

# Legislations Mandating Insurance Coverage Are Highly Effective in Delivering Surgical Care of Transgender Patients

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**Background:** Although gender-affirming surgery is increasingly performed, few studies have examined any temporal correlation between legislations mandating transgender care and the actuation of such surgical care.

**Methods:** We assembled a retrospective cohort utilizing the National Inpatient Sample database from 2000 to 2018. We stratified utility trends of gender-affirming surgery based on insurance payer types and regions in a crisscrossing effort to detect any temporal or cause-effect relationship between legislations and outcomes. All regions according to the latest National Inpatient Sample categorization were examined based on the nature of their member state's legislations relating to gender-affirming care coverage. Diametrically, opposite regions were selected for further comparisons. Interrupted time series analyses were used to demonstrate any significant uptrend since implementation of relevant legislations.

**Results:** In states with explicit inclusion of gender-affirming care, our interrupted time series analyses showed a significant increase in the number of patients on state-dependent insurance (Medicaid and private insurance) receiving gender-affirming surgery around the time during which state legislations began mandating care ( $P < 0.01$ ) and thereafter ( $P < 0.01$ ). This significance was not seen in the same regions among patients under nonstate-dependent payers (Medicare and self-pay), nor was it seen in either payer group in states without explicit inclusion of gender-affirming care. At the federal level, statistical significance was noted among Medicare recipients across all states around the time federal legislations took effect and thereafter.

**Conclusion:** Legislations mandating coverage seem highly effective in actuating surgical care of transgender patients in corresponding jurisdictions, which may provide a roadmap for further care expansion. (*Plast Reconstr Surg Glob Open* 2022;10:e4496; doi: [10.1097/GOX.0000000000004496](https://doi.org/10.1097/GOX.0000000000004496); Published online 31 August 2022.)

## INTRODUCTION

Transgender individuals, whose gender identity differs from their sex assigned at birth, are estimated to comprise 1.4 million adults and 150,000 teenagers in the United States.<sup>1,2</sup> As a result, transgender patients may choose to undergo gender-affirming surgery as a means of aligning their gender and sex identities. There are numerous types

of gender-affirming procedures, ranging from facial feminization/masculinization, and breast augmentation/mastectomy, to vaginoplasty/phalloplasty.<sup>3,4</sup>

Increased awareness and societal acceptance paired with legislative changes have caused a significant increase in the use of gender-affirming surgery.<sup>5</sup> Between 2000 and 2014, gender-affirming procedures for transgender patients tripled in number.<sup>6</sup> While gender-affirming surgery is cost-effective in improving transgender patients' quality of life,<sup>7,8</sup> fewer than half of states have laws in place directing the explicit inclusion of transgender healthcare within state insurance mandates.<sup>9</sup>

Section 1557 of the Affordable Care Act implemented protections that prevented discrimination based on sexual orientation and gender identity, which forced insurance companies to begin covering medically necessary gender-affirming hormones and procedures. At the federal level,

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transgender care was not included in Medicare coverage until late 2014, when the US Department of Health and Human Services overturned the prohibition on Medicare coverage of gender-affirming surgery.<sup>10</sup> Despite the dramatic overall increase in transgender surgery in recent years, there has been scarce scrutiny over how impactful legislations are in leading to coverage of these procedures. With disparate insurance mandates across state lines, there exists a need to establish such relationships to further support transgender surgical needs in a wider swath of the population.

Herein, using the National Inpatient Sample (NIS), we analyze utility trends of gender-affirming surgery over the years. These trends are stratified based on insurance payer type (ie, Medicaid, Medicare, private insurance, and self-pay) and regions. To limit the background noise that comes hand-in-hand with coding for outpatient surgery, our analysis focuses solely on inpatient gender-affirming surgery as reflected in the NIS database. We aim to unequivocally demonstrate a high level of temporal concordance of increased utility of gender-affirming surgery following enactment of legislations mandating coverage of transgender surgical care. Given the profound impact such legislations are shown to have had, we hypothesize that legislative approaches are a highly effective tool in ensuring surgical care to transgender patients.

## METHODS

### Study Design

We assembled a retrospective cohort utilizing the NIS database, including all available participant user files from 2000 to 2018. The NIS database is structured to include a stratified sample of discharges from US hospitals, covering over 97% of the American population.<sup>11</sup> We identified all patients diagnosed with transsexualism (TS) or gender identity disorder (GID), as described by Canner et al.<sup>6</sup> The institutional review board's approval at Lahey Medical Center was obtained in June 2021 before the use of the NIS database.

