Letters

RESEARCH LETTER

Association Between the Affordable Care Act Dependent Coverage Expansion and Cervical Cancer Stage and Treatment in Young Women

On September 23, 2010, the Affordable Care Act Dependent Coverage Expansion (ACA-DCE) went into effect, allowing young adults to remain on their parents' health insurance plans until age 26 years. Implementation of the ACA-DCE was followed by a net increase in private health insurance coverage among young adults aged 19 to 25 years.[1] Persons without private health insurance are less likely to be screened and more likely to be diagnosed at an advanced stage of cancer.[2]

For young adults, the uterine cervix is the only cancer site for which screening is recommended. Since November 2009, the American College of Obstetricians and Gynecologists has recommended cervical cancer screening begin at age 21 years. Diagnosis of cervical cancer at early stages also allows use of fertility-sparing treatments. Using data before and after the ACA-DCE, we compared changes in cervical cancer stage at diagnosis and initial treatment among young women aged 21 to 25 years (DCE-eligible) and 26 to 34 years (non–DCE-eligible).

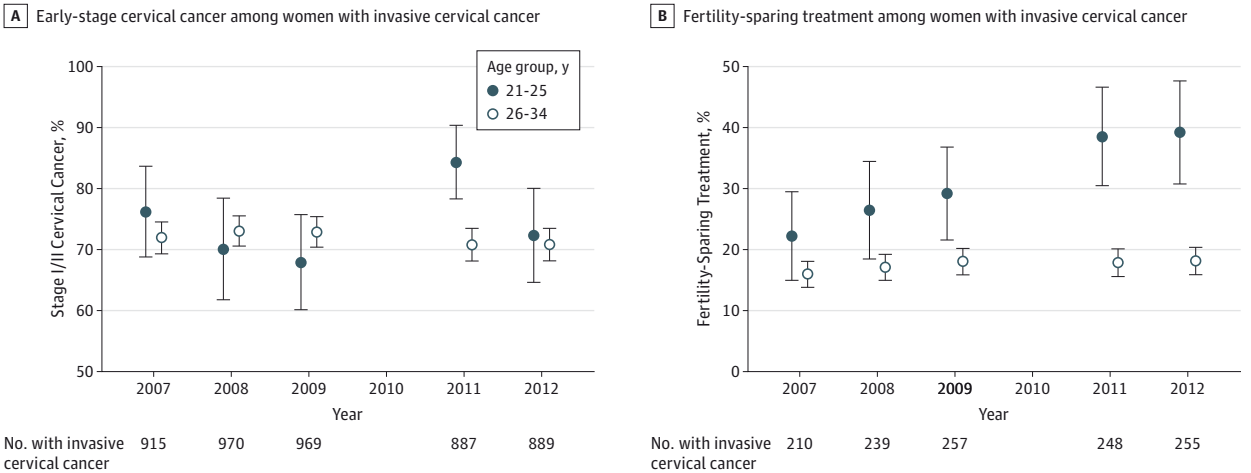
Methods | The National Cancer Data Base, a national hospital-based cancer registry, was used to obtain data on cases of invasive cervical cancer, with stage at diagnosis classified as early (stages I/II) or late (stages III/IV).[3] The database documents approximately 70% of all malignant cancers in the United States annually.[4] We selected all women aged 21 to 34 years with a first primary invasive cervical cancer. The deidentified study was waived from institutional review board approval by the Morehouse School of Medicine.

The associations between insurance (categorized as private, uninsured, Medicaid, or other/unknown) and diagnosis of early-stage disease and receipt of fertility-sparing treatments were examined. We also examined stage at cancer diagnosis and initial treatment of cervical cancer across 2 periods (before ACA-DCE, January 2007-December 2009; after ACA-DCE, January 2011-December 2012). The year 2010 was treated as a washout or phase-in period and was excluded. We used a pre-post design and conducted a difference-in-differences analysis, in which young women aged 21 to 25 years were the treatment group and those aged 26 to 34 years were controls.

Both unadjusted and adjusted linear probability models were fitted, controlling for single years of age, race/ethnicity, and area-level education and income. Temporal trends in proportions of early-stage disease and fertility-sparing treatment by DCE eligibility were plotted using an arithmetic scale. Version 9.4 of SAS (SAS Institute Inc) was used for the statistical analyses. All statistical testing was 2-sided at a significance level of .05.

