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Impact of the Affordable Care Act (ACA) Medicaid Expansion on Cancer Admissions and Surgeries

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Abstract

Objective: This study aims to evaluate the trends in cancer (CA) admissions and surgeries after the Affordable Care Act (ACA) Medicaid expansion.

Methods: This is a retrospective study using HCUP-SID analyzing inpatient CA (pancreas, esophagus, lung, bladder, breast, colorectal, prostate, and gastric) admissions and surgeries pre- (2010–2013) and post- (2014) Medicaid expansion. Surgery was defined as observed resection rate per 100 cancer admissions. Nonexpansion (FL) and expansion states (IA, MD, and NY) were compared. A generalized linear model with a Poisson distribution and logistic regression was used with incidence rate ratios (IRR) and difference-indifferences (DID).

Results: There were 317, 858 patients in our sample which included those with private insurance, Medicaid, or no insurance. Pancreas, breast, colorectal, prostate, and gastric CA admissions significantly increased in expansion states but decreased in nonexpansion states. (IRR 1.12, 1.14, 1.11, 1.34, 1.23; $P < .05$) Lung and colorectal CA surgeries (IRR 1.30, 1.25; $P < .05$) increased, while breast CA surgeries (IRR 1.25; $P < .05$) decreased less in expansion states. Government subsidized, or self-pay patients had greater odds of undergoing lung, bladder, and colorectal CA surgery (OR 0.45 vs 0.33;0.60 vs 0.48; 0.47 vs 0.39; $P < .05$) in expansion states after reform.

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Conclusions: In states that expanded Medicaid coverage under the ACA, the rate of surgeries for colorectal and lung CA increased significantly, while breast CA surgeries decreased less. Parenthetically, these cancers are subject to population screening programs. We conclude that expanding insurance coverage results in enhanced access to cancer surgery.

Keywords

Affordable Care Act Medicaid expansion; healthcare disparities; public health policy; racial disparities; surgical oncology

The Affordable Care Act (ACA) was signed into law in 2010 by President Barak Obama. Medicaid expansion was subsequently implemented in 2014 and increased the eligibility criteria for all adults with an income level up to 138% of the federal poverty threshold. Since its inception, it has been well established in the literature that the ACA Medicaid expansion has increased insurance coverage and access to care in those states that expanded Medicaid compared to those that did not.[1] As a result, this has led to coverage of millions of low-income adults across the country in addition to increased access to care to primary care and prescription medications.[1] Furthermore, studies have revealed that uninsured people who gain access to insurance have an increase in a usual source of care, reduction in out of pocket spending, and increase in preventative healthcare.[2–4]

We understand the impact of improved access to care in other areas, however little remains known about the effect of the ACA Medicaid expansion on surgical oncology patients. This study aims to evaluate the trends in cancer admissions and surgeries after ACA Medicaid expansion. We hypothesize that states which expanded Medicaid had an increase in cancer-related hospital admissions and surgeries.

METHODS

Study Design

This was a retrospective cohort study between the years 2010 and 2014. We used a quasi-experimental, difference in difference (DID) design to compare surgical outcomes in Medicaid Expansion (2014) versus nonexpansion states (2010–2013). This study was deemed exempt from institutional review board approval by the Loyola University Chicago because deidentified, publicly available data were used.

Data Source

Patients were identified using the Healthcare Cost and Utilization Project (HCUP), State Inpatient Database (SID) for the following states, Iowa, New York, Maryland, and Florida. The HCUP is an administrative data set composed of a family of healthcare databases developed through a Federal-State-Industry partnership sponsored by the Agency for Healthcare Research and Quality (AHRQ). Each SID captures all inpatient discharges stays at non-federal facilities for the respective state, regardless of primary payer. Encounters in the SID are obtained from participating state-level data organizations and based on data abstracted from inpatient discharge records. Our Medicaid expansion states were Iowa, Maryland, and New York. Due to data limitations, the only nonexpansion state included in

our analysis was Florida. The expansion and nonexpansion states were identified from the previously published literature and the data available from the HCUP SID before and after implementation of the ACA Medicaid expansion.[5]

