Does Multiracial Matter? A Case Study of Racial Health Disparities

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How do self-identified multiracial adults fit into documented patterns of racial health disparities? We assess whether the health status of adults who view themselves as multiracial is distinctive from that of adults who maintain a single race identity. Using a six-year (2001-2006) pooled sample of the nationally representative Behavioral Risk Factor Surveillance System (BRFSS), we explore racial differences in self rated health between Whites and several mono- and multi-race adults with ordered logistic and binary logistic regression analyses. Our findings reveal that the health of many multi-race groups is essentially indistinguishable from Whites -- with the great exception of White-American Indians and Black-American Indians, whose self-rated health is lower than either component racial group. We also find that placing multi-race groups into a "preferred" single race category likely obscures the pattern of health disparities, as many multi-race adults identify with a group whose health experience they do not share.

INTRODUCTION

Studies of health disparities between racial groups are at a crossroads. On one hand, persistent differentials in mental and physical health, mostly between Blacks and Whites, continue to reveal the many ways that "race matters" for well-being (e.g., Crimmins, Hayward and Seeman 2004; Keppel, Pearcy, and Wagener 2002). On the other hand, increasing attention towards identities that span racial boundaries has caused health researchers to question the nature of racial distinctions. The new complexity in the collection of racial data, most notably in the U.S. census as well as many major health surveys, provides an opportunity for respondents to self-report their race in monoracial or multiracial terms (Sandefur, Campbell, and Eggerlin-Boeck 2004). However, in recognition of the fact that, socially, race is constructed as a mutually exclusive marker of identity, individuals are also allowed to declare one preferred race that best describes their racial membership. Although accounting for race in this fashion may better reflect the nuances of racial identity than prior surveys that forced all individuals into "one box," does this level of detail – be it selecting multiple races or allocating persons to the race that "best describes" themselves – affect patterns of racial differences in health outcomes? Do persons who bridge racial categories have distinctive health outcomes from their component racial subgroups, and if so, what does that tell us about the nature of the "racial difference" in health between groups if racial mixture becomes increasingly common?

We explore these questions using a six-year (2001-2006) pooled sample of the nationally representative Behavioral Risk Factor Surveillance System (BRFSS). Since 2001, this survey has allowed individuals the option of identifying with multiple races (including White, Black, Asian, Pacific Islander, American Indian, and Some Other Race), and for those selecting multiple

races, the survey allows individuals to declare a "preferred race." Our sample of over 1.4 million cases includes over 20,000 persons who identify with a combination of races. In this paper we assess racial differences in self-reported health and our investigation proceeds in the following steps. We begin with an assessment of racial and "multi" racial differences in self-rated health. Secondly, we explore if these differences can be explained by a standard set of predictors that have been used to address racial differences in health: demographic, socioeconomic, behavioral, and health status. After we gauge to what extent multiracial subgroups differ net of these predictors, we re-assess self-rated health using preferred race. Applying "preferred race" as opposed to self-reported racial background will show if self-reported mixed-race populations are actually "living race" and thus experiencing health in ways that mirror the racial group that they most associate with.

Although this research applies a focus on health disparities, the issues raised in this research affects all assessments of well-being (e.g. educational disparities, income inequality). Given the fundamental individual right to live free of disease and disability, differences in health across subgroups provide crucial indicators of inequality. By extension, racial differences in health represent a well-documented and persistent condition of racial inequality, and so framing our paper in a health context is an appropriate choice.

RACE IN HEALTH DISPARITY STUDIES: A CONSTRUCT IN NEED OF REVIEW?

Research that has tracked racial health disparities has traditionally marked differences between monoracial or single-origin groups. However, with a growing focus on the multiracial population and new data collection tools that allow for the enumeration of multiracial persons

(Office of Management and Budget 1997),[1] we now have the ability to identify where multiracial persons fit into the broader health profile of the U.S. population. According to the most recent U.S. census, 2.4% of the U.S. population -- or more than six million persons -- use multiple racial categories to identify themselves (Jones and Smith 2001). Estimates derived by Lee, Edmonston, and Passell (2002) project that the population hailing from multiple racial and ethnic origins population will grow to 26 million by 2010, representing 9 percent of the U.S. population.[2] As such, incorporating the multiracial population into studies of health disparities is justified based on size alone. Indeed, as this group represents the outcome of intimate racial interaction, its size, stability, and well-being forecasts America's racial future (Lee and Bean 2004). For example, if we observe that few health disparities exist between the multiracial and single race population, this may portend a narrowing of racial health disparities as races continue to blend.

Yet, incorporating the multiracial population into a discussion of racial health disparities is a complex task because, as Tashiro (2005: 205) argues, they "...have not been accounted for in the dominant discourse of race." Multiracial persons disrupt the classic binary model of health disparities which contrasts non-Whites to Whites by asserting that some persons may exist "in-between" these statuses (Spickard 1992). Accounting for the presence of multiracial persons in analyses of race-based health disparities raises two questions for the study of race and social inequality, one conceptual and one methodological. First, what truly distinguishes one race from another in studies of health, and are multiracial persons simply a "new" racial group whose

[1] We elect to use the term "multiracial" to refer to persons of multiple racial origins.
[2] The base population for 2000, which is 22 million, includes persons who indicated multiple ancestries in 1990, their descendants, and the offspring of interracial and interethnic marriages, and not exclusively those reporting multiple racial categories in 2000 (Lee, Edmonston, and Passell, 2002: 245).

health experiences should be contrasted against members of the majority race? Second, what is the best way to capture such differences in light of new classification strategies that allow for more complex forms of racial identification? We briefly review the theoretical and methodological issues raised by including multiracial identity in a study of racial health disparities by addressing these questions in the section below.

Theoretical Considerations

Racial disparities in disease and mortality are substantial and long-standing. For example, while the life expectancy of both Blacks and Whites has improved substantially across the 20th century, Blacks continue to live shorter lives than Whites (National Center for Health Statistics 2007a). Furthermore, differences exist in the relative burden of several of the Top 10 leading causes of death (Heron 2007). While heart disease, cancer, and stroke are the top-three causes of mortality for Whites and Blacks, deaths due to chronic lower respiratory disease, Alzheimer's disease, and suicide are higher among Whites, while diabetes mellitus, homicide, and HIV are more prevalent among Blacks.

The sources of these and other racial disparities have been theorized in both biological and social terms; however, social explanations have been more successful in explaining the above differentials. From a biological standpoint, these disparities could result from genetically based differences between racial groups. This explanation has been largely discredited in the social sciences due to the unscientific and socially constructed nature of racial categories (Frank 2001; Frank 2007; Williams 1997 ; Zuberi 2001). Most importantly, a focus on biology overlooks the crucial importance of social conditions in shaping racial health patterns, and the manner in which members of selected racial/ethnic groups are differentially exposed to social

risks and resources (see Williams and Jackson 2005). Specifically, racial and ethnic differences in socioeconomic status and medical care use, health behaviors, and residential conditions shape observed disparities in disease and mortality (CDC 2004; National Research Council 2004; Williams and Jackson 2005). Furthermore, evidence exists that racial and ethnic minorities experience stereotyping and bias that contribute to lower quality care than non-minorities, and that they experience a range of barriers that limit their access to medical care (Smedley, Stith, and Nelson 2003). Overall, these relationships can be quite complex (e.g., see Crimmins, Hayward, and Seeman (2004) for an excellent discussion of race/ethnicity, SES, and health), and as such our understanding of their relevance for racial and ethnic disparities in health is still unclear.

