

Screening and Diagnostic Mammography Utilization During the COVID-19 Pandemic: Public Health Implications and Future Research Needs

Sarah Nechuta, PhD¹ and Heather Wallace, PhD¹

¹Grand Valley State University, Department of Public Health, College of Health Professions,
Grand Rapids, MI, USA

Correspondence: Sarah Nechuta, MPH PhD, Grand Valley State University, College of Health
Professions, Department of Public Health, 500 Lafayette Street, Grand Rapids, MI 49503. (t)
616-331-5537; nechutas@gvsu.edu

On March 11th 2020 the World Health Organization declared coronavirus disease 2019 (COVID-19) a global pandemic (1). As of February 28th 2021, COVID-19 infections have resulted in 513,122 deaths in the United States (U.S.) since the start of the pandemic, and 1,803,940 new hospitalizations since August 1st 2020 (2). The impact of COVID-19 on preventive and diagnostic health care delivery is unprecedented. At the start of the pandemic, medical and public health experts recommended complete cessation of cancer screening and other elective medical procedures in the U.S. to direct resources to treating COVID-19 patients and reduce potential exposure risks at health-care facilities (3, 4).

Screening mammography is a critical tool in the early detection and prevention of advanced breast cancer and mortality (5). Access to follow-up care and diagnostic mammography is vital for early diagnosis and appropriate and timely breast cancer treatment. Studies have shown that utilization of screening mammography varies by race/ethnicity and socioeconomic status (SES) (6, 7). Poverty and lack of health insurance are key barriers to breast cancer screening at recommended intervals. Based on data from the National Health Interview Survey, only 39.5% of uninsured women in the U.S were up to date with breast cancer screening in 2018, compared to 77.2% of women who were privately insured (8). The pandemic has resulted in unemployment and loss of health insurance (9), which may amplify known barriers and racial disparities in breast cancer screening, diagnosis and treatment. Further, accumulating evidence supports that access and use of health-care services decreased during the pandemic across many health outcomes and settings (10-13). This may represent a new mechanism by which disparities in breast cancer evolve, and data is needed to understand and document gaps in screening and diagnosis overall and by key population characteristics.

In this issue of the Journal, Sprague and colleagues use data from the Breast Cancer Surveillance Consortium to understand trends in screening and diagnostic mammography utilization during the COVID-19 pandemic (through July 2020) overall and by age, race/ethnicity, and select established breast cancer risk factors (14). The Breast Cancer Surveillance Consortium provides a rich and large data resource that enabled Sprague and colleagues to analyze a diverse sample of breast cancer registries. Data from six breast imaging registries, representing 62 community and academic facilities, covering the New England, Midwest, Northern California, and the Pacific Northwest regions of the U.S, were included. The authors found that diagnostic mammography volumes were at 98.0% (95% confidence interval = 90.2% to 106.6%) of pre-pandemic levels by June 2020 and screening mammography volumes were at 89.7% (95% confidence interval = 79.6% to 101.1%) by July 2020. However, when evaluating by race/ethnicity, differences were found in rebound of mammography utilization. As compared to pre-pandemic levels, both Hispanic and Asian women had much lower rebound of mammography volumes by July 2020. A similar pattern by race/ethnicity was found for diagnostic mammography. Mammography volume rebound patterns for both screening and diagnosis were similar by age and family history of breast cancer.

As COVID-19 mortality data has become available by race/ethnicity in the U.S., a concerning pattern of racial disparities has emerged with higher excess mortality for Black, Hispanic, and American Indian/Alaskan Native (AI/AN) populations (15-17). Beyond mortality, the pandemic has illuminated old and new health disparities in many areas among minority, underserved and low-income communities (18-21). Black women have higher breast cancer mortality rates, compared to White women, are diagnosed at later stages, and have the lowest 5-year survival regardless of stage compared to all other race/ethnicities (22). Despite the potential

for disparities in access to cancer screening and follow-up care, Sprague and colleagues reported that both White and Black women had close to 100% rebound in screening mammography volumes and slightly over 100% rebound in diagnostic mammography volumes by July 2020. It is worth noting that results did vary by each registry showing geographic variation in rebound of mammography utilization by race/ethnicity (14). In contrast, as of July 2020, mammography utilization volumes for Hispanic and Asian women had not rebounded to pre-pandemic levels.

