State Health Services Plan Task Force
May 30th, 2024
Time 9:00 a.m.
Perimeter Center, Board Room 2
9960 Mayland Drive
Henrico, VA 23233

Task Force Members in Attendance In-Person – Entire Meeting (alphabetical by last name): Jeannie Adams; Dr. Kathy Baker; Dr. Keith E. Berger; Karen Cameron; Carrie Davis; Michael Desjadon; Paul Dreyer; Amanda Dulin; Dr. Thomas Eppes, Jr.; Paul Hedrick; Shaila Camile Menees.

Task Force Members in Attendance Virtually – Entire Meeting: Rufus Phillips.

Staff in Attendance (alphabetical by last name): –Erik O. Bodin, COPN Director, VDH OLC; Michael Capps, Senior Policy Analyst, VDH Office of Governmental and Regulatory Affairs; Allyson Flinn, Policy Analyst, VDH OLC; Joseph Hilbert, Deputy Commissioner of Governmental and Regulatory Affairs, VDH; Val Hornsby, Policy Analyst, VDH OLC; Dr. Karen Shelton, State Health Commissioner, VDH.

Dr. Marilyn West joined the meeting virtually at 9:07 am and left the meeting at 10:47 am.

1. **Call to Order and Welcome**

   Dr. Thomas Eppes, Jr. called the meeting to order at 9:04 a.m. Dr. Eppes reminded the meeting members that private conversations would be picked up by the microphones in the room.

2. **Roll Call**

   Allyson Flinn called the roll of the members. Ms. Flinn noted that Rufus Phillips had joined the meeting virtually, and that Kyle Elliott and Dr. Marilyn West would be joining the meeting virtually.

3. **Review of Mandate**

   Ms. Flinn reviewed the statutory mandate within § 32.1-102.2:1 of the Code of Virginia and Chapter 423 of the 2024 Acts of Assembly.

4. **Review of Agenda**

   Joseph Hilbert reviewed the agenda.

5. **Approval of Meeting Minutes from March 8 Meeting**

   The minutes from the March 8, 2024 meeting were reviewed. Michael Desjadon made a motion to amend the minutes by changing the adjournment at 12:10 a.m. to p.m.

Amanda Dulin seconded the amendments and the motion passed unanimously by voice vote. The meeting minutes as amended were approved without objection.

6. Adoption of Updated Remote Participation Policy

Ms. Flinn reviewed the amendments to the remote participation policy. Karen Cameron motioned to adopt the updated remote participation policy with Dr. Eppes seconding that motion. The policy was adopted unanimously by voice vote.

7. Presentation from the Department of Behavioral Health and Developmental Services

Nelson Smith, Commissioner for the Department of Behavioral Health and Developmental Services presented to the Task Force on the following topics: (i) Governor Youngkin's *Right Help, Right Now Plan* and its Crisis Pillar, (ii) an update on the *Right Help, Right Now* plan, (iii) Public and Private Psychiatric Bed Estimates, (iv) Temporary Detention Orders, (v) Psychiatric Bed Capacity, and (vi) a Nationwide COPN Overview.

There was discussion regarding the licensure of crisis centers, exclusionary criteria, private vs public bed capacity, the effectiveness of crisis centers in keeping people from requiring inpatient care, school education initiatives, the number of crisis stabilization centers and the capacity of those centers, and the 988 number.

8. Review of Meeting Materials

Ms. Flinn reviewed the meeting materials with the Task Force, concluding the review with a brief overview of VDH's data observations. There was discussion about the most recent COPN denial for a psychiatric project, and the regulation of state hospitals in Oregon.

9. Public Comment Period

Two members of the public signed up to give public comment, Brent Rawlings from the Virginia Hospital and Healthcare Association and Clark Barrineau from the Medical Society of Virginia regarding the Task Force's upcoming votes on recommendations.

10. Psychiatric Beds and Services & Expedited Review

10.1. Staff Presentation

Ms. Flinn discussed the break-out session groups with the Task Force and requested that Mr. Desjadon move from Group 1 to Group 3 due to absences, to which Mr. Desjadon agreed.

There was discussion regarding the mandate found in Chapter 423 of the 2024 Acts of Assembly, the future meeting schedule, and the options for consideration by the Task Force.

10.2. Breakout Sessions

Dr. Eppes announced that the Task Force members would be breaking into three smaller groups for breakout sessions. Ms. Flinn explained that Task Force members would go across the hall the hearing rooms according to which group they had been randomly assigned.

Group 1 – Hearing Room 4

Group 1 consisted of Jeannie Adams, Dr. Kathy Baker, and Paul Hedrick.

The breakout group discussions consisted of the interest in closing the loop that allows a psychiatric beds to be converted to a non-psychiatric bed, the ability for members of the public to voice their opinions on expedited projects, the acceptance of TDOs by private hospitals and the potential to condition COPNs on that, the difference between civil TDOs and forensic TDOs, and general discussion regarding the current COPN landscape in Virginia. The group then ended its breakout session and returned to Board Room 2.

Group 2 – Hearing Room 3

Group 2 consisted of Dr. Keith Berger, Carrie Davis, Shaila Camile Menees, and Amanda Dulin

The breakout group discussions consisted of the concerns with psychiatric staffing, the merits of COPN and its ability to regulate the market, COPN deregulation, an increase in the number of application batch cycles, the unregulated conversion of psychiatric beds to non-psychiatric beds, the interest in ensuring expedited projects include a charity care requirement, the complexities of TDOs and the acceptance of them by facilities, and general discussion regarding economic arguments for COPN regulations. The group then ended its breakout session and returned to Board Room 2.

Group 3 – Hearing Room 2

Group 3 consisted of Paul Dreyer, Karen Cameron, Dr. Thomas Eppes, Jr., and Michael Desjadon

The breakout group discussions consisted of the current efforts aimed at addressing the behavioral health crisis in Virginia, whether COPN plays a role in regulating the market, what barrier, if any, COPN introduces for psychiatric care, the staffing of psychiatric beds and potential shortages that may exist, the staff time and resources it takes to review applications, concerns surrounding the current expedited process and its lack of public participation, whether a recommendation should include a request for the General Assembly to fund the regional health planning agencies that have shut down, the addition of a batch cycle for expedited review projects, and the reasons for why a project should be

moved from expedited review into full review. The group then ended its breakout session and returned to Board Room 2.

10.3. Group Discussion

Dr. Eppes called the Task Force back for a group discussion at 11:42 am. Dr. Kathy Baker gave the group 1 report. Option 1 & Option 2 opposed, Option 3 support on caveat of 90-day extension of expedited review, Option 4, 5, and 6 support, Option 7 oppose, Option 8 highly support, Option 9 oppose at face value, but need more information, Option 10 support, but not as a mandate, Option 11 & 12 support, and Option 13 need more information, but had discussion on diagnostic imaging.

Shaila Menees gave the group 2 report. With option 1 3 group members support and 1 would like to repeal COPN, option 2 maybe add another cycle for psychiatric services rather than expedited review, option 3 and 4 similar proposition to option 2, option 5 support, option 6, 7, and 8 3 group members oppose and 1 would like to repeal COPN, option 9 support, option 10 need more information regarding accepting TDOs, option 11 support, option 12 oppose, option 13 need more information and there was further discussion on conversion from psychiatric to medical-surgical beds.

Mr. Desjadon gave the group 3 report with the following options and reasonings – Option 1 support, option 2 table for further discussion, option 3 support, option 4 support with caveat of in the same PD, option 5 support, option 6 support with caveat of in the same PD, option 7 no consensus, option 8 support, options 9 & 10 support, option 11 tabled for further discussion, option 12 support, option 13 tabled, option 14 discussion of addition of batch cycle.

There was discussion regarding the fiscal and staffing impacts the presented options would have, the scope of each proposed change, and potential impacts of the various proposed options.

11. Wrap-Up and Next Steps

Mr. Hilbert requested that the Task Force members fill out the worksheets when they are sent to them in order to prepare them for the next meeting. Dr. Keith E. Berger handed out two documents to the Task Force members for their review (these can be viewed at the end of this document). Dr. Eppes proposed a July 12th all-virtual meeting to vote on the options for recommendation.

12. Meeting Adjournment

The meeting adjourned at 12:22 p.m.

VDH VIRGINIA DEPARTMENT OF HEALTH

State Health Services Plan Task Force

May 30, 2024 Meeting

Task Force Mandate

- § 32.1-102.2:1. State Health Services Plan; Task Force
- The Board of Health shall appoint and convene a State Health Services Plan Task Force for the purpose of advising the Board on the content of the State Health Services Plan (SHSP)
- Provide recommendations related to:
  - Periodic revisions to the SHSP
  - Specific objective standards of review for each type of medical care facility of project type for which a certificate of public need is required
  - Project types that are generally noncontested and present limited health planning impacts
  - Whether certain projects should be subject to expedited review rather than full review process
  - Improvements in the certificate of public need process

Task Force Mandate – Cont

- Chapter 423 of the 2024 Acts of Assembly
- Develop recommendations on expedited review of project types subject to certificate of public need (COPN) requirements that are generally non contested and present limited health planning impacts. The Task Force shall also create recommendations regarding:
  - What facilities and projects listed in § 32.1-102.1:3 of the Code of Virginia should be added to the expedited review process;
  - Criteria that should apply to any project types subject to expedited review; and
  - A framework for the application and approval process of such projects.
- Project types for consideration shall include:
  - Increases in inpatient psychiatric beds;
  - Relocation of inpatient psychiatric beds;
  - Introduction of psychiatric services into an existing medical care facility; and
  - Conversion of beds in an existing medical care facility to psychiatric inpatient beds.
- Report findings to the the Secretary of Health and Human Resources, the Chairman of the Senate Committee on Education and Health, and the Chairman of the House Committee on Health and Human Services by November 1, 2024

Review of the Agenda

Approval of Prior Meeting Minutes

Adoption of Updated Remote Participation Policy

- Chapter 56 of the 2024 Acts of Assembly amended § 2.2-3708.3 of the Code of Virginia, requiring an update to the Task Force's Remote Participation and All-Virtual Meeting Policy. The updates to conform to the mandate are as follows:
  - Inserted a provision on page 1 section 1.0 to require the Task Force to update its Remote Participation and All-Virtual Meeting Policy annually.
  - Inserted a provision on page 3 section 6.0 to make any member absent from any portion of the meeting during which visual communication with the member is voluntarily disconnected or otherwise fails or during which audio communication involuntarily fails, when audio-visual technology is available.
  - Amended the provision on page 4 section 7.1, changing the all-virtual meeting allowance from 25 percent to 50 percent of the meetings held per calendar year.

