

SOCIAL FACTORS ASSOCIATED WITH PSYCHOLOGICAL DISTRESS DURING THE ONSET OF COVID-19 PANDEMIC: SOME EVIDENCE FROM PEW RESEARCH DATA

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The paper examines disparities in psychological effects of COVID-19 in the United States within the context of the framework of social determinants of health. Survey responses from Pew Research Center (2020) were the data source. Psychological distress was the outcome variable and respondents' race, sex, age, marital status, location, education, and income were the explanatory variables. In a bivariate context, the majority of racial categories (White, Black, Hispanic, and other) reported low distress when thinking about coronavirus disease. In a multivariate context, the index of psychological indicators was regressed on all the variables in the model – race, sex, age-group, marital status, level of education, location, and family income, to determine their predictive powers. The results show that the psychological impact of the coronavirus has been disproportionate, more along the lines of their ages, family incomes, sex, marital status, and location rather than racial lines. Thus, any policy measures geared toward health equity should not lose sight of these factors.

INTRODUCTION

With the advent of the coronavirus disease (COVID-19), the United Nations Department of Economic and Social Affairs (UN DESA, 2020), in celebration of its 25 years of championing a worldwide social inclusion program, included an extensive statement on the social impact of COVID-19. The UN DESA is a foremost analytic voice in the promotion of social inclusion, inequality reduction, and poverty elimination worldwide. They noted that the coronavirus pandemic has affected all segments of society, but more detrimental to groups that were prone to vulnerable situations such as the poor, disabled, elderly, youth, and minorities. Evidence shows that poor people bear the brunt of the health and economic

impacts of the virus. The organization also noted that the consequential social crisis of the pandemic, if not addressed through proper policy, could culminate in increased inequality, discrimination, exclusion, unemployment both in the short and long terms. The provision of comprehensive protective systems could play a useful role in protecting workers and prevent the exacerbation of poverty. Thus, the provisions of basic income security at all times would be helpful to vulnerable groups in this situation (UN DESA, 2020).

Over the years, numerous studies on health disparities have been done. Notably, health disparities are critical public concerns, because health disparities are not problems for only persons experiencing them, but they are also health issues for the entire population (Xin 2017). Besides, disparities can be costly and a financial burden on the healthcare system. With the outbreak of COVID-19, health experts have been concerned about the potential mental health effects of the coronavirus in the United States (Keeter 2020). Given this, the current research examines the racial disparities in psychological effects of COVID-19 in the United States within the context of selected social, economic, and demographic factors. The research questions to be addressed were: 1) What are the racial variations in psychological distress when thinking about COVID-19? 2) What are the significant social factors associated with psychological distress when thinking about COVID-19? To address these questions, survey responses from Pew Research Center (2020) were examined based on the following demographic, social, and economic factors: race, sex, age, marital status, location, education, and income. Racial categories and their social circumstances are not necessarily in a vacuum nor independent of each other and therefore, adjusting for the influences of these social factors in a study constitutes a useful elaboration model and can provide valuable information about the psychological impact of COVID-19 on racial groups.

The paper is informed by the explanatory framework of social determinants of health. According to Healthy People 2030, social determinants of health (SDOH) are the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality of life outcomes and risks. Healthy People 2030

approach to SDOH is a “place-based” organizing framework that reflects five (5) key areas which are economic stability, education, social and community context, health and health care, and neighborhood and built environment. It is noted that working to establish policies that positively influence social and economic conditions and those that support changes in individual behaviors can improve health for the population. Also, improving the conditions in which we live, learn, work, play, and the quality of our relationships can result in a healthier population (Healthy People 2030).