The study by Sprague et al. serves to identify several areas for future research and public health efforts in breast cancer prevention and control. While the study contributes to knowledge of the impact of COVID-19 on cancer screening and diagnosis, the aggregate nature of the data and lack of specific geographic information precludes understanding the factors that contribute to the differences found for Hispanic and Asian women. Future studies should include data from other regions in the U.S, including the southern states, which have high rates of health disparities (for example in cancer, obesity, and other chronic and infectious diseases) that could be increased due to COVID-19 (23). Studies that jointly incorporate SES factors, evaluate urban and rural differences, and include additional unique and under-studied populations are needed to fully evaluate the impact of the pandemic on mammography utilization and subsequently long-term breast cancer outcomes. Studies focusing on communities with both high COVID-19 burden and cancer disparities could provide data on those most vulnerable during the pandemic, particularly those with social, economic, and/or environmental obstacles to accessing appropriate and timely health-care services. This research could identify barriers and health beliefs to inform local and community-based programs that build and enhance equitable health care access, utilization, and quality.

Among Hispanic women, lower education and income have been reported as key barriers for screening and timely diagnosis (24). Mobile mammography, as an example, represents an effective means to reduce cost, improve access, and increase adherence to screening guidelines (24, 25). Public health efforts that aim to reduce SES-related and perceived barriers through education, literacy, and culturally competent patient navigation for breast cancer screening, diagnosis, and treatment are needed. Similarly, research that contributes to a greater understanding of the role of health beliefs and health prioritization under competing health concerns in breast cancer prevention and clinical care is warranted, particularly among diverse and vulnerable populations. AI/AN women, for example, have low rates of breast cancer screening, and are also more likely to live in underserved, rural areas (26). AI/ANs may not be captured accurately in registries and therefore are too often excluded from cancer surveillance and research. This known limitation is highlighted here as this population could not be included due to lack of data on AI/AN women.

The COVID-19 pandemic has highlighted the critical need for accurate, timely data that incorporates social and geographic information to identify potential disparities and provide evidence to make public health decisions (27) and cancer data is no exception. While the results from Sprague et al. overall showed a return to preventive and diagnostic care, the long-term impact of delayed breast cancer screening and diagnosis is not known, including if breast cancer burden and disparities will increase. Close monitoring of trends and patterns in mammography utilization and breast cancer outcomes in diverse populations will be needed to identify areas to target for education, resource allocation, and public health interventions. Further, collaborative efforts are needed to leverage innovative methods and expertise in public health surveillance,

data science, health information technology, and related fields to provide timely and comprehensive data for cancer surveillance and research.

Funding

None.

Notes

Role of the funder: Not applicable.

Disclosures: The authors have no disclosures.

Author contributions: Writing, original draft—SN, HW; writing, revision and editing—SN, HW.

Data Availability

Not applicable.

References

1. Cucinotta D, Vanelli M. WHO Declares COVID-19 a Pandemic. *Acta Biomed* 2020;91(1):157-160.
2. Centers for Disease Control and Prevention. COVID Data Tracker. <https://covid.cdc.gov/covid-data-tracker/#datatracker-home>. Accessed March 2, 2021.
3. American Cancer Society. Cancer Facts & Figures 2021. Atlanta: American Cancer Society; 2021. <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and->

statistics/annual-cancer-facts-and-figures/2021/cancer-facts-and-figures-2021.pdf. Accessed March 2, 2021.

4. Framework for HealthCare Systems Providing Non-COVID-19 Clinical Care During the COVID-19 Pandemic. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/framework-non-COVID-care.html>. Accessed March 2, 2021.
5. Nelson HD, Fu R, Cantor A, *et al.* Effectiveness of Breast Cancer Screening: Systematic Review and Meta-analysis to Update the 2009 U.S. Preventive Services Task Force Recommendation. *Ann Intern Med* 2016;164(4):244-55.
6. Vang S, Margolies LR, Jandorf L. Mobile Mammography Participation Among Medically Underserved Women: A Systematic Review. *Prev Chronic Dis* 2018;15:E140.
7. Ahmed AT, Welch BT, Brinjikji W, *et al.* Racial Disparities in Screening Mammography in the United States: A Systematic Review and Meta-analysis. *J Am Coll Radiol* 2017;14(2):157-165 e9.
8. Sabatino SA, Thompson TD, White MC, *et al.* Cancer Screening Test Receipt - United States, 2018. *MMWR Morb Mortal Wkly Rep* 2021;70(2):29-35.
9. McIntyre A, Brault MW, Sommers BD. Measuring Coverage Rates in a Pandemic: Policy and Research Challenges. *JAMA Health Forum* 2020;1(10):e201278-e201278.
10. Hartnett KP, Kite-Powell A, DeVies J, *et al.* Impact of the COVID-19 Pandemic on Emergency Department Visits - United States, January 1, 2019-May 30, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69(23):699-704.
11. Morelli N, Rota E, Terracciano C, *et al.* The Baffling Case of Ischemic Stroke Disappearance from the Casualty Department in the COVID-19 Era. *Eur Neurol* 2020;83(2):213-215.

