Social Science & Medicine 185 (2017) 71–80

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed

Asian Americans and disproportionate exposure to carcinogenic hazardous air pollutants: A national study

Sara E. Grineski Professor of Sociology *, Timothy W. Collins Professor of Geography, Danielle X. Morales Postdoctoral Fellow

Department of Sociology and Anthropology, BUILDing SCHOLARS, University of Texas at El Paso, 500 W. University Ave., El Paso, TX, USA

ARTICLE INFO

Article history:
Received 21 October 2016
Received in revised form
19 April 2017
Accepted 17 May 2017
Available online 18 May 2017

Keywords:
Environmental injustice
Asian Americans
Hazardous air pollutants

ABSTRACT

Studies have demonstrated disparate exposures to carcinogenic hazardous air pollutants (HAPs) in neighborhoods with high densities of Black and Hispanic residents in the US. Asians are the fastest growing racial/ethnic group in the US, yet they have been underemphasized in previous studies of environmental health and injustice. This cross-sectional study investigated possible disparities in residential exposure to carcinogenic HAPs among Asian Americans, including Asian American subgroups in the US (including all 50 states and the District of Columbia, $n = 71{,}208$ US census tracts) using National Air Toxics Assessment and US Census data. In an unadjusted analysis, Chinese and Korean Americans experience the highest mean cancer risks from HAPs, followed by Blacks. The aggregated Asian category ranks just below Blacks and above Hispanics, in terms of carcinogenic HAP risk. Multivariate models adjusting for socioeconomic status, population density, urban location, and geographic clustering show that an increase in proportion of Asian residents in census tracts is associated with significantly greater cancer risk from HAPs. Neighborhoods with higher proportions (as opposed to lower proportions) of Chinese, Korean, and South Asian residents have significantly greater cancer risk burdens relative to Whites. Tracts with higher concentrations of Asians speaking a non-English language and Asians that are US-born have significantly greater cancer risk burdens. Asian Americans experience substantial residential exposure to carcinogenic HAPs in US census tracts and in the US more generally.

1. Introduction

Air pollution is a significant international public health threat, causing more than seven million deaths per year. Outdoor air pollution exposure is linked with heart disease, stroke, respiratory diseases and cancer (World Health Organization, 2014). In cities and countries worldwide, the burden of outdoor environmental exposures is more often borne by low-income and minority people (Crouse et al., 2009; Jephcote and Chen, 2013; Pearce et al., 2011). In the United States, Black and Latino/a populations experience greater exposure to environmental toxics than do Whites (Bell and Ebisu, 2012; Clark et al., 2014; Jones et al., 2014; Mohai et al., 2009). This uneven exposure is termed 'environmental injustice' and is a contributing factor to disparities in health (Coker et al., 2016; Payne-Sturges and Gee, 2006; Pearce et al., 2011). Asians are the fastest growing racial/ethnic group in the US (Pew Research Center, 2016), yet they have been underemphasized in previous studies of environmental health and injustice. Currently, there are over 18 million Asian Americans in the US. They comprise 6% of the total population and three-quarters of Asian adults are foreign-born (Pew Research Center, 2016).

The lack of attention paid to the environmental health of the nation's fastest growing racial/ethnic group likely relates to the model minority label, which has been applied to Asian Americans, since they have the highest incomes and levels of education of all racial groups in the US. Specifically, half of Asian American adults have a college degree compared to one-quarter of all Americans, and their median annual household income is $66,000 compared to the national average of $49,800 (Pew Research Center, 2016). The model minority label was originally constructed in a context of Black-White race relations in the 1960s and used to undermine arguments for race-specific policies to promote the status of disadvantaged minorities (Yi et al., 2016). The claims underpinning the label are that the failures of non-Asian minorities are

* Corresponding author.
E-mail addresses: segrineski@utep.edu (S.E. Grineski), twcollins@utep.edu (T.W. Collins), xdeng2@utep.edu (D.X. Morales).

http://dx.doi.org/10.1016/j.socscimed.2017.05.042
0277-9536/

attributable to personal shortcomings, such as laziness, rather than socially-structured disadvantages, and that Asian minorities are hard-working individuals whose success reflects the unfettered opportunities available to everyone in the US.

The model minority label has diverted attention away from health disparities experienced by the Asian American population. For example, cancer is the leading cause of death for Asian Americans (CDC, 2010; Chen, 2005), yet physicians recommend preventative cancer screenings to Asian patients at a lower rate than other groups, in part because of the model minority stereotype (Ibaraki et al., 2014). The neglect of health disparities experienced by Asian Americans has only recently been highlighted in the political arena. In 2009, President Obama signed an Executive Order on the Asian community, which included calling for strategies to improve the health of Asian Americans and to redress health disparities impacting them (Obama, 2009).

