Original Article

The Affordable Care Act Improved Health Insurance Coverage and Cardiovascular-Related Screening Rates for Cancer Survivors Seen in Community Health Centers

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BACKGROUND: This study assessed the impact of Affordable Care Act (ACA) Medicaid expansion on health insurance rates and receipt of cardiovascular-related preventive screenings (body mass index, glycated hemoglobin [HbA1c], low-density lipoproteins, and blood pressure) for cancer survivors seen in community health centers (CHCs). **METHODS:** This study identified cancer survivors aged 19 to 64 years with at least 3 CHC visits in 13 states from the Accelerating Data Value Across a National Community Health Center Network (ADVANCE). Via inverse probability of treatment weighting multilevel multinomial modeling, insurance rates before and after the ACA were estimated by whether a patient lived in a state that expanded Medicaid, and changes between a pre-ACA time period and 2 post-ACA time periods were assessed. **RESULTS:** The weighted estimated sample size included 409 cancer survivors in nonexpansion states and 2650 in expansion states. In expansion states, the proportion of uninsured cancer survivors decreased significantly from 20.3% in 2012-2013 to 4.5%in 2016-2017, and the proportion of those with Medicaid coverage increased significantly from 38.8% to 55.6%. In nonexpansion states, there was a small decrease in uninsurance rates (from 33.6% in 2012-2013 to 22.5% in 2016-2017). Cardiovascular-related preventive screening rates increased over time in both expansion and nonexpansion states: HbA1c rates nearly doubled from the pre-ACA period (2012-2013) to the post-ACA period (2016-2017) in expansion states (from 7.2% to 12.8%) and nonexpansion states (from 9.3% to 16.8%). **CONCLUSIONS:** This study found a substantial decline in uninsured visits among cancer survivors in Medicaid expansion states. Yet, 1 in 5 cancer survivors living in a state that did not expand Medicaid remained uninsured. Several ACA provisions likely worked together to increase cardiovascular-related preventive screening rates for cancer survivors seen in CHCs. ***Cancer* 2020;126:3303-3311**.

KEYWORDS: Affordable Care Act, cancer survivors, community health centers, health insurance.

INTRODUCTION

Cancer survival rates increased over the past 40 years from 49% in 1975-1977 to 68% in 2004-2011.[1] Despite these gains, there are still significant disparities in cancer survival among different subpopulations, which often stem from delayed care and/or a lack of coverage for care.[2,3] Uninsured patients are more likely than insured patients to experience delayed cancer care, whereas health insurance is associated with improved survivor care.[4-7] The 2014 Affordable Care Act (ACA) Medicaid expansions were aimed at reducing such disparities by calling for increased eligibility for all US citizens and legal residents earning ≤138% of the federal poverty level (FPL).[8] After the US Supreme Court ruled that Medicaid expansion was optional for states, some states chose to expand Medicaid eligibility, whereas others did not. Community health centers (CHCs), our nation's health care safety net, provide care for millions of patients with low-income who have been directly affected by these policy changes. Uninsurance rates among CHC patients decreased dramatically after the ACA, particularly in states that expanded Medicaid eligibility.[9] For example, rates of uninsured visits to CHCs decreased 57% from the period before the ACA to the period after the ACA in expansion states, whereas nonexpansion states saw a 20% decrease; however, Medicaid-insured visits increased by 60% in expansion states and remained unchanged in nonexpansion states.[9]

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Information on insurance coverage rates among cancer survivors with low-income after the ACA, however, is limited. One study found that uninsured rates decreased for patients newly diagnosed with cancer after the ACA Medicaid expansion, especially in expansion states.[10] Other studies, which selected patients with specific cancer types, found significant reductions in uninsurance rates in states that expanded Medicaid in comparison with states that did not expand Medicaid.[10-13] These cancer-specific studies used cancer registry databases with cross-sectional insurance information at the time of cancer diagnosis. In another cross-sectional study using health survey data, Davidoff et al[14] found a 38% decrease in the uninsurance rate for cancer survivors. None of these studies assessed changes in health insurance for cancer survivors seen in CHCs before and after the ACA.