THE LITERATURE

Since the onslaught of coronavirus disease, racial disparities have been in the national conversation. The media and elected officials have persistently called for a more thorough collection of racial and demographic data on infected patients of the virus. Based on past epidemic data and recent natural disasters, it is expected that the most marginalized populations will bear the brunt of COVID-19. It is also important that the data be contextualized with adequate analysis (Chowkwanyun and Reed 2020). The authors explained that disparity figures without explanatory context can perpetuate stereotypic myths and misunderstandings that may undermine health equity. Thus, researchers must be aware of the following errors: 1) Data in a vacuum can invoke false biological explanations for racial health disparities. For example, there is a documented assumption that there are biological differences between the organs of Blacks and Whites; 2) Non-contextual data can give rise to explanations based on racial stereotypes relating to behavioral patterns. Similarly, totalizing depictions of Chinese, Japanese, and Mexicans in Los Angeles are circulated in these times of the pandemic. Chowkwanyun and Reed (2020) remind us that racialized characterization of behavior is common in the media discussions of conditions such as obesity as a coexisting condition that increases the risk of severe COVID-19. The authors also suggested a few effective ways to guard against the above-mentioned dangers. For example, data on socioeconomic status (SES) should be collected simultaneously with racial data. Analysis of both data categories will clarify how racial and SES data are intertwined. So, “to mitigate myths of racial biology and behavioral

explanation based on racial stereotypes, coronavirus disparities must be contextualized in material resource deprivation caused by low SES, chronic stress brought on by racial discrimination, or place-based risk." (Chowkwanyun and Reed 2020: 203). The authors' caution has been adhered to by the current research in terms of designing the analytic approach used in this paper.

Braveman (2006) advised that in doing health disparities studies, we need to be clear about what we should measure, monitor, and why. In the United Kingdom and the rest of Europe, "health inequalities" are considered functions of socioeconomic disparities, whereas in the United States, on the other hand, "health disparities" are generally assumed to refer to racial/ethnic disparities, and thus many people assume that such disparities are rooted in biological or cultural factors rather than underlying social disadvantaged situations. In corroboration with Braveman's comments, Adler and Rehkopf (2008) also noted that the literature lacks definitive agreement on a definition of health disparities, and some literature limit disparities to those associated with race/ethnicity or socioeconomic status (SES). According to them, such a limitation can be problematic. For example, there are differences in levels of education, income, occupation, and wealth within and across racial categories. Therefore, examining race/ethnicity without adjusting for socioeconomic status can skew observations on race/ethnicity thus mistakenly emphasizing biological differences. These foregoing observations have been taken into consideration in designing the analytic framework for this paper.

Palmer, Ismond, Rodriguez, and Kaufman (2019) have noted the importance of social determinants of health and their relationship to health disparities. To them, social determinants of health represent economic and political structures, social and physical environments, and access to health services. According to them, although observational research has documented the influence of social determinants on actual health, unanswered questions relating to why those who are socioeconomically disadvantaged suffer disproportionately from disease and health-related conditions remain. Among key directions for future research is "embodiment" – identifying how adverse exposures affect the body and how they lead to illness and disease is an area for exploration. Central to this line of study is understanding how

social stress influences health (Palmer et al. 2019: 51). The greatest challenge perhaps is understanding the difference between the influence of daily stress versus social inequity on health disparities.

Karaca-Mandic, Georgiou, and Sen (2020) have found racial and ethnic disproportions in COVID-19 hospitalizations across 12 states (Arizona, Indiana, Kansas, Massachusetts, Minnesota, New Hampshire, Ohio, Oregon, Rhode Island, Utah, Virginia, and Washington) within two months period from April to June 2020. The proportion of hospitalizations of White patients were significantly smaller than that of Black, Latino, American Indian, and Alaskan Native populations. One of the study's limitations was that it did not adjust for age, sex, underlying conditions, and socioeconomic factors within racial/ethnic groups that are likely related to COVID-19 hospitalizations and the authors highlighted the need for increased data reporting. The current study did take note of the limitation in Karaca-Mandic and others' (2020) study and adjusted for contextual factors.

An important observation by Hooper, Napoles, and Perez-Stable (2020) revealed that underlying medical comorbidities, older age, diabetes, obesity, and male sex are biological vulnerabilities for serious and more severe COVID-19 outcomes. The writers also noted that African Americans, Latinos, American Indians, Alaska Natives, and Pacific Islanders bear a disproportionate burden of the virus-related outcomes based on the existing data and that the pandemic has drawn more attention to health disparities. More importantly, the underlying causes of health disparities are complex and include social and structural determinants of health, racism, and discrimination, economic and educational disadvantages, health care access and quality, individual behavior, and biology. Taking a cue from Hooper et al's (2020) observations, age and sex were included in our elaboration analysis, even though the Pew Research Center data set used in the current study restricted the selection of the other variables identified by Hooper and others (2020).

