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NOVEMBER 2025

Opportunities for Local Mammography Deployment

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Executive Summary

There is considerable variation in mammography deployment, utilization, and breast cancer detection in the United States. While some locations have a high density of mammography resources and a corresponding high rate of breast cancer screening and detection, other places have far fewer resources and a corresponding low rate of screening and detection.

This report uses the location of every mammogram machine in the United States to quantify the geographic distribution of mammography, assess how the deployment of mammography corresponds to county-level breast cancer incidence, and provide evidence to guide more equitable investment and resource allocation to women's preventive health services.

We estimate that if low-detection counties could perform as well as their high-detection counterparts, then the US could identify about 9,600 additional cases of breast cancer earlier. Counties with lower rates of detection tend to have smaller populations, a larger percentage of racial and/or ethnic minority populations, higher poverty rates, lower rates of health insurance coverage, a higher proportion of households speaking limited English, and a lower rate of women receiving a mammogram in the past year. There is a large cluster of these counties in the Southwest.

We then project which places would have the highest return on investment (in terms of early detection) with additional mammogram machines. Seventy-four counties yield a high return for both measures (all cases and ductal carcinoma in situ) of cases caught earlier. These are places where a lack of machine capacity is a barrier to meeting screening guidelines; however, this does not mean that other barriers are not present. Additional machines are likely necessary to improve detection but may not be sufficient if other obstacles (such as cost, language barriers, inability to take time off, or lack of engagement with the health system) are not addressed in tandem.

Background

More than 42,000 women die each year due to breast cancer in the United States. It is the second-leading cause of cancer death among American women and the leading cause of cancer death for Black and Hispanic women. According to the American Cancer Society,¹ in the US around 13 percent of women will be diagnosed with invasive breast cancer in their lifetime, and 2 percent of all women will die of the disease.

There has been significant progress: The breast cancer mortality rate fell by 44 percent between 1989 and 2022, while invasive breast cancer incidence rates rose 40 percent among women aged 50 and older between 1980 and 2000. Both the increase in incidence and the decrease in mortality can be attributed at least partially to the uptake in screening. From 1987 to 2021, the percentage of women aged 40 and over who had a mammogram in the last two years more than doubled, reaching approximately 65 percent.²

Recommendations for screening mammography, especially among women with an average risk profile, vary but always include a strong endorsement of clinical judgment by the provider. However, there are general best practices.

The first is that women begin receiving annual mammograms at age 40, as recommended by the American College of Radiology and the Society of Breast Imaging.³ The American Cancer Society recommends that women aged 40–44 have the option to start annual mammogram screening, women aged 45–54 receive annual mammograms, and women aged 55 and older have the option of switching to every other year. It advises continuing screening as long as a woman is “in good health and expected to live at least 10 more years.”⁴ The US Preventive Services Task Force (USPSTF) updated its guidelines in 2024 to recommend biennial screening mammography for women aged 40–74. This is an update to its 2016 recommendations that women aged 50–74 receive biennial screening and that the decision for women aged 40–49 should be based on individual factors.⁵

In addition to early diagnosing of invasive breast cancer, the advent of mass screening mammography in the United States in the 1980s had implications for ductal carcinoma in situ (DCIS), a form of “stage 0” breast cancer, which is caught almost entirely through preventive screening. DCIS is diagnosed when abnormal cells are detected in the milk ducts and have not invaded surrounding tissue. This is distinct from invasive ductal carcinomas, in which the cancer cells have spread to surrounding tissue; invasive ductal carcinomas represent two-thirds of new breast cancer diagnoses.

42,000+
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2/3

OF NEW BREAST CANCER
DIAGNOSES ARE
INVASIVE DUCTAL
CARCINOMAS

Not all DCIS will progress to invasive cancer. Estimates of the percentage that will progress range from 10 percent to more than 50 percent, although the true number is likely somewhere between 10 and 20 percent.⁶

The relationship between screening mammography and breast cancer incidence shows there is a clear case to be made that lack of access is at least partly responsible for missed breast cancer diagnoses. Similar to the soaring rates of breast cancer diagnoses as screening programs were implemented nationwide, areas within the US that have greater access to mammograms often report higher rates of breast cancer cases. These areas possess superior screening infrastructure, which allows for earlier and more frequent detection.⁷

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Patients with access to such infrastructure also tend to face lower barriers to follow-up care, meaning that cancers are caught at earlier stages and treated before progressing. Conversely, areas with limited screening infrastructure see fewer cases, not necessarily because the true incidence of breast cancer is lower, but because more women go unscreened, unable to comply with the preventive guidelines. The result is that cases go undetected and undiagnosed until they are more advanced and symptomatic, leading to higher treatment costs in both monetary terms and in the burden placed on patients and caregivers, to say nothing of the higher mortality associated with later-stage diagnosis.

Areas with limited screening infrastructure see fewer cases, not necessarily because the true incidence of breast cancer is lower, but because **more women go unscreened**, unable to comply with the preventive guidelines.

A quarter of the reduction in breast cancer mortality since the 1970s is attributable to increased screening,⁸ but as long as screening improvements remain more concentrated in certain geographic areas and among certain populations, inequities in health outcomes for women will persist. Although some posit that the slowing pace of breast cancer mortality decline represents a saturation of the effect of screening uptake,⁹ it is also possible that this saturation is merely occurring in areas where infrastructure is in place. Rather than focus efforts on compliance with guidelines in places where mammography is available and adherence is already high, it could benefit society to focus on infrastructure improvements in areas where compliance is currently difficult to achieve.

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Purpose

This study aims to assess and compare the availability, capacity, and performance of screening mammography across US counties. Specifically, we examine the geographic distribution of mammography machines and evaluate their alignment with local breast cancer detection. We map these indicators to identify counties with potential mismatches between capacity and need.

The objectives of the study are to:

- Quantify the geographic distribution of mammography.
- Assess how the current deployment of mammography corresponds to county-level breast cancer incidence.
- Provide evidence to guide more equitable investment in and resource allocation to women's preventive health services.