In terms of self-rated health (the health outcome examined in this paper), substantial racial variation exists. In 2005, 14.3% of black adults reported that their health was fair or poor, compared to 13.2% of American Indians, 8.6% of Whites, and 6.8% of Asians (National Center for Health Statistics 2007a). Past studies have examined a variety of potential explanations for these patterns, especially socioeconomic status, which is often viewed as a "fundamental cause" of health outcomes (Link and Phelan 1995; Phelan et al.. 2004). Racial groups in the United States tend to be strongly stratified along socioeconomic lines (DeNavas-Walt, Proctor, and Smith 2007), although studies show that while adjustment for socioeconomic status is important, it does not explain-away the relationship between race and self-rated health (Borrell and Dallo 2007; Read and Gorman 2006; Ren and Amick 1996). Indeed, racial disparities in self-rated health tend to be persistent, as these studies also show that adjustment for demographic

characteristics, health behaviors, and physical health conditions also cannot fully account for racial disparities in self-rated health status.

For all the insights gained from a social constructionist view on racial disparities, the place of multiracial persons remains illusive. While it is well-known that races are ethnic and racial amalgams (Nash 1994), they are understood as stand-alone groups with a shared ancestry, history, and common signatures of physicality, including skin color and hair texture (Cornell and Hartmann 1998). The social, legal, and political construction of singular race has folded the offspring of interracial mixing into singular racial groups (Spickard 1992). Resolving multiracial status in a world of single race identification means determining *which* of the multiple racial groups in a mixed-race genealogy patterns their social experience. There have been three answers to this question, each of which has implications for patterns of multiracial social well-being.

The classic answer to this question evokes what anthropologists refer to as "hypodescent," whereby mixed-race offspring are identified with, and whose experience reflects, the group of least status (Davis 1991). The "one-drop" rule provides the most infamous example of this process. This rule is a legal and cultural convention of racial identity stipulating that persons of any African admixture would be included in the category of "Black" (Davis 1991). In the context of health, there is empirical evidence supporting hypodescent patterns of health. For example, Collins and David (1993) find that biracial White-Black infants with Black mothers were more likely to experience classic Black/white disparities in low birth weight than monoracial and multiracial infants of Whites mothers. In addition, Udry, Li, and Hendrickson-Smith (2003) find that White-Asian and White-American Indian adolescents were more likely than single-race White adolescents, but statistically *as likely* as their minority counterparts, to

report fair or poor self-rated health. While noteworthy, it is unclear what these patterns would look like among adults.

The second expectation is that the health of multiracial population, particularly those of partial White ancestry, will iterate toward their White counterparts. Recent theorizing on the changing nature of racial stratification purports that a new structure may have emerged, differentiated along the lines of skin color, yielding a space between "White" and the "dark-skinned" minority collective (Bonilla-Silva 2004; Bonilla-Silva & Embrick 2006). According to this theory, multiracial persons of partial White ancestry may have greater access to social mobility than is extended to their minority counterparts. This condition may also extend to the health of multiracial individuals. As we indicated above, the patterns of adult health have yet to be assessed, however there is evidence that White-Black and White-American Indian adults are structurally advantaged relative to their minority counterparts (Goldstein and Morning 2002; Jones and Smith 2001). Asians, on the other hand, tend to be structurally advantaged and healthier than Whites. Therefore, the health of multiracial Asians, according to this expectation, would iterate towards that of Whites, even though this is the less healthy pattern.

Finally, it may be that the health of the multiracial population is not distinctive at all, but rather mirrors the racial community they most closely identify with. Understanding oneself as a member of a group presumably implies that they are similarly exposed to racially specific conditions (i.e. access to material resources, experiences of discrimination) that affect health (Williams and Jackson 2005). Recent studies have uncovered a clear propensity of multiracial youth who identify themselves in monoracial terms (Brunsma 2006; Campbell 2007) or whose understanding of their ethnic identity or perceptions of discrimination echo a specific group of

monoracial peers (Herman 2004). However, it is unclear if an affinity with a specific racial group coincides with similar race-specific vulnerabilities to disease. Ultimately, a definitive understanding of *which* racial community a self-reported multiracial person identifies with most strongly may provide crucial information in assessing their health status.

Methodological Considerations

Beyond the theoretical considerations, incorporating the multiracial population in a discussion of social well-being has unique methodological challenges (Mays, Ponce, Washington, and Cochran 2003; Sandefur, Campbell, and Eggerling-Boeck 2004; Snipp 2003). Over time, the number of racial categories included in national health surveys has increased to better reflect the growing diversity of the American population (e.g., National Center for Health Statistics 2007b). Generally, multiracial persons, a group many new surveys have attempted to capture, have been identified as those selecting more than one race (Harris 2002; Morning 2003).[3] Using data where respondents can report multiple races has the advantage of allowing for greater complexity in identification than was previously available, but does acknowledging this complexity necessarily make our estimates of disparities more accurate? This remains an open question, as those currently classifying themselves with multiple races were previously members of single race categories, and the shift in categorization could result in substantial changes in racial health profiles. According to Mays et. al.(2003), if those selecting multiple races share common health advantages or risk factors, single racial groups may appear either healthier or more at-risk without any change in their health behaviors or disease patterns. Such a shift influences both our current assessment of race and health as well as our efforts to bridge

[3] Identifying multiracial persons as those reporting multiple races represent only one of several ways to identify this population (see Harris 2002 for review; Goldstein and Morning 2000).

racial data from one year to the next as we track racial disparities over time (see Liebler 2007; Mays et al. 2003; Snipp 2003).

Researcher have employed one of three common approaches when analyzing multiple-response race data, including (1) limiting the sample to single-race respondents (i.e. excluding those reporting multiple races); (2) constructing racial categories that reflect the specific combination of races selected; or (3) allocating multiple-race respondents to a single race group. We review these approaches and assess their implications for accurately reflecting race and racial patterns of inequality.

Excluding the Multiple-Race Reporting Population

One possibility is to simply exclude the population reporting multiple races. Though not common, some social science studies have simply removed those respondents who select multiple races from their sample or population. For example, in their update of patterns of segregation, Wilkes and Iceland (2004) opted to exclude those reporting multiple races as nearly 99% of the U.S. population identifies as only one race, and excluding this group had a proportionately small impact on the findings for the other racial groups (i.e., non-Hispanic Whites, African Americans, and Asian / Pacific Islanders). Their justification notwithstanding, excluding respondents who select multiple races has ceased to be a viable option. Small (absolute or proportionate) population size is not an adequate justification, as findings from health data on small ethnic and racial sub-groups (including Native Americans, Asians and selected Latino ethnic groups) has been a priority in order to capture meaningful disparities that would otherwise go unmeasured. Further, the multiracial population represents a substantial share of smaller groups like American Indians. Indeed, monoracial American Indians represent

just 60.1% of the total American Indian identified population (Farley 2002, see Figure 1.3). And, as stated above, the multiracial population is expected to increase substantially in size by the 2010 census (Lee, Edmonston, and Passell 2002).