In addition, cancer and its treatment have detrimental consequences for long-term health. Cancer survivors have an average of 5 chronic conditions.[15] In comparison with the general population, cancer survivors have increased risk for health conditions.[16-18] These problems include obesity, cardiac damage or heart failure,[19,20] diabetes, and hypertension.[21-24] Recent epidemiological studies have shown that the burden of cardiovascular disease is greater for cancer survivors than the general population.[25-27] Because there is a lack of screening recommendations for assessing cardiovascular dysfunction for cancer survivors,[28] preventive screening is extremely important. Recent studies have observed disparities in the long-term health of underserved cancer survivors[29,30]; therefore, patients seen in CHCs offer a good setting for studying changes in insurance coverage and cardiovascular preventive service receipt with ACA Medicaid expansion eligibility changes.

In this study, we assessed both health insurance coverage rates and the receipt of several recommended cardiovascular-related preventive screenings, including body mass index (BMI), glycated hemoglobin (HbA1c), low-density lipoproteins (LDLs), and blood pressure (BP).[31] We hypothesized that cancer survivors seen in expansion states would experience a greater increase in Medicaid coverage after the ACA than survivors in nonexpansion states. Because health insurance is associated with receipt of preventive screenings,[32] we also hypothesized that cardiovascular-related screening rates would increase from the period before the ACA to the period after the ACA, with expansion states having greater changes than nonexpansion states.

MATERIALS AND METHODS

Data Source

We used the Accelerating Data Value Across a National Community Health Center Network (ADVANCE) Clinical Data Research Network.[33] This network includes all electronic health record (EHR) data from 311 CHCs from OCHIN (not an acronym) and the Health Choice Network, which are harmonized with the PCORNet common data model, and contains states that either expanded Medicaid or did not expand Medicaid after the ACA.

Study Population

We identified cancer survivors through their medical histories, encounter diagnoses, and problem-list records up until the date of their last visit in the pre-ACA period.[34] We included survivors aged 19 to 64 years throughout the entire study period. We focused on this age group because individuals in this age range were most likely to gain coverage through ACA health insurance expansions. Public health insurance coverage has (and has had) more generous eligibility for children under the Children's Health Insurance Program, and most patients 65 years old or older are likely eligible for Medicare.

This was an observational cohort study of cancer survivors from 2012 to 2017 with at least 1 visit to a CHC during each 2-year period (at least 3 visits over 6 years total): before the ACA (2012-2013), immediately after the ACA (2014-2015), and follow-up after the ACA (2016-2017). To be included, CHCs also had to be live on their EHR system by January 1, 2012. We included patients who lived in 4 nonexpansion states (Florida, Kansas, Missouri, and North Carolina) and 9 expansion states (California, Hawaii, Maryland, New Mexico, Ohio, Oregon, Rhode Island, Washington, and Wisconsin). We included Wisconsin as an expansion state because it opened Medicaid to adults earning up to 100% of the FPL (near the threshold of ≤138% of the FPL).[9,35] We included women who were not pregnant because pregnant women have different public health insurance options and preventive screening needs. The final study sample included 3769 cancer survivors accessing care across 311 CHCs (inclusion diagrams are shown in Supporting Fig. 1 [CHCs] and Supporting Fig. 2 [cancer survivors]).

Primary Outcomes

For all cancer survivors, we estimated primary outcomes at three 2-year time periods: before the ACA, immediately after the ACA, and follow-up after the ACA. This resulted in 3 observations per patient for each outcome.

Our first primary outcome was a 4-level categorical variable of health insurance type at ambulatory visits during each 2-year time period (uninsured only; insured and uninsured; insured, Medicaid only; and insured, some private). The categories were defined at the 3 time periods listed previously as follows:

- Uninsured only: All visits in that time period were uninsured.
- Insured and uninsured: Some visits in that time period were insured, and some were uninsured. We used this category because previous research has shown that gaps in coverage are associated with difficulty in accessing health care.[36]
- Insured, Medicaid only: Visits were covered by Medicaid insurance only during that time period. Those with both Medicaid and Medicare coverage were excluded.
- Insured, some private: There was at least some private coverage for visits during that time period.

