



Intersecting Positions of Social Disadvantage and Self-Reported Health Status Disparities

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Carla S. Alvarado , *Oregon State University*, alvaradc@onid.oregonstate.edu

Chunhuei Chi , *Oregon State University*, chunhuei.chi@oregonstate.edu

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Abstract

Health disparities along the gender, race and class are particularly important to monitor and study given the predicted differential distribution of health along these social identities. Intersectionality is a theoretical framework that allows public health and health disparities researchers to account for the simultaneous, mutually constitutive, reinforcing and multidimensional effects of gender, class, and race with the aim to better understand health disparities. Disparities along gender, race and class have been noted in self-reported health status (SRHS) which has been shown to be a strong predictive factor of mortality, morbidity and mental health independent of other physiologic, behavioral and psychosocial risk factors. To assess SRHS disparities through an intersectional lens, a quantitative application of the framework was applied to a secondary data analysis of the 2010 Medical Expenditure Panel Survey (MEPS) Household Component. Two models were constructed to assess the relationship between the probability of reporting a poor/fair health status and two versions of a variable denoting socially disadvantaged populations. The first model explored the relationship between poor/fair health status and a variable of interest that denoted low-income females of any minority racial group where the referent comprised of those individuals who did not meet the socially disadvantaged criteria for the model. The second model explored the relationship between poor/fair health status and a variable of interest that identified low-income females of five different racial groups (White, Black, Asian, Native [Native American/Alaskan Native & Native Hawaiian & other Pacific Islander], and Multiracial) compared to the referent (which was composed of those who did not meet the criteria to be in any of the social disadvantaged groups pertaining to the model). The models were estimated using survey-weighted logit regression with average marginal effects at varying levels of age (25, 45, and 65) and years of education (12 or 16 years). Results show that for the two models the social disadvantage variables had a positive relationship with the probability of reporting a poor/fair health status. For both models, the magnitude of the social disadvantage effect on the probability of reporting a poor/fair health status increased with age and was moderated by education levels, with higher levels of education reducing the magnitude of the social disadvantage effect. The second model results show that Black low-income females had an almost ten percentage point increase in the probability of reporting a poor or fair health status compared to the referent, the largest magnitude noticed in the results. It is important to study the joint effects of the social positions occupied by those bearing the burden of health disparities; applying the intersectional framework may elucidate on new ways to present, address and target health disparities. **Keywords:** Health Disparities, Health Inequities, Intersectionality, Social Disadvantage, Self-Reported Health Status

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School of Community Health Sciences

University of Nevada, Las Vegas

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Carla S. Alvarado, Oregon State University

Chunhuei Chi, Oregon State University

ABSTRACT

Health disparities along the gender, race and class are particularly important to monitor and study given the predicted differential distribution of health along these social identities. Intersectionality is a theoretical framework that allows public health and health disparities researchers to account for the simultaneous, mutually constitutive, reinforcing and multidimensional effects of gender, class, and race with the aim to better understand health disparities. Disparities along gender, race and class have been noted in self-reported health status (SRHS) which has been shown to be a strong predictive factor of mortality, morbidity and mental health independent of other physiologic, behavioral and psychosocial risk factors. To assess SRHS disparities through an intersectional lens, a quantitative application of the framework was applied to a secondary data analysis of the 2010 Medical Expenditure Panel Survey (MEPS) Household Component. Two models were constructed to assess the relationship between the probability of reporting a poor/fair health status and two versions of a variable denoting socially disadvantaged populations. The first model explored the relationship between poor/fair health status and a variable of interest that denoted low-income females of any minority racial group where the referent comprised of those individuals who did not meet the socially disadvantaged criteria for the model. The second model explored the relationship between poor/fair health status and a variable of interest that identified low-income females of five different racial groups (White, Black, Asian, Native [Native American/Alaskan Native & Native Hawaiian & other Pacific Islander], and Multiracial) compared to the referent (which was composed of those who did not meet the criteria to be in any of the social disadvantaged groups pertaining to the model). The models were estimated using survey-weighted logit regression with average marginal effects at varying levels of age (25, 45, and 65) and years of education (12 or 16 years). Results show that for the two models the social disadvantage variables had a positive relationship with the probability of reporting a poor/fair health status. For both models, the magnitude of the social disadvantage effect on the probability of reporting a poor/fair health status increased with age and was moderated by education levels, with higher levels of education reducing the magnitude of the social disadvantage effect. The second model results show that Black low-

income females had an almost ten percentage point increase in the probability of reporting a poor or fair health status compared to the referent, the largest magnitude noticed in the results. It is important to study the joint effects of the social positions occupied by those bearing the burden of health disparities; applying the intersectional framework may elucidate on new ways to present, address and target health disparities.

Keywords: Health Disparities, Health Inequities, Intersectionality, Social Disadvantage, Self-Reported Health Status