### Patient Cohort from NIS

Analyzed variables included patient demographics, payer type, diagnoses, and procedures. Diagnoses were classified according to International Classification of Diseases Ninth Revision (ICD-9) and Tenth Revision (ICD-10) codes depending on participant user file year. Due to the shift to ICD-10 codes in 2015, ICD-9 codes were utilized for analyses between the year 2000 and the third quarter of 2015, as suggested by procedures outlined by the NIS database documentation.<sup>11</sup> The specific ICD-9 codes and patient identifiers used to select gender-affirming procedures were chosen in accordance with the procedure outlined by Canner et al.<sup>6</sup>

### Insurance Coverage

To analyze the impact of state mandates on gender affirmation surgery, we aimed to compare states that differed based on their inclusive versus exclusive coverage

## Takeaways

**Question:** Is there a temporal correlation between legislations mandating transgender care and the actuation of such surgical care?

**Findings:** In states with explicit inclusion of gender-affirming care, our interrupted time series analyses showed a significant increase in the number of patients on state-dependent insurance receiving gender-affirming surgery around the time during which state legislations began mandating care ( $P < 0.01$ ) and thereafter ( $P < 0.01$ ).

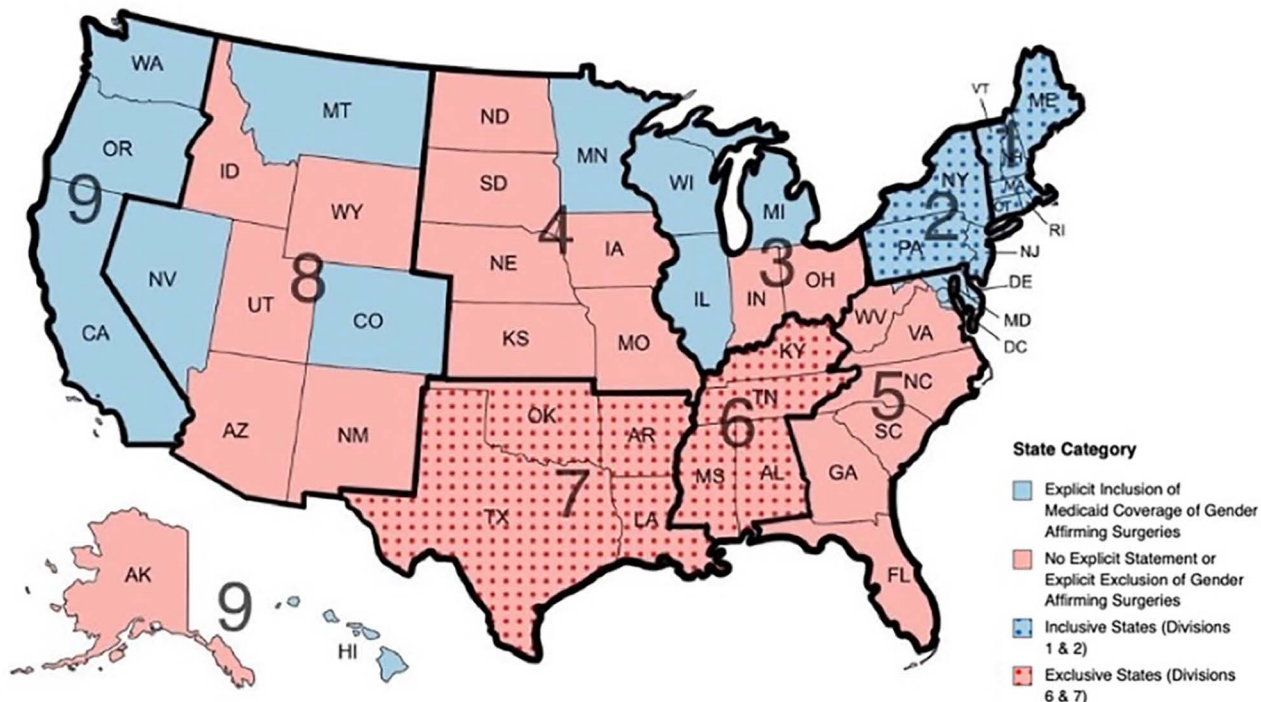
**Meaning:** Legislations mandating coverage seem highly effective in actuating surgical care of transgender patients in corresponding jurisdictions, which may provide a roadmap for further care expansion.