Study Population

The analysis cohort included patients with the following inclusion criteria: (1) adult patients between the ages of 18 and 64 years; (2) patients discharged from hospitals in expansion and nonexpansion states included in the SID between 2010 and 2014; and (3) received oncologic surgical procedures for pancreatic, esophageal, lung, bladder, breast, colorectal, prostate, and gastric cancer. Cancer-related diagnosis and procedures were identified based on International Classification of Diseases, Ninth Revision (ICD-9) codes (Supplemental Table 1, http://links.lww.com/SLA/B460). Cancer admissions were identified by finding patients with a respective cancer diagnosis ICD-9 code at the time of their discharge. The surgical cohort was found by identifying patients with a respective cancer diagnosis and surgical procedure ICD-9 code during their admission. These procedures were chosen given their broad inclusion of cancers and propensity to surgical intervention. Patients older than 64 years of age or on Medicare were excluded because they were not eligible for the ACA's Medicaid expansion. US Census data was used to account for population growth during the study period and levels of insurance status.[6]

Statistical Analysis

The primary outcome of interest was defined as the rate of surgical resection and admissions pre- and post-ACA Medicaid expansion. Our secondary outcomes were to analyze the rates of Medicaid admissions, comparison of Medicaid versus private insured patients, and analyze the effects of Medicaid expansion by race. A DID analysis was used to estimate the effects of the ACA expansion on cancer surgery rates, cancer admission rates, and the odds of resection for cancer patients on Medicaid or self-pay compared with those with private insurance.

For the analysis, we first calculated surgery and admission rates in the expansion (IA, MD, and NY) and nonexpansion states (FL), before (2010–2013) and after (2014) the expansion, and then calculated the difference between the change in expansion states and change in the nonexpansion state. The models also included state indicators as fixed effects to account for differences across expansion states.

To test the significance of the impact of ACA expansion, we employed generalized linear regression models with a Poisson distribution and log link. These models used yearly counts of cancer resections or admissions in each state as outcomes, and the log of the corresponding number of admissions as offset, thereby converting the counts to rates. The exponentiated regression coefficient of the interaction term yielded an estimate of incidence rate ratio.

Next, a logistic regression model was fitted to the data with the following predictors: treatment, time and Medicaid or self-pay patients' indicator in addition to their 2-way and 3-way interactions. The analysis was adjusted for patient's age, gender, race, Charlson Comorbidity Index, and state fixed effects. The model produced estimates of Medicaid or

self-pay patients to private insurance odds ratios in expansion and nonexpansion states, in pre- and postexpansion periods.

RESULTS

In the analysis cohort, there were a total of 317,858 surgical oncology patients (Table 1). A total of 157,533 patients resided in the states that expanded preexpansion. A higher proportion of these patients were on Medicaid compared with the patients in the non-expansion states (67.8% vs 59.1%), and a lower proportion was privately insured compared with those in nonexpansion states (28.4% vs 31.6%). In nonexpansion states, there was a higher proportion of Hispanics and whites (15.1% vs 7.5%; 63.8% vs 60.9%) compared with expansion states.

In the examination of admissions pre and post-ACA Medicaid expansion for patients with various cancers, there was a 12% increase in the rate of admission for Medicaid patients with pancreatic cancer in expansion states compared with nonexpansion states (IRR 1.12; P <.05) (Table 2). There was a 14% increase in Medicaid patients with breast cancer in expansion states compared with nonexpansion states (IRR 1.14; P <.001) as well as an 11% increase in colorectal cancer patients compared with nonexpansion states (IRR 1.11; P <. 001). Lastly, there was a 34% increase in prostate cancer (IRR 1.34; P <.001) and 23% in gastric cancer (IRR 1.23; P <.001) Medicaid patient admissions in states that expanded insurance coverage compared to those that did not expand.

Next, we analyzed surgical trends in patients who underwent various surgical procedures (Table 3). In patients with lung cancer, there was a 30% increased rate of resection for Medicaid patients (IRR 1.30; P <.01) in expansion states compared to nonexpansion states. In patients with breast cancer, there was a decrease in inpatient surgical procedure in both expansion and nonexpansion states but less so in states that expanded Medicaid. Hence, there was a 25% increased rate of resection for those with Medicaid in expansion states compared to nonexpansion states (IRR 1.25; P <.02). Lastly, in states that expanded Medicaid, there was a 25% increase in colorectal surgeries (IRR 1.25; P <.01) compared to nonexpansion states.

