Reviewer's report

Title: Metropolitan-level ethnic residential segregation, racial identity, and body mass index among U.S. Hispanics: a multilevel cross-sectional study

Version: 2 Date: 23 September 2013

Reviewer: Theresa Osypuk

Reviewer's report:

This manuscript, “Metropolitan-level ethnic residential segregation, racial identity, and body mass index among U.S. Hispanics: a multilevel cross-sectional study” tested whether Hispanic segregation was associated with BMI among Hispanics, using BRFSS individual level data and census-derived metropolitan/micropolitan measures of residential segregation. The authors also tested whether this association between segregation and BMI varied by race, stratified by gender. The authors found no segregation-BMI associations for men. For women, the authors found marginally significant associations between Hispanic segregation and BMI in initial models, which was attenuated once controlling for education and language. This association was also heterogeneous for women by race, such that for black Hispanics, the segregation-BMI association was positive (segregation was salubrious), but for white Hispanics the segregation-BMI association was inverse (segregation was adverse).

I think this manuscript is interesting and important, and I think it is very nicely executed. There is a demographic imperative to understand health patterns among Hispanic Americans, especially for such a common health risk as BMI, given that Hispanics are such a large and increasing minority population in the US. Moreover, racial/ethnic residential segregation remains moderate to high in America, and is growing worse for Hispanic Americans. Segregation may be a fundamental cause of health disparities, through pathways such as housing discrimination, wealth accumulation, and socioeconomic opportunity, so it is important to examine segregation associations with health. No prior research, as far as I am aware, has tested heterogeneity of segregation-health associations by race for Hispanics, despite that race and ethnicity are simultaneously acting to influence health. I think that the analytic approach to testing these hypotheses is solid, and that all the data sources are appropriate. It is nice to see use of the ACS data to provide a more updated measure of segregation, and isolation is a common segregation measure to test. Moreover, the results are interesting. The authors also nicely cite the segregation demography literature. I have some suggestions for the authors to clarify the setup and interpretation of results.

Minor Essential Revisions

The authors hypothesize that segregation is salubrious for certain reasons and harmful for other reasons. However they do not name the (sociological) theories that guide these hypotheses. It would help to name these theories in the
introduction (e.g. place stratification theory, spatial assimilation theory, or ethnic resurgence theory) and to refer back to them in the discussion section. See Walton 2009 for descriptions of these theories.

The hypotheses articulated by the author on p. 6 are not clear. I don’t understand why one would hypothesize a priori that white Hispanics would exhibit harmful effects of segregation, but that black Hispanics would exhibit beneficial effects of segregation. Since the prior empirical literature is inconsistent on directionality that segregation would have with BMI, and since two prominent sociological theories could both operate, it is not clear in my opinion what one would expect. I think it’s reasonable to expect (and hypothesize) heterogeneity by race. Although I would not have hypothesized a salubrious effect of segregation for blacks a priori. If nativity was conflating/confounding these associations, then perhaps black Hispanics are mostly immigrants, and immigrants in immigrant enclaves might exhibit better health because of tighter social networks or country of origin-specific resources. However white Hispanics may not be primarily immigrants. Although I would save such explanations for the discussion, since I think it is difficult to hypothesize a priori the heterogeneity you found.

Related, I think the interpretation of the opposite findings by race needs to be clarified in the discussion. The explanation on p. 12 was particularly confusing. I had to read it several times to understand the argument, and I think perhaps the reference to longitudinal assimilation patterns do not help clarify. I think perhaps the authors mean this: that when Hispanic whites are living in low Hispanic segregation areas, they are likely integrated with nonhispanic whites, and therefore, in (relatively) high quality neighborhoods. But when Hispanic blacks are in low Hispanic segregation areas, they could still be living in highly black segregated areas/black neighborhoods, which are relatively low quality. I think the authors are saying that racial segregation could be conflated here with Hispanic (ethnic) segregation. Although the authors do not have neighborhood level racial composition measures to be able to test this, I don’t think neighborhood level data is necessary. They could adjust for racial segregation (e.g. white isolation or black isolation, for example) in their models, or they could describe the correlations or cross tabulations of racial segregation with Hispanic segregation. Doing so would inform whether these speculations are consistent with the data. Related, I think the authors take too much space to explain what they are trying to say about why the quality of neighborhoods might be differential along the gradient of Hispanic segregation for white hispanics vs. black Hispanics, which might more concisely be stated that Hispanic segregation is co-occurring with black and white segregation, meaning that even though black hispanics might be less segregated from Hispanics in low-hispanic-segregated areas, they are likely still highly segregated from whites.