Including Separate Multiple-Race Group(s)

Grouping those who report multiple races into either one "catch-all" multiracial category or a series of combination specific (e.g. Black-White, Asian-American Indian) categories represents the most common approach employed with multiple-race data. Separate categories for multiracial respondents reflects concerns that this group face unique experiences, and at times challenges, due to blending races in a racially divided world (Campbell and Eggergling-Boeck 2006; Gibbs 1989; Herman 2004). The clear advantage of this approach is the ability to contrast the well-being of one multiracial group with its monoracial counterparts, as several studies now do (Campbell and Eggergling-Boeck 2006; Herman 2004; Udry, Li, and Hendrickson-Smith 2003). Both Udry and colleagues (2003) and Campbell and Eggergling-Boeck 2006 find that White-American Indian adolescents stand out relative to single-race Whites for negative health outcomes; specifically, lower self-rated health and higher rates of smoking and drinking, depressive symptoms, and suicidal thoughts. These comparisons provide insight into disparities that might otherwise go overlooked if these groups were folded into one single category.

Allocating Multiple Race Persons to One Racial Category

Lastly, persons reporting multiple races may be allocated into just one of their reported racial categories. One resolution proposed for studies employing health surveys has been to allocate respondents to the category they report in response to the question, "Of the races you selected, which race best describes you?" Assigning persons to the group they self-select honors

the principle of self-identity (Mays et al. 2003; Snipp 2003), and therefore improves upon the approach employed by the census that simply allocates multiracial respondents to their minority populations (Goldstein and Morning 2002; Office of Management and Budget 2000). By extension, it acknowledges that multiracial persons, like all persons, exist in a world where singular race identification and single race communities are the norm – and that norm impacts personal identities and interpersonal experiences (Harris and Simm 2002). However, it is not clear if allocating individuals to a "best race that describes you" category addresses the second issue; that is, the impact this approach has on actual profiles of health experiences. The concern is that multiracial persons who choose a single "best describes" category may be distinctive from those who always identified as a single-race individual. Presumably, those reporting multiple races have a shared experience of being reared in racially diverse circumstances, many that include Whites persons.[4] In capturing disparities between Whites and non-Whites, do those reporting partial White background, regardless of the race that "best describes" themselves, experience fewer disparities than their monoracial minority counterparts? The answer to this question can inform broader discussions of how shifting lines of racial identity, asserted by individuals, influences structural patterns of racial stratification (Bonilla Silva 2004; Bonilla Silva and Embrick 2006; Lee and Bean 2004).

RESEARCH QUESTIONS AND HYPOTHESES

We present the following research questions and accompanying hypotheses to guide our investigation. First, since capturing socially constructed racial disparities hinges on the way that

[4] According to the U.S. Census, over 97% of all interracial families include a non-Hispanic Whites spouse (Lee and Edmonston 2005). Additionally, over 80% of multiracial persons report Whites as one of their races (Jones and Smith 2001).

people identify themselves, does acknowledging a multiracial identity through the use of multiple-response race data change our understanding of racial health disparities in the United States? We begin by contrasting the health of racial populations through the use of both single-race and multi-race classifications. We then adjust for background controls to explore whether the explanatory mechanisms that are often applied to single-race health disparities operate in a similar manner for multiracial adults. We proceed with the null hypothesis that the self-rated health of the multiple race reporting population does not differ significantly from the non-Hispanic White population.

> H_1: The health of multiracial respondents who cite a partial White identity is in between non-Hispanic Whites and the minority component race (e.g. Black-White respondents health is in-between Blacks and Whites). For those citing dual minority identity, their self rated health will lie in-between non-Hispanic Whites and the least advantaged minority component racial group.
>
> H_2: The health of multiracial respondents who cite a partial White identity is similar to their minority component race (e.g. Black-White respondents health is similar to Blacks). For those citing dual minority identity, the self rated health will be similar to the least advantaged minority component racial group.

Second, does allocating the multiracial group to the race that "best describes" their identity accurately represent their health experience? We begin by first reclassifying multiple-race respondents into their separate "preferred race" categories, and then contrasting the self-rated health of these respondents to their single-race counterparts. This will show to what degree folding these groups into their single best race, as is suggested by some (e.g. Mays et al. 2003), will obscure health profiles. We again proceed with the null hypothesis that the self-rated health of multiracial respondents does not differ significantly from the non-Hispanic White population, regardless of the race that they indicate best describes their identity.

H_3: The health of multiracial respondents will echo the racial group they claim best describes their identity

DATA AND METHODS

Data

Our analysis of racial identity and self-rated health is based on data from the 2001 through 2006 waves of the Behavioral Risk Factor Surveillance System (BRFSS), an ongoing collaborative project between U.S. states and territories and the Centers for Disease Control and Prevention (CDC). The BRFSS is designed to assess behavioral risk factors and preventive health practices that are linked to chronic diseases, injuries, and preventable infectious diseases in the adult population (aged 18 and older). Households with telephones in each state were selected via a disproportionate stratified sample design, based on areas with a high or low density of telephone numbers. Respondents were then selected based on a random sample of one adult per household, using a computer-assisted telephone interviewing (CATI) system.

We utilize information from the core component of the BRFSS questionnaire, which asks a standard set of questions of respondents in all U.S. states and territories, and includes demographic measures in addition to current health-related perceptions, conditions, and behaviors (e.g., health insurance, tobacco use, disability). Additionally, the questions asked in the core component are relatively stable across years, which makes it possible to merge several years of BRFSS data together into one file – an important feature of this data, given our interest in the relatively small multiracial population. Our sample is based on the 2001-2006 waves of the BRFSS because starting in 2001, the question on racial identity was changed to allow respondents to select more than one racial group ("Which one or more of the following would

you say is your race? Mark all that apply"). For respondents who reported more than one race, respondents were then asked to identify a preferred racial identity ("Which one of these groups would you say best represents your race? (1) White, (2) Black or African American, (3) Asian, (4) Native Hawaiian or Other Pacific Islander, (5) American Indian, Alaska Native, and (6) Other Race). If respondents identified they that they belong to more than one racial group, but did not report a preference, they are coded as having "no preferred race."