12. Miller MJ, Xu L, Qin J, *et al.* Impact of COVID-19 on Cervical Cancer Screening Rates Among Women Aged 21-65 Years in a Large Integrated Health Care System - Southern California, January 1-September 30, 2019, and January 1-September 30, 2020. *MMWR Morb Mortal Wkly Rep* 2021;70(4):109-113.
13. Patt D, Gordan L, Diaz M, *et al.* Impact of COVID-19 on Cancer Care: How the Pandemic Is Delaying Cancer Diagnosis and Treatment for American Seniors. *JCO Clin Cancer Inform* 2020;4:1059-1071.
14. Sprague BL, Lowry KP, Miglioretti DL, *et al.* Changes in mammography utilization by women's characteristics during the first five months of the COVID-19 pandemic. *J Natl Cancer Inst.* 2021.
15. Gross CP, Essien UR, Pasha S, *et al.* Racial and Ethnic Disparities in Population-Level Covid-19 Mortality. *J Gen Intern Med* 2020;35(10):3097-3099.
16. Bassett MT, Chen JT, Krieger N. Variation in racial/ethnic disparities in COVID-19 mortality by age in the United States: A cross-sectional study. *PLoS Med* 2020;17(10):e1003402.
17. Cheng KJG, Sun Y, Monnat SM. COVID-19 Death Rates Are Higher in Rural Counties With Larger Shares of Blacks and Hispanics. *J Rural Health* 2020;36(4):602-608.
18. Vahidy FS, Nicolas JC, Meeks JR, *et al.* Racial and ethnic disparities in SARS-CoV-2 pandemic: analysis of a COVID-19 observational registry for a diverse US metropolitan population. *BMJ Open* 2020;10(8):e039849.
19. Kullar R, Marcelin JR, Swartz TH, *et al.* Racial Disparity of Coronavirus Disease 2019 in African American Communities. *J Infect Dis* 2020;222(6):890-893.
20. Lopez L, 3rd, Hart LH, 3rd, Katz MH. Racial and Ethnic Health Disparities Related to COVID-19. *JAMA* 2021;325(8):719-720.

21. Wang D, Gee GC, Bahiru E, *et al.* Asian-Americans and Pacific Islanders in COVID-19: Emerging Disparities Amid Discrimination. *J Gen Intern Med* 2020;35(12):3685-3688.
22. American Cancer Society. Breast Cancer Facts & Figures 2019-2020. Atlanta: American Cancer Society, Inc. 2019. <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/breast-cancer-facts-and-figures/breast-cancer-facts-and-figures-2019-2020.pdf>. Accessed March 11, 2021.
23. Signorello LB, Hargreaves MK, Blot WJ. The Southern Community Cohort Study: investigating health disparities. *J Health Care Poor Underserved* 2010;21(1 Suppl):26-37.
24. Jerome-D'Emilia B. A systematic review of barriers and facilitators to mammography in Hispanic women. *J Transcult Nurs* 2015;26(1):73-82.
25. Yu SWY, Hill C, Ricks ML, *et al.* The scope and impact of mobile health clinics in the United States: a literature review. *Int J Equity Health* 2017;16(1):178.
26. Guadagnolo BA, Petereit DG, Coleman CN. Cancer Care Access and Outcomes for American Indian Populations in the United States: Challenges and Models for Progress. *Semin Radiat Oncol* 2017;27(2):143-149.
27. Krieger N, Gonsalves G, Bassett MT, Hanage W, Krumholz HM. The fierce urgency of now: closing glaring gaps in us surveillance data on COVID-19. Health Affairs Blog, 2020 Apr 14 . <https://www.healthaffairs.org/doi/10.1377/hblog20200414.238084/full/>. Accessed March 11, 2021.