The discussion did not sufficiently address *why* Hispanic segregation may be salubrious/beneficial for black hispanics, but harmful for white Hispanics, aside from this conflation with other racial segregation measures argument, which was unclear. I think the authors need to refer to specific theories to explain their findings, and relate back to BMI and its neighborhood mechanisms. For example,
white Hispanics living in Hispanic enclaves may live in higher poverty higher crime areas, which may have worse environments for healthy diet, exercise, and stress -- evidence in support of place stratification theory. However black Hispanics may exhibit beneficial effects of segregation if for example black Hispanic enclaves shield blacks from discrimination or racism, or offer social networks or immigrant-specific resources that lower stress (one pathway to obesity), or offer healthy food specific to one’s country of origin (e.g. Dominican Republic). Notably, the results for black Hispanics may indicate support for ethnic resurgence theory, especially if black Hispanics are dominated by immigrants. (You might look to Susan Mason’s paper on black immigrant enclaves and preterm birth in New York City). The authors should cite some theories, as well as some demographic evidence here to speculate how nativity plays a role or not (e.g. what % of black (vs. white) Hispanics are foreign born?)

Why are there so many other race Hispanics (e.g. 10 times as large as the number of Hispanic blacks)? This seems really large to me. Do you have further racial breakdowns (Asian, Native American, or multiple races)? Since they are in such large numbers, I think you need to consider that there are reporting differences for hispanics who self-identify as a specific race, vs. those who do not, for example, if this ‘other race’ category includes people who did not select a race (missing). You should cite something about racial vs. ethnic classification. Does the BRFSS clarify this category? This ‘other race’ category may also indicate immigrants who are not familiar with the US system of racial/ethnic classification, and therefore don’t answer the question.

Please report the magnitude of the associations between segregation and BMI for white Hispanic and black Hispanic women (and other Hispanic women I guess) from the interaction model, for example, in the Figure notes, or in the text. It would also be helpful to report whether each of these associations is significant from zero, rather than whether they are just significantly different from each other (which I believe is what your statistical test is testing).

It is not clear how isolation is modeled. It ranges 0-1 in its original form. On p. 9, the text reads “estimates… correspond to a difference equivalent to a 1-Standard Deviation unit increase”. This is unclear, and if isolation is modeled in units of 1 standard deviation, then this sentence should be amended to denote that *isolation* is modeled in one standard deviation units because I assume BMI is modeled in one-unit increases.

Please clarify whether nativity is available in the BRFSS data. I would recommend adjusting for nativity if so. In the manuscript, the authors discuss the lack of data to adjust for country of origin, which is distinct from country of birth (nativity). I think if the data lacks both, then this needs to be enumerated as limitations of the dataset. (currently these are not in the limitations). I think this lack of control for nativity could explain the divergent segregation-BMI patterns for white and black Hispanics, if there is differential immigrant composition of these racial hispanic groups. Therefore, the fact that BRFSS does not have this variable available is a rather large limitation to any analysis among Hispanics.
p. 14 “cross sectional studies do not allow us to assess the longitudinal association of residential segregation on health”. This is self evident, since cross sectional studies are not longitudinal. I think perhaps the authors meant that a cross sectional study does not allow assessing the temporal order between segregation and health, to rule out reverse causation.

I feel that the discussion was underreferenced. Every factual assertion should be supported by a reference. For example these assertions need references:

“residential segregation is hypothesized to act on health across the life course”
“the persistence of race in the US as a driver of structural processes that may limit exposure to health promoting aspects of residential environments” …
“blocked opportunities for mobility”
“given the considerable heterogeneity of the Hispanic population with respect to characteristics like immigration status, country of origin, and race”

References are needed throughout p. 12.

p. 13 “reasons for classifying themselves as other race”
“observed race influences housing discrimination”

References


Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests