

The Effect of Medicare Prevention Benefit Expansion on Cancer Detection and Mortality

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Context

- Breast and colorectal cancers are leading causes of death among older adults, but early detection greatly improves survival
- In 2011, multiple ACA-related policy changes were implemented to encourage utilization of evidence-based preventive care:
 - Cost sharing eliminated for preventive services with A or B rating from the US Preventive Services Task Force
 - Introduction of a new annual check-up, the Annual Wellness Visit (AWV), also with no cost sharing
 - 10% bonus payment to primary care providers (PCPs) serving health care shortage areas

Research Objective

- To estimate the causal effects of the ACA's 2011 Medicare prevention benefit expansion on breast and colorectal cancer detection and mortality using methods that account for patient and provider selection biasing observational estimates of effects

Study Design

Data: Surveillance, Epidemiology, and End Results (SEER) cancer registry data and CDC vital statistics data from 2008-2013

Cancer sites: Focus on cancers sites for which prevention is nearly universally recommended (A and B ratings for Medicare-aged adults): breast and colorectal cancers

Sample: A Medicare-eligible population aged 65-70 years and a near-eligible (i.e., age 59-64) control group who were not affected by the 2011 Medicare benefit expansion

Outcomes: Number of new cancer diagnoses (per 100,000 population), overall and early-stage; cancer-related mortality

Primary predictor: Over age 65 in the post-2011 period

Covariates: Age, sociodemographic factors, and factors related to healthcare access and utilization from HRSA's Area Health Resources Files

Analytic approach:

- Difference-in-differences design with a negative binomial regression to estimate the incremental effect of post-2011 Medicare coverage on new cancer diagnoses and mortality
- Restrict sample to individuals in bandwidth around age 65 (an arbitrary cutoff determining Medicare eligibility) following a regression discontinuity approach; controls are those just below age 65
- Following previous research, initial bandwidth is 6 years
- Population exposure accounting for variable population sizes, and to compute population-standardized rates

Sample is balanced around age cutoff

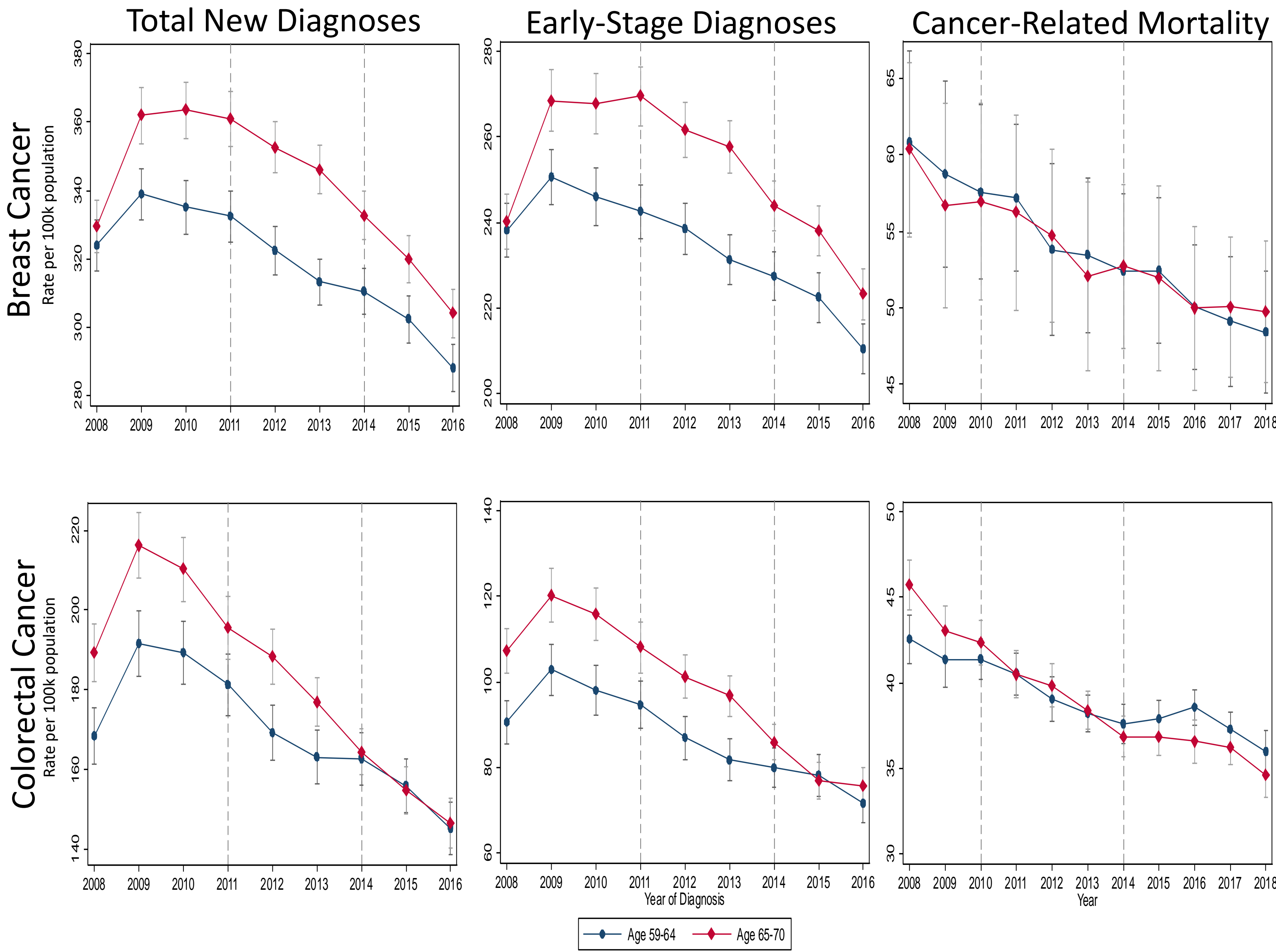
County Characteristics	Age 65-70	Age 59-64
Demographics, mean (sd)		
Rural, %	24.0 (42.7)	23.5 (42.4)
Non-Hispanic white, %	70.3 (20.7)	70.0 (20.6)
Med. household income (1000s)	\$50.7 (14.9)	\$50.8 (15.1)
Less than high school education, %	16.0 (7.0)	16.0 (7.1)
Below poverty level, %	16.9 (6.5)	17.0 (6.7)
Unemployment, %	8.6 (3.2)	8.6 (3.2)
Insurance Characteristics, mean % (sd)		
Uninsured, under age 65	17.6 (4.9)	17.7 (4.9)
Enrolled in Medicare, aged only	13.0 (3.4)	12.8 (3.3)
Medicare Advantage penetration	17.5 (11.0)	17.7 (11.0)
Health Care Supply		
Health Provider Shortage Area (HPSA), primary care, % (sd)		
0 – Not a HPSA	20.8%	21.3%
1 – Whole county	41.4%	41.3%
2 – Part county	37.7%	37.4%
Physicians, per 100k population	284.7 (156.4)	284.2 (158.3)
Hospital beds, per 100k population	3031.1 (2939.3)	3032.1 (3010.1)

