacks by immigrant generational status. Since few studies document this source of variation among Blacks in the U.S. (e.g. Elo et al. 2015; Hamilton 2014; Ifatunji 2016), we provide a set of descriptive statistics to highlight the degree of variation in two important resources – income and educational attainment – among Blacks by immigrant generational status. Using data from the 2001-2014 waves of the March files of the CPS, Table 1 displays an association between generational status and educational attainment among Blacks between the ages of 25 and 64. Panel 1of Table 1 shows that, relative to third or higher-generation Blacks, first generation blacks have lower levels of education and second-generation blacks have higher levels of education. Among women, Panel 2 of Table 1 shows that, relative to third/higher generation blacks, first- and second- generation black immigrants have higher levels of education. Table 1 also shows that weekly earnings vary considerably among Blacks by generational status. Among men and women, relative to third/higher generation Blacks, first- and second- generation Black immigrants have higher unadjusted weekly earnings.

In summary, this section suggests that disaggregating the Black population along the proposed analytic domains allows for a more nuanced understanding of disparities in SES among Blacks in the U.S. Understanding variations in social and economic statuses could contribute to researchers and policy-makers gaining a better understanding of the sources of health disparities, and subsequently targeting interventions in a manner that maximizes reductions in social and economic inequities.

Health Behaviors

Studies within the population domains we have proposed also will provide important insights into the relative importance of health behaviors in explaining variation in population health. Some of the more commonly studied health behaviors include: smoking, substance use, physical activity, and diet and nutrition. Many also consider body mass index (BMI) to be the result of health behaviors, namely, energy intake (i.e., diet and nutrition) and energy expenditure (i.e., physical activity). While health behaviors are associated with SES, differences in health behaviors do not fully account for health disparities between those with higher and lower SES (Pampel, Krueger and Denney 2010). Few studies document differences in health behaviors within the analytic domains that we propose.

Of the population domains we propose, birthplace is the most frequently researched. Several studies have found relationships between skin color and health outcomes (e.g., Armstead et al. 2014; Borrell et al. 2006; Boyle 1970; Coresh et al. 1991; Dressler 1990; Gleiberman et al. 1995; Gravlee and Dressler 2005; Harburg et al. 1973; Keil et al. 1981; Keil et al. 1992; Klag et al. 1991; Knapp et al. 1995; Monk 2015; Nelson et al. 1993; Rosenblum et al. 2015; Schwam et al. 1995; Sweet et al. 2007; Taylor et al. 2012). Only one study found a relationship between skin color and health behaviors (Harburg et al. 1978).[2] This single study, however, found no relationship between skin color and smoking behavior (b = .05, se = .06, ns). Since there is very little work on the relationship between internal migration, immigrant generational status and health (e.g., Bennett et al. 2008; Hamilton 2015; Hamilton 2013), we did not conduct an extended review of these domains and their relationships to health behaviors. Instead, we focus our review on birthplace (including nativity as well as country and region of origin when possible) and then conclude with an exploratory analysis of the relationship between our analytic domains and health behaviors.

[2]A few studies reveal a relationship between skin color and smoking behavior. These studies argue that smoking alters skin color. If true, and smoking does cause changes in skin color as opposed to skin color being predictive of smoking, then the effects may be bi-directional.

Body mass index by birthplace

Body mass index is an anthropometric measure that investigators often use as a 'global index' of health behaviors. That is, those who take in few substances, smoke less, move more and have better diet and nutrition tend to have a lower BMI than those who take in more substances, smoke more, move less and have worse diet and nutrition. In general, studies have found that foreign-born Blacks have lower BMIs than do native-born Blacks (i.e., African Americans). For instance, a study using data from the 1997-2002 National Health Interview Survey (NHIS) on adults 18 or older, found that, on average, U.S. born Blacks have a higher BMI than foreign-born Blacks (28.4 versus 26.6; Borrell et al., 2008). A study using 1988-1994 National Health and Nutrition Examination Survey (NHANES) data for adults aged 20 to 79, also found slightly greater BMIs and waist circumference among native-born Blacks (27.9, 92.8) than among foreign-born Blacks (26.8, 90.3; Lancaster, Watts and Dixon 2006). According to the 1979-1989 National Longitudinal Mortality Study (NLMS; Singh and Siahpush 2002), among adults aged 18-64 African Americans have an average BMI (27.1) that is greater than Black immigrants (25.6).

Investigators have replicated this more general finding in two smaller area samples. A study focused on the Blacks in Philadelphia (Elo and Culhane 2010), found that native-born Blacks (26 percent) are twice as likely to be obese (BMI > 30) than foreign-born Blacks (11 percent). Among registered nurses and pharmacists living in the Houston, Texas metropolitan area (Hyman et al. 1999, Poston et al. 2001), another small study found that foreign-born Africans (28.4) have lower BMIs than native-born Blacks (31.3) do. A small area study of New Hampshire (Ryan, Gee and Laflamme 2006), found that native-born Blacks (30.1) have greater mean BMI than do foreign-born Blacks (26.4). In a small sample of men aged 20-64 in Washington DC (O'Connor et al. 2014), native-born Blacks reported higher average BMIs (29.3) than foreign-born Blacks did from Africa (27.4).

Several studies have also identified similar patterns to the ones described above when comparing estimates for various sub-populations. One study disaggregated the native-born Black population among those living in the North and the South and foreign-born Blacks (Hicks et al. 2003). Using data on participants aged 30 to79 from 1988-1994 NHANES, a slightly lower BMI was found among Northern Black women (29.2) and men (26.8) than among Southern Black women (30.3) and men (26.9), but even lower BMI among foreign-born Black women (28.2) and men (25.3). Using data from the 1989-1996 NHIS, Antecol and Bedard (2006) found a slightly higher BMI for native-born Blacks (28) in comparison to foreign-born Black women (26.7). Findings from the same study also illustrate that native-born Black women are more likely to be

overweight (BMI between 25 and 29.9; 63 percent) and obese (32 percent) than are foreign-born Black women (59 percent, 22 percent). The same study further found a similar pattern for Black men; native-born Black men have a slightly greater BMI (26.5) than foreign-born Black men (25.1). The same pattern held for obesity among Black men. Native-born Black men are more likely to be overweight (57 percent) and obese (20 percent) than foreign-born Black men (49 percent, 6 percent). Moreover, they found among adults aged 25 to 74 the same pattern of disparities in BMI and obesity between native-born and foreign-born Black women and men (Ford, Narayan and Mehta 2015).

Additional studies from the 2000-2006 NHIS focusing on adults aged 25 or more (Elo, Mehta and Huang 2008), found that native-born non-Hispanic Blacks are more likely to be obese (37 percent) than are foreign-born Blacks from West Indian, Caribbean and South American countries (24 percent), African countries (18 percent) and European countries (32 percent). One study reported differences in BMI for native-born Black women and men and foreign-born Black women and men from the Caribbean/South America and Africa (Mehta et al. 2015). Employing data on adults aged 25-59 from the 2000-2013 NHIS Metha et al (2015) reported findings that are in line with all previous estimates, with the exception of the overweight category. Native-born Blacks have greater mean BMI, are less likely to be within the normal range (BMI 18.5-24.9), and are more likely to be obese (for class I [low-risk; BMI 30.0 to 34.9] and II [moderate-risk; BMI 35.0 to 39.9]) than are foreign-born Blacks. Foreign-born Black women (Caribbean/South America: 35.5; Africa: 37.5) and men (Caribbean/South America: 43.6; Africa: 46.7), however, are more likely to be overweight than native-born Black women (28.7) and men (37.2).

Overall, foreign-born Blacks have better health behaviors than African Americans., There is evidence, however, of notable variation among foreign-born Blacks. Using 2000-2006 National Health Interview Survey data, Elo, Mehta and Huang (2008) found among Blacks 18 years or older, that obesity (BMI >30) was lowest among Black immigrants from Africa (18 percent). The next lowest was among Hispanic Black immigrants (22 percent), then Black immigrants from the Caribbean and South America (23.7 percent), then Black immigrants from Europe (32.4 percent), then non-Hispanic (37 percent) and Hispanic African Americans (38 percent). Based on a sample of "self-identified healthy men" ages 20-64 in Washington DC, O'Connor et al. 2014 found that African Americans (29.3) have average BMIs that are slightly higher when compared to those among Black immigrants from Africa (27.4); but that Black immigrants from Central Africa have BMIs that are not statistically different from East Africans (26.9).

While there is evidence of variation among Black immigrants, however, some studies also suggest the largest source of the variation is between African Americans and Black immigrants. Based on data from the 1994 and 1996 NHANES and the International

Collaborative Study of Hypertension in Blacks (ICSHIB), BMI among African Americans was slightly higher than among Nigerians and Jamaicans, but within the margin of error (Okosun et al. 1998). According to a 1999-2004 sample of Black women living in Philadelphia, African Americans are more likely to be obese (25.1 percent) than are those born in the Caribbean (19 percent) or Africa (17.9 percent; Elo and Culhane 2010). When Mehta et al. (2015) standardized BMI by age in the 2000-2013 NHIS, they found that African Americans had greater average BMIs (30.8) than Black immigrants from South America/Caribbean and Africa, which were not statistically different from each other (28.3 and 28, respectively).