of gender-affirming procedures. In 2012, state identifiers for patients and hospitals included in the NIS database were removed to ensure patient confidentiality. Hospitals, instead, are bundled into one of nine census divisions according to the state and region in which the hospital is located. Due to the lack of state-specific analysis available through the NIS database, our analysis was dependent on hospital census divisions including states that either fell in the category of inclusive coverage or exclusive coverage. To begin this analysis, we first categorized all 50 states and the District of Columbia into two categories: (1) states that explicitly include Medicaid coverage of gender-affirming healthcare ( $n = 23$ ) or (2) states that explicitly exclude or have no explicit statement regarding Medicaid coverage of gender-affirming healthcare ( $n = 28$ ; Fig. 1; Table 1).<sup>9</sup> Next, we identified hospital census divisions as defined by the NIS database that exclusively included states that fell under one of the categories listed above.

Census division 1 (ME, NH, VT, MA, RI, and CT) and census division 2 (NY, PA, and NJ) contain states that have state mandates, as manifested by Medicaid policies, with explicit inclusion of transgender healthcare. For simplicity purposes, we term those as inclusion states. Census division 6 (KY, TN, MS, and AL) and census division 7 (OK, TX, AR, and LA) contain states that have Medicaid policies with either explicit exclusion or no explicit statement of transgender healthcare (Fig. 1; Table 1), which we term as exclusion states. Data analyzed before 2012 (in which hospitals had state-specific identifiers) were grouped according to their placement in the hospital census divisions as listed above to ensure a cohesive analysis.

### Statistical Analysis

Patient baseline demographics, procedures, and payer status were collected and categorized according to our inclusion criteria. To assess the impact of policy change around 2015–2016 for patients who underwent gender-affirming procedures, an interrupted time series analysis was implemented. This study design utilized segmental regression to estimate the longitudinal impact after interested time points and whether there was a significant change in procedure numbers. All analyses were performed on R studio version 3.4.<sup>12</sup>



**Fig. 1.** Hospital census divisions as categorized by the National Inpatient Sample database. This figure highlights the nine hospital census divisions and each individual state's inclusive or exclusive legislation governing Medicaid coverage of gender-affirming surgery. Divisions 1 and 2 contain states that solely have explicit inclusion of Medicaid coverage of gender-affirming surgery, while divisions 6 and 7 contain states that solely exclude or have no explicit statement regarding Medicaid coverage of gender-affirming surgery.

## RESULTS

Between the years 2000 and 2018, our analysis of the NIS database included a weighted estimate of 79,440 patients with a diagnosis of TS or GID. Of these patients, 7287 (9.2%) had a gender-affirming procedure (Fig. 2). The mean age of included patients was  $35.6 \pm 17.6$ , and the majority identified as white (60.6%). The most common type of gender-affirming surgery among our sample was genital reconstruction ( $n = 4925$ ; Table 2).

The most common payer was private insurance (34.1%;  $n = 26,995$ ), followed by Medicaid (30.6%;  $n = 24,195$ ), Medicare (21.1%;  $n = 16,655$ ), and self-pay (9.4%;  $n = 7415$ ; Table 2). When analyzed over the study period, large shifts in payer status were revealed among patients receiving gender-affirming surgery.

We chose to group payers based on whether their policies are impacted by state-specific legislation. Ultimately, this led to the creation of two groups of payers: (1) payers impacted by state-specific legislature, such as Medicaid and private insurance, and (2) payers who are not impacted by state-specific legislature, such as Medicare and self-pay. Next, these two groups were analyzed between hospital census divisions 1 and 2 (inclusion states with explicit inclusion of gender-affirming care) as compared with hospital census divisions 6 and 7 (exclusion states with explicit exclusion or no explicit statement of gender-affirming care). Our findings demonstrated significant upward trends in the number of patients utilizing Medicaid and private insurance among inclusion states as compared with

exclusion states ( $P < 0.01$ ; Table 3; Fig. 3), while patients utilizing Medicare and self-pay showed relatively similar trend lines between inclusion states and exclusion states ( $P < 0.01$ ; Table 3; Fig. 3). Conversely, the number of patients who used Medicare as their payer for gender-affirming surgery began to decrease in 2015 and did not demonstrate a large difference between hospitals in inclusion states versus exclusion states ( $P = 0.013$ ; Fig. 4; Table 4).