Our initial merge of the 2001-2006 waves gave us a starting sample size of 1,740,802 respondents. We limit this sample based on several criteria. First, we removed respondents who identified themselves as Hispanic (n = 1,602,484). Our reasoning reflects insights discussed elsewhere (Harris 2002; Qian 2004) – in short, that surveys that ask about Hispanic ethnicity do not provide an option for indicating "part-Hispanic" identity. Second, we exclude respondents who are living outside of the 50 U.S. states – specifically, in Puerto Rico, Guam, or the Virgin Islands (n = 1,587,377). Third, we removed respondents who currently reside in Hawaii because of the unique condition that interracial marriage and multiracial identity is far more frequent (n = 1,549,111).This provides a highly distinctive context for the study of multiracial identity (see Kana'iaupuni and Liebler. 2005), which may confound the patterns we observe for multiracial respondents living in the mainland United States. Fourth, we limit the sample to respondents who selected only one racial group (excluding those who identified as Native Hawaiian or other Pacific Islander), or who selected two racial groups in a group that made up at least 1,000 cases in the sample (n = 1,534,675); see measures section for more information. As a final restriction,

we limit our sample to cases with valid information on both the dependent and independent measures, resulting in our final sample size of 1,416,717 adults.[5]

Dependent Measures

Our dependent measure in this paper is self-rated health. All respondents were asked to rate their general health on a five-point scale, where 1 = poor, 2 = fair, 3 = good, 4 = very good, and 5 = excellent. This is a powerful measure of health, as studies have consistently found it to be an independent predictor of mortality and morbidity (Benyamini and Idler 1999; Idler and Benyamini 1997). We examine two versions of this measure in our analysis. First, we examine self-rated health (SRH) in its continuous form in order to examine how racial identity is related to the full range of self-rated health categories, from poor to excellent. Second, we recode this measure into two categories that contrasts bad health (1 = poor or fair self-rated health) against good health (0 = good, very good, or excellent health). We examine this dichotomous version so we can examine the conditions which result in the most problematic outcome from a health standpoint – and this is especially relevant for understanding racial disparities, given the strong differences in health outcomes seen across racial groups.

Independent Measures

Our main independent measure of interest is a categorical measure of racial group identity that includes both single-race and multi-race groups. Specifically, our measure includes five single-race groups: White (reference), Black, Asian, American Indian/Alaskan Native, and Other; and five multi-race groups: White-Black, White-Asian, White-American Indian, White-Other,

[5] The percent missing on most measures was quite low, with the exception of annual household income, where 11.5% of cases had missing values. As a result, we did not remove cases with missing information on annual household income. See measures section for more information.

and Black-American Indian (see Table 1 for the sample size of each racial group). This measure is used in the first section of our analyses, which examines the self-rated health profile of multi-racial adults relative to single-race adults. In the second portion of analysis, we examine what health status of respondents looks like when we ignore their multi-racial identity, and instead use the measure of preferred racial status: White (reference), Black, Asian, American Indian/Alaskan Native, Other, and No Preferred Race.

Our control measures are clustered into four groups: demographic characteristics, socioeconomic status, health behaviors, and health problems. We control for five demographic characteristics in our analysis. In addition to gender (1 = female, 0 = male) and a continuous measure of age at interview, we include a three-level categorical measure of the number of adults living in the home: none (reference), one, and two or more. We also include a dichotomous measure of whether any children under the age of 18 are living in the home (1 = yes, 0 = no). Last, we control for a categorical measure of marital status, which identifies married (reference), divorced or separated, widowed, and never married adults.

We also include five measures of socioeconomic status, including a categorical measure of the highest grade of school completed: less than a high school diploma (reference); high school graduate; attended college or technical school but did not graduate; and graduated from college or technical school. Annual household income is added as an ordinal measure with five categories: less than $1=25,000 (reference); $25,000 to $49,999; $50,000 to $74,999; $75,000 and above; and missing on income (since 11.5% of respondents did not provide valid information on this measure). Current employment status is added as a categorical measure that contrasts persons who are currently working for wages or are self-employed (reference), with persons who

are unemployed, homemakers, students, retired, or are unable to work. We also include two measures that are related to medical care access: whether or not respondents currently have medical insurance (1 = yes, 0 = no), and whether or not they have one person who they think of as their personal doctor or health care provider (1 = yes, 0 = no).

Four measures of health behaviors are also included. First, we use a categorical measure of current smoking status, contrasting respondents who do not smoke (reference) with former smokers, persons who smoke on some days, and persons who smoke every day. Second, we include a dichotomous measure of whether respondents drink heavily on a daily basis (1 = yes, 0 = no), with heavy drinking defined as men who drink more than two drinks per day, and women who drink more than one drink per day. Third, we include a categorical measure of body weight: overweight, obese, and neither overweight nor obese (which we refer to as "normal" weight, and treat as the reference category). Fourth, we include a dichotomous measure of whether or not respondents participated in any physical activities or exercises (such as running, calisthenics, golf, gardening, or walking) during the past month (1 = yes, 0 = no).

Our last set of control measures capture two aspects of health problems – both of which vary strongly across racial groups (CDC 2003; NHIS 2003), and likely contribute to racial disparities in self-rated health. First, we construct a measure of current asthma where 1 = respondent has ever been told by a doctor, nurse, or other health professional that they have asthma, and they report that they still have it now, and 0 = does not currently have asthma. Second, we include a measure of whether or not respondents have ever been told by a doctor that they have diabetes (1 = yes, 0 = no).

Analysis

All analyses are run using version 9.1 of the SAS software package. We use the PROC SURVEYMEANS and PROC SURVEYLOGISTIC procedures to adjust for the complex sample design of the BRFSS. All analyses in this paper are also weighted with the final sampling weight (that accounts for differences in the basic probability of selection among strata, and includes an adjustment for the number of adults and telephone lines within a household, in addition to poststratification and nonresponse adjustments).

Our analysis proceeds in three steps. First, we begin with a presentation of the self-rated health profile of our sample of adults across both single-race, multi-race, and preferred race groups. Following this, we present logistic regression and ordered logit models that examine whether demographic, socioeconomic, health behavior, and health problem characteristics explain race-specific differences in self rated health. Next, we restrict our sample to multi-race adults, and cross-tabulate our multi-race measure with preferred race to see where multi-race adults cluster when they are asked to choose only a single-race identity. And, last, we substitute respondents preferred racial identity for their multiracial identity, and remodel the relationship between race and both measures of self-rated health, with adjustment for the control measures described above.

One comment about our sample size before we present our findings. In order to pull in enough multi-race respondents to support the analysis included in this paper, we had to aggregate several years of the BRFSS data. As a result, our sample size is well over one million. As expected, White adults are the most prominent group (n = 1,233,162), followed by Blacks (n = 116,390), American Indians (n = 22,955), and Asians (n = 16,743), with most of the multi-race groups having sample sizes between 1,000 and 2,000 (with the exception of White-American

Indians, n = 12,562). We recognize that tests of statistical significance are influenced by sample size, but rather than only reporting p-values less than .001, we still report .01 and .05 levels of significance since this follows conventional norms and provides more detail to the reader on the nature of the relationships we are exploring. However, we do view .05 cut-points for p-values as evidence of marginal significance, and throughout the paper we have tried to emphasize effect sizes in our discussion, rather than relying too strongly on the reporting of significance tests.

RESULTS

Descriptive Statistics

Table 1 shows the health characteristics of our analytical sample of the BRFSS. In two panels, we show the sample size, the percent of the respondents reporting poor to fair health, and the mean score of self-rated health by reported race(s) of the respondent. The top panel (Panel A) shows the patterns by their responses to the first race question where respondents either reported one race (single race adults) or more than one (multi-race adults). Panel B limits the sample to multi-race respondents, and shows the self-rated health patterns for these adults when they are sorted into their "preferred race" categories. To examine the 'place' of multi-race adults in a picture of racial health disparities, we conduct several bivariate comparison between the self-rated health of each non-White population and the majority racial population (i.e., single race Whites). We also explore how the health of multi-race adults differs from respondents in their non-White component racial groups (significant differences shown with subscripts [b] through [e]). Finally, we conduct the same tests of White/non-White difference along lines of preferred race classification (shown in Panel B).