We evaluated the odds risk of Medicaid patients undergoing surgery compared to those with private insurance after the ACA Medicaid expansion. Before the ACA Medicaid expansion, Medicaid patients with lung cancer had lower odds of undergoing surgery compared to privately insured patients in nonexpansion (OR 0.34; P <.05) and expansion states (OR 0.44; P <.05). After Medicaid expansion, a lower odds remained for Medicaid lung cancer patients but the gap diminished in expansion states (OR 0.45; P <.05) and increased in nonexpansion states (OR 0.33; P <.05). Before the ACA Medicaid expansion, Medicaid patients with bladder cancer had lower odds of undergoing surgery compared to privately insured patients in nonexpansion (OR 0.61; P <.05) and expansions states (OR 0.46; P <.05). After Medicaid expansion those disparities remained for Medicaid bladder cancer patients, but the gap diminished in expansion states (OR 0.48; P <.05) and increased in nonexpansion states (OR 0.60; P <.05). Lastly, Medicaid colorectal cancer patients had lower odds of undergoing surgery before Medicaid expansion compared to privately insured patients in nonexpansion

(OR 0.45; P <.05) and expansion states (OR 0.42; P <.05). After Medicaid expansion a lower odds remained for Medicaid colorectal cancer patients, but the gap diminished in expansion states (OR 0.47; P <.05) and increased in nonexpansion states (OR 0.39; P <.05) (Table 4 and Supplemental Figure 1, http://links.lww.com/SLA/B460).

Lastly, we evaluated the impact of the ACA insurance expansion on the odds of Medicaid patients by racial minority groups undergoing surgery relative to privately insured patients. Before the ACA Medicaid expansion, Medicaid patients with colon cancer had lower odds of undergoing surgery compared to privately insured patients in expansion states (OR 0.45; 95% CI 0.40–0.50) and nonexpansion states (OR 0.45; 95% CI 0.40–0.52). After Medicaid expansion, the insurance coverage gap remained but decreased for black Medicaid colon cancer patients in expansion states (OR 0.48; 95% CI 0.39–0.59) and increased in nonexpansion states (OR 0.42; 95% CI 0.32–0.54). Likewise, before the ACA Medicaid expansion, Medicaid patients with prostate cancer had lower odds or undergoing surgery compared to privately insured patients in expansion states for blacks (OR 0.27; 95% CI 0.24–0.31) and Hispanics (OR 0.29; 95% CI 0.23–0.36). After Medicaid expansion, in expansion states the odds of black Medicaid patients with prostate cancer undergoing surgery increased (OR 0.28; 95% CI 0.21–0.37) as well as for Hispanics (OR 0.33; 95% CI 0.21–0.53) whereas in nonexpansion states there was a decrease. (Supplemental Table 2, http://links.lww.com/SLA/B460).

DISCUSSION

This study aimed to evaluate the rates in cancer admissions and surgeries after ACA Medicaid expansion. We assessed the effect of Medicaid expansion in states that expanded Medicaid under the ACA in patients with pancreatic, esophageal, lung, bladder, breast, colorectal, prostate, and gastric cancers. We found there was an increase in the number of patients who had access to surgery, an increase in admission rates, and a decrease in odds risk for undergoing cancer resection surgery in Medicaid patient compared to privately insured patients after the ACA Medicaid expansion. Ultimately, these gains in access to cancer surgery care were seen in racial minority groups.

A key factor in helping to determine the effectiveness of the ACA Medicaid expansion in reducing disparities was whether it helped increase coverage to marginalized low-income populations. This was determined by evaluating the utilization of healthcare services. In our study, we found the ACA Medicaid expansion helped improve access to care, which had been anticipated by prior research. A study evaluating Massachusetts 2006 coverage expansion on resection of colorectal cancer found that Massachusetts insurance expansion was associated with an 8% increase in the probability of an elective admission (95% CI, 1.34–14.91, P .019) compared with the control states.[7] Furthermore, a study by Loehrer et al found Medicaid expansion was associated with a 7.5% decreased probability of patients being uninsured (95% CI, 12.2 to 2.9, P .002) and an 8.6 percentage point increased probability of having Medicaid (95% CI, 6.1–11.1, P <.001).[8] We found there was an increase in admissions for Medicaid patients after the ACA Medicaid expansion for pancreatic, breast, colorectal, prostate, and gastric cancer. This growth in cancer patient hospital admissions is likely due to states expanding their Medicaid programs which have

led to an increase in Medicaid enrollment and a decrease in uninsured rates. Studies have shown that the sharp decline in uninsured rates among the low-income population in expansion states is attributable to gain in Medicaid coverage.[9–12]