The interrupted time series analysis assessed the temporal impact of transgender healthcare policy changes by comparing the Medicaid and private insurance group to the Medicare and self-pay group across inclusion states and exclusion states. Legislative changes in Medicaid and private insurances were introduced in 2015 and implemented in 2016 thereafter. Thus, we chose to start our time series analysis in 2016. However, legislative changes in the federally mandated Medicare program were introduced in 2014 and implemented in 2015; thus, we analyzed a time series starting in 2015. We found that Medicaid and private insurance showed a significant increase in the number of patients receiving gender-affirming surgery [79.13 (95% CI, 35.59–122.66)  $P < 0.01$ ] only among inclusion states during the year 2016. This trend has continued to climb since 2016 for Medicaid and private insurances, with the number of patients analyzed among this group showing significant growth between the years 2016–2018 [68.73 (95% CI, 49.48–87.98)  $P < 0.01$ ] (Table 3). When Medicare was analyzed independently between inclusion states and

**Table 1. State-by-state Status of Medicaid Coverage of Gender-affirming Surgery**

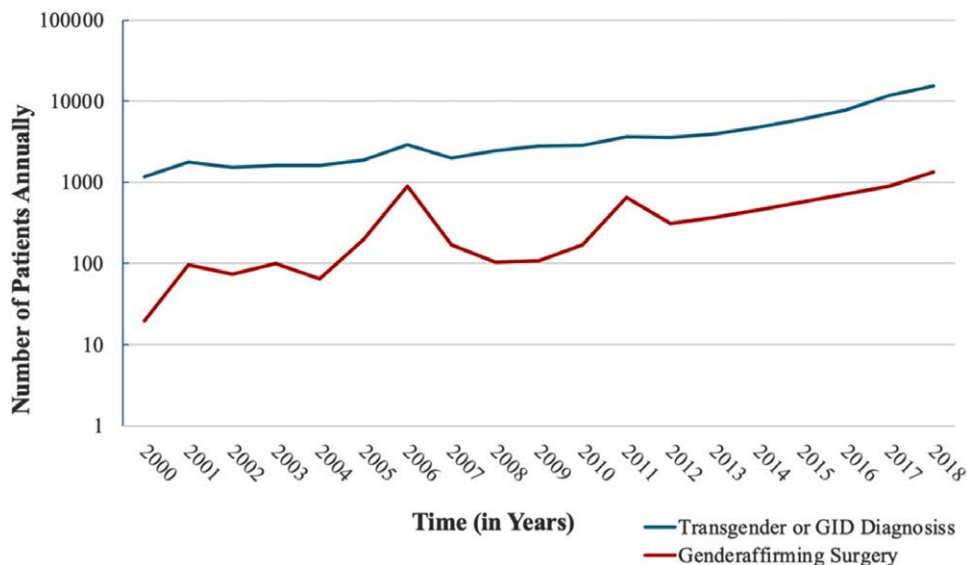
Division	State	Stance on Transgender Healthcare	Year Implemented
1	ME	Inclusive	2019
	NH	Inclusive	2017
	VT	Inclusive	2008
	MA	Inclusive	2015
	RI	Inclusive	2015
2	CT	Inclusive	2015
	NY	Inclusive	2016
	NJ	Inclusive	2017
3	PA	Inclusive	2016
	WI	Inclusive	2019
4	MI	Inclusive	2019
	IL	Inclusive	2019
	IN	No explicit statement	N/A
	OH	Explicit exclusion	2015
	MO	Explicit exclusion	2017
	ND	No explicit statement	N/A
	SD	No explicit statement	N/A
	NE	Explicit exclusion	1990
	KS	No explicit statement	NA
	MN	Inclusive	2017
IA	Previously excluded care but now insurers have the option to include or exclude; falls under an in-between category	N/A	
5	DE	Inclusive	2018
	MD	Inclusive	2016
	DC	Inclusive	2014
	VA	No explicit statement	N/A
	WV	No explicit statement	2005
	NC	No explicit statement	N/A
	SC	No explicit statement	N/A
	GA	Explicit exclusion	1992
	FL	No explicit statement	N/A
6	KY	No explicit statement	N/A
	TN	Explicit exclusion	2006
	MS	No explicit statement	N/A
7	AL	No explicit statement	N/A
	OK	No explicit statement	N/A
	TX	Explicit exclusion	2019
8	AR	Explicit exclusion	2021
	LA	No explicit statement	N/A
	ID	No explicit statement	N/A
	MT	Inclusive	2017
	WY	Explicit exclusion	1992
	NV	Inclusive	2018
	UT	No explicit statement	N/A
9	CO	Inclusive	2017
	AZ	Explicit exclusion	2004
	NM	No explicit statement	N/A
	AK	Explicit exclusion	2010 but a 2019 lawsuit challenging this policy is currently under review
	WA	Inclusive	2015
	OR	Inclusive	2015
	CA	Inclusive	2013
	HI	Inclusive	2016