INTRODUCTION

Equity in health has been defined as minimizing avoidable disparities in health and its determinants between groups of people who have different levels of underlying social advantage (Braveman, 2006). Health disparities along the social categories of gender, race and class are particularly important to monitor and study given the differential distribution of health along these social identities (Cummings & Jackson, 2008). Health disparities research tends to focus particularly on the socially disadvantaged positions of gender, race and class, i.e. females, racial minorities, and those of a low socioeconomic status and their respective insulated relationships on health. These social positions are often treated as independent explanatory variables that are isolated from one another, and often the focus is placed on one of the social identities (e.g. racial minorities) and the rest are viewed as moderators (e.g. income status) or are controlled for (e.g. gender). However, the social categories that are occupied by individuals within a society are naturally intertwined, simultaneous, interdependent, dynamic and mutually-constitutive and not discrete (Weber & Parra-Medina, 2003). For example, the experience of being a woman is inextricable from and constituted by the social location of class and race; similarly, being of a higher social class status is modified and constituted by the race of a person and their gender (Schulz & Mullings, 2006). Health disparities scholars have noted that an individual's health cannot be sufficiently understood by examining only one of the social locations, identities or positions that they occupy (Williams et al., 2012). Therefore, it is important to study social categories and their joint or simultaneous effects on health; intersectionality is a framework that can guide health disparities researchers in this endeavor. To this end, this study applies a quantitative application of intersectionality to health disparities in self-reported health status in a U.S. nationally representative sample. The endeavor demonstrates that the simultaneity of multiple social disadvantaged intersections have a discernible and sizeable effect on self-reported health status, a recognized health indicator.

Gender, Race, Class and Health

Gender, race and class are social constructs that are a product of the time and place under which a particular society is functioning and as such are part of the social determinants of health (Glenn, 1999; Ridgeway, 1991). Gender, for example, has specific biological health implications for men and women and but also carries weight as a social construct by creating different opportunity structures that impact health (Evans, Whitehead, Diderichsen, Bhuiya, Wirth, & Whitehead, 2001). For instance, the still secondary role that women have in society (Rosaldo, Lamphere, & Bamberger, 1974) hinders access to resources that are known to have positive effects on health outcomes, such as income (Kilbourne, Farkas, Beron, Weir, & England, 1994), and positions of power within the workforce (Eagly & Carli, 2007) which directly and indirectly

grant access to health-related resources. Similarly, race, as a social construct, denotes the differential access to power and other less tangible resources in society like respect and deference (Andersen & Hill Collins, 1998). Racism, as an example of social discrimination behaviors, has been documented to have an impact on the ability of to maintain, produce and recover health (Paradies, 2006; Priest et al., 2012). In terms of socioeconomic (SES) status, a higher class standing not only affords greater and better access to health care services, including preventive services (Jackson and Cummings 2008), but is also associated with lower rates adverse health behaviors such as smoking and drinking and higher levels of positive health behaviors such as exercising and healthy eating habits (Isaacs & Schroeder, 2004; Lantz et al., 1998). When addressing racial disparities in health, SES accounts for much of the observed disparities (Williams, 1999).

Intersectionality

Intersectionality is a theoretical framework that allows public health and health disparities research to address the interconnectedness of social identities affecting health with the aim to achieve health equity. Intersectionality is a theoretical product of the Black feminist discourse of the 1970s and 1980s (Bowleg, 2012; Price, 2011). The term focused attention on the dynamics i.e. intersections of different social categories regarding antidiscrimination and social movement politics and has evolved into a conceptual tool for understanding how multiple social identities such as race, gender, sexual orientation, socioeconomic status (class), and disability intersect at the micro-level of individual experience to reflect interlocking systems of privilege and oppression (i.e., racism, sexism, heterosexism, and classism) at the macro-social structural level (Bowleg, 2012). The application of intersectionality to health research at large has focused on the impact that gender, class and race as social locations/identities have on the social and health conditions of those at their intersection (Schulz & Mullings 2006).

Intersectionality has become a core concept in women's and gender studies and has been applied to ethnic studies, legal studies, psychology, history, sociology, literature, philosophy, anthropology, geography and organizational studies as well as interdisciplinary gender studies and queer studies, yet remains underutilized in public health (Bowleg 2012; Cho, Crenshaw & McCall 2013). Historically, intersectional research has been approached via qualitative social research, such as archival work, ethnographies and in-depth interviews, allowing the processes and intersections of social categories to be recorded, described and explored (Dubrow, 2013). The quantitative application of intersectionality is still in its early stages (Veenstra, 2011; 2013) and recently there has been an increase in the research that employs quantitative applications of intersectionality on cross-sectional national survey data, mainly in Canada and Western Europe (Dubrow, 2013; Veenstra, 2011; Warner & Brown, 2011). In the U.S., the intersectional framework has been applied, both quantitatively and qualitatively, to HIV research, (Bowleg, Teti, Malebranche, & Tschann, 2013; Collins, von Unger, & Armbrister, 2008; Dworkin, 2005; Young & Meyer, 2005), mental health research (Ojeda & Bergstresser, 2008; Rosenfield, 2012; Seng, Lopez, Sperlich, Hamama, & Reed Meldrum, 2012) lung cancer (Williams et al., 2012) disability (Warner & Brown, 2011), smoking behaviors (Wallace et al., 2009), immigrant health (Rosemberg & Hsin-Chun, 2015; Viruell-Fuentes, Miranda, & Abdulrahim, 2012), health information seeking behaviors (Warren et al., 2012), women's reproductive health (Price, 2011), and men's health (Griffith, 2012). In particular to health disparities research and public health approaches, a nascent but mounting body of work is being produced (Bowleg, 2012; Brown,

Angela, & Adkins, 2012). In Canada, the intersectional framework has been specifically applied to national-sample survey data on a number of health issues including diabetes, hypertension, self-reported health status, and their corresponding inequities (Hankivsky, 2011; Veenstra, 2009; 2011; 2013).

Self- Reported Health Status and the Intersection of Gender, Race, and Class

Self-reported health status (SRHS) is an individual's evaluation of his or her general well-being of quality of life rather than an objective evaluation of the absence of disease (Cummings & Jackson 2008). Generally, self-reported health (also known as subjective, self-perceived, self-rated health) has strong predictive validity for mortality, morbidity and mental health independent of other physiologic, behavioral and psychosocial risk factors (Connelly, Philbrick, Smith Jr, Kaiser, & Wymer, 1989; DeSalvo, Bloser, Reynolds, He, & Muntner, 2006; Farmer & Ferraro, 2005; Idler & Benyamini, 1997; Idler & Kasl, 1991; Idler & Kasl, 1995; Kaplan & Camacho, 1983; Wannamethee & Shaper, 1991). Self-reported health status (SRHS) measures permit the assessment of health across a range of illnesses, thereby providing measurements that can reflect population health in both clinical and community settings; moreover the measure has been purported to serve as a monitoring tool for the outcome and quality of a broad range of both clinical care and public health programs (Franks, Gold, & Fiscella, 2003). Therefore, along with objective measures of health, disparities in SRHS are important to study.

Self-reported health status (SHRS) disparities have been identified along each of the socially disadvantaged positions of gender, race and class; that is, those who are female, racial minorities and the low income. The SRHS literature renders that the gender patterns are difficult to identify and distill. Some research has found that women report lower levels of health than men (Idler 2003), where others find that women's self-assessed health has improved over time and that as of 2004, there were no significant differences between the sexes (Schnittker, 2007). In terms of race, when comparing Blacks to Whites, studies have found that Blacks have lower levels of health compared to Whites and that perceived health declines faster for Blacks (Ferraro & Farmer, 1996). In regards to socioeconomic status, one of the most robust determinants of variations in health, low SES is associated with lower levels of self-reported health (House et al., 1994). Across gender and race, SES is important in determining the relationship with self-reported health status (Jackson and Cummings 2008). The literature has documented disparities in SRHS along gender, race and class as social categories; for example, by race and ethnicity (Borrell & Crawford, 2006; Borrell & Dallo, 2008; Braveman et al., 2005; Cagney, Browning, & Wen, 2005; Liang et al., 2010; Okosun, Choi, Matamoros, & Dever, 2001); gender and class (C. Borrell, Muntaner, Benach, & Artazcoz, 2004; Dunn, Walker, Graham, & Weiss, 2003); race and class (Ren & Amick, 1996); gender and race (Schulz et al., 2000); and by education (Bennett, Chen, Soroui, & White, 2009).

Intersectionality and Self-Reported Health Status

Intersectionality has been quantitatively applied to the study of self-reported health status disparities by race, gender and SES by a few authors (Cummings & Jackson, 2008; Veenstra, 2011; Warner & Brown, 2011) each with their own analytic method of applying intersectionality. Results have varied in terms of the quality of the relationships that the social categories have with SRHS. The Cummings and Jackson (2008) study tracked the changes in self-reported health status differentials by gender, race and class for a 30 year period and found that although

the overall gender gap had narrowed by 2004, there were significant differential remaining in terms of race. For instance, the authors report that White men have maintained the health advantage as time passes, and White women have (as of 2004) established parity with male peers (2008). However, they note that although Black women have seen an improvement in SRHS they continue to report the lowest levels of SRHS, and they also note that in the 30 year span the SRHS of Black men has been erratic and as of 2004 is in a general decline (Cummings & Jackson, 2008). The Warner and Brown (2011) study looked at the effect of race/ethnicity and gender on age-trajectories of functional limitations among White, Black, and Mexican-American Men and Women and examined the extent to which disability disparities stem from socially constructed differential access to life course capital. The authors found that White men had the lowest number of functional limitations, and that Mexican-American women had the highest number. The overall magnitude of the difference was slighter between men and women, but Black and Mexican American women had more functional limitations than the men of any race and White women (Warner & Brown, 2011). The Veenstra (2011) study sought to assess SRHS differentials by gender, race, class and sexual orientation applying different principles of intersectionality. The author found that when looking at health status and intersectionality in an additive approach, that Aborigines, Asians and South Asians, those of low SES and bisexuals reported a lower SRHS. When approached in a multiplicative manner, Veenstra found that the two-way interactions between each discrete social category and another rendered significant results indicating interactions in two axes of inequality. The study found that mitigating multiplicative effects on self-reported health were found in the poor and by Asian Canadians.

Since intersectionality highlights the need to address the interconnected and simultaneous intersections of identity that mark social difference, its quantitative application can help redefine how we think about and approach the relationships between health and social location to achieve health equity. The objective of this study is to explore disparities in self-reported health status through a quantitative application of intersectionality where the simultaneity of the social disadvantaged positions of being female, of a racial minority group, and low socioeconomic positions are accounted for.

METHODS

Data Collection and Sample

The data was retrieved from the U.S. Department of Health and Human Services' (USHHS) Agency for Healthcare Research and Quality's (AHRQ) Medical Expenditure Panel Survey (MEPS). The MEPS is a set of large-scale surveys of families and individuals, their medical providers, and employers across the United States. The MEPS is the most complete source of data on the cost and use of health care and health insurance coverage (AHRQ, 2014). The analytic file was retrieved from the 2010 Full-Year Consolidated Person-Level Data Household Component (MEPS-HC), a public access dataset. The MEPS-HC file provides information collected on a nationally representative sample of 32,846 persons of the civilian noninstitutionalized population of the United States for calendar year 2010. The corrections for non-applicable responses, age restriction (18+) as well as missing values rendered the analytic sample of individuals at 21,161. MEPS imputes missing data for variables by taking information from preceding rounds of data collection and thus the amount of missing variables for the yearly data is contained to a minimum with none of the social disadvantage indicator variables (gender,

race, class [low income]) having missing information and only 1.2% (409) of the dependent variable (perceived health status) was missing. MEPS survey person-level weights were employed. The Oregon State University Institutional Review Board determined that this research did not qualify as human subjects' research.