Presentation – Nelson Smith, Commissioner, Virginia Department of Behavioral Health & Developmental Services

Break

Review of Meeting Materials

Meeting materials

- Tableau Dashboard
- Past Legislative Efforts
  - Spreadsheet & One-pager
- State Comparison Data
  - Spreadsheet
- Process Change Analysis
- Analysis on the Impacts of Medicaid Expansion on Psychiatric Services

Data Observations

- Virginia has an estimated total of 17,186 staffed hospital beds, with Medical-surgical and Pediatric beds having the lowest staffing rates (73% and 65%)*
  - Adult ICU - 1,673
  - Adult psychiatric - 2,795
  - Alcohol/Drug - 66
  - Medical Rehabilitation - 960
  - Medical-Surgical - 9,457
  - Obstetric - 1,172
  - Pediatric - 388
  - Pediatric ICU - 188
  - Pediatric psychiatric - 487
- Virginia private hospitals staff almost all of their licensed beds
  - 83% of all licensed beds in the Commonwealth are staffed
  - 90% of all adult psychiatric beds are staffed
    - 92% of all pediatric psychiatric beds are staffed
  - Southwest Virginia has the lowest percentages of licensed beds staffed

*Bed count includes psychiatric beds found in state hospitals

Data Observations – Cont.

- TDO admissions for state hospitals have decreased, but admissions at private hospitals have stayed relatively consistent
  - Increase in wait time for TDO bed has led to overall decrease in TDOs
  - In FY23, state hospitals admitted 1920 TDOs while private hospitals admitted an estimated 18,335 TDOs
- COPN projects for psychiatric services are rarely denied in Virginia
  - Since SFY2013, there have been 38 decisions for psychiatric services
    - 35 were approved (673 beds)
    - 3 were denied (147 beds)
      - One was ultimately approved when resubmitted (33 beds)

Data Observations – Cont.

- COPN expedited review processes vary from state to state
  - Average review time of 47 days nationally
  - 20 states have expedited review, with 6 of those having some form of public participation
  - Most common projects types are non-substantial change, capital expenditures under certain amounts, and emergency projects
  - 3 states specifically include psychiatric projects in their expedited review processes
    - Kentucky - Change of location or relocation of beds to a psychiatric treatment facility for a proposal that involves an application to establish an inpatient psychiatric unit in an existing licensed acute care hospital
    - Michigan - Acquisition of a psychiatric hospital or replacement of a psychiatric hospital in new construction or contiguous space not currently licensed as part of the existing health facility
    - Oregon - Development of a new Oregon State Hospital facility

Public Comment Period

Break Out Session

Break out groups

Group 1	Group 2	Group 3
Jeannie Adams	Dr. Keith Berger	Paul Dreyer
Dr. Kathy Baker	Carrie Davis	Karen Cameron
Maribel Ramos	Shaila Camile Menees	Dr. Thomas Eppes, Jr.
Paul Hedrick	Amanda Dulin	Dr. Marilyn West
Michael Desjadon		Kyle Elliott

Break

Discussion

Wrap-Up and Next Steps

Meeting Adjournment

DBHDS

Governor Youngkin's *Right Help, Right Now* and status of Virginia Psychiatric Inpatient Beds

State Health Facilities Task Force

Nelson Smith, Commissioner
Department of Behavioral Health & Developmental Services

May 30, 2024

Governor Youngkin's *Right Help, Right Now* Plan

1. Ensure same-day care for individuals experiencing behavioral health crises
2. Relieve law enforcement's burden and reduce the criminalization of mental health
3. Develop more capacity throughout the system, going beyond hospitals, especially community-based services
4. Provide targeted support for substance use disorder and efforts to prevent overdose
5. Make the behavioral health workforce a priority, particularly in underserved communities
6. Identify service innovations and best practices in pre-crisis prevention services, crisis care, post-crisis recovery and support and develop tangible and achievable means to close capacity gaps

Pillar 1: Crisis

988 SUICIDE & CRISIS LIFELINE
24/7 CALL, TEXT, CHAT

Call Center
- *Standardized risk assessment*

Dispatch
- *Clinician or former 911 dispatcher*
- *Reviews call Conducts assessment*

Resolve on Phone

Mobile Crisis
- *Voluntary service*
- *Resolves 70% of calls*

30% of calls

911
- *Life threatening emergencies*
- *Backup to mobile crisis*

Virginia 988:

80% resolved on the phone through 988	70% resolved in the field through mobile crisis	65% discharged to the community from crisis receiving centers

- Crisis Now

Pillar 1: Crisis

988

New 988va.org website

- 988 is like 911 for mental health concerns.
- Anyone in mental distress can call or text 988 and trained crisis call center staff will help right away.
- Virginia averages about 8,000 calls per month
- About 80% of calls to 988 can be resolved on the phone

988 SUICIDE & CRISIS LIFELINE

- National and Virginia marketing is under-way to spread the word

The Behavioral Health Services of Virginia Mobile Crisis Response team works 24 hours a day, seven days a week helping people experiencing a mental health, substance use, or suicide crisis. – WTVR, July 23, 2023

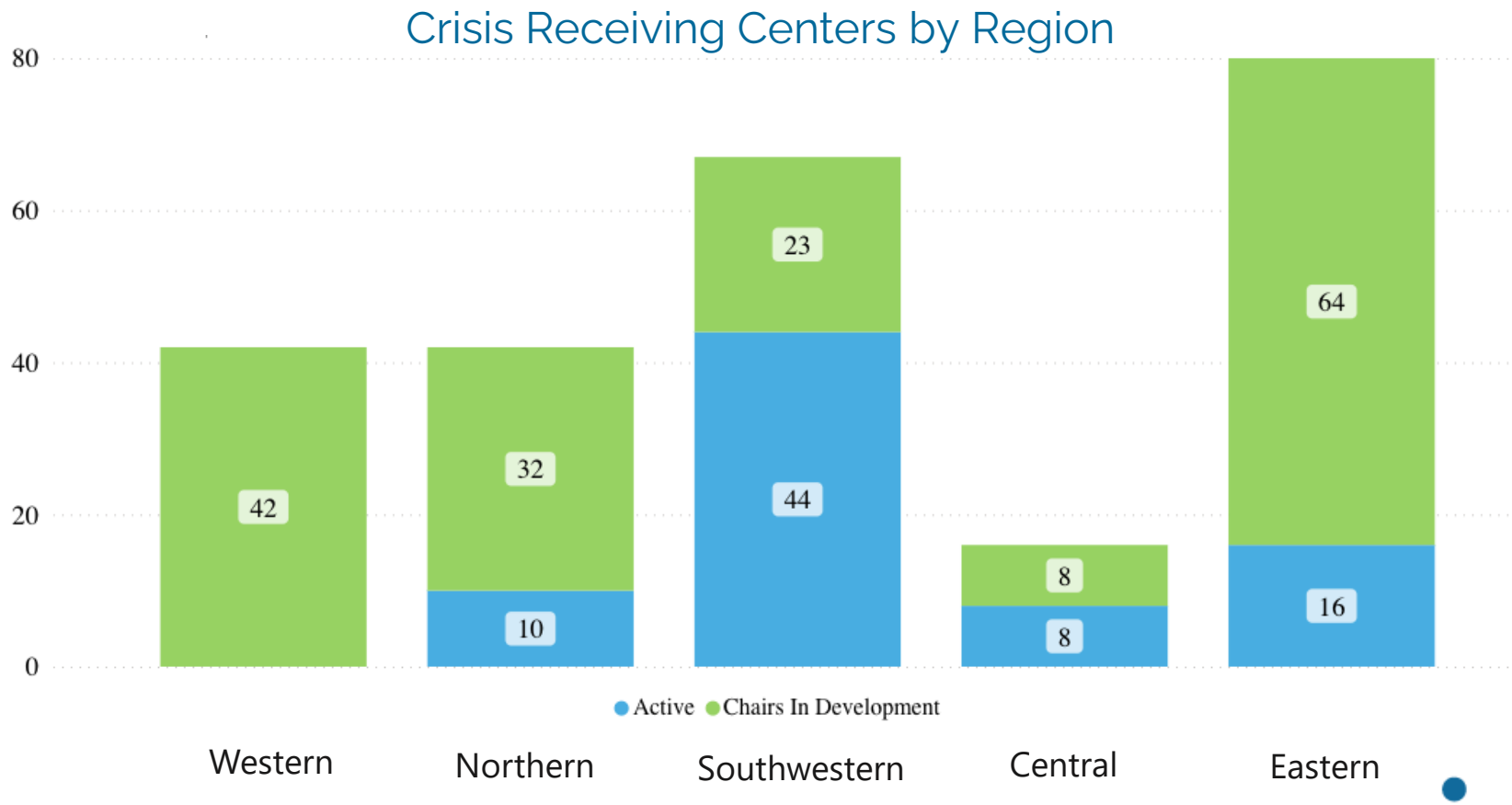
Mobile Crisis

- Teams are deployed by 988 or regions to race directly to people in crisis.
- Mobile crisis teams can resolve 70% of the cases they handle
- Virginia now has 98 mobile crisis teams.
- The goal is 140 teams across Virginia

Pillar 1: Crisis

Crisis Receiving Centers/ Crisis Stabilization Units

- Community stabilization of mental health crises for walk-ins, ambulance, fire and police drop-offs
- Stabilize crises and safely discharge about 65% of individuals without needing longer-term inpatient care
- Virginia currently has 236 active beds and chairs, with 307 more in development
- More projects will be underway later in 2024



RHRN Update

WS 2: Alleviating Law Enforcement Burden

- Advances in alternative custody and alternative transportation
- Statewide surveys shows positive impacts of the alternative transportation program

WS 3: Building Capacity

- Developing strategies and seeking feedback on regulatory process, peer-to-peer support, evaluative and redesign conversations specific to hospital discharges and readiness, and emphasizing school-based services

WS 4: Substance Use Disorders

- Increasing availability of Naloxone
- Assessing the needs for community SUD services

WS 5: Workforce

- Collecting baseline data
- Developing strategies, particularly in underserved areas

WS 6: Innovation

- Implementing legislation to mandate commercial insurance for mobile crisis and residential crisis
- Reprocuring of the Medicaid MCOs