Related to the current discussion, data from the Pew Research Center point to the disproportionate impact of COVID-19 on the American population. For example, the financial fallout from COVID-19 varies by race, ethnicity, and income. Forty-three percent of Blacks have difficulty paying bills compared with 18%

of Whites, 37% of Hispanics, and 23% of Asians. Considering rent or mortgage payment, those in the lower-income group (32%) find it the hardest to meet such an obligation, followed by middle income (11%) and high income (3%) groups respectively (Parker, Minkin, and Bennett 2020). The variables in the above information were included in the current analysis for elaboration and to test for their predictive powers concerning psychological distress.

Schaeffer and Rainie (2020) have noted variations in COVID-19 experiences by age. Older Americans see the virus as a threat to their health whereas younger Americans see the virus outbreak as a threat to their finances. Younger Americans have experienced lost jobs and wages during the outbreak of COVID-19, unlike older Americans. In the same study, younger Americans (<50 years) relied heavily on the internet for regular activities such as business or social contacts unlike older (>50 years). A noteworthy difference reported by Schaeffer and Rainie (2020) was that younger Americans were more likely to suffer emotional distress during the era of COVID-19 than those aged 65 or older. This observation is further investigated in a multivariate context in the present study.

DATA SOURCE AND SAMPLE

Pew Research Center “is a nonpartisan fact tank that informs the public about the attitudes and trends shaping the world. It conducts public opinion polling, demographic research, media content analysis, and other empirical social science research.” (Pew Research Center, 2020). For this paper, the 2020 Pew Research Center’s American Trends Research (ATP) Panel, Wave 64 was used for analysis. ATP is a nationally representative panel of randomly selected U.S. adults who participated in the self-administered web surveys. Data from the panel were drawn from March 19 to March 24, 2020. The sample size was 11,537.

MEASURES AND ANALYTIC PROCEDURE

Psychological Distress (the outcome variable) was measured on 3 levels – low distress (bottom 50%), medium distress (next quarter), and high distress (top quarter). In the dataset, five indicators of distress used to elicit information from respondents were: a) felt nervous, anxious, or on edge, b) felt depressed, c) felt lonely, d) felt hopeful about the future, and e) had trouble sleeping. These five

indicators were chunked into three groups (low, medium, and high) and used as a measure of psychological distress.

Racial categories were self-reported as White, Black, Hispanic, and Other.

Social contextual factors included in the analysis for elaboration were sex, age categories, marital status, level of education, metropolitan location, and level of family income.

A bivariate analysis was first conducted to ascertain the association between racial categories and psychological distress. Next, in a multivariate context, the index of the five psychological indicators was regressed on all the variables in the model – race, sex, age-group, marital status, level of education, location, and family income, to determine their predictive powers.

LIMITATIONS

First, the variables selected for the study were constrained by the content of the data set. Second, the nature of the data set allows for only a one-shot descriptive correlational evaluation of the factors and phenomenon under study.

ANALYSIS AND FINDINGS

The study sample comprises mostly White non-Hispanics (66.1%), 7.7% Blacks, 20.1% Hispanics and the rest are of the “Other” racial/ethnic (5.5%) category. Fifty-five percent of the sample are female and the rest (45%) are male. More than 55% of them have either college or postgraduate degrees, 30% have some college and/or associate degrees, and more than 14% have a high school or less than high school education background. The majority of the sample (88.8%) is between 30 years and above and the rest (11.2%) is between 18 and 29 years of age. Almost 56% of the sample are married whereas the rest are not. In terms of family income, the majority of the sample (53.6%) reported less than \$75,000 and the rest (46.4%) reported more than that. Almost 90% of the sample reside in a metropolitan area and the balance of the sample lived in a non-metropolitan area.