Variables of Interest

Self-Reported Health Status

Self-reported health status is ascertained in the MEPS HC survey by directly asking the respondent to rate his/her own health status on a five point scale: Excellent, Very Good, Good, Fair, and Poor. Given the categorical nature of the dependent variable, the variable was dichotomized to Fair/Poor (1) and Excellent/Very Good/ Good (0) in order to secure a viable sample size.

Socially Disadvantaged Positions of Gender, Race and Class

The gender of the survey participant is collected as standard demographic information of MEPS and is binary (female and male). In this analysis, the conception of gender is limited to the conventional binary operationalization of the sexes, i.e. female and male. It is acknowledged, however, that the social understanding of gender is more evolved than its binary designation.

The variable for race is the MEPS-imputed version of the variable since individuals are allowed to choose more than one race. The imputation sorted the response to the following categories: White (no other race reported), Black (no other race reported), American Indian or Alaskan Native (no other race reported), Asian (no other race reported), Native Hawaiian/Pacific Islander (no other race reported), and multiple races. The categorical variable of race was reconstructed to identify Whites, Blacks, Asians, Native populations (American Indian or Alaskan Natives and Native Hawaiians and Other Pacific Islanders) and those identifying as multiracial.

The concept of class was captured via a proxy; through the categorical variable of poverty level for 2010. The poverty level was constructed by MEPS by dividing the CPS (Current Population Survey) family income by the applicable poverty line (which itself is based on family size and composition). The categorical variable of poverty takes the continuous variable for each person and classifies it into one of five poverty categories: negative or poor (less than 100% FPL), near poor (100% to less than 125% FPL), low income (125% to less than 200% FPL), middle income (200% to less than 400%), and high income (greater than or equal to 400% FPL). The low-income indicator capturing the concept of class was constructed by combining the poor, near poor and low income categories.

Social Disadvantage Indicator Variables

Two variables capturing the simultaneity of social disadvantage were constructed. The first identified low-income females of *any* minority (non-white) racial group. The referent was composed of those who did not meet the socially disadvantaged criteria for this model. The second model identified low-income females of five different racial groups (White, Black, Asian, Native American/Alaskan/Native Hawaiian, and Multiracial); the referent was composed of those who did not meet the criteria to be in any of the social disadvantaged groups pertaining to this model (see Table 1).

Covariates

The covariates used in the models were selected given their respective established relationship with perceived health status. The age range of the sample was restricted to from 18

to 85 years. The education variable represents the years of formal schooling at the point of interview; the range is from 0 to 17. The indicators of employment status, marital status, and metropolitan statistical area (MSA) residence, and U.S. region of residence were included as well. Ethnicity has been included due to its importance and focus in the U.S. in terms of health disparities research and practice but is not the focus of this intersectional study. The utilization of indicator variables as independent variables, with the exception of age and years of education, yield categories with sufficient sample size for estimation and facilitate the interpretation of results (see Table 1).

Analytical Approach

Two models were constructed, the first included the social disadvantage variable of interest that denoted low-income females of a racial minority group and second included the social disadvantage variable that additionally identified racial groups. Average marginal effects were estimated to assess the magnitude of both social disadvantage variables at varying levels of age (25, 45, 65) and years of education (12 or 16 years). The models were specified as:

- (1) Intersection of Social Disadvantage Model:

$$y_i = f(\beta_0 + \beta_{\text{socialdisadvantage}}X_1 + X\beta_{\text{cov}X4-8}) + \varepsilon_i$$

- (2) Intersection of Social Disadvantage by Racial Group Model:

$$y_i = f(\beta_0 + \beta_{\text{social disadvantage by racial group}}X_1 + X\beta_{\text{cov}X4-8}) + \varepsilon_i$$