Smoking by birthplace

Both national and regional studies reveal that, compared to African Americans, Black immigrants are less likely to be current or former smokers. Several studies using the NHIS have found that African Americans smoke more than Black immigrants do. For instance, King et al. (1999) using data from the 1990-1994 NHIS on Black adults aged 18 to 64 found that African Americans were about twice as likely to be current smokers (30.4%) than were Black immigrants (14.1%). Lucas, Anderson and Kington (2003) in a study of Black men aged 18 and older in the 1997-2000 NHIS, found that African Americans are more likely to be either current (29.8%) or former smokers (20.7%) than are Black immigrants (14.4 and 15.8%, respectively). A study using data from the 1997-2002 NHIS on adults aged 18 or older (Borrell et al. 2008), found that African Americans were much more likely to report being current (30.9 percent) or former smokers (49 percent) than Black immigrants (11.9 and 30.3 percent). Studies that draw on three other nationally representative samples find similar patterns. Based on the 1979-1989 NLMS Singh and Siahpush (2002)) found among adults aged 18-64, African Americans were about three times more likely to report being current smokers (29.3 percent, N=25,655) than were Black immigrants (10.4%, N=777). Based upon the 2006 Tobacco Use Supplement (TUS) of the CPS Wade, Lariscy and Hummer (2013) found that African Americans were more likely to report moderate to heavy smoking (4.6%), light or intermittent smoking (6.2%) or to be former smokers than Black immigrants (1.6, 5.4 and 2.5%, respectively;). Finally, Doamekpor and Dinwiddie (2015) found in data from the 2001-2010 NHANES that African Americans compared to Black immigrants were about twice as likely to report being current smokers (33.2 versus 14.4%).

A few smaller area studies have also found that African Americans are more likely to smoke than are Black immigrants. For example, a study of adults aged 18 or older in New Hampshire (Ryan, Gee and Laflamme 2006), found that African Americans were three times more likely to report being current smokers (31.2%) than Black immigrants (10.7%). According to the 2002 NYC Department of Health and Mental Hygiene and 2005 Community Health

Surveys (White et al. 2011), African Americans were more likely to be current (15%) or former smokers (28.1%) than were Black immigrants (9.8 and 9.2 %, respectively). O'Connor et al. (2014) in a small sample of self-identified healthy men ages 20-64 in Washington DC found that African Americans (16%) compared to Black immigrants from Africa (7%). were twice as likely to report being current smokers (16%). Among pharmacists and registered nurses living in the Houston metropolitan area, Poston et al. (2001) found that African Americans were far more likely to report being current smokers (8.1%) than were Black immigrants from Africa (1.1%). Finally, in a small area study of Miami-Dade and Broward Counties in Florida Huffman et al. (2011) found that African Americans were much more likely to report being smokers (78%) when compared to Haitian Americans (16%).

While additional descriptive utility is gained by comparing African Americans to Black immigrants from different places (e.g., countries or regions) of birth, it appears that most of the variation in smoking behavior is collectively between African Americans and Black immigrants. In the 2000-2006 NHIS, Elo, Mehta and Huang (2008) found among Blacks 18 years or older, Black immigrants from South America/Caribbean and Africa were the least likely to be current smokers or have ever smoked (16 and 19%, respectively), followed by Black immigrants from Europe (30.2%), and both Hispanic and non-Hispanic U.S. born Blacks (41%). According to an analysis of Black women in the 2008 vital statistics birth record data from 27 states (Elo, Vang and Culhane 2014), African American women reported being 10 times more likely to have smoked during their pregnancy (10.5%) than Black immigrants from Sub-Saharan Africa (0.4%) and the Caribbean (0.7%). Ford, Narayan and Mehta (2015) using data on adults aged 25-74 from the 2000-2013 NHIS found that African American men were more likely to be current (28.6%) or former (19%) smokers than were Black immigrant men from the "Americas" (12.7 and 13.9%, respectively) and Africa (11.8 and 14.5%, respectively). In the same study Ford, Narayan and Mehta (2015), found that this pattern was even starker for Black women. African American women were more likely to be current (21.2%) or former (13%) smokers than were Black immigrant women from the Americas (4.8 and 4.7%) and Africa (1.6 and 2.2%, respectively). A 1999-2000 prospective study of Black women living in Philadelphia (Elo and Culhane 2010), reported that African Americans were much more likely to smoke tobacco (21.7%) than Black immigrants (3.9%) and that Black immigrants from the Caribbean were more likely to smoke (5%) than were those born in Africa (1.9%).

Substance abuse by birthplace

The few studies that have investigated drug and alcohol abuse by nativity have found African Americans are more likely to abuse substances than are Black immigrants. Those who

take more than the recommended amounts of legal substances or consume any illegal substances, including alcohol and drugs, are abusing substances. According to a study of Black men aged 18 and older in the 1997-2000 NHIS (Lucas, Barr-Anderson and Kington 2003), African Americans are less likely to have never been drinkers (21.5%) than are Black immigrants (31.5%). According to the same study, African Americans are much more likely to be heavy drinkers (5.1%) than are Black immigrants (0.8%), but there are no differences in these populations in being a current smoker (50.4 % for both populations). Hicks et al (2003) disaggregated the native-born Black population between those living in the North and the South and compared these populations to foreign-born Blacks. Using data from 1988-1994 NHANES on participants aged 30 to 79, this study found no differences between African American and Black immigrant men, but did find that a greater percentage of Northern African American women drank more than 12mg per day alcohol (19.6%) in comparison to Southern African American women (15.6 percent) and Black immigrant women (6.6 percent). Another study that used a small sample of self-identified healthy men ages 20-64 in Washington DC (O'Connor et al. 2014), found no differences in alcohol intake between African Americans and Black immigrants from Africa.

Very few studies have examined substance abuse by country or region of origin. Drawing upon population samples in the U.S. and the Caribbean, however, one study found that the prevalence rates of lifetime substance abuse were much lower among those who decided not to migrate than among those who migrated (Lacey et al. 2016). The substance abuse rates among Blacks in Guyana and Jamaica (2.7, 2.6) are much lower than the rate of substance abuse among African Americans and Black immigrants from the Caribbean in the U.S. (11.5, 9.6). There are also notable differences between Black immigrants from Africa and the Caribbean. A 1999-2000 prospective study of Black women living in Philadelphia (Elo and Culhane 2010), found that African Americans were more likely to drink alcohol (35.6%) and smoke marijuana (22.7%) than were Black immigrants (22.1 and 4.2%, respectively). The same study also found that Black immigrants from the Caribbean drink (26.8%) and smoke marijuana (6.2%) more when compared to Black immigrants from Africa (14.2 and 0.9%, respectively). According to a small study of self-identified immigrant men ages 20-64 living in Washington DC (O'Connor et al. 2014), African Americans were more likely to be current smokers (16%) when compared to African immigrants (7%). O'Connor et al. (2014) also found some notable differences, however, among African immigrants; East Africans are more likely to be current smokers (12%) than are Black immigrants from West (8%) or Central Africa (0%).

Physical activity by birthplace

Few studies have examined the physical activity of African Americans and Black immigrants. Findings from the small number of published studies provide mixed results. According to a study of Black men aged 18 and older in the 1997-2000 NHIS (Lucas, Barr-Anderson and Kington 2003), Black immigrants are slightly more likely to report "at least some physical activity" (56.8%) than are African Americans (54%). Similarly, among registered nurses and pharmacists living in the Huston metropolitan area (Hyman et al. 1999), African Americans were less likely to report intense exercise levels (16%) than were Black immigrants from Africa (24%), but both groups were about equally likely to report moderate exercise (13 and 12%, respectively). However, other small studies suggest the opposite trend. For example, a small area study of adults aged 18 or older in New Hampshire (Ryan, Gee and Laflamme 2006), reported that African Americans were more likely to report moderate or vigorous exercise (44.9%) than are Black immigrants (37.5%). One study that used a small sample of self-identified healthy men ages 20-64 in Washington DC (O'Connor et al. 2014), reported that African Americans were almost twice as likely to exercise 3 or more times a week for 30 minutes (49%) than were Black immigrants from Africa (28%). Finally, a small area study of Miami-Dade and Broward Counties, found no differences in physical activity levels between African Americans and Haitian Americans (Huffman et al. 2011).

Diet and nutrition by birthplace

There are a number of studies that link diet and nutrition to cardiovascular diseases in various Black populations (for a review, see Lancaster 2009). According to a study of Black adults aged 20 to 79 from the 1988-1994 NHANES III (Lancaster, Watts and Dixon 2006), Black immigrants (whether Hispanic or not) have more healthful dietary habits than African Americans. For example, Black immigrants have lower energy intakes and consume lower levels of all recorded fats; "higher intakes of carbohydrate, fiber, total carotenes, vitamin C, foliate, vitamin B-6, potassium and magnesium" (Lancaster, Watts and Dixon 2006: 447). Black immigrants also consumed fewer "servings of dark green leafy vegetables, cheese, eggs, luncheon meats, discretionary fat, added sugars and more servings of dried beans and peas, fruits, milk and total grains" than did African Americans (Lancaster, Watts and Dixon 2006: 448). African Americans reported eating more fruits and fiber than did first generation African immigrants (Hyman et al. 1999). Another study found similar outcomes in a comparison between African Americans and Haitian Americans (Huffman et al. 2011).[3]

[3] This study used a number of specific measures of diet and nutrition.

