Decline and Rebound in Routine Cancer Screening Rates During the COVID-19 Pandemic

BACKGROUND

Breast and colorectal cancer are two of the most commonly diagnosed cancers in the USA, generating 400,000 new cases and 90,000 attributable deaths in 2019 alone. Early detection through routine screenings is essential for improving cancer-related morbidity and mortality rates.[1] The COVID-19 pandemic has created the potential for a backslide in cancer screening rates, particularly forms of screening like mammography and colonoscopy that rely on office-based medical technologies.[2] Yet, whether cancer screening rates have declined, and how reductions vary across patient populations, remains largely unknown.

OBJECTIVE

To examine mammography and colonoscopy rates among commercially insured American adults before and after March 13, 2020—the date on which COVID-19 was declared a national emergency—as well as US county-level characteristics predictive of screening rates.

METHODS

We quantified weekly medical claims from commercially insured US adults between January 15, 2020, and July 31, 2020. Medical claims data were provided by Castlight Health, a health benefits manager for employer-sponsored health insurance plans across all 50 states, which included 6.8 million individuals.[3] We limited the study sample to those ages 46 to 64, target populations for cancer screening procedures prior to Medicare eligibility. For screening mammography, we limited our sample to women. Procedures were identified using IBM Watson Health procedure categories.[4] We calculated weekly number of individuals, per 10,000 eligible beneficiaries, who received cancer screenings. We also included patient age category (ages 46–59, 60–64) and sex, and linked claims to

county-level demographic characteristics: percent non-Hispanic black and percent Hispanic, and median household income, according to the U.S. Census Bureau; and weekly prevalence of SARS-CoV-2 cases per 10,000 population, according to USAFacts.

Longitudinal multivariable fixed-effects regression analyses estimated change in screening rates following March 13, 2020, relative to prior weeks. Fixed effects were included for calendar year, calendar week, and US state. Standard errors were clustered at the state level. Additional models interacted the dichotomous time variable with demographic characteristics. For each model, marginal means were generated to estimate adjusted, weekly screening rates through July 2020. This study was approved by the RAND IRB.

RESULTS

Prior to the national emergency declaration on March 13, 2020, median weekly rate of screening mammography was 87.8 women per 10,000 beneficiaries, which declined to 6.9 in April—a 96% decline (Table 1). By the end of July, this figure had rebounded to 88.2 screenings per 10,000 beneficiaries. Over the same period, colonoscopy screenings declined from 15.1 per 10,000 beneficiaries to 0.9, a 95% difference, and rebounded to 12.6 per 10,000 beneficiaries by the end of July. Adjusted estimates from multivariable regression analyses confirmed a significant decline (mammography: − 84.7 screenings per 10,000 beneficiaries, 95%CI − 96.8, − 72.3; colonoscopy: − 11.6, 95%CI − 14.8, − 8.4), with marginal adjusted means comparable to pre-COVID levels by the end of July (mammography: 0.2, 95%CI − 14.5, 14.9; colonoscopy: 1.6, 95%CI − 1.3, 4.5) (Fig. 1). For colonoscopy screenings, we observed a sharper decline in highest-income quartile counties compared to lowest-income quartile counties (3.0 fewer screenings; 95% CI 0.3, 5.8). We did not find any significant demographic differences when inspecting screening mammography rates.

DISCUSSION

While the COVID-19 pandemic has catalyzed a shift from office-based medical visits to telemedicine, routine cancer screenings typically require office-based care. We found that, following the COVID-19 national emergency declaration, mammography and colonoscopy rates declined by over 90%

