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Ethno-racial disparities in COVID-19 morbidity and mortality

Simeng Wang

EDITOR'S NOTE

Text translated from French to English by Hannah Bramekamp, student in Master "Migrations" (EHESS - University of Paris 1) and intern at the multidisciplinary research network "Migration from East and Southeast Asia in France" (MAF) recruited in the framework of the MigraChiCovid ("Chinese migration in France facing the Covid-19 pandemic") project funded by the French National Research Agency (ANR).

- 1 In light of the current context of the COVID-19 pandemic, numerous scientific publications discussing ethno-racial disparities in COVID-19-related morbidity and mortality have emerged since 2020. This research topic has especially caught the interest of researchers in medicine, public health and epidemiology, but also in social sciences (demography, sociology, economics, political science, psychology, etc.).
- 2 In this article, we propose a synthetic reading of a selected range of these scientific productions, focusing on the positions of the mentioned researchers, in their ways of noting (or not) ethno-racial disparities in COVID-19-related morbidity and mortality, and, where relevant, of explaining these ethno-racial disparities, drawing on genetic/biological and/or socio-demographic/socio-economic reasons. By examining these scientific contributions, we aim to shed light on the use and conceptualisation of the notion of race as a biological reality or a social construct.
- 3 In general, the reading of 28 scientific articles –mostly written in English¹– leads us to recognise that, according to their authors, the linkage between race/ethnicity on the one hand, and the identified risk factors for morbidity and mortality in clinical outcomes from COVID-19 disease on the other hand, are concurrently driven by biological and socio-economic mechanisms, with different stances among the authors regarding the degrees of 'biology' and 'social conditions' in their respective

explanatory models. Even those authors who primarily rely on biological/genetic explanations, point at some point in their article to the impact of social conditions to be explored or already underlying potential disparities in the prevalence of comorbidities among ethno-racial minorities.

- 4 For the sake of greater comprehensibility, we draw an analytical distinction between two poles of interpretation –the first focusing on biological and genetic reasons and the second emphasising socio-economic factors– considering that, as stated *supra*, these two poles together form a *continuum* rather than being antagonistic to one another, as they can co-exist as models of interpretation in one and the same article.

Predominant genetic reasons

- 5 A research unit at the Hospital Universitario Fundación Alcorcón in Spain (Guijarro et al. 2020) provides a cohort analysis of the population infected with the COVID-19 virus (PCR-confirmed cases) among adult residents of the municipality of Alcorcon during the first wave of the pandemic (up to April 25, 2020). Comparing the risk of COVID-19 morbidity in migrants of different origins to the majority population, the authors find that disparities arise not between the majority population and the immigrant population, but especially within the latter, depending on ethno-racial origin.
- 6 According to the authors, individuals from sub-Saharan Africa, the Caribbean and Latin America had a significantly higher risk than migrants from other European countries (especially from Romania and Ukraine), Asia or North Africa (with a risk similar to the majority population). Referring to two studies conducted in the United States that put in evidence the vulnerability of African-Americans and Hispanics to COVID-19 (Rentsch et al. 2020, Moore et al. 2020), the authors seek to explain these ethno-racial disparities, in particular, with regard to presumed genetic susceptibilities, separately from socio-economic factors for migrants.
- 7 Other clinical studies identify risk factors in COVID-19 morbidity and mortality. In the U.S., African-Americans were found to be the ethno-racial group with reportedly the highest incidences of COVID-19-related morbidity and mortality (Yancy 2020). Moreover, this group has been shown to have an increased risk of thrombosis (Frydman et al. 2020). The authors distinguish biological from socio-economic factors. Based on their findings, they argue that baseline coagulation status and predisposition to the development of coagulation vary between ethno-racial groups, with African-Americans likely to be disproportionately affected. Several studies suggest differences in certain genetic factors (higher concentrations of FVIII, vWF, and D-dimer, sickle cell disease (SCD), FV Leiden, platelet activation, chronic kidney disease...) in coagulation and in response to anticoagulant therapy (Akinboboye 2015, Limdi et al. 2015). Besides the factors that predispose African-American to thrombosis, other pathological conditions, such as high prevalence of heart disease or hypertension (diabetes), contribute to an increased risk of thrombosis; and some report even additional comorbidities leading to a prothrombotic state. Furthermore, the authors note that other than the inheritance of common comorbidities, socio-economic factors, including access to medical care and medication, nutrition, lifestyle habits, influence coagulation mechanisms especially for this “prothrombotic phenotype” (p. 5) [of African-Americans] in the treatment and control of coronavirus disease. Thus, the risk of COVID-19 morbidity tends to be higher in working-class neighbourhoods where disadvantaged ethno-racial communities are