Our second set of outcomes were specific cardiovascular-related preventive screening rates (number of specific screenings divided by number of ambulatory visits) during each 2-year time period. We estimated rates (whether or not the patient was screened) for the following cardiovascular-related screenings during each time period: BMI, HbA1c, LDLs, and BP.

Independent Variables

The primary independent variable for all models included a set of indicators denoting the study time period (the pre-ACA reference period [2012-2013], the period immediately after the ACA [2014-2015], or the follow-up period after the ACA [2016-2017]), a binary indicator denoting whether a patient lived in an expansion state or a nonexpansion state, and the interaction between the study time period and the expansion status.

Covariates

To describe patients living in expansion and nonexpansion states and to control for potential differences between expansion groups, we considered the following EHR-derived pre-ACA period (baseline) covariates in our analyses: patient's sex, race/ethnicity, age (as of January 1, 2014), comorbidity as assessed by the enhanced Charlson Comorbidity Index (0-2, 3-4, or ≥5),[37] years before 2012 with a cancer diagnosis, status (new or established) at the first visit, mean number of visits in the pre-ACA period, FPL percentage (as of January 1, 2014), and zip code–level unemployment percentile. Because CHCs are required to collect and report many of these individual-level demographic variables to the US Health Resources and Services Administration to receive funding, the amount of missingness for these variables was relatively low. When data were missing, we assigned them a separate category in our analyses. In our analyses, we did not control for cancer type because the varying number of cancer types with low prevalences would not yield stable models. However, we do provide descriptive statistics of cancer type frequencies and relative frequencies by expansion status.

Statistical Analysis

Propensity score weighting

To control for important differences in pre-ACA (baseline) patient-level characteristics between the expansion groups, we used inverse probability of treatment weighting (IPTW). We implemented a generalized boosted model that included all of the covariates listed previously. Average treatment effect propensity weights were specified with the toolkit for weighting and analysis of nonequivalent groups (*twang*) package in R (version 3.4.0). We calculated standardized mean differences between expansion status groups before and after weighting to assess propensity score performance; standardized differences <0.10 indicated good balance.[38] We also estimated the effective sample size, which was the approximate number of observations under simple random sampling that would produce a variation equivalent to that of the IPTW sample.

Difference-in-differences approach

Using a difference-in-differences (DD) approach, we constructed an IPTW multinomial mixed-effects regression model to compare insurance types in the period preceding Medicaid expansion (2012-2013) and the 2 periods after Medicaid expansion (2014-2015 and 2016-2017) by expansion status. This model included fixed effects for period, expansion status, their interaction, and all covariates described previously. We estimated parameter coefficients and their associated standard errors by using generalized structural equation modeling (GSEM) via the *gsem* command in Stata 15.1 and incorporated patient random effects to account for repeated observations within a patient over time. We then used the estimated regression coefficients to obtain adjusted predicted probabilities of each insurance category and report those over time for each expansion group.

For cardiovascular-related screening outcomes, we also used a DD approach. To estimate changes in

TABLE 1. Frequencies and Percentages of the Top 15 Cancer Types Among Cancer Survivors in Expansion and Nonexpansion States: Unweighted Study Sample (n = 3769)

Cancer Type	Nonexpansion (n = 861), No. (%)	Expansion (n = 2908), No. (%)
Breast	184 (21.4)	497 (17.1)
Cervix (uterine)	33 (3.8)	324 (11.1)
Colorectal	51 (5.9)	151 (5.2)
Melanoma	25 (2.9)	159 (5.5)
Thyroid	49 (5.7)	154 (5.3)
Non-Hodgkin lymphoma	40 (4.6)	79 (2.7)
Prostate	35 (4.1)	78 (2.7)
Kidney and renal pelvis	27 (3.1)	66 (2.3)
Ovary	17 (2.0)	63 (2.2)
Hodgkin lymphoma	11 (1.3)	55 (1.9)
Oral cavity and pharynx	20 (2.3)	42 (1.4)
Testis	7 (0.8)	52 (1.8)
Leukemia	12 (1.4)	42 (1.4)
Endometrium	3 (0.3)	42 (1.4)
Lung and bronchus	14 (1.6)	28 (1.0)
Other	333 (38.7)	1076 (37.0)