Ultimately, this research supports the broader goal of advancing data-driven health-system planning, ensuring that innovations in early detection are equitably accessible to all women.

Data

Cancer and Mammography Data

We collect county-level data on breast cancer cases, including DCIS, from US Cancer Statistics (USCS) for 2017–2021.¹⁰ USCS does not include cancer data from Indiana or Kansas; cancer variables were instead collected from those respective state departments of health.¹¹

We also collect the percentage of female Medicare participants in each county that had a mammogram in the previous year, as of 2022, from the University of Wisconsin's County Health Rankings.¹² This captures how well part (but not all) of the recommended female population can access mammography. This measure targets a population for which insurance coverage is not a barrier to access, meaning that when this measure performs poorly, even a fully covered population has access issues.

All US-based mammography machines are required to be certified to operate by the American College of Radiology (or by the state of Arkansas or Texas for facilities in those states) under the Mammography Quality Standards Act.¹³ The Food and Drug Administration (FDA) Mammography Program Reporting and Information System (MPRIS) collects details on all certified machines.

We requested the MPRIS facility and equipment data from the FDA via the Freedom of Information Act and received the data on February 27, 2025. The data include all certified mammography machines and their locations as of February 25, 2025.¹⁴ Each machine is assigned to a county based on the street address reported by MPRIS.

Population Data

For each county, we use the female population aged 40 and above from the 2017–2021 American Community Survey (ACS) five-year estimates.¹⁵ This is a rough approximation of the population for which mammography is most beneficial and includes the populations advised to receive regular mammograms by the American College of Radiology, the Society of Breast Imaging, the American Cancer Society, and the USPSTF.

We also use the ACS five-year estimates to gather demographic data, including the racial/ethnic makeup of the female population of counties, female poverty and insurance rates, and the percentage of female limited-English-speaking households (households where all members aged 14 and above have at least some difficulty with English).

We assign each county one of five urban classifications based on the National Center for Health Statistics Urban-Rural Classification Scheme for Counties.¹⁶ We classify large metros as counties in metropolitan statistical areas (MSAs)—including principal cities and suburbs—with at least one million in population; medium metros as counties in MSAs of 250,000 to 999,999; and small metros as counties in MSAs of less than 250,000. Counties are classified as micropolitan if they have a population cluster of 10,000–49,000, with the remaining counties classified as rural or noncore.

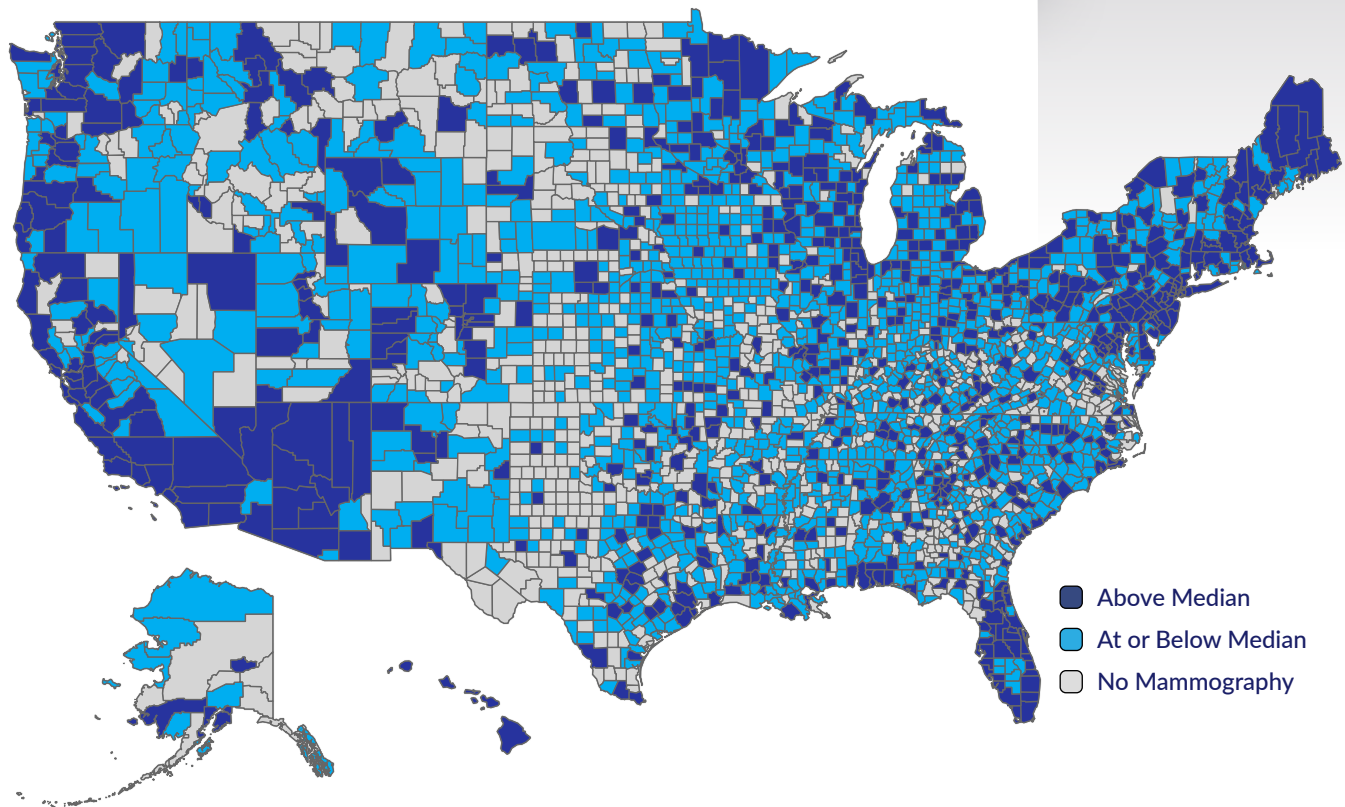
Data Patterns

Figure 1 displays the locations of mammogram machines throughout the US. Dark blue counties have above the median number of mammogram machines for their population (14 for a large metro, 12 for a medium metro, 9 for a small metro, 4 for a micropolitan area, and 2 for a rural county), light blue counties have at or below the median number of mammogram machines, and gray counties have no mammogram machines. There are 890 counties in the US with no mammogram machines.

