


Marginalized Males, Disparate COVID-19 Outcomes, and Health Equity: A Profile of Highest Risk

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Abstract

This paper is a direct response to Smith et al.'s (2020) call for more insight into health equity concerns pertaining to COVID-19 outcomes. The goal of this discussion is to offer the field with an evidence-informed 'avatar' representing the most-impacted group as it pertains to COVID-19 mortality and morbidity. Policy and practice implications are offered as a call to action for public health professionals to support these most impacted and highest risk communities.

Keywords

COVID-19, health equity, vulnerable populations, risk factors

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Purpose

Significant progress has been made during the past 18 months to understand the nature of transmission, risk factors, disparities in outcomes, and susceptibility of the novel coronavirus, SARS-CoV-2, along with its resulting disease, COVID-19. Many challenges lie ahead, however, including the rise and spread of specific variants of the virus and the overall effectiveness and delivery of vaccinations.

One large factor demanding increased attention and resources are the current global health disparities witnessed among marginalized communities. Smith et al. (2020) provided a thorough commentary on sex and gender pertaining to COVID-19 health inequities. The authors specifically highlighted a certain "invisibility" for such "sex and gender-specific approaches to COVID-19 from a men's health equity perspective" (p. e55). They called the field into action by encouraging the provision of "evidence-based and equity-focused syntheses" in order to "promote positive public health responses for vulnerable groups" (p. e53).

Although 'equity' has a very important role to play in the future of delivering a true public health for all, unfortunately, many times it does not. The COVID-19 pandemic is no different. This paper, therefore, serves as a supportive response of Smith et al. (2020) in attempting

to offer the field a more poignant characterization of who the highest risk group is pertaining to COVID-19 mortality and morbidity. Our end goal is to help proffer more equitable outcomes in any way we can, in this case, vis-à-vis showcasing an avatar of highest COVID-19 morbidity and mortality risk through publicly available data. Policy and practice implications are offered as a call to action for public health professionals to support our most vulnerable communities.

COVID-19 Health Equity Concerns

The evidence presented in the literature suggests that emerging COVID-19 outcome disparities are exacerbating present health inequities among medically underserved or

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marginalized communities. The body of literature to study, address, and eventually achieve health equity regarding COVID-19 outcomes is growing. However, concrete plans of action, or at least something tangible for healthcare professionals to use as a platform to expand and enhance their work, are contained within very few. The literature that does make available practical policy or practice steps offer sound advice and plans of action to help mitigate COVID-19 health equity concerns [see Glover et al. (2020), for example].

Blumenshine et al. (2008) discussed the possible impact a pandemic could have on different racial/ethnic subgroups to “call attention” to many avoidable disparate health outcomes. Currently, with the global crisis created from the COVID-19 pandemic, marginalized populations are indeed bearing an undue burden of detrimental effects and unprecedented consequences. As Smith et al. (2020) clarifies, for example, disparate COVID-19 morbidity and mortality outcomes are manifesting among a variety of demographic subgroups, including racial, ethnic, and gender minorities. For example, epicenters within Louisiana, Illinois, and Michigan have shown COVID-19 mortality rates to be the highest among African Americans at 70.5%, 70%, 40%, respectively (Yancy, 2020). Other regions of the country with large minority populations are witnessing the same phenomenon within Latino and Native American population (CDC 2020b). Preliminary evidence involving studies on gender, further, suggests males are more vulnerable to becoming critically ill/vulnerable with certain diseases/outcomes (i.e., heart disease, suicide, among others) than their female counterparts (Seifart et al., 2020; Wenham et al., 2020), most notably, COVID-19. How prescient Blumenshine et al. (2008), among others, were over a decade ago.

