

INTRODUCTION

The rapid emergence of SARS-CoV-2, and the associated COVID-19 coronavirus disease, has led to a number of novel, public health guidelines to control the spread of this worldwide pandemic. Chief among these are social distancing measures, which are intended to reduce the number of contacts within a completely susceptible population. Older adults are especially susceptible to COVID-19 and have been shown to comprise a large proportion of severe cases requiring hospitalization, as well as higher case fatality rates reaching 14.8% and 8% in those ≥ 80 years old and 70-79 years old, respectively (Wu & McGoogan, 2020). Due to the absence of treatment and early, tight supply constraints on personal protective equipment (PPE), social distancing was established as the most effective measure for reducing risk of COVID-19 infection among older adults.

It is also clear that the rates of COVID-19 infection, hospitalization, and deaths also disproportionately affect Black and Brown communities in the United States. For example, the case mortality rate in Michigan state is nearly 40% for Black adults, while Black adults only comprise 15% of Michigan's general population (Burke & Fresques, 2020). The overrepresentation of severe cases in Black and Brown communities is in no way attributable to biological differences and is instead an effect of several social and economic disparities, derived from cultural-level phenomena and structural inequality.

Those who are older adults and part of the Black or Brown community are particularly vulnerable to the immediate health risks, as well as the prolonged psychosocial effects, of COVID-19. These psychosocial effects may also persist well into the future, due to the further entrenchment of existing economic insecurity and structural inequality. In addition, the large and disproportionate loss of life in Black and Brown communities during social distancing may lead to disrupted bereavement. As a result, levels of chronic loneliness among surviving spouses and partners may rise and persist well after social distancing measures are lifted.

Loneliness has been demonstrated to have clear effects on physical, psychological, and cognitive outcomes. Cognitive outcomes, in particular, are also racially biased, due to many of the same social factors associated with COVID-19. Public health policy and interventions should be aimed at alleviating distress in underrepresented communities that have been disproportionately affected by COVID-19. In this background research document, a focus on social disparities and cognitive health will be discussed in the context of loneliness, with an emphasis on post-COVID-19 recovery.

CULTURAL-LEVEL PHENOMENA – SOCIOCULTURAL HEALTH EFFECTS

A History of Inadequate Care and Exploitation

There has been a long history of exploitation in Black and Brown communities by both the government and the medical-industrial complex. Biased governmental and institutional restrictions on freedom and mass incarcerations, offer a glimpse in to the historical injustices that may have shaped information and action in communities of color (Becared & Nazroo, 2020). Distrust toward the medical community by Black Americans is warranted, because it has been reinforced repeatedly through receiving adequate levels of proper care. Milwaukee Health Commissioner, Jeanette Kowalik, who is a member of the Black community herself, perhaps said it best, "What Black folks are accustomed to in Milwaukee and anywhere in the country, really, is pain not being acknowledged and constant inequities that happen in health care delivery" (Burke & Fresques, 2020).

At a federal level, information that has been shared with the general public in regarding to COVID-19 has been incomplete or underreported. For example, the CDC had not been reporting on the race/ethnicity of COVID-19 infections, hospitalizations, and deaths, although that is standard practice for

other health reporting (Burke & Fresques). A lack of governmental transparency additionally stokes distrust among Black and Brown communities, which has already experienced as long history of dishonesty. Even after additional statistics were released, other ethnic groups, such as Asian, Pacific Islanders, and the Navajo Nation, were aggregated into the singular, homogenous group of “Other”.

Lastly, Black and Brown Americans may have had negative experiences with medical care in the past, which may negatively affect formed attitudes about seeking medical care. They may also have had a high motivation to reject negative, normative beliefs regarding ethnic stereotypes, which may create a barrier to seeking adequate medical care. Black and Brown Americans may also perceive that they have low levels of control. This is especially true toward health systems, which have historically been institutionally biased toward this population, resulting in poorer health outcomes, from routine surgeries to pregnancies. Inequities in the healthcare delivery system stem from the disinvestment in, and undervaluing, those that belong to Black and Brown communities (Becared & Nazroo, 2020).