exclusion states, an increase in patients receiving gender-affirming surgery was detected during the year 2015 between both regions [19.37 (95% CI, 7.76–30.98)  $P < 0.01$ ; 29.57 (95% CI, 11.35–47.79)  $P < 0.01$ , respectively]. Between the years 2015 and 2018, this trend was found to shift downward, with both inclusion states and exclusion states exhibiting decreasing numbers of Medicare patients receiving gender-affirming surgery [–4.83 (95% CI, –8.79 to –0.87)  $P < 0.01$ ; –9.61 (95% CI, –15.83 to –3.40)  $P < 0.01$ , respectively] (Table 4).

## DISCUSSION

In this current study, we aimed to demonstrate an unequivocal temporal relationship between legislative advancements in advocating for transgender care and when such care was being actuated and delivered. To demonstrate causation, we examined the relationship between different legislative and geographical settings. Insurance types within these settings served as internal controls. To accurately accomplish these goals and to ensure literature cross comparability, we canvassed the NIS using the same group of codes as published by Canner et al<sup>6</sup> in a landmark 2018 *JAMA Surgery* article. Beyond federal guidance and mandates, we suspected that the most sensitive impact on transgender surgical care utility would manifest locally in response to state-specific mandates, since, as also reported by Canner et al,<sup>6</sup> most transgender patients are covered under private insurance or Medicaid (Table 2), both of which strictly conform to state regulations. Specifically, divisions 1 and 2 (inclusion states) mandate explicit inclusion of gender-affirming care, whereas divisions 6 and 7 (exclusion states) mandate explicit exclusion or have no explicit statement of gender-affirming care. We rationalized that if any difference could be detected, comparison of these two polar-opposite groupings would enable us to see it. Furthermore, while Medicaid and private insurance are stipulated at the state level, self-pay and Medicare are far less influenced by state legislations, therefore serving as convenient internal controls. As such, we found an astonishing increase in the utility of gender-affirming surgery in inclusion states not only when compared with the same insurance type cohort in exclusion states, but also when compared with their internal control of Medicare and self-pay patients from the same inclusion states. In addition, the up-trending curve of Medicaid and private insurance patients in inclusion states diverged from all the rest of the curves (Fig. 3). This started in 2015, just when the most populous inclusion states, such as Massachusetts, Connecticut, New York, New Jersey, and Pennsylvania, began implementing their inclusive transgender care mandates (Table 1). These findings were quantified with our interrupted time series analysis, which demonstrated that patients covered under Medicaid and private insurance in inclusion states were significantly more likely to receive gender-affirming surgery in 2016 and in the years thereafter. On the contrary, patients in inclusion states utilizing Medicare and self-pay to cover their gender-affirming surgery did not show a significant increase in the utility of gender-affirming surgery in response to these state legislations (Table 3). These findings are remarkable in that within the same geographical region, presumably with similar cultural and political demographics, only the population covered by state-dependent insurance carriers would show any uptick in utilization of transgender surgical care if there were state legislative mandates to do so, and only in a fashion that is temporally related to when such mandates were rolled out.

Admittedly, we also noted a relatively smaller and more transient increase in the overall number of patients receiving gender-affirming procedures among exclusion states. Reasons for this increase may be several-fold, such as the



**Fig. 2.** TS/GID diagnosis versus gender-affirming surgery utility. The number of patients diagnosed with TS or GID has increased significantly over the past several years. Increases in gender-affirming surgery were seen as well.

