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Sara S.J. Willems, PhD, Mariana C. Castells, MD, PhD, Alan P. Baptist, MD, MPH

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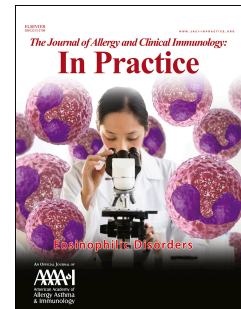
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The Magnification of Health Disparities During the COVID-19 Pandemic

Sara S J Willems, PhD^a, Mariana C Castells, MD, PhD^b, Alan P Baptist, MD, MPH^c

^a Professor Equity in Health Care

Director Expert Centre Quality and Safety Ghent

Department of Public Health and Primary Health Care

Faculty of Medicine and Health Sciences

Ghent University

Corneel Heymanslaan 10, entrance 42

9000 Gent

Belgium

Sara.Willems@ugent.be

^b Director Drug Hypersensitivity and Desensitization Center

Director Mastocytosis Center

Professor of Medicine

Harvard Medical School

Brigham and Women's Hospital, Boston, MA

USA

mcastells@bwh.harvard.edu

^c Director UM Comprehensive Asthma Management Program

University of Michigan

Division of Allergy and Clinical Immunology

24 Frank Lloyd Wright Drive, Suite H-2100

Ann Arbor, MI 48106

27 USA

28 abaptist@med.umich.edu

29

30 Corresponding author: Sara Willems, Sara.Willems@ugent.be

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Abstract

Covid-19 has created and amplified racial health disparities. This has been particularly noticeable in populations with asthma. There is no one simple reason for this occurrence, but rather a complex interaction of biological, structural, and socioeconomic factors. This article will highlight reasons why the COVID-19 pandemic has been particularly impactful among minority populations throughout the world and will also offer potential solutions to help overcome health disparities.

Keywords:

COVID-19; health disparities; race; minority populations; asthma; social determinants of health; health care organization

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Global COVID-19 pandemic disparities

Two sisters lived few miles from each other in a rural area. They were the bread winners of their families selling produce in the open market. Both were married, in their 50s, and had children. They were Hispanic with low socioeconomic status and had limited access to information, health care, and resources. However, they were in good health: they did not smoke, did not have diabetes or hypertension, although one had mild asthma. They could not stop working during the pandemic and vaccination for COVID-19 had not started. One sister acquired COVID-19 from one of her adolescent children, a few days before the family was reunited for a birthday party. Masks and social distancing were not enforced. Her symptoms worsened in the next week with fever, cough and shortness of breath. Her sister with whom she had close contact during the party started 5 days later with similar symptoms, which also worsened quickly. Access to medical care was difficult, the hospitals were overloaded, and they were treated at home with azithromycin, dexamethasone, inhaled corticosteroids and bronchodilators. Oxygen became necessary and the family searched for it. Attempts were made for transport of both sisters to the capital however oxygen became unavailable in and outside hospitals. The two sisters died within few days of each other gasping for air, within two weeks of becoming symptomatic. Their deaths had devastating impact in the family, destroying the sources of income and emotional support of the children and the entire family.

At the end of 2019, a novel coronavirus (SARS-CoV-2) emerged from an animal reservoir in Wuhan, China.^{1,2} In January 2020, WHO recognized the worldwide infection with the virus as a public health emergency of international concern. In March 2020, it was declared a pandemic for which a global coordinated effort is needed to stop the further spread of the virus.³ Globally, as of December 6, 2021, there have been 265.194.191 confirmed cases of coronavirus disease 2019 (COVID-19), including 5.254.116 deaths.⁴ Globally, the mortality rate is 57.833 deaths/100K population. However, the global COVID-19 incidence and mortality rate varies temporally (as the epidemic progresses) and spatially (among countries).⁵ Countries throughout the world have reported very different case fatality ratios (the number of deaths divided by the number of confirmed cases) ranging from 7.6 % in Mexico, 4.1% in Bulgaria, 1.6% in the USA, and 0.2% in Iceland.⁶ In addition to differences in the

number of people tested and the way numbers are reported, the wide range of these figures can be explained by differences in the composition of the population (e.g., a higher proportion of elderly), the scope of the measures taken to flatten the curve, and the organization of health care (e.g., the organization of primary care, the testing abilities, the availability of medical oxygen, and the country-specific capacity to tackle a large number of patients requiring respiratory assistance and intensive care).⁵