Culture, Structural Factors, and Individual Health Behaviors

Disparities are transmitted socially and influence how people make judgements at the group and individual levels. Not only do disparities spread within the current society, but it is also transmitted intergenerationally. These experiences generate ideas, set strategies for ways of living, and form perspectives on the world. Orlando Patterson (2000) describes this ‘repertoire’ of ideas as culture and goes on to describe it as an ‘information system’ that guides individuals, ranging from how they should represent themselves in society to the set of instructions used in food preparation. Patterson goes on to say that culture interacts with the structural environment and produces certain outcomes, health outcomes or otherwise, which should not be reduced to the product of individual-level behavior.

The clash between culture and structure could not be more evident than that of Black and Brown Americans in the American health system. Patterson posits that culture is causal, but only through its interaction with structural forces. However, he notes that culture should not be characterized in a pejorative way, because it is often structural factors that ascribe a value judgment based on the ‘norm’. In many other contexts, cultural beliefs may be highly adaptive.

The structural factors may interact with Black and Brown American culture and may create a toxic interpretation of individual health behaviors, which public health experts should vigilantly guard against. Patterson (2020) says, “We cannot restrict the cultural exclusivity to what is normative.” Black and Brown Americans have had a long history of cultural disenfranchisement, while often White Americans may have engaged in the same behaviors with very different outcomes.

Vulnerabilities to COVID-19 – Racism, Weathering, & Cumulative Psychosocial Stressors

In the past, public health efforts have inaccurately targeted genetics as the root cause of health disparities between racial and ethnic groups. For example, genetic factors do not play a significant role in the differences of pregnancy outcomes between Black Americans and recently immigrated Black Africans, as demonstrated by healthier pregnancies of recent immigrants, who are genetically similar (David & Collins, 2007). The driver of this observed effect is that Black Americans have experienced discrimination and institutional racism at much higher rates, which has been demonstrated to affect pregnancies, as notes above, as well as many other health outcomes. This bias in health outcomes has been found across socioeconomic divides and persists even when controlling for education and income.

Persistent sociocultural and psychological stressors, due to racism, may instead lead to significant physiological and psychological risks. This has been referred to as the “weathering” effect, which is the result of a lifetime of systemic racism. While race was originally targeted as an overt cause in various health gaps, researchers have demonstrated that genetic variance, attributed to race alone,

does not explain this effect. However, epigenetics may help us understand the role that social stressors and environmental factors play in the biological health of individuals. For example, a lifetime of social stressors, due to individual or institutional racism, may modify gene expression and affect biological outcomes, such as hypertension and cardiovascular disease. These effects may even be trans-generational and accumulate, as they are transferred from one generation to the next.

Conditions such as asthma, diabetes, high blood pressure, and coronary heart disease have been found to be ‘socially-patterned’, which can be explained by entrenched structural and institutional racism (Becares & Nazroo, 2020) and the environments that people live. These conditions also make individuals more susceptible to having symptomatic COVID-19, a more severe course, and higher mortality. In other words, these socially imbued risks for developing chronic conditions may also be associated with an increased risk of COVID-19 infection, hospitalization, and death.

Ageism & The Value of Human Life

To compound these issues further, older adults also face disproportionate levels of infection, severe hospitalization, and death, due to COVID-19. Many difficult, ethical discussions have been had about the valuation of human lives, especially in the context of severe shortages of critical health equipment, such as ventilators. The value of a life is often measured by the remaining years of productivity in the absence of other severe comorbidities and disability.

Older adults are also considered a marginalized and vulnerable group, which are also subject to inadequate care based on preexisting biases and assumptions. In addition, the voice of an elderly adult is often figuratively quieted, especially in a medical setting, as decision-making may be deferred to other family members or the medical team itself. This may have special meaning in the context of altered cognitive states, due to delirium, age-related cognitive decline, or dementia – especially when family members may not be allowed to be present in COVID-19 hospital units or nursing homes to advise about care decisions.

Peterson et al (2020), a team of bio ethicist, has recently proposed an alternative model for ventilator allocation that includes forming specialized triage teams, lessening the emotional burden for critical care doctors, and aiding transparent communication with the family. The proposed protocol is intended to particularly minimize bias and protect the lives of older adults, those from Black and Brown communities, and people with disabilities.