890

COUNTIES IN
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MACHINES

Figure 1: Distribution of Mammography Machines in the United States

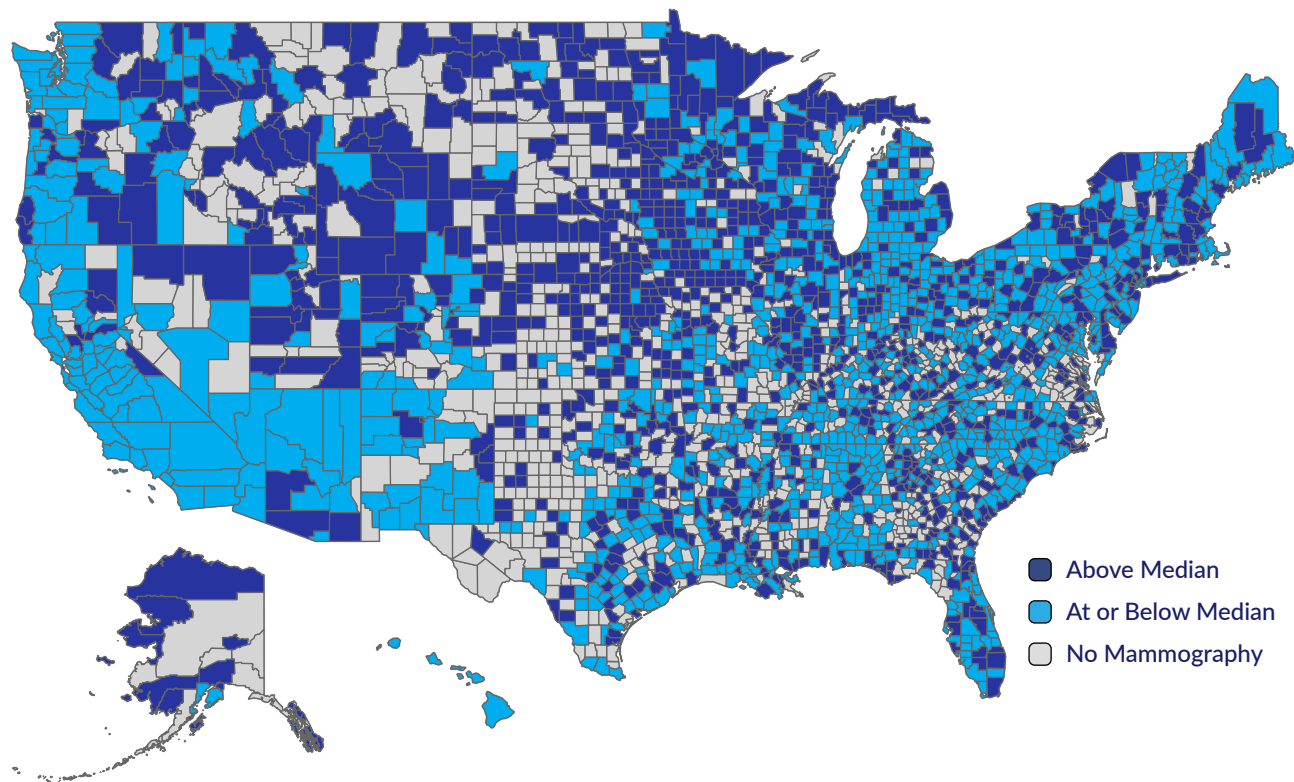


Sources: MPRIS (2025), Milken Institute (2025)

Mammography machines tend to be concentrated in more populated areas, with the largest presence in major urban areas, particularly along the coasts. This is roughly in line with the US population distribution, although, as shown in Figure 2, the ratio of the number of machines to the number of women aged 40 and above, which we refer to as capacity, does not follow the same pattern.

Some places have more machines per person and thus more capacity, while others have fewer machines per person, resulting in less capacity. Places with below median mammography capacity are more evenly spread throughout the country than those with higher capacity and are less commonly found on the coasts. For example, California, which has a high number of total machines, has a lower capacity due to its large population.

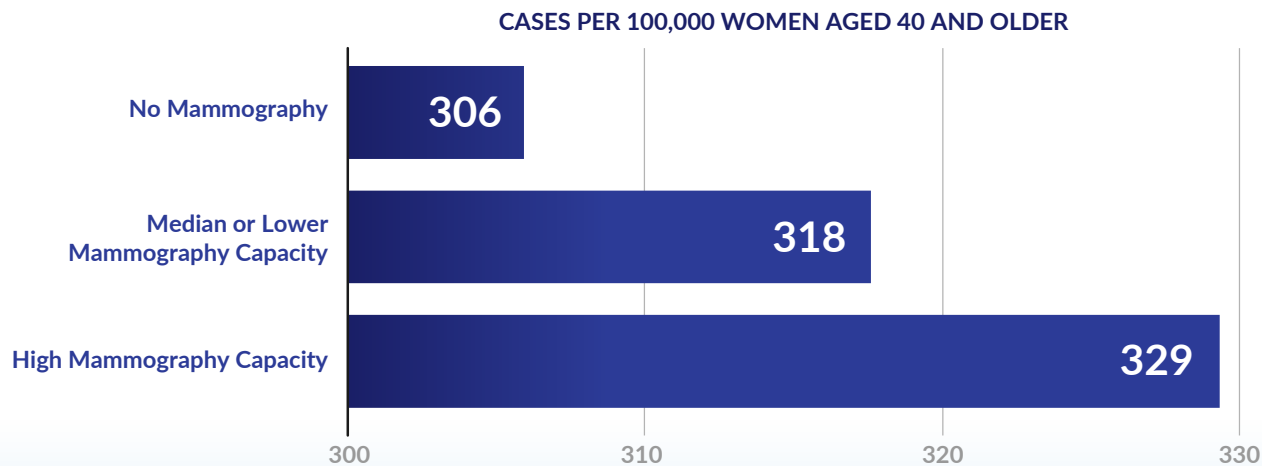
Figure 2: Mammography Capacity in the US (Number of Machines per 100,000 Women Aged 40+)