— Table 1 about here —

In general, we find that most groups rank their health poorer than Whites, who on average rank their health as 3.6 (between "good" and "very good"), with 13.5% reporting fair-to-poor SRH. Among single race groups, we observe the greatest health disparity among American Indians, with significantly higher percentages reporting fair-to-poor SRH (23.8%) and a significantly lower mean SRH score. The solid exception are single race Asians, who are less likely to report fair-to-poor SRH and who rank their health the highest of any racial group (mean = 3.8).

Where do multi-race adults fit into these patterns? The SRH of White-Black respondents lies in-between Blacks and Whites, supporting Hypothesis 1. White-Blacks have self-rated health scores that are statistically similar to Whites, but at the same time are significantly better than single-race Blacks. White-Other multi-race adults also experience substantial health disparities but not to a greater degree than single-race Others – although they do report significantly worse health than single-race Whites, supporting Hypothesis 2. In addition we find patterns that do not conform to any of our predictions. We find the lowest average SRH score (mean = 3.2) and the largest percentage reporting poor health among multi-race American Indians, with a slightly higher percentage of Black-American Indians reporting fair-to-poor health (27.0%) than White-American Indians (26.0%). SRH for both groups are lower than the single-race American Indians. We also find the highest rating of SRH (mean = 4.0) and lowest percentage reporting fair-to-poor health (6.7%) among White-Asians. Additional statistical tests reveal these health ratings are also different than their component single racial groups, suggesting a distinctive health experience that would not be captured if these populations were folded into their single-race counterpart populations.

How much are the above patterns are an artifact drawing false distinctions between multi-race and single race adults? Put another way, do patterns change when multi-race adults are asked to classify themselves with a single, "preferred" race? Looking at Panel B, we find consistency at the extremes of SRH. Multi-race adults who prefer the label "American Indian" continue to have the lowest SRH among all multi-race adults (mean = 3.2) and the highest percentage reporting fair-to-poor health (30.3%); meanwhile, those who prefer the label "Asian" continue to have the highest SRH (mean = 4.0) and are the least likely to report their health as fair-to-poor (7.7%). However, the standard of comparison in most studies of racial disparities in health (i.e., Whites) has changed dramatically, as a substantially higher percentage of respondents who prefer the racial label "White" now report their health as fair-to-poor (22.9% – an increase of nearly two-thirds from the 13.5% reported among single-race White adults in Panel A), and average SRH scores are somewhat lower as well. As a result, Black adults in Panel B report significantly better health than Whites (in contrast to Panel A, where Blacks had worse health). "Other" race adults are no longer significantly different from White adults (unlike in Panel A, where their health status was worse), and adults who chose not to select a "preferred" race do not differ from Whites in terms of fair-to-poor SRH, but they do report a significantly higher average SRH score.

Multivariate Regression Models Among Single-Race and Multi-Race Adults

Table 2 shows the odds of reporting fair-to-poor SRH for each single and multi-racial sub-population (relative to Whites). We assess the disparities in SRH independent of demographic background (Model 1), socioeconomic factors (Model 2), health behaviors (Model 3), and health status (Model 4). Turning first to single-race groups, we find the background

controls explain a large, but not complete, part of the difference between White and non-White SRH. For example, adjusting for socioeconomic profiles explained 68% of the SRH disadvantage for Blacks (i.e., it reduced the odds ratio from 1.75 to 1.24) and 63% of the difference between American Indians and Whites (i.e., it reduced the odds ratio from 2.32 to 1.49). According to Model 4, adjusting for behaviors that impact overall health (i.e. exercise, smoking, alcohol use) and health status (i.e. having asthma or diabetes) reduce these differentials further, though they remain statistical significant. The fully adjusted model shows that Blacks are 13% more likely than Whites to report fair-to-poor SRH and American Indians are 31% more likely. Only 34% of the differential between Other racial groups and Whites is explained by the controls (i.e., the odds ratio reduces from 1.61 to 1.40 between Models 1 and 4) due perhaps to combining several race/ethnic groups with varying health profiles under one umbrella category. For Asians, we see that their superior SRH is reflective of their advantaged socioeconomic profiles and their lower rates of risky health behaviors and chronic health conditions, like asthma and diabetes. Indeed, once we adjust for these measures, Asians are actually 26% *more* likely than Whites to report poor SRH in Model 4.

— Table 2 about here —

Relative to disparities of single-race groups, the SRH of multi-race groups appears statistically similar to SRH of the White population, supporting our first hypothesis. We find most of the initial disparities observed in Table 1 are explained by background characteristics. For example, the lower propensity of White-Asians to report fair-to poor SRH is reduced to non-significance once we adjust for differences in their demographic profile (see Model 1). Additional controls moderate the odds ratio to some degree, but the differentials never attain

statistical significance. White-Black respondents, who initially had no difference from Whites in SRH, are 55% more likely than Whites to report their SRH as fair-to-poor independent of their demographic background (see Model 1); however, this difference reduces to non-significance after accounting for socioeconomic status. Similarly, we find that White-Others are 52% more likely than Whites to report fair-to-poor SRH independent of demographic background, but this again reduces to non-significance once adjusted for socioeconomic profiles (see Model 2). The exceptions to this pattern are the American Indian descent groups (White-American Indian, Black-American Indian), who retain their distinctive SRH, independent of demographic, socioeconomic, behavioral, or health status background. In the fully adjusted model, both groups are more than 40% more likely than single-race Whites to report their health as fair-to-poor. This provides the only evidence that multi-race health iterates toward the least advantaged minority counterpart.

In Table 3, we account for the full variation of self-rated health with an ordered logit model predicting self rated health, instead of focusing the probability of rating health at the low end of the scale. Comparing the pseudo R^2 statistics reveals that our models do a better job of explaining the variation in tendencies to report fair-to-poor SRH than the full variation in self-rated health. The pseudo R^2 of Model 4 in Table 2 shows that the fully adjusted model explains 25% of the variance in self-rated health, while the R squared from the ordered logit is only 12%. Despite the lower explained variance, does capturing the full range of self-rated health scores reveal any differences in the patterns of racial disparities discussed from Table 2? In general, the majority of the patterns of single and multi-race groups remain the same in Table 3. For example, the disparities between Whites and Blacks, American Indians, and Others in rankings

of self rated health are narrower in the fully adjusted model, though each group is still significantly different from Whites. Baseline differences between Whites and Asians hide the protective effects of relatively higher socioeconomic status and improved health profiles, although – similarly to fair-to-poor SRH in Table 2 – adjusting for these factors results in poorer self rated health ranking for Asians. Furthermore, the initially lower rankings of self-rated health for White-Blacks and White-Others relative to Whites are reduced to non-significance in the fully adjusted model, while the lower ranking of American Indian multi-race adults remains significant in the full adjusted Model. That said, the pattern for White-Asians in Table 3 does differ from Table 2, as White-Asians in the demographic-adjusted model have better rankings of self-rated health than single-race Whites (in Table 2 there were no differences), although this difference disappears once we adjust for socioeconomic status in Model 2.