**Table 2. Patient Demographics**

Variable	Description	Value (%)
Patients		79,440
Age	Years (SD)	35.6±17.6
Sex category	Male	39,430 (49.6)
	Female	35,235 (44.4)
	Missing	4775 (6.0)
Gender-affirming surgery	Yes	7287 (9.2)
	No	72,153 (90.8)
Type of gender-affirming procedure	Genital reconstruction	4925 (67.5)
	Chest reconstruction	1085 (14.9)
	Abdominal surgery (ie, hysterectomy)	1145 (15.7)
	Other gender-affirming surgery	2300 (31.5)
Primary payer	Medicare	16,655 (21.0)
	Medicaid	24,195 (30.5)
	Private insurance	26,995 (34.0)
	Self-pay	7415 (9.3)
	No charge	555 (0.7)
	Other	3290 (4.1)
Length of stay	Missing	325 (0.4)
	Median (IQR), days	4 (2–7)

elevated number of Medicare patients receiving gender-affirming surgery in 2015, as seen in Figure 4, in response to the aforementioned 2014 federal legislation. A smaller contributor could also be the indirect effect of that legislation on increased overall cultural awareness of transgender surgical care, even in states where legislative and

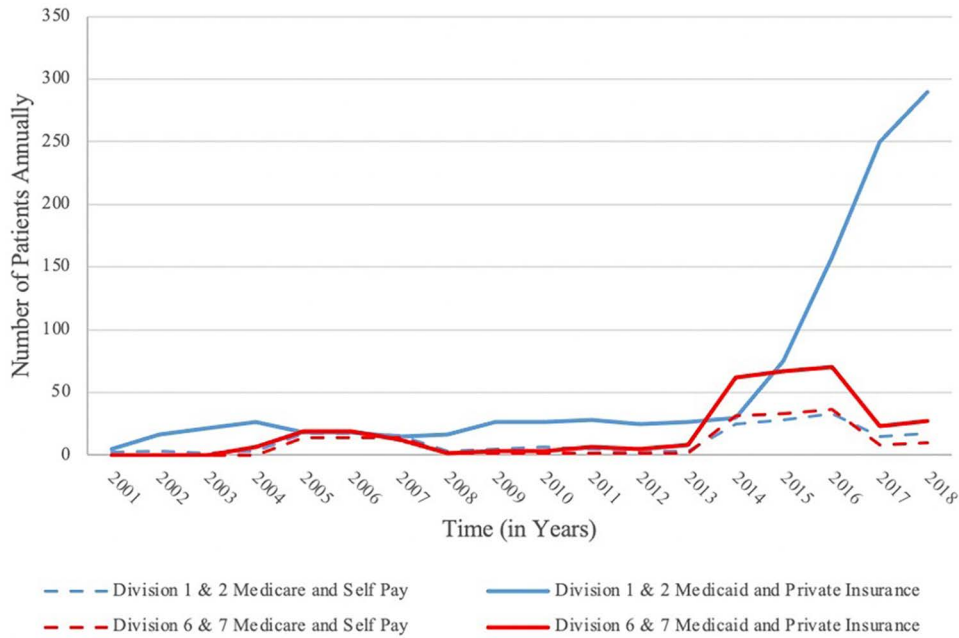
cultural inclines may be more conservative. Underpinned by the same rationale, a nearly identical jump in 2015 was also seen among Medicare patients among inclusion states. This trend is understandably similar as Medicare is a national healthcare plan, and legislative changes apply equally across all states. These increases fall in line with the lift of Medicare exclusions on gender-affirmation-related care in late June 2014 and implementation in 2015.<sup>10</sup>

Unexpectedly, transgender healthcare in exclusion states showed a small but notable increase followed by a swift decrease in utility of Medicaid/private insurance-covered gender-affirming surgery among the most recent years studied (Fig. 3), a region-specific situation that proved seemingly difficult to explain. Upon closer examination of the raw data, we noticed that this short-lived blip in exclusion states could be traced to a possible aberrancy from one specific state. Additional research delving into region-specific legislation that may have impacted gender-affirming surgery coverage within this area may be necessary to analyze the idiosyncrasies that influenced surgical coverage in that particular circumstance. Despite this aberrancy, the utility of gender-affirming surgery among exclusion states demonstrated a much lower number of patients receiving gender-affirming surgery as compared with inclusion states. Therefore, region-specific legislation

**Table 3. Interrupted Time Series Analysis Analyzing the Impact of All Policy Changes in the Year 2016 and the Time Thereafter**

Insurance	Division	Coefficient	Estimate	CI	P	
Medicare and self-pay	1 and 2	Policy change	-10.93	-76.01	54.14	0.72
		Time since	1.04	-27.73	29.82	0.94
Medicaid and private insurance	1 and 2	Policy change	79.13	35.59	122.66	<0.01
		Time since	68.73	49.48	87.98	<0.01
Medicare and self-pay	6 and 7	Policy change	-21.60	-103.97	60.77	0.58
		Time since	0.33	-36.10	36.75	0.99
Medicaid and private insurance	6 and 7	Policy change	-45.10	-183.41	93.21	0.50
		Time since	-17.35	-55.55	66.78	0.85

Note: We used policy changes beginning in 2016, since time estimates impact from years 2016–2018.