STRUCTURAL INEQUALITY AND CLASS – SYSTEMS OF OPPRESSION

Class, Poverty, & Structural Inequality

The class divide between higher and lower socioeconomic status communities is also at the center of health disparities and COVID-19. Ethnic minorities are more likely to have lower paying jobs, less financial security, and employment in high-risk positions (Becares & Nazroo, 2020). Positions that increase risk for exposure to COVID-19 are common for low socioeconomic workers, and they experience this increased risk because they are both at the front lines with a high number of contacts and are less likely to receive critical PPE (Becares & Nazroo, 2020). Workers in these positions are often unseen or invisible in society during non-COVID-19 times (Sivramakrishana, 2020) and although the popular trend is to now venerate them as heroes, it does not negate the fact that they are still treated as a class of people who are deemed expendable at a societal level.

Working from home is also often reserved for higher-status workers. The class divide in jobs has been the result of longstanding structural inequalities in education, job opportunities, and other institutional practices. This socioeconomic division is especially important in non-white communities.

These economic differences are racially driven by factors, such as disproportionate college debt, neighborhood poverty, and poor access to good schools. These larger forces trigger a trajectory of stagnant or downward mobility, which in turn affects outcomes related to health. Targeting these community-specific factors of inequality as a primary prevention strategy may lead to improved socioeconomic trajectories and healthier outcomes.

Socioeconomic status (SES) is a fundamental cause of health inequalities, because it has an effect on individual or group-level access to health-enhancing resources (Phelan & Link, 2015). Without access to these resources that buffer against health risks, those with lower SES experience a disproportionate number of stressors and exposures, which produce poor health outcomes. This is especially relevant for Black Americans, because SES is differentially distributed, due to entrenched racism. Longstanding bigotry in the US has produced a socially stratified caste, which primarily benefits White Americans and proliferates the unequal distribution of money, knowledge, power, prestige, freedom, and social capital, all of which have a health-enhancing effects (Phelan & Link, 2015).

In the case of COVID-19, this unequal access to health-enhancing resources may have helped drive the overrepresentation of infection non-white ethnic communities. In a recent New York Times piece by Kevin Quealy (2020), cell phone mobility data was used to determine that many in the most affluent parts of Manhattan left the city as the virus intensified. Those with high-SES status utilized their wealth and/or social capital as health-enhancing resource that allowed them to lower their risk by traveling or relocating to areas with a lower density of cases.

The divide between social class is also represented in the failure of our largely, employer-based health insurance system. At a time when the public needs the protection of health programs the most, up to 26.8 million Americans, as of May 2nd, 2020, may have lost employer-based health insurance (Kaiser Family Foundation, 2020). Job loss has disproportionately affected lower-paid workers in the food services, leisure and hospitality, and community health-care and education, further entrenching economic instability and setting up difficulties for years to come as low SES groups will struggle to recover financially.

Environmental Factors & Disadvantaged Neighborhoods – Residential Segregation

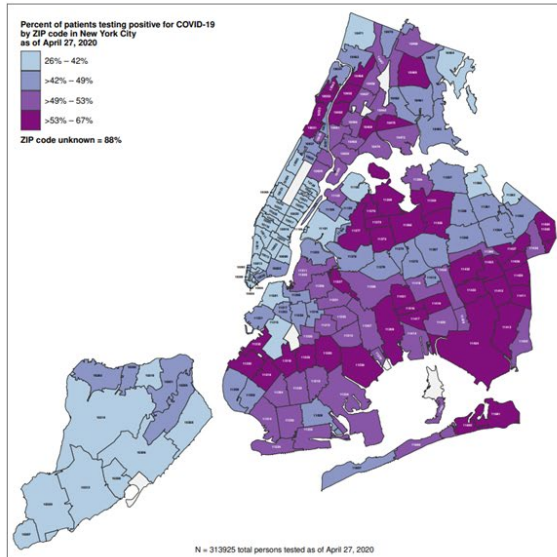
Certain environmental factors may also lead to a greater risk for COVID-19 infection. For example, considering decile-level neighborhood information below on health disparities, compared to the spread of COVID-19 in each zip code, helps to illuminate these potential associations in New York City. Becares and Nazroo (2020) states that many underrepresented groups “live in over-crowded, multi-generational housing... live in deprived neighborhoods with high rates of concentrated poverty and increased pollution levels.” Factors which may contribute to the spread of COVID-19.