Smith et al. (2020) suggest a general ignorance exists from governments on the health inequities experienced during the COVID-19 pandemic, particularly towards minority males. The authors emphasize that empirical evidence is needed to demonstrate the realities of COVID-19 risk. We need to, however, view the issue through an intersectional lens while keeping social determinants of health central to any conceptual framework that may emerge (i.e., assessing aggregate risk through race/ethnicity, social status, employment). Much has been theorized on the topic, but little evidence has been compiled in an ecological design sense to produce a workable model from which public health officials can use to implement practical solutions for those hit hardest by the pandemic. Admittedly, this task would take time and resources to collate the appropriate information, ensure its homogeneity in terms of operationalization and categorization of key outcomes, and analyze the data. We, therefore, offer but an exploratory attempt to produce an avatar of highest risk for COVID-19 morbidity and

mortality outcomes. This should be seen as a preliminary next step in devising large-scale ecological analyses to assist with an expansion of effort and resources to help allay the burden of COVID-19 health outcome inequities.

Risk Factors

Smith et al. (2020) called for empirical demonstrations on how COVID-19 disparities exist within demographic subgroups. Duly, we scoped publicly available U.S. data to identify risk factors linked with COVID-19 case severity and mortality data. The primary measures at the national and county level included sex, race, age, body mass index (BMI), invasive mechanical ventilation usage (IMV), and pre-existing cardiovascular health and ailments.

Through the analysis of these aggregate data, we intended to highlight the most vulnerable subpopulation and thereby illustrate the most urgent necessity of healthcare resources. COVID-19 related data on race and ethnicity stemmed from The COVID Tracking Project (n.d.), the American Public Media Lab (n.d.), and CDC data. The list of underlying conditions relevant to COVID-19 was developed from WHO (2020) guidelines, as well as pertinent peer-reviewed literature.

There is one caveat: Lai et al. (2020) analyzed the rapid spread of COVID-19 in long-term care facilities. They made it clear that individuals living in nursing homes fell into the highest risk group. This, unfortunately, is a well-known assertion and tracks with COVID-19 mortality rates by location, as well as vulnerability studies previously conducted. For the purposes of our study, however, we wished to identify an avatar of highest risk outside of nursing homes or assisted care facilities.

Sex-Specific Outcomes. Previous research indicated a significant degree of higher risk for males to experience worse COVID-19-related outcomes (e.g., Griffith et al., 2020; Smith et al., 2020). This evidence continues to grow. For example, recent data from a study conducted at the Capital Medical University in Beijing reported mortality among men to be 2.4 times that of women (Jin et al., 2020). Pertaining to overall sex-specific mortality, Table 1 illustrates the disproportionate nature of COVID-19 outcomes by sex and age as of January 2021.

The raw mortality data indicate an overwhelming disparity in the numbers of males who died compared to females. Pertaining to COVID-19-related proportional deaths, individuals over the age of 64 make up the largest percentage of deaths. Specifically, males aged 65–74 experience nearly 40% more deaths than similarly aged females while those aged 75–84 experience a nearly 20% increase in the number of deaths. Among those who were 85+,

Table 1. Counts of Death Involving COVID-19 and Select Causes of Death by Sex and Age Group for the United States (as of January 6, 2021).

Sex	Age group	All deaths involving COVID-19	Deaths from all causes	Population	Proportional mortality ratio (%)
Male	All ages	169,742	1,656,122	161,657,324	10.25
	<1 year	21	9,776	1,935,117	0.21
	1–4 years	11	1,899	8,074,090	0.58
	5–14 years	32	3,141	20,941,023	1.02
	15–24 years	296	24,840	21,810,359	1.19
	25–34 years	1,359	48,548	23,359,180	2.80
	35–44 years	3,715	64,075	20,792,080	5.80
	45–54 years	10,061	111,878	20,171,966	8.99
	55–64 years	23,887	253,487	20,499,219	9.42
	65–74 years	40,863	365,797	14,699,579	11.17
Female	75–84 years	47,988	401,080	6,998,223	11.96
	85 years+	41,509	371,601	2,376,488	11.17
	All ages	143,423	1,515,683	166,582,199	9.46
	<1 year	11	7,945	1,847,935	0.14
	1–4 years	8	1,377	7,719,541	0.58
	5–14 years	22	2,106	20,053,140	1.04
	15–24 years	198	8,756	20,877,151	2.26
	25–34 years	770	20,255	22,581,141	3.80
	35–44 years	1,844	33,470	20,867,064	5.51
	45–54 years	4,901	66,562	20,702,936	7.36
55–64 years	13,348	158,548	21,949,318	8.42	
65–74 years	25,881	264,552	16,783,854	9.78	
75–84 years	37,935	368,946	8,971,649	10.28	
85 years+	58,505	583,166	4,228,470	10.03	