Sources: MPRIS (2025), ACS (2025), Milken Institute (2025)

In general, places with more mammogram capacity tend to have better detection ability (Figure 3). Crude rates of breast cancer increase along with the density of mammogram machines, which is consistent with a higher number of machines detecting more cases of cancer in the population. Counties with the most machines have the highest crude rate of breast cancer (329 cases per 100,000). Low-capacity counties have the second-highest crude rate (318 cases per 100,000), and counties with no capacity have the lowest crude rate (306 cases per 100,000).

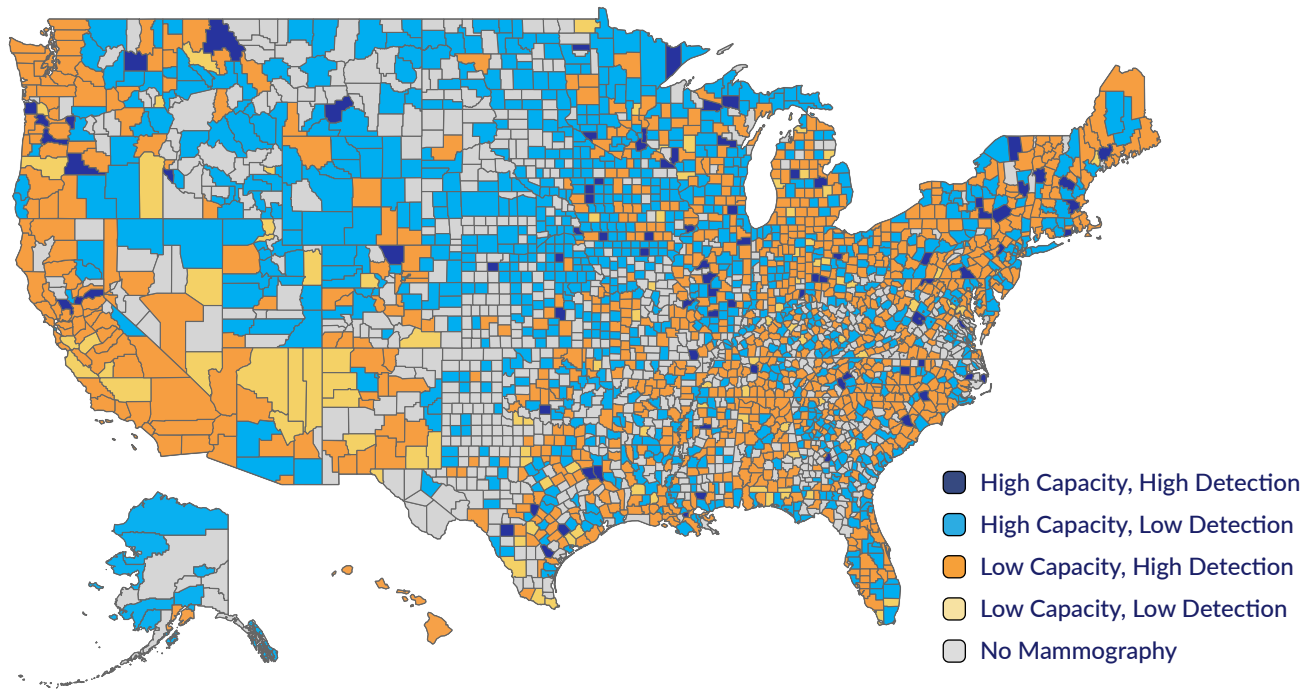
Figure 3: Mammography Machines and Crude Rate of Breast Cancer Among Women Aged 40+



Sources: MPRIS (2025), USCS (2024), ACS (2025), state departments of health of Indiana and Kansas (2024), Milken Institute (2025)

Figure 4 shows the geographic dispersion of counties based on their mammography capacity and crude rate of breast cancer. Gray counties have no mammography. High-capacity counties (dark blue in Figure 2) are indicated in blue, and low-capacity counties (light blue in Figure 2) in orange. In both cases, a darker shade indicates higher crude rates of breast cancer (high detection), while counties shaded in a lighter version of the color have lower case rates (low detection).

Figure 4: Geography of Mammography Machines and Crude Rate of Breast Cancer Among Women Aged 40+



Sources: MPRIS (2025), USCS (2024), ACS (2025), state departments of health of Indiana and Kansas (2024), Milken Institute (2025)

The dark blue areas, those with high capacity and high detection, are the highest performing counties. They have numerous mammogram machines, which translates into a high catch rate for breast cancer. Light blue areas have high capacity but are not among the top performers in terms of detection. This suggests that in these locations, something other than capacity is constraining the ability to detect breast cancer (a topic that we will return to later).

Dark orange counties have low capacity but high detection, meaning that despite having fewer machines, women are still managing to get screened. The light orange counties have both low capacity and low detection; investment in mammogram machines in these 97 counties would likely yield large benefits. Gray counties have no mammogram machines present.

The light orange counties have both **low capacity** and **low detection**; investment in mammogram machines in these 97 counties would likely **yield large benefits**.

The map shows that the Southwest represents an area with a large number of potentially undetected cases. Even in the few high-capacity counties, case rates fall below the median. With its large number and small sizes of counties, Eastern capacity tends to vary; we do not observe many large clusters of either high- or low-detection counties. California, on the other hand, outside of a relatively small area in the north of the state, is almost entirely low-capacity, likely due to its large population along the coast.

The middle of the country, notably the northern plains and extending down to west and northwest Texas, is also interesting. While many small, less-populated counties in this area fall in high-capacity, low-detection sections, numerous have no mammography machines at all. Women in those counties must travel to nearby counties with machines, most of which are high-capacity, low-detection areas (as seen in light blue).

