Breast cancer screening during the COVID-19 pandemic: moving from disparities to health equity

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Abstract

The COVID-19 pandemic created unprecedented disruptions to routine health care in the United States. Screening mammography, a cornerstone of breast cancer control and prevention, was completely halted in the spring of 2020, and screening programs have continued to face challenges with subsequent COVID-19 waves. Although screening mammography rates decreased for all women during the pandemic, a number of studies have now clearly documented that reductions in screening have been greater for some populations than others. Specifically, minoritized women have been screened at lower rates than White women across studies, although the specific patterns of disparity vary depending on the populations and communities studied. We posit that these disparities are likely due to a variety of structural and contextual factors, including the differential impact of COVID-19 on communities. We also outline key considerations for closing gaps in screening mammography. First, practices, health systems, and communities must measure screening mammography use to identify whether gaps exist and which populations are most affected. Second, we propose that strategies to close disparities in breast cancer screening must be multifaceted, targeting the health system or practice, but also structural factors at the policy level. Health disparities arise from a complex set of conditions, and multimodal solutions that address the complex, multifactorial conditions that lead to disparities may be more likely to succeed and are necessary for promoting health equity.

In the early months of the COVID-19 pandemic, breast cancer screening was substantially reduced or halted entirely in many regions of the United States both to mitigate potential SARS-CoV-2 exposure and to redirect resources toward pandemic response. The impact on screening mammography use was immediate and dramatic. Across a range of health systems and geographies, screening rates fell precipitously, with almost complete cessation of screening in April 2020 (1,2). The rapid reduction in screening generated substantial concern from clinicians, researchers, and the general public alike. Anecdotes in the lay press about patients presenting with late-stage cancers echoed concerns about ripple effects of the pandemic (3). Many health systems, though, were able to adapt quickly to the pandemic and resumed screening within weeks to months. A modeling study that projected long-term effects of disruptions in screening and treatment suggested that the pandemic may only have a modest impact on breast cancer mortality (4).

Although the return to screening came as welcome news, a second worrisome story soon emerged. The depth of disruption and speed of recovery from the pandemic’s initial disruptions were uneven, resulting in disparities in breast cancer screening. A number of studies have since documented that reductions in breast cancer screening have been greater for women in minoritized populations. In some cases, disparities reflect a greater decrease in screening rates and in other cases, a slower return to prepandemic screening. Even after the early days of the pandemic, COVID-19 has continued to disrupt routine health care, including screening mammography, creating ongoing opportunities for gaps in care to widen (5).

In this commentary, we provide an overview of the recent literature demonstrating disparities in screening mammography during the COVID-19 pandemic and place these findings in the broader context of breast cancer screening and screening disparities in the United States. We also suggest approaches to closing these gaps, drawing on a multilevel framework for addressing health disparities. Understanding and addressing disparities will be critical for reducing inequities caused by the pandemic and closing screening gaps for all women.
Mechanisms driving disparities

Although several studies have documented disparities in breast cancer screening during the COVID-19 pandemic, fewer have tried to elucidate mechanisms that have produced disparities. One study of Boston area women indicated that women of color were more likely to cancel mammograms after the initial “lockdown” period, when routine screening mammography was returning to typical volumes (18). A second study of women in San Francisco reported that Black and Latinx women were less likely to attend scheduled mammography visits during COVID-19 lockdown periods (19).

Particularly early in the pandemic, minoritized populations bore a greater share of morbidity and mortality from COVID-19 (20). Women from hard-hit communities may have been reluctant to attend or reschedule nonurgent medical procedures in order to reduce potential exposure to SARS-CoV-2. A variety of other structural factors may have contributed to these disparities, including limited paid time off from work, greater representation in some sectors of the essential workforce (including health care), limited transportation options, and competing priorities like caregiving (21). Health-care facilities serving majority minority populations may have also faced greater strain during the pandemic. Although these factors may have contributed to disparities, challenges remain in understanding the root causes of observed disparities because these factors are often not measured as part of routine clinical care.

Are screening disparities consequential?