Results | We identified 3937 cervical cancer cases diagnosed pre-DCE and 2480 cases post-DCE. Patients with private insurance were more likely than those with Medicaid or uninsured to be diagnosed with early-stage disease (77.8% [2753/3540] with private insurance vs 64.7% [1265/1954] with Medicaid and 67.0% [409/610] uninsured; $P < .001$) and more likely to re-

Figure. Diagnosis and Treatment Trends of Cervical Cancer Among Women Aged 21 to 34 Years



Patients had invasive cervical cancer recorded in the National Cancer Data Base, 2007-2009 and 2011-2012. Disease stage was coded using American Joint Commission on Cancer, Sixth Edition. The year 2010 was excluded as a washout phase.

Table. Difference-in-Differences Analysis of Changes in Stage and Treatment Among Women Aged 21 to 34 Years With Cervical Cancer Before and After Implementation of the Affordable Care Act Dependent Coverage Expansion (ACA-DCE), 2007-2009 and 2011-2012 (N = 6417)

	Ages 21-25 y			Ages 26-34 y			Difference-in-Differences Analysis			
	Pre-DCE (n = 380)[a]	Post-DCE (n = 270)[b]	Risk Difference	Pre-DCE (n = 3557)[a]	Post-DCE (n = 2210)[b]	Risk Difference	Unadjusted Estimate	*P* Value	Adjusted Estimate	*P* Value[c]
AJCC-6 stage at diagnosis, %										
I/II (early)	71.3 (66.8 to 75.9)	78.5 (73.6 to 83.4)	7.2 (0.5 to 13.9)	72.6 (71.2 to 74.1)	70.8 (68.9 to 72.7)	−1.8 (−4.2 to 0.5)	9.0 (2.0 to 16.2)	.01	7.6 (0.3 to 14.8)	.04
III/IV (late)	24.7 (20.4 to 29.1)	19.3 (14.6 to 24.0)	−5.5 (−11.9 to 0.9)	23.7 (22.3 to 25.1)	26.8 (24.9 to 28.6)	3.1 (0.7 to 5.4)	−8.5 (−15.3 to −1.7)	.01	−7.3 (−14.3 to −0.4)	.04
Unknown	3.9 (2.0 to 5.9)	2.2 (0.5 to 4.0)	−1.7 (−4.4 to 0.9)	3.6 (3.0 to 4.2)	2.4 (1.8 to 3.1)	−1.2 (−2.1 to −0.3)	−0.5 (−3.3 to 2.2)	.70	0.1 (−3.0 to 3.2)	.95
Initial treatment, %										
Fertility-sparing[d]	26.1 (21.6 to 30.5)	38.9 (33.1 to 44.7)	12.8 (5.5 to 20.1)	17.1 (15.8 to 18.3)	18.0 (16.4 to 19.6)	0.9 (−1.1 to 3.0)	11.9 (4.3 to 19.5)	.002	13.4 (5.8 to 21.0)	.001
Non-fertility-sparing[e]	69.5 (64.8 to 74.1)	58.9 (53.2 to 64.8)	−10.6 (−18.1 to −3.1)	80.1 (78.8 to 81.4)	79.0 (77.3 to 80.7)	−1.2 (−3.3 to 1.0)	−9.4 (−17.2 to −1.6)	.02	−10.7 (−18.5 to −2.8)	.008

Abbreviation: AJCC-6, American Joint Commission on Cancer, Sixth Edition.

[a] The ACA-DCE went into effect on September 23, 2010. The pre-DCE portion of the study period included January 2007-December 2009.

[b] The post-DCE portion of the study period included January 2011-December 2012.

[c] Adjusted for single years of age, race/ethnicity, and area-level education and income. Maximum likelihood estimation was used in modeling.

[d] Includes conization and trachelectomy.

[e] Includes hysterectomy, radiation, and chemotherapy.

ceive fertility-sparing treatments (23.6% [837/3540] with private insurance vs 12.2% [239/1954] with Medicaid and 16.7% [102/610] uninsured; $P < .001$).

Between the pre- and post-DCE periods, compared with 26- to 34-year-olds, women aged 21 to 25 years experienced a net increase of 9.0 (95% CI, 2.0-16.2) percentage points in early-stage disease ($P = .01$) and 11.9 (95% CI, 4.3-19.5) percentage points in receipt of fertility-sparing treatments ($P = .002$). Both results remained statistically significant in multivariable models (**Table**).

Among women aged 21 to 25 years, the proportion of early-stage disease increased from 67.9% in 2009 to 84.3% in 2011 and decreased to 72.3% in 2012; the proportion receiving fertility-sparing treatment increased throughout the study period (**Figure**).