The data reviewed in this section clearly reveal that notable differences in health behaviors exist among the domains of disaggregation. In all areas of health behaviors that we reviewed (smoking, obesity, substance abuse, physical activity, etc.), available literature revealed significant differences among various disaggregated groups, often in very different ways, favoring immigrant domains in some studies and favoring domestic groups in others. We believe that these observations are consistent with our earlier conclusions that the domains of disaggregation are relevant and health behaviors are related to physical and mental health statuses differentially across the domains of interest.

Exploratory Analyses Using the National Survey of American Life (NSAL)

Table 2 draws upon data from the National Survey of American Life to explore the association between health behaviors and the proposed population desegregations (see the appendix below for a description of this dataset). Data in this table generally provide support for by disaggregating the Black population we discover important variations in the health behaviors among the Black population. In fact, statistically significant variation is consistent with the literature on differences in health behaviors across these Black subpopulations. The one population disaggregation that does not result in additional analytic utility for health behaviors is internal migration status. Those that were living in a different state than their birth at the time of the survey do not have different health behaviors than those who never left their birth state. In addition, while drinking behavior varies least across the populations, the largest and most consistent differences are in smoking behavior.

The first three columns, at the far left of the table, display results from a bivariate regression model with a continuous measure of the Body Mass Index (BMI) as the outcome and a dichotomous measure of skin color as the independent variable. Since the model is a simple bivariate regression, we present the model f-statistic to assess whether skin color is a statistically significant correlate of BMI. The table shows that those who self-report darker skin colors have greater BMIs. There is a similar pattern for smoking. Those who self-report a darker skin color also tend to report a higher likelihood of being a current smoker. There is no relationship, however, between skin color and either drinking or physical activity.

There is also a relationship between nativity status and select health behaviors. African Americans have higher BMIs and are more likely to report being a current smoker than are Black immigrants. African Americans are also more likely to abuse substances and have lower levels of physical activity than Black immigrants. A more complicated association exists between drinking and nativity status.

Table 2. Unadjusted Means of Health Behaviors for Selected Disagregations for the U.S. Black Populaiton

	Skin Color[1]				Internal Migration[2]			Nativity[3]			Generational Status[4]			Country of Birth[5]			
	Light	Medium	Dark	*f*	No	Yes	*f*	Native	Foreign	*f*	Second	First	*f*	AfAm	Eng	non-Eng	*f*
Body Mass Index	28.2	28.8	29.1	.009	28.9	28.9	.920	28.9	26.5	.000	29.1	26.5	.001	28.9	26.2	27.5	.000
	(.219)	*(.173)*	*(.204)*		*(.166)*	*(.222)*		*(.128)*	*(.244)*		*(.649)*	*(.244)*		*(.128)*	*(.312)*	*(.455)*	
Health Behaviors																	
Smoking	.214	.259	.298	.002	.268	.274	.790	.270	.107	.000	.252	.107	.004	.270	.106	.114	.000
	(.017)	*(.013)*	*(.015)*		*(.011)*	*(.019)*		*(.009)*	*(.027)*		*(.043)*	*(.027)*		*(.009)*	*(.034)*	*(.027)*	
Drinking (mean)	2.00	1.89	1.95	.645	1.93	1.92	.877	1.93	1.79	.301	2.21	1.79	.107	1.93	1.77	1.91	.579
	(.106)	*(.057)*	*(.067)*		*(.066)*	*(.073)*		*(.048)*	*(.116)*		*(.211)*	*(.116)*		*(.048)*	*(.139)*	*(.100)*	
None	.192	.228	.239	.147	.226	.240	.552	.231	.169	.070	.092	.169	.031	.231	.164	.192	.157
	(.022)	*(.019)*	*(.018)*		*(.018)*	*(.018)*		*(.014)*	*(.030)*		*(.031)*	*(.030)*		*(.014)*	*(.037)*	*(.036)*	
Less than once a month	.288	.251	.232	.209	.247	.253	.811	.249	.304	.179	.325	.304	.804	.249	.324	.206	.096
	(.027)	*(.013)*	*(.017)*		*(.012)*	*(.019)*		*(.011)*	*(.039)*		*(.055)*	*(.039)*		*(.011)*	*(.043)*	*(.036)*	
1-3 days per month	.151	.168	.177	.535	.165	.155	.517	.162	.282	.009	.221	.282	.342	.162	.278	.302	.011
	(.018)	*(.014)*	*(.017)*		*(.010)*	*(.014)*		*(.009)*	*(.043)*		*(.032)*	*(.043)*		*(.009)*	*(.051)*	*(.065)*	
1-2 days per week	.185	.188	.155	.253	.190	.158	.083	.179	.128	.006	.122	.128	.894	.179	.124	.146	.023
	(.021)	*(.012)*	*(.016)*		*(.012)*	*(.015)*		*(.010)*	*(.015)*		*(.037)*	*(.015)*		*(.010)*	*(.018)*	*(.045)*	
3-4 days per week	.071	.081	.087	.538	.077	.090	.360	.081	.046	.024	.123	.046	.063	.081	.034	.104	.009
	(.011)	*(.009)*	*(.011)*		*(.006)*	*(.012)*		*(.005)*	*(.014)*		*(.042)*	*(.014)*		*(.005)*	*(.014)*	*(.035)*	
Nearly every day	.114	.083	.110	.148	.096	.104	.671	.098	.072	.323	.117	.072	.295	.098	.077	.050	.071
	(.018)	*(.009)*	*(.014)*		*(.010)*	*(.015)*		*(.008)*	*(.024)*		*(.035)*	*(.024)*		*(.008)*	*(.030)*	*(.018)*	
Substance abuse	.119	.108	.126	.511	.111	.127	.293	.116	.044	.000	.215	.044	.009	.116	.045	.039	.000
	(.016)	*(.009)*	*(.012)*		*(.007)*	*(.015)*		*(.007)*	*(.013)*		*(.054)*	*(.013)*		*(.007)*	*(.017)*	*(.016)*	
Physical activity	2.66	2.71	2.72	.377	2.69	2.71	.734	2.70	2.81	.004	2.74	2.81	.457	2.70	2.86	2.64	.000
	(.033)	*(.023)*	*(.033)*		*(.021)*	*(.035)*		*(.021)*	*(.032)*		*(.105)*	*(.032)*		*(.021)*	*(.037)*	*(.052)*	
Observations[6]	1,019	2,289	1,698		2,342	1,114		3,456	1,157		427	1,157		3,456	794	363	

[1] These colums include all Blacks (Afrcian Americans and Black immigrants, both generations).
[2] These colums only inlcude African Americans (all Black immigrants are excluded, both generations).
[3] These colums include African Americans and first generation Black immigrants (Second-generation Black immigrants are excluded).
[4] These colums only include Black immigrants (no African Americans are included).
[5] These colums include African Americans and first generation Black immigrants (no Second-generation Black immigrants are included).
[6] The number of observations is for each colum before lossing cases as a result on non-response on the measure of health behavior.
Data in this table is from the National Survey of American Life, 2001-3 (Program for Research on Black Americans at the University of Michigan).

While there are no differences in the overall mean for drinking, there are differences between African Americans and Black immigrants at specific levels of drinking.

The generational status of Black immigrants is important for understanding several health behaviors. Second generation Black immigrants have greater average BMIs than first generation Black immigrants. They are also more likely to report being current smokers. While the relationship is not statistically significant, the second generation has a lower probability of reporting that they never drink and a higher probability of reporting that they drink 3-4 days per week. The second generation is also more likely to report substance abuse when compared to the first generation.

Data in the final set of columns attempt to approximate the relationship between country of birth and health behaviors. Since the NSAL does not have large numbers from all Caribbean countries, we group countries according to whether English is the official language of the country. In general, English-speaking Black immigrants have better health behaviors than African Americans and non-English-speaking Black immigrants. This pattern holds for BMI and smoking behavior, but it is less clear for other health behaviors. In other cases, it seems as those the primary distinction is between African Americans and Black immigrants, ignoring language.

Environmental Exposure

There is a growing recognition among researchers that environmental context is important in understanding health and health behaviors (e.g., Richardson et al. 2015). A large and growing body of research suggests that where you work, live and play are essential to health outcomes (Diez Roux 2012; Takeuchi et al. 2016; Williams and Collins 2001). Williams and Mohammed (2009) proposed racial residential segregation as a fundamental cause of disease. For racial and ethnic minorities and individuals living in poverty, environmental factors are often directly and indirectly associated with poorer health outcomes. Historical trends reveal that Blacks have occupied geographical spaces that are typically urban or rural, and commonly highly segregated due to poor socio-economic conditions and circumstances stemming from a legacy of discriminatory practices, including restrictive zoning laws (Massey 2001; Taylor 2014). These discriminatory laws have had lingering effects on residential patterns (Taylor 2014). Although residential segregation has declined over time, many Blacks continue to reside in these environments, independent of socioeconomic standing. In many instances, residential segregation further compounds social disadvantage and results in increased poverty rates among Black Americans, further relegating them to less desirable areas (Massey 2001). An estimated 70% of

Blacks reside in segregated Black neighborhoods, while 40% to 50% reside in hyper-segregated neighborhoods (Frey 2015; Landrine and Coral 2009; Massey 2001).