Note. Source: https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm.

females had a higher raw count of deaths than males, however, there are nearly double the number of females than males in that age category, which may explain the disparate numbers. In terms of the proportionate mortality ratio (PMR), except for the 15-24- and 25–34-year-old categories, males had higher PMRs than females. For 65-74- and 75-84-year-old categories, the PMR disparity was at its highest between males and females. In summary, not only are more males dying than females but the overall percentage of males who contract and die from the disease is higher.

Comorbidities. In tandem with reference to WHO (2020) and CDC (2020a, 2020b) data sources, Simonnet et al.'s (2020) study regarding the prevalence of obesity within COVID-19 patients requiring administered invasive mechanical ventilation (IMV) helped guide our categorization efforts for comorbidities. The data indicate that male patients admitted to intensive care for COVID-19 are nearly 2.5 times more likely to require mechanical ventilator support than not. Additionally, those requiring IMV support (i.e., more severe cases with increasing mortality) have nearly a four times higher instance of diabetes and an average BMI that is 4.1 indexes higher than the non-IMV group.

Popkin et al.'s (2020) research reinforces the idea of obesity as a significant risk factor for severity and mortality of COVID-19. Pooled analyses show individuals with obesity were at greater risk for (1) testing positive for COVID-19 [$>46.0\%$ higher (OR = 1.46; 95% CI, 1.30–1.65; $p < 0.0001$)], (2) hospitalization [113% higher (OR = 2.13; 95% CI, 1.74–2.60; $p < 0.0001$)], (3) ICU admission [74% higher (OR = 1.74; 95% CI, 1.46–2.08)], and (4) mortality [48% increase in deaths (OR = 1.48; 95% CI, 1.22–1.80; $p < 0.001$)]. In summary, the presence of comorbid conditions, specifically increased BMI and the presence of diabetes, increases the chance of needing IMV, which is related to an increase in the risk of death from COVID-19.

Race and Ethnicity. Data from the American Public Media lab (n.d.) indicate significant differences in overall age-adjusted mortality rates between minority racial/ethnic groups as compared to their White/Caucasian counterparts: Black/African Americans ~ 3.6 times the risk, Indigenous Peoples ~ 3.4 times the risk, Latinos ~ 3.2 times the risk, Pacific islanders: ~ 3 times the risk, and Asians ~ 1.3 times the risk. We adjusted for age as to highlight the gap in the nation-wide mortality rates

Table 2. Mortality and race.

Race	Deaths per 100,000
Black/African American	137
American Indian/Alaskan Native	123
Hispanic/Latino	108
White/Caucasian	86
Native Hawaiian/Pacific Islander	85
Other	73
Asian	64
Two+ races	12

Note. Source: adapted January 10, 2021 from <https://covidtracking.com/race>.

between all groups and White/Caucasians, who have the lowest rate. Table 2 illustrates death per 100,000 by ethnicity tabulated by the COVID Tracking Project. The most vulnerable groups for a COVID-related death are racial and ethnic minorities, most notably, Black/African Americans.