This pattern is partly due to the clusters of small, low-population counties. Because women in counties without access to mammography machines are being diagnosed in other counties, it might be more realistic to group the gray counties with the light blue, which would flip part of this area to low capacity, low detection. To put it simply, a mammogram machine in a county bordering no-machine counties serves a much larger population.

Table 1: Demographics of Counties Stratified by Capacity and Detection

	High capacity, high detection	High capacity, low detection	Low capacity, high detection	Low capacity, low detection	No machines
Population (female, 40+)	11,779	8,561	12,870	10,125	2,267
% Racial and/or ethnic minority (female, 40+)	9.0	11.3	12.0	22.2	11.4
% Poverty rate (female)	13.6	14.3	14.6	17.5	15.7
% Uninsured rate (female)	5.3	7	7	8.4	9
% Had mammogram in last year (female Medicare enrollees)	48	46	44	38	40
% Limited-English-speaking households	1.3	1.76	1.64	3.64	1.66

Sources: MPRIS (2025), USCS (2024), ACS (2025), state departments of health of Indiana and Kansas (2024), Milken Institute (2025)

Table 1 provides demographic information on counties based on their capacity and detection profile. Much of the data align with cancer outcomes. Within a given capacity, poorer detection correlates with smaller populations, a larger percentage of racial and/or ethnic minority populations, higher poverty rates, a lower rate of health insurance coverage, a higher proportion of households speaking limited English, and a lower rate of women receiving a mammogram in the past year, revealing multiple layers of vulnerability. This suggests that while the capacity of screening mammography is important to detection, other barriers outside of capacity are also relevant.

While Figure 3 suggests that increasing capacity in low-capacity areas will improve detection, Table 1 shows that this is unlikely to close the gap in detection completely. Though higher capacity does allow for the possibility of increased screening, it does not guarantee it, and capacity alone is far from the only determinant

of breast cancer detection. The successful deployment of mass screening mammography relies on machine availability but also on uptake. Health-care access encompasses five key dimensions: availability, accessibility, accommodation, affordability, and acceptability.¹⁷ The deployment of additional mammography machines addresses the availability of this care but not the other dimensions of health-care access.

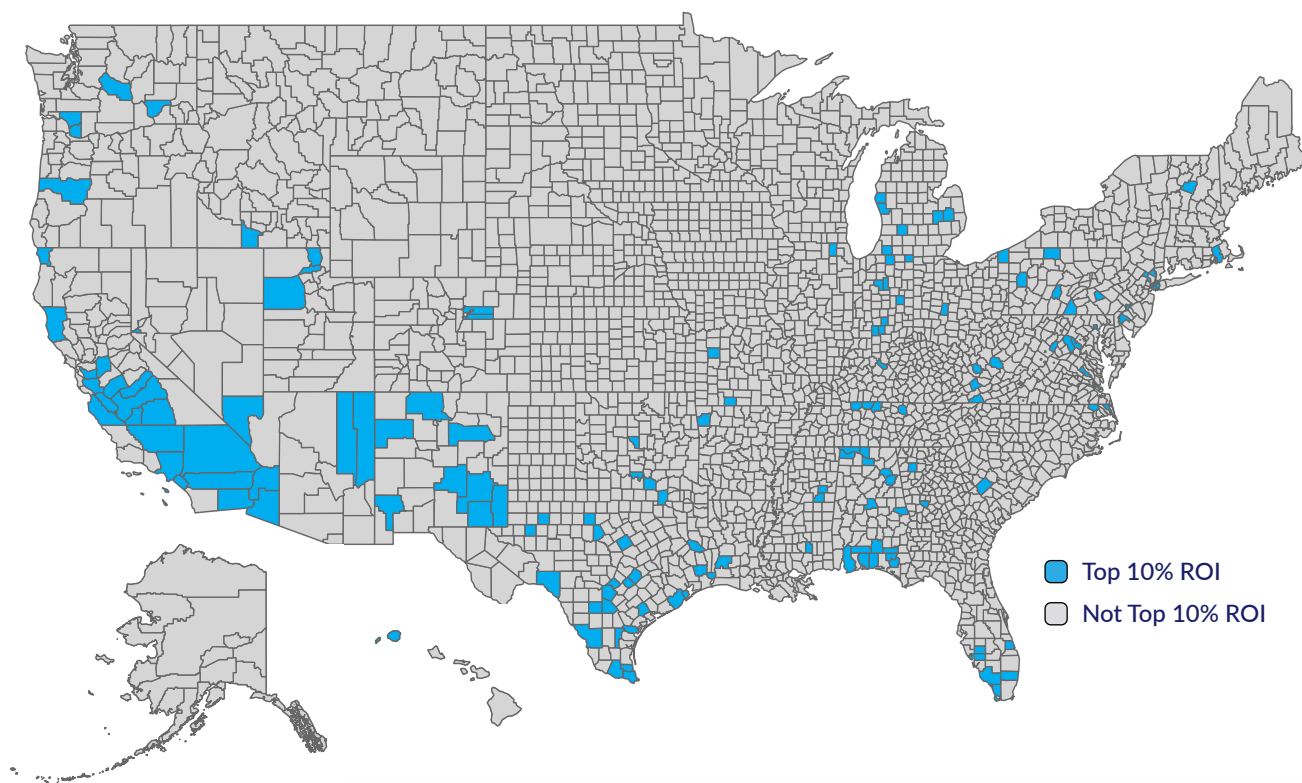
Projections

We next project how many additional cases could be caught, and how many could be caught early (as DCIS), if low-capacity, low-detection, and no-mammography counties performed at the average level of their high-capacity, high-detection counterparts. This reasonably approximates the growth potential for detection through additional investment.

If low- and no-capacity counties were able to detect at the same rate as their high-capacity counterparts, we project that the US could catch about 9,600 additional cases of breast cancer earlier. We also project that 4,200 cases could be caught as DCIS, before they progress to later stages.