For more details about Right Help, Right Now: www.hhr.virginia.gov

Public and Private Psychiatric Bed ESTIMATES

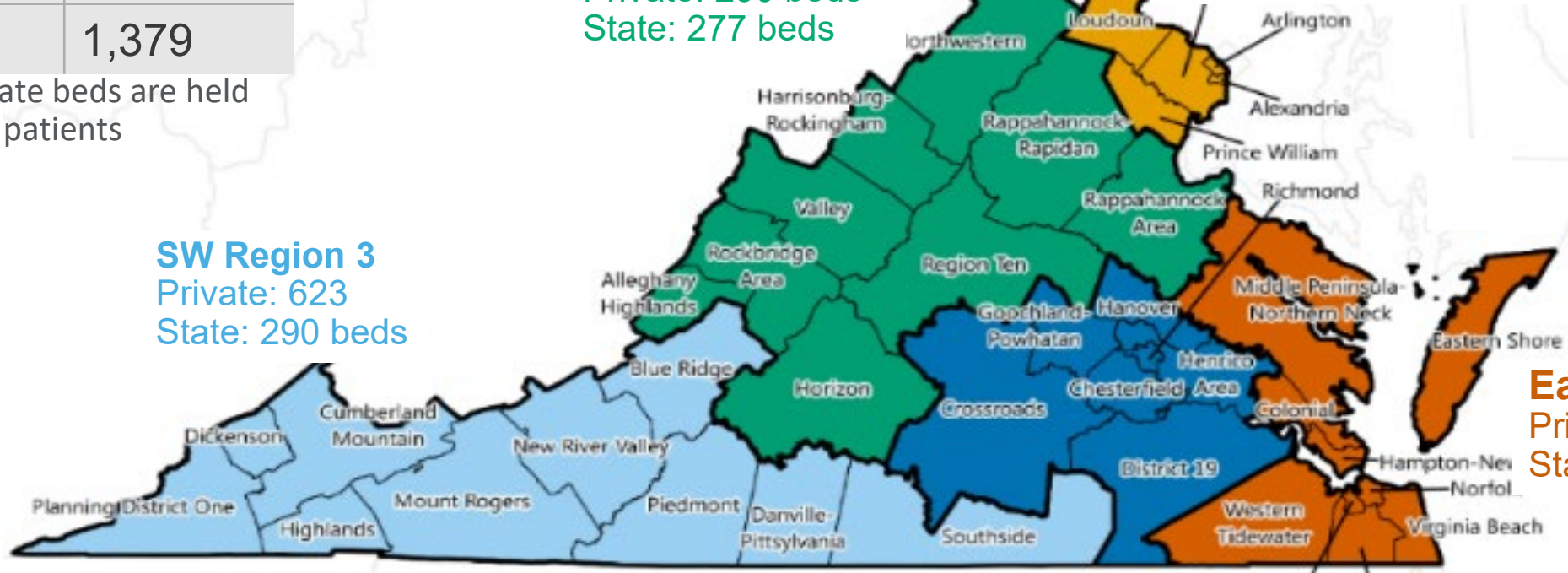
Statewide Totals	
Private	2,075
State	1,379

63.6% of state beds are held by forensic patients

Western Region 1
Private: 290 beds
State: 277 beds

Northern Region 2
Private: 243 beds
State: 139 beds

SW Region 3
Private: 623
State: 290 beds



Eastern Region 5
Private: 366 beds
State: 307 beds

Central Region 4
Private: 553 beds
State: 366 beds

Notes: Private psych beds licensed by DBHDS as of April 2022; not all private beds may be open. 25 children's state beds divided equally among regions. Excludes max security; totals artificially high as forensic patients are included in the bed count

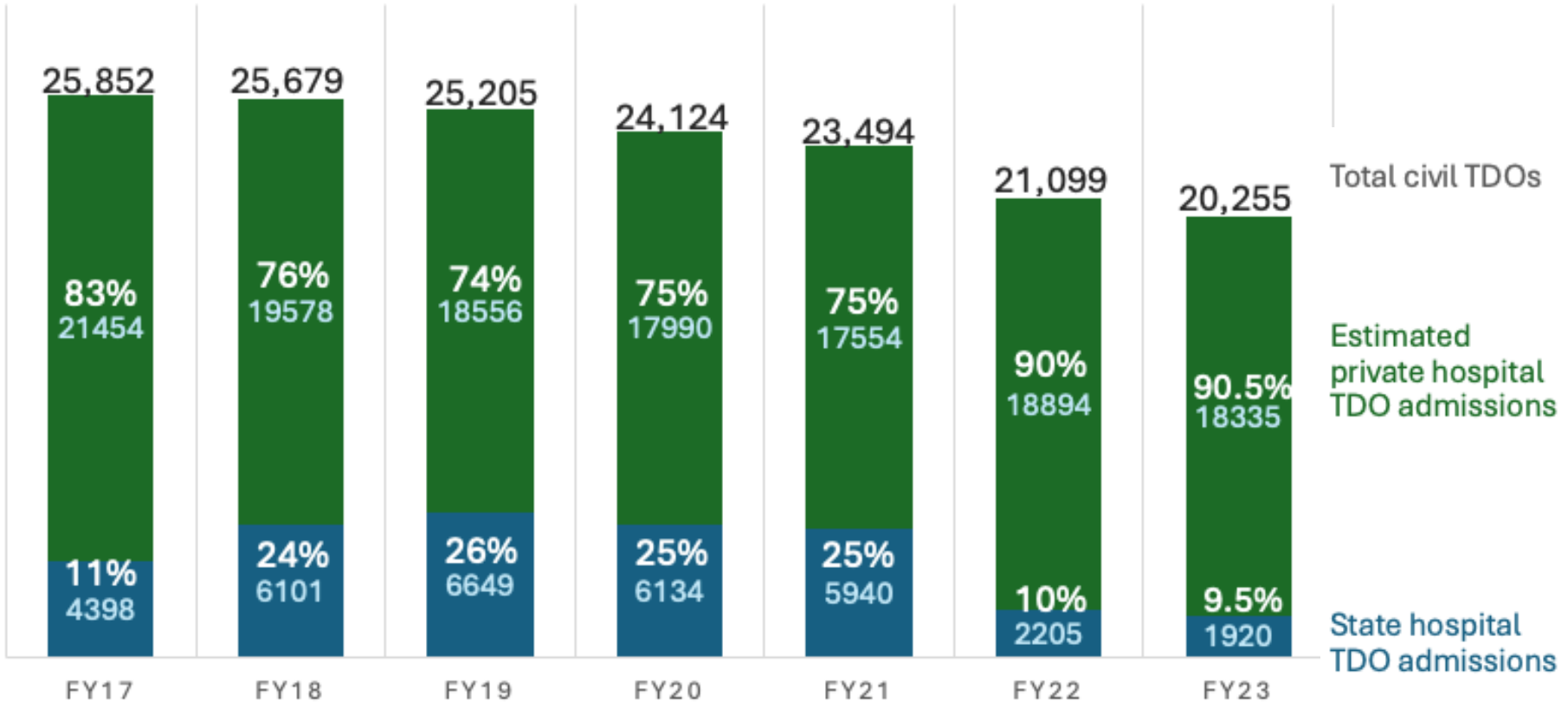
State Hospital Census (May 2024)

	Total Capacity	Current Census	% Current Utilization	% Current Forensic Beds
Catawba (adult and geriatric)	110	103	94%	26%
Central State (excluding VA's only max security unit)	166	165	99%	84%
Eastern State (adult and geriatric)*	302	270	96%	89%
Northern VA Mental Health Institute	134	135	101%	50%
Piedmont (all geriatric)	123	112	91%	17%
Southern VA Mental Health Institute	72	62	86%	77%
SW VA Mental Health Institute (adult and geriatric)	175	164	94%	27%
Western State	272	265	97%	72%
Commonwealth Center for Children & Adolescents	25	25	100%	--

* Eastern State has 22 of its 302 beds offline for a renovation project

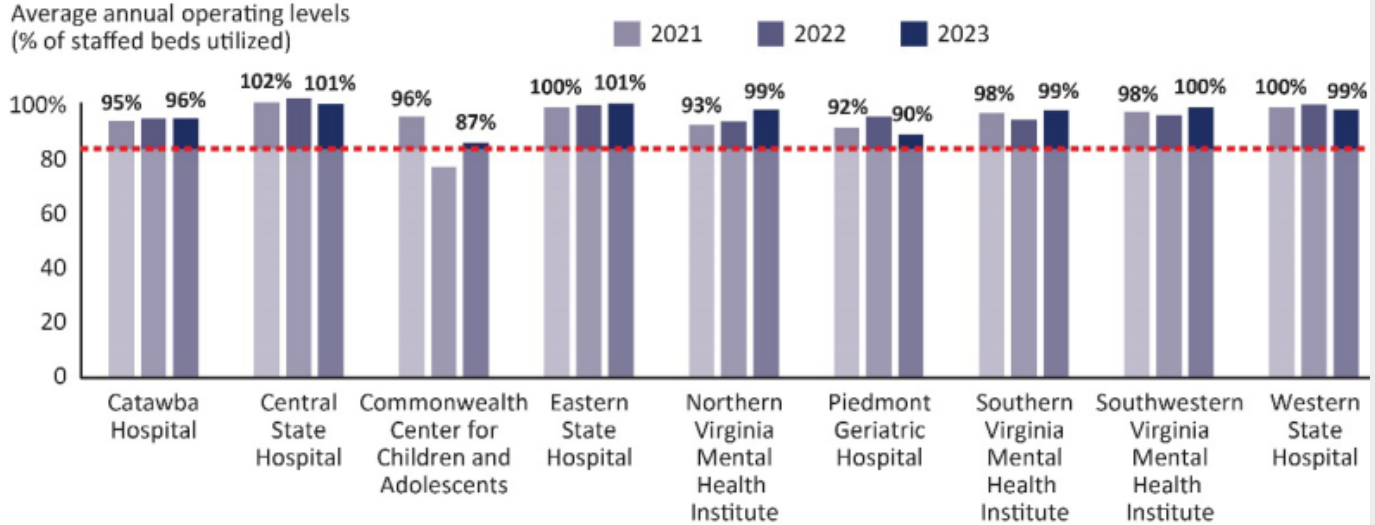
Temporary Detention Orders (TDOs)

- TDO numbers skyrocketed in 2014 with new Bed of Last Resort laws, but % of private TDO admissions dropped.
- Staffing crisis in the pandemic caused many state hospital beds to close.
- Since wait times for TDO beds began increasing, total numbers of TDOs has declined.
- Private hospitals average 18,265 TDO admissions over the last 5 years.
- Reduction of state hospital civil TDO admissions, but forensic admissions increased **93%** from FY14 – FY23.

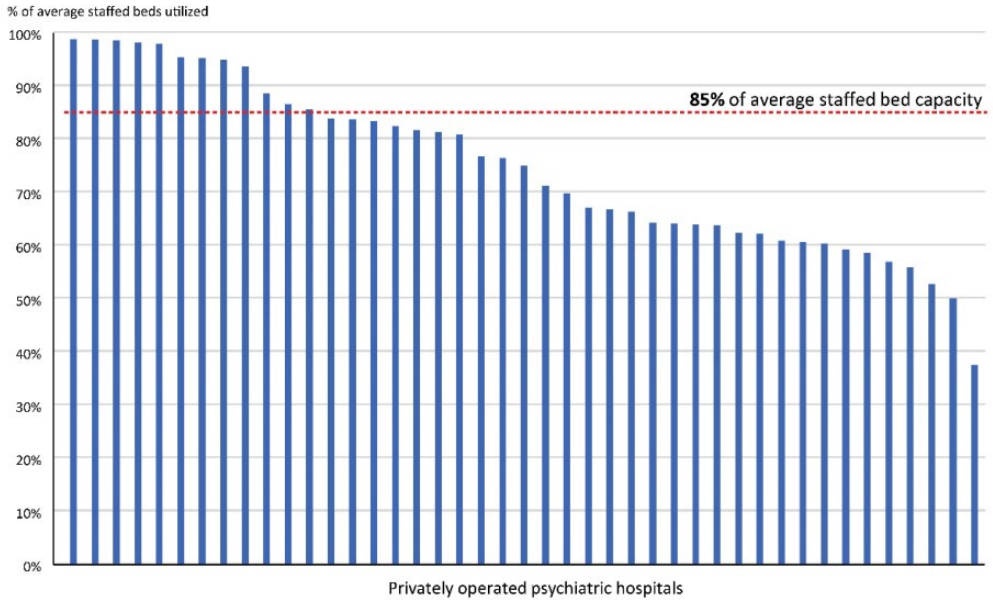


Psychiatric Bed Capacity

All state hospitals have been regularly operating OVER the industry standard for safe operating levels of 85%



About 2/3 of private psych hospitals operated BELOW 85% of staffed capacity



Source: JLARC analysis of DBHDS and Virginia Health Information data for 2022

No Exclusionary Criteria

- Prohibit discrimination in admission based on the acuteness of behavioral health conditions.
- Contractual agreements may require acceptance of ECO/TDO patients (no exclusionary criteria) and participation in the Virginia Crisis Connect bed registry.