Before the ACA Medicaid expansion, researchers had attempted to project its effects by analyzing previous states which had undergone similar insurance reform. Similar to our results they found that expansion helped decreases disparities in accessing care. A study by Al-Refaie et al estimated the effects of New York's 2001 Medicaid expansion on patients undergoing cancer surgery and found the proportion of cancer operations paid by Medicaid increased from 8.9% to 15.1% in the 5 years after the expansion. Additionally, the percentage of uninsured patients dropped by 21.3% immediately after the expansion (P <. 01).[13] Furthermore, Loehrer et al evaluated Massachusetts 2006 insurance expansion and found that patients with government-subsidized or self-pay had a 44% increased rate of resection (IRR 1.44; 95% CI, 1.23–1.68, P <.001), a 6.21 percentage point decreased probability of emergent admission (95% CI, 211.88–20.54, P .032), and an 8.13 percentage point increased probability of an elective admission (95% CI, 1.34–14.91, P =.019) compared with the control states.[7] Similarly, we found that Medicaid expansion increased surgical access to cancer patients for surgeries such as lung (IRR 1.30; P <.01), breast (IRR 1.25; P <.02), and colorectal resection (IRR 1.25; P <.001). These procedures that were affected by increased access to insurance parenthetically are associated with cancers that are amenable to a screening test. Our results suggest that part of the increase in cancers admissions and earlier surgical intervention were a product of early cancer detection. These findings appear to corroborate the literature in which studies have found that the ACA Medicaid expansion led to an increase in preventative services and screenings.[14–17] A study by Sun et al compared age-adjusted incidence rates of early-stage breast, colorectal, and cervical cancer. This group found that from pre- to post-ACA, the incidence of early-stage breast cancer increased from 55.5 (95% CI, 54.6–56.3) to 56.9 (95% CI, 56.0–57.7) cases per 100,000 person-years, with an IRR of 1.025 (95% CI, 1.003–1.048). The incidence of early-stage colorectal cancer increased from 13.5 (95% CI, 13.0–14.1) to 15.3 (95% CI, 14.7–15.9) cases per 100,000 person-years, with a pre- to post-ACA IRR of 1.132 (95% CI, 1.07–1.198).[18] Furthermore, a study by Sammon et al found that prostate cancer screening decreased nationally between 2011 and 2013 but increased in early Medicaid expansion states.[19]

Most research demonstrates that Medicaid expansion positively affects the access to care, utilization of services, the affordability of care, and financial security among low income-populations.[1] We found a narrowing of the insurance coverage gap between privately insured and Medicaid cancer patients in expansion states compared to nonexpansion states. For patients with lung, bladder, and colorectal cancer there was an increased odds risk of undergoing surgery in expansion states after the ACA Medicaid expansion. Although inequalities still existed between Medicaid and privately insured patients in accessing surgical care, we found they had decreased with improved access to insurance. In our subgroup analysis, these results translated into racial minorities having increased access to care for colon and prostate cancer. This leads us to believe that increased access to insurance helps reduce disparities in providing surgical care. We believe that these results which only

look at the effect of Medicaid expansion after 1 year will be further extrapolated to increased access to care as more data becomes available.

Although our study and most research have demonstrated the positive effects of the ACA Medicaid expansion, there has been some negative sentiment toward this expansion.[20] Studies have cited that Medicaid enrollee had worse access to care and outcomes.[21,22] Also, it leads to excessive federal and state spending. With this increase in spending on the rise, fewer priorities are placed on other services such as education, transportation, and criminal justice funding.[20] Contrary to these beliefs our study demonstrated that cancer patients, which some would argue are some of the most vulnerable patients in our healthcare system, have gained timely access to care. Research has demonstrated the positive effects of expansion on economic outcomes and results in a reduction in uncompensated care costs for hospitals and clinics as well as a positive or neutral effect on employment and the labor market.[1] Also, the economic effect on Medicaid expansion has decreased per enrollee Medicaid spending in expansion states but increased in nonexpansion states.[23,24] Further more, charity care cost has decreased among hospitals in Medicaid expansion states compared to nonexpansion states.[25] Also, states that have expanded Medicaid have seen a reduction in uncompensated care delivered by safety net institutions as well as a decrease in the uninsured rate.[26] These studies would suggest that out of pocket costs to uninsured patients have decreased after Medicaid expansion. We believe future studies are needed to identify further how other surgical procedures may have been affected by the expansion of Medicaid and what the longitudinal and economic effects may be. Furthermore, more studies are needed to identify if this has impacted mortality in cancer patients.