RESULTS

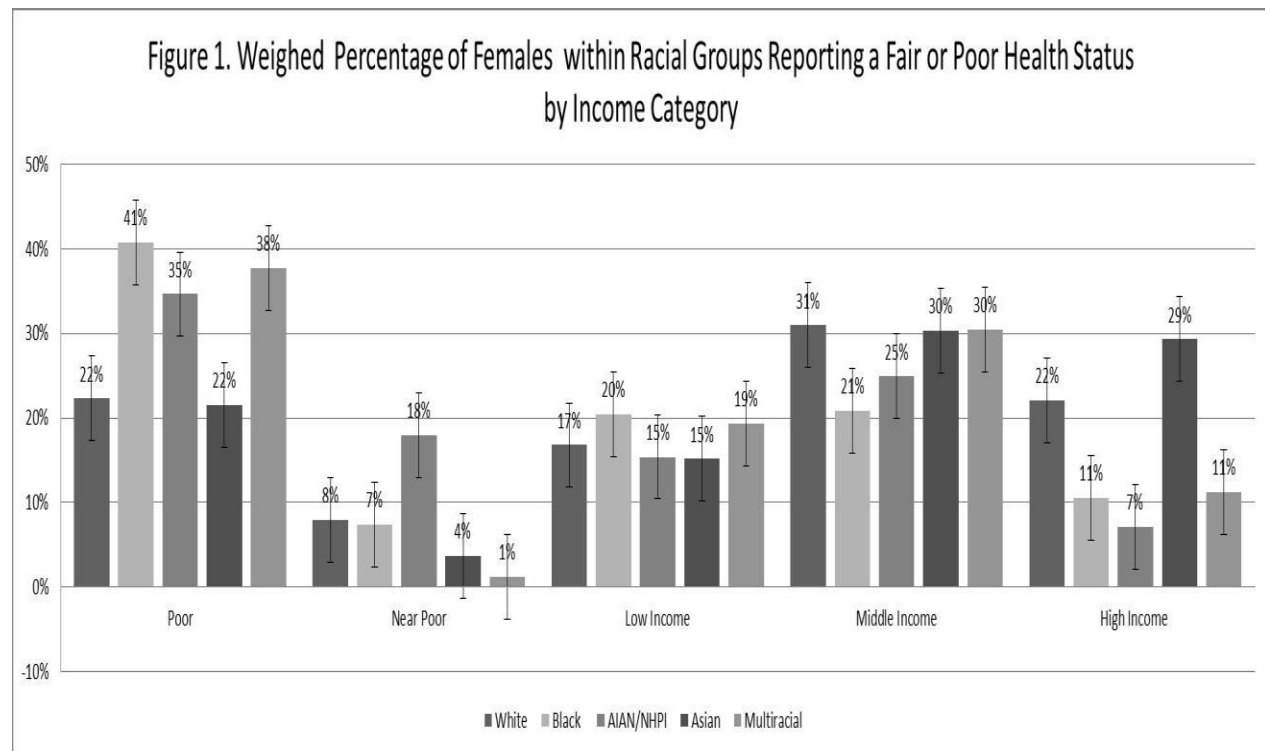
The weighed and unweighted summary statistics of the analytical sample of 2010 MEPC adults are presented in Table 1. Females comprised 53.36% of the unweighted sample, and 38.76% of were categorized as low income (<125% FPL). The racial group compositions were as follows: White 70.65%, Black 18.9%, Native 1.44%, Asian 7.64%, and Multiracial 1.38%. The number of individuals in the sample who fit the social disadvantaged designation of being low-income females of a racial minority group for the purposes of this study was 1,746 or 8.25% (unweighted) of the analytic sample. When the racial groups of the socially disadvantaged were assessed: Whites made up 15% Black 6%, Asians 1.14%, Native 0.43% and finally the multiracial population comprised of 0.33% of the unweighted sample.

Table 1. Summary Statistics: Characteristics of Analytic Sample (n= 21,161)

| Variable | Frequency | % (unweighted) | % (weighed) |
|---|-----------|-----------------------|----------------|
| Health status | | | |
| Good, Very Good and Excellent | 18,125 | 85.65 | 87.02 |
| Fair/Poor | 3,036 | 14.35 | 12.98 |
| Gender | | | |
| Female | 11,291 | 53.36 | 48.80 |
| Male | 9,870 | 46.64 | 51.20 |
| Poverty Category | | | |
| Low Income | 8,202 | 38.76 | 29.85 |
| Middle/High Income | 12,959 | 61.24 | 70.15 |
| Race | | | |
| White | 14,950 | 70.65 | 81.45 |
| Black | 4,000 | 18.9 | 11.46 |
| Native (American Indian/Alaska Native + Native Hawaiian/Pacific Islander) | 304 | 1.44 | 1.19 |
| Asian | 1,616 | 7.64 | 4.71 |
| Multiple races reported | 291 | 1.38 | 1.19 |
| Social Status | | | |
| Socially Disadvantaged Population Female, low income, racial minority | 1,746 | 8.25 | 4.43 |
| Social Disadvantage Groups by Racial Group | | | |
| White (Low Income Female) | 3,077 | 15 | 12.29 |
| Black (Low Income Female) | 1,346 | 6 | 3.20 |
| Asian (Low Income Female) | 241 | 1.14 | 0.68 |
| Native (Low Income Female) | 90 | 0.43 | 0.30 |
| Multiracial (Low Income Female) | 69 | 0.33 | 0.26 |
| Marital Status | | | |
| Married | 15,308 | 72.34 | 73.88 |
| Single | 5,853 | 27.66 | 26.12 |
| MSA | | | |
| MSA residence | 18,141 | 85.73 | 84.04 |
| non-MSA residence | 3,020 | 14.27 | 15.96 |

| Variable (Continued) | Frequency | % (unweighted) | % (weighed) |
|---------------------------|-----------|-----------------------|----------------|
| U.S. Region | | | |
| Northeast | 3,294 | 15.57 | 18.44 |
| Midwest | 4,382 | 20.71 | 21.95 |
| South | 7,949 | 37.56 | 36.69 |
| West | 5,536 | 26.16 | 22.93 |
| Hispanic Ethnicity | | | |
| Hispanic of any race | 4,989 | 23.58 | 13.70 |
| non-Hispanic of any race | 16,172 | 76.42 | 86.30 |
| Employment | | | |
| Not employed | 7,588 | 35.86 | 33.19 |
| Employed | 13,573 | 64.14 | 66.81 |
| Insurance Status | | | |
| Insured | 16,792 | 79.35 | 85.04 |
| Uninsured | 4,369 | 20.65 | 14.96 |

The weighted percentages of females reporting a fair or poor health status by income categories are presented in Figure 1.. In the poor income group (< 100% FPL), Black women were more likely to report a fair or poor health status. American Indian/ Alaskan Natives and Native Hawaiians/Pacific Islanders had the highest percentage of women reporting a fair or poor health status in the near poor category (100 to 125% FPL). In the low income (125% to <200% FLP) category, Blacks were again more likely to report a fair or poor/fair health status. At the middle income level (200 % to < 400%), white, Asian and multiracial women were more likely to reported a fair or poor health status. Asian women in the high income category (>400 % FLP) were more likely to report a fair or poor health status.