Williams and Collins (2001) state that the segregation of Black Americans is the result of SES as a fundamental cause driving health disparity. They acknowledge the historical roots of racial segregation in residential communities based on discrimination, but then extend residential segregation into present day through the “concentration of urban poverty”. The authors outline several of the concepts that have been touched on before, such as lower educational and employment opportunity and demonstrate that SES indicators for Black Americans in 1998 differ considerably, compared to White Americans.

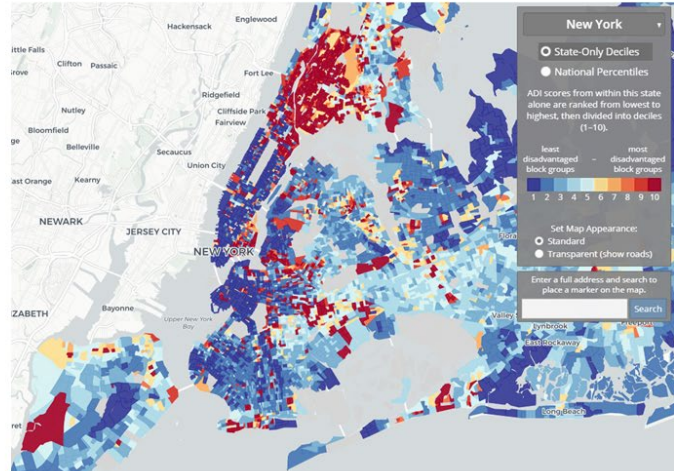
Furthermore, geographic differences in health outcomes appear to be associated with socioeconomic disparities, as demonstrated in the NYC DOH charts and statistics. In areas of greater advantage, residents may have more exposure to health education, better access to quality screenings and healthcare management, and more health-promoting resources (e.g. food, parks, etc.). This effect points to a clear breakdown in primary and secondary prevention for more disadvantaged, NYC residents. In addition, toxicants, such as the dense air pollution in metropolitan areas (e.g. New York

City), may lead to increased COVID-19 risks. The respiratory system may be particularly vulnerable to social and environmental factors in the early stages of COVID-19 infection.

Spread of COVID-19 & Health Disparities



<https://www1.nyc.gov/site/doh/covid/covid-19-data.page#download>



<https://www.neighborhoodatlas.medicine.wisc.edu/mapping>

The experience of being Black and/or Brown in America is associated with several racial and ethnic health disparities at both individual and community levels. Socioeconomic constraints, institutional bias, and housing insecurity all contribute to social stressors throughout the life-course, which may be associated with social and physiological vulnerabilities to COVID-19.

COVID-19 FALLOUT – A FOCUS ON LONELINESS AND COGNITIVE DECLINE

Loneliness During COVID-19

A consensus definition of loneliness has not been established, but it can be described as “a painful feeling of social isolation that accompanies perceived deficiencies in the number or quality of one’s social relationships” (Peplau & Perlman, 1982, as cited in Hawkey et al, 2008, p. S375). While social isolation does not necessarily lead to loneliness, objective and subjective social isolation are related (Hughes et al, 2004). The prevalence and severity of loneliness during social isolation may differ at the individual and/or group level, due to several factors. Known vulnerabilities include, “Low SES, depression, poor marital quality, infrequent contact with friends and family, few social roles, lack of participation in voluntary organizations, physical health symptoms, and physical limitations” (Hawkey et al, 2008; Savikko et al, 2005, as cited in Cacoppo et al, 2010). Those with the greatest risk for loneliness include older adults, residents of disadvantaged neighborhoods, groups experiencing disproportionate loss, and especially spouses and partners who have experienced recent loss.

The effects of social distancing may also have unintended health consequences for old age adults in these already at-risk groups. Nearly half of those over 80 years of age report frequent loneliness (Hawkey, 2015), and 19.3% of older adults over 65 years of age report feeling lonely much of the previous week (Theeke, 2009, as cited in Masi et al, 2011). Loneliness is linked with several poor

health outcomes and is independently associated with declines in physical, psychological, and cognitive health (Buchman et al, 2010; Cacioppo et al, 2010; Wilson et al, 2007). For example, decreased socialization during late-life is also associated with greater cognitive decline (James et al, 2011). The growing number of older adults experiencing loneliness has been identified as a unique public health challenge, which warrants special attention (Fried et al, 2020).