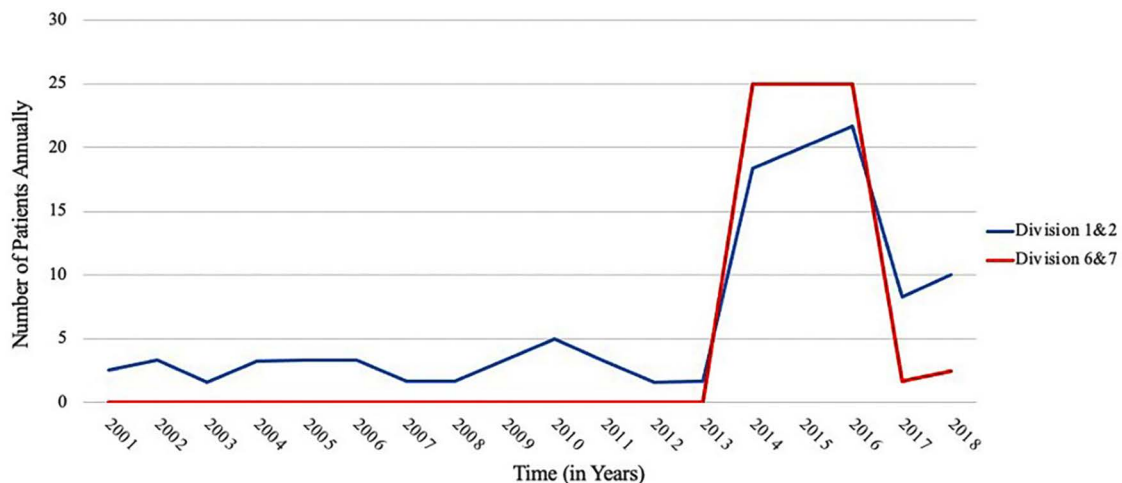
**Fig. 3.** Gender-affirming surgery utility by payer type. The number of patients utilizing Medicaid and private insurance to pay for gender-affirming surgery was shown to drastically increase among hospital census divisions 1 and 2 as compared with hospital census divisions 6 and 7. On the contrary, the number of patients utilizing Medicare and self-pay to pay for gender-affirming surgery remained relatively similar among hospital census divisions 1 and 2 and 6 and 7, with a less significant increase in recent years.

may have a profound impact on transgender patients’ access to gender-affirming surgery.

A small increase in the utility of gender-affirming care among self-pay patients in inclusion states was also noted. This may be due to cohort effects, arising from the culturally liberal nature of Northeastern states, better care access in those states,<sup>13</sup> or a response to the nationwide loosening of federal restrictions on gender-affirming care.

Interestingly, analysis of Figure 4 highlights that the increase in Medicare patients seeking gender-affirming

surgery largely dissipated after 2015 (as quantified in Table 4). It is known that Medicare only covers patients who are older than 65 or those who are disabled, both patient demographic strata with a comparatively lower likelihood to seek gender-affirming surgery (corroborated in Table 2). With an out-of-gate phenomenon in response to the novel 2014 legislation, we postulate that this transient increase in gender-affirming procedures might have covered many of these patients in 2015 who had been waiting (many for their whole lives) for pertinent coverage.



**Fig. 4.** Gender-affirming surgery among Medicare recipients. Among patients using Medicare as their payer for gender-affirming surgery, the temporal trend among patients in divisions 1 and 2 as compared with 6 and 7 remained relatively similar. A large spike in utility was seen in 2015, after the US Department of Health and Human Services overturned the prohibition on Medicare coverage of gender-affirming surgery in 2014.

**Table 4. Interrupted Time Series Analysis Analyzing Solely the Federal Impact of Medicare Policy Change in the Year 2015 and the Time Thereafter**

Division	Regression Coefficient	Estimate	CI	P
1 and 2	Policy change	19.37	7.76 30.98	<0.01
	Time since	-4.83	-8.79 -0.87	0.02
6 and 7	Policy change	29.57	11.35 47.79	<0.01
	Time since	-9.61	-15.83 -3.40	<0.01

Note. We used policy change beginning in 2015, since time estimates impact years 2015–2018.