In the following sections, we summarize the relationship between specific components of a given environment (e.g., environmental pollutants, built environment factors, exposure to deleterious conditions, and stress) and health outcomes, revealing how these patterns vary by our analytic domains within the U.S. Black population. As was the case for our discussion of health behaviors, there is a dearth of research on variations in health-related environmental exposures by skin color and internal migration within the U.S. Black population; we only review the literature on variations in these exposures by birthplace and immigrant generational status.

Environmental pollutants

Scholars have associated residential segregation with exposure to poor housing quality and environmental hazards (Williams 1999). For example, exposure to poor quality housing may expose individuals to lead poisoning. Lead poisoning has been linked to neuropsychological impairment and developmental disabilities (e.g. Baghurst et al. 1992; Hicken, Gragg and Hu 2011). Moreover, many Blacks reside in neighborhoods that are in close proximity to toxic waste dumps, freeways and other environmental locations that may expose them to toxins, arsenic, sulphur, and dioxide (Braveman, Egerter and Williams 2011; Brown 1995; Mays, Cochrane and Barnes 2007; Ross and Mirowsky 2000; Williams and Collins 2001). Daily exposure to threatening and noxious environmental elements erodes health and causes chronic diseases and death (Ross and Mirowky 2001; Williams and Collins 2001).

Built environment factors

Environments or neighborhoods can affect health in ways other than exposing populations to poor air quality, toxins, hazards and other dangers. Environments can present physical characteristics that can encourage or discourage healthy behaviors. Neighborhoods, for instance, that are within proximity to parks, recreational facilities, health clinics and supermarkets may provide access and opportunities for healthy diet and exercise which may aid in reducing health risks, e.g. cardiovascular disease, osteoporosis, colon cancer, high blood pressure, and diabetes (Arcaya et al. 2016; Diez Roux 2011; Landrine and Carrol 2009; Ross and Mirosky 2001). Moreover, being in close proximity to pharmacies where medications are easily accessible is essential to the health of individuals who suffer from chronic illnesses and diseases.

Unfortunately, limited access to facilities and spaces (i.e., parks, supermarkets, safe streets) common to segregated and disadvantaged neighborhoods that Blacks tend to reside in can negatively influence choices in health and health behaviors. Some studies, in fact, have found that

residents in deprived (disadvantaged) neighborhoods are less likely to exercise regularly and consume vegetables (Arcaya et al. 2016; Landrine and Carrol 2009). Poor consumption habits can increase risk for obesity and other predisposing bad health conditions. Researchers have associated obesity and being overweight with coronary heart disease, high blood pressure, stroke, type 2 diabetes, osteoarthritis and cancer (Bianchini, Kaaks and Vainio 2002; Rahmouni et al. 2005; Sarikaya et al. 2011; Van Gaal, Mertens, and De Block 2006). Recent estimates suggest approximately half of African Americans meet criteria for obesity (Flegal et al. 2002; Ogden et al. 2013).

Built environment factors by birthplace and immigrant generational status

Although U.S. Blacks reside in racially segregated communities, it is unclear specifically how some of the physical characteristics/features of the environment that might facilitate or impede healthier choices challenge them. Data from the NSAL (see Table 3 below) indicate that a higher percentage of Caribbean Blacks, as compared to African Americans report having parks in their neighborhoods (86.5% vs. 87.1%; $p < .001$), supermarkets (89.0% vs. 73.0%, $p < .001$; $p < .001$) and medical clinics in their neighborhood (78.2% vs. 67.5%, $p < .001$). The proportion of respondents who have parks (87.1% vs. 86.5%), supermarkets (93.4% vs. 81.2%; $p < .001$), and medical clinic in their neighborhood (82.1% vs. 71.5%; $p < .05$) is higher for foreign-born Caribbean blacks in comparison to U.S. born Caribbean Blacks.

Additionally, relative to first or second generation Caribbean Blacks, a lower percentage of third generation Caribbean blacks (77.2% vs. 92.8% vs. 87.1%; $p < .001$) reside in neighborhoods with parks. In relation to the presence of a supermarket in the neighborhood, significantly lower rates are found among third generation Caribbean Blacks in comparison to first and second generations (70.3% vs. 93.4% vs. 88.5%; $p < .001$). Similarly, the presence of medical clinics in neighborhoods was lower among third generation Caribbean blacks compared to first and second generations (57% vs. 82.1% vs. 82.1%; $p < .001$).

Table 3. Selected Built Environmental Factors by Domains of Disaggregation

Neighborhood Characteristic	African American %	Caribbean Black %	U.S. Born Black %	Foreign Born Black %	First Gen %	Second Gen %	Third Gen %
Parks	73.2	86.8	86.5	87.1	87.1	92.8	77.2
Supermarket	73.0	89.9	81.2	93.4	93.4	88.5	70.3
Medical Clinic	67.5	78.2	71.5	82.1	82.1	81.5	57.0

Source: The National Survey of American Life

Exposure to drugs, alcohol, and violence

The degree to which drugs and alcohol are present in a given community can also influence the propensity for residents to engage in these behaviors. Omnipresent characteristics of segregated and disadvantaged communities, particularly in urban areas, are drug activity on the streets and the high numbers of alcohol outlets. Illicit drug sales and use are more prevalent in African American neighborhoods than it is in White neighborhoods (Arcaya et al. 2016; Landrine and Carrol 2009). Increased exposure to drugs and alcohol not only reduce negative perceptions of substance usage but also increase the likelihood that individuals will use or abuse them. In particular, research suggests that individuals within these spaces are more likely to smoke cigarettes (Chartier and Caetano 2010) and a growing body of literature has associated high alcohol outlet density with morbidity, shorter life expectancy and premature death (Matheson et al., 2014). In part, because of the volume of these types of establishments in underserved neighborhoods, Blacks, in comparison to Whites are more likely to report alcohol dependency symptoms (Chartier and Caetano 2010). Cirrhosis of the liver has become one alcohol-attributed disease that has dire consequences for some groups in comparison to others. As compared to Whites, Blacks and Hispanics are more likely to develop liver disease and other alcohol related esophagus and pancreatic diseases (Chartier and Caetano 2010; Polednak 2007; Yang et al. 2008).

Pathways by which alcohol consumption may affect criminal activity and community violence in segregated and underserved neighborhoods have also been suggested (e.g.,Williams and Collins 2001). A number of studies have found an association between alcohol outlet density and exposure to violence (Branas et al. 2011). In a study in Washington, D.C., Franklin and co-

authors (2010) found that violence, including robbery, assault and sexual violence were related to density of alcohol outlets.

While there might be a reciprocal relationship between community violence and density of alcohol outlets, violence in Black communities has been receiving more national attention due to fluctuating homicide rates. Blacks are disproportionately affected by homicide (Cooper and Smith 2011; Harrell 2007). Living in urban environments increases the risk for exposure to violence (Buka, Stichick and Earls 2001). Black youth are more at risk for violent exposure and victimization when compared to Whites. Black youth are more likely to be victims of robbery and violent crimes (Harrell 2007). In recent years police violence is growing as a major concern in Black neighborhoods.

The exposure to violence not only increases the risk for perpetration (within communities and households), but can also have various health and social consequences. Exposure to violence increases the risk for physical injury and mental health disorders, such as substance abuse, post-traumatic stress disorder (PTSD), depression and grief (Clark et al. 2007; Lacey and Mouzon 2016; Ross and Mirowsky 2001; Stockdale et al. 2007; Williams and Williams- Morris 2000). It may also create fear among community members that hinders their ability to engage in daily activities that may reduce other health risks.

Exposure to drugs and violence by birthplace and immigrant generational status

The extent to which there might be variation within the Black population relating to exposure to drugs and crime in their neighborhood is unclear. Data from the NSAL (see Table 4 below) reveals a marginally significant relationship between ethnicity and reports of crime in neighborhoods; percentages were marginally significantly higher among Caribbean Blacks compared to African Americans (86.9% vs. 76.1%; $p = .0545$). In relation to the nature of drugs in their neighborhood, slightly more Caribbean Blacks compared to African American participants indicated that it was serious (70.2% vs. 67.5%). Prevalence was higher among U.S. Blacks compared to Caribbean Blacks regarding crime in their neighborhoods (87.7% vs. 78.8%). Similarly, significantly more U.S. born Caribbean Blacks compared to foreign-born Caribbean Blacks (76.3% vs. 66.6%; $p < .01$) reported that drugs are a serious issue in their neighborhood.