Also, within countries the health effects of COVID-19 have been unevenly distributed among and within regions and communities. The most recent findings on ethnic disparities are those of Mude et al.⁷, who conducted a systematic literature search of studies published between January 1, 2020, and April 15, 2021, reporting on prevalence, hospitalizations, and deaths from COVID-19 by race groups. The meta-analysis on the 72 included studies (with most from the US), showed that COVID-19 significantly impacted Black people more across all the outcomes measured than White people. The prevalence ratios and hospitalization rates in Black people were 156% and 153% higher than in White people, and deaths in Black people were 105% higher than in White people. Although not as high as Black people, this study showed that also Hispanic people experienced a higher burden of disease than White people (154% higher incidence rates, 78% higher hospitalization rates, and 15% higher deaths).⁷ These results largely confirm the results of the two earlier reviews^{8,9} and one meta-analysis.¹⁰

Racial and ethnic disparities seem to have been amplified during the pandemic. For example, while over 600,000 people have died in the USA from COVID-19, the death rate through March of 2021 among Black people was 1.4 times higher than White people.¹¹ In urban areas, the disparities were even more pronounced. In Chicago, Black individuals accounted for nearly 70% of deaths from COVID-19 despite representing only 30% of the population.¹² The COVID-19 death rate among Hispanic individuals was significantly higher than that among non-Hispanic individuals in New York (74.3 vs 45.2 per 100,000, respectively).¹³ Disparities among under-25-year-olds in the US were especially high during the first months of the pandemic (January-April 2020). Although disparities remained, they decreased the months after, mainly because of a greater increase of mortality in White

people.¹⁴

Determinants of health disparities in COVID-19, with a focus on asthma

The identified racial disparities in prevalence, hospitalizations, and mortality ratio from COVID-19 could be attributed to several reasons, including biological, structural, and socioeconomic, and there is growing evidence for the relationship between ethnicity and the already known risk factors for poor clinical outcomes in COVID-19. Although there was initial significant concern that asthma was a significant risk factor for mortality from COVID-19, this generally not been observed in studies.^{15,16}

However, in a study comparing COVID-19 outcomes, the percent of African American asthma patients with COVID was significantly higher than the percent of African American non-asthma patients with COVID (35.5% vs 21.4%),¹⁷ and African American patients overall were more likely to require hospitalization. Additionally, in another study of 1,827 patients with asthma, those who required hospitalization were more likely to be African American than those who did not require hospitalization (19.1% vs 15.0%).¹⁸

To better understand the possible contributing factors of COVID-19 as an exacerbating factor of asthma health disparities, as well as to quantify the impact of the pandemic on asthmatic patients, a survey was conducted among 1,171 asthma patients and 225 physicians from April – May 2020.¹⁹ Of the asthma survey respondents, a total of 10% of the subjects were considered minority individuals (Black or Hispanic). The results of the survey helped to delineate the unequal impact of COVID-19 and possible causes.

Table 1 summarizes how COVID-19 has worsened or magnified existing health inequities.