There are several limitations of this study which includes the use of an administrative dataset, which does not contain detailed clinical information such as laboratory results and physiologic measures which may contribute to patient outcomes. Also, there is no variable to indicate the stage of the patient's cancer at the time of their admission, previous outpatient treatments and end of life care, which would help indicated if the patient's admission might have been futile. Furthermore, there may be inherent under or over coding of ICD-9 codes. Also, this study was limited to 2014 due to the data availability via HCUP database. Therefore, more recent rates were not examined. Furthermore, this study was limited to only a select spectrum of oncologic procedures; therefore, it is not generalizable to all oncologic surgeries. Lastly, due to data constraints, our study was limited to a few states and cannot be extrapolated to the US population. Further research is needed to look at a broader inclusion of patients and states as well as databases that contain more granular information which would help elucidate if patients being admitted and undergoing surgery may have undergone futile care. Also, additional research is required to clarify if increased access to healthcare insurance leads to improved survival.

CONCLUSION

In conclusion, this study has shown that the Medicaid expansion results in coverage gains and reduction in uninsured rates. Also, it demonstrates a positive effect on access to oncologic care and utilization of service which ultimately leads to a decrease in disparities

and narrows the insurance gap marginalized communities face in accessing safe, efficient, and timely care.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Meeting Presentation: Will be presented as an oral presentation at the 138th American Surgical Association, April 20, 2018.

DISCUSSANTS

Dr Selwyn Vickers (Birmingham, AL):

I want to thank Dr Kuo and his colleagues for an outstanding presentation and a chance to review the manuscript.

I think this paper was very well done; it demonstrates, as many others have shown, that in those states where Medicaid expansion has occurred, it certainly appears to have provided increased access.

I have 3 questions that hopefully you can shed some light on.

1. Your data clearly demonstrates a significant increase in the rate of admissions related to pancreas, breast, and colorectal cancers. Were these admissions tied to their index procedure for resection? Or were these admissions in any way tied to end-of-life care associated with poor utilization? These patients admitted to the ICI 6 weeks before they died, might this in fact have been due to improved utilization and access, or was it an unfortunate, unintended consequence?

2. You showed in your paper that there were 2 diseases, pancreas cancer and lung cancer, where there appeared to be an increased resection rate or increased admissions associated with ethnicity. Was the increase in states with expansion driven by the fact that these are obviously diseases with a high incidence and dismal outcomes? Could the difference in states without expansion be attributed to the fact that care appeared to be futile in those cases? There have been publications that clearly show significant disparities for full treatment in these diseases. Could you speak to any other level of treatment rather than just resection or surgery? Because, as you know, these diseases are treated by adjuvant care or neoadjuvant care as well as surgery.

3. While the goal of increased access would hopefully be an increase in resections or index procedures, the ultimate goal is an improvement in survival. Did you look at any data that would imply increased access and increased resection affected survival?

Response from Paul C. Kuo:

Thank you, Dr Vickers, for your time in reviewing our manuscript and also for your insightful questions.

In regards to your first question, one of the limitations of using large databases is that we cannot get the clinical information such as clinical staging– –has the patient received any neoadjuvant or adjuvant therapies– –which would help answer that question as to if patients were kind of at the end of life of care when we did our study. The admissions that we did look at were primarily those associated with their index operation and associated with surgical treatment as their primary form of care.

To your next question, in our manuscript, which we did not include in our presentation, we did a secondary analysis looking at how the Affordable Care Act impacted various racial minorities. As you said, we found that there was an increased probability of African Americans undergoing pancreatic and lung surgery. Although when we compared these to pre- and post-years, we found that there was no statistical significance.

But we did do a separate analysis in which we identified if the odd * risk of Medicaid patients compared to privately insured patients changed after the expansion, and we did find that patients who had undergone colorectal cancer had increased access to care, which was statistically significant.

In regards to your next question, in regards to talking about overall survival, this kind of goes back to your first question which there is limited data to be able to perform this type of analysis at this time. We believe that future studies should look at survival and the impact that the Affordable Care Act has had. Thank you very much for your questions.

Dr Hiram Polk (Louisville, KY):

This is one of several papers on this theme that are in the process of being published now. The first of these came from West Virginia more than 2 years ago. We had one from Kentucky last year that’s somewhere in the JACS process.

All of them show unequivocally that if you take the simple approach to Obamacare expansion, that is expand Medicaid, then you can really make changes in a hurry, and all of these produce the same outcome– –that more patients seek more care under these circumstances, even if they must learn the process of a new way they get care, but they get it.

The outcomes of these half a dozen papers are incontrovertible. More care is given to people with especially chronic and serious illness. There are questions that Dr Vickers brought up like, did you give chemotherapy first or did you give end-of-life care first? But you got more care for all of these people all of the times. This will continue to happen as Medicaid expands.

The really interesting experiment is the one from Tennessee from nearly 30 years ago in which they are almost the only state that withdrew Medicaid or reduced it, and, clearly, the

opposite confirms the positive. In other words, those patients got less care under the circumstance.