Discussion | Although based on early data (2 years after the ACA-DCE), these findings suggest an association between the ACA-DCE provision and cervical cancer stage at diagnosis and receipt of fertility-sparing treatment among young women aged 21 to 25 years, but not among women aged 26 to 34 years. However, the increase in proportion of early-stage disease in 2011 followed by a decrease in 2012 may reflect detection of prevalent early-stage disease associated with increased access to care or random fluctuation. The increase in rates of fertility-spring treatment after the ACA may reflect continuation of a pre-ACA trend.

Our study is limited by its ecological design. Future work should continue to monitor cancer care and outcomes in populations targeted by the ACA.

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COMMENT & RESPONSE

Cost-effectiveness of Statin Therapy for ASCVD

To the Editor Using a microsimulation model, Dr Pandya and colleagues[1] found that it was cost-effective to treat more than 60% of all US adults aged 40 through 75 years with a generic statin for primary prevention of atherosclerotic cardiovascular disease (ASCVD). Using a weighted average of the lowest *Red Book* wholesale acquisition costs for generic 20-mg tablets, the authors estimated costs of $11 per patient per year for simvastatin, $110 for atorvastatin, and $2277 for rosuvastatin in the base-case analysis.

In the sensitivity analysis, the authors showed that the 10-year ASCVD risk threshold of 7.5% was no longer cost-effective at a willingness-to-pay threshold of $50 000 per quality-adjusted life-year (QALY) if the annual statin costs exceeded $500. At higher willingness-to-pay thresholds (eg, ≥$100 000/QALY), statin treatment was not cost-effective if annual costs exceeded $1000.

Although a drug's wholesale acquisition costs may be the most reasonable estimate to use for microsimulation purposes, patients and insurers may pay more for each dispensed prescription than what can be estimated from an annual wholesale acquisition cost list price. For example, a patient without full prescription drug coverage may pay between $50 to $154 for a 30-day supply of generic atorvastatin in Boston.[2] Dispensing fees may also not necessarily be included as part of the wholesale acquisition cost and can vary between $0.97 to more than $10 per prescription among state Medicaid programs.[3]

There is little transparency about the overall costs of statins (or any other drug), either through public payers or private payers and pharmacy benefit managers. The Centers for Medicare & Medicaid Services is legislatively prohibited from disclosing average manufacturer prices (an index based on actual sales). State Medicaid programs are contractually prohibited from disclosing manufacturer drug rebates.

Even pharmacists may not know the price for a prescription until they run a claim through a computer terminal located inside a retail store. These challenges highlight the difficulty in interpreting cost-effectiveness studies that rely on the cost of prescription medications, particularly if the cost of statins was a major driver of the authors' conclusions.

Managing limited health care resources will require attention to real prescription drug costs. Greater transparency in drug prices is a necessary first step.

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In Reply We agree with the points Drs Luo and Kesselheim raised and have the following points to add regarding our cost-effectiveness analysis in light of these issues.

As Luo and Kesselheim noted, we used the weighted average of the lowest *Red Book* wholesale acquisition costs in our base-case analysis, but also paid particular attention to the price of statins when presenting our results. Specifically, we presented (1) separate cost-effectiveness analysis tables for blended generic/branded and generic-only drug prices and (2) a 1-way sensitivity analysis figure showing the optimal ASCVD treatment threshold as a function of drug cost for 3 separate cost-effectiveness thresholds ($50 000/QALY, $100 000/QALY, and $150 000/QALY).

As Luo and Kesselheim also mentioned, there is likely heterogeneity in drug prices paid by patients, insurers, or both. By presenting multiple drug cost scenarios (including a figure that showed a range of prices from $0-$1500 per person per year), we hope that decision makers can identify an optimal treatment threshold based on the drug prices (and cost-effectiveness thresholds) that are of most relevance to them or their institution.

We agree with the general suggestion to include dispensing fees in the cost of drugs in cost-effectiveness analyses, particularly when these fees are a relatively large percentage of overall drug costs or when prescription lengths are short. Luo and Kesselheim reported a range of $0.97 through $10 per prescription among state Medicaid programs; adding the higher bound for 30-day prescription dispensing fees ($120 per year) to our base-case blended statin cost ($267 per year) resulted in an incremental cost-effectiveness ratio of $50 000/QALY for the 7.5% ASCVD treatment threshold compared with the 10% ASCVD treatment threshold.