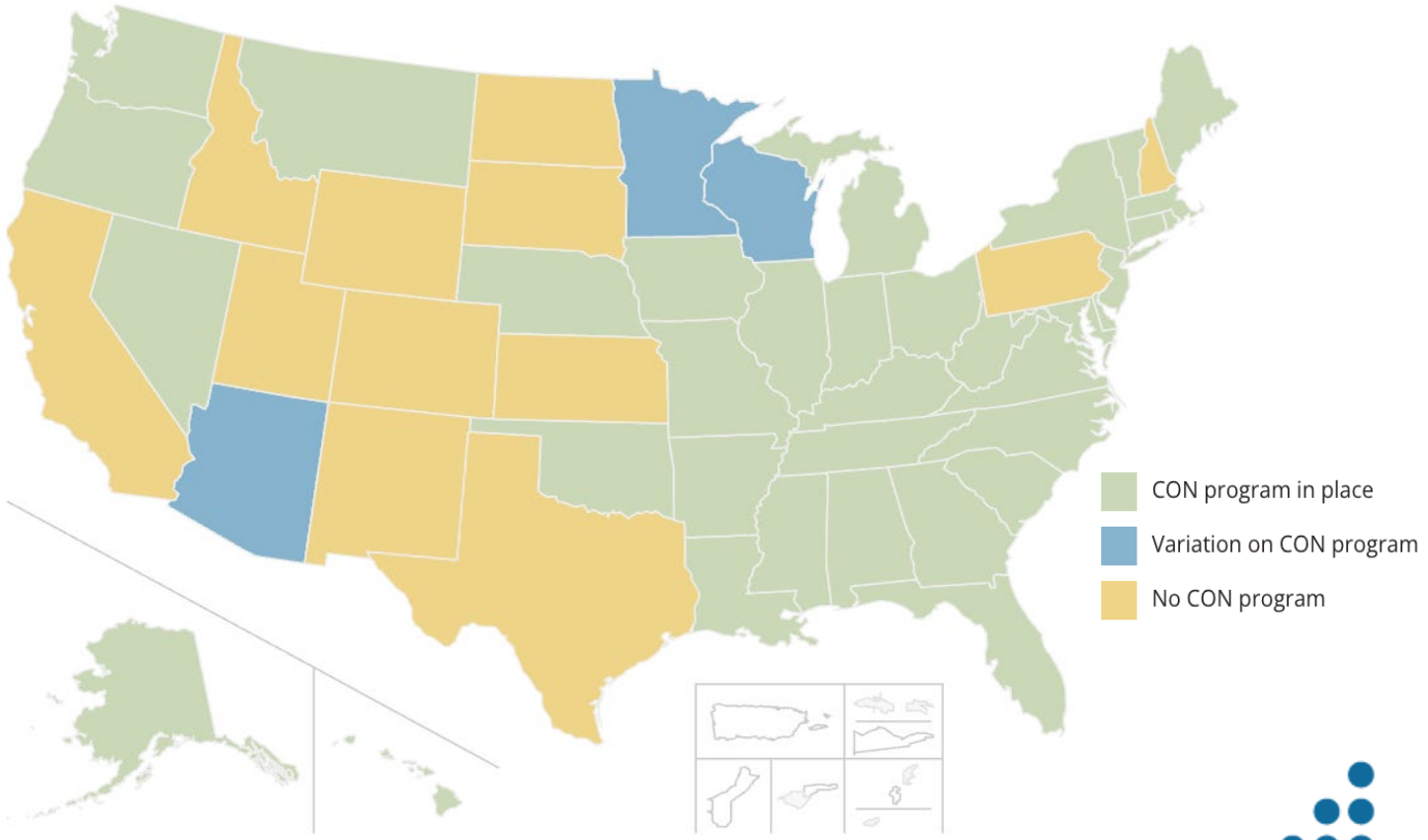
Oversight and Reporting

- Include reporting requirements to monitor and address cases where admission to behavioral health services is denied.
- Private hospitals shall regularly report any denial of admission of TDO patients/very acute behavioral health patients to DBHDS.

Nationwide COPN Overview

NCSL
NATIONAL CONFERENCE OF STATE LEGISLATURES

- 12 states have repealed COPN or allowed programs to expire
- 11 states specifically add psychiatric facilities as regulated under COPN
- 5 states regulate ICFs under COPN but do not specify mental illness or developmental disability (Iowa includes MI and DD)
- 4 states recently exempted mental health facilities from COPN review in varying extents



ncsl.org/health/certificate-of-need-state-laws

VIRGINIA HOSPITAL & HEALTHCARE ASSOCIATION

4200 INNSLAKE DRIVE, SUITE 203, GLEN ALLEN, VIRGINIA 23060-6772
P.O. BOX 31394, RICHMOND, VIRGINIA 23294-1394
(804) 965-1227 FAX (804) 965-0475

SUBMITTED ONLINE AT regulatory.comment@vdh.virginia.gov

May 23, 2024

Karen Shelton, MD
State Health Commissioner
Virginia Department of Health
P.O. Box 2448
Richmond, Virginia 23218-2448

Re: Public Comment to State Health Services Plan Task Force, May 30, 2024, Meeting

Dear Commissioner Shelton,

Thank you for the opportunity to submit this public comment to the State Health Services Plan (SHSP) Task Force in advance of its May 30, 2024, meeting. Members of the Task Force were notified that the Virginia Department of Health has established a mechanism for the members of the Task Force, their organizations, and the public, to submit comment for consideration by the Task Force to regulatory.comment@vdh.virginia.gov at least 5 days before the start of each meeting of the Task Force, and this public comment is submitted accordingly.

General Comment on Needed Updates to the SHSP

As an initial matter, we are grateful that the work of the Task Force is underway. The Task Force plays an important role in the COPN Program, including completing a number activities required by statute. Most notable of these required activities is the development of a comprehensive SHSP (formerly the "State Medical Facilities Plan" or "SMFP") for adoption by the Board of Health. The COPN law at Va. Code § 32.1-102.2:1 required the Task Force to develop recommendations for a comprehensive SHSP for adoption by the Board of Health by November 1, 2022. That work has not yet commenced, which is particularly troubling considering the SHSP/SMFP − a critical health planning document − has not been updated since 2009.

We understand that the Task Force is currently focused on recommendations for expedited review pursuant to Chapter 423 of the 2024 Acts of Assembly, but we urge you and the Task Force to not delay work on its recommendations for a comprehensive SHSP for adoption by the Board as required by law and we submit it should be a priority that can be undertaken in parallel with any work on expedited review.

VHHA Perspective on COPN and Behavioral Health Services

With respect to the Task Force's current work on expedited review, the Task Force has understandably focused on the challenges faced by the state hospitals and private hospitals and has heard from industry experts that the capacity and capabilities of psychiatric beds in the state, and access to them, is a multifaceted concern impacted in large part by a behavioral health care workforce shortage and increasingly complex patient care needs.

Unlike state hospitals, psychiatric services provided by private hospitals are regulated under COPN. These private hospitals accommodate the substantial majority of behavioral health inpatient admissions in the state. In FY22, private hospitals admitted 92% of all behavioral health patients, including 100% of all voluntary admissions and 87% of involuntary TDOs. In addition, in 2022, private hospitals saw 393,294 behavioral health emergency department visits equating to 13% of all visits in that year.

VHHA has historically supported the use of expedited review for certain projects that are typically non-contested and/or raise comparatively few health planning concerns. As it pertains to psychiatric projects, VHHA maintains that the existing process for COPN review does not appear to be creating a barrier to expanding available bed capacity:

- The high rate of approvals demonstrates that COPN review is not creating a barrier.
- The workforce shortage is the greatest barrier to expanding available bed capacity.

In many ways, COPN applications for psychiatric projects are a great example of how COPN works well:

- Hundreds of psychiatric beds have been added under COPN in the last ten years and no COPN application has been denied in that period.
- The last denial was in 2015, for a 40-bed psychiatric hospital on the grounds that it would have had a significant adverse impact on existing providers.
- The private hospitals for which these COPNs have been approved are treating the substantial majority of voluntary and involuntary patients in the Commonwealth.

Insufficient Time Has Been Allowed for Public Input on Proposed Options

The meeting materials for the May 30, 2024, meeting of the Task Force include a document titled "VDH Analysis on Potential Expedited and Psychiatric Process Changes," which sets forth a series of options for moving various psychiatric projects from standard review to expedited review. The analysis should be helpful for the Task Force to consider possible recommendations around which there may be consensus, but insufficient time has been allowed for thorough consideration of these options.

The materials were distributed on May 20, 2024, only seven business days prior to the meeting date and only two business days before public comments are due to the Task Force. The materials were not posted on Regulatory Town Hall and available to the public to prepare public comment until May 22, 2024, only one business day before public comments are due to the Task Force. Due to the lack of appropriate notice, it would be premature for the Task Force to take any formal action to adopt any recommendations on these options at the May 30, 2024, meeting.

Likewise, due to the lack of appropriate notice, VHHA is unable to provide specific responses to each of the various options presented. Doing so will require additional time to process this information with our members in an effort to determine whether there is consensus to definitively support any one of them.

<u>If the Task Force is considering moving any psychiatric projects to expedited review, then there are, however, some bright lines we can draw in response to the options presented based upon VHHA's policy position on COPN</u>:

- VHHA would not support moving the establishment of psychiatric *facilities* or psychiatric *services* from standard review to expedited review and would be opposed to any such recommendation by the Task Force. Such projects are not non-contested and can raise health planning concerns.
- Any project that is contested by a member of the public, to include a competing applicant, should not be eligible for expedited review and should be moved into standard review.
- All other provisions of COPN law and regulations applicable to COPN applications, approvals, and enforcement under standard review must likewise apply to expedited review (e.g., calculation and application of fee amounts, determination that the proposed project is consistent with the provisions of the State Health Services Plan, capital expenditure requirements, conditions on certificates, etc.).

VHHA support for expedited review is limited to certain projects that are non-contested and/or raise comparatively few health planning concerns. Accordingly, expedited review should not be considered for competitive projects such as establishing outpatient surgical hospitals, expanding operating room capacity, or establishing or expanding CT/MRI/PET imaging. Further, as reflected in legislative mandates, the Task Force is to develop recommendations on expedited review of project types "that are generally non contested and present limited health planning impacts" and it is submitted that such competitive projects would go well beyond the scope of the Task Force.