— Table 3 about here —

Before turning to our analysis of preferred racial identity, we should note that the control measures demonstrated the expected relationships with both versions of self-rated health. Self-rated health is better among persons who are more educated, wealthier, employed, married, have children living in the home, and who exercise regularly. On the other hand, self-rated health is worse among persons who are older, uninsured, smoke, are overweight or obese, or who are diabetic or asthmatic. The only finding that is somewhat unexpected is for the measure of whether respondents have a personal doctor – which is associated with poorer self-rated health. This may indicate that persons who have established a regular relationship with a physician are more likely to have an accurate assessment of their health status, including the diagnosis of health problems that require a visit to a doctor to obtain.

Preferred Race Outcomes

Patterns of Identity

In Table 4 we limit the sample to multi-race adults (n = 18,026), and cross-tabulate respondent's multi-race identity (shown in rows) with their preferred race identity (shown in columns). Reading across the top row, for example, we see that 29.0% of White-Blacks indicated "White" as their preferred race, while 54.9% indicated "Black" and 15.7% indicated "No preference."

— Table 4 about here —

Overall, the distributions of preferred race reveal clear norms that guide the "preferred" choices of certain multi-race groups, while others have looser social conventions and display a wider range of choices. In addition to over half of White-Blacks, we see that more than 70% of Black-American Indians prefer Black as the label to describe themselves, demonstrating an adherence to the "one-drop" rule, or hypodescent mode of racial identity (Davis 1991, Campbell 2007). American Indian identity appears less salient or "enduring" to American multi-racials (e.g. Eschach 1995) as only 15% of White-American Indians prefer the label American Indian, while 78.8% of this group prefers the label Whites. White-Asians are more evenly distributed along preferred race identities (see Xie and Goyette 1997), as just over half of White-Asians selected either White (52.7%) with the remainder divided between Asian (27.9%) as their preferred race and "no preference" (18.1%). The only remaining group, White-Others, demonstrates a strong preference toward the White racial label (74.2%), with most of the remaining group maintaining that "Other" best describes them.

Beyond racial identity, how do these patterns inform a discussion of racial disparities in social well-being? In the final analysis, we explore the picture of racial health disparities painted by responses to preferred race as opposed to component races.

Self-Rated Health Disparities Using the Preferred Race Identity

Lastly, we turn to the results of Table 5 where we test the last hypothesis that multiracial respondents who declared a "preferred race" would experience health disparities similar to those that reported this race as their sole racial identification (i.e., single-race respondents). We present results from the logistic regression model assessing racial differences in SRH using the dichotomous outcome of fair-to-poor SRH (see Panel A) and the results from the ordered logit analysis of the continuous outcome of SRH (see Panel B). Because of space limitations, we only present odds ratios for the measure of racial group membership, suppressing the effects of the background controls (although they are available from the authors by request).

— Table 5 about here ---

The results are mixed at best, with little evidence that multiracial respondents who report a preferred race have the same health experience as those respondents who report a single racial identity. To begin, we see that the health of preferred race Whites strongly diverges from single-race Whites. According to Model 1, this group is twice as likely as single-race Whites to report fair-to-poor SRH (OR = 2.04) in Panel A, and 40% less likely than single-race Whites to advance from low to high SRH (OR = 0.58, Panel B). This gap narrows but remains significant in the fully adjusted model, suggesting a substantial health disparity between multiracial respondents who felt "White" was the race that best described their identity, and respondents who classified themselves solely as Whites. This likely reflects, in part, the presence of White-American

Indians who, despite having a more disadvantaged health experience than Whites, report "White" as a preferred race.

The nature of disparities for those preferring a non-White group also differed from their single-race counterparts. American Indian/White disparities in SRH are greater for those who report "American Indian" as a preferred race compared to single-race American Indian adults. Both the baseline and fully adjusted disparities are wider between Whites and preferred race American Indians than between Whites and single-race American Indians. The nature of Asian-White disparities also differ depending on whether one reports Asian as a preferred race or as the only race reported. As was shown in Tables 2 and 3, controlling for socioeconomic status and risk health behaviors reveals that Asian/White disparities in SRH favor Whites, despite the reverse that appears in the baseline models. These adjustments do very little for preferred race Asians who are not even statistically different from Whites beyond the baseline model in the ordered logit analysis (see Panel B). The one exception was Black/Whites disparities. The baseline disparities between preferred race Blacks and Whites are fairly similar to those between single-race Blacks and Whites in both Panel A (OR = 1.68 vs. OR = 1.75) and Panel B (OR = .65 vs. OR = 0.68). Although the fully adjusted model statistically explains the differences between preferred race Blacks and Whites only, the odds ratios for single-race Blacks and preferred race Blacks in Model 4 in Panels A and B are highly similar.

Interestingly, we find that exiting outside of the norms of single race identification coincides with poorer health. Those who do not indicate a preferred race experience substantial disparities in SRH in the baseline model, as they are twice as likely as Whites to report fair-to-poor SRH (OR = 2.00) and their odds of advancing from high to low SRH indicated in the

ordered logit model are 48% lower than Whites (OR = 0.62). Although this gap narrows in the fully adjusted model, it remains significant for both categorical and continuous forms of SRH.

DISCUSSION

The current study explores the implications of incorporating those who select multiple races into an analysis of racial health disparities. First, we explored whether acknowledging a multiracial identity through the use of multiple-response race data changes our understanding of racial health disparities in the United States. Using self-rated health as our indicator, we began by assessing racial differences in this outcome across several single-race and two-race combinations (e.g., White-Black, White-Asian). We hypothesized that multiracial respondents would either experience *fewer,* or the same, health disparities than their minority component race. We find that baseline patterns of self-rated health vary considerably across multiracial subgroups, with White-Black respondents reporting SRH most closely to whites, White-Others rating their health most like Others, White-Asians reporting better SRH than either group, and White-American Indians and Black-American Indians reporting poorer SRH than either group.

Net of background controls, most notably socioeconomic status and health behaviors, all statistically significant gaps in self-rated health from the White population disappear for most groups, in support of our first hypothesis. The major exceptions are both groups of partial American Indian ancestry who, in the fully adjusted model, report worse SRH. As this group most clearly iterates toward the least-advantaged component race, the findings presented here parallel the results from studies on multiracial adolescents revealing worse health outcomes and more at-risk behaviors for those of partial American Indian descent (Campbell and Eggerling-Bock 2006; Udry et al. 2003).

Second, we investigated whether allocating the multiracial group to the race that "best describes" their identity accurately represents their health experience. We then examined the implications of placing these individuals into one self-reported "preferred race" category by investigating the differences in health between single-race minorities and whites, and those who state a preferred race and whites. We find little evidence that multiracial respondents who state their preferred race as either White or Asian experience similar health disparities as their single-race counterparts. Most notably, the health of preferred race Whites is significantly worse than their single-race counterparts, due most likely to the presence of part-American Indians who indicated this as their preferred race (see Table 4). Net of controls, single-race Asians report worse SRH than Whites, while preferred race Asians report similar SRH as Whites. It appears that the dynamics that result in suppression of the disparities between Whites and single-race Asians cannot be extended to multiracial persons who label themselves as "Asian."

