mental health and substance use prevention and treatment among diverse groups beyond low SEP rural Whites, they must caution against a reversion to stigma and criminalization of drug use and mental illness. By expanding the net of despair to people of color, as public health professionals we must be careful in our messaging—we must ensure that we maintain a public health approach by focusing on prevention, while also leading treatment efforts and equitable provision of services to those in need. As public health professionals, it is our obligation to fight against the historical model of discriminatory legal practices toward drug use and mental illness that threaten to reemerge when these symptoms are associated with people of color. The hope is that we can take advantage of the current public empathetic feelings toward the plight of those affected by the opioid epidemic, even after research is published noting that the despair of people of color also needs to be addressed. AJPH

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CONFLICTS OF INTEREST

The author has no conflicts of interest to declare.

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What Are the Public Health Effects of Dense Breast Notification Laws?

See also Busch et al., p. 762.

As of December 2018, 35 states have enacted some form of dense breast notification laws mandating that women receive information about breast density following a mammogram. Breast density is the relative amount of glandular, connective, and fatty breast tissue measured during a mammogram and is uncorrelated with how "firm" a woman's breast may feel. Having dense breasts is an independent risk factor for breast cancer and can mask tumors from being read during a mammogram. Dense breast notification laws began as part of a grassroots advocacy effort, led by Nancy Cappello, who was shocked to receive a breast cancer diagnosis after a negative mammogram result (also referred to as interval cancer in the scientific literature). She was informed that her tumor was not detected because of dense breast tissue, and when she asked why this information had not been shared sooner, she was told that it was not part of the standard protocol. This motivated her to petition the Connecticut legislature to pass the first dense breast notification law in 2009.[1]

In the 10 years since the first dense breast notification law was enacted, there has been controversy and unanswered questions about the benefits, consequences, and implementation of such legislation in the community and rightfully so. An estimated four in 10 women in the United States have dense breasts, with an even higher proportion (38%–57%) among women in their 40s and 50s; thus, the effect of dense breast notification laws, both favorable and unfavorable, could be sweeping.[2] Previous studies have shown that supplemental ultrasounds and magnetic resonance imaging (MRI) detect more cancers in women with dense breasts but also lead to higher false-positive rates, and supplemental testing has not been shown to improve survival and, based on predictive models, is not cost-effective.[3,4] Understandably, concern also exists about how physicians and women might misinterpret their overall breast cancer risk, because it varies according to not only breast density but also other risk factors. Evidence also indicates that language included in notification letters is vague and difficult to interpret and may be especially so for women with lower educational attainment and health literacy.[5]

EFFECT OF DENSE BREAST NOTIFICATION LAWS

In this issue of *AJPH,* Busch et al. (p. 762) examined whether dense breast notification laws are associated with breast cancer diagnosis and additional testing, a key question among the many surrounding dense breast notification laws. They studied 1.4 million mammograms performed between 2014 and 2015 among nearly 1.2 million women aged 40 to 59 years in a private health insurance claims database. States with laws preceding the study time frame were not included. Relative to states without laws, no difference in breast cancer detection was seen among five states (Arizona, Ohio, Minnesota, North Dakota, and Tennessee) enacting generic dense breast notification laws instructing women to discuss findings with their provider.

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However, in four states (Massachusetts, Michigan, Missouri, and Rhode Island) with dense breast notification laws with an additional mandate that women be informed of the potential benefits of supplemental screening, an additional 0.37 (95% confidence interval = 0.05, 0.69) breast cancers were detected per 1000 mammograms compared with states without laws. The lack of significant findings in states with generic laws but increases in detection in states with dense breast notification plus supplemental screening laws suggests that notification language could influence outcomes.

One of the concerns of dense breast notification laws is that they could lead to additional testing, false-positive results, and increased cost. Busch et al. did not examine the effect on positive test results or cost but found that about nine to 10 more ultrasounds per 1000 mammograms were performed in states with dense breast notification plus supplemental screening laws compared with states with generic dense breast notification laws and states without such laws, although rates of MRIs and biopsies were similar. In total, about 82 ultrasounds and five MRIs per 1000 mammograms were performed in states with dense breast notification plus supplemental screening laws, far lower than what would be anticipated if all women with dense breasts, about 40% to 60% of women in this age range,[2] received additional testing. These modest supplemental testing rates could mean that dense breast notification laws are not being broadly implemented, that some women may not understand or ignore their notifications, or that women are having discussions with their physicians but do not pursue additional testing.

The incremental increase of 0.37 breast cancers per 1000 mammograms in states with dense breast notification plus supplemental screening laws may sound negligible but is considerable given the similar biopsy rates across dense breast notification groups, the somewhat modest incremental ultrasound use in these states, and the reported finding that two to 2.5 breast cancers were detected for every 1000 mammograms in this study population. This could mean that most women referred for additional testing have higher risk profiles, but this hypothesis could not be confirmed. Furthermore, across a population, the absolute number of additional detected cancers could be sizable. For example, according to self-reported survey data, about a million women aged 40 to 59 years in Michigan, one of the states with dense breast notification plus supplemental screening laws, received a mammogram in the past two years.[6] Putting limitations aside, this could mean that an additional 370 women could be given breast cancer diagnoses in this state alone, but it could be as low as 50 or as high as 690 after incorporating confidence intervals reported by Busch et al. To put this into perspective, a total of 2846 women aged 40 to 59 years in Michigan were diagnosed with breast cancer annually between 2012 and 2015 according to cancer registry data.[7]

CONCLUSIONS

What makes the Busch et al. study noteworthy is that it was one of the first to measure the relation between dense breast notification laws and breast cancer occurrence and supplemental testing; however, they relied on administrative claims, which are limited in the information they can provide. Breast cancer occurrence was based on predictive algorithms, which may under capture breast cancer diagnosis. The lack of information on women's breast density and other risk factors, such as family history, actual receipt of notification, socioeconomic status, and race/ethnicity, limits what can be gleaned from the study's findings. Furthermore, these factors may vary by state and affect downstream testing and breast cancer diagnosis, potentially confounding results.

Additional studies with more detailed information on breast density, other risk factors, and sociodemographic factors are needed to elucidate and confirm the relation between dense breast notification laws and breast cancer detection. Furthermore, whether dense breast notification laws ultimately lead to fewer interval breast cancers, late-stage breast cancers, and breast cancer deaths in the community has yet to be seen, and questions on what dense breast notification laws mean for disparities are looming. Only seven of 35 states with dense breast notification laws mandate that insurance companies cover supplemental testing, and it is unclear if lack of coverage will influence women's ability and willingness to receive supplemental testing or dampen confidence in the screening process. Furthermore, if dense breast notification laws were to improve breast cancer detection and reduce mortality but only among the subset of women living in states with more specific laws and the health literacy to interpret notification letters, access to providers, and the means to pay for supplemental testing, then we must determine whether socioeconomic disparities in breast cancer will widen. On the contrary, if dense breast notification laws do not reduce interval breast cancer or death rates but women are receiving supplemental testing, it will be important to assess indirect and direct costs to women and their families, especially among those individuals and communities with limited resources.

Dense breast notification laws appear to be here to stay. The next steps forward will be to measure their public health effect, ensure health equity, and improve language of notifications so that they are written in a way that best serves the women they are trying to help. AJPH

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