It is likely that the model minority label has informed conventional wisdom within the research community regarding who in the US is likely to experience environmental health disparities. Asians are included less often than Blacks and Latinos/as in studies of environmental health disparities and injustice, based on the conventional presumption that they would have similar risk profiles to Whites. Sometimes, their population size in a given study area is too small for them to be considered. When Asians are examined, results indicate that they face higher risk from environmental health hazards than Whites (Clark et al., 2014; Cushing et al., 2015; Downey et al., 2008; Houston et al., 2014; Lievanos, 2015; McKelvey et al., 2007; Morello-Frosch and Jesdale, 2006; Payne-Sturges and Gee, 2006) [see Jones et al. (2014) for an exception]. However, results indicative of disproportionate risk for Asian Americans have been de-emphasized in many studies.

The model minority label has obfuscated understanding of environmental health disparities experienced by Asian Americans in varied ways. First, the population-level statistics documenting high levels of education and income among Asian Americans conceal the systemic racism that Asians have experienced in the US over the past 150 years (Chou and Feagin, 2015). Greater recognition of this racism would lead to more research on its effects, including those related to environmental health.

Second, internalization of the model minority label by many Asian Americans has produced individuated understandings and experiences of racial oppression. As compared to Black Americans, Asian Americans more often suffer alone and in silence after being victims of discriminatory incidents, which disables them from collectively mobilizing based on their shared experiences of oppression (Chou and Feagin, 2015). In Black communities, there is a stronger collective memory of racism and resistance culture. This contributes to lower levels of social movement organizing by Asians as compared to Blacks (Chou and Feagin, 2015).

Third, the label was strategically created and circulated in the Civil Rights era in order to drive a wedge between other minorities and Asians, as dominant Whites upheld Asians as an example of minority success and evidence for the existence of equal opportunity (Yi et al., 2016). The logical extension of accepting this discourse as fact is that the prevalence of environmental health disparities among Asians in the US appears highly improbable (and, in any case, inexplicable), since it is taken for granted that Asian Americans share high status with Whites. Relatedly, it should be recognized that the environmental justice (EJ) movement itself—and the attendant research on environmental health disparities that the EJ movement spawned—is a political-racial project connecting Civil Rights concerns about racial equality to environmental conditions (Pulido, 1996). It should thus come as no surprise that the dominant framing of EJ in the US has been one of low-income Blacks, and more recently Latino/as, facing environmental injustices in their neighborhoods, with Whites being environmentally privileged. As a result, Asian EJ organizing has been poorly documented in the academic literature and rarely recognized by the wider EJ community, which Sze (2004) terms “the problem of Asian invisibility” (p. 155). In cities across the US, Asian communities have mobilized against hazards in their communities, winning a multilingual warning system and halting an expansion at a Chevron Refinery in Richmond, CA (Asian Pacific Environmental Network, 2012); saving Boston's Chinatown from demise (Leong, 1995/1996); and providing emergency relief to Vietnamese Americans following Hurricane Katrina (Community-Wealth, 2017). While there is some evidence of Asian EJ activism, the lack of coverage of their organizing feeds back into a lack of focus on Asians in environmental health disparities research.

The discourse of Asians as a model minority group also masks substantial diversity that exists within the US Asian population, and may conceal disparate environmental health risks experienced by particular Asian subgroups. The importance of disaggregating the US Hispanic/Latino population in studies of environmental health disparities has been recognized, and significant differences in exposure to toxics have been uncovered between Latino/a subgroups (Chakraborty et al., 2017; Collins et al., 2011; Grineski et al., 2016; Grineski et al., 2013). In one of the only studies of its kind, Korean and Japanese women in California were found to face substantial exposure to mammary gland carcinogens in their neighborhoods, even though the risks for White women as compared to Asian women aggregated into one category were similar overall (Quach et al., 2014). Another study found that over 40% of the Japanese population and 30% of the Filipino population in the US lived in counties that exceed PM2.5 air quality standards; when aggregated together, they found that 20% of the US Asian population lived in exceedance counties (Gordon et al., 2010). Weaknesses in both of these studies include their bivariate study designs that did not adjust for other known factors influencing environmental exposures, e.g., population density and socioeconomic status, and their reliance on data from 2000.

This is the first study to focus on environmental health disparities among Asian Americans and Asian American subgroups in terms of cancer risks from HAPs. We conduct a national-level study at the census tract level using the recently released 2011 National Air Toxics Assessment. We assess the disproportionate risk of Asian Americans to carcinogenic HAPs before disaggregating the Asian category into ancestry, language and nativity subgroups in order to examine risk disparities exhibited within this heterogeneous population.

2. Materials and methods

2.1. Study population

We conducted our investigation across all 50 states and the District of Columbia using a set of socio-demographic variables derived from the 2010 Decennial Census and the 2008–2012 American Community Survey (ACS) estimates at the census tract level. To ensure stable proportions for all our variables, we use the 71,208 census tracts with at least 500 people, 200 households, and complete data for all analysis and clustering variables.

2.2. Assessment of exposure to carcinogenic HAPs

We used the US EPA's 2011 National Air Toxics Assessment (NATA), which was released in 2015 (Environmental Protection Agency, 2016) to measure tract-level cancer risk exposure estimates in the US. The NATA includes 187 specific substances identified in the Clean Air Act Amendments of 1990 that are known or