We look forward to the Task Force's May 30, 2024, meeting and continued deliberation regarding options for expedited review. We anticipate that, depending upon the outcome of these discussions, VHHA will submit further public comment in response to the options that VDH has presented. Within these options we are hopeful that the Task Force will find a reasonable path forward that includes appropriate safeguards to prevent a negative impact on the ability of existing acute psychiatric providers to continue to provide historic levels of services to patients in the community, including Medicaid or other indigent patients.

Again, we are grateful for the work that you and the Task Force are undertaking to improve Virginia's COPN Program. The COPN Program is a critical policy function of the Commonwealth and reforms to modernize this program present a great opportunity to produce greater efficiencies and generate even better outcomes.

Thank you for your consideration of this public comment.

Sincerely,

R. Brent Rawlings
Senior Vice President & General Counsel

Analysis on Potential Expedited and Psychiatric Process Changes

Legislative Mandate: Chapter 423 of the 2024 Acts of Assembly mandates the State Health Services Plan Task Force to develop recommendations on expedited review of project types subject to certificate of public need (COPN) requirements that are generally non contested and present limited health planning impacts. The Task Force shall also create recommendations regarding:

1. What facilities and projects listed in § 32.1-102.1:3 of the Code of Virginia should be added to the expedited review process;
2. Criteria that should apply to any project types subject to expedited review; and
3. A framework for the application and approval process of such projects.

Project types for consideration shall include:

1. Increases in inpatient psychiatric beds;
2. Relocation of inpatient psychiatric beds;
3. Introduction of psychiatric services into an existing medical care facility; and
4. Conversion of beds in an existing medical care facility to psychiatric inpatient beds.

Potential Expedited and Psychiatric Process Changes:

Option	How it works now	How it would change	Alternative?	Vote Support, Oppose, No Position, or Undecided
1. Move psychiatric beds from full COPN review to expedited review*	Psychiatric beds are required to be requested using the full 190-day COPN process during the C application cycle.	Psychiatric beds could be requested at any time and would be reviewed during a 45-day review period.		
2. Move the establishment of a	In order to establish a psychiatric facility, a	A person could apply for a COPN for a		

psychiatric facility from full COPN review to expedited review*	person is required to apply during the C application cycle for the full 190-day review process.	psychiatric facility at any time and would be reviewed during the 45-day review period.		
3. Allow facilities that already provide psychiatric services to add beds using the expedited review process*	All facilities, whether they already have psychiatric beds or not, are required to submit an application using the full 190-day COPN process during the C application cycle.	Facilities with psychiatric beds would be able to request beds through the 45-day expedited process.		
4. Allow facilities to relocate psychiatric beds through the expedited process*	All facilities are required to obtain a COPN through the full 190-day review cycle to relocate beds. If the bed relocation is 10 beds or 10%, whichever is less, and when the cost of relocation is less than $5 million, facilities may apply for a COPN through the 45-day expedited review process.	Facilities could obtain a COPN through the 45-day expedited review process to relocate any number of beds.		
5. Require facilities to request a COPN in	Facilities are able to convert psychiatric	Facilities would be required to request a		

order to convert beds from psychiatric beds to non-psychiatric beds*	beds to non-psychiatric beds freely (this does not apply to beds added through the RFA process).	COPN in order to convert beds from psychiatric beds to non-psychiatric beds.		
6. Allow facilities that already provide psychiatric services to establish a new psychiatric facility through the expedited review process*	All projects involving a new psychiatric facility are required to obtain a COPN.	Facilities that already provide psychiatric services would be able to utilize the expedited process in order to establish a new psychiatric facility under its current hospital license.		
7. Move the addition of psychiatric services from full COPN review to expedited review*	A facility is required to obtain a COPN in order to add new psychiatric services that have not been provided in the previous 12 months.	To add new psychiatric services, a facility would be able to apply at any time and the application would be reviewed during the 45-day review cycle.		
8. Extend expedited review from 45 days to 90 days	Expedited review projects adhere to a 45-day review cycle that begins when an application is submitted and ends with a decision from the Commissioner by the 45th day.	Expedited review projects would adhere to a 90-day review cycle that begins when an application is submitted and ends with a decision from the Commissioner by the 90th day.		

9. Require the Commissioner to condition expedited review applications on providing a specified level of charity care*	The Commissioner does not have the authority to condition expedited review projects.	The Commissioner would be required to condition all approved expedited project COPNs on providing a specified level of charity care.		
10. Require the Commissioner to condition psychiatric projects on the acceptance of Temporary Detention Orders (TDOs)*	The Commissioner does not have the authority to condition COPNs on the acceptance of TDOs.	The Commissioner would be required to condition all approved psychiatric project COPNs on the acceptance of TDOs.		
11. Require any project that is contested to be pulled from expedited review and placed into full review	There is no requirement regarding contested projects in the regulation.	Any project that is contested by a member of the public would be pulled out of expedited review and placed into full review.		
12. Allow for members of the public to request a hearing for an expedited project	There is no public participation requirement in the regulation.	Members of the public would be able to request a public hearing for an expedited project to be held during the 45-day review cycle.		
13. Add the following COPN projects to the expedited review	Any facility interested in adding any items from the list are required to obtain a	Facilities that already provide the applicable services for the corresponding listed		

process for existing medical care facilities that already provide the applicable existing service:* • Medical-surgical beds • Hospice beds • Psychiatric beds • Rehabilitation beds • Cardiac catheterization laboratories • Operating rooms • CT machines • MRI machines • PET machines • Linear accelerators	COPN through the 190-day process.	items may request a COPN through the expedited review process to add any of the projects listed.		
14.				

15.				
16.				

17.				

*Requires a legislative change

MERCATUS CENTER
George Mason University

TESTIMONY

Virginia's Certificate-of-Public-Need Law: A Comparison with Other States

Matthew D. Mitchell, PhD
Senior Research Fellow
Director, Project for the Study of American Capitalism
Mercatus Center at George Mason University

Virginia House of Delegates
Health, Welfare, and Institutions Committee

April 18, 2018

Chairman Orrock, Vice Chairman Garrett, and distinguished members of the House of Delegates Health, Welfare, and Institutions Committee:

My name is Matthew Mitchell. I am an economist at the Mercatus Center at George Mason University where I am an adjunct professor of economics. In recent years, my colleagues and I have been studying certificate-of-need laws in healthcare. I am grateful for the opportunity to discuss our findings with you today.

INTRODUCTION TO CON LAWS

Certificate-of-need (CON) laws—or certificate-of-public-need (COPN) laws, as they are called in Virginia—require healthcare providers wishing to open or expand a healthcare facility to first prove to a regulatory body that their community needs the services the facility would provide. The regulations are typically *not* designed to assess a provider's qualifications or safety record. Other regulations such as occupational licensing aim to do that. Instead, the process aims to determine whether or not a service is economically viable and valuable. The process for obtaining a CON or COPN can take years and tens or even hundreds of thousands of dollars in preparation costs.[1] While these regulations appear to benefit incumbent providers by limiting their competition, their effects on patients and taxpayers have generally been found to be negative. This helps explain why antitrust authorities at the Federal Trade Commission (FTC) and at the US Department of Justice (DOJ) have long taken the position that these rules are anticompetitive. In a joint report from 2004, for example, the FTC and DOJ declared,

> The Agencies believe that, on balance, CON programs are not successful in containing health care costs, and that they pose serious anticompetitive risks that usually outweigh their purported economic benefits.[2]

---

[1] Kent Hoover, "Doctors Challenge Virginia's Certificate-of-Need Requirement," *Business Journals*, June 5, 2012.
[2] Federal Trade Commission and US Department of Justice, *Improving Health Care: A Dose of Competition*, July, 2004, 22. For more recent examples, see *Competition in Healthcare and Certificates of Need, Hearing before a Joint Session of the Health and Human Services Committee of the State Senate and the CON Special Committee of the State House of Representatives of the General Assembly of the State of Georgia*, 149th Gen. Assemb. (2007) (statement of Mark J. Botti, Chief, Litigation I Section, US

In the remainder of my testimony today, I will offer a brief history of CON laws and an overview of the economic evidence that has led many, including the FTC and DOJ, to conclude that these laws pose anticompetitive risks to consumers and taxpayers. Finally, I compare Virginia's COPN program to the CON programs in surrounding states.

A BRIEF HISTORY OF CERTIFICATE-OF-NEED REGULATION

More than four decades ago, Congress passed and President Ford signed the National Health Planning and Resources Development Act of 1974.[3] The statute enabled the federal government to withhold federal funds from states that failed to adopt CON regulations in healthcare.

New York had already enacted the first CON program in 1964; by the early 1980s, with the federal government's encouragement, every state except Louisiana had implemented some version of a CON program.[4] Policymakers hoped these programs would restrain healthcare costs, increase healthcare quality, and improve access to care for poor and underserved communities.

In 1986—after Medicare changed its reimbursement practices and as evidence mounted that CON laws were failing to achieve their stated goals—Congress repealed the federal act, eliminating federal incentives for states to maintain their CON programs.[5] Since then, 15 states, representing about 40 percent of the US population, have done away with their CON regulations, and many have pared them back.[6] A majority of states still maintain CON programs, however, and vestiges of the National Health Planning and Resources Development Act can be seen in the justifications that state legislatures offer in support of these regulations.[7]

THE ECONOMICS OF CERTIFICATE-OF-NEED REGULATION

Unfortunately, by limiting supply and undermining competition, CON laws may undercut each of the laudable aims that policymakers desire to achieve with CON regulation. In fact, research shows that CON laws *fail* to achieve the goals most often given when enacting such laws. These goals include

1. ensuring an adequate supply of healthcare resources,
2. ensuring access to healthcare for rural communities,
3. promoting high-quality healthcare,
4. ensuring charity care for those unable to pay or for otherwise underserved communities,

---

Department of Justice, Antitrust Division); Federal Trade Commission and US Department of Justice, *Joint Statement of the Federal Trade Commission and the Antitrust Division of the U.S. Department of Justice to the Virginia Certificate of Public Need Working Group*, October 2015; Federal Trade Commission and US Department of Justice, *Joint Statement of the Federal Trade Commission and the Antitrust Division of the U.S. Department of Justice on Certificate-of-Need Laws and South Carolina House Bill 3250*, January 2016; *Statement of the Federal Trade Commission to the Alaska Senate Committee on Labor & Commerce on Certificate-of-Need Laws and Alaska Senate Bill 62, Hearing before the Senate Labor and Commerce Standing Committee*, 30th Leg. (2018) (statement of Daniel Gilman, Attorney Advisor, Federal Trade Commission, Office of Policy Planning).

[3] National Health Planning and Resources Development Act of 1974, Pub. L. No. 93-641, 88 Stat. 2225 (1975) (codified at 42 U.S.C. §§ 300k-300n-5), repealed by Pub. L. No. 99-660, § 701, 100 Stat. 3799 (1986).

[4] Matthew D. Mitchell and Christopher Koopman, "40 Years of Certificate-of-Need Laws across America," Mercatus Center at George Mason University, September 27, 2016.

[5] Patrick John McGinley, "Beyond Health Care Reform: Reconsidering Certificate of Need Laws in a 'Managed Competition' System," *Florida State University Law Review* 23, no. 1 (1995).