Survivors were included if the medical history, encounter diagnosis, or problem list indicated a malignant cancer diagnosis (excluding nonmelanoma skin cancer). Cancer diagnoses were grouped into primary sites according to classifications from the US Surveillance, Epidemiology, and End Results program.

screening rates by expansion status, we used IPTW linear mixed-effects modeling separately for each preventive screening (BMI, HbA1c, LDLs, and BP). Fixed and random effects followed specifications similar to the models for insurance type. We implemented the models by using the *meglm* command in Stata 15.1 and report adjusted predicted rates of screening over time for each expansion group.

All statistical testing was 2-sided with a type I error set to 5%. The study was approved by the Oregon Health & Science University institutional review board.

RESULTS

Cancer Type

In our unweighted sample (Table 1), the most common type of cancer for this population was breast cancer (21% in nonexpansion states and 17% in expansion states). Several cancer types, including cervical cancer (4% in nonexpansion states and 11% in expansion states), melanoma (3% in nonexpansion states and 6% in expansion states), and non-Hodgkin lymphoma (5% in nonexpansion states and 3% in expansion states), differed by expansion status.

Study Population and Covariate Balance

Our unweighted sample included 861 cancer survivors in nonexpansion states and 2908 cancer survivors in expansion states (Table 2). Before weighting, expansion and nonexpansion states differed significantly in race/ethnicity, pre-2012 years with cancer, new patient status at first visit, race/ethnicity, and FPL.

The weighted estimated effective sample size was 409 cancer survivors in nonexpansion states and 2650 cancer survivors in expansion states. After weighting, expansion groups showed a similar distribution of demographic characteristics (all standardized mean differences <0.10). The weighted sample was 71% female and 59% non-Hispanic white, nearly 30% had 5 or more chronic conditions (28% in nonexpansion states and 31% in expansion states) and 10 or more ambulatory visits (29% in nonexpansion states and 31% in expansion states), and the majority had incomes ≤ 138% (69% in nonexpansion states and 68% in expansion states).

Health Insurance Type

Unweighted estimates of health insurance type over time by expansion status are reported in Supporting Table 1. Unweighted estimates were similar to weighted estimates; therefore, we report weighted analyses only.

In weighted analyses (Fig. 1 and Supporting Table 2), we observed that pre-ACA, 33.6% of cancer survivors in nonexpansion states and 20.3% in expansion states did not have health insurance. In expansion states, we observed a significant decrease in uninsured cancer survivors after Medicaid expansion (Fig. 1): The percentage of cancer survivors who were uninsured pre-ACA decreased to 6.2% immediately after ACA Medicaid expansion (DD for expansion vs nonexpansion, −0.85%; 95% CI, −5.6% to 3.9%) and remained low in the follow-up post-ACA time period (2016-2017) at 4.6% (DD for expansion vs nonexpansion, −4.5%; 95% CI, −9.5% to 0.6%). For cancer survivors in nonexpansion states, the percentage of uninsured cancer survivors before the ACA was higher in comparison with expansion states, and they also experienced a significant decrease in uninsurance rates after ACA Medicaid expansion (a −13.3% decrease). However, from 2016 to 2017, patients in nonexpansion states saw a change in this trend (a 2.2% increase), which resulted in 22.5% of cancer survivors being uninsured at all of their visits in 2016-2017.

The decrease in uninsured cancer survivors in expansion states paralleled an increase in survivors with Medicaid coverage. From pre-ACA to immediately after the ACA, cancer survivors with Medicaid coverage in expansion states increased 15.2%; in contrast, there was a 3.2% decrease in the percentage of cancer survivors with Medicaid coverage in nonexpansion states (DD, 19.1%; 95% CI, 13.1%-25.0%).