Despite initial worry, studies using established cancer screening simulation models have since suggested that the temporary decrement in screening may have only a modest long-term impact on breast cancer outcomes and that other factors, like access to

Figure 1. Percent change in breast cancer screening in 2020 compared with 2019 volume within the Yale New Haven Health System. This figure depicts monthly screening volumes between January 1, 2020, and December 31, 2020, as a percent of monthly volume between January 1, 2019, and December 31, 2019. The total number of screening mammograms performed in 2020 was 23,181 and 35,479 in 2019. Data were extracted from the Yale New Haven Health System electronic medical record system, and use of this data was approved by the Yale Human Investigation Committee. Racial and ethnic identifiers were based on self-report in the medical record.
A framework for potential solutions

The varied patterns of disparity in breast cancer screening reported across multiple studies suggest the pandemic may have influenced receipt of care differently in different places. It also suggests that a single solution is unlikely to be successful for all communities, given the variation observed. Rather, solutions should be guided by 2 principles. First, health-care providers, practices, and communities must understand whether and what disparities exist. Second, since multiple domains influence health disparities, solutions must also address multiple domains. Given the multilayered, multifaceted nature of health disparities, solutions must come from multiple levels, including the practice
or health system and at the level of state and national health policy. Here we draw on an established framework to identify and propose solutions to address screening disparities at multiple levels (Figure 2) (26).

The role of measurement

Because health disparities may be different in each community, identifying disparities through measurement is a critical first step toward addressing disparities. Measuring receipt of screening, as well as disparities according to racial, ethnic, geographic, and socioeconomic characteristics, is important for clinicians, health systems, and communities to be able to begin to address disparities.

Measurement, however, can be easier said than done. Despite the widespread use of electronic health records, obtaining accurate data on breast cancer screening for populations of interest is still a challenge. Health systems and electronic health records may not be designed for population health management. For example, electronic health records may capture who receives mammography (the numerator) but not patients in a community or population (the denominator). Electronic health records are also not designed or used with the goal of increasing health equity, and information on key demographic variables such as race, ethnicity, and socioeconomic indicators may be inaccurate or missing. Health systems are even less likely to collect information on structural determinants of health such as housing, neighborhood characteristics, or employment. Standardized reports that allow clinicians and groups to track progress may not show screening data according to key variables such as race, ethnicity, neighborhood, income, and insurance type. Thus, clinicians may not have the basic tools necessary to begin to evaluate their own performance.

Despite the challenges, measuring use of screening mammography is possible, and indeed, measuring receipt of breast cancer screening at the clinician, group, and health plan levels is already routine (27). Quality measures have historically been an important tool for improving health-care performance and ensuring accountability and transparency. More recently, quality measure developers have begun to incorporate notions of equity by creating measures that can be stratified by race, ethnicity, or other dimensions or that measure social and structural determinants of health (28,29). Such approaches could identify disparities in screening mammography and upstream causes. Moreover, building on established quality measurement programs may be important because such programs provide structure and incentives for measurement and performance improvement.

Lastly, although understanding disparities locally is critical to developing targeted health system responses, there is an important role for national measurement as well. Public health benchmarks, such as Healthy People 2030, set national goals for preventive care and increasingly have begun to incorporate health equity as an important dimension. Ongoing, established nationally representative surveys are used to track progress toward these goals and can be leveraged to identify and respond to disparities on the national level. Registries such as the Breast Cancer Surveillance Consortium could augment these efforts by providing granular, high-quality information on screening. Such tools could be expanded to a greater set of geographic areas and augmented to focus on disparities and real-time surveillance.

Figure 2. A multilevel approach to measuring and addressing breast cancer screening disparities during the COVID-19 pandemic. This figure is a schematic depiction of multilevel interventions to improve equity in breast cancer screening. Measurement at the level of the clinician, practice, health system, or community can inform interventions, which, in turn, improve equity.
Most preventive care, including screening mammography, is delivered in the context of discrete clinical encounters, and clinician beliefs and behaviors can create or exacerbate disparities. Implicit bias, for example, is common and has been shown to influence patient-provider interactions, treatment recommendations, and patient outcomes (30). A number of frameworks have been proposed for addressing bias on the level of individual clinicians (31–33). These frameworks may help clinicians work toward equitable care by teaching clinicians to recognize and respond to racism and bias, treat patients with respect and humility, and advocate for patients.

As important as individual behaviors are, though, relying on individual clinicians alone to identify and reduce health disparities is unlikely to be successful. Rather, systematic approaches at the practice or health system level must be considered. A variety of methods were successfully used before the pandemic to systematically engage women in screening, including patient navigation, education, outreach, and reminders through text messages, letters, and patient portal messages (34). Such evidence-based approaches could be adapted to the current context to reengage women in screening.