For example, those without a close, intimate partnership, including – but not limited to – individuals who are unmarried, widowed, caregivers, etc., may be particularly vulnerable to loneliness during social distancing measures. The loss of a loved one, due to COVID-19, may have a particularly profound effect on experienced loneliness during social isolation, because of measures that have restricted final arrangements and possibly interfered with normal bereavement. While not exclusively limited to ethnic communities, it stands to reason that disproportionate rates of COVID-19 infections and deaths in racial/ethnic communities may also lead to disrupted bereavement and potentially chronic loneliness in these groups as well, even when social distancing measures are relaxed.

Social Factors in Cognitive Decline and Neurodegenerative Disease

Public health efforts have added ~30 years to life expectancy. However, this extension will have a profound effect on the number of those living with age-related diseases. Alzheimer's Disease and Related Dementias (ADRD) was a top five cause of death worldwide in 2016 and had not been listed previously in 2000 (World Health Organization, 2018). The prevalence of ADRD is expected to triple by 2060, as large segments of the population reach very old age, of which Black and Latino rates of diagnosis are expected to accelerate the fastest (Matthews et al, 2018).

Alzheimer's disease affects 5.8 million Americans age 65 years and older according to the Alzheimer's Association's 2020 Facts and Figures report. Alzheimer's disease leads to increased mortality. The number of deaths due to Alzheimer's disease has risen 146.2% between 2000 and 2018, while other major causes of death, such as heart disease, stroke, and HIV, have declined (Alzheimer's Association, 2020). Due to a substantial demographic shift, which brings an unprecedented number of individuals into the age ranges associated with the greatest risk, the number of those diagnosed with Alzheimer's disease is expected to increase to 13.8 million Americans by 2050.

Social determinants may provide a new way to look at high-risk populations. For example, higher risks have been associated with non-white groups (Mehta & Yeo, 2018), and these non-white groups are expected to have the greatest increases in incident dementia over the next 40 years (Matthews et al, 2018). Many social forces are driving this trend, such as poor access to sub-specialty neurological care for the uninsured or underinsured. Individual or cultural beliefs and attitudes about the medical system may be a barrier to detection and diagnosis. Social disparities, such as the education gap (Zahodne, 2015), may withhold certain protective benefits in cognition from those not granted access to high educational or occupational attainment (Stern, 2012).

Alzheimer's disease risk is a story of social inequality between classes. Less advantaged individuals are not provided the same opportunities to fend off the deleterious effects of Alzheimer's disease as more advantaged individuals. The risk differences between ethnic groups are not explained though differences in genetics or health behaviors, and are better understood as the cumulative effects of disparities, such as access to quality education, employment opportunities, and sufficient healthcare across the lifespan.

Due to the current structure of our education and healthcare systems, more advantaged families hoard these opportunities through better education, better jobs, greater available resources, better health insurance coverage, and increased social capital. Not only do these disparities limit health agency across the life course, but they also threaten dignity, security, and humanity. It is the byproduct of this demoralizing, power dynamic that inflicts very real, neuropathologic damage.

It is said that Alzheimer's disease does not discriminate. But it is clear that socioeconomic status and class differences drive higher rates of cognitive decline in some groups, but not others. In bio ethics circles, Alzheimer's disease has come to be considered a disease of autonomy. It is well known that the disease robs individuals of their cognitive and functional abilities, but it is the presence of socioeconomic disparities that heightens risk for subsets of the population that are disproportionately affected.

COVID-19, Loneliness, and ADRD

The social risks associated with COVID-19, loneliness, and ADRD overlap considerably. Disproportionate deaths due to COVID-19 may lead to increased levels of loneliness among older adults, due to unintended consequences of social distancing measures, interruptions in normal bereavement, or other unknown effects at this point in time. If steps are not taken to help lonely, older adults, they may have difficulty transitioning from lonely and non-lonely state when social distancing measures are lifted, leading to chronic loneliness. The negative health effects of chronic loneliness have been well documented and include additional associated risks to physical, psychological, and cognitive health. Creating opportunities to help older adults transition fluidly between lonely and non-lonely states is essential to mitigate unintended, short and long-term health consequences of social distancing measures. This is especially true for the oldest old, disproportionately affected groups, caregivers, and those with disabilities.