Firstly, racial minority populations experience disproportionately higher rates of underlying health conditions, of which it is known that they are associated with an increased vulnerability to COVID-19.²⁰ For example, Native American populations have disproportionately higher heart disease and diabetes levels, which make them particularly at risk of complications from COVID-19.²¹ And in the most impoverished neighborhoods, Black people and Hispanic people are at greater risk for

respectively hypertension and diabetes compared with White neighbors, resulting in greater risk of death from a COVID-19 infection than their White counterparts.²² The reasons for increased comorbidities are complex and include social and structural determinants of health, racism (the belief that personality, behavior and morals can be traced back to race, and the belief that one race is superior to another), discrimination (acting upon racist thoughts), economic and educational disadvantages, health care access and quality, individual behavior, and biology. Minority patients with asthma are more likely to have medical comorbidities than White individuals, observed in both adult and pediatric populations.^{23,24} These comorbidities include cardiac disease, diabetes, and obesity. The presence of medical comorbidities presented a particular impetus for worsening asthma disparities. Patients with medical comorbidities have worse outcomes on most asthma metrics than those without.²⁵ Medical comorbidities (such as obesity and congestive heart failure) are a major risk factor for morbidity and mortality due to COVID-19.²⁶ The additive effects of medical comorbidities during the pandemic amplify health disparities present for individuals with asthma.

Secondly, the disproportionate impact of COVID-19 on ethnic minority communities might be attributable to higher exposure to the virus leading to an increased infection rate amongst these communities.^{10,21,22,27-30} Such factors were seen in the survey of asthma patients as well, where minority individuals with asthma were more likely to have been diagnosed with COVID-19, were more likely to have become unemployed due to COVID-19, were more likely to have difficulties obtaining asthma medications during COVID-19, and were more likely to live in communities with high number of COVID-19 cases.²³ As sustained close contact with someone who is infected with SARS-CoV-2 drives the majority of new infections, the virus is much more efficiently spread in enclosed and crowded environments. In addition, individuals from ethnic minority communities are more likely to live in larger household sizes comprised of multiple generations.⁸ Compared to their White counterparts they are also more likely to experience various deprivations in their daily lives, such as poor health, lack of education, inadequate living standards, disempowerment, poor quality of work, the threat of violence, among others (“multidimensional poverty”).²⁸ They also more often live in overcrowded households or accommodations with shared facilities or communal areas.¹⁰ Ethnic

minorities disproportionately make up "essential workers" such as retail grocery workers, public transit employees, healthcare workers, and custodial staff are more exposed to the public and at higher risk of getting infected.^{22,29,30} As it pertains to employment, social distancing is a privilege that requires the opportunity and digital access to work from home, and this is not distributed equally in society.

Thirdly, one of the most effective tools against serious complications and death from COVID-19 is vaccination, but unfortunately this again is a significant contributor to health disparities as minorities and migrant populations are less likely to be vaccinated. When the mRNA vaccines received emergency approval in the United States, vaccine hesitancy rates were significantly higher among Black and Hispanic individuals as compared to White individuals. For example, a July 2020 survey in Arkansas among 1,200 adults found that 50% of Black individuals reported significant vaccine hesitancy, compared to only 18% of White individuals.³¹ Reasons for vaccine hesitancy include mistrust of the medical establishment developed over centuries through racist exploitation by medical researchers and doctors.³² Minority individuals were underrepresented in the COVID-19 vaccine trials, further contributing to a communal sense that the vaccine was not designed for certain populations. Additionally, minority individuals face language and cultural barriers limiting their access to accurate information on prevention and mitigation, compelling them to rely on social media or advice from friends that may be erroneous.^{29, 33}

Similar to vaccine hesitancy, minority patients who contract COVID-19 are less likely to accept monoclonal antibody therapy.³⁴ In that study, patients who did not consent to monoclonal antibody therapy were significantly more likely to subsequently require hospitalization. Additionally, a large study of over 12,000 COVID-19 patients found that minority patients were far less likely to receive monoclonal antibody therapy, though whether this was related to patient hesitancy or lack of access is unclear.³⁵ There is no current data regarding COVID vaccine and/or monoclonal antibody hesitancy rates among those with asthma, and additional research is needed to determine if disparities in uptake are present in this population.