[6] New Hampshire is the state that most recently repealed its CON program, which it did in the summer of 2016. Mitchell and Koopman, "40 Years of Certificate-of-Need Laws across America."

[7] According to Virginia's CON website, "The program seeks to contain health care costs while ensuring financial viability and access to health care for all Virginia at a reasonable cost." Virginia Department of Health, Licensure and Certification, "Certificate of Public Need Program," accessed April 6, 2018, http://www.vdh.virginia.gov/licensure-and-certification/the-certificate-of-public-need-program/.

5. encouraging appropriate levels of hospital substitutes and healthcare alternatives, and
6. restraining the cost of healthcare services.[8]

We have quite a bit of information to help us predict what would happen if other states such as Virginia were to repeal their laws because 15 states have repealed their CON programs. Economists have been able to use modern statistical methods to compare outcomes in CON and non-CON states to estimate the effects of these regulations. These methods control for factors such as socioeconomic conditions that might confound the estimates. Table 1 summarizes some of this research. It is organized around the stated goals of CON laws.

TABLE 1. SUMMARY OF RESEARCH ADDRESSING THE GOALS OF CERTIFICATE-OF-NEED (CON) LAWS IN HEALTHCARE

Question	Answer	Research
1. Do CON programs help ensure an adequate supply of healthcare resources?	No. CON regulation explicitly limits the establishment and expansion of healthcare facilities and is associated with fewer hospitals, ambulatory surgical centers, dialysis clinics, and hospice care facilities. It is also associated with fewer hospital beds and decreased access to medical imaging technologies. Residents of CON states are more likely than residents of non-CON states to leave their counties in search of medical services. Regression analysis by Stratmann and Koopman (2016) suggests that a Virginia without COPN would have 42 percent more hospitals than it currently has.	Ford and Kaserman (1993); Carlson et al. (2010); Stratmann and Russ (2014); Stratmann and Baker (2017); and Stratmann and Koopman (2016)
2. Do CON programs help ensure access to healthcare for rural communities?	No. CON programs are associated with fewer hospitals overall, but also with fewer rural hospitals, rural hospital substitutes, and rural hospice care facilities. Residents of CON states must drive farther to obtain care than residents of non-CON states. Stratmann and Koopman's research suggests that a Virginia without COPN would have 44 percent more rural hospitals than it currently has.	Cutler, Huckman, and Kolstad (2010); Carlson et al. (2010); and Stratmann and Koopman (2016)
3. Do CON programs promote high-quality healthcare?	Most likely not. While early research was mixed, more recent research suggests that deaths from treatable complications following surgery and mortality rates from heart failure, pneumonia, and heart attacks are all statistically significantly higher among hospitals in CON states than hospitals in non-CON states. Also, in states with especially comprehensive programs such as Virginia, patients are less likely to rate hospitals highly.	Stratmann and Wille (2016)
4. Do CON programs help ensure charity care for those unable to pay or for otherwise underserved communities?	No. There is no difference in the provision of charity care between states with CON programs and states without them, and CON regulation is associated with greater racial disparities in access to care.	DeLia et al. (2009) and Stratmann and Russ (2014)
5. Do CON programs encourage appropriate levels of hospital substitutes and healthcare alternatives?	No. CON regulations have a disproportionate effect on new hospitals and nonhospital providers of medical imaging services. Research also finds that states such as Virginia that have an ambulatory surgical center–specific CON (COPN) have, on average, 14 percent fewer total ambulatory surgical centers.	Stratmann and Baker (2017) and Stratmann and Koopman (2016)

[8] Each of these goals was first articulated in the National Health Planning and Resources Development Act of 1974.

6. Do CON programs help restrain the cost of healthcare services?	No. By limiting supply, CON regulations increase per-service and per-procedure healthcare costs. Even though CON regulations might reduce overall healthcare spending by reducing the quantity of services that patients consume, the balance of evidence suggests that CON laws actually increase total healthcare spending.	Mitchell (2016) and Bailey (2016)

Sources: James Bailey, "Can Health Spending Be Reined In through Supply Constraints? An Evaluation of Certificate-of-Need Laws" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, August 2016); Melissa D. A. Carlson et al., "Geographic Access to Hospice in the United States," *Journal of Palliative Medicine* 13, no. 11 (2010); David M. Cutler, Robert S. Huckman, and Jonathan T. Kolstad, "Input Constraints and the Efficiency of Entry: Lessons from Cardiac Surgery," *American Economic Journal: Economic Policy* 2, no. 1 (2010); Derek DeLia et al., "Effects of Regulation and Competition on Health Care Disparities: The Case of Cardiac Angiography in New Jersey," *Journal of Health Politics, Policy and Law* 34, no. 1 (2009); Jon M. Ford and David L. Kaserman, "Certificate-of-Need Regulation and Entry: Evidence from the Dialysis Industry," *Southern Economic Journal* 59, no. 4 (1993); Matthew D. Mitchell, "Do Certificate-of-Need Laws Limit Spending?" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, September 2016); Thomas Stratmann and Matthew C. Baker, "Barriers to Entry in the Healthcare Markets: Winners and Losers from Certificate-of-Need Laws" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, August 2017); Thomas Stratmann and Christopher Koopman, "Entry Regulation and Rural Health Care: Certificate-of-Need Laws, Ambulatory Surgical Centers, and Community Hospitals" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, February 2016); Thomas Stratmann and Jacob W. Russ, "Do Certificate-of-Need Laws Increase Indigent Care?" (Working Paper No. 14-20, Mercatus Center at George Mason University, Arlington, VA, July 2014); Thomas Stratmann and David Wille, "Certificate-of-Need Laws and Hospital Quality" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, September 2016).

CERTIFICATE-OF-PUBLIC-NEED REGULATION IN VIRGINIA

Virginia's COPN program is one of the more comprehensive CON programs in the country. Among many other things, Virginia's program regulates acute hospital beds, ambulatory surgical centers, medical imaging technologies, rehabilitation centers, and psychiatric care facilities. Table 2 shows the number of technologies and procedures regulated by Virginia and surrounding states. Nationally, the average number of technologies and procedures regulated is 12, among CON states the number is 16, and among states in the Mid-Atlantic region it is 18. Virginia regulates 20 technologies and procedures.

TABLE 2. CERTIFICATE-OF-PUBLIC-NEED IN VIRGINIA AND CERTIFICATE-OF-NEED IN SURROUNDING STATES

State	Number of Technologies and Procedures Regulated
Delaware	8
Kentucky	21
Maryland	17
New Jersey	26
North Carolina	25
Ohio	1
Pennsylvania	0
South Carolina	22
Tennessee	23
Virginia	20
West Virginia	20
District of Columbia	28

Regional average	18
National average among CON states	16
National average among all states	12

Source: Christopher Koopman and Anne Philpot, "Certificate of Need Laws in 2016," Mercatus Center at George Mason University, September 27, 2016. West Virginia's number was updated by the author to reflect changes in 2017.

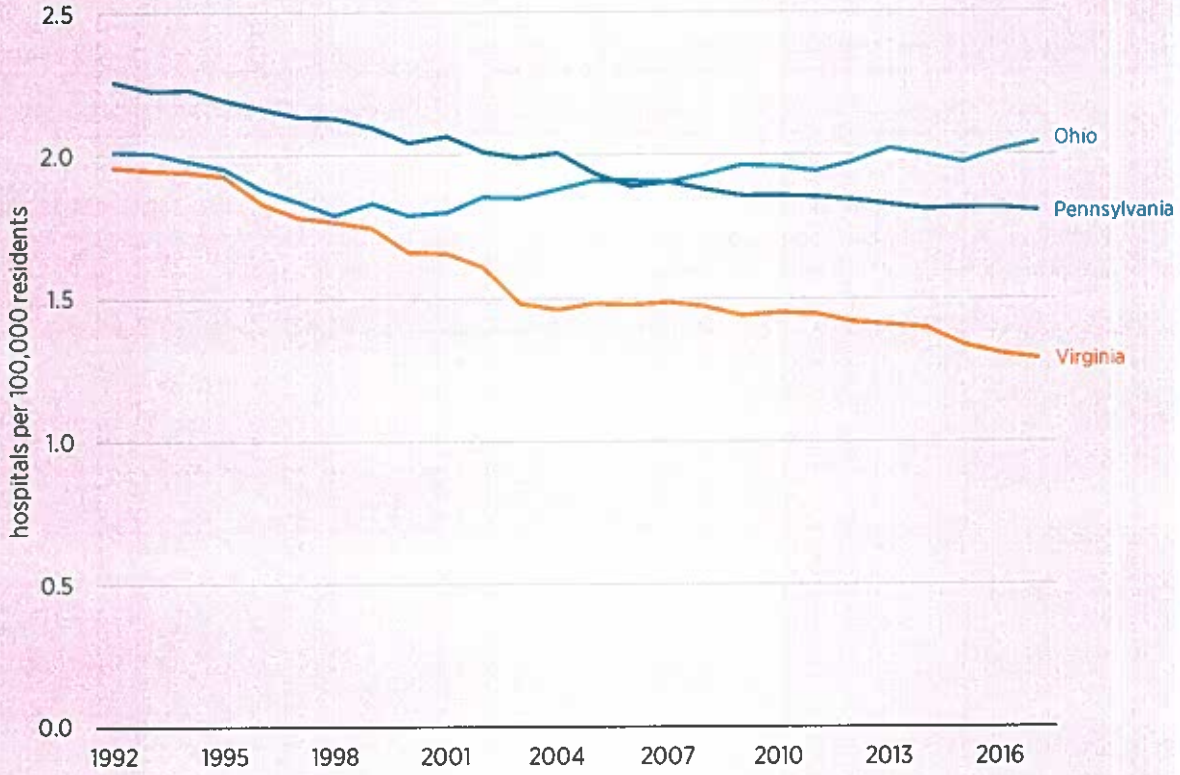
All of the evidence reviewed in table 1 was derived from point estimates in regression analyses. Though a regression is one of the best ways to assess the effect of a policy while controlling for other factors, it is not an intuitive concept for many. So to better illustrate the data behind these results, I have created four charts that show changes over time in healthcare facilities per capita in Virginia and the two states in the region with limited or no CON programs, Ohio and Pennsylvania. These states are illustrative because they are comparable in location, size, and socioeconomic makeup. The differences that do exist between these states would lead one to believe that Virginia has the advantage. For example, per capita personal income is higher in Virginia than in either Ohio or Pennsylvania, while poverty rates are lower in Virginia than in either of the other two states.[9]

As I have mentioned, Virginia regulates 20 different procedures and technologies. In contrast, Ohio's CON program regulates just one item, nursing home and long-term care beds, while Pennsylvania has no CON program at all, having repealed its program in 1996.