An Avatar of Highest Risk

Observing the previous data in the aggregate demonstrate a significantly higher COVID-19 burden among males, especially at ages over 55. This finding supports the literature suggesting an increased male susceptibility and a higher degree of negative outcomes (Griffith et al., 2020; Smith et al., 2020; Wenham et al., 2020). The data also indicate that the presence of comorbid conditions along with a COVID-19 diagnosis made prognoses worse for those infected with the SARS-CoV-2 virus. Those who were overweight/obese, had cardiopulmonary conditions, and/or other respiratory issues were identified to have an increased COVID-19 mortality. Simonnet et al. (2020) indicated obesity and severe obesity to be present in 47.6% and 28.2% of cases, respectively. Through a univariate logistic regression analysis between patient clinical characteristics and the need for invasive mechanical ventilation (IMV), males with BMI ≥ 35 kg versus < 25 kg had 6.75 higher odds of requiring IMV (Simonnet et al., 2020). Given the consistent tracking of BMI and COVID-19 severity/prevalence, we found controlling for obesity to be one of the most important factors in controlling for susceptibility.

Finally, through 2020 into 2021, Black/African Americans have the highest deaths per 100,000 from COVID-19. This population possessed nearly 2.3 times the rates of infections and 3.6 times higher mortality rates compared to White/Caucasians. Aggregating the data led to our baseline avatar of highest susceptibility from COVID-19-related mortality being a Black/African American male between the ages of 55 and 85 who has

comorbid conditions, such as overweight/obesity, cardiovascular disease, and/or respiratory health concerns.

Closing Thoughts and Future Implications

In the course of this research, it has become clear that there is inadequate study data collected on COVID-19 outcome differences between male and females within minority populations. There is a host of data surrounding racial characteristics of COVID-19 patients by sex and gender, however, there is a clear lack of attention towards studying the nuances of sex/gender disparities within minority population's outcome data. More research is needed to provide more context to race/ethnicity and sex/gender disparities.

Acknowledging the potential for much of these statistics to reflect systematically ingrained racial disparities and phenomena such as ethnic "weathering," these data may indicate an exacerbation of such disparities experienced by this marginalized population. However, even if a significant amount of the increased disease burden and mortality for minority communities is simply a reflection of exacerbated longstanding disparities, it remains a clarion call for larger attention to be drawn to mitigating this crisis. By improving the health indicators of our most underserved populations, it will ease burden on the U.S. healthcare system overall, and specifically in the case of COVID-19, reduce mortality across the country while addressing a reality that has long been overlooked.

Pertaining to the profile of highest COVID-19 risk, given the disproportionate nature with which Black/African American males are affected by the virus, a comprehensive risk education program, along with mass vaccination sites in and around majority minority regions can potentially save the lives of tens of thousands. This is precisely why we recommend a robust federal plan to couple community education campaigns in urban centers where the virus is raging the hardest with access to the vaccine determined by necessity when available. In the immediate future, we must concentrate on equitable vaccine distribution and deploy all available resources towards assisting these communities nationwide. The higher the disease burden within any community, the more it strains the resources of the overall system, and by concentrating resources in terms of vaccine distribution and education campaigns within the epicenters, it will reduce the overall burden.

With three FDA-approved effective vaccines (Pfizer, Moderna, and Johnson & Johnson) on the market for combating COVID-19, there is skepticism from elements within every community for acceptance. Unfortunately, the African American community has a long history of government mistrust and some vaccine skepticism, and not without sound, legitimate reasoning. By focusing on

coupling transparent education campaigns with increased vaccine availability, we recommend repairing communication gaps between healthcare providers and historically underserved communities, as well as increase vaccination rates in the most susceptible populations, thereby reducing future transmission and disease burden. We understand, however, this is a monumental task that would need a long-term commitment for implementation. Sustained, not sporadic, support is needed to grow trust. Dedicated federal, state, and local funding is needed to maintain these outreach efforts.

Even assuming success in vaccine distribution, which would, at least theoretically, translate to high vaccination rates, there are significant implications for the nearly 30 million Americans who have already been infected with COVID-19 (CDC, 2020b). Addressing their concerns regarding quality of life and inevitable accumulation of comorbidities must be considered now so as to eliminate increased healthcare burden in the future. Developing a plan of action to preemptively allocate resources to stave off the worst of the long-term effects should be a top priority, in addition to basic education campaigns regarding proper mask usage and other common facts regarding the virus.

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Ethics Approval Statement

Ethical approval and informed consent is not required, as this study is a retrospective review in nature.

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