In relation to generation status and crime problems in the neighborhood, although lower among the third generation in comparison to first and second generations (78.8% vs. 86.3% vs. 89.8%; $p = 0.07$), the rates did not differ significantly. This was also true for the presence of drug problems in neighborhoods where rates tended to be lower (66% vs. 73.7% vs. 80.3%; $p < .05$) among first generation in comparison to second and third generations, respectively.

Table 4. Selected Crime Factors by Domains of Disaggregation

Neighborhood Characteristic	African American %	Caribbean Black %	U.S. Born Black %	Foreign Born Black %	First Gen %	Second Gen %	Third Gen %
Crime	76.1	81.9	87.7	78.8	78.8	86.3	89.8
Drug Problem	67.5	70.2	76.3	66.6	66.6	73.7	80.3

Source: The National Survey of American Life

Stress and the environment

Multiple and cumulative stress developed from poor environmental quality and exposures to discrimination and violence can have implications for health and health behaviors (Diez Roux 2012). Stress can affect health directly and indirectly in various pathways. Stress can weaken the immune system and predispose individuals to risk for infections and diseases (Massey 2004; McEwen 1998). Similarly, the effects of stress can lead to risky coping behaviors in order to relieve the stress and escape their reality (Diez Roux 2011). For instance, stressed individuals might overeat or abuse alcohol to cope with the stress (Dallman et al. 2003; Diez Roux 2011). Stressors from poor living conditions and perceptions of the environment can also increase allostatic loads (a summary measure of biological reactions to stress exposure; McEwen, 1998; Ross and Mirowsky 2001). The "wear and tear" of exposure to stressors have been associated with hypertension and other cardiovascular diseases. For Blacks, multiple stressors may be normative resulting from poverty, pollution, deteriorating housing, discrimination and violence, increasing their risk for poorer health outcomes (Strenthal, Slopen and Williams 2011). In the next section, a more detailed discussion of domain variation in stress biomarkers is presented.

There seems to be little doubt that environmental factors have direct and indirect effects on physical and mental health statuses and well-being in general. It is also clear from our brief review of a voluminous literature that these consequences differ by major population groups (e.g., Blacks and Whites), and, more directly to our interests, within and across the proposed domains of disaggregation of the Black population.

Biology

Disaggregating the Black population can also provide insight into potential biological determinants of health (e.g., Cooper 2004). The grouping of peoples into sub-populations based on a certain set of racialized physical features necessarily results in the aggregation of great biological diversity. Thus, comparing sub-groups within the larger Black population allows for the study of biological factors while 'holding race constant.' Conceptualizing health status as the outcome of multi-system and long-term processes, we specifically review genetic factors and biomarkers associated with the stress response. An important driver of health differences, both within and across populations, is stress, particularly chronic stress. We also consider and observe how biomarkers vary along our population domains.

While genetics play an important role in the pathway to disease risk and development at the individual level, we know much less about the genetic contributions to disparities in population health, racial or otherwise (Cooper 2004). While population differences in monogenic diseases are relatively easy to detect, the role of genetics in disease risk is often more complex and polygenic. As most diseases have polygenetic risk profiles, the likelihood that two populations have unique distributions of the allele configurations associated with disease risk is rather small (Cooper 2004). As a result, it is unlikely that the primary source of racial or ethnic disparities in health is population genetics. It may also be too early, however, to completely rule out a role for genomics writ large. The basic methodologies of population genetics are still in their infancy and we are still unraveling the complex role of genomics in population health.

One of the more important factors to consider moving forward is that very few genetic mapping studies include large samples of the U.S. Black population. Indeed, most do not include any Blacks. This is important because those with greater proportions of African genetic ancestry have greater genetic density and variation. In fact, scientists have only recently designed chips that are able to read accurately the dense genetic information found in populations with high concentrations of African ancestry. Most Black populations have high levels of African-ancestry. Thus, less confounded by conflations between 'genetics and racial categorization', comparative studies of Black subpopulations with similar African-ancestry profiles can therefore shed greater light on genetics and population health, controlling for racial categorization (Yudell et al 2016).

In addition to limitations in data and methods, we are only now beginning to understand factors that necessarily complicate the relationship between genetic profiles and disease risk, namely: gene methylation and expression. In short, these emerging fields of inquiry suggest that two people or populations exposed to different sociocultural and environments with similar genetic profiles have different genomic risk profiles. For example, if there are similarities in genetic risk profiles for hypertension between native and foreign-born Blacks, but different rates

of hypertension across Black nativity, one might speculate that differential resources, environments or health behaviors might be responsible for different rates of hypertension.

With respect to methods, most of the statistical approaches to studying genomic associations are parametric and rooted in multivariate regression. The nature of genomic data, however, might lend themselves to contextual analytic methods used in analyses of "big data." Among other reasons, many of these methods are nonparametric, require fewer assumptions – are therefore less rigid – and allow for the discovery of complex interactions that are impossible to detect when using parametric regression models. As these statistical techniques continue to come online, scientists might discover a greater role for genetics in population health.

In the end, collecting representative genomic information from populations with high levels of African ancestry and then assessing disparities within this population across the population domains we are proposing may result in a more refined understanding of the role – limited or otherwise – that population genomics play in disparities in population health. Given limited data availability and current uncertainty concerning the role of genomics in population health disparities, we focus our review of biological explanations for population health disparities on biomarkers that are associated with sociocultural and environmental stress.

Stress biomarkers

In this section, we briefly review emerging research on the pathways that link the social context to stressors and stress through the observation of stress-related biological markers. There is a growing area of research that employs biomarkers as a means of identifying the biological mechanisms that may link social conditions to physical health (Chang et al. 2008; Crimmins and Seeman 2001; Ewbank 2008; Finch and Vaupel 2001; Lindau and McDade 2008; Steptoe and Marmot 2002). In one use, the term 'biomarker' refers to the collection of biological information in social surveys. Examples include markers for the stress response (e.g., cortisol), immune functioning (e.g., C-reactive protein and interleukin 6), cardiovascular system (e.g., heart rate, blood pressure) and metabolism (e.g., body mass index, hemoglobin A1c). Biomarkers represent theoretical lynchpins, influenced by the overall social context, and in turn are linked to specific morbidities. This evidence is limited relative to other predictors of health status discussed above, due to the scarcity of available data. Early evidence, however, reveals variations in biomarkers across our four Black population domains.

The concept of stress is central in exploring the links between social context and health status. Stress is the product of a disruption in the biological homeostasis of an organism; the stress response represents a set of behavioral and physiological changes related to reestablishing homeostasis in the face of environmental (or internal) threats (Sapolsky 2002). The stress

response most likely evolved to confront acute and short-term environmental stressors. Chronic stressors on the other hand have long-term negative, physiological effects for which humans are poorly equipped to adapt. Thus, chronic stress may be more important in understanding the types of health disparities that plague racial and ethnic populations rather than the effects of acute stressors (McEwen 1998).

Two key related bodies of research exploring the idea of the accumulation of stress over the life course and its effect on health are relevant to the Black population. These include "weathering" and "allostatic load." Geronimus' concept of "weathering" suggests that Black Americans' greater experience of various forms of social adversity and marginalization (both sources of chronic stress) leading to an earlier deterioration of physical health. The concept of weathering is useful in explaining racial disparities in physical health as Blacks carry a heavier burden when compared to Whites, especially early in the life-course (Geronimus 2001).

Allostatic load represents a multi-system index of dysregulation across a range of biological systems including the stress response, which originates in the hypothalamic pituitary adrenal axis (HPA), the sympathetic nervous system (SNS), the cardiovascular system, immune system, and the metabolic system. The premise is that cumulative exposure to stress across the life course translates into physiological consequences, including greater risk for various diseases and lower life expectancy (Beckie 2012; McEwen 1998; Seeman et al. 2001). Although research that is more recent has expanded the empirical measures, the overall meaning of allostatic load remains the same; it is intended as a summary measure of a range of biological systems, representing exposure to stress.

Discrimination is a particular form of stress that is uniquely important for understanding health disparities. Research supports the notion that both the psychological and physiological predictors and consequences of discrimination are similar to other psychosocial indicators of stress (Clark et al. 1999; Williams et al. 2008). Measurement of discrimination varies but common elements include lifetime and day-to-day experiences with unfair treatment, domains of life in which unfair treatment occurs, frequency of the occurrences, and an assessment of the attribution of unfair treatment (Essed 1991; Lewis, Cogburn, and Williams 2015; Williams et al 1997; Williams and Mohammed 2009). Expanding streams of research document the association between exposure to discrimination, particularly racial discrimination, and a variety of health risk factors and poor health outcomes including hypertension and cardiovascular disease (Lewis et al 2014; Williams and Mohammed 2009).