The real question about this for all of us as citizens is, how are we going to pay for the state's share of Medicaid when 2020 comes to an end and we have to make our share of all of this pay?

It is literally imponderable. The good is good. The imponderability of payment is frightening. Thank you.

Response from Paul Kuo:

Thank you very much for your comments, sir. As you have said and commented, there are several studies that have looked at how the Affordable Care Act, Medicaid expansion has affected patients. As you said, a lot of studies have looked at kind of predicting outcomes. As you have said, a lot of these studies have shown that the increase of insurance has led to increased access to care, increased utilization.

But I think to your point about how are we going to pay for all of this, I do not have a very good answer for that. Obviously, that is a very difficult question to answer. But studies have shown that out-of-pocket spending for patients on an individual level has decreased, as well as increased reimbursements for hospitals.

So I think from a patient standpoint, I think this has affected them in a positive way.

Dr Saman Arbabi (Seattle, WA):

Nothing to disclose. I enjoyed your talk. One of your hypotheses was that early detection increased the number of operations. As you mentioned, the HCUP database does not have staging of the cancer.

I wonder whether you have looked at national cancer registries to look at this, specifically looking at the time of the operation and the staging at the time of operation, especially as it relates to minorities.

Response from Paul Kuo:

Thank you, Dr Arbabi. We have not looked at other cancer registries to perform this analysis, although that is kind of the second part of the study is looking at the National Cancer Database, the SEER database, which might be able to give us more granular data as to what the overall outcomes are.

Kind of going back to Dr Vickers' point, ultimately has this changed survival? Most likely it might have, but also looking at underrepresented minorities and how it has affected them as well.

REFERENCES

1. Antonisse L, Garfield R, 25, Samantha Artiga Published: Sep. The effects of Medicaid expansion under the ACA: Updated findings from a literature review. 2017 Available at: https://www.kff.org/medicaid/issue-brief/the-effects-of-medicaid-expansion-under-the-aca-updated-findings-from-a-literature-review-september-2017/. Accessed March 12, 2018.
2. Sommers BD, Maylone B, Blendon RJ, et al. Three-year impacts of the affordable care act: improved medical care and health among low-income adults. Health Aff. 2017;36:1119–1128.
3. Baicker K, Taubman SL, Allen HL, et al. The Oregon experiment—effects of Medicaid on clinical outcomes. N Engl J Med. 2013;368:1713–1722. [PubMed: 23635051]
4. Hu L, Kaestner R, Mazumder B, et al. The Effect of the Patient Protection and Affordable Care Act Medicaid Expansions on Financial Wellbeing; 2016.
5. Miller S, Wherry LR. Health and access to care during the first 2 years of the ACA Medicaid expansions. N Engl J Med. 2017;376:947–956. [PubMed: 28273021]
6. Bureau UC. Health insurance coverage in the united states: 2016. Available at: https://www-census-gov.archer.luhs.org/library/publications/2017/demo/p60-260.html. Accessed March 7, 2018.
7. Loehrer AP, Song Z, Haynes AB, et al. Impact of health insurance expansion on the treatment of colorectal cancer. J Clin Oncol. 2016;34:4110–4115. [PubMed: 27863191]
8. Loehrer AP, Chang DC, Scott JW, et al. Association of the affordable care act Medicaid expansion with access to and quality of care for surgical conditions. JAMA Surg. 2018;153:e175568. [PubMed: 29365029]
9. Avery K, Finegold K, Whitman A. Affordable care act has led to historic, widespread increase in health insurance coverage. Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation 2016.
10. Wehby GL, Lyu W. The impact of the ACA Medicaid expansions on health insurance coverage through 2015 and coverage disparities by age, race/ethnicity, and gender. Health Serv Res. 2018;53:1248–1271. [PubMed: 28517042]
11. Decker SL, Lipton BJ. Most newly insured people in 2014 were long-term uninsured. Health Aff (Millwood). 2017;36:16–20. [PubMed: 28069842]
12. Decker SL, Lipton BJ, Sommers BD. Medicaid expansion coverage effects grew in 2015 with continued improvements in coverage quality. Health Aff (Millwood). 2017;36:819–825. [PubMed: 28461347]
13. Al-Refaie WB, Zheng C, Jindal M, et al. Did pre-affordable care act Medicaid expansion increase access to surgical cancer care? J Am Coll Surg. 2017;224:662–669. [PubMed: 28130171]
14. Sommers BD, Long SK, Baicker K. Changes in mortality after Massachusetts health care reform: a quasi-experimental study. Ann Intern Med. 2014; 160:585–593. [PubMed: 24798521]
15. Sommers BD, Blendon RJ, Orav EJ, et al. Changes in utilization and health among low-income adults after Medicaid expansion or expanded private insurance. JAMA Intern Med. 2016;176:1501–1509. [PubMed: 27532694]
16. Simon K, Soni A, Cawley J. The impact of health insurance on preventive care and health behaviors: evidence from the first two years of the ACA Medicaid expansions. J Policy Anal Manage. 2017;36:390–417. [PubMed: 28378959]
17. Sommers BD, Gawande AA, Baicker K. Health Insurance Coverage and Health—What the Recent Evidence Tells Us; 2017.
18. Sun M, Cole AP, Lipsitz SL, et al. Trends in breast, colorectal, and cervical cancer incidence following the affordable care act: implications for cancer screening. JAMA Oncol. 2018;4:128–129. [PubMed: 29098266]
19. Sammon JD, Serrell EC, Karabon P, et al. Prostate cancer screening in early Medicaid expansion states. J Urol. 2018;199:81–88. [PubMed: 28765069]
20. Schaefer NO. Why the Obamacare Medicaid expansion is bad for taxpayers and patients. The Heritage Foundation Web site. /health-care-reform/report/why-the-Obamacare-Medicaid-expansion-bad-taxpayers-and-patients. Accessed March 12, 2018.