[9] For per capita income, see Bureau of Economic Analysis, "Personal Income, Population, Per Capita Personal Income, Disposable Personal Income, and Per Capita Disposable Income (SA1, SA51)," accessed April 10, 2018, https://www.bea.gov/iTable/iTable.cfm?reqid=70&step=1&isuri=1&acrdn=6#reqid=70&step=1&isuri=1&7022=21&7023=0&7033=-1&7024=non-industry&7025=0&7026=39000,42000,51000&7001=421&7027=2017,2016,2015,2014,2013,2012,2011,2010,2009,2008,2007,2006,2005,2004,2003,2002,2001,2000,1999,1998,1997,1996,1995,1994,1993,1992&7028=-1&7031=0. For poverty rates, see Jessica L. Semega, Kayla R. Fontenot, and Melissa A. Kollar, *Income and Poverty in the United States: 2016*, (Washington, DC: US Census Bureau, 2017).

Figure 1 shows hospitals per 100,000 residents. In Ohio, the number of hospitals per 100,000 residents rose slightly. Over the same period, in both Virginia and Pennsylvania, the number has fallen. In Virginia, however, the decline was sharper, falling 34 percent, compared with a 20 percent decline in Pennsylvania. On a per-resident basis, Virginia now has seven-tenths as many hospitals as Pennsylvania and a little more than six-tenths as many as Ohio.

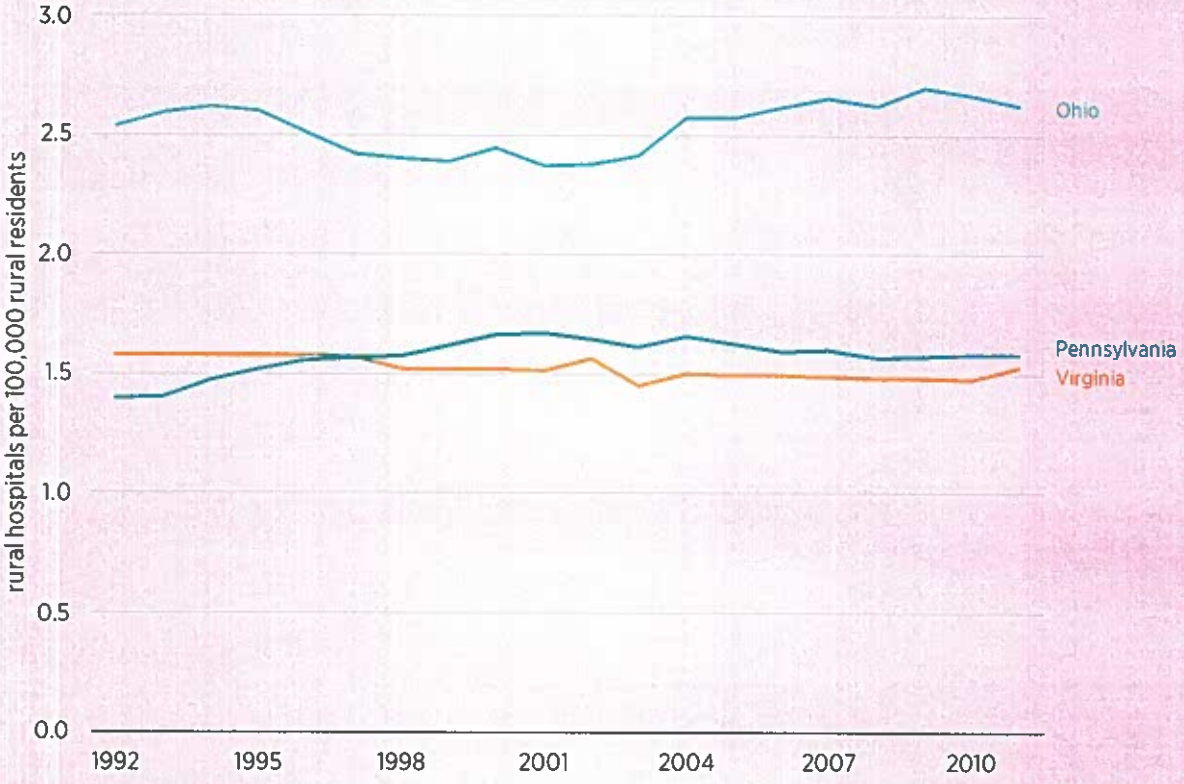
FIGURE 1. HOSPITALS PER 100,000 RESIDENTS



Sources: Provider Data: US Centers for Medicare & Medicaid Services, "Provider of Services Current Files," accessed April 10, 2018, https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Provider-of-Services/. Population Data: US Census Bureau, "State Population Totals and Component of Change: 2010–2017," accessed April 20, 2018, https://www.census.gov/data/tables/2017/demo/popest/state-total.html.

Figure 2 shows rural hospitals per 100,000 rural residents. Virginia not only has fewer rural hospitals per rural resident than either of the other two states; it is the only one of the three that has seen a decline in that figure over time.

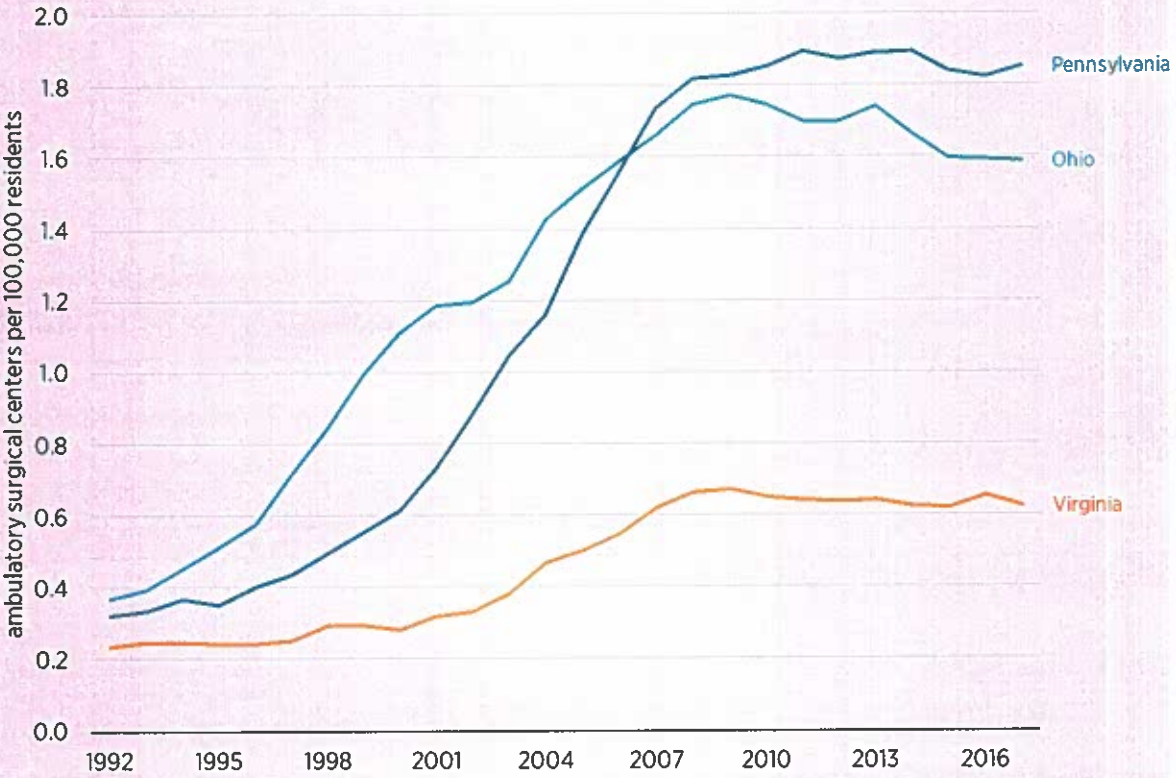
FIGURE 2. RURAL HOSPITALS PER 100,000 RURAL RESIDENTS



Sources: Provider Data: US Centers for Medicare & Medicaid Services, "Provider of Services Current Files," accessed April 10, 2018, https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Provider-of-Services/. Population Data: US Census Bureau, "Population and Housing Unit Estimates Tables," accessed April 10, 2018, https://www.census.gov/programs-surveys/popest/data/tables.html.

Figure 3 shows ambulatory surgical centers (ASCs) per 100,000 residents over time. In all three states, the number of these centers per resident has been rising. In Virginia—the only state of the three that regulates ASCs through COPN—the rise has been the most modest. On a per capita basis, Virginia has about one-third as many ASCs as Pennsylvania and four-tenths as many as Ohio.

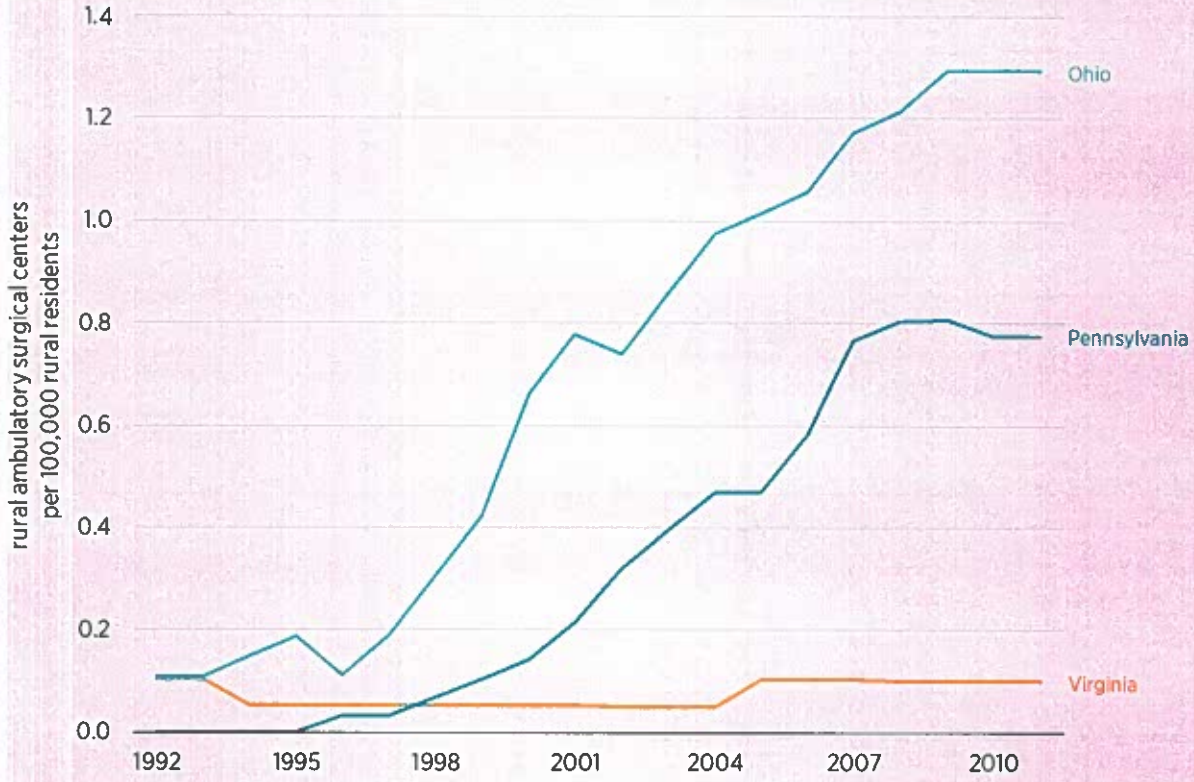
FIGURE 3. AMBULATORY SURGICAL CENTERS PER 100,000 RESIDENTS



Sources: Provider Data: US Centers for Medicare & Medicaid Services, "Provider of Services Current Files," accessed April 10, 2018, https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Provider-of-Services/. Population Data: US Census Bureau, "State Population Totals and Component of Change: 2010–2017," accessed April 20, 2018, https://www.census.gov/data/tables/2017/demo/popest/state-total.html.