Together with the increased exposure, these healthcare-related variables are found to underlie COVID-19-related disparities even more than susceptibility (that is, comorbid conditions).⁸

Fourthly, also health care system characteristics play a significant role in COVID-19 related disparities. Barriers in health care contribute to higher rates of comorbidities that increase the risk of getting a COVID-19 infection and higher rates of bad COVID-19 outcomes.^{7,29} Despite ethnic minorities being at increased risk of exposure to the virus, they also experience increased barriers to testing such as the lack of transportation and co-payments. As a result, the only recourse for many ethnic minority patients is to seek testing in an emergency room.^{36,37} Individuals from ethnic minority groups also experience barriers in health care once they become ill with COVID-19. Sometimes healthcare is even not available. For example, in NYC, the borough of Bronx, with 58% of the population at or below "NYCgov Poverty threshold," has half the rate of ICU beds per 100,000 population of adults 60 years of age and older, compared with the borough of Manhattan with 31% of the population at or below the poverty threshold.²² Among asthma patients, minority individuals are more likely to seek care for an exacerbation at an emergency department rather than at a PCP office.³⁸ Not only do racial minority groups have less access to care, but they are also more likely to receive the inappropriate diagnosis, treatment, or referrals compared to White people.²⁰ In Europe, the PRICOV-19 study examines how primary care practices in 37 European countries and Israel organized care during the COVID-19 pandemic. Results show that practices actively reached out to patients. However, this was significantly more the case for patients with chronic conditions such as diabetes, than for socially vulnerable patients such as patients known as at risk for domestic violence or patients with limited social resources.³⁹ Hence, health care services and systems are not always offered on the basis of healthcare need, which is often highest in materially disadvantaged groups or ethnic minority groups. And together with the increased exposure, these healthcare-related variables are found to underlie COVID-19-related disparities even more than susceptibility (that is, comorbid conditions).⁸

The US National Academy of Medicine notes that unconscious bias, stereotyping, and prejudice may play an important role in persisting healthcare disparities.⁴⁰ For example, Black people are less likely to be detected with pressure ulcers.²⁰ One of the root causes can be found in the medical training and in medical science: darker skin tones are significantly underrepresented and lighter skin tones overrepresented in dermatologic texts, general medical texts, and scientific literature.⁴¹ This example

is one example of institutional (or systemic) racism: “the collective failure of an organization to provide an appropriate and professional service to people because of their color, culture or ethnic origin.” It does not necessarily have to be deliberate or overt, but rather manifest itself through unwitting prejudice, ignorance, thoughtlessness, and racist stereotyping.⁴²

Institutional and structural racism are related and interconnected. While institutional racism relates to entities such as education and healthcare systems, structural racism refers to wider political and social disadvantages within society, such as higher rates of poverty for indigenous people or higher COVID-19 mortality rates among Black people. Multiple examples of institutional and structural racism were identified in the survey of asthma patients: minority asthmatic individuals were more likely to have lost health insurance during COVID-19, to live in urban environments (where as noted above hospitals are often under significant financial constraints and are under-resourced), to have difficulty affording asthma medications during COVID-19, and were less likely to have a primary care physician. Physicians also noted potential effects of structural racism, as nearly 30% of providers noted they encountered more obstacles when providing asthma care for black patients than for white patients, and approximately 25% of physicians felt that during COVID-19, it was more challenging to care for black patients.²³ Although not explored in that study, institutional racism and individual physician implicit bias both may contribute to physician responses. For example, difficulties caring for minority patients may be related to factors such as perceived difficulties in affording medications, baseline health status, or attending office visits.

The COVID-19 pandemic crisis is expected to have unintended consequences in the most vulnerable individuals and households, amplifying disparities. For example, pregnant women and children are expected to have increased mortality due to collapsed health facilities, limited critical and intensive care beds, limited resources such as oxygen, and barriers to pre-natal care and social services.^{43,44} Figure 1 describes the number of excess deaths due to maternal causes due to the effect of the response to the pandemic in selected countries in Latin America and the Caribbean.⁴⁵

Urgent priorities oriented towards health equity during and after the pandemic

Table 2 gives an overview of the areas that can be identified to start assessing and correcting disparities during and after the pandemic.⁴⁷

There is also a pressing need to decrease systemic racism throughout the medical establishment.