It is challenging to establish with certainty links between distal markers of the social environment, such as SES and race, with proximal psychosocial and physiological stress processes that have health consequences. There is evidence, however, suggesting that individuals

of low SES and underrepresented racial groups are more likely to experience greater stressful life events than high SES groups and Whites, respectively (Baum, Garofalo and Yali 1999; Pearlin et al. 2005). Data is also accumulating regarding the relationship between stress and responses in the endocrine and immune systems (see Miller, Chen and Cole 2009 for a review). Although results are mixed, there is support that experiences with stress lead to the activation of HPA axis as evidenced by levels of cortisol. Chronic activation of the HPA axis is thought to lead to a cascade of biological processes affecting metabolic and immune systems leading to such shifts as increased markers of inflammation (e.g., measured by C-reactive protein), heightened blood pressure, and heightened hemoglobin levels (Dowd, Simanek and Aiello 2009; Nazmi and Victoria 2007; Rosmond 2005; Rosmond and Bjorntorp 2000). We give additional attention to the HPA axis because activation of this cascade process has implications for multiple biological systems, including the central nervous and cardiovascular systems, and thus likely has implications for understanding disparities in stress-related health problems (Vreeburg et al. 2009).

Below we describe how stress biomarkers (e.g., allostatic load, cardiovascular and metabolic markers, hypertension, type I diabetes) have been studied along the two of the four specific analytic domains, birthplace and skin color. As will be evidenced, few studies exist. We then supplement these studies with analyses of data from the National Longitudinal Study of Adolescent Health (Add Health). We examine biomarkers disaggregating by skin color, birthplace, and immigrant generational status.

Allostatic load by skin color

Cobb and colleagues (2016) assessed variation on allostatic load among Blacks based on interviewer-rated skin color. The data come from the Nashville Stress and Health Study, which is a representative community sample of 1270 non-Hispanic Black and White adults, aged 22 to 69, in the greater Nashville Tennessee metropolitan area. Interviewers rated skin color on a 5-point scale, collapsed to three categories for analytical purposes, dark, brown, and light. Controlling for age and sex, the results suggest that participants ascribed as having dark-skin color had a significantly higher allostatic load than those with light skin color.

Cardiovascular and metabolic markers by skin color

Using data from The National Longitudinal Study of Adolescent to Adult Health (Add Health), Wassink and colleagues (2016) examined the relationship between interviewer-assessed skin color and markers of cardiometabolic health. The indicators included obesity, hypertension, and type 2 diabetic statuses. Obesity is defined as a BMI (kg/m^2) score of 30 and higher. The definition of hypertension included a systolic blood pressure of at least 140, diastolic blood pressure of 90 or higher, a previous hypertension diagnosis, or prescribed medications for high blood pressure. For diabetic status, the authors used a continuous measure of HbA1c and identified respondents with HbA1c levels of 6.4 or more. In addition, Wassink and colleagues (2016) categorized participants with a prior diagnosis and those prescribed diabetes medications as diabetic. Interviewers assessed skin color on a 5-point scale: black, dark-brown, medium-brown, light brown, and white. For analyses among blacks, the white and light brown categories were collapsed. Although not always linear, the patterns for the individual markers of cardiometabolic health suggest that participants ascribed with a skin color of black had the highest indicators of cardiometabolic health. The cardiometabolic index analyses revealed parallel results; relative to respondents categorized as being white or light brown, participants ascribed as being black had a higher cardiometabolic score.

Allostatic load by birthplace

Using data from the 2001-2010 NHANES, Doamekpor and Dinwiddie (2015) calculated an 8-item version of allostatic load, including the following markers: systolic blood pressure, diastolic blood, pressure, 60-second pulse, C - reactive protein, high-density lipoprotein, total cholesterol, creatinine clearance, and serum albumin. The analytic sample excluded pregnant women and individuals below the age of 20; the resulting sample size included 2,745 U.S.-born Blacks and 152 foreign-born Blacks. The results suggested that a higher proportion of U.S. born Blacks than foreign-born Blacks were high on allostatic load. In addition, among the foreign-born Blacks, there was a positive association between length of stay in the U.S. and increased allostatic load.

Cardiovascular and metabolic markers by birthplace

Research on cardiovascular and metabolic markers also demonstrates the validity of birthplace as a meaningful domain for disaggregation. Lancaster and colleagues (2006) use data from the third wave of the NHANES (1988-1994) and include all participants who self-identified as Black. The results suggest that both foreign-born non-Hispanic Blacks and foreign-born

Hispanic Blacks had lower levels of total serum cholesterol and HDL cholesterol than their counterparts born in the U.S.

Metabolic syndrome is a summary index used to identify risk for cardiovascular disease and for Type 2 Diabetes (Alberti et al. 2009). Historically, there has been disagreement regarding the exact components, but recently there has been growing consensus about the definition of metabolic syndrome. The criteria for metabolic syndrome include the presence of three of five factors: central obesity, hypertriglyceridemia, low HDL cholesterol, hypertension, and fasting hyperglycemia. In a small sample (n=95), Ukegbu and colleagues (2011) find that although African American men and Black African immigrant males had similar levels of metabolic syndrome scores; however, particular components of the metabolic syndrome including hypertension and glycemia were higher among Africans.

O'Connor and colleagues (2014) in a study conducted in Washington D.C. included 214 self-identified healthy Black men (138 African immigrants and 76 African Americans). They found differences among African American men versus African immigrant males in predictors of cardiovascular disease and Type 2 Diabetes. BMI and waist circumference were lower among African immigrants; and in contrast, blood pressure and fasting glucose levels were higher among African immigrant males as compared in African American male counter parts.

Hypertension by birthplace

There is research suggesting a relationship between nativity status and prevalence of hypertension and complications from hypertension. Using data from the 1997-2005 NHIS 2005, Borrell and colleagues 2008 assessed the relationship between nativity status and self-reported hypertension (i.e., "Has a doctor ever told you…")[4]. The sample included 289,767 individuals aged 18 and above. The results show that foreign-born Blacks had lower rates of self-reported rates of hypertension than U.S. born Blacks.

Through the use of the 1988-1994 NHANES, Hicks et al. (2003) sought to evaluate the associations between both U.S. region of residence (South vs. Northeast, Midwest, and West) and immigrant status with hypertension and related complications from hypertension. The analytic sample included 3,369 Black individuals between the ages of 30 and 79. In multivariate analyses, controlling for a range of demographic and health status indicators, the researchers found that Black immigrant women were significantly less when compared to Black women living in the North to have hypertension. In addition, the analyses suggest that among women with

[4] Note that self-reported hypertension is not a biomarker but is highly correlated with measured hypertension. Due to the limited research in this area we chose to include this study in this review.

hypertension, that Black immigrant participants had lower prevalence rates of hypertension related organ damage than U.S. born women.

Linking individual-level data from the New York City Community Health Survey (2002-2005) to neighborhood-level U.S. Census data, White and colleagues (2011) examined the relationship between levels of segregation and self-reported hypertension among U.S.-born Blacks and foreign-born Blacks. This study included 4,499 individuals aged 18 and above. Broadly speaking, the measure of segregation represents the potential for interaction among Blacks and non-Blacks within the local community and adjacent communities (Wong 2002). The results suggest that after adjusting for individual level covariates (e.g., age, sex, education) and neighborhood-level characteristics (e.g., percent of population in poverty), levels of segregation was not associated with self-reported hypertension among U.S.-born Blacks or among foreign-born Blacks under the age of 65. However, foreign-born Blacks over the age of 65 and residing in highly segregated areas had a lower probability of reporting hypertension than older foreign-born Blacks living in low segregation communities.

Type I diabetes by birthplace

As part of a dissertation research project, O'Connor (2013) compared rates of Type 1 diabetes between U.S. immigrant and nonimmigrant Black youth in King County, Washington. Pediatric patients diagnosed with T1D and seen at SCH on at least one occasion between January 1, 2000, and July 31, 2011, were identified. Since East African immigrants represented over 90% of Black immigrant youth with T1D at SCH, the immigrant sample was restricted to this group. East African immigrant Black youth represented 28.1% of the overall Black population between 0 and 17 years old in King County, but accounted for 60.2% of T1D cases among Black youth in the county (see Table 3.3). The estimated prevalence rate of T1D among immigrant Black youth ages 0–17 was more than 3.5 times the rate among non-immigrant Black youth ages 0–17.

Add Health: A detailed empirical example of variations in allostatic load by analytic domain

In this section, we extend previous discussions of allostatic load and provide a detailed examination of data from Add Health (See Appendix A for description of these data) in which we disaggregate allostatic load using three different domains including skin color, birthplace (nativity and country/region of origin), and immigrant generational status.

In Table 5, we use data from Add Health to examine stress biomarkers by domain. All measures in this analysis are from the universe of Black respondents at Wave IV (N=2957). We assess allostatic load using an abbreviated measure based on analyses by Wickrama et al. (2015).

Standardized, continuous scores (z-scores) were summed for six biomarkers of cardiovascular and metabolic systems. The biomarkers assessed include: systolic blood pressure, diastolic blood pressure, pulse rate, glycohemoglobin (HbA1c), glucose, and body mass index (BMI). Systolic and diastolic blood pressure (mmHg) and pulse rate measurements were taken on the right arm, absent contraindications in a rested/seated position by trained field interviewers using oscillometric blood pressure monitors. Using standard procedures, trained and certified interviewers obtained whole blood spots for dried blood analysis. Measures from these samples included, HbA1c, an integrated measure of blood glucose control over the preceding 2-3 months, and total glucose values. Trained interviewers also obtained measurements of respondents' height and weight, and this information was used to compute their BMI, the ratio of weight in kilograms to height in meters squared ([lbs/in.2] × 703; Wickrama et al. 2015).