Intersection of Social Disadvantage Model

The model estimates show that the indicator variable of social disadvantage denoting low-income females of a racial minority group is positively associated with reporting a poor or fair health status and is highly significant ($p < 0.000$, see Table 2). The estimation of the average marginal effects, holding education (at 12 and 16 years) as well as age (at 25, 45, and 65 years) at combinations of representative levels is presented in Table 3. The average marginal effects estimates show that for this population, the probability of reporting a fair or poor health status increases with age and is moderated by education. For the high school education level (12 yrs.) population, the AMEs show that there is a 5 percentage point increase ($0.05 * 100$) in the probability of reporting a poor or fair health status compared to those who are not part of the socially disadvantaged population at 25 years of age. The probability of reporting a poor/fair health status increases by 6.2 percentage points at age 45 and by 7.4 percentage points by age 65. For those with a college level of education, the probability of reporting a poor/fair health status increases by 3.6, 4.6 and 5.6 percentage points at 25, 45, and 65 years of age, respectively.

Table 2. Intersection of Social Disadvantage Model Results

| <i>Social Position</i> | Coefficient | 95% Confidence Interval |
|---|--------------------|--------------------------------|
| Referent | Referent | |
| Socially Disadvantaged Indicator: Females, Low Income, Racial Minority | 0.491*** | [0.334,0.647] |
| <i>Covariates</i> | | |
| Education | -0.110*** | [-0.128,-0.092] |
| Age as of 2010 | 0.015*** | [0.011,0.019] |
| Marital Status | | |
| Married | Referent | |
| Single | -0.156 | [-0.312,0.001] |
| Residence | | |
| Non-MSA | Referent | |
| MSA | -0.276** | [-0.483,-0.070] |
| U.S. Region | | |
| Northeast | Referent | |
| Midwest | 0.057 | [-0.151,0.265] |
| South | 0.079 | [-0.101,0.260] |
| West | -0.101 | [-0.336,0.133] |
| Ethnicity | | |
| Not Hispanic | Referent | |
| Hispanic | 0.200* | [0.020,0.379] |
| Employment Status | | |
| Not employed | Referent | |
| Employed | -0.972*** | [-1.088,-0.856] |
| Insurance Status | | |
| Uninsured | Referent | |
| Insured public/private | -0.09 | [-0.234,0.054] |

n = 21,161

95% Confidence intervals in brackets,

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Model Statistics: $F(11, 195) = 70.38$ Prob > F = 0.0000

Referent: Individuals who were not low income, females of a racial minority

Table 3. Average Marginal Effects of Intersection of Social Disadvantage

| Social Disadvantage Indicator | AMEs | * | Delta-method Std. Err. | 95% Confidence Intervals |
|--|-------|-----|---------------------------|--------------------------------|
| Female, Low Income, Racial Minority at: | | | | |
| HS education, Age 25 | 0.05 | *** | 0.01 | 0.032 0.069 |
| HS education, Age 45 | 0.062 | *** | 0.011 | 0.039 0.084 |
| HS education, Age 65 | 0.074 | *** | 0.014 | 0.047 0.101 |
| College education, Age 25 | 0.036 | *** | 0.007 | 0.022 0.05 |
| College education, Age 45 | 0.046 | *** | 0.009 | 0.029 0.062 |
| College education, Age 65 | 0.056 | *** | 0.011 | 0.035 0.077 |

Comparison is made against the referent *p< 0.05 **p< 0.01 *** p< 0.000

Intersection of Social Disadvantage by Racial Group Model

The model shows that low-income females who identify with three (White, Black and Multiracial) of the five racial groups have a statistically significant higher probability of reporting a poor or fair health status (White and Black, $p<0.000$, and Multiracial, $p<0.05$) (see Table 4). Only the average marginal effects of the White, Black and Multiracial racial categories were estimated (see Table 5). When compared to the referent, White low-income females aged 25 years with 12 years of education had a 3.1 percentage point increase in the predicted probability of reporting a poor/fair health status, those aged 45 had a percentage point increase of 3.9, and those aged 65 had a percentage point increase of 4.7. The college level education individuals aged 25, had a percentage point increase of 2.2, while those aged 45 had a 2.8 percentage point increase and those aged 65 had an increase of 3.6 percentage points.

Black low-income females with a high school level of education and aged 25 had a 6.5 percentage point increase in the probability of reporting a poor/fair health status compared to the referent, while the 45 year-old group had an 8 percentage point increase, and the 65 year-old group had a 9.6 increase, the largest percentage point increase seen in the results. It is worthy to note that the average marginal effects show that for both the Black and White intersectional groups the predicted probability of reporting a poor/fair health status increased with age as with the lower levels of education. Although the average marginal effects for the multiracial intersectionality group were not statistically significant at the 0.05 level, they were close and exhibited the same patterns of modification by education and age as the White and Black intersectionality groups.

Table 4. Intersection of Social Disadvantage by Racial Group Model Results

| | Coefficient | 95% Confidence Interval |
|------------------------------------|--------------------|--------------------------------|
| <i>Social Disadvantage by Race</i> | | |
| Referent | Referent | |
| White Female Low Income | 0.336*** | [0.200,0.471] |
| Black Female Low Income | 0.627*** | [0.451,0.804] |
| Native Female Low Income | 0.657 | [-0.002,1.316] |
| Asian Female Low Income | -0.021 | [-0.428,0.386] |
| Multiracial Female Low Income | 0.897* | [0.162,1.633] |
| <i>Covariates</i> | | |
| Education | -0.107*** | [-0.124,-0.089] |
| Age as of 2010 | 0.015*** | [0.012,0.019] |
| Marital Status | | |
| Married | Referent | |
| Single | -0.152 | [-0.309,0.005] |
| Residence | | |
| Non-MSA | Referent | |
| MSA | -0.260* | [-0.464,-0.055] |
| U.S. Region | | |
| Northeast | Referent | |
| Midwest | 0.05 | [-0.154,0.255] |
| South | 0.078 | [-0.100,0.256] |
| West | -0.092 | [-0.322,0.137] |
| Ethnicity | | |
| Not Hispanic | Referent | |
| Hispanic | 0.153 | [-0.028,0.334] |
| Employment Status | | |
| Not employed | Referent | |
| Employed | -0.921*** | [-1.038,-0.803] |
| Insurance Status | | |
| Uninsured | Referent | |
| Insured public/private | -0.081 | [-0.224,0.062] |

n= 21,161 * p < 0.05, ** p < 0.01, *** p < 0.001 Model Statistics: F(15,191) = 56.14,

Prob > F = 0.0000 Referent: Individuals who did not meet criteria to be in any of the socially disadvantaged groups.

Table 5. Average Marginal Effects- Intersection of Social Disadvantage by Racial Group

| Social Disadvantage by Racial Group | AMEs | * | Delta-method Std. Err. | 95% Confidence Intervals |
|--|-------|-----|---------------------------|--------------------------------|
| White, Low Income, Female Group | | | | |
| At | | | | |
| HS education, Age 25 | 0.031 | *** | 0.007 | 0.018 0.044 |
| HS education, Age 45 | 0.039 | *** | 0.009 | 0.022 0.055 |
| HS education, Age 65 | 0.047 | *** | 0.01 | 0.027 0.068 |
| College education, Age 25 | 0.022 | *** | 0.005 | 0.012 0.032 |
| College education, Age 45 | 0.028 | *** | 0.006 | 0.016 0.041 |
| College education, Age 65 | 0.036 | *** | 0.008 | 0.02 0.051 |
| Black , Low Income, Female Group | | | | |
| at | | | | |
| HS education, Age 25 | 0.065 | *** | 0.011 | 0.043 0.087 |
| HS education, Age 45 | 0.08 | *** | 0.013 | 0.053 0.106 |
| HS education, Age 65 | 0.096 | *** | 0.016 | 0.065 0.127 |
| College education, Age 25 | 0.047 | *** | 0.008 | 0.03 0.063 |
| College education, Age 45 | 0.059 | *** | 0.01 | 0.039 0.08 |
| College education, Age 65 | 0.074 | *** | 0.013 | 0.049 0.099 |
| Multiracial, Low Income, Female Group | | | | |
| at | | | | |
| HS education, Age 25 | 0.102 | | 0.056 | -0.007 0.212 |
| HS education, Age 45 | 0.124 | | 0.066 | -0.005 0.253 |
| HS education, Age 65 | 0.147 | | 0.075 | 0 0.295 |
| College education, Age 25 | 0.075 | | 0.043 | -0.008 0.158 |
| College education, Age 45 | 0.094 | | 0.052 | -0.008 0.196 |
| College education, Age 65 | 0.115 | | 0.062 | -0.007 0.237 |

*p< 0.05 **p< 0.01 *** p< 0.000
Comparison is made against the referent

DISCUSSION

This study explores self-reported health status disparities through a quantitative application of the intersectional framework using nationally representative sample in the U.S. Two models were constructed to assess the relationship between the probability of reporting a

poor/fair health status and two versions of a variable denoting socially disadvantaged populations using survey-weighted logit regression with average marginal effects. The first model explored the relationship between poor/fair health status and a variable of interest that denoted low-income females of any minority racial group where the referent was composed of individuals who did not meet the criteria to be part of the social disadvantage group. The second model explored the relationship between poor/fair health status and a variable of interest that compared low-income females of five different racial groups (White, Black, Asian, Native American/Alaskan/Native Hawaiian, and Multiracial) to the referent (those who did not meet the criteria to belong to any of the social disadvantaged groups). Average marginal effects were estimated to assess the magnitude of both social disadvantage models at varying levels of age (25, 45, 65) and years of education (12 or 16 years). Results show that for the two models the respective social disadvantage variables had a positive relationship with the probability of reporting a poor/fair health status. For both models, the magnitude of the effect on the probability of reporting a poor/fair health status increased with age and was moderated by education levels, with higher levels of education reducing the magnitude of the social disadvantage effect. The second model results show that Black, low-income females had almost a ten percentage point increase in the probability of reporting a poor or fair health status compared to the white, high/middle income male, the largest magnitude noticed in the results.