Table 1 Screening Mammography and Colonoscopy Rates

Demographic characteristic	Mammography			Colonoscopy		
	Rate, pre-COVID (SD)	Rate, low point[a] (SD)	Rate, end of July (SD)	Rate, pre-COVID (SD)	Rate, low point[a] (SD)	Rate, end of July (SD)
All	87.8 (367.3)	6.9 (67.1)	88.2 (386.1)	15.1 (144.1)	0.88 (16.3)	12.6 (132.1)
Age group						
46–59	87.3 (331.4)	7.0 (58.6)	88.0 (375.0)	14.5 (133.7)	1.1 (18.9)	11.6 (143.1)
60+	88.3 (402.4)	6.7 (75.0)	88.5 (397.6)	15.7 (154.4)	0.6 (12.8)	13.7 (119.2)
Income						
1st quartile (lowest)	86.9 (406.3)	6.6 (85.9)	78.7 (408.6)	14.4 (163.9)	0.9 (16.6)	12.6 (138.7)
2nd quartile	92.7 (405.0)	7.7 (68.4)	85.6 (288.8)	15.0 (167.9)	1.0 (20.4)	15.0 (199.8)
3rd quartile	83.5 (357.6)	8.5 (74.6)	111.3 (566.4)	14.7 (139.7)	0.7 (9.0)	10.8 (86.5)
4th quartile (highest)	88.0 (292.9)	4.9 (25.7)	76.9 (171.9)	16.2 (95.2)	0.9 (16.9)	12.1 (58.1)
Rurality						
Metropolitan	88.1 (117.8)	8.1 (44.5)	85.3 (115.0)	16.1 (51.4)	0.9 (13.5)	13.8 (41.3)
Non-metropolitan	87.7 (430.9)	6.4 (74.5)	89.5 (454.1)	14.7 (168.2)	0.9 (17.3)	12.1 (155.0)
% African American						
1st quartile (lowest)	87.2 (509.2)	7.8 (103.0)	88.1 (594.6)	15.2 (202.8)	0.5 (12.2)	11.6 (219.0)
2nd quartile	85.5 (361.5)	5.3 (57.5)	97.2 (434.6)	15.5 (154.6)	1.1 (19.6)	11.5 (78.1)
3rd quartile	87.7 (312.3)	5.7 (50.9)	81.4 (230.5)	14.2 (102.1)	0.9 (18.5)	13.9 (116.0)
4th quartile (highest)	90.3 (278.8)	8.7 (51.2)	87.5 (226.0)	15.5 (109.8)	0.9 (13.5)	13.1 (83.3)
% Hispanic						
1st quartile (lowest)	88.6 (385.8)	8.6 (101.5)	76.8 (276.6)	14.9 (166.6)	0.8 (20.9)	16.1 (217.2)
2nd quartile	89.0 (352.7)	6.1 (48.0)	95.1 (439.1)	16.3 (161.6)	1.1 (16.5)	12.8 (89.4)
3rd quartile	85.2 (331.7)	5.2 (33.3)	97.7 (404.5)	14.8 (95.8)	0.8 (11.6)	10.4 (49.0)
4th quartile (highest)	88.6 (400.3)	7.9 (66.9)	82.3 (403.9)	14.3 (142.2)	0.8 (14.7)	11.1 (111.3)
Prevalence of SARS-CoV-2						
1st quartile (lowest)	91.0 (460.5)	4.7 (77.9)	74.7 (403.2)	14.3 (195.8)	1.0 (19.4)	15.5 (241.3)
2nd quartile	82.6 (360.8)	8.9 (81.5)	95.3 (481.5)	14.3 (125.5)	0.7 (17.8)	11.7 (82.2)
3rd quartile	89.6 (329.1)	6.8 (54.1)	81.3 (248.6)	14.6 (92.3)	1.0 (13.8)	11.1 (65.8)
4th quartile (highest)	88.3 (320.1)	6.9 (52.2)	99.3 (380.6)	16.9 (151.4)	0.8 (14.0)	12.5 (81.5)

Mean and standard deviation reflect the number of patients per 10,000 beneficiaries by patient gender, age category and county
[a]*Low point represents the lowest weekly number of screenings per 10,000 beneficiaries—in mid-April*

in a large cross-section of commercially insured adults throughout the country. Furthermore, despite an even larger spike in COVID case rates during summer months, cancer screening rates continued to rebound to pre-COVID levels—suggesting that health systems were able to recalibrate resources and protocols in a relatively short interval. Early in the pandemic, experts expressed concerns about the potential for a large drop-off in cancer screenings,[5] confirmed by these findings. However, health systems also rapidly responded with proto-cols and strategies to reopen in an appropriate manner,[6] and this study is the first to document the success of this effort.

We note three study limitations. First, the data derive from a subset of individuals with private insurance and does not include publicly insured or uninsured patients. Second, our colonoscopy results do not include alternative forms of colorectal cancer screening, such as FOBT. Finally, our results are limited to the first 7 months of 2020.
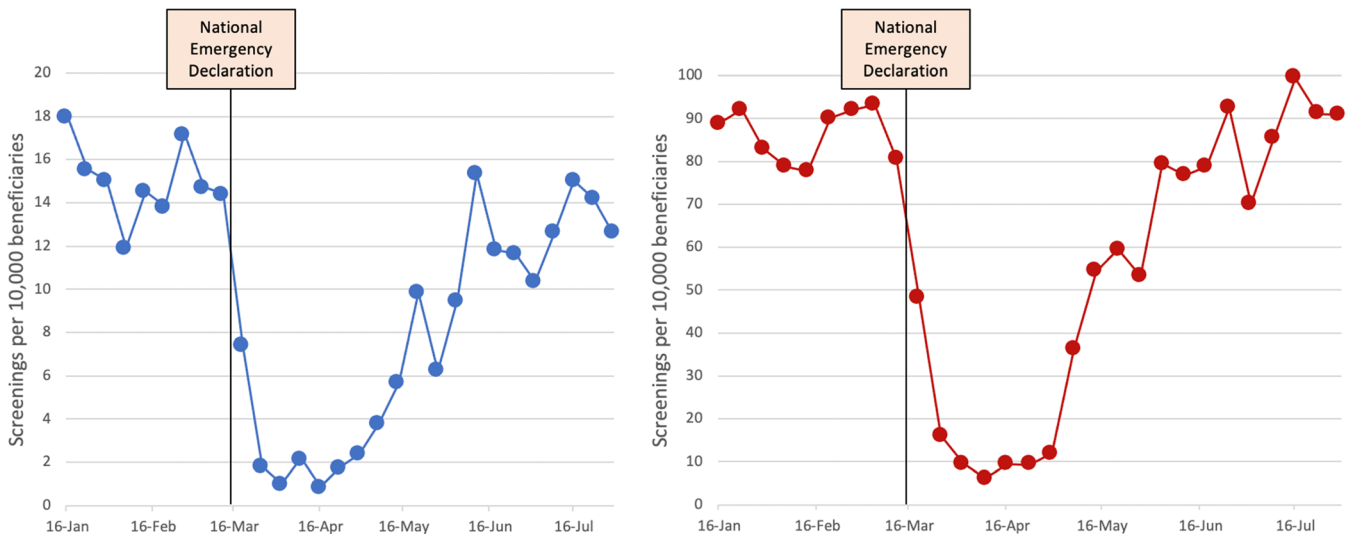

Figure 1 Cancer screening rates during 2020.

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Declarations:

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