

The “Sweet Spot” for Digital Screening Mammography Recall Rates and Cancer Detection in the Metro Chicago Breast Cancer Registry

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BACKGROUND:

- ❖ Federal regulation requires mammography facilities to conduct annual audits to evaluate performance in detecting breast cancer.
- ❖ Recall, biopsy recommendation and cancer detection are important measures.
- ❖ The optimal recall rate recommendation by the Breast Cancer Surveillance Consortium is 10%.

PURPOSE:

- ❖ To visually evaluate the trade-offs of varying recall rates relative to cancer detection and biopsy recommendation among radiologists in an organization with multiple radiologist groups.
- ❖ To determine the “Sweet Spot” (optimal recall rate) in the Metro Chicago Breast Cancer Registry (MCBCR).

METHODS:

- ❖ Screening mammography outcomes during 2005-2017 were assessed for women ages 40-79 with no history of breast cancer.
- ❖ Eligible radiologists (N=90) each read at least 1000 screening mammograms.
- ❖ Logistic regression with marginal standardization estimated radiologist-level mean recall, biopsy recommendation and cancer detection rates adjusted for differences in patient mix.

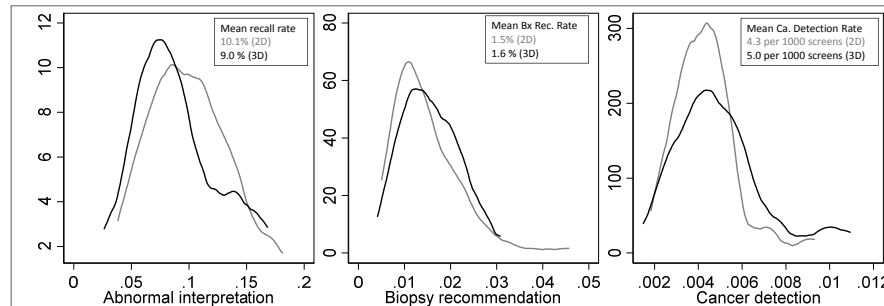


FIGURE 1. Smoothed histograms of mammogram screening measures by modality: gray = 2D digital, black= 3D tomosynthesis.

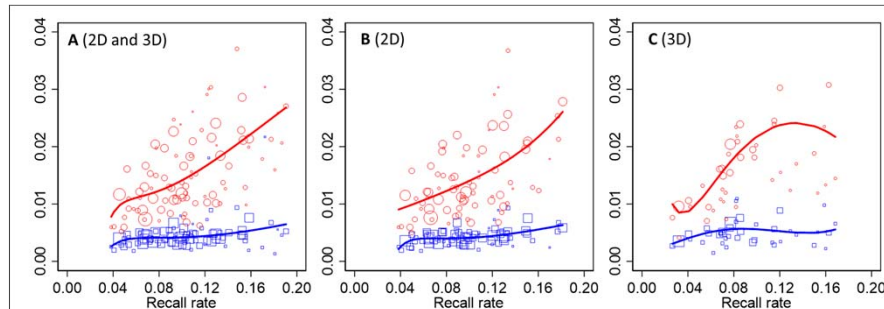


FIGURE 2. Plots of adjusted radiologist-level mean cancer detection (blue squares) and biopsy recommendation rates (red circles) as a function of recall rates (x-axis). Larger circles and squares represent larger screening volumes. (A) All screening mammograms; (B) 2D digital mammograms; (C) 3D tomosynthesis exams.

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RESULTS:

- ❖ 1,243,051 Screening Mammograms (870,348 2D digital and 124,639 3D tomosynthesis exams)
- ❖ Recall Rate = 12.0% (148,698 abnormal interpretations); recall was higher for 2D, though cancer detection was higher for 3D.
- ❖ Biopsy Recommendation Rate = 0.76%
- ❖ Cancer Detection Rate = 0.49% (6,131 *in situ* & invasive screen detected breast cancers)
- ❖ As recall rate increased from 5% to 15%, cancer detection rate increased by 1.6 per 1000 screens (from 3.6 to 5.1 per 1000 screens), whereas biopsy recommendation increased by 10 per 1000 screens (from 10 to 21 per 1000 screens).
- ❖ Recall rates between 5-7% appeared to maximize cancer detection while minimizing unnecessary biopsies.

CONCLUSIONS:

- ❖ The “Sweet Spot” for optimal cancer detection in MCBCR is in the recall rate range 5-7%.
- ❖ Results are more in line with lower recall rates for European countries, and with a recent large European study suggesting that recall rates of about 5% were optimal.
- ❖ The study exemplifies a practical use of cancer registry data with other data sources to inform public health.