INTERVENTIONS & POLICY

Transitioning from lonely to non-lonely offers several benefits, such as better self-rated health, lower family strain, and more frequent socializing (Hawkey & Kocherginsky, 2018). Without intervention, certain groups (i.e. non-white, older adults) may be more vulnerable to declines in physical, psychological, and cognitive health; suffer from increased morbidities and mortality; and their communities may experience a loss of social capital. Fully eliminating loneliness in society is unlikely, but preventing chronic loneliness within vulnerable communities can have several downstream public health benefits (Perlman & Peplau, 1984).

Increased socialization during late-life is associated with less cognitive decline (James et al, 2011). This example demonstrates that sustained social engagement contributes to successful aging (Rowe & Kahn, 1997). Loneliness across the lifespan peaks in young adulthood, recedes during midlife, then spikes in very old age (Luhmann & Hawkey, 2016). This observation may provide a special opportunity to broadly reduce loneliness in society, through intergenerational interventions. One such intervention, Experience Corps, increased physical, cognitive, and social activity compared to age-matched controls (Fried, 2004).

Experience Corps is a volunteering program that involved the active engagement of older African American women. The peripheral benefit of this intervention is that it "places older adults in the public elementary school system in support of improved academic outcomes for children" (Tan et al, 2009). As a result, benefits related to aging could be two-fold 1) for the immediate benefit of older adult volunteers, and 2) for the future benefit of the students, i.e. better educational outcomes.

In addition, initiatives to address public policy decisions and community-level support may be an effective way to dramatically alter future risks for loneliness, post-COVID-19. Legislation, may provide legal safeguards and benefits for older adults as a protected class. Community outreach programs by health systems may help improve health education and strengthen relationships with the community. Novel grant programs may provide enhanced opportunities for quality education and employment, stabilize and strengthen financial security in a post-COVID-19 economy, and enable healing of the collective trauma caused by COVID-19.

Lastly, bias training should be a mandated government policy to educate and inform medical staff and public health professionals. It has been shown that standards of care, such as chart review, good bedside manner, and attention to vital signs, may be less attended in Black and Brown patients. Unconscious, racial bias may create this inattention and should be addressed and corrected. Providing routine sensitivity training may help medical staff be more consciously aware of bias and bring greater responsiveness to the care of Black and Brown patients.

CONCLUSION

The short and long-term effects of social distancing measures as a public health strategy are currently unknown, but the social, economic, and health costs are already becoming apparent. Long-term effects for vulnerable populations (i.e. the oldest old, disproportionately affect groups, caregivers, and the disabled) may be especially difficult to manage. Those that belong to disproportionately affected groups may be at greater risk for experiencing chronic loneliness from substantial loss of life, even when social distancing measures are lifted.

Loneliness has been associated with many negative health outcomes, but one specific area where these risks may be compounded is cognitive health. Without adequately addressing the needs of lonely, older adults, COVID-19 public health efforts may risk increasing deleterious, downstream effects that stem from the very measures designed to protect older adults. If unaddressed, the increased prevalence in chronic loneliness may coalesce with other risk factors and lead to an increased risk for cognitive decline and/or Alzheimer's Disease and Related Dementias.