Fundamentally changing the structure of care delivery may also facilitate screening. Several paradigms in breast cancer screening have already done this: mammography vans and patient scheduling of mammography without a physician’s order are examples of ways to reconfigure care delivery to improve access (35). Resuming and augmenting such programs may help close screening gaps. The pandemic also saw greater use of digital health tools, including telemedicine, patient portals, and electronic self-scheduling (36). Each of these tools is potentially valuable as a way to move care out of traditional settings and make breast cancer screening more accessible and flexible. Fully realizing the promise of digital health tools will require design and deployment of systems that are accessible to all (37).

Should health systems use approaches that explicitly consider race or ethnicity when identifying patients for screening, triaging appointment requests, or providing support services to patients? The idea of incorporating race or ethnicity into screening algorithms has been proposed as a way to reduce disparities in breast cancer outcomes (23). The approach acknowledges that some patients, particularly Black women, experience racism that affects health, and intensifying screening may help reduce health disparities downstream (24). Such a framework could be extended or modified based on local conditions to acknowledge and address disparities that emerged during the pandemic.

However, incorporating race or ethnicity into screening protocols is complex and carries specific risks. In particular, incorporating race or ethnicity into screening triage decisions does not address the systemic racism that led to the disparity but rather applies a downstream solution. Addressing health disparities without addressing the historical and present conditions that led to those disparities allows the status quo to persist rather than creating more fundamental change. In addition, incorporating race into clinical screening protocols could be harmful by encouraging clinicians to treat patients differently based on race or by flattening important differences among women when they are grouped by crude categories of race or ethnicity (38). Given these considerations, in the context of pandemic-related disparities in mammography, it is not clear that the potential benefits would outweigh potential harms. Rather, approaches that leverage measurement to elucidate disparities along the health-care continuum may be more successful.

### Community- and policy-level approaches

Although strategies to address disparities at the health system level may be valuable, they have a common, inherent limitation. Health system approaches do not fundamentally address the structural barriers to care that create and exacerbate disparities. Examples of these structural barriers include lack of health insurance, transportation, lack of a usual source of care, and difficulty taking time away from work or other responsibilities.

Strategies to address structural barriers may range from large-scale public policies to smaller programs designed to meet a community’s need. For example, expansion of health insurance coverage through the Affordable Care Act has increased use of mammography and reduced disparities in late-stage breast cancer diagnoses (12,39). Continuing to expand coverage for uninsured or underinsured populations is critical for continuing to address and reduce disparities. Paid time off from work can also allow women to obtain needed preventive care, including breast cancer screening (40). Policies that require employers to offer paid time off work for health care would specifically benefit women who do not currently receive such protections. Smaller, targeted programs designed to address specific community needs such as patient transportation, language interpretation, navigation, and free screening to women without health insurance have also been successful in improving uptake of screening mammography (41).

Lastly and critically, policies must continue to address the pandemic itself. SARS-CoV-2 is likely to continue to circulate, and the conditions that created these observed disparities in breast cancer screening remain. Many policies to address COVID-19 disparities have been proposed, including expanding health insurance coverage; increasing access to equitable, community-based health care; maintaining funding for and access to COVID-19–specific interventions (testing, vaccines, treatment); building systems to monitor community transmission; enhancing workplace protections; consistently using nonpharmacologic interventions to reduce the spread of COVID-19; and addressing unmet social needs (42–45). Further, policies that have been effective in addressing the pandemic and pandemic disparities must be sustained (46). These broad community- and policy-level interventions are necessary not only for reducing morbidity and mortality from COVID-19 itself but also for mitigating downstream disruptions to important preventive care like screening mammography.

### Conclusions

The COVID-19 pandemic has been marked by striking disparities in morbidity and mortality from the virus itself (20). However, disruptions from COVID-19 to the health-care system have also had secondary effects, including interruption of high-value care like routine breast cancer screening. Although many health systems were able to respond relatively quickly to reinstitute screening, the recovery has been uneven, with new health disparities emerging. Our overview of the literature suggests that although disparity is a common theme, the specifics of the disparity— which populations are affected—vary considerably by locality. Clinicians and health systems must understand the needs of their communities. Multilayered approaches that use data to identify women who are overdue for screening and use specific...
community-centered strategies to both reengage women in care and lower barriers to screening may be most successful.

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**Data availability**

Raw data used in this work are identifiable and contain protected health information and therefore cannot be shared under current use terms. Authors are able to share code used to analyze electronic health record data.

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