TABLE 2. Unweighted and Inverse Probability of Treatment–Weighted Characteristics of Cancer Survivors in Medicaid Expansion and Nonexpansion States

	Unweighted			Weighted		
Characteristic	Nonexpansion (n = 861)	Expansion (n = 2908)	SMD	Nonexpansion (ESS = 409)	Expansion (ESS = 2650)	SMD
Female, %	72.4	71.6	−0.016	71.2	71.3	0.002
Age group as of 1/1/2014, %						
20-26 y	2.1	1.9	−0.015	2.1	1.9	−0.013
27-39 y	10.7	12.7	0.059	10.5	12.1	0.051
40-52 y	38.7	39.4	0.016	39.6	39.4	−0.004
53-60 y	48.5	46.0	−0.051	47.8	46.5	−0.026
Race/ethnicity, %						
Non-Hispanic white	39.0	64.3	0.528	58.6	59.0	0.008
Non-Hispanic black	24.4	7.3	−0.655	12.4	10.9	−0.047
Non-Hispanic other	1.4	4.0	0.133	2.0	3.5	0.080
Hispanic	31.7	21.7	−0.242	24.0	23.8	−0.005
Unknown	3.5	2.6	−0.052	3.0	2.8	−0.009
Charlson Comorbidity Index, %						
0-2	37.2	42.3	0.104	43.4	41.4	−0.040
3-4	29.2	27.2	−0.044	27.8	27.5	−0.007
≥5	33.7	30.5	−0.069	28.8	31.1	0.049
Pre-2012 years with cancer, %						
0 (diagnosed in 2012-2013)	64.6	40.6	−0.489	48.7	45.8	−0.057
1-4	33.3	46.3	0.260	43.5	43.4	−0.003
≥5	2.1	13.1	0.326	7.8	10.8	0.096
New patient at first visit, %	22.3	13.5	−0.258	15.0	15.1	0.003
Pre-ACA period ambulatory visits, %						
1-4	37.3	33.6	−0.079	33.5	34.1	0.012
5-9	39.3	33.6	−0.121	37.4	34.9	−0.051
≥10	23.5	32.9	0.200	29.1	31.0	0.041
FPL % as of 12/31/2013, %						
≤138%	72.1	66.6	−0.116	69.2	68.2	−0.021
>138%	16.8	16.1	−0.019	14.7	16.0	0.035
Unknown	11.0	17.2	0.164	16.1	15.8	−0.008
ZCTA-level unemployment, %						
0.00%-9.75%	17.0	25.9	0.203	23.1	24.0	0.020
9.76%-11.78%	21.8	30.7	0.193	28.1	28.9	0.017
11.79%-15.06%	20.3	25.0	0.109	23.4	23.9	0.012
15.07%-100.00%	40.8	14.9	−0.725	23.3	20.5	−0.070
Unknown	0.1	3.4	0.182	2.1	2.8	0.041

Abbreviations: ESS, effective sample size; FPL, federal poverty level; SMD, standardized mean difference; ZCTA, zip code tabulation area.
We generated inverse probability of treatment weights with a generalized boosted model that included the covariates listed above. We calculated SMDs between expansion status groups before and after weighting to assess propensity score performance; standardized differences <0.10 indicate good balance.

For nonexpansion states, the reduction in uninsurance rates mirrored increases in rates of private insurance coverage. Specifically, the percentage of cancer survivors with some private insurance from the pre-ACA period to the follow-up post-ACA period (2016-2017) increased 11.4% in nonexpansion states, whereas in expansion states, the increase was 2.7% (DD, −12.2%; 95% CI, −17.3% to −7.0%).

Screenings for Cardiovascular Health

Screenings for BP and BMI were relatively high (>85%) and similar in both expansion and nonexpansion states, whereas HbA1c and LDL screening rates were much lower (<25%) than BP and BMI rates before the ACA.