Wave III data collection, conducted in 2001 and 2002, asked interviewers to record the respondent's skin color. Interviewers were able to indicate whether the respondents' skin color was White, Light Brown, Medium Brown, Dark Brown, or Black. Nativity, generational status, and country of origin variables used data from the Wave I parent and in-home interviews, both conducted in 1994 and 1995. We use both interviews to increase the validity of responses. Whether or not a respondent was born in the U.S. defined nativity status and generational status for black immigrants are defined as first generation or second generation. A respondent is a first generation black immigrant if neither they nor their parents were born in the U.S. A respondent is second generation if they were born in the U.S. but at least one of their parents was not. Lastly, country of origin was defined as the U.S., English-speaking countries, or non-English-speaking countries. Whether a sending country is defined as English-speaking or the national language listed on the Central Intelligence Agency (CIA) World Factbook (https://www.cia.gov/library/publications/the-world-factbook/) determines non-English-speaking. African Americans were labelled as respondents born in the U.S. in Table 5.

Within our sample, allostatic load scores range from a minimum score of -7.88 to a maximum score of 33.52. In interpreting these results, note that scores that are more negative indicate a lower allostatic load score while scores that are more positive indicate a higher allostatic load score. Respondents with a "black" skin color had the highest allostatic load score, while those respondents with a "white" skin color had the lowest allostatic load score. In fact, the results reveal that the darker the skin color, the higher the allostatic load score ($p < 0.001$).

Table 5. **Unadjusted Means and Standard Errors of Allostatic Load and Construct Components for Selected Disaggregations for the U.S. Black Population [1,2]**

	Skin Color[3]						Nativity[3]			Generational Status[4]			Country of Birth[3,5]			
	White	Light Brown	Medium Brown	Dark Brown	Black	*f*	Native	Foreign	*f*	Second	First	*f*	AfAm	Eng	non-Eng	*f*
Allostatic Load	-0.54	-0.56	-0.20	0.16	0.46	.000	0.05	-1.18	.006	-1.03	-1.62	.000	0.05	-2.86	-0.85	.022
	(0.63)	*(0.14)*	*(0.12)*	*(0.14)*	*(0.17)*		*(0.07)*	*(0.36)*		*(0.31)*	*(0.31)*		*(0.07)*	*(0.58)*	*(0.41)*	
Construct Components																
Systolic Blood Pressure	122.44	122.58	125.22	125.45	126.72	.002	125.42	120.08	.053	122.68	118.38	.002	125.42	117.12	120.91	.081
	(2.39)	*(0.64)*	*(0.49)*	*(0.50)*	*(0.55)*		*(0.27)*	*(1.61)*		*(1.41)*	*(1.57)*		*(0.27)*	*(4.10)*	*(1.78)*	
Diastolic Blood Pressure	76.79	78.31	79.27	79.51	80.20	.000	79.48	77.07	.001	77.10	75.58	.002	79.48	75.62	77.38	.005
	(1.82)	*(0.47)*	*(0.37)*	*(0.39)*	*(0.40)*		*(0.20)*	*(1.12)*		*(1.00)*	*(1.04)*		*(0.20)*	*(3.39)*	*(1.19)*	
Pulse Rate	73.15	74.06	74.25	74.69	74.35	.492	74.39	72.62	.184	72.21	71.39	.011	74.39	70.71	72.77	.190
	(2.09)	*(0.58)*	*(0.38)*	*(0.41)*	*(0.43)*		*(0.22)*	*(1.09)*		*(1.08)*	*(1.30)*		*(0.22)*	*(2.30)*	*(1.24)*	
Glycohemoglobin	5.68	5.74	5.78	5.96	6.04	.000	5.00	5.76	.325	5.62	5.73	.007	5.00	5.51	5.82	.464
	(0.09)	*(0.03)*	*(0.02)*	*(0.05)*	*(0.05)*		*(0.02)*	*(0.07)*		*(0.44)*	*(0.06)*		*(0.02)*	*(0.12)*	*(0.08)*	
Glucose	102.44	102.43	102.44	104.23	107.22	.012	104.28	101.21	.487	98.76	100.96	.111	104.28	99.36	101.58	.526
	(4.00)	*(1.28)*	*(0.94)*	*(1.18)*	*(2.03)*		*(0.74)*	*(2.34)*		*(1.77)*	*(2.42)*		*(0.74)*	*(4.21)*	*(2.77)*	
Body Mass Index	31.64	29.67	30.40	31.35	30.83	.019	30.74	28.62	.027	29.78	27.77	.050	30.74	26.94	29.12	.069
	(1.34)	*(0.36)*	*(0.28)*	*(0.32)*	*(0.30)*		*(0.16)*	*(0.82)*		*(0.67)*	*(0.90)*		*(0.16)*	*(1.92)*	*(0.91)*	
Overweight & Obesity[6]	0.86	0.72	0.72	0.75	0.75	.286	0.74	0.63	.032	0.74	0.60	.512	0.74	0.62	0.66	.088
BMI ≥ 25	*(0.06)*	*(0.02)*	*(0.01)*	*(0.02)*	*(0.02)*		*(0.01)*	*(0.05)*		*(0.04)*	*(0.07)*		*(0.01)*	*(0.14)*	*(0.06)*	
Obesity[6]	0.54	0.41	0.43	0.49	0.47	.047	0.46	0.33	.021	0.40	0.30	.055	0.46	0.31	0.34	.041
BMI ≥ 30	*(0.09)*	*(0.02)*	*(0.02)*	*(0.02)*	*(0.02)*		*(0.01)*	*(0.05)*		*(0.05)*	*(0.06)*		*(0.01)*	*(0.13)*	*(0.06)*	
Observations[7]	35	414	914	806	783		2875	82		117	57		2875	13	67	

[1] Data in this table is from the National Longitudinal Survey of Adolescent to Adult Health (Add Health; Carolina Population Center at the University of North Carolina at Chapel Hill), Wave 4. Standard Errors are in parentheses.

[2] Black respondents were identified based on self-reported race (N = 2957). Minimum age is 25 and maximum age is 34.

[3] These columns include all Blacks [African Americans (AfAm) and Black immigrants, both generations].

[4] These columns only include Black immigrants (no African Americans are included).

[5] Country of origin is defined as the United States (AfAm), English-speaking countries, or non-English-speaking countries.

[6] Overweight and Obesity are reported in proportions. Standard Errors are in parentheses.

[7] The number of observations is for each column before losing cases as a result on non-response on the measure of health behavior.

Respondents who are foreign-born have significantly lower allostatic load scores than their native born peers ($p < 0.01$) and first-generation black immigrants have significantly lower scores than their second-generation counterparts ($p < 0.001$). Lastly, the association between country of origin and allostatic load shows that respondents from English speaking countries have the lowest scores, while African Americans have the highest ($p <0.05$). However, only 13 respondents are immigrants from English speaking countries, so a small sample size may be biasing this result. The small sample sizes of immigrants from English speaking countries (N=13), black respondents with a "white" skin color (N=35), foreign-born blacks (N=82), first generation black immigrants (N=57), and immigrants from non-English speaking countries (N=67) highlight the need for sampling designs in national surveys with increased representation of these.

In summary, although the use of biological data in understanding sources of disparities is relatively new, a significant number of studies find support, especially implicating chronic stress and its physiological sequelae as major culprits. Again, though little research has examined the domains of black sub-group differences we proposed to disaggregate the black population, what has been done (e.g., skin color) shows promising results in being an important source of variation in health status and increasing our understanding of sources of overall sub-population (e.g., Black and White) differences and disparities.

RECOMMENDATIONS

In this report, we identified four analytic population domains within the U.S. Black population that have utility for understanding the principal causes of health and health disparities. These domains include skin color, internal migration, birthplace, and immigrant generational status. Unfortunately, as documented in this report, we currently have limited data to examine these important sources of heterogeneity and related associations. Therefore, we suggest strongly that there is a pressing need to collect nationally representative data that focuses on the increasingly diverse and dynamic U.S. Black population, and that these studies can improve our understanding of the mechanisms that may underlie larger population trends. These data collection efforts can build on prior success in collecting data on the U.S. Black population carried out over the last 35 years at the Program for Research on Black Americans (PRBA). Studies collected at the PRBA have successfully collected high quality and nationally representative data on the U.S. Black population. These studies have been instrumental in increasing knowledge regarding health risks and protective factors. We envision our suggestions as contributing to these important innovations. Below we outline various approaches to

operationalizing data collection on these population domains and strongly recommend that national data collection efforts begin to include these important measures.

