



Encountering the social determinants of health on a COVID-19 ICU: Frontline providers' perspectives on inequality in a time of pandemic

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ABSTRACT

Efforts to improve health equity may be advanced by understanding health care providers' perceptions of the causes of health inequalities. Drawing on data from in-depth interviews with nurses and registered respiratory therapists (RRTs) who served on intensive care units (ICUs) during the first surge of the pandemic, this paper examines how frontline providers perceive and attribute the unequal impacts of COVID-19. It shows that nurses and RRTs quickly perceived the pandemic's disproportionate burden on Black and Latinx individuals and families. Providers attribute these inequalities to the social determinants of health, and also raise questions about how barriers to healthcare access may have made some patients more vulnerable to the worst consequences of COVID-19. Providers' perceptions of inequality and its consequences on COVID-19 ICUs were emotionally impactful and distressing, suggesting that this is a critical moment for offering clinicians practical strategies for understanding and addressing the persistent structural inequities that cause racial inequalities in health.

1. Introduction

Data from the Centers of Disease Control and Prevention, as well as state and local health departments, make clear that the COVID-19 pandemic has disproportionately affected Black and Latinx people in the United States.¹ During the first surge of the pandemic, from April to June of 2020, Latinx and Black residents of the United States were three times as likely to become infected as their white neighbors. During the same time period, Black and Latinx Americans were nearly twice as likely to die from the virus as white Americans. The unequal impacts of the pandemic become even more clear when comparing groups of people of the same age. For example, during the first surge, Latinx people between the ages of 40 and 59 were infected at five times the rate of white people in the same age group. Of Latinx people who died from COVID-19, more than a quarter were younger than 60; among white people, only 6 percent of those who died were that young (see also Bassett et al., 2020). While

the pandemic is projected to result in an unprecedented decline in life expectancy across the U.S. population, the reductions in life expectancy for the Black (2.10 years) and Latinx (3.05 years) populations are 3–4 times as large as the anticipated reduction for whites (0.68 years) (Andrasfay & Goldman, 2021: 3).²

Black and Latinx Americans have experienced a disproportionate burden of COVID-19 morbidity and mortality as a consequence of “persistent structural inequalities that increase risk of exposure to COVID-19 and mortality risk for those infected” (Andrasfay & Goldman, 2021: 1; see also Chen & Krieger, 2020; Ray, 2020). It is well documented that these underlying social, economic, environmental, and political inequalities – often referred to as the “social determinants of health” – contribute to racial inequalities in the onset, course, and outcomes of illness for a myriad of conditions (Adler & Rehkopf, 2008; Williams, 2012). A robust social scientific and public health literature identifies structural racism (Hicken et al., 2018) and racial capitalism (Laster Pirtle,

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¹ The CDC data were obtained by the New York Times, after the newspaper filed a Freedom of Information Act suit (Oppel et al., 2020). For details of the Times analysis, see URL: <https://www.nytimes.com/interactive/2020/07/05/us/coronavirus-latinos-african-americans-cdc-data.html>, accessed January 2, 2021.

² See also URL: <https://www.cdc.gov/nchs/data/vsrr/VSRR015-508.pdf>, accessed July 22, 2021.

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2020) – i.e., “racism not race” (Khazanchi et al., 2020) – as “fundamental causes” of racial inequalities in morbidity and mortality (Link & Phelan, 1995). Nonetheless, the naturalization and individualization of racial inequalities in health persist within biomedicine, as many scientists and clinicians continue to focus on supposedly innate biological differences and/or individual behaviors in their explanations of racial health inequalities, both in general (Bliss, 2020) and for specific conditions, such as cardiovascular disease (Shim, 2014), diabetes (Hatch, 2016) and COVID-19 (c.f., McCarty et al., 2020).

In this paper, we examine healthcare providers' perspectives on racial inequalities in health in the context of the COVID-19 pandemic. Our analysis draws on data from in-depth interviews with nurses and registered respiratory therapists (RRTs) who served on COVID-19 intensive care units (ICUs) at a large academic medical center during the first surge of the COVID-19 pandemic in the greater Boston area, from April to June 2020.³ We find that frontline providers clearly observed the disproportionate impacts of COVID-19 on Black and Latinx individuals and families. Further, we find that nurses and RRTs point to the social determinants of health, rather than individual level factors, in accounting for disproportionate numbers of Black and Latinx patients in the ICUs. To our knowledge, this is among the only studies that examines how healthcare providers other than physicians perceive and attribute inequalities in health among their patients. Likewise, we believe that this is the first analysis of providers' attributions for health inequalities in the context of COVID-19. Importantly, it is also among the first studies to suggest that health care providers' observations and attributions of health inequalities should be understood as emotionally impactful and, potentially, a cause of moral distress. Together, these findings have important implications for efforts to build “structural competency” in health care education and practice to advance health equity (Metzl & Hansen, 2014; Neff et al., 2017; Woolsey & Narruhn, 2020).