For both BP and BMI screenings, we observed significant differences between cancer survivors in expansion and nonexpansion states when we compared trends over time. Specifically, screening rates among patients from expansion states increased 0.4% from the pre-ACA period to the period immediately after the ACA for BP, whereas the rates among nonexpansion patients decreased 1.8% (DD, 2.3%; 95% CI, 0.7%-3.8%). This difference widened in 2016-2017: Cancer survivors in expansion states had higher rates of BP screenings than those in nonexpansion states (DD from pre-ACA period to 2016-2017 follow up post-ACA period, 5.5%; 95% CI, 3.4%-7.6%). We observed a similar trend in BMI screening rates (DD from pre-ACA period to immediate post-ACA period, 4.5%; 95% CI, 2.5%-6.5%; DD from pre-ACA period to 2016-2017 follow up post-ACA period, 8.2%; 95% CI, 6.0%-10.5%; Table 3).

LDL and HbA1c screenings significantly increased in both expansion and nonexpansion states over the 2

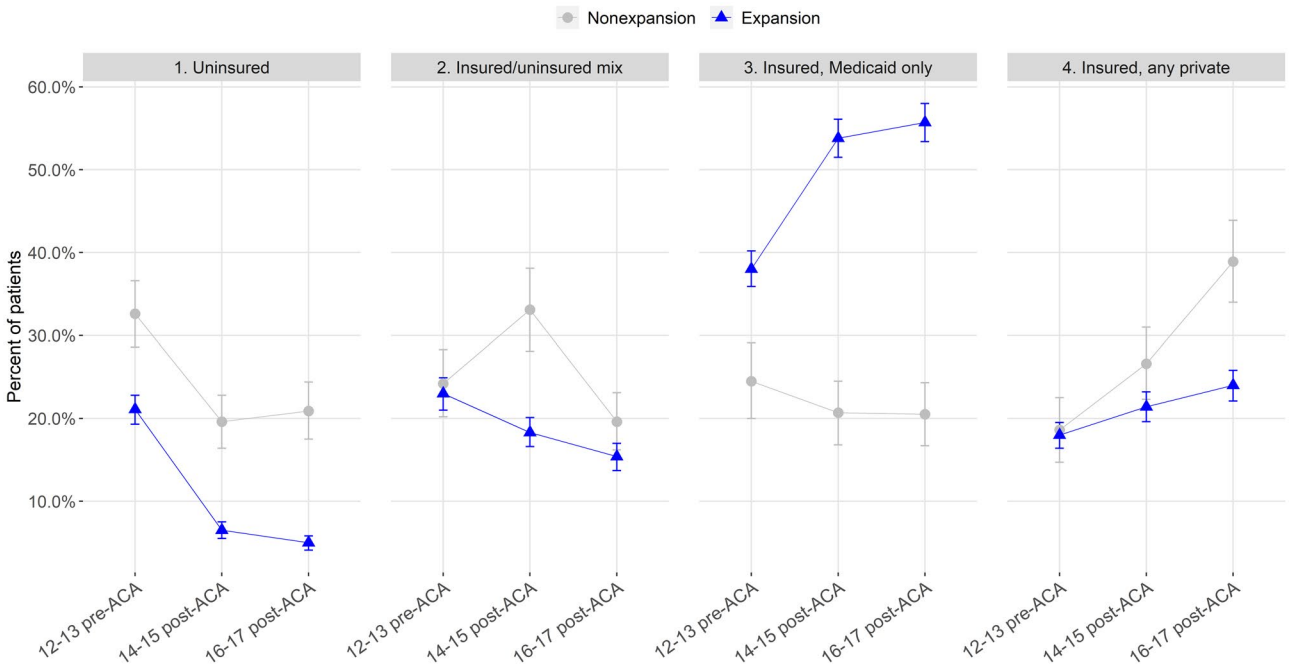

Figure 1. Adjusted likelihood of being uninsured, insured/uninsured, insured with Medicaid, or insured with some private insurance during each 2-year period (2012-2013, 2014-2015, and 2016-2017) by expansion status. We estimated parameter coefficients and their associated standard errors by using generalized structural equation modeling and incorporating patient random effects to account for repeated observations within a patient over time; we then used the estimated regression coefficients to obtain adjusted predicted probabilities of each insurance category and report those over time for each expansion group. ACA indicates Affordable Care Act Medicaid expansion.