Skin Color

Our review of existing studies reveals associations between skin color and health. Moreover, variations in skin color are associated with variations in resources, health behaviors, environmental exposures, and biological processes. Future studies should therefore collect data on skin color among U.S. Blacks. There are important considerations when evaluating which operational definition to adopt. Most vitally are the mechanisms researchers suspect might be responsible for the association between skin color and health. For instance, if a researcher believes that skin color is associated with discrimination and or blocked opportunities, then it will be important to collect data in a way that accounts for the perceptions of others. In order to capture the assessment of skin color by others, a researcher might use one of the various measures of interviewer-assessed skin color. While these measures capture other perceptions, researchers might also compliment these assessments with the use of more objective spectrophotometer assessments on socially relevant parts of the body (e.g., somewhere on the face as opposed to under the arm). Researchers should also be mindful that studies suggest that intergroup relations are shaped by skin color categories, as opposed to color on a continuous spectrum. Conversely, if researchers are more interested in the role of skin color in shaping health behaviors, personal decisions and or stigma in health, researchers might collect information using various measures of self-reported skin color. Finally, to the extent that "natural" skin color (unaffected by the sun) might correlate with percentage African ancestry, preliminary studies of the association between African ancestry and health might use spectrophotometers under the arm (or on other parts of the body that are not often exposed to sunlight).

Our general recommendation is that studies include both objective and subjective measures of skin color. In order to reduce confounding, analyses of these data should also include information on region and season of survey administration. Ideally, researchers might use the longitude and latitude of the survey location in order to mark distance from the equator. Moreover, when using interviewer assessments, studies should include basic demographic characteristics and the skin color of the interviewer, as these are associated with the perception of the skin color of others. Research designs that gather information on interviewers should collect these data independently of fielded surveys (e.g., following protocols used in the Add Health Study).

Internal Migration

This report highlights significant variation across the principal causes by internal migration status, including lifetime and recent moves, among blacks in the U.S. (e.g., Hamilton 2015). Given this heterogeneity, we recommend surveys attempting to understand the causes of health disparities among Blacks include a standard set of questions assessing internal migration. Surveys should include questions that allow researchers to observe whether the respondent has migrated to their current place of residence within the last 1, 3, 5 or 10 years or more. In addition, surveys should include questions that assess location of birth (i.e., the name of the city or town). Researchers might also include questions that would allow for the observation of the number and location of respondent migrations. For example, research protocols might query respondents on the cities or towns in which they have lived and at what age the respondent migrated. Gathering information on the role the respondent played in each move might provide additional insights and, if the migrant played a central role in the decision, a set of response options listing common factors associated with internal migration might be useful in parsing self-selection mechanisms (e.g., employment or education).

Birthplace

This review reveals associations between nativity and health by place of birth. For example, upon arrival in the U.S., immigrants tend to have more favorable health profiles than their native-born counterparts. Of the analytic domains that we propose, birthplace is the most commonly studied. Researchers most often, however, collect data on whether or not the respondent was born in the U.S., leaving questions about the context of the sending country and the role of self-selection poorly understood. Research also shows the health of immigrant populations varies by sending region and state, and by tenure of U.S. residence (Hamilton 2013, Hamilton 2015). Studies also show that the process of assimilation for immigrants varies by their age at time of immigration (Kimbro 2009; Portes and Rumbaut 2006). Therefore, questions that allow for the observation of birthplace should include questions concerning the country of birth, the state, city or town of birth, the year of migration to the U.S., age of migration to the U.S., and reason for migration. Similar to internal migration, researchers might also include a question or set of questions designed to obverse the selection mechanism (or mechanisms) for immigration to the U.S. (e.g., family reunification, education, employment, political asylum). Finally, it might be useful to gather information on the social, political and economic status of any given immigrant before migration (e.g., occupational status, earnings and or political affiliation).

Immigrant Generational Status

Important variation in health by immigrant generational status was also found in this review. We recommend that future surveys collect information on generational status of U.S. Blacks.. There are at least two different ways to collect information on generational status. First, a few existing studies collect data that situates the respondent at the end of a three generational family. That is, researchers ask respondents about the birthplace of their parents and grandparents. This permits researchers to know over how many generations a given family has lived in the U.S. We recommend a revision to this question format. Surveys should also ask respondents to identify the birthplace of their children. More recently, researchers have explored another way to study the relationship between generational status and health outcomes in a more dynamic fashion (Jackson and Hatchett 1986; Jackson, Caldwell, and Sellers 2012). This study design allows for the development of a representative sample of three generational families (Jackson et al 2012). First, respondents are asked about all living grandchildren, children, parents or grandparents. Researchers then sample from the network of three generational family members (where the initial or focal respondent might be the grandchild, parent or grandparent). Then, respondents provide contact information for their family members based on how the respondent fits within this living three generational family. This method allows researchers to gather nationally representative data on contiguous three-generational family members in the U.S. (and internationally if relevant) and facilitates a more dynamic assessment of immigrant generational status.

CONCLUSION

This review has stressed the need to develop questions and methods and collect data in four domains to provide additional knowledge of sources of health variations within the U.S. Black population. We have proposed that more sophisticated within group examinations can add important insights relating to the origins of health disparities across and within large racial population groups in the U.S. It is important to note that this review largely focused on physical health. However, these domains of disaggregation are also relevant to mental health outcomes, such as depression and anxiety disorders. For example, risk of depression and depressive symptoms varies greatly by skin color. It is also important to note that our analysis did not focus on individuals who identify as mixed race (i.e., individuals who identify as Black and one or more other races). This is an important, rapidly growing, population subgroup. It is also true that a large proportion of African Americans currently and historically are of mixed race origins, even if they do not identify as such (Guo et al. 2014). Nonetheless, questions should continue to allow

individuals to report multiple races to explore associations in this growing subpopulation. Finally, to better understand health risks and resilience, new data collection efforts should focus on nationally representative longitudinal health and social surveys of documented and undocumented Black Americans, both native- and foreign-born,

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APPENDIX A: DESCRIPTION OF REPRESENTATIVE DATA SETS USED IN THIS REPORT

The National Longitudinal Study of Adolescent to Adult Health (Add Health; Carolina Population Center at the University of North Carolina at Chapel Hill).
The National Longitudinal Survey of Adolescent Health (Add Health) was initiated in 1994, Add Health is the largest, most comprehensive survey of adolescents ever conducted. Add Health is a longitudinal panel study, with the fifth wave of data collection schedule for 2016-2018. Add Health is a school-based longitudinal study of a nationally-representative sample of adolescents in grades 7-12 in the United States in 1994-95. Data have been collected from adolescents, their fellow students, school administrators, parents, siblings, friends, and romantic partners through multiple data collection components, including four respondent in-home interviews. In addition, existing databases with information about respondents' neighborhoods and communities have been merged with Add Health data, including variables on income and poverty, unemployment, availability and utilization of health services, crime, church membership, and social programs and policies (Harris, et al. 2009).

For more technical descriptions of the data:

Harris, K.M., C.T. Halpern, E. Whitsel, J. Hussey, J. Tabor, P. Entzel, and J.R. Udry. 2009. The National Longitudinal Study of Adolescent to Adult Health: Research Design [WWW document]. URL: http://www.cpc.unc.edu/projects/addhealth/design.
Carolina Population Center. "Add Health Research Design: Waves I-V". Retrieved January 24, 2017

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National Survey of American Life, 2001-3
The National Survey of American Life (NSAL)is a study designed to explore racial and ethnic differences in mental disorders, psychological distress, and informal and formal service use from within the context of a variety of presumed risk and protective factors in the African-American and Afro-Caribbean populations of the United States as compared with White respondents living in the same communities (Description from: https://www.icpsr.umich.edu/icpsrweb/ICPSR/studies/00190).

For more technical descriptions of the data:

Jackson, James S., Harold W. Neighbors, Randolph M. Nesse, Steven J. Trierweiler and Myriam Torres. 2004. "Methodological Innovations in the National Survey of American Life." *International Journal of Methods in Psychiatric Research* 13(4):289-98.

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Current Population Survey

(http://www.census.gov/programs-surveys/cps/about.html)

The Current Population Survey (CPS) is one of the oldest, largest, and most well-recognized surveys in the United States. In addition to being the primary source of monthly labor force statistics, the CPS is used to collect data for a variety of other studies that keep the nation informed of the economic and social well-being of its people. This is done by adding a set of supplemental questions to the monthly basic CPS questions. Supplemental inquiries vary month to month and cover a wide variety of topics such as child support, volunteerism, health insurance coverage, and school enrollment. Supplements are usually conducted annually or biannually, but the frequency and recurrence of a supplement depend completely on what best meets the needs of the supplement’s sponsor.

American Community Survey

https://www.census.gov/programs-surveys/acs/methodology/design-and-methodology.html

The American Community Survey (ACS) is an ongoing survey that provides vital information on a yearly basis about the U.S. population. Information from the survey generates data that help determine how more than $400 billion in federal and state funds are distributed each year. Through the ACS, we know more about jobs and occupations, educational attainment, veterans, whether people own or rent their home, and other topics. Public officials, planners, and entrepreneurs use this information to assess the past and plan the future. When individuals respond to the ACS, they help communities plan hospitals and schools, support school lunch programs, improve emergency services, build bridges, and inform businesses looking to add jobs and expand to new markets, and more.
The American Community Survey (ACS) is a relatively new survey conducted by the U.S. Census Bureau. It uses a series of monthly samples to produce annually updated estimates for the same small areas (census tracts and block groups) formerly surveyed via the decennial census long-form sample.