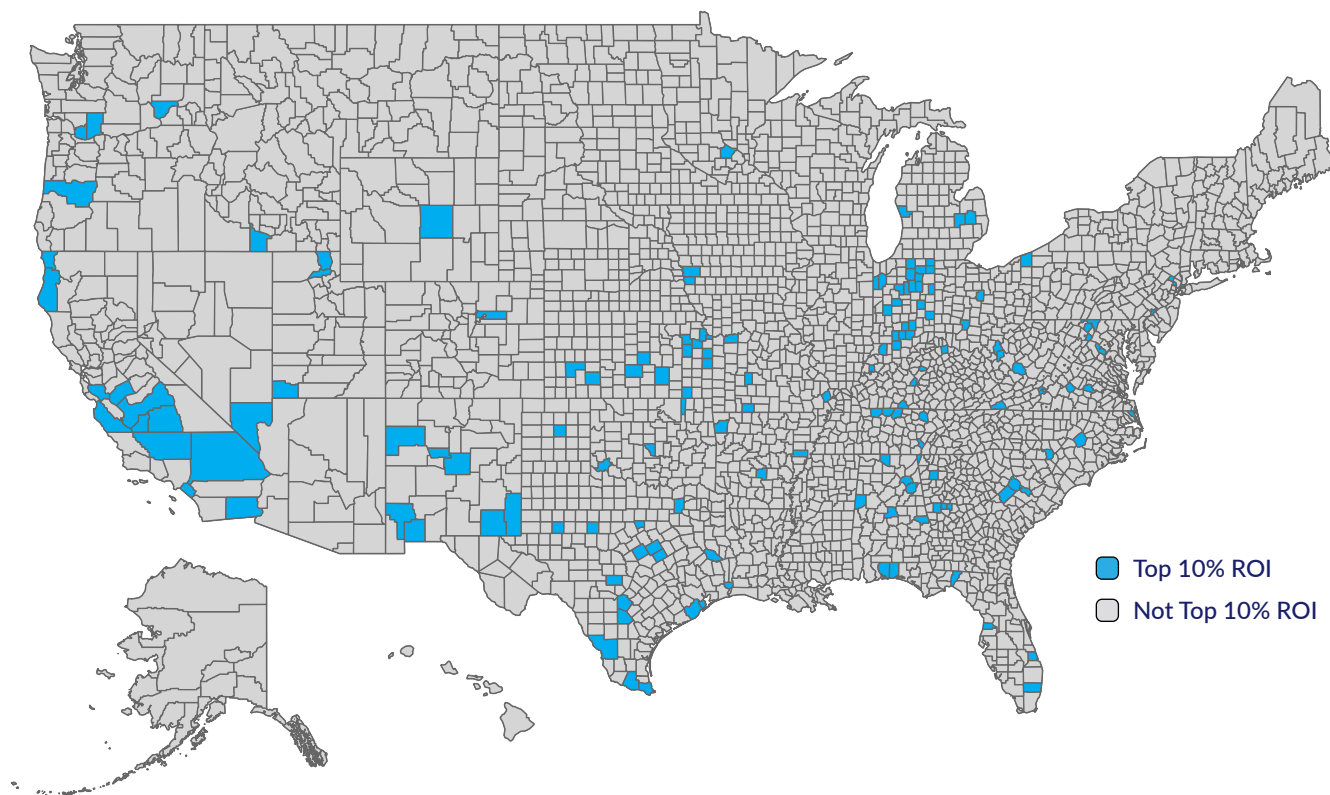
Figures 5 and 6 show the geographic dispersion of places with the highest (top 10 percent) projected improvements on a per-machine basis. They indicate the top 155 counties where the deployment of an additional machine could have the largest return on investment (ROI) in terms of detection improvements per machine.

Figure 5: Counties with the Highest ROI (Breast Cancer Cases Caught) from Mammogram Deployment



Sources: MPRIS (2025), USCS (2024), ACS (2025), state departments of health of Indiana and Kansas (2024), Milken Institute (2025)

Figure 6: Counties with the Highest ROI (DCIS Cases Caught) from Mammogram Deployment



Sources: MPRIS, USCS, ACS, state departments of health of Indiana and Kansas, Milken Institute (2025)

Generally speaking, if a county is highlighted in Figure 5 or 6—even more so if it is highlighted on both maps—then it is likely a high-return location for mammography deployment. The top ROI counties have a similar but not identical footprint for ROI in terms of breast cancer versus DCIS cases caught earlier. There are 74 counties, such as Broward County, Florida, and Adams County, Colorado, that are highlighted on both maps, indicating a high ROI for identifying both additional breast cancer and DCIS cases.

Non-Capacity Barriers and Implications for Deployment

To identify potential health gains from investing in additional machines, we need to target areas where a large number of women are unable to meet the recommended mammogram screening guidelines. The previous analysis shows places where a lack of machine capacity is a barrier to meeting guidelines, but that does not mean that this is the only barrier present in these places. Additional machines are likely necessary to improve detection but may not be sufficient to do so if other barriers are not addressed in tandem.

Mammography screening shares the same common barriers as other types of health care: Patients face time and financial constraints from lack of paid time off, inability to secure childcare, lack of transportation, or even an overly busy schedule.¹⁸ And income and health insurance are particularly important factors in determining whether or not women get screened.¹⁹ Even a small copayment is associated with much lower adherence to screening guidelines.²⁰

Though little to no cost-sharing is required for screening mammography under most health insurance plans, lack of health insurance continues to be strongly associated with insufficient breast cancer screening.²¹ This is likely because those with insurance tend to be more connected to the health-care system. Lack of a regular source of health care is associated with lower mammography use, and many women receive mammograms only after being referred by a provider.²²

Additionally, the differing screening guidelines from various organizations can confuse even those with high health literacy. A trusted provider can help individuals navigate confusing recommendations and overcome the fear that prevents some women from receiving a mammogram.²³

Factors such as immigration status, language, acculturation, and time spent living in the United States also impact breast cancer screening.²⁴ For example, patients who only speak Spanish demonstrate lower rates of screening and follow-up care, and while translation services are available, they are a finite resource and are not always ideally tailored to a patient's specific language and culture.²⁵

This report aims to highlight locations that have a capacity barrier. The recommended policy response to improve utilization in these locations should include investment in capacity, along with additional investment to address other barriers present. If the local population has no capacity and is also unable to take time off to get screened, for example, then both barriers need to be addressed to get the maximum increase in screening and detection.