21. Roetzheim RG, Gonzalez EC, Ferrante JM, et al. Effects of health insurance and race on breast carcinoma treatments and outcomes. Cancer. 2000; 89:2202–2213. [PubMed: 11147590]

22. Ayanian JZ, Kohler BA, Abe T, et al. The relation between health insurance coverage and clinical outcomes among women with breast cancer. N Engl J Med. 1993;329:326–331. [PubMed: 8321261]

23. Decker SL, Lipton BJ, Sommers BD. Medicaid expansion coverage effects grew in 2015 with continued improvements in coverage quality. Health Affairs. 2017;36:819–825. [PubMed: 28461347]

24. Lassman D, Sisko AM, Catlin A, et al. Health spending by state 1991–2014: measuring per capita spending by payers and programs. Health Affairs. 2017;36:1318–1327. [PubMed: 28615193]

25. Cunningham P, Garfield R. (2015, -04–30T07:00:47þ00:00). How are hos pitals faring under the affordable care act? early experiences from ascension health. Retrieved from https://www.kff.org/health-reform/issue-brief/howare-hospitals-faring-under-the-affordable-care-act-early-experiences-from-ascension-health/.

26. Dobson A, DaVanzo JE, Haught R, et al. Comparing the affordable care act's financial impact on safety-net hospitals in states that expanded medicaid and those that did not. Issue Brief (Commonw Fund). 2017;2017:1–10.

TABLE 1.

Characteristics of Cohort in Expansion Versus Nonexpansion States

	Expansion States (n = 194,601)		Nonexpansion States (n = 123,257)	
Age, mean (SD)	54.5	7.7	54.48	7.6
Female, n (%)	93,199	47.9%	60,678	49.2%
CCI, mean (SD)	4.6	2.3	4.56	2.3
Race/ethnicity, n (%)				
Hispanic	14,648	7.5%	18,602	15.1%
Black	37,896	19.5%	20,525	16.7%
White	118,463	60.9%	78,684	63.8%
Other	21,355	11.0%	3,954	3.2%
Insurance, n (%)				
Private	55,188	28.4%	38,905	31.6%
Medicaid	131,890	67.8%	72,878	59.1%
Self-pay	7263	3.7%	7662	6.2%
No-charge	260	0.1%	3333	2.7%
Surgery, n (%)				
Pancreas	1397	0.7%	618	0.5%
Esophagus	52	0.0%	13	0.0%
Lung	6985	3.6%	3670	3.0%
Bladder	1557	0.8%	733	0.6%
Breast	11,131	5.7%	5212	4.2%
Colorectal	17,209	8.8%	11,305	9.2%
Prostate	19,707	10.1%	10,217	8.3%
Gastric	1600	0.8%	664	0.5%

Pre-ACA period is from 2010 to 2013; Post-ACA is 2014.

Expansion states: MD, NY, IA. Nonexpansion states: FL.

CCI indicates Charlson Comorbidity Index.

TABLE 2.