Summary of Model Estimates

- The table below summarizes negative binomial regression models using marginal effects to predict the number of cancer diagnoses and deaths (per 100k population)
- Difference-in-differences estimates represent the relative effect of the 2011 Medicare policy changes on Medicare beneficiaries in the post-ACA period

Total Cancer Diagnoses				Early-Stage Cancer Diagnoses				Cancer-Related Mortality			
Breast Cancer	N		22,795	N		22,795	N		66,051		
	Predicted number of events, per 100k			Predicted number of events, per 100k			Predicted number of events, per 100k				
	Age 59-64 * Pre-2011		324.91	Age 59-64 * Pre-2011		238.03	Age 59-64 * Pre-2011		55.67		
	Age 59-64 * Post-2011		312.67	Age 59-64 * Post-2011		227.82	Age 59-64 * Post-2011		56.94		
	Age 65-70 * Pre-2011		346.29	Age 65-70 * Pre-2011		254.71	Age 65-70 * Pre-2011		55.35		
	Age 65-70 * Post-2011		345.30	Age 65-70 * Post-2011		255.59	Age 65-70 * Post-2011		57.15		
	Diff-in-diff		11.25	P=0.002	Diff-in-diff		11.09	P<0.001	Diff-in-diff		0.53
Colorectal Cancer	N		15,253	N		15,253	N		76,669		
	Predicted number of events, per 100k			Predicted number of events, per 100k			Predicted number of events, per 100k				
	Age 59-64 * Pre-2011		180.65	Age 59-64 * Pre-2011		92.66	Age 59-64 * Pre-2011		41.77		
	Age 59-64 * Post-2011		168.01	Age 59-64 * Post-2011		87.33	Age 59-64 * Post-2011		42.54		
	Age 65-70 * Pre-2011		200.33	Age 65-70 * Pre-2011		108.27	Age 65-70 * Pre-2011		41.27		
	Age 65-70 * Post-2011		180.55	Age 65-70 * Post-2011		100.81	Age 65-70 * Post-2011		40.51		
	Diff-in-diff		-7.14	P=0.191	Diff-in-diff		-2.13	P=0.652	Diff-in-diff		-1.53

Adjusted Cancer Diagnoses and Mortality, by age group



All models satisfied the pre-period parallel trends assumption (unadjusted and adjusted)

Principal Findings

- Medicare's prevention benefit expansion was associated with an increase in total breast cancer detection, driven by early-stage cancers. There was no change in late-stage cancers (data not shown) or breast cancer mortality
- There was no change in colorectal cancer detection, total or by stage. There was a small, but significant decrease in colorectal cancer deaths attributable to Medicare's policy changes

Sensitivity Analysis

- Effects were smaller and not statistically significant when the post-period was extended to 2016. This may be due to other policy changes affecting the control group after 2014: Medicaid expansion, waving pre-existing conditions exclusion, and preventive service coverage by private plans
- Given that mortality is likely to be a lagging indicator, the effect on colorectal cancer mortality was larger when the post-period was extended to 2018 (-2.48 deaths per 100k population)
- Results were robust to changing the age bandwidth

Implications

- This study provides causal evidence that Medicare's 2011 policy changes eliminating cost sharing, introducing the AWV, and physician fee bump were associated with an increase in detection of total and early-stage breast cancers among Medicare beneficiaries over and above the known effect of gaining Medicare coverage alone on cancer diagnoses and outcomes in the pre-ACA era
- This study contributes to the body of evidence supporting expanded access to preventive care services as a cancer control strategy
- Policies that increase use of cancer screening services, thereby increasing early-stage detection and ultimately decreasing cancer-related mortality, are potentially of substantial economic and social impact

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