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At the intersection of sexual orientation, race/ethnicity, and cervical cancer screening: Assessing Pap test use disparities by sex of sexual partners among black, Latina, and white U.S. women

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ABSTRACT

Understanding how various dimensions of social inequality shape the health of individuals and populations poses a key challenge for public health. Guided by ecosocial theory and intersectionality, we used data from the 2006–2010 National Survey of Family Growth, a national probability sample, to investigate how one dimension of sexual orientation, sex of sexual partners, and race/ethnicity jointly influence Pap test use among black, Latina and white U.S. women aged 21–44 years ($N = 8840$). We tested for an interaction between sex of sexual partners and race/ethnicity ($p = 0.015$) and estimated multivariable logistic regression models for each racial/ethnic group, adjusting for socio-demographic factors. The adjusted odds of Pap test use for women with only female sexual partners in the past year were significantly lower than for women with only male sexual partners in the past year among white women (odds ratio [OR] = 0.25, 95% confidence interval [CI]: 0.12,0.52) and may be lower among black women (OR = 0.32, 95% CI: 0.07,1.52); no difference was apparent among Latina women (OR = 1.54, 95% CI: 0.31,7.73). Further, the adjusted odds of Pap test use for women with no sexual partners in the past year were significantly lower than for women with only male sexual partners in the past year among white (OR = 0.30, 95% CI: 0.22,0.41) and black (OR = 0.23, 95% CI: 0.15,0.37) women and marginally lower among Latina women (OR = 0.63, 95% CI: 0.38,1.03). Adding health care indicators to the models completely explained Pap test use disparities for women with only female vs. only male sexual partners among white women and for women with no vs. only male sexual partners among Latina women. Ecosocial theory and intersectionality can be used in tandem to conceptually and operationally elucidate previously unanalyzed health disparities by multiple dimensions of social inequality.

1. Introduction

Understanding how multiple dimensions of social inequality simultaneously shape the health of individuals and populations poses a key challenge for public health. Given that almost all prior studies had assessed the social patterning of cervical cancer screening in relation to either sexual orientation or race/ethnicity, we investigated how sex of sexual partners, a dimension of sexual orientation, and race/ethnicity jointly influence U.S. women's utilization of the Pap test, a lifesaving tool that detects changes in cells of the uterine cervix before cancer develops (Safaeian et al., 2007). Our empirical analysis, which relied on a national probability sample, was explicitly informed by two complementary theories: ecosocial theory and intersectionality.

Ecosocial theory, a multilevel theory of population disease distribution, addresses the central question of "Who and what is responsible for patterns of health, disease, and well-being as manifested in present, past, and changing social inequalities in

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health?" (Krieger, 1994, 2001a, 2001b, 2011, 2014). This social epidemiologic theory offers four constructs to help investigators assess how societal factors influence health inequities across the lifecourse, including: 1) embodiment, which refers to how humans – as both social beings and biological organisms – literally incorporate and manifest lived experiences of social inequality; 2) pathways of embodiment, or the multiple ways in which societal factors become incorporated as population health outcomes; 3) the cumulative interplay between exposure, susceptibility, and resistance to social inequality at multiple levels, in multiple domains, and at multiple spatial and temporal scales; and 4) accountability and agency – not only in terms of who and what is responsible for the social patterning of disease and the (re)production of health inequities but also on the part of epidemiologists for the theories they use, explicitly or implicitly, to describe and explain population distributions of disease, including health inequities (Krieger, 1994, 2001a, 2001b, 2011, 2014). Moreover, ecosocial theory draws attention to how and why the population distribution of disease varies not only across but also *within* social groups and thus promotes nuanced, population-level thinking about how multiple dimensions of social inequality singly and jointly influence the patterning of health in historical and ecological context (Krieger, 1994, 2001a, 2001b, 2011, 2014).

Our analysis was also guided by intersectionality, a sociological theory with roots in black feminist thought (The Combahee River Collective, 1986; Davis, 1983; hooks, 1981; Smith, 1998; Collins, 2000) that focuses on how individuals' lived experience is simultaneously shaped by interlocking systems of oppression related to gender, race/ethnicity, socioeconomic position (SEP), and sexuality (Crenshaw, 1989, 1991; Bowleg, 2008; Hancock, 2007; Weber, 2009; Bowleg, 2012). Of note, intersectionality provides empirical researchers with a theoretical basis for conceptually and operationally identifying how multiple dimensions of social inequality simultaneously influence population health, including health inequities (Hankivsky et al., 2010; Bauer, 2014). By drawing on both ecosocial theory and intersectionality, this paper examines whether – in a dynamic process that involves the distribution of social and economic resources, the political economy of health care, and the embodiment of societal factors in the form of individual and collective agency (Krieger, 1994, 2001a, 2001b, 2011, 2014; Connell, 2012) – one dimension of sexual orientation, sex of sexual partners, and race/ethnicity jointly influence U.S. women's utilization of services to screen for cervical cancer, a preventable and treatable disease primarily caused by the sexually-transmitted human papillomavirus (HPV) (National Cancer Institute, 2011).