Table 1 summarizes responses on the indicators of psychological effects of COVID-19 on adults when thinking about COVID-19 as distributed on racial/ethnic lines. Respondents were asked how often they experienced the psychological indicators in the past 7

days before the survey. As explained earlier, the five psychological indicators were indexed into low distress, medium distress, and high distress. The psychological experiences of the four racial groups appear identical on the three levels of distress. The majority of each racial category reported low-level distress when they think about COVID-19. However, a noticeable difference was that more Hispanics (23.3%) reported a high level of distress than reported by Blacks (19.8%),

Table 1. Percentage Distribution of Psychological Indicators by Racial Categories

Race/Ethnicity	Level of Distress (% Distribution)		
	Low	Medium	High
White	52.4	27.6	20.0
Black	54.1	26.1	19.8
Hispanic	50.4	26.4	23.3
Other	51.2	27.0	21.8

$\chi^2(6, N = 11283) = 13.1, p < .05$

Whites (20%), and Other (21.8%). More than 27% of Whites and 27% of Other racial category reported medium level distress. Also, an identical percentage of Blacks (26.1%) and Hispanics (26.4%) share similar experiences at that level. As suggested in the literature and to elaborate on the above descriptive observations, a generalized linear model was run on respondents' characteristics – race, sex, age category, marital status, location, level of education, and family income. The results are summarized in Table 2.

Table 2. Generalized Linear Model Depicting Adjusted Estimates of Respondents' Characteristics and Psychological Effects of COVID-19 (N=10816)

Characteristics Psychological Effect (ref.=high)	B	Sig.	Exp(B)
Racial Category			
White	.117	.157	1.124
Black	-.304	.004*	.738
Hispanic	-.044	.622	.957
Other	—	—	1
Age category			
18-29	.822	.000*	2.275
30-49	.717	.000*	2.048
50-64	.354	.000*	1.424
65+	—	—	1
Educational Level			
College graduate	.024	.695	1.024
Some college	-.108	.077	.897
H.S graduate or less	—	—	1
Family Income			
75,000+	-.323	.000*	.724
\$30,000-\$74,999	-.289	.000*	.749
<\$30,000	—	—	1
Sex			
Female	.581	.000*	1.789
Male	—	—	1
Marital Status			
Not married	.352	.000*	1.421
Married	—	—	1
Location			
Metropolitan	.208	.001*	1.231
Non-Metropolitan	—	—	1

*P < .005

In Table 2, the outcome variable, distress was regressed on race, age, education, family income, sex, marital status, and location. In effect, the predictive value of each variable was determined in a multivariate context whilst holding the effect of others constant. First, the beta weight of the White racial category (B = .117) is positive, meaning they are more likely than the "Other" racial category (the reference category) to experience high distress. The odds ratio for the White category is 1.12, that is, they are 1.12 times more likely to report high distress than will "Other" racial category. On the other hand, Blacks (B = -.304) and Hispanics (B = -.044) have negative regression estimates and are less likely than the "Other" category to experience high distress. Nonetheless,

White and Hispanic racial categories are not statistically significant, but the Black category is ($p < .05$).

Next, the beta coefficients associated with age categories are all positive indicating that they have the likelihood of falling into the high distress level. Age 65 plus is the reference category to which other age groups are compared. The exponential values, $\text{Exp}(B)$, indicate that age group 18-29 members are 2.27 times more likely to experience high distress than those in age 65 above and group. Similarly, members of the age group 30-49 are 2 times more likely to fall into the high distress level and members of the 50-64 group are almost 1.5 times more likely to experience high distress than those aged 65 years and older. All age categories are significant predictors of psychological distress ($p < .05$).

On examining the educational level, the regression coefficient for college graduate attribute is positive ($B=.024$) which means college graduates are more likely than the referent group, high school graduates or less, to report high distress. The odds ratio is 1.024. On the other hand, people with some college education have a negative beta weight ($-.108$) and they are .897 less likely to fall into the high-stress group than will high school graduates or less. Statistically, education is not a significant predictor of distress ($p > .05$).

Family income is inversely associated with the level of distress. Those with \$75,000 or higher family income are less likely to experience high-level distress than will people whose family income is less than \$30,000 (the reference category). Family income is a statistically significant factor in the model. On the sex variable, females ($B=.581$) are more likely than males to report high distress experience and the odds are 1.8 times for the females. The variable sex is a significant predictor. Those who are unmarried have the likelihood of 1.4 times expressing high distress than will married people do. The association between marital status and distress is statistically significant at a .05 level. Finally, respondents who reside in metropolitan areas are 1.4 times more likely than non-metropolitan residents to fall into the high distress group. The association between metropolitan location and distress level is a significant one ($p < .05$).