2. Background

Even before the COVID-19 pandemic, significant and persistent racial inequalities in the onset, course, and outcomes of illness had been extensively documented in the United States (Williams, 2012). The suffering and loss of life represented by these inequalities is extraordinary; for example, Black-white differences in mortality have been estimated to account for the premature deaths of 260 African Americans every day (Levine et al., 2001). Reducing racial inequalities in health and health care must be an urgent priority for health care policy and practice (World Health Organization, Commission on Social Determinants of Health, 2008; Koh et al., 2011; Smedley et al., 2003).

Although the social determinants of health are complex and multi-level, there is clear evidence that health care organizations and providers contribute to racial inequalities in health; as such, health care organizations and providers have a critical role to play in eliminating them (Schulman et al., 1999; Smedley et al., 2003; van Ryn & Fu, 2003; Williams & Wyatt, 2015). Towards this end, health care systems, state and federal agencies, and professional organizations have developed an array of educational and training materials for health care providers, on topics such as implicit bias, structural competence, and access to care (Eliacin et al., 2019; Metzl & Hansen, 2014; Neff et al., 2017; Ross et al., 2010; Woolsey & Narruhn, 2020).

Both to support the development of effective educational interventions and to assess whether and how providers may see themselves as part of the solution to the problem of racial health inequalities, scholars have sought to understand providers' “causal attributions” for health and illness (Burgess et al., 2019; Eliacin et al., 2019; Malat et al., 2013). Much of this research is grounded in insights from social psychology, which suggest that an “individual's causal attributions for

problems are important contributors to their beliefs about solutions” (Gollust et al., 2018: 2; see also Shostak et al., 2009). Broadly, this approach differentiates between causes seen as *internal* (i.e., related to individual-level patient factors, such as genetics, knowledge, or adherence to medication regimens) and those seen as *external* (i.e., related to provider, health care system, or societal factors) (Roberts-Dobie et al., 2013). This distinction is expected to be important because “if providers perceive that racial health care disparities result from factors internal to their patients of color, they may be less inclined to feel that they have a responsibility to address disparities than when they perceive the causes of those disparities to lie with health care providers and the larger health care system” (Gollust et al., 2018, p. 2).

To date, most of what is known about health care providers' causal attributions for racial inequalities in health comes from surveys of physicians. In the first decade of the 21st century, surveys of medical specialists (e.g., cardiologists, thoracic surgeons) found that while many physicians are aware of racial inequalities in health, they tend to attribute racial inequalities in health and health care to individual, patient level factors, such as knowledge and behavior (Lurie et al., 2005; Sequist et al., 2008; Taylor et al., 2006). Notably, this pattern of attribution to individual level causes persists even among providers who agree that patients of color receive different health care treatments, as compared to white patients (Malat et al., 2013; Sequist et al., 2008). Nonetheless, many physicians do believe that they – along with health care organizations – have a responsibility to help reduce disparities (Sequist et al., 2008). More recent research suggests that health care providers' causal attributions may be changing, as they become more aware of the social determinants of health; for example, in a mixed-methods study that included physicians, nurse practitioners, and physician assistants, participants attributed racial disparities in health more to social and economic conditions than to patient behavior (Gollust et al., 2018).

Despite their essential roles in health care delivery and their leadership in health care organizations, nurses' beliefs about the causes of racial inequalities in health have been almost entirely unstudied (Wittenauer et al., 2015). When nurse practitioners are included in surveys of providers' causal attributions, they are usually a small proportion of the overall respondent group (Burgess et al., 2019; Malat et al., 2013; Sequist et al., 2008). We could find only one study that focuses entirely on the causal attributions of nurses; based on a survey of nurses in Iowa, it finds that Black nurses are more likely to attribute health disparities to physician and social factors, while white nurses are more likely to attribute disparities to genetics (Roberts-Dobie et al., 2013). Similarly, the causal attributions of specialized health care professionals, such as respiratory therapists, have not been examined. We begin to address this gap in the literature by assessing how nurses and RRTs perceive and attribute the unequal impacts of the COVID-19 pandemic.

3. Data and methods

This analysis draws on data from in-depth qualitative interviews (n = 20) with frontline providers who served in COVID-19 ICUs during the first surge of the pandemic. Because one of the goals of the larger study was to understand how providers with different backgrounds experienced the COVID-19 ICUs, our sample includes nurses who were practicing in ICUs before the pandemic began (n = 8), general care nurses who were deployed to COVID-19 ICUs from other units of the hospital during the surge (n = 8), and RRTs (n = 4). Because we observed no systematic variation in their responses to the questions relevant to this specific analysis, in this paper, we treat the three groups as a single sample (n = 20). This is consistent with a pragmatic understanding of sampling and saturation, which emphasizes developing the properties of the theoretical focus of the analysis (Low, 2019).