Although self-identified lesbians and women who have sex with women are at risk of HPV from female and male sexual partners throughout the lifecourse (Singh and Marrazzo, 2009; Marrazzo and Gorgos, 2012), they are less likely than self-identified heterosexual women and women who have sex with men only, respectively, to have received a Pap test (Fish, 2009; Agénor et al., 2014; Diamant et al., 2000; Kerker et al., 2006; Mays et al., 2002; Marrazzo et al., 2001; Matthews et al., 2004; Cochran et al., 2001; Brown and Tracy, 2008; Tracy et al., 2010; Tracy et al., 2013; Charlton et al., 2011). Researchers have also identified racial/ethnic disparities in cervical cancer screening – as well as incidence, stage of diagnosis, treatment, survival, and mortality – among U.S. women (Centers for Disease Control and Prevention, 2013a; Virnig et al., 2009; Garner, 2003; Newmann and Garner, 2005; National Center for Health Statistics, 2013; Singh et al., 2011; Siegel et al., 2013; Chen et al., 2012; Chen et al., 1994; Ward et al., 2004). In particular, among women aged 18 years and older who received a Pap test in the last three years, Asian (68.0%) women had the lowest cervical cancer screening prevalence in 2010, followed by white (72.8%), American Indian/Alaska Native (73.4%), Latina (73.6%), and black (77.9%) women (National Center for Health Statistics, 2013). Further, Surveillance, Epidemiology, and End Results (SEER) data show that, between 2006 and 2010, the age-adjusted cervical cancer incidence rates were 10.9 per 100,000 for Latina women and 9.6 per 100,000 for black women compared to 7.9, 7.3, and 6.6 per 100,000 for white, American Indian/Alaska Native, and Asian/Pacific Islander women, respectively (Howlader et al., 2013). During the same time period, age-adjusted cervical cancer mortality rates were highest among black women (4.2 per 100,000), followed by American Indian/Alaska Native (3.5 per 100,000), Latina (2.9 per 100,000), white (2.2 per 100,000), and Asian/Pacific Islander (1.9 per 100,000) women (Howlader et al., 2013).

Despite evidence of cervical cancer screening disparities by sexual orientation on the one hand and race/ethnicity on the other, only one sub-national U.S. study has investigated the distribution of Pap test use in relation to both dimensions of social inequality using a non-population based sample of lesbian and bisexual women living in Los Angeles County (Mays et al., 2002). Our paper is the first to investigate whether one dimension of sexual orientation, sex of sexual partners, and race/ethnicity – in relation to socioeconomic and health care factors – jointly influence Pap test use in national probability sample of U.S. women. Further, although other investigators have noted the lack of data on cervical cancer screening among U.S. women of color who have sex with women (Mays et al., 2002; Kerr, 2006; Rankow, 1995; Cochran et al., 2001; Matthews et al., 2013), we present the first nationally representative estimates of Pap test use among black and Latina U.S. women with female sexual partners.

2. Methods

2.1. Study participants

We analyzed data from the 2006–2010 National Survey of Family Growth (NSFG), which used a stratified, three-stage probability sampling strategy to establish a representative sample of 10,403 men and 12,279 women aged 15–44 years in the civilian, non-institutionalized population residing in the 50 U.S. states and the District of Columbia (Centers for Disease Control and Prevention, 2013b). The 2006–2010 NSFG, which had a response rate of 78% among women overall, over-sampled black and Latino/a individuals such that each group represented approximately 20% of the total sample (Lepkowski et al., 2010).

We limited our analyses to women aged 21 years and above in line with American Congress of Obstetricians and Gynecologists (ACOG) cervical cancer screening guidelines during the study period ($n = 9581$) (ACOG Committee on Practice Bulletins, 2003; ACOG Committee on Practice Bulletins, 2009). Additionally, we excluded women who identified as "other" or "multiple race" ($n = 741$) due to their heterogeneity and sample size, which would preclude analyses by sex of sexual partners, and restricted our analytic sample to the 8840 women aged 21–44 years who identified as black ($n = 1904$), Latina ($n = 2090$), or white ($n = 4846$).

2.2. Measures

The NSFG assessed Pap test use as follows: "In the past 12 months, have you received a Pap smear?" Possible responses included "yes," "no," or "don't know." Although the survey measures all three main dimensions of sexual orientation – sexual attraction, sexual identity, and sex of sexual partners – we decided to use sex of sexual partners in the past year as the single measure of sexual orientation in this study. Indeed, the sex of women's sexual partners influences women's and health care providers'