DISCUSSION AND CONCLUSION

The impetus behind this study was the increasing literature on the

disparities in the impact of COVID-19 in the United States. The focus was to describe variations in psychological effects of the virus on racial/ethnic categories and examine them alongside contextual factors – age category, educational level, family income, sex, marital status, and regional location for clarification and elaboration. In our initial bivariate analysis, there is very little observed variation in psychological effects of COVID-19 experienced by the racial groups - Whites, Blacks, Hispanics, and Other racial groups. Blacks show less representation in high and medium distress levels than do the three racial groups. As well, Blacks are overrepresented in the low distress level in contrast to the observations on the other racial groups. As suggested by previous research, racial and ethnic categories are not isolated nor monolithic; at least, there are social, economic, and demographic characteristics associated with them and therefore, racial categories' experiences were examined within the context of these contextual characteristics. The choice of the contextual variables was informed and based on the framework of social determinants of health.

When the observed association between the racial groups and level of distress (psychological measure) was further examined in a multivariate context, the association disappeared, except for the Black category. Nonetheless, Blacks were less likely than the three other racial categories to report high distress. Age-group, family income, sex, marital status, and metropolitan residence are better predictive factors of distress than racial categories. In other words, these social, economic, and demographic factors, except educational level, moderate the influence of racial category experiences.

About age categories, the current finding corroborates past research by Shaeffer and Rainie (2020) that indicated that older Americans see the virus as a threat to their physical health, whereas younger Americans see it as an affront to their financial statuses, which given this study's findings, pose a stressful event for them. To be sure, younger Americans are more likely than older ones (65+) to report high distress levels. Just as Shaeffer and Rainie (2020) reported, younger Americans than older Americans aged 65 or older were more likely to suffer emotional distress during this era of COVID-19. Further study is needed to map this observation along racial lines.

The literature shows that income level is a significant factor in

determining disparities in health in the United States. In this COVID-19 era, financial fallout varies by race and ethnicity (Parker, Minkin, and Bennett, 2020). As presented in Table 2, family income is a significant explanatory factor in predicting distress levels. Related to Parker and others' (2020) work, people with a family income of \$75,00 and higher are less likely to experience high distress than those who have low family income (< \$30,000). Whereas Parker et al. (2020) examined racial categories and financial fallout and inability to meet some financial obligations such as payment of a mortgage, rent, and other bills, this study focused on family income and distress. Looking at family income and distress along racial lines is another avenue for further research.

We also found out that sex is an important predictor of distress during this pandemic era. Females are more likely than males to fall into the high distress category. In her study, Kuehner (2017) found sex disparity in depression but limited evidence exists for the risk factors linking that observation. In an earlier related study, Reskin and Coverman (1985) revealed that sex roles are related to psychological distress through differential risks of disrupted marriages, unemployment, and low income. However, caution is exercised in these current findings since the descriptive purpose of our study delimits the causal evaluation of sex on psychological distress. Rather, a future examination of sex-role and distress is warranted and will be useful for added knowledge to the subject. Another important predictive factor of psychological distress is marital status. Married couples are less likely than unmarried individuals to experience a high level of distress. This finding concurs with previous literature on this association. Gender-related roles are common modifiers for marital-nonmarital variation (Inaba, 2002).

Finally, Metropolitan residents experience a higher level of distress than do nonmetropolitan residents when they think of COVID-19. Studies on rural-urban relationships with the pandemic are rare and there is little or no literature for comparison. Nonetheless, Basta, Shacham, and Reece (2009) explored the nature and range of psychological distress symptoms experienced by individuals living with HIV in rural and urban areas. The results indicated that rural participants had higher levels of symptoms of psychological distress than their urban counterparts. These

differences were attributed to access to care, social isolation, and perceived stigma. Our current finding does not support Basta and others' (2009) observation and for a good reason that the COVID-19 disease presents a different context and evokes a different attitude than would HIV. Because of this, further research involving metropolitan and non-metropolitan areas would be desirable.

In sum, the psychological impact of the coronavirus has been disproportionate, more along social, economic, and other demographic lines than racial lines, indicating that people of the same racial categories do live under different social and economic circumstances that may influence their psychological frames of reference. Much as there are some observed variations in psychological distress among Whites, Blacks, Latinos, and other racial categories, such experiences can temper and intertwine with their ages, family incomes, sex, marital status, and location. That is, these contextual factors are very important correlates of psychological distress that must be evaluated alongside racial categories. As well, any considerations of policy measures geared toward health equity should not lose sight of these factors. The study results sync with the framework of the social determinants of health, which represents social and environmental structures within which people live, learn, work, age.