Impact of the Affordable Care Act on Rates of Admissions for Medicaid Patients

	Expansion States			Nonexpansion State					
Admissions	**Pre**	**Post**	**Rate Change**	**Pre**	**Post**	**Rate Change**	**DID**	**IRR**	***P* Value**
Pancreatic	5.30	5.72	0.42	5.31	5.11	−0.20	0.63	1.12	0.04
Esophageal	0.15	0.14	0.00	0.23	0.18	0.05	0.05	1.24	0.51
Lung	24.48	24.01	−0.47	34.84	33.50	−1.34	0.87	1.02	0.42
Bladder	2.90	2.53	−0.37	3.60	3.25	−0.35	−0.03	0.96	0.64
Breast	10.52	11.91	1.39	13.79	13.72	−0.07	1.46	1.14	0.00
Colorectal	18.44	18.45	0.01	23.06	20.80	−2.26	2.27	1.11	0.00
Prostate	6.31	6.89	0.58	5.45	4.46	−0.99	1.57	1.34	<.0001
Gastric	3.53	3.95	0.42	3.78	3.44	−0.35	0.77	1.23	0.00

Pre-ACA period is from 2010 to 2013; Post-ACA is 2014.

Per 100,000 residents who are 18 to 64 years old.

TABLE 3.

Impact of the Affordable Care Act on Rates of Surgery for Medicaid Patients

	Expansion States			Nonexpansion State					
Surgery	**Pre**	**Post**	**Rate Change**	**Pre**	**Post**	**Rate Change**	**DID**	**IRR**	***P* Value**
Pancreatic	5.33	5.93	0.6	5.31	6.59	1.28	−0.67	0.89	0.63
Esophageal	2.94	4.00	1.06	4.81	4.76	−0.05	1.10	1.32	0.84
Lung	7.07	8.48	1.41	5.08	4.69	−0.40	1.81	1.30	0.01
Bladder	11.91	15.44	3.53	11.92	10.35	−1.58	5.10	1.49	0.07
Breast	24.51	21.37	−3.14	16.51	11.38	−5.12	1.98	1.25	0.02
Colorectal	25.53	28.39	2.85	27.43	24.44	−2.99	5.84	1.25	0.00
Prostate	32.78	29.23	−3.55	28.69	24.37	−4.32	0.77	1.05	0.69
Gastric	14.88	15.45	0.58	10.58	9.55	−1.03	1.61	1.15	0.50

Pre-ACA period is from 2010 to 2013; Post-ACA is 2014.

The rate is the observed resection rate per 1000 cancer admissions.

DID indicates difference-in-difference; IRR, incidence rate ratio.

TABLE 4.

Impact of ACA on the Odds of Medicaid Patients Undergoing Resection Relative to Patients With Private Insurance

Cancer	State(s)	Period	Medicaid Versus Private	CI(Low)	CI (High)
	Expansion	Post	0.52	0.39	0.71
Pancreas		Pre	0.50	0.43	0.59
	Nonexpansion	Post	0.72	0.49	1.06
		Pre	0.67	0.54	0.82
	Expansion	Post	0.13	0.02	1.16
Esophagus		Pre	0.11	0.03	0.38
	Nonexpansion	Post	0.46	0.03	8.27
		Pre	0.49	0.14	1.7
	Expansion	Post	0.45	0.4	0.51
Lung		Pre	0.44	0.41	0.47
	Nonexpansion	Post	0.33	0.27	0.39
		Pre	0.34	0.31	0.37
	Expansion	Post	0.60	0.44	0.81
Bladder		Pre	0.46	0.39	0.54
	Nonexpansion	Post	0.48	0.32	0.71
		Pre	0.61	0.51	0.74
	Expansion	Post	0.53	0.47	0.6
Breast		Pre	0.57	0.53	0.6
	Nonexpansion	Post	0.46	0.39	0.56
		Pre	0.51	0.47	0.55
	Expansion	Post	0.47	0.43	0.52
Colorectal		Pre	0.42	0.4	0.44
	Nonexpansion	Post	0.39	0.35	0.44
		Pre	0.45	0.43	0.48
	Expansion	Post	0.23	0.2	0.27
Prostate		Pre	0.22	0.21	0.24
	Nonexpansion	Post	0.23	0.18	0.29
		Pre	0.22	0.19	0.24

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Cancer	State(s)	Period	Medicaid Versus Private	CI(Low)	CI (High)
	Expansion	Post	0.51	0.39	0.67
Gastric		Pre	0.55	0.48	0.63
	Nonexpansion	Post	0.40	0.26	0.59
		Pre	0.49	0.4	0.59

Odds ratio (OR) of resection were adjusted for age, gender, race and Charlson Comorbidity Index.