We consider the implications of these findings first for multiracial health, and then for studies of race and health more generally. Turning first to multiracial health, the SRH of most multiracial groups counter the notion, purported by hypodescent theory, that partial-minority ancestry necessarily places oneself apart from White population. Given the importance of SRH in forecasting patterns of disease and mortality (Idler and Benyamin 1998; Williams and Jackson 2005), our findings indicate a need to explore the health of this population more broadly. White-Blacks, White-Asians, and White-Others display no statistically significant disparities from single-race Whites. Although the odds ratios are not 1.00, these groups likely to do not experience health disparities in the same way as single race Blacks or Asians counterparts.

By contrast, we also find that those of partial American Indian ancestry have the most problematic health profiles, which mirrors findings from research on multiracial adolescent health (Campbell and Eggerling-Boeck 2006; Udry et al. 2003). Although it seems reasonable to assume that this group likely suffers from similar conditions that plague the health of the single-race American Indian population, it is notable that many persons of both partial-American Indian groups (i.e. White-American Indian and Black-American Indians) declare that they would prefer to be labeled as other racial groups. Therefore, they likely have not been counted as American Indians in population in health surveys that do not provide multiracial labels, and thus past studies have likely mis-estimated the degree of degree of ill-health for American Indians living in the United States. More specifically, health research that has not allowed for multiracial identification has not been able to identify conditions that may be unique to this population. For example, Campbell and Troyer (2007) recently explored the role of racial mis-classification (i.e. when observer race conflicts with self-reported race) for American Indians. Their findings suggest that this may be an important mechanism in assessing patterns of risky health behaviors and poor mental health, as those who are mis-classified have higher rates of suicidal attempts and depression, independent of their parent's education and social support. Our findings suggest the counter scenario, in that those who view themselves in "White" or "Black" terms may have a social experience closer to other single-race American Indians, and this conflict may intensify vulnerability to poor health.

For broader studies of race and health, the key issue in including the multiracial population is the impact that accounting for multiracial identity will have on racial health profiles that we have been observing for some time (Mays et. al 2003; Tashiro 2005). Proposals for

simply allocating those who report multiple races to one preferred racial group are attempting to ease the comparison between old and new data, given the movement toward increased complexity in the measurement of racial identity. Therefore, the real issue is: How would such an allocation impact health profiles of single-race populations? Given the size of our single-race subsamples, allocating the multiple-race population to their preferred race would likely have little effect on the patterns of previously observed health profiles. Yet, issues of relative size notwithstanding, our findings suggest this is *not* a good strategy for accurately tracking health disparities. As the multiracial population continues to grow, allocating those who report that "White" is the group that best describes them, for example, may result in a worsening of the overall health profile of Whites, providing the impression that some of the gaps in White/non-White health disparities are closing.

Such an approach would also be likely to obscure the health profile of Asians and Blacks, and the manner in which background mechanisms (e.g., SES, health behaviors) operate. For Asians, this would diminish our ability to correctly gauge the background factors responsible for their apparently superior health profile. This is less likely to be a problem for studies that examine the health status of Blacks, as the nature of the differences where highly simlar to single-race Blacks. Ultimately, we can better understand the health profile of US adults by highlighting the details and nuances of racial classification, rather than ignoring the complexities of multiracial health by placing them in single-race categories. Given the persistence of racial health disparities in the United States, perhaps what is needed is more acknowledgment of the complexity in circumstances across racial groups if we are to even hope to effectively remedy racial disparities in health status.

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Table 1. Self-Rated Health Status for Sample Adults, by Race

	Sample Size	Fair-to-poor Self-Rated Health, %	Self-Rated Health, mean score (SD)
PANEL A: ALL ADULTS, RACIAL GROUP INCLUDING MULTIRACIAL OPTION			
Single Race Adults			
Whites	1,233,162	13.5	3.6 (1.1)
Black	116,390	19.7***	3.4 (1.1)***
Asian	16,743	8.0***	3.8 (1.0)***
American Indian	22,955	23.8***	3.3 (1.2)***
Other	9,408	18.6***	3.5 (1.2)***
Multi-Race Adults [a]			
Whites-Black	1,845	14.3 [b]	3.6 (1.1) [b]
Whites-Asian	1,076	6.7***	4.0 (1.0)*** [c]
Whites-American Indian	12,562	26.0*** [d]	3.2 (1.2)*** [d]
Whites-Other	1,331	19.3***	3.5 (1.2)**
Black-American Indian	1,245	27.0*** [b]	3.2 (1.1)*** [b]
PANEL B: LIMITED TO MULTIRACIAL ADULTS, PREFERRED RACE ANSWER			
Preferred Race			
Whites	12,056	22.9	3.3 (1.2)
Black	1,926	18.6*	3.5 (1.1)**
Asian	300	7.7**	4.0 (1.0)***
American Indian	2,096	30.3***	3.2 (1.2)**
Other	324	16.9	3.6 (1.2)
No preferred race	1,323	19.4	3.4 (1.2)*

Note: Standard deviation's in parentheses. Sample size for Panel A = 1,416,717; Sample size for Panel B = 18,026.

***p ≤ .001, **p ≤ .01, *p ≤ .05 (relative to Whites adults).

[a] Additional significance tests (p ≤ .05) are included for multiracial adults, contrasting each multiracial group against the non-Whites single race groups that make up their multiracial identity. Reference group: [b]Black adults; [c]Asian adults; [d]American Indian adults; [e]Other Race adults.

Table 2. Odds Ratios from Logistic Regression Models: Fair-to-poor Self-Rated Health

	Model 1	Model 2	Model 3	Model 4
Racial Group (ref: Whites)				
Black	1.75***	1.24***	1.18***	1.13***
Asian	.79***	1.10	1.29***	1.26***
American Indian	2.32***	1.49***	1.42***	1.31***
Other	1.61***	1.41***	1.45***	1.40***
Whites-Black	1.55***	1.27	1.25	1.22
Whites-Asian	.77	1.05	1.13	1.12
Whites-American Indian	2.36***	1.64***	1.57***	1.46***
Whites-Other	1.52***	1.32	1.32	1.31
Black-American Indian	2.21***	1.73**	1.65*	1.47*
Demographic Measures				
Age	1.04***	1.03***	1.03***	1.03***
Female	1.03**	.92***	.95***	.94***
Marital status (ref: Married)				
Unmarried couple	1.41***	1.10*	1.11**	1.08*
Divorced or separated	1.95***	1.20***	1.15***	1.13***
Widowed	1.45***	.93***	.94***	.94**
Never married	1.44***	.93***	.99	.99
Other adults in Hhld (ref: None)				
One	1.08***	1.02	1.02	1.01
Two or more	1.30***	1.16***	1.13***	1.09***
Any children in Hhld	.90***	.91***	.89***	.91***
Socioeconomic Measures				
Completed education (ref: < HS)				
High school graduate		.60***	.65***	.67***
Some college		.51***	.59***	.59***
College graduate		.34***	.45***	.46***
Annual hhld income (ref: <$25,000)				
$25,000 - $49,999		.64***	.66***	.68***
$50,000 - $74,999		.47***	.50***	.52***
$75,000 and above		.33***	.38***	.40***
Missing		.67***	.73***	.76***
Employment status (ref: Employed)				
Unemployed		2.17***	2.08***	1.99***
Homemaker		1.37***	1.47***	1.43***
Student		1.01	1.23***	1.19***
Retired		1.55***	1.66***	1.58***
Unable to work		12.31***	10.34***	9.09***
No medical insurance		1.33***	1.27***	1.28***
Has a personal doctor		1.38***	1.38***	1.26***