References

- Adler, Nancy E. and David H. Rehkopf. (2008). "U.S. Disparities in Health: Descriptions, Causes, and Mechanisms." *Annual Review of Public Health*, 29: 235-52.
- Basta, Tania B., Enbal Shacham, and Michael Reece (2009). "Symptoms of Psychological Distress: A Comparison of Rural and Urban Individuals Enrolled in HIV-Related Mental Health Care." *AIDS Patient Care and STDs*, vol. 23, No. 12: 1053-1057.
- Braveman, Paula (2006). "Health Disparities and Health Equity: Concepts and Measurement" *Annual Review of Public Health*, 27: 167-94
- Centers for Disease Control and Prevention (CDC) (2020). "Social Determinants of Health: Know What Affects Health" Retrieved November 8, 2020 <https://www.cdc.gov/socialdeterminants/about.html>
- Chowkwanyun M, Reed AL Jr. (2020). "Racial Health Disparities and Covid-19 - Caution and Context." *New England Journal of Medicine*. 2020 Jul 16; 383(3):201-203. doi: 10.1056/NEJMp2012910. Epub 2020 May 6. PMID: 32374952.
- "Everyone Included: Social Impact of COVID-19." (2020). United Nations: Department of Economic and Social Affairs. Social Inclusion. Retrieved

- November 2, 2020. <https://www.un.org/development/desa/dspd/everyone-included-covid-19.html>
- Healthy People 2030, U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Retrieved November 18, 2020, from <https://health.gov/healthypeople/objectives-and-data/social-determinants-health>
- Hooper, Monica Webb, Anna Maria Naples, and Eliseo J. Perez-Stable (2020). "COVID-19 and Racial/Ethnic Disparities" JAMA volume 323, Number 24. Retrieved January 31, 2021. <https://jamanetwork.com/journals/jama/article-abstract/2766098>
- Inaba, Akihide (2002). "Marital Status and Psychological Distress in Japan." Japanese Sociological Review, vol. 53, pages 69-84.
- Karaca-Mandic, Pinar, Archelle Georgiou, Soumya Sen. (2020). "Assessment of COVID-19 Hospitalizations by Race/Ethnicity in 12 States" JAMA Internal medicine. Retrieved November 7, 2020. <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2769369>
- Keeter, Scott (2020). "Measuring the Psychological Effects of COVID-19," FactTank. Pew research Center. Retrieved December 12, 2020. The psychological toll COVID-19 may be taking on Americans | Pew Research Center
- Kuehner, Christine (2017). "Why is Depression more common among Women than among Men?" The Lancet Psychology, vol.4, issue 2. February 2017: pages 146-158.
- Palmer, Richard C., Deborah Ismond, Erin J. Rodriguez, Jay S. Kaufman (2019). "Social Determinants of Health: Future Directions for Health Disparities Research," *American Journal of Public Health* 109, No 51: 570-571.
- Parker, Kim, Rachel Minkin, and Jesse Bennett (2020). "Economic Fallout from COVID-19 Continues to Hit Lower-Income Americans the Hardest" Retrieved November 2, 2020. <https://www.pewsocialtrends.org/2020/09/24/economic-fallout-from-covid-19-continues-to-hit-lower-income-americans-the-hardest/>
- Reskin, Barbara F. and Shelley Coverman (1985). "Sex and Race in the Determinants of Psychological Distress: A Reappraisal of the Sex-Role Hypothesis" *Social Forces*, vol. 63, issue 4. June 1985, pages 1038-1059.
- Schaeffer, Katherine and Lee Rainie (2020). "Experiences with the COVID-19 outbreak can vary for Americans of different ages." FACTTANK. Pew Research Center. Retrieved February 15, 2021. <https://www.pewresearch.org/fact-tank/2020/06/16/experiences-with-the-covid-19-outbreak-can-vary-for-americans-of-different-ages/>
- Xin, Haichang (2017). "Editorial: Health Disparities – An Important Public Health Policy Concern." Retrieved November 8, 2020 <https://www.frontiersin.org/articles/10.3389/fpubh.2017.00099/full>



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