TABLE 3. Adjusted Estimates of Cardiovascular-Related Preventive Screening Rates (Number of Specific Screenings Divided by Number of Ambulatory Visits) During Each 2-Year Time Period by Expansion Status

	Nonexpansion, % (95% CI)			Expansion, % (95% CI)			Expansion vs Nonexpansion (2016-2017 vs 2012-2013): Difference in Differences, % (95% CI)
	2012-2013	2014-2015	2016-2017	2012-2013	2014-2015	2016-2017	
BP	92.5 (91.4 to 93.7)	90.7 (89.5 to 91.8)	87.2 (85.7 to 88.8)	92.0 (91.4 to 92.5)	92.4 (91.8 to 92.9)	92.2 (91.6 to 92.8)	5.5 (3.4 to 7.6)
BMI	90.0 (88.6 to 91.4)	89.3 (88.0 to 90.6)	86.4 (84.8 to 87.9)	84.5 (83.6 to 85.4)	88.2 (87.5 to 89.0)	89.1 (88.4 to 89.9)	8.2 (6.0 to 10.5)
LDLs	22.2 (20.4 to 24.0)	24.1 (22.1 to 26.1)	27.2 (24.6 to 29.8)	13.8 (13.0 to 14.6)	15.8 (14.9 to 16.6)	16.2 (15.2 to 17.1)	−2.7 (−5.8 to 0.4)
HbA1c	9.3 (7.8 to 10.8)	13.2 (11.6 to 14.9)	16.8 (14.7 to 19.0)	7.2 (6.6 to 7.8)	9.9 (9.1 to 10.6)	12.8 (12.0 to 13.7)	−2.0 (−4.8 to 0.9)

Abbreviations: BMI, body mass index; BP, blood pressure; HbA1c, glycated hemoglobin; LDL, low-density lipoprotein; ZCTA, zip code tabulation area.
The models were adjusted for sex, age group, race and ethnicity, comorbidity level, years with a cancer diagnosis, patient status at the first visit, pre-ACA period ambulatory visits, pre-ACA period federal poverty level, and ZCTA-level unemployment percentage. For a full list of within-group and between-group differences, see Supporting Table 3.

post-ACA follow-up periods with no apparent differential change in trends over time between expansion groups (ie, DD estimates suggested that rate increases over time were similar among expansion and nonexpansion cancer survivors).

DISCUSSION

After ACA Medicaid expansions were implemented, uninsurance rates fell substantially among cancer survivors with regular CHC visits who were living in expansion states; this was coupled with a large increase in the proportion who were insured by Medicaid after the ACA. In nonexpansion states, by contrast, we saw only a small decline in uninsured rates along with a slight increase in privately insured cancer survivors, which was not statistically significant. These findings follow previous studies of the overall CHC population[9,35] and patients with diabetes,[39,40] which showed reductions in uninsured rates and

surges in Medicaid-insured rates among CHC patients in states that chose to expand Medicaid eligibility and little change in nonexpansion states. These results suggest that a higher percentage of cancer survivors in states that chose to expand Medicaid gained the health insurance coverage that they needed in comparison with those living in states that chose not to expand. In fact, 1 in 5 CHC cancer survivors in nonexpansion states remained uninsured throughout the study. Because cancer survivors have a 3.5% to 36.9% increased risk for a secondary cancer diagnosis[15] and access to cancer treatment, such as chemotherapy, may be based on coverage,[41] it is critical for cancer survivors to maintain stable health insurance coverage. Therefore, states that expanded Medicaid may see greater reductions in health and health care disparities among cancer survivors in comparison with states that did not expand because coverage facilitates timely access to health care services needed by these populations. More research is needed to uncover changes to health and health care disparities for cancer survivors after the ACA.