WORKS CITED

- American Association for Retired Persons (2018). A National Survey of Adults 45 and Older: Loneliness and Social Connectedness. Accessed online. Retrieved March 7th, 2020 from https://www.aarp.org/content/dam/aarp/research/surveys_statistics/life-leisure/2018/loneliness-social-connections-2018.doi.10.26419-2Fres.00246.001.pdf
- Alzheimer's Association (2020). 2020 Alzheimer's Disease Facts and Figures. Alzheimer's Association. Accessed online March 15th, 2020 from <https://www.alz.org/media/Documents/alzheimers-facts-and-figures.pdf>
- Becares, L. and Nazroo, J. (2020). Racism is the root cause of ethnic inequities in COVID19. Discover Society. Accessed online May 12th, 2020 from <https://discoversociety.org/2020/04/17/racism-is-the-root-cause-of-ethnic-inequities-in-covid19/>
- Buchman, A.S., Boyle, P.A., Wilson, R.S., James, B.D., Leurgans, S.E., Arnold, S.E., and Bennett, D.A. (2010). Loneliness and the rate of motor decline in old age: The Rush memory and aging project, a community-based cohort study. *BMC Geriatrics*, 10(77), p. 1-8.
- Burke, D. and Fresques, H. (2020). Early Data Shows African Americans Have Contracted and Died of Coronavirus at an Alarming Rate. ProPublica. Accessed online May 14th, 2020 from <https://www.propublica.org/article/early-data-shows-african-americans-have-contracted-and-died-of-coronavirus-at-an-alarming-rate>
- Cacioppo, J.T., Hawkley, L.C., and Thisted, R.A. (2010). Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago health, aging, and social relations study. *Psychology and Aging*, 25(2), p. 453-463.
- David, R. and Collins, J. (2007). Disparities in Infant Mortality: What's Genetics Got to Do With It? *American Journal of Public Health*, Vol 97, No. 7.
- Fried, L.P. (2016) Investing in health to create third demographic dividend. *The Gerontologist*, 56(S2), p. S167-S177.
- Fried, L.P., Carlson, M.C., Freedman, M., Frick, K.D., Glass, T.A., Hill, J., McGill, S., Rebok, G.W., Seeman, T., Tielsch, J., Wasik, B.A., and Zeger, S. (2004). A social model for health promotion for and aging population: Initial evidence on the experience corps model. *Journal of Urban Health*, 81(1), p. 64-78.
- Fried, L., Prohaska, T., Burholt, V., Burns, A., Golden, J., Hawkley, L., Lawlor, B., Leavey, G., Lubben, J., O'Sullivan, R., Perissinotto, C., van Tilburg, T., Tully, M., & Victor, C. (2020). A unified approach to loneliness. *The Lancet*, 395, p. 114.
- Hawkley L.C. (2015) Loneliness and Social Embeddedness in Old Age. In: Pachana N. (eds) Encyclopedia of Geropsychology. Springer, Singapore.

- Hawkley, L.C., Hughes, M.E., Waite, L.J., Masi, C.M., Thisted, R.A., & Cacioppo, J.T. (2008). From social structural factors to perceptions of relationship quality and loneliness: The Chicago health, aging, and social relations study. *Journal of Gerontology: Social Science*, *63B*(6), p. S375-S384.
- Hawkley, L.C. and Kocherginsky, M. (2018). Transitions in loneliness among older adults: A 5-year follow-up in the national social life, health, and aging project. *Research on Aging*, *40*(4), p. 365-387.
- Hawkley, L.C., Wroblewski, K., Kaiser, T., Luhmann, M., & Schumm, L.P. (2019) Are U.S. older adults getting lonelier? Age, period, and cohort differences. *Psychol Aging*, *34*(8), p. 1144-1157.
- Holt-Lunstad, J., Smith, T.B., Baker, M., Harris, T., and Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science*, *12*(2), p. 227-237.
- Hughes, M.E., Waite, L.J., Hawley, L.C., & Cacioppo, J.T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, *26*(6), p. 655-672.
- James, B.D., Wilson, R.S., Barnes, L.L., & Bennett, D.A. (2011). Late-life social activity and cognitive decline in old age. *Journal of the International Neuropsychological Society*, *17*, p. 998-1005.
- Kaiser Family Foundation (2020). Eligibility for ACA Health Coverage Following Job Loss. Accessed online May 15th, 2020 from <https://www.kff.org/coronavirus-covid-19/issue-brief/eligibility-for-aca-health-coverage-following-job-loss/>
- Luhmann, M. and Hawkley, L.C. (2016). Age differences in loneliness from late adolescence to oldest old age. *Developmental Psychology*, *52*(6), p. 943-959.
- Masi, C.M., Chen, H-Y, Hawkley, L.C., & Cacioppo, J.T. (2011). A meta-analysis of interventions to reduce loneliness. *Personality and Social Psychology Review*, *15*(3), p. 219-266.
- Matthews, K.A., Xu, W., Gaglioti, A.H., Holt, J.B., Croft, J.B., Mack, D., McGuire, L.C. (2018). Racial and ethnic estimates of Alzheimer's disease and related dementias in the United States (2015–2060) in adults aged ≥65 years. *Alzheimer's and Dementia*, *15*(1), 17-24.
<https://doi.org/10.1016/j.jalz.2018.06.3063>
- Mehta, K.M. and Yeo, G.W. (2018). Systematic review of dementia prevalence and incidence in United States race/ethnic populations. *Alzheimer's & Dementia*, *13*(1), 72-83.
<https://doi.org/10.1016/j.jalz.2016.06.2360>
- Patterson, O. (2000). Taking culture seriously: A framework and an Afro-American illustration. In L. E. Harrison & S. P. Huntington (Eds.), *Culture matters: how values shape human progress* (1st ed. ed.). New York Basic Books.
- Peplau, L. A., and Perlman, D. (1982). *Loneliness: A sourcebook of current theory, research and therapy*. New York: Wiley Interscience.