Table 2. Odds Ratios from Logistic Regression Models: Fair-to-poor Self-Rated Health

	Model 1	Model 2	Model 3	Model 4
Health Behaviors				
Smoking status (ref: Non-smoker)				
Former smoker			1.30***	1.25***
Smoke some days			1.53***	1.51***
Smoke every day			1.71***	1.72***
Heavy drinker			.96	1.02
Body Mass Index (ref: Normal)				
Overweight			1.12***	1.05***
Obese			1.95***	1.59***
Any exercise			.48***	.49***
Health Problems				
Diabetes				2.26***
Asthma				3.04***
Pseudo R^2	.08	.20	.23	.25

Sample Size = 1,416,717. ***p ≤ .001, **p ≤ .01, *p ≤ .05

Table 3. Odds Ratios from Ordered Logit Models: Continuous Self-Rated Health

	Model 1	Model 2	Model 3	Model 4
Racial Group (ref: Whites)				
Black	.62***	.81***	.87***	.90***
Asian	.97	.76***	.66***	.67***
American Indian	.52***	.76***	.81***	.86***
Other	.76***	.84***	.83***	.86***
Whites-Black	.72***	.86	.89	.92
Whites-Asian	1.41***	1.13	1.05	1.08
Whites-American Indian	.50***	.69***	.74***	.78***
Whites-Other	.74***	.82	.84	.87
Black-American Indian	.53**	.66***	.69**	.75**
Demographic Measures				
Age	.97***	.98***	.98***	.98***
Female	1.01	1.08***	1.01	1.02**
Marital status (ref: Married)				
Unmarried couple	.70***	.88***	.88***	.90***
Divorced or separated	.60***	.90***	.94***	.95***
Widowed	.61***	.97*	.94***	.94***
Never married	.70***	.99	.93***	.93***
Other adults in Hhld (ref: None)				
One	.89***	.93***	.92***	.93***
Two or more	.77***	.86***	.87***	.89***
Any children in Hhld	1.04***	1.05***	1.07***	1.05***
Socioeconomic Measures				
Completed education (ref: < HS)				
High school graduate		1.58***	1.47***	1.43***
Some college		1.95***	1.69***	1.67***
College graduate		2.86***	2.19***	2.16***
Annual hhld income (ref: <$25,000)				
$25,000 - $49,999		1.44***	1.40***	1.36***
$50,000 - $74,999		1.81***	1.72***	1.67***
$75,000 and above		2.43***	2.18***	2.11***
Missing		1.50***	1.36***	1.32***
Employment status (ref: Employed)				
Unemployed		.64***	.66***	.68***
Homemaker		.95***	.88***	.89***
Student		1.08***	.90***	.92***
Retired		.75***	.68***	.71***
Unable to work		.09***	.10***	.12***
No medical insurance		.85***	.90***	.90***
Has a personal doctor		.85***	.85***	.89***

Table 3. Odds Ratios from Ordered Logit Models: Continuous Self-Rated Health

	Model 1	Model 2	Model 3	Model 4
Health Behaviors				
Smoking status (ref: Non-smoker)				
Former smoker			.83***	.85***
Smoke some days			.68***	.68***
Smoke every day			.57***	.56***
Heavy drinker			1.01	.98
Body Mass Index (ref: Normal)				
Overweight			.74***	.76***
Obese			.42***	.48***
Any exercise			1.85***	1.82***
Health Problems				
Diabetes				.50***
Asthma				.32***
Pseudo R^2	.03	.08	.10	.12

Sample Size = 1,416,717. ***p ≤ .001, **p ≤ .01, *p ≤ .05

Table 4. Multi-Race Identity * Preferred Race Identity Cross-Tabulation

	Preferred Racial Identity						
Multi-Race Identity	Whites	Black	Asian	American Indian	Other	No Preference	Total
Whites-Black							
%	29.0	54.9	0.0	0.0	0.5	15.7	100%
N	532	1,008	0	0	9	288	1,837
Whites-Asian							
%	52.7	0.0	27.9	0.0	1.2	18.1	100%
N	564	0	299	0	13	194	1,070
Whites-American Indian							
%	79.5	0.0	0.0	15.2	0.2	5.1	100%
N	9,978	0	0	1,908	29	638	12,553
Whites-Other							
%	74.2	0.0	0.0	0.0	20.5	5.4	100%
N	982	0	0	0	271	71	1,324
Black-American Indian							
%	0.0	73.9	0.1	15.1	0.2	10.6	100%
N	0	918	1	188	2	132	1,242

Table 5. Multi-Race Adults: Odds Ratios from Logistic Regression and Ordered Logit Models Predicting Fair-to-Poor Self-Rated Health and Continuous Self-Rated Health, Using the Preferred Race Measure

PANEL A: Fair-to-poor SELF-RATED HEALTH (N = 1,416,683)

	Model 1	Model 2	Model 3	Model 4
Single Race Adults				
Whites (reference)	---	---	---	---
Black	1.75***	1.24***	1.18***	1.13***
Asian	.79***	1.10	1.29***	1.26***
American Indian	2.33***	1.49***	1.42***	1.31***
Other	1.61***	1.41***	1.45***	1.40***
Multi-Race Adults				
Preferred Whites	2.04***	1.55***	1.50***	1.42***
Preferred Black	1.66***	1.30	1.27	1.16
Preferred Asian	.91	1.27	1.34	1.30
Preferred American Indian	3.01***	1.95***	1.83***	1.67***
Preferred Other Race	1.60	1.13	1.19	1.16
No Preferred Race	2.00***	1.59**	1.56*	1.44*
Pseudo R^2	.08	.20	.23	.25

PANEL B: CONTINUOUS SELF-RATED HEALTH (N = 1,416,683)

	Model 1	Model 2	Model 3	Model 4
Single Race Adults				
Whites (reference)	---	---	---	---
Black	.62***	.81***	.87***	.90***
Asian	.97	.76***	.66***	.68***
American Indian	.52***	.76***	.81***	.86***
Other	.76***	.84***	.83***	.86***
Multi-Race Adults				
Preferred Whites	.58***	.72***	.76***	.80***
Preferred Black	.68***	.84*	.88	.92
Preferred Asian	1.57*	1.20	1.12	1.16
Preferred American Indian	.44***	.69***	.75**	.79*
Preferred Other Race	.86	1.04	1.04	1.10
No Preferred Race	.62***	.70***	.73**	.76*
Pseudo R^2	.03	.08	.10	.12

*p ≤ .05, **p ≤ .01; ***p ≤ .001

Model 1: Adjusted for demographic characteristics.
Model 2: Adjusted for demographic characteristics and socioeconomic status.
Model 3: Adjusted for demographic characteristics, socioeconomic status, and health behavior measures.
Model 4: Adjusted for demographic characteristics, socioeconomic status, health behavior, and health problem measures.