Programs that have shown a positive impact include exposure to counterstereotypical exemplars and implicit bias training.⁴⁷ Increasing public spending on health and social policies to favor social and

economic reactivation and reconstruction would help decrease maternal and infant deaths and re-

establish vaccination. Also, building strong primary and community health care is essential. Primary

care units deliver the first line of care in communities during the acute phase of a pandemic while

maintaining continuity of care for individuals with other diseases. By doing so Primary Care also

reduces pressure on the entire health system.^{29,48} Stronger involvement of patients in care can

contribute to health care systems that address the needs of people whose lives are impacted most.⁴⁸

While vaccination is the primary component of the solution for the pandemic, low rates of vaccination

and resistance to vaccination are high among underserved populations. In the United States, there has

been a recent increase among minority populations regarding COVID-19 vaccination uptake. Some

methods that appear to have helped include incentivization of COVID-19 vaccination as well as

promotion through community leaders, churches, celebrities, and organizations embedded in the fabric

of the underserved populations.

Collecting data on disparities and report success and failures of interventions is necessary to

understand the true magnitude of the problem. While we start to understand the impact of the

pandemic there is a need to maintain essential health services for all.

Conclusions

The evidence from the COVID-19 pandemic shows the impact of social determinants in the incidence

of cases and in mortality. These inequities must be addressed to improve both overall health outcomes

as well as COVID-19 related outcomes. The factors that predispose to these disparities include ones

265 that are easier to address as well as ones that are achievable but will require significantly more effort
266 As Mude et al.⁸ conclude, "Governments and policymakers have an opportunity to turn the course of
267 health inequities in minority populations by investing in programs that facilitate equity in
268 disadvantaged communities for improved health outcomes.⁸"

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FIGURE LEGENDS

Figure 1: Estimate of the number of excess deaths due to maternal causes for each range of reduction of coverage (5%, 10% or 25%) during one year due to the effect of the response to the pandemic in selected countries in Latin America and the Caribbean