- Perlman, D., and Peplau, L. A. (1984). Loneliness research: A survey of empirical findings. In L. A. Peplau & S. E. Goldston (Eds.), *Preventing the harmful consequences of severe and persistent loneliness* (p. 13–46). National Institutes of Mental Health.
- Peterson, A., Largent, E. A., and Karlawish, J. (2020). Ethics of reallocating ventilators in the covid-19 pandemic. *BMJ*, 369, doi: 10.1136/bmj.m1828
- Phelan, J.C. and Link, B.G. (2015). Is racism and fundamental cause of inequalities in health? *Annual Review of Sociology*, 41, p.311-330, doi: 10.1146/annurev-soc-073014-112305
- Quealy, Kevin (2020). The Richest Neighborhoods Emptied Out Most as Coronavirus Hit New York City, *New York Times*. Accessed online May 15th, 2020 from <https://www.nytimes.com/interactive/2020/05/15/upshot/who-left-new-york-coronavirus.html>
- Rabin (2019). Huge Racial Disparities Found in Deaths Linked to Pregnancy. *New York Times*. Accessed online August 17, 2019.
- Rowe, J.W. and Kahn, R.L. (1997). Successful Aging. *The Gerontologist*, 37(4), p. 433-440.
- Sivaramakrishnan, K. (2020). Epidemics have been times of a huge amount of social stress... *CNN News* 18. Accessed online May 14th, 2020 from <https://www.facebook.com/cnnnews18/videos/303985417257053/>
- Stern, Y. (2012). Cognitive reserve in ageing and Alzheimer's disease. *Lancet Neurology*, 11(11), 1006-1012. [https://doi.org/10.1016/S1474-4422\(12\)70191-6](https://doi.org/10.1016/S1474-4422(12)70191-6)
- Tan, E.J., Rebok, G.W., Yu, Q., Frangakis, C.E., Carlson, M.C., Tao, W., Ricks, M., Tanner, E.K., McGill, S., & Fried, L.P. (2009). The long-term relationship between high-intensity volunteering and physical activity in older African American women. *Journal of Gerontology: Social Sciences*, 64B(2), 304–311, doi:10.1093/geronb/gbn023
- Villarosa (2018). Why America's Black Mothers and Babies are in a Life-or-Death Crisis. *New York Times*. Accessed online July 31st, 2019.
- Williams, D.R. and Collins, C. (2001). A fundamental cause of racial and disparities in health. *Public Health Reports*, 116, p. 404-416.
- Wilson, R.S., Krueger, K.R, Arnold, S.E., Schneider, J.A., Kelly, J.F., Barnes, L.L., Tang, Y., & Bennett, D.A. (2007). Loneliness and Risk of Alzheimer Disease. *Archives of General Psychiatry*, 64, p. 234-240.
- World Health Organization (2018). The top 10 causes of death. Accessed online August 18, 2019: <https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death>
- Wu, Z. and McGoogan, J.M. (2020). Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: Summary of a report of 72,314 cases from the Chinese center for disease control and prevention. *Journal of the American Medical Association*.

Zahodne, L.B., Stern, Y., Manly, J.J. (2015). Differing effects of education on cognitive decline in diverse elders with low versus high educational attainment. *Neuropsychology*, 29(4), 649-657.
<http://dx.doi.org/10.1037/neu0000141649>