over-represented. Treatment of COVID-19 reveals further social inequalities in terms of ethno-racial disparities: African-Americans are likely to rely less on anticoagulant prescriptions (than individuals classified as Caucasian) and to spend less time in therapy.

- 8 Similarly to the study discussed above, the research team of Martín Giménez et al. (2020) point to the coexistence of genetic and socio-economic factors in the high mortality rates among African-Americans in the United States. Considering socio-demographic and socio-economic explanations insufficient, the researchers seek to attribute these ethno-racial disparities in COVID-19 morbidity and mortality to genetic grounds, namely vitamin D deficiency/insufficiency and hypertension related to the peculiarities of the renin-angiotensin-aldosterone system (RAAS) (that is the regulatory system of autonomous, cardiovascular and pulmonary functions). The authors argue: “Either due to African genetic ancestry or phenotypic features of the Black race –such as increased skin pigmentation– and the vitamin D deficiency/insufficiency prevalent in Black people, there is greater susceptibility in this ethnic group to infection and death due to SARS-CoV-2 infection.” (p. 6-7) The researchers elaborate on how, given the high mortality of salt-depletive diseases in Black people during slavery and, consequently, the survival advantage of African slaves with an improved genetic capacity to retain salt –passing on their genotype to following generations– today’s African-American population is thought to have an improved genetic ability to retain sodium causing inhibition of systemic RAAS, which is implicated in hypertension; and that evolutionary adaptations of the RAAS in Black populations differ from those in other races –also partially accounting for the differences in blood pressure levels between White and Black populations. As regards the context of the COVID-19 pandemic, the authors hypothesize that, because antihypertensive drugs using RAAS inhibitors may present a potential risk factor for patients with SARS-CoV-2 infection, since these treatments increase levels of angiotensin-converting enzyme 2 (ACE2) which functions as a binding receptor for SARS-CoV-2 to cause infection inside the cell. As a result, SARS-CoV-2 exacerbates the damaging effect on the lungs of infected patients by inducing the reduction of ACE2, while the African-American population already has lower ACE2 activity, driven by genetics or epigenetics² and reinforced by adverse factors in social settings or social hardship. This “disequilibrium” predisposes Black populations to high blood pressure, cardiovascular risk as well as to lung damage by COVID-19 disease (p. 2).

Compelling socio-economic and socio-demographic factors

- 9 This second body of literature reviewed *infra* provides further explanation for ethno-racial disparities in COVID-19 morbidity and mortality arising from socio-economic and socio-demographic factors, besides genetic causes. We begin by considering a Letter to the Editors-in-Chief signed by a medical and neurological research group and printed in the journal of *Thrombosis Research*. This article challenges the association of local racial disparities in COVID-19 mortality with biological differences in risk of thrombosis. Examining the prevalence of thrombotic disorders in patients with COVID-19 hospitalised in the Bronx, New York, the results of this study indicate considerable demographic and socio-economic disparities between different racial

groups. Hence, the authors recommend to focus more closely on the effects of inequalities in access to healthcare services.

- 10 As for medical (psychiatry, pediatrics, cardiology) researchers and epidemiologists Gelaye, Bizu et al. (2020), they stress the undeniable link between increased COVID-19 morbidity among Black, Indigenous and People of Color (BIPOC) in the U.S. and their socio-economic status, physical living situations, health care access, along with psychosocial factors (toxic stress, trauma, bias, etc.). Thus, the authors associate the experiences of structural racism and discrimination with the increased risk of COVID-19 morbidity and mortality in BIPOC individuals. The principal hypothesis suggests that the stress resulting from socio-economic and environmental inequalities experienced by the BIPOC population prior to the COVID-19 pandemic contributed to their increased morbidity and mortality risk, through a “combination of stress response and immune response related factors aligned against them” (p.7). Furthermore, the authors point out that COVID-19 mortality and morbidity are also related to metabolic syndrome (MetS), i.e. obesity, hypertension, type 2 diabetes, dyslipidemia. The overrepresentation of BIPOC individuals in high-stress groups, related to experienced discrimination and among those with lower socio-economic status, makes them more vulnerable to MetS and to COVID-19 disease. The authors find a correlation between immune perturbations associated to stress-related neurobiological activity and the ethno-racial disparities in COVID-19 morbidity and mortality among BIPOC patients. Based on the link between social determinants – including loneliness, chronic stress burden, and discrimination– and inflammation and its adverse impact on gene expression, the impact of stress on the inflammatory response is two-fold: through the reduction of anti-viral actions and through the enhancement of pro-inflammatory immune activity. Along these lines, low socio-economic status, more prevalent among marginalized ethno-racial minority groups, confers an increased pro-inflammatory state.
- 11 These findings are consistent with the results provided by epidemiological and public health researchers Millet et al. (2020). Using data on confirmed cases and COVID-19-related deaths in 3142 U.S. counties, the researchers identify social conditions and structural racism faced by racialized individuals as important contributors to ethno-racial disparities in COVID-19-related morbidity and mortality. In the same vein, medical and public health researchers (Marcello et al. 2020) examine specifically potential disparities in COVID-19 morbidity and mortality between different ethnic subgroups of the Asian American population (“South Asians” [Afghani, Bangladeshi, Indian, Nepalese, Pakistani, Sri Lankan], “Chinese” and “All other Asian”), and report a mortality rate of 35.7% for patients of Chinese origin –the highest rate among all Asians, but also among all racialized groups (“Blacks”, “Hispanics”, etc.), hereby indicating a 1.5 times higher probability of death for this subgroup compared to “Whites”. According to the authors, these disparities are due to clinical or/and social vulnerabilities. Among the Asian population, Chinese and individuals from South-Asia in particular have a higher prevalence of chronic diseases and higher rates of obesity, diabetes, and hypertension –factors that are known to increase their vulnerability to COVID-19 disease. Moreover, the authors point to the considerable increase in xenophobic harassment and racism against people of Chinese and Asian origin³ during the pandemic as an additional barrier affecting testing and care seeking. Indeed,

reluctance to and delay in seeking care may contribute to the high hospitalisation and mortality rates of these Asian patients.

- 12 In Brazil, a retrospective analysis based on 228,196 confirmed (by PACR-RT-qPCR tests) COVID-19 cases in hospitalized adult patients attempts to explain the association between self-reported race (or skin colour) (“White”, “Black”, “Yellow”, “Indigenous” / “Branca”, “Preta”, “Amarela”, “Indígena”) and COVID-19 in-hospital mortality, after adjusting for clinical characteristics and comorbidities, using a logistic regression model (Peres et al. 2021). The authors find that patients who self-reported as “Whites” (36%) and “Asian” (34%) were admitted more frequently to the intensive care unit (ICU) than those self-reported as “Black” or “Brown” (32%) and “Indigenous” (28%) (p. 2). Higher in-hospital mortality was associated with patients who self-reported as “Black” or Brown, but also with those with a lower level of education, or illiterate. Race/colour, level of education and region of residence confer different risks of mortality. “These variables highlight the wider social determinants of health, differences in access to health care and the quality of care throughout Brazil.” (p. 4). In contrast to the studies discussed in the first section, the authors do not rely on a biological explication of race, but emphasise socio-economic factors and confirm:

The effect of race on COVID-19 mortality in Brazil may be related not only to the social inequity presented in the country but also to the colonial heritage and the structural racism that is frequently not admitted by Brazilian elites or policymakers. (p. 4)

- 13 Thus, the researchers plead for prevention actions to target vulnerabilities of racialized populations, in order to address adverse economic conditions, as well as the limited access to testing and care.
- 14 In England and Wales, political scientists and economists Lucinda Platt and Ross Warwick (2020) analyse risk factors for COVID-19 among several ethnic minorities (White, Indian, Pakistani, Bangladeshi, Black African, Black Caribbean). Supporting the thesis of social inequalities in health, the authors attribute these ethno-racial disparities to social factors, such as location of residence, household structures, occupation and financial savings. Through the lens of intersectionality, socio-economists Emily Wiemers et al. (2020) explore disparities in vulnerability to hospitalisation from COVID-19 by income, education, and race for U.S. adults on a national scale. The researchers note that black individuals and those from disadvantaged socio-economic backgrounds are more likely to have health conditions that amplify their vulnerability to COVID-19. Furthermore, these differences in vulnerabilities due to socio-economic status and/or ethnicity emerge early in the life cycle, and may be compounded by disparities in the risk of exposure to COVID-19 arising from working conditions. By articulating race, gender, class and age, Emily Wiemers and her collaborators highlight the cumulative and intersectional characteristics of these social factors as they determine risk factors for COVID-19. For instance, adults with a high school education or less show higher risks (60%) than those in privileged groups (with a college degree, high income, or white skin colour). Still in comparison to these privileged groups, adults with a low income are 9.4 times more likely to be infected with COVID-19; and Black adults are 32% more vulnerable to the virus. The authors conclude by arguing that socio-economic disparities in pre-existent living conditions affect hospitalisations even more than ethno-racial disparities; and that, however, these socio-economic disparities (in education and income) also exist within any given ethno-racial group.

- 15 As in the two studies previously mentioned, Graziella Bertocchi and Arcangelo Dimico (2020) of the Institute of Labor Economics contest the explanation solely based on genetic or biological factors and defend the thesis of health inequalities and the decisive impact of socio-economic factors on COVID-19 mortality among racialized people. In particular, the authors reveal historical determinants, namely the persistent influence of racial segregation dating back to the discriminatory policies of the 1930s – reflected in the increased vulnerabilities of black populations facing the COVID-19 pandemic. They associate ethno-racial disparities and spatial distribution of COVID-19 mortality with “redlining” maps, induced by segregation policies and believed to be conducive to unemployment, low housing quality, and unhealthy living conditions in the lower-graded neighborhoods of Chicago.⁴ Besides poor living and working conditions and low savings, the authors argue, that the high prevalence of comorbidities among African-American populations is also related to socio-economic factors. Additional factors related to health and risks including drug, tobacco and alcohol use remain especially influenced by social inequalities.
- 16 On French soil, Sylvain Papon and Isabelle Robert-Bobée (2020) of the “Enquêtes et études démographiques” (“Demographic Surveys and Studies”) division of INSEE emphasise the fact that, in March-April 2020, the death rate for people born abroad was twice as high as for those born in France –without distinction of causes of death (due to COVID-19 or not). This report has sparked vivid debates in academic circles, and researchers in migration studies concur on a “statistical deficit” (Brun and Simon 2020, Melchior et al. 2020) concerning ethno-racial inequalities and discriminations in health data in France and in the context of the pandemic. In this regard, the EpiCoV (“Epidemiology and living conditions”) study, conducted by INSERM in collaboration with Drees, Insee and Santé publique France (2020), responds to this gap and sheds light on social inequalities within the French working population (aged 18 to 64 years) during the COVID-19 pandemic. With an intersectional approach, the study notes the “cumulative effect of social inequalities” (Bajos et al. 2020, p. 8), which particularly affects immigrants or individuals with an immigrant background, and notably those of non-European origin (often from the most disadvantaged social backgrounds).
- 17 In conclusion, the COVID-19 pandemic, by the nature of this crisis and its primarily sanitary, medical and biological management, offers an exceptional opportunity for observations on the scientific debates surrounding the notion of “race”, used and conceptualised at times as a biological reality, at others as a social construct. In these ever-reviving multidisciplinary debates, it is worth recalling that based on our synthetic reading of a variety of scientific productions, these two models of interpretation –biological/genetic and socio-economic/socio-demographic– do not stand in opposition to each other: the relationships between race and identified risk factors in COVID-19-related morbidity and mortality, as recognised by researchers are often conjointly conditioned by both biological mechanisms and socio-economic factors. Finally, the intersectional approach –articulating various social relations of race, class, gender, age, disability, etc.– proves to be particularly fruitful in grasping the ethno-racial disparities in COVID-19-related morbidity and mortality.