The results of this study are in agreement other intersectional health disparities literature that has documented that Black women remain the most disadvantaged in terms of health given their self-reported health status levels (Cummings & Jackson, 2008). Also in agreement with other intersectionality and SRHS research, is the finding that even when only two social identities are accounted for simultaneously there are discernible effects on self-reported health. For example, Veenstra found that the two-way interactions between each discrete social category (gender, race, class and sexual orientation) and another rendered statistically significant interaction effects, where some interactions reduced the probability of reporting a poor/fair health status, some increased it and some interactions were neutral on SRHS. In contrast with what Jackson and Cummings (2008) found, this study found a gender gap between White males and females, albeit this was a cross-sectional analysis not directly comparable to a panel analysis. The findings show that education does not offer the same advantages to the self-reported health of Blacks as it does for the SRHS of Whites. The attenuated social advantage derived by the Black population has also been noted in infant mortality, where Black women of high and middle incomes still have higher rates of mortality than White women of any income level and even the exacerbation of negative birth outcomes as educational attainment increases has been noted (Giscombe & Lobel 2005). The persistence of study results that identify Black women as the ones with worse health outcomes requires public health policy and resource attention. These findings also support the application of the life-course perspectives to intersectionality, health disparities and public health research (Berkman, 2009), given the extended exposure of older individuals in disadvantaged positions to the social forces that affect the maintenance and production of health (Shuey & Willson, 2008).

The findings show the need to account for social categories simultaneously when investigating health disparities so as to provide a more complete and realistic picture of the health burden carried by socially disadvantaged groups. The consideration of the simultaneity and mutually constitutive nature of these social identities should be present at every stage of the

research and practice process given its improved representation of simultaneous social identities (Rosemberg & Hsin-Chun, 2015). In terms of health disparities research, the majority is still presented on a racial and ethnic basis undermining the important role that other social categories play in the production and reproduction of health disparities and in the attention they deserve at the policy level. A key action to the incorporation of intersectionality to health disparities research is the support of important funding agencies to foster an amenable environment where intersectional research can flourish. Fortunately, a few years ago in recognition that the experiences of “LGBT individuals are not uniform and are shaped by factors of race, ethnicity, socioeconomic status, geographical location, and age, [...] can have an effect on health-related concerns and needs” the Institute of Medicine opted to include intersectionality in its effort to address LGBT health disparities (IOM, 2011). An important step to the integration of intersectionality informed stance to health disparities research.

There are several limitations with this research. First, the intersectionality definition used in this quantitative approach is limited to gender, race and class. The researcher acknowledges the fact that this “trinity,” as termed in the literature, only represents the most prominent of social categories and does not delve into other social identities and categorizations like the lesbian, gay, bisexual and transsexual (LGBT), disability communities or ethnicity. This does not mean that these social categories are not important or worthy of study, it simply denotes that the focus here is placed on the three “master” social categories that arguably every individual must navigate throughout their respective lifetime. Ethnicity, for example, was not included in either of the social disadvantaged variables because it would constrain the sample size of the groups to a level where statistical analyses would be made unfeasible. We did account for ethnicity, however, in the covariates given its importance in health disparities research in the U.S.; ethnicity had a positive association with poor/fair self-reported health status. Moreover, it is acknowledged that although interconnected, each category in the trinity has a different ontological basis, irreducible to other social divisions and are therefore not qualitatively the same (Dhamoon & Hankivsky, 2011). Nonetheless, given the documented relationship between each of the trinity components and health the approach is defensible. Second, each of the variables used to identify the intersectional population do not have “socially inclusive” categorizations. For example, the social understanding of gender is more evolved than its binary designation and the “macro” grouping of racial groups like Asian, sometimes suppresses health disparities within subgroups (Southeast Asians, Cambodians, and Hmong) but without the copious collection and availability of disaggregated data, researchers are left without the ability to study subgroup dynamics. Third, the operationalization of class in this instance is limited to the MEPS poverty level categorization and is based solely on family income as opposed other approaches that combine income/wealth or assets, education level and profession/occupation. This highlights the need to collect data that does not divorce social contexts from health related data and that is made available for study. Intersectionality supports the current heightened focus on the collection, analysis and presentation of surveillance and health data that allow examination of the interplay of multiple identities across several social categories (Bowleg, 2012). Finally, the analyses are cross-sectional and the causal inferences that can be drawn are limited, even so they are informative.

CONCLUSION

The vocalized desire of health disparities scholars and researchers in the U.S. to move beyond the enumeration of health disparities by race and ethnicity is heard by the application of intersectionality where multiple social identities are taken into consideration simultaneously (Bowleg, 2012). Intersectionality can help elucidate on the relationships between the production, maintenance and restoration of health, and intersecting social positions (Warner & Brown, 2011) that go beyond the additive and multiplicative relationships. In terms of public health activities, the application of an intersectionality-informed stance to public health can facilitate the development of well-targeted and comprehensive health promotion messages, interventions and policies (Bowleg, 2012). The intersectional framework also supports intersectoral approaches, where the collaboration and communication are the tools to achieve an integration of programs, policies and interventions that take a holistic approach to health and wellbeing. Intersectoral approaches have a tangible role to play in addressing health disparities in that advocacy groups from civil society, and distinct governmental programs (from different agencies) may truly collaborate to address disparities in an intersectional approach. Investments in areas outside of health and public health, like education, employment and standards of living for example, are necessary to improve health for all populations and even more so for those who are disadvantaged. The social determinants of health have to be considered integrated into health and other social policies for a chance of actually improving health status. Intersectoral approaches are already being developed, such as the Federal Interagency Team to Address Health Disparities. Moreover, the framework also supports the current heightened focus on the collection, analysis and presentation of surveillance and health data that allow examination of the interplay of multiple identities across several social categories (Bowleg, 2013).

Future research may employ the intersectionality framework to inform health disparities research in the areas of health services, health outcomes and health policy. As policies are developed and resources are targeted to address health disparities using the social determinants of health approach, intersectionality is positioned to explore these as they actually occur, simultaneously. The application of intersectionality can lead to the identification and enumeration of yet unseen health inequities and aid in developing more defined population-based interventions as well as support the integration of services to better support these populations and further commit to health equity.

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