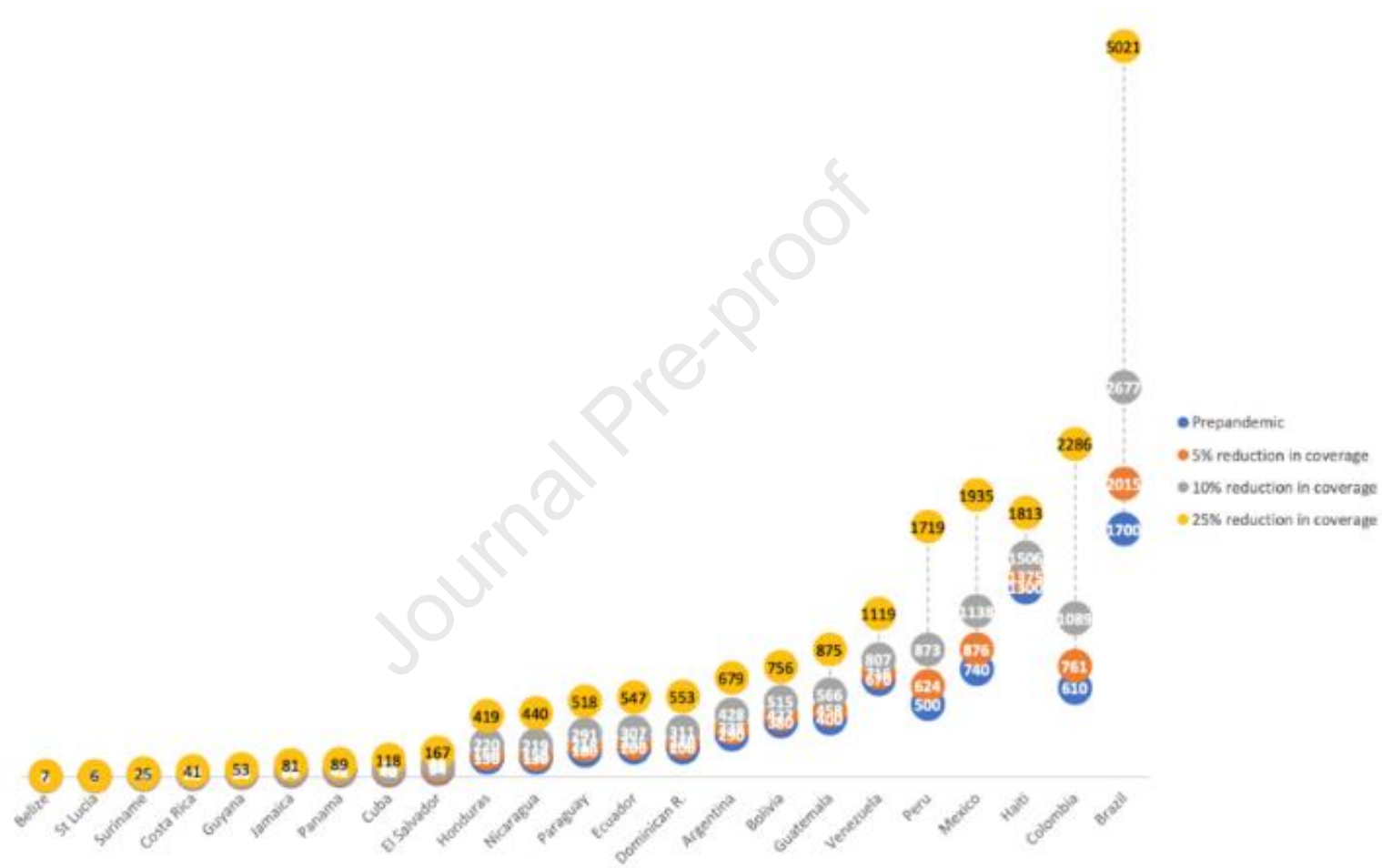


Table 1. How COVID-19 has worsened or magnified disparities for underrepresented minority individuals***General Socioeconomic Factors***

Increased multidimensional poverty

More likely to become unemployed because of COVID-19

Structural and institutional racism

Increased Exposure

Jobs with higher likelihood for virus exposure (“essential workers”) and less opportunities to work remotely

Dependent on public transportation for work, leisure, and healthcare

Crowded clinics

More likely to live in communities with high number of COVID-19 cases

More likely to live in enclosed and crowded housing with shared facilities

Personal Factors

Genetic determinants

Angiotensin Converting Enzyme 2 (ACE2) receptor expression

Interferon responses

Associated risk factors: diabetes, hypertension, obesity, chronic pulmonary diseases

Health Care Factors

More likely to have lost insurance coverage

Problems paying for medication and health care

Closure of primary care services

Language and cultural barriers forcing to use erroneous data sources for information on prevention and mitigation, treatment options, and shared decision making

Lower vaccination rates

Unavailable healthcare or barriers in access to healthcare

Increased likelihood for lower quality of care

Table 2: Areas to address regarding disparities during and after the pandemic

1. Identify populations at risk and provide a forum in the news, TV, social media for their voices
2. Develop and provide accessible and vetted information targeting underserved populations
3. Incentivize vaccinations in local neighborhoods, targeting community leaders, churches and organizations imbedded in the fabric of the underserved populations
4. Develop culturally responsive, gender and race sensitive targeted interventions in partnership with trusted leaders and community-based organizations within communities
5. Monitor and collect data on gender/race/ethnicity disparities and accurate reporting of success and failure of interventions
6. Determine the interactions between asthma and race on outcomes related to COVID-19
7. Increase awareness about existing inequities the medical community and implement implicit bias training for health care providers at all levels, including those in training