Because health insurance coverage is also important for receipt of preventive care, we assessed cardiovascular-related health screenings (BP, BMI, LDL, and HbA1c screenings). BP and BMI screening rates were on target with Healthy People 2020 goals[42] in the pre-ACA time period, and this highlights the great work of CHCs and provides a starting point that is difficult to improve upon. BP screening rates among cancer survivors were similar to the 90% BP screening rates among all CHC patients.[43] That said, there are still visits at which patients are not screened for BP and/or BMI; therefore, these rates can be improved.

LDL and HbA1c screening rates among cancer survivors in this study were low in both expansion and nonexpansion states before the ACA, and there was only a small increase seen over time in the cancer survivor population, which did not differ much according to the expansion status. The lack of difference seen between expansion and nonexpansion states may be related to several factors. First, 1 provision of the ACA required all payers to fully cover preventive services without cost sharing. This provision likely reduced barriers associated with receipt of screening, especially for those with private health insurance. There was also mounting evidence over the study period that showed how cancer survivors are at increased risk for cardiovascular disease because of cancer treatment[44,45]; this evidence likely persuaded some patients and providers to prioritize these screenings. Lastly, efforts among CHCs to engage in quality improvement programs and/or to receive pay-for-performance incentives may have contributed to increased screenings. It was surprising to not see greater gains in these screenings among cancer survivors in expansion states in light of the recent findings of a similar study that showed a significant increase in LDL and HbA1c screenings among CHC patients with diabetes in expansion states.[39] Thus, despite some modest gains in LDL and HbA1c screening among cancer survivors, future research is needed to understand the multilevel barriers associated with persistently low screening rates in this patient population.

Limitations

Our cohort included cancer survivors from 9 expansion states and 4 nonexpansion states, which may not be representative of all states or all CHCs. In addition, we may have missed cancer survivors in our cohort because CHCs may not have access to their patients' cancer histories or treatment information. For example, we previously found that only 3% of patients seen in CHCs had a history of cancer recorded in the EHR; this seems low in comparison with national estimates.[34] In addition, we did not distinguish between preventing and monitoring existing comorbid disease, which could lead to more frequent screenings. We did, however, adjust for the Charlson Comorbidity Index score, which considers diseases such as diabetes and heart disease.[37] There may be differential dropout of patients from expansion states in comparison with nonexpansion states leading to bias. The study inclusion criteria allow the statistical inference of our study findings to relate to those seen in CHCs over time: This was balanced in both groups, and thus we believe that the study findings do not suffer from a dropout bias because they relate to patients who regularly seek primary care. Lastly, we weighted our sample and adjusted for covariates, yet it is possible that we did not account for specific city- or state-level covariates; thus, biases could remain. The effect estimates obtained from IPTW analyses may be generalizable only to populations similar to the weighted sample.

Overall, this study suggests that the ACA Medicaid expansion provided additional coverage options for cancer survivors regularly seen in CHCs, especially in states that expanded Medicaid. Unfortunately, 1 in 5 cancer survivors living in a state that did not expand Medicaid coverage eligibility remained uninsured. The ACA Medicaid expansion provision change, likely in tandem with the private insurance marketplace, no-cost preventive screening, and the individual mandate, also contributed to modest improvements in rates of cardiovascular-related screenings for cancer survivors.

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CONFLICT OF INTEREST DISCLOSURES

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AUTHOR CONTRIBUTIONS

Heather E. Angier: Conceptualization, supervision, and writing–original draft. **Miguel Marino:** Conceptualization, supervision, methodology, visualization, and writing–review and editing. **Rachel J. Springer:** Formal analysis, visualization, and writing–review and editing. **Teresa D. Schmidt:** Data curation and writing–review and editing. **Nathalie Huguet:** Conceptualization, supervision, and writing–review and editing. **Jennifer E. DeVoe:** Funding acquisition, conceptualization, supervision, and writing–review and editing.

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