We suspect that this trend will continue as increased insurance coverage and societal acceptance allow more patients to receive gender-affirming care before reaching the age of 65.

The management of transgender patients continues to evolve across the United States, and legislative changes have shifted significantly in the last decade to adapt to the needs of these patients. Although transgender patients are now widely accepted socially and politically, more work must be done to ensure that this patient population is not disadvantaged simply due to the state in which they reside and its corresponding legislature.

Due to the nature of this study, several limitations must be addressed. Insurance coverage is an incredibly heterogeneous topic as it pertains to who can receive coverage (ie, minors) as well as the type of gender-affirming procedures that are covered. Moreover, the social, political, and economic differences among states may impact both patient and provider ability to receive and offer gender-affirming care, respectively. Although these limitations likely have an impact on the accessibility of care within individual states, our paper is among the first to broadly show the impact of expansion of coverage for gender-affirming surgery on their utility within specific regions of the United States. Although our findings do not prove a direct causal effect relationship between coverage-expanding legislations and delivery of the covered services in transgender care, we have established not only an unequivocal temporal relationship between the two but also a definitive geographically dependent and insurance-related response in such care delivery to those pertinent legislations on multiple levels.

Still, our results highlight that a large degree of disparity remains within regions of the United States, likely secondary to societal acceptance and political legislation within these areas. As transgender healthcare-inclusive reform continues to grow and equality prevails among societal norms nationwide, we hope that policymakers and governing bodies will ensure that insurance coverage continues to adapt to allow for gender-affirming surgery coverage across state lines, for all patients alike.

## CONCLUSIONS

We have, in this study, unequivocally demonstrated significant impacts of relevant legislative initiatives on the delivery of transgender care. Given the work that still remains to be done for the transgender community, we aim for our findings to serve as evidence on the effectiveness of legislative approaches, both at state and federal levels, to ensure expanded transgender care.

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## REFERENCES

- Baker KE. The future of transgender coverage. *N Engl J Med*. 2017;376:1801–1804.
- Cooper K, Russell A, Mandy W, et al. The phenomenology of gender dysphoria in adults: a systematic review and meta-synthesis. *Clin Psychol Rev*. 2020;80:101875.
- Morrison SD, Chen ML, Crane CN. An overview of female-to-male gender-confirming surgery. *Nat Rev Urol*. 2017;14:486–500.
- Safa B, Lin WC, Salim AM, et al. Current concepts in feminizing gender surgery. *Plast Reconstr Surg*. 2019;143:1081e–1091e.
- Weissler JM, Chang BL, Carney MJ, et al. Gender-affirming surgery in persons with gender dysphoria. *Plast Reconstr Surg*. 2018;141:388e–396e.
- Canner JK, Harfouch O, Kodadek LM, et al. Temporal trends in gender-affirming surgery among transgender patients in the United States. *JAMA Surg*. 2018;153:609–616.
- Defreyne J, Motmans J, T'sjoen G. Healthcare costs and quality of life outcomes following gender affirming surgery in trans men: a review. *Expert Rev Pharmacoecon Outcomes Res*. 2017;17:543–556.
- Padula WV, Heru S, Campbell JD. Societal implications of health insurance coverage for medically necessary services in the U.S. transgender population: a cost-effectiveness analysis. *J Gen Intern Med*. 2016;31:394–401.
- Movement Advancement Project. Healthcare Laws and Policies: Medicaid Coverage for Transition-Related Care. Available at <https://www.lgbtmap.org/img/maps/citations-medicaid.pdf>. 2020. Accessed February 10, 2022.
- American Medical Association. *Health Insurance Coverage for Gender-Affirming Care of Transgender Patients*. Chicago, IL: American Medical Association. 2019.
- Agency for Healthcare Research and Quality R, MD. HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP). 2020. Available at [www.hcup-us.ahrq.gov/nisoverview.jsp](http://www.hcup-us.ahrq.gov/nisoverview.jsp). Accessed April 25, 2021.
- Team RC. R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing. 2013. Available at <http://www.R-project.org/>. Accessed June 27, 2021.
- Dagi AF, Boskey ER, Nuzzi LC, et al. Legislation, market size, and access to gender-affirming genital surgery in the United States. *Plast Reconstr Surg Glob Open*. 2021;9:e3422.