Conclusion:

Beyond Basic Screening

Mammography is an important first step in improving breast cancer outcomes; you cannot treat what you cannot detect. However, not all mammography is equally capable of catching breast cancer in all people: Standard mammography is far less effective in detecting cancer in people with dense breasts. While it is important to ensure that populations have access to screening at all, it is also vital to ensure they have access to the appropriate quality of screening. Investment is not one-size-fits-all, and as more enhanced data on risk subpopulations (such as women with dense breasts) become available, better technology can be deployed to more efficiently meet needs.

Increased introduction of advanced diagnostic technology, such as AI-enhanced imaging, computer-assisted diagnostics, whole breast ultrasound, liquid biopsy, thermography, molecular imaging (MRI, PET), and tomosynthesis (3D mammography), will increase the precision with which analytics similar to those in this report can be applied.²⁶

Finally, the presence or use of mammography does not speak to the availability of and access to treatment. Better deployment of screening resources ensures that women can get screened and diagnosed more quickly, but this is merely the first step in a treatment plan and, hopefully, recovery journey. Just as improvements can be made through investment in screening capacity, there is also room for health improvements through additional and smart investment in treatment capacity.

Endnotes

1. Angela N. Giaquinto et al., “Breast Cancer Statistics 2024,” *CA: A Cancer Journal for Clinicians* 74, no. 6 (October 1, 2024): 477–95, <https://doi.org/10.3322/caac.21863>.
2. American Cancer Society, *Cancer Prevention & Early Detection Facts & Figures 2023–2024*, <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/cancer-prevention-and-early-detection-facts-and-figures/2024-cped-files/cped-2024-cff.pdf>.
3. Debra L. Monticciolo et al., “Breast Cancer Screening Recommendations Inclusive of All Women at Average Risk: Update from the ACR and Society of Breast Imaging,” *Journal of the American College of Radiology* 18, no. 9 (September 2021): 1280–88, <https://doi.org/10.1016/j.jacr.2021.04.021>.
4. “American Cancer Society Recommendations for the Early Detection of Breast Cancer,” American Cancer Society, last revised December 19, 2023, <https://www.cancer.org/cancer/types/breast-cancer/screening-tests-and-early-detection/american-cancer-society-recommendations-for-the-early-detection-of-breast-cancer.html>.
5. US Preventive Services Task Force, “Screening for Breast Cancer: US Preventive Services Task Force Recommendation Statement,” *JAMA* 331, no. 22 (April 30, 2024): 1918–30, <https://doi.org/10.1001/jama.2024.5534>.
6. Bircan Erbas et al., “The Natural History of Ductal Carcinoma in Situ of the Breast: A Review,” *Breast Cancer Research and Treatment* 97, no. 2 (December 1, 2005): 135–44, <https://doi.org/10.1007/s10549-005-9101-z>; Lars J. Grimm et al., “Ductal Carcinoma in Situ: State-of-the-Art Review,” *Radiology* 302, no. 2 (December 21, 2021): 246–55, <https://doi.org/10.1148/radiol.211839>.
7. Andrew Friedson et al., “Breast Cancer Detection: Untapped Potential,” Milken Institute, October 15, 2024, <https://milkeninstitute.org/content-hub/research-and-reports/research-and-data-tools/breast-cancer-detection-untapped-potential>.
8. Jennifer L. Caswell-Jin et al., “Analysis of Breast Cancer Mortality in the US—1975 to 2019,” *JAMA* 331, no. 3 (January 16, 2024): 233–41, <https://doi.org/10.1001/jama.2023.25881>.
9. Giaquinto et al., “Breast Cancer Statistics 2024.”
10. US Cancer Statistics, “About the US Cancer Statistics Data Visualizations Tool,” June 2, 2025, US Centers for Disease Control and Prevention, accessed June 2024, <https://www.cdc.gov/united-states-cancer-statistics/dataviz/index.html>.
11. The University of Kansas Medical Center Query System, Kansas Cancer Registry, 2016–2020, The University of Kansas Department of Health and Environment, accessed June 2024, <https://www.kdhe.ks.gov/2239/Data>; Indiana Department of Health, “Cancer Surveillance and Data,” accessed June 2024, https://www.in.gov/health/cdpc/cancer/cancer-surveillance-and-data/#Cancer_Statistics_Data_Requests.
12. “Mammography Screening,” County Health Rankings & Roadmaps, University of Wisconsin Population Health Institute, accessed 2025, <https://www.countyhealthrankings.org/health-data/community-conditions/health-infrastructure/clinical-care/mammography-screening>.
13. FDA, “Mammography Quality Standards Act (MQSA) and MQSA Program,” accessed 2025, <https://www.fda.gov/radiation-emitting-products/mammography-quality-standards-act-mqsa-and-mqsa-program>.