Following the review and approval of both the hospital and university Institutional Review Boards, eligible respondents were invited to participate in the study via an email from Nursing Directors at the hospital. This email included an information sheet that described the goals of

³ Confirmed cases of COVID-19 increased during this time from 7783 on April 1st to 100,805 cases on June 1st, 2020.

the study, emphasized that participation was voluntary, and provided assurances regarding confidentiality. Interested participants contacted a study coordinator, who was based at Brandeis University, to schedule interviews. Interviews were conducted by four members of the research team with experience doing qualitative research. Due to restrictions on in-person research during the pandemic, all interviews were conducted (and recorded) via Zoom or telephone; they lasted between 35 minutes and 1 hour, with an average length of 50 minutes. All interviews were conducted between June and August 2020.

Each interview included open-ended questions about providers' experiences across three domains: 1) working under unfamiliar practice conditions and adapting to new ways of organizing patient care; 2) caring for a patient population with a novel infectious disease; 3) managing risks to self and family. We did not directly ask providers about how they attributed the unequal impacts of COVID-19. Rather, their attributions emerged in response to two open-ended interview questions. In the first, we asked how the COVID-19 patient population was similar to and different from patients for whom they previously had provided care. We then asked whether they had seen any "disproportionate impacts" of COVID-19.⁴

The interview data were transcribed verbatim by members of the Brandeis University research team, who also removed all identifying information before importing the transcripts into Atlas.ti (version 8.4). Two members of the research team then coded the data thematically; the codebook for the study was developed using the principles of grounded theory, which allowed investigation of the core concerns at the initiation of the study, as well as emerging areas of analytic interest (Charmaz, 2006). To establish consistency in coding, after one team member coded an interview, a second reviewed the coded data. Coding discrepancies were discussed and resolved during research team meetings.

Demographic information was gathered using a self-administered online survey instrument, which 18 participants completed (90 % response rate). Of these, the mean (SD) age was 32.8 (8.8) years. Seventeen participants (94.4 %) identified as female, and one as male (5.6 %). Sixteen (88.9 %) identified as white, and 2 (11.1 %) as Black. Participants had a mean (SD) of 9.3 (7.6) years of experience as a nurse. While personnel data suggest that white nurses are slightly over-represented in this sample (88.9 % vs. 85 %), the nursing workforce at the hospital is predominantly white and female.⁵ To protect the confidentiality of participants, while also allowing readers visualize the breadth of interviews included in the analysis, we identify quotations from each speaker with a number assigned to the interview.

4. Results

Our analysis focuses on frontline providers' descriptions of the patients they cared for in the ICU during the first surge of the COVID-19 pandemic. We begin with a dominant theme in these interviews: the extraordinary severity of illness among patients admitted to the ICU with COVID-19 in Spring of 2020. We then describe how providers became aware that COVID-19 was disproportionately affecting people of color. Finally, we consider providers' causal attributions for the racial inequalities that they observed in COVID-19 ICUS. Throughout, we attend to providers' emphasis on the emotional consequences of their observations and attributions.

⁴ Approximately 30% of respondents mentioned racial inequalities in response to the first, open-ended, question about the patient population. When we compared respondents' answers to the first and second questions, we observed no meaningful difference in regard to the descriptions of patients with COVID-19 or attributions for the pandemic's impact. Therefore, we combine answers to these two questions in our analysis.

⁵ Per personnel data, nurses at the hospital are 85 % white, 5 % Asian, 4 % Black, 3.5 % Hispanic, and 1.5 % "Other or 2 or more" (with 1 % missing data) (personal communication, 2021).

4.1. "The patients were so incredibly sick"

When initially asked about their experiences of caring for patients with COVID-19 during the first surge of the pandemic, almost every respondent began by emphasizing how "incredibly sick" (05) the patients in the ICUs were. Providers with years of clinical experience, including in intensive care, reported that these patients were "the sickest people I've ever taken care of in my entire life" (01) and "... unlike anything I've ever seen" (03).

Even as they sought to mitigate the risks posed to their own health by a novel virus and navigate new staffing models, providers faced the challenge of caring for "the sickest patients in the hospital" (16) at a moment in which "everything was so new and just no one knew anything and all you knew was people were dying" (08). As a nurse described, these challenges went beyond the care of "typical ICU patients," as patients with COVID-19 were not only "intubated, sedated, had centralized A lines, but they were on rocket fuel for blood pressure medicines, sedation, [and] the ventilators...were on such high settings" (01). Further, for many patients, it seemed like "every system in their body was being affected" (20). Consequently, a respiratory therapist commented that they could "barely sit down" during the surge, as "it was one after the other. They just crashed so fast" (08). A nurse recounted that "There was one night in particular that my patient was so so sick...I didn't leave the room until like about 4:00 a.m.; 8 hours in, I could like taste the sweat dripping into my mouth from inside the mask" (05).

Further, as practitioners noted, the ICUs devoted to patients with COVID-19 had extraordinarily sick people "in every single bed of the unit"; while typically "we would see patients that ill once in a while," during the surge, the ICUs were full of "the sickest of the patients we would have had on another day" (06). Another nurse described this as having "your sickest patients ... in every single room" (02). A respiratory therapist observed that at the beginning of the surge, "It was almost like half my assignment became the sickest patients I've seen, and then it became almost my entire assignment" (17). As this nurse concluded, "Never have I experienced what I've experienced in a COVID ICU. I've never seen the clinical presentation, I've never seen the rapid decompensation of a patient, I've never seen- I've just never seen it, I've never seen it ..." (17).

4.2. "Every single patient I took care of was Hispanic or African American"

Frontline providers quickly recognized that the extraordinarily sick patients in their ICUs were disproportionately people of color.⁶ In the words of a RRT, "we saw our Hispanic/Latinx community get disproportionately hit hard" (08). Another RRT noted that "the majority of my patients were Hispanic or African American" (12).

Despite their observation that both Black and Latinx patients were disproportionately represented in the ICU, providers' accounts focused overwhelmingly on Latinx patients and their families, whom they reported identifying through names and primary language. Several providers pointed to names as a marker of Latinx ethnicity. As this nurse described, "I mean I could see it just in looking at the census at work. You know you look at the whole floor and it's a majority of Hispanic names ..." (06). Especially at a time when patients' families were unable to visit, and with so many patients intubated and unable to speak, the names of patients seemed like an "evident" indicator of ethnic background, "It very

⁶ According to data from twelve Massachusetts hospitals, Latinx and African American patients were more likely to be admitted to the hospital than white patients (35.9 % and 29.1 %, respectively, vs 25.8 % for white patients) and Latinx and African American patients disproportionately required the ICU, with 39 % of hospitalized Latinx patients requiring the ICU compared with 33 % of African Americans, 24 % of Asian Americans, and 30 % of whites (Izzy et al., 2020, p. 3).

quickly became evident...we...write people's names on the boards with erase markers so you could just walk around...see that every single patient had a Hispanic last name...it became evident...[that] these communities are being devastated" (11).

Many providers mentioned the prevalence of Spanish speaking patients and families as central to their perception of the pandemic's unequal impacts. As this nurse observed, "there was one day that like every single COVID patient on our unit was Spanish-speaking only" (07). Navigating "the language barrier" was a significant part of providers' experiences with patients with COVID-19: "The language barrier was huge. Because most...[patients] did not speak English, and most of the nurses don't speak Spanish" (01). Similarly, many patient families also spoke Spanish, which "made it hard for us to be able to communicate with the families, as well" (04). Communication with families was also complicated by the fact that, during the surge, the hospital's protocols prohibited visitors in the ICUs, so family members could not be at patients' bedsides. Several nurses recounted difficult situations in which a child was put on the phone to translate for their family because "being bilingual, they could translate, but they're also a child and to be translating ... grim news, it just, it was ... a very uncomfortable position...it was hard for me to tell them 'I can't speak to you. I'm going to have to ... get the interpreter on the phone'" (13). Indeed, many respondents expressed empathy for family members, especially in the context of the language barrier: "I mean I could not imagine having a loved one admitted to a hospital, [and] 1) not even being able to see them and 2) not even speak the language of the people who were providing care" (19).

Nurses appreciated the interpreter services made available by the hospital, which could be accessed from the Voalte system (i.e., the phones in patient rooms) and/or a portable phone with video translation device.⁷ They noted, however, that these interpreter services made communication a more lengthy process: "there is such a delay in the conversation-because like I have to say it in English, they have to hear it, they have to translate it, they have to listen to it, then they- and then it's right back at it. So it's-what you want to say in like 3 minutes takes 10" (01). They preferred working with the hospital's Spanish language medical team, which included physicians who could talk directly with patients and their families. Nurses emphasized that the Spanish language medical team was "vital" in communicating with patients when serious medical decisions had to be made, especially in regard to intubation (11).

The language barrier, and especially the challenges it created in "crisis situations" (15), was mentioned specifically as a source of moral distress for frontline providers. For example, a nurse told us that "the most devastating" of all of her experiences on a COVID-19 ICU came from seeing that her patients were scared, and not being able to comfort them:

I would go in the room in the morning and I don't speak Spanish at all but you try to have that limited interaction and...it was just devastating, like the fear on their face ... and then you come in the next day and they're intubated ... And it was just devastating because you could see the fear on their faces even though...you're not speaking their language, you can read their facial expressions...you know they're scared...[but] there's nothing you can say, obviously, because they can't understand you...I feel like that was, definitely, the most devastating of all (19).

Another nurse commented that it felt "scary and sad" to see children trying to step in as translators for their families (20).

More broadly, realizing that communities of color were "being

devastated" (11) by COVID-19 was an emotionally impactful experience for providers. Though several mentioned that they had heard about the pandemic's unequal impacts, whether in media coverage or during rounds at the hospital, it was their experiences on the ICUs that made this "real" for them. For example, one nurse commented that although she had "heard" that specific communities were bearing the brunt of the epidemic, it "was hard for me to understand that until I saw ... all of my patients were Spanish [speaking]"; she described this as an "astounding" moment (03). Another nurse reported getting chills during the interview as she described to us that "I remember one day we were looking at our patient census and we realized like, everybody is Hispanic...like, it gives me the chills to think about it ... it made the pandemic just seem so real" (11). As we describe below, providers actively sought to make sense of their observations, which one nurse described as taking on "the investigator role" (09).

4.3. "We had to take on the investigator role"

The frontline providers in our study attributed the disproportionate impacts of the COVID-19 pandemic to the social determinants of health, including neighborhood of residence, socioeconomic status (SES), and associated factors, such as employment and transportation options. They also raised questions about how prior lack of access to healthcare may have made some patients more vulnerable to the worst consequences of COVID-19. On the whole, their causal attributions pointed to *external factors* – including societal factors and the organization of the health care system – in accounting for racial inequalities in COVID-19, although they did not explicitly name "racism" as an underlying cause.

Alongside the realization that the patients in COVID-19 ICUs were disproportionately people of color, providers reported noticing that many patients came from the same "lower income" neighborhoods, including "neighborhoods right near Mass General - East Boston, Chelsea" (17) and communities just to the north of the hospital (15), such as "Lynn, Everett, Revere" (01). This nurse described how "upset" she was when she observed that "everyone was coming in from was like Somerville, East Boston, Chelsea" which she described as places where "people are living with a huge amount of family members, and they still have to go to work" (20).⁸

As suggested by the above comments, providers recognized the role of SES in making people vulnerable to exposure to COVID-19 in both workplace and residential settings. For example, a nurse noted that her patients had jobs that came with exposure to the public: "we had like a pizza delivery person, we had an MBTA [bus] driver ..." (02). Another pointed to the exposure risks associated with taking public transportation to work (01). Several respondents pointed to housing density as a risk factor, especially when there are "families living...close together, [and] a lot of family members together...in apartments" (17). Related, they mentioned the potential importance of providing housing options for people with COVID-19, especially for individuals who live in multi-generational family units, so that they could recover without exposing family members.

Providers also attributed the disproportionate impacts of the COVID-19 to patients' health status, and their health care access and utilization,

⁸ As one of the anonymous reviewers of this manuscript pointed out, such comments could be seen as relying on cultural stereotypes. That said, analysis of data from the medical records of patients hospitalized with COVID-19 at twelve Massachusetts hospitals found that both residence in a zip code of low median income and greater density of living in the same household were closely correlated with higher rates of hospitalization (Izzy et al., 2020, p. 3). More broadly, an emerging research literature supports the perceptions of the frontline providers in this study regarding the role of employment status, neighborhood residence, housing arrangements, use of public transportation, and health insurance coverage as factors shaping the disproportionate impacts of COVID-19 on communities of color (Andrasfay & Goldman, 2021; Hawkins, 2020; Jay et al., 2020; Krieger et al. 2020; Stephenson, 2020).

⁷ Later in the surge, each unit received one or two iPads with Zoom capability; several nurses mentioned holding these iPads so that patients could communicate with their families. Since the close of the first surge, each unit has been provided with iPads in every room equipped with care team connect, in person translators, as well as continued use of Voalte and portable video phones to connect with translation services, both in and out of the hospital.

prior to the pandemic. Multiple providers described taking care of patients with previously undiagnosed comorbidities – especially diabetes and hypertension – that potentially made them vulnerable to worse outcomes from a COVID-19 infection. As this nurse recalled, “we had countless countless patients come in with “no past medical history,” but then they’d have an A1C of 10. And you’re like “Well actually” But they just had never had [health]care before, to find out that they were diabetic”⁹ (05). The possibility that patients might “might not know [that they have diabetes] because they just aren’t getting health care” was a topic of discussion on the ICUs, as this nurse recalled: “we would talk about that, how we think that their basic healthcare definitely affected their resilience in the ... the face of this [COVID-19]” (11).

On the whole, health-related causal attributions were framed as external factors, in that they highlighted systemic barriers to care, rather than pointing to individual-level factors such as biology, genetics or behavior. Providers’ comments about access to care explicitly highlighted barriers such as the cost of insurance and of transportation to the hospital. For example, a nurse stated that she believed that “being uninsured or underinsured” likely contributed to “some of the other health conditions they had that might have made them more susceptible” (15). Another nurse observed that “if I lived somewhere that is low-income [and] there’s not a lot of resources ... if I don’t have let’s say a car or money to get an Uber, good health insurance? How am I...[going] to get to [the hospital] to get the proper care that I need?” (09). Several providers suggested the importance of increasing access to preventative care to patients from the low-income communities most devastated by COVID-19.

That said, some providers pointed, as well, to what they described as “cultural issues.” For example, a nurse who described herself as “a person of color, as a minority myself” commented that: “[in] my culture, we’re not going to the hospital until we’re deathly ill they’re not calling the doctor just because they have a cough. You know, so by the time they got to the hospital ... they need to be straight admitted to the ICU. They need to be intubated, they need anticoagulation, they need fluids, they need [vaso]pressors.¹⁰ Like, they’re tanking” (09). She was one of the providers who told us that their experiences during the first surge of the COVID-19 pandemic had motivated them to get more involved with diversity, equity, and inclusion initiatives at the hospital. As a RRT explained, “I felt like those patients deserved to see someone who looks like them and knows their culture to tell them what’s truly happening... because yes, the interpreters are great, but there also needs to be physicians and nurses and respiratory of all departments, of all different ethnicities to show up for these patients. ...we truly need people to know the culture and the origin of the language to be with these people and their families” (08).

Providers reported that it was “disheartening,” “devastating” and a source of moral distress to realize that people were getting sick because of their socioeconomic circumstances. “I think that almost every COVID patient I took-care for was...from like lower-income sections of Boston...[it] was super disheartening to know that this person got this disease, essentially, because of their socioeconomic circumstances...that was really hard to see...[and]...felt unfair to them” (04). Another respondent described as “devastating” her sense that her patients, due to the conditions in which they live and work, could not avoid exposure to the coronavirus: “...the fact that these people don’t have the means to like keep themselves safe and like unexposed from this, it was just devastating” (20). Although respondents did not frequently use the term “moral distress” to describe their experiences, it did come up directly

when this nurse described taking phone calls from family members who likely shared the risks of their loved one in the hospital: “... it was very clear that ... COVID-19 was...directly affecting people [from] low-income communities and people with like less resources. So, it was super, super challenging from a like moral distress perspective to like answer the phone calls from the family members” (06). Similarly, a nurse described realizing that she had to consider the consequences of illness for her patients’ families and the communities in which they live: “... if this man is laying in this bed and he’s this sick and he’s a provider for this family, then he’s not able to provide right now...how is it impacting his entire family?” (09). Another provider told us about a patient whose family didn’t call to ask about his progress; she described it as “heart-breaking” when she learned that no one had called because the entire household was seriously ill: “nobody was calling to check in on him... because his entire family was sick with COVID. And we had a lot of patients like that...not only is our patient sick, but everybody in their house is sick...It’s heartbreaking” (05).

5. Discussion

In contrast to previous studies which found that that the causal attributions of health care providers focus on internal or individual-level factors for racial inequalities in health, such as patient knowledge or behavior (Lurie et al., 2005; Taylor et al., 2006; Sequist et al., 2008; Malat et al., 2013) or genetics (Roberts-Dobie et al., 2013), the nurses and RRTs in this study clearly attributed the unequal impacts of COVID-19 to external factors, including the social determinants of health. In “real time” conversations with their peers on the ICUs, and then reflecting on their experiences during in-depth interviews, frontline providers pointed to neighborhood of residence, housing, transportation, socioeconomic status, and barriers to access to care, as likely contributors to the pandemic’s “devastating” and unequal consequences for Black and Latinx individuals and families. Further, they expressed the emotional impacts of observing these inequalities, from their vantage point in ICUs caring for extraordinarily sick patients.

There are several possible reasons for this divergence of our findings from previous studies. First, as noted above, research on health care providers’ causal attributions for racial inequalities in health has drawn almost exclusively on data from surveys of physicians. It is possible that nurses are more attuned to the social determinants of health, perhaps as a consequence of the greater amount of time that nurses spend at the bedside (Butler et al., 2018) and their interactions with both patients and their families (Cadge & Hammonds, 2012). We also noted that many nurses mentioned that they had grown up in the Boston area, and that this was the basis of their familiarity with the neighborhoods from which their patients came; if the nursing workforce is particularly aware of local (e.g., neighborhood) contexts, this might also be a source of insight into the impacts of the social determinants of health. Second, most studies of health care providers’ causal attributions for racial inequalities in health and health care have focused on illness overall (Roberts-Dobie et al., 2013), specific chronic conditions, such as cardiovascular disease (Lurie et al., 2005) and diabetes (Sequist et al., 2008), and/or on quality of care (Eliacin et al., 2019; Gollust et al., 2018). It is possible that health care providers are more likely to identify the social determinants of health as contributors to inequalities in the context of infectious disease. Related, media coverage of COVID-19 may have heightened provider awareness of the role of the social determinants of health in the context of the pandemic. Lastly, there is some evidence that health care providers, overall, are becoming more aware of the social determinants of health (Gollust et al., 2018). All of these possibilities point to important directions for future research.

It is also possible that our methodology, in-depth qualitative interviewing, has a role in generating these novel findings. In a recent mixed methods study of provider attributions, researchers noted that quantitative assessments (e.g., via surveys) of causal attributions provide limited opportunities for participants to contextualize their responses

⁹ A1C is a blood test for Type 2 Diabetes. According to the CDC, “a normal A1C level is below 5.7 %, a level of 5.7 %–6.4 % indicates prediabetes, and a level of 6.5 % or more indicates diabetes.” At URL: <https://www.cdc.gov/diabetes/managing/blood-sugar/a1c.html>, accessed July 19, 2021.

¹⁰ Vasopressors are a group of medicines used to treat severely low blood pressure, especially in people who are critically ill.

(Gollust et al., 2018). In contrast, in-depth interviews may allow providers to offer more detailed interpretations of how social contexts shape individual behavior. For example, multiple respondents in this study noted the importance of what might be seen as patient level factors, e.g., individual level behaviors associated with physical distancing or quarantining. The interview format, however, provided respondents with the opportunity to articulate how these individual behaviors are shaped by external factors, such as socioeconomic status. In-depth interviews also allow participants to think through explanations in conflict with each other, without having to choose between them. For example, the only person in our sample who invoked genetics as a possible explanation for the disproportionate presence of “non-white” patients in the ICUs, then immediately offered that socioeconomic status was a compelling alternative explanation (20). At the same time, our methodology might be seen as particularly vulnerable to social desirability bias, especially at a time when the deathly consequences of anti-Black racism and the urgent need for racial justice were also very much in the news. We did note that one respondent commented that she didn’t “want to say the wrong thing, especially because I’m like being recorded” just after commenting that “it was very clear that a lot of our patients were from different socioeconomic [backgrounds]” (12). In contrast, surveys that are administered via mail or online offer greater privacy, thereby allowing respondents to be more forthcoming about what they may perceive as controversial positions.

Our findings overlap, in one important aspect, with others that have assessed the causal attributions of health care providers. That is, we find that even providers who pointed to external factors as causes for racial inequalities in health outcomes, did not explicitly name or address the role of racism (Malat et al., 2013; Gollust et al., 2018). Moreover, as we note above, while providers clearly articulated the disproportionate presence of both Black and Latinx patients on COVID-19 ICUs, their more detailed accounts of providing care centered almost entirely on their Latinx patients and their families.

Again, there are several possible explanations for these findings, which should be evaluated in future research. First, “one of the core principles of contemporary racial ideology is that individuals and organizations should be blind to race,” including in health care settings (Malat, 2013, p. 606). The (mostly white) providers in this study did not shy away from naming racial or ethnic groups in describing the African American and Latinx patients whom they cared for on the COVID-19 ICUs (c.f., Malat, 2013). However, they spoke at much greater length about Latinx patients and families, whom they believed that they could identify through cultural markers, such as their names and primary language. Their causal attributions, as well, were relatively “color blind,” as they focused on external factors that they associated with socioeconomic status. As such, it may be that color-blind racial ideology is at least a partial explanation for these findings. Second, we know that by early April 2020, the hospital had reported a 400 % increase in Latinx hospital admissions relative to baseline (Prince et al., 2021) and that, across hospitals in this healthcare system, Latinx patients were more likely than patients of other sociodemographic groups to be admitted to the ICU (Izzy et al., 2020); this also may have shaped providers’ perceptions and recollections of providing care on the COVID-19 ICUs. Lastly, providers made very clear that communicating with Spanish-speaking patients and their families – especially when difficult decisions had to be made and/or when patients were visibly scared and in need of comfort – was an intensely challenging aspect of their experiences of caring for patients on the COVID-19 ICUs. Consequently, it is possible that providers’ accounts

focus on Latinx patients and their families, in part, because of the practical and emotional salience of their experiences of language barriers in a critical care setting.¹¹

The emotional impacts that providers associated with their observations and attributions of inequalities were an unanticipated finding. Especially as we are reporting on data from a small and homogenous sample (i.e., of mostly white, female nurses), we suggest that the emotional consequences for providers of observing racial inequalities in health and/or the impacts of the social determinants of health on their patients and their patients’ families merits further investigation, especially as a potential cause of moral distress.¹² That said, we note that there is already some evidence from evaluations of training programs for medical residents that learning about the social determinants of health can generate feelings akin to moral distress: “residents reported feeling overwhelmed by their increased recognition of structural influences on health. They expressed a need for practical strategies to address structural vulnerabilities in and beyond clinical settings” (Neff et al., 2017: 432). Similarly, an evaluation of structural competency training for nurses found that, over time, their awareness of “influences beyond the immediate encounter” – i.e., of structural inequities – was associated with feelings of disempowerment and “burnout” (Woolsey & Narruhn, 2020, p. 607). This suggests that educational programs that seek to build “structural competency” in the health care workforce by providing instruction in “structural approaches to race, racism, and inequity” should include explicit consideration of structural interventions to build clinicians’ efficacy and mitigate feelings of “helplessness” (Metzl et al., 2018, p. 200; Woolsey & Narruhn, 2020, p. 608).

Nurses and RRTs have been on the front lines of the COVID-19 pandemic, where they have witnessed the disproportionate burden of disease suffered by Black and Latinx patients and families. While the providers in our study did not explicitly name structural racism as a cause of these inequalities, they clearly attributed them to external factors, such as socioeconomic status, neighborhood characteristics, and employment – i.e., to the social determinants of health. Based on their observations in the ICUs, the providers in our study expressed support for interventions oriented to the social determinants of health as a means of supporting communities and families most affected by the pandemic. Further, they told us that they anticipate that their experiences taking care of people with COVID-19 will have long term implications for their own understandings of themselves as health care practitioners, including their engagement with diversity, equity, and inclusion initiatives at the hospital. Consequently, we join with researchers from across the health professions in identifying *now* as a critical time for offering health care providers, including nurses and RRTs, not only education but practical strategies for understanding and addressing the persistent structural inequities that cause racial inequalities in health (Hardeman et al., 2020; Prince et al., 2021).

CRediT author statement

Sara Shostak: Conceptualization, Methodology, Investigation, Formal analysis, Writing-Original Draft; **Julia Bandini:** Investigation, Writing-Reviewing and Editing; **Wendy Gadge:** Conceptualization, Methodology, Investigation, Writing-Reviewing and Editing; **Vivian Donahue:** Supervision, Writing-Reviewing and Editing; **Mariah Lewis:** Formal analysis; **Katelyn Grone:** Writing-Reviewing and Editing; **Sophie Trachtenberg:** Formal analysis, Project administration; **Robert Kacmarek:** Supervision; **Laura Lux:** Supervision, Writing-Reviewing and

¹¹ A neighboring Boston hospital identified language barriers as an urgent “safety issue” in the care of patients with COVID-19, with Latinx patients who don’t speak English having a 35 % greater chance of death. The hospital quickly expanded translation services in response to these data. At URL: <https://www.wbur.org/commonhealth/2021/01/29/mass-general-brigham-covid-community-intervention>, accessed February 2, 2021.

¹² To be sure, this framing as moral distress deviates from its original definition: “Moral distress arises when one knows the right thing to do, but institutional constraints make it nearly impossible to pursue the right course of action” (Jameton, 1984, p. 6). The literature on moral distress tends to focus *within* health care institutions, especially in the context of end-of-life care (Hamric & Blackhall, 2007).

Editing; **Cristina Matthews**: Supervision, Writing-Reviewing and Editing; **Mary Elizabeth McAuley**: Supervision, Writing-Reviewing and Editing; **Frederic Romain**: Supervision; **Colleen Snyderman**: Supervision, Writing-Reviewing and Editing; **Tara Tehan**: Supervision, Writing-Reviewing and Editing; **Ellen Robinson**: Conceptualization, Methodology, Investigation, Supervision, Writing-Reviewing and Editing.

Ethical statement

This study was reviewed (and determined to be exempt) by the Institutional Review Boards of both Partners Healthcare and Brandeis University.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

The following authors work at the hospital where the study was conducted: Vivian Donahue, Katelyn Grone, Robert Kacmarek, Laura Lux, Cristina Matthews, Mary Elizabeth McAuley, Frederic Romain, Colleen Snyderman, Tara Tehan, Ellen Robinson.

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