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NOTES

1. This critical note does not claim to represent an exhaustive reading of the literature on the subject. For further reading, see the two following "systematic review" papers on reporting the ethnicity of COVID-19 patients and its impact on clinical outcomes. The first article is based on a reading of hundreds of articles from the databases EMBASE, MEDLINE, Cochrane Library, PROSPERO, NJEM, Lancet, BMJ, JAMA, MedRxiv, protocols of clinical trials, grey literature, surveillance data; published in English between December 2019 and May 2020 (Pan et al. 2020). The second article draws on 50 studies from the databases MEDLINE, EMBASE, PROSPERO, Cochrane Library, and MedRxiv; published in the United States or the United Kingdom between December 2019 and August 2020 (Sze et al. 2020). According to the authors of the first article, "[...], existing evidence does indicate a relationship between ethnicity and known risk factors for poor clinical outcomes in COVID-19, driven by both biological and socio-economic mechanisms." (p. 6). The authors of the second note: "Within the USA and the UK, COVID-19 has evolved from a pandemic to a syndemic –until policies and programmes are devised to address such disparities, we must be careful not to prematurely attribute worse clinical outcomes in ethnic minority groups to genetics." (p. 12).

2. Genetics is the study of genes, and epigenetics is the study of changes in gene activity without altering the DNA sequence and which can be transmitted through cell division. Unlike mutations that affect DNA sequence, epigenetic alterations are reversible. Some epigenetic patterns/features could be transmitted across generations. Source: <https://www.inserm.fr/information-en-sante/dossiers-information/epigenetique>.

3. On these phenomena of hostility towards Chinese or Asian populations on the European continent, see Pang 2020 for the British scenario, and Wang et al. 2020 for France.

4. The « redlining » policies were introduced by the *Home Owners Loan Corporation* in 1935 and consist of ranking areas of a city on the basis of default risk in order to improve the accuracy of real-estate appraisal. On a geographical map, based on neighbourhood characteristics, those areas with a higher share of “foreign and black” families, those labelled “hazardous” were outlined in red, whence the term “redlining”.

ABSTRACTS

The COVID-19 pandemic, by the nature of this crisis and its primarily sanitary, medical and biological management, offers an exceptional opportunity for observations on the scientific debates surrounding the notion of “race”, used and conceptualised at times as a biological reality, at others as a social construct. Based on a synthetic reading of a variety of scientific productions –in medicine, public health, epidemiology, and social sciences– discussing ethno-racial disparities in COVID-19 related morbidity and mortality, this article shows that these two models of interpretation –biological/genetic and socio-economic/socio-demographic– do not stand in opposition to each other: the relationships between race and identified risk factors in COVID-19 related morbidity and mortality, as recognised by researchers are often conjointly conditioned by both biological mechanisms and socio-economic factors. Furthermore, the intersectional approach –articulating various social relations of race, class, gender, age, disability, etc.– proves to be particularly fruitful in grasping the ethno-racial disparities in COVID-19 related morbidity and mortality.

La pandémie de Covid-19, par la nature de cette crise et de sa gestion avant tout sanitaire, médicale et biologique, offre une occasion inédite pour observer les débats scientifiques autour de la notion de « race », utilisée et conceptualisée tantôt en tant que réalité biologique, tantôt en tant que construction sociale. En s'appuyant sur une lecture synthétique d'un éventail des productions scientifiques – en médecine, en santé publique, en épidémiologie et en sciences sociales – discutant des disparités ethno-raciales dans les cas de morbidité et de mortalité liées au Covid-19, cet article montre que les deux modèles d'interprétation – biologique/génétique et socio-économique/sociodémographique – ne sont pas antagoniques l'un de l'autre : les relations entre la race et les facteurs de risque de morbidité et de mortalité liés au Covid-19, qui ont été mises en évidence par des chercheurs, sont souvent conditionnées à la fois par des mécanismes biologiques et des facteurs socio-économiques. Par ailleurs, l'approche intersectionnelle – articulante les divers rapports sociaux de race, de classe, de genre, d'âge, de handicap, etc. – s'avère particulièrement féconde dans l'appréhension des disparités ethno-raciales dans les cas de morbidité et de mortalité liées au Covid-19.

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Keywords: COVID-19 pandemic, race, ethno-racial disparities, morbidity, mortality, intersectionality

Mots-clés: pandémie de Covid-19, race, disparités ethno-raciales, morbidité, mortalité, intersectionnalité