14. US Food and Drug Administration, “Mammography Program Reporting and Information System (MPRIS),” US Department of Health and Human Services, received February 27, 2025.
15. “American Community Survey (2021),” US Census Bureau, received March 2025, <https://www.census.gov/programs-surveys/acs>.
16. D. D. Ingram and S. J. Franco, 2013 NCHS Urban-Rural Classification Scheme for Counties (*Vital and Health Statistics Series 2, Number 166*) (National Center for Health Statistics, April 2014), 1–73, https://www.cdc.gov/nchs/data/series/sr_02/sr02_166.pdf.
17. R. Penchansky and J. W. Thomas, “The Concept of Access: Definition and Relationship to Consumer Satisfaction,” *Medical Care* 19, no. 2 (February 1981): 127–40, <https://doi.org/10.1097/00005650-198102000-00001>.
18. Maria Castaldi et al., “Disparate Access to Breast Cancer Screening and Treatment,” *BMC Women’s Health* 22, no. 1 (June 22, 2022): 249, <https://doi.org/10.1186/s12905-022-01793-z>.
19. Vama Jhumkhawala et al., “Social Determinants of Health and Health Inequities in Breast Cancer Screening: A Scoping Review,” *Frontiers in Public Health* 12 (February 6, 2024), <https://doi.org/10.3389/fpubh.2024.1354717>.
20. Amal N. Trivedi et al., “Effect of Cost Sharing on Screening Mammography in Medicare Health Plans,” *New England Journal of Medicine* 358, no. 4 (January 24, 2008): 375–83, <https://doi.org/10.1056/NEJMsa070929>.
21. Jhumkhawala et al., “Social Determinants of Health and Health Inequities in Breast Cancer Screening: A Scoping Review”; Ruth C. Carlos et al., “Breast Screening Utilization and Cost Sharing Among Employed Insured Women After the Affordable Care Act,” *Journal of the American College of Radiology* 16, no. 6 (June 2019): 788–96, <https://doi.org/10.1016/j.jacr.2019.01.028>.
22. David Moiel and John Thompson, “Early Detection of Breast Cancer Using a Self-Referral Mammography Process: The Kaiser Permanente Northwest 20-Year History,” *The Permanente Journal* 18, no. 1 (March 1, 2014): 43–48, <https://doi.org/10.7812/TPP/13-038>; Arica White et al., “Cancer Screening Test Use—United States, 2015,” *Morbidity and Mortality Weekly Report* 66, no. 8 (March 3, 2017): 201–6, <http://dx.doi.org/10.15585/mmwr.mm6608a1>.
23. Castaldi et al., “Disparate Access to Breast Cancer Screening and Treatment.”
24. Jhumkhawala et al., “Social Determinants of Health and Health Inequities in Breast Cancer Screening: A Scoping Review.”
25. Shanen Jean et al., “Identifying and Reducing Barriers to Breast Imaging,” *Current Breast Cancer Reports* 15, no. 2 (April 5, 2023): 114–18, <https://doi.org/10.1007/s12609-023-00480-8>; Miral M. Patel and Jay R. Parikh, “Patient Diversity in Breast Imaging: Barriers and Potential Solutions,” *Journal of Breast Imaging* 3, no. 1 (January/February 2021): 98–105, <https://doi.org/10.1093/jbi/wbaa092>.
26. “Mammogram 2024: Top 5 Breakthrough Technologies,” Inview Imaging, accessed 2025, <https://www.inviewimaging.com/2024/10/08/mammogram-2024-top-5-breakthrough-technologies/>; Ola I. A. Lafi et al., “Breakthroughs in Breast Cancer Detection: Emerging Technologies and Future Prospects,” *International Journal of Academic Health and Medical Research* 8, no. 9 (September 2024): 8–15, <http://ijeais.org/wp-content/uploads/2024/9/IJAHMR240902.pdf>.

About the Authors

Andrew Friedson, PhD, is the head of research for Milken Institute Health. He is an economist with a specialization in health care and related sectors. Before joining the Milken Institute, he spent over a decade in academia, where he was an associate professor of economics at the University of Colorado Denver, with a secondary appointment in the Department of Health Systems, Management and Policy at the Colorado School of Public Health. He is the author of the textbook *Economics of Healthcare: A Brief Introduction*, which is published by Cambridge University Press and is used in classrooms around the country.

Friedson has wide expertise in health economics and has published peer-reviewed research on health behaviors, markets, and policy in premier journals in economics, public policy, and medicine, including the *Journal of Public Economics*, *Journal of Law and Economics*, and *JAMA Health Forum*. His research has been covered in popular press outlets, including *The Economist*, *The New York Times*, and *The Wall Street Journal*. He received the Richard Musgrave Prize from the National Tax Association in 2014 and the Excellence in Research Award from the University of Colorado Denver College of Liberal Arts and Sciences in 2022.

Abigail Humphreys, PhD, is a senior associate on the Milken Institute's Research team, where she applies her expertise to projects associated with women's health and well-being. Prior to joining the Milken Institute, she was a part of the Colorado Fertility Project and affiliated with the Colorado University Population Center at the University of Colorado Boulder. There, she conducted research on public health and contraceptive access. Her work has been published in *JAMA Network Open* as well as in *Contraception*, and she has presented at the annual Population Association of America conference. Humphreys received her PhD in health economics from the University of Colorado Denver in 2024 and holds a BA in economics from Binghamton University.

Bumyang Kim, PhD, is an associate director of health economics research at Milken Institute Health. He specializes in data-driven and evidence-based quantitative research, utilizing real-world data analytics to address health disparities. His work focuses on improving access to social infrastructure for vulnerable and underserved populations through strategic policy decision-making.

Kim's research emphasizes access to care, technology diffusion, geographic variations in resources, and evaluations of public programs. Prior to his role at the Milken Institute, he was involved in health economics and outcomes research within the Cancer Economics and Policy Division at the Department of Health Services Research, University of Texas MD Anderson Cancer Center.

He earned his PhD in health economics and health services research from the University of Texas Health Science Center at Houston and holds a master's degree in health administration from the University of North Carolina at Charlotte.

Katherine Sacks, PhD, is an associate director in research at Milken Institute Health. Her research concerns health equity, health disparities, and social determinants of health, focusing particularly on adverse maternal birth outcomes, as well as the effects of the social safety net on measures of population health. Prior to joining the Milken Institute, Sacks taught in the department of public policy at the University of North Carolina at Chapel Hill and in the department of political science and public policy at North Dakota State University. Sacks holds a PhD and an MA in public policy from the University of North Carolina at Chapel Hill, an MSc from the London School of Economics and Political Science, and a BA from Barnard College.