Figure 4 shows rural ASCs per 100,000 rural residents. Virginia is the only state of the three that has seen a decline in this figure over time. On a per-rural-resident basis, Virginia has one-eighth as many rural ASCs as Pennsylvania and one-twelfth as many as Ohio.

FIGURE 4. RURAL AMBULATORY SURGICAL CENTERS PER 100,000 RURAL RESIDENTS



Sources: Provider Data: US Centers for Medicare & Medicaid Services, "Provider of Services Current Files," accessed April 10, 2018, https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Provider-of-Services/. Population Data: US Census Bureau, "Population and Housing Unit Estimates Tables," accessed April 10, 2018, https://www.census.gov/programs-surveys/popest/data/tables.html.

None of these results should be surprising. CON laws are a restriction on the supply of facilities and services, and economic theory suggests that supply restrictions limit access to services while raising costs and undermining quality. Indeed—as shown in table 1—that is exactly what empirical studies of CON have consistently found.

CONCLUDING REMARKS

Given the substantial evidence that CON laws do not achieve their stated goals, one may wonder why these laws continue to exist in so much of the country. The explanation seems to lie in the special-interest theory of regulation.[10] Specifically, CON laws perform a valuable function for incumbent providers of healthcare services by limiting their exposure to new competition. Indeed, recent evidence

[10] This theory holds that regulations exist as a way to limit competition or raise rivals' costs, or both. See George J. Stigler, "The Theory of Economic Regulation," *Bell Journal of Economics and Management Science* 2, no. 1 (April 1, 1971): 3–21; Ernesto Dal Bó, "Regulatory Capture: A Review," *Oxford Review of Economic Policy* 22, no. 2 (June 20, 2006): 203–25; Matthew D. Mitchell, *The Pathology of Privilege: The Economic Consequences of Government Favoritism* (Arlington, VA: Mercatus Center at George Mason University, 2014).

suggests that special interests are able to use political donations to increase the odds that their CON requests will be granted.[11] This aspect of CON laws helps explain why economists as well as antitrust authorities have long argued that these regulations are anticompetitive and harmful to consumers.

For those who are interested in further details on the effects of CON on spending patterns, I have also attached my paper, "Do Certificate-of-Need Laws Limit Spending?" Like all Mercatus Center research, it has been through a rigorous, double-blind peer review process.

Thank you again for the opportunity to share my research with you. I look forward to answering any questions you may have.

Sincerely,

Matthew D. Mitchell, PhD

Senior Research Fellow
Director, Project for the Study of American Capitalism
Mercatus Center at George Mason University

ATTACHMENT

"Do Certificate-of-Need Laws Limit Spending?" (Mercatus Working Paper)

[11] Thomas Stratmann and Steven Monaghan, "The Effect of Interest Group Pressure on Favorable Regulatory Decisions: The Case of Certificate-of-Need Laws" (Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, 2017).

Do Certificate-of-Need Laws Limit Spending?

Matthew D. Mitchell

September 2016

MERCATUS WORKING PAPER

MERCATUS CENTER
George Mason University

3434 Washington Blvd., 4th Floor, Arlington, Virginia 22201
www.mercatus.org

Matthew D. Mitchell. "Do Certificate-of-Need Laws Limit Spending?" Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, September 2016.

Abstract

In 35 states, certificate-of-need (CON) laws in health care restrict the supply of medical services. These regulations require providers hoping to open a new healthcare facility, expand an existing facility, or purchase certain medical equipment such as an MRI machine or a hospital bed to first prove to a regulatory body that their community needs the service in question. The approval process can be time consuming and expensive, and it offers incumbent providers an opportunity to oppose the entrance of new competitors. However, it was originally hoped that these laws would, among other things, reduce healthcare price inflation. In this brief, I review the basic economic theory of a supply restriction like CON, then summarize four decades of empirical research on the effect of CON on healthcare spending. There is no evidence that CON regulations limit healthcare price inflation and little evidence that they reduce healthcare spending. In fact, the balance of evidence suggests that CON laws are associated with higher per unit costs and higher total healthcare spending.

JEL codes: D72, D78, H75, I1, L51

Keywords: economics of regulation, certificate of need, supply constraints, regulatory capture, special interests, rent-seeking

Author Affiliation and Contact Information

Matthew D. Mitchell
Senior Research Fellow, Mercatus Center at George Mason University
Director, Project for the Study of American Capitalism
Adjunct Professor of Economics, George Mason University
mmitchell@mercatus.gmu.edu

Acknowledgments

I thank Scott Eastman and Mohamad Elbarasse for their excellent research assistance on this paper. I am also grateful to Nita Ghei, Christina Behe, and two anonymous reviewers for numerous helpful suggestions. I alone am responsible for any errors or omissions that remain.

Received: 3 November 2023 | Accepted: 11 April 2024

DOI: 10.1002/soej.12698

SYMPOSIUM ARTICLE

Southern Economic Journal WILEY

Certificate-of-Need laws in healthcare: A comprehensive review of the literature

Matthew D. Mitchell

Knee Regulatory Research Center, West Virginia University, Morgantown, West Virginia, USA

Correspondence
Matthew D. Mitchell, Knee Regulatory Research Center, West Virginia University, Morgantown, WV, USA.
Email: matthew.mitchell1@mail.wvu.edu

Abstract

Certificate-of-Need (CON) laws limit the supply of healthcare services in about two-thirds of U.S. states. The regulations require those who wish to open or expand their facilities to first prove that their services are needed. Once encouraged by the federal government, Congress eliminated the inducement in the 1980s and since then several states have either pared their CON programs back or eliminated them altogether. To date, there have been 128 academic assessments of CON laws and together these papers contain over 450 tests. In this paper, I review this literature, organizing the results around the most common rationales for CON laws. The accumulated evidence is overwhelming that CON laws do not achieve their purpose. Instead, the balance of evidence suggests that these regulations increase spending, reduce access to care, undermine quality, and fail to ensure care for underserved populations.

KEYWORDS

Certificate of Need, healthcare, regulation

JEL CLASSIFICATION

I11, I18, H75

1 | INTRODUCTION

A Certificate-of-Need (CON) law requires anyone hoping to open a new facility, expand an existing facility, or acquire certain equipment to first prove to a regulator that the new capacity is

needed. Though the laws date back to the first decades of the 20th century and have been applied to various markets, New York was the first state to adopt a CON law in healthcare in 1964 (McGinley, 1995). A decade later, the federal government enacted the National Health Planning and Resources Development Act (NHPRDA), which encouraged states to adopt CON regulations by threatening to withhold federal funds from any state without such a program (NHPRDA, 1975). The threat never materialized as Congress repeatedly postponed the financial penalty (Conover & Bailey, 2020, p. 2). But the Act achieved its goal of encouraging state CON programs: By the 1980s, nearly every state in the country had instituted a CON program in healthcare (Mitchell et al., 2021).

The intellectual origins of healthcare CONs date to 1959, when UCLA health researcher Milton Roemer published a coauthored study reporting a positive correlation between the number of hospital beds available per capita and the number of used hospital days per capita (Shain & Roemer, 1959). The finding became known as "Roemer's Law" and was shortened to the pithy characterization that "in an insured population, a hospital bed built is a hospital bed filled (Page, 2001)." The phenomenon can be characterized as an example of supplier-induced demand, in which physicians use their informational advantage to encourage unneeded care. Auster and Oaxaca (1981) have argued that in the absence of supplier-induced demand, the "only purpose [of CON] is to prevent competition through which the efficient may take business away from the nonefficient" (Auster & Oaxaca, 1981, p. 340).

In encouraging CON, lawmakers hoped hospitals would acquire fewer beds, fill them with fewer patients, and spend less money. The main purpose of CON, therefore, was to reduce healthcare expenditures by rationing care. The authors of the NHPRDA also apparently believed that CON would restrain spending by encouraging "the use of appropriate alternative levels of healthcare, and for the substitution of ambulatory and intermediate care" which, presumably, would be less-costly than other modes of care (NHPRDA, 1975, 88:2). Beyond costs and expenditures, the authors of the NHPRDA also hoped to ensure an adequate supply of care, especially for "underserved populations," including "those which are located in rural or economically depressed areas" (NHPRDA, 1975, 88:3). Finally, they hoped to "achieve needed improvements in the quality of health services" (NHPRDA, 1975, 88:4). These goals—cost containment, greater access (especially for underserved populations), and quality improvement—continue to be widely shared aims of health policy. They also constitute convenient buckets into which the empirical CON research can be sorted.

If the NHPRDA had been Congress's last word on CON, then research on the regulation's effects might have come to an end once CON was universally adopted. By the mid-1980s, however, Congress had concluded that CON laws were not achieving their goals and so the federal CON mandate was repealed in 1986 (Pub. L. 99-660, § 701, 100 Stat. 3799, 1986). Almost immediately, 12 states eliminated their CON programs and, in time, others followed suite. Over time, the trend has been for states to gradually pare their programs back either by eliminating CON requirements for certain categories of medical equipment, by raising the dollar threshold at which a CON is required, or by exempting certain areas, such as rural counties, from the requirement. This history has yielded wide variation in CON regulation across time and states (Mitchell et al., 2021). And this, in part, explains why CON laws have been so widely studied.

2 | CON TODAY

Today, 39 states and the District of Columbia require a CON for at least one healthcare service or technology.[1] In many of these states, however, the CON regime is quite limited. For example, Arizona, Minnesota, and New Mexico only require CONs for ambulance services. Indiana, Montana, Ohio (and soon, South Carolina) only require CONs for nursing homes.[2] Hawaii, which requires a CON for 28 services and technologies, regulates more activities than any other state.

The most-common CON requirement is for nursing home beds, found in 34 states (including DC). The next-most-common requirements are for psychiatric services (31 states), new hospitals (29 states), and intermediate care facilities for those with intellectual disabilities (28 states). The least-common CONs are for ultrasounds (required in 2 states) and subacute services (only regulated by Illinois).

In about half of CON states, the decision to grant a CON is made by a board whose members are appointed by the governor; in the rest, the decision is made by governor-appointed officials. Employees of incumbent providers are typically allowed to serve on this board, earning the regulation the moniker "competitor's vetoes" (Ohlhausen & Luib, 2015; Sandefur, 2015). In all but six CON states, incumbent providers are allowed to participate in the CON process and object to the application of a would-be competitor.[3] Even when competitors do not object, statutes and regulations typically require regulators to deny CONs if they believe the applicant's services will duplicate an existing service, virtually guaranteeing a local monopoly.

We lack systematic data on application costs, the length of review, or approval rates. And all of these factors would be good candidates for future study. Anecdotal evidence suggests, however, that the CON process is typically long and expensive. It can take years and can cost providers tens or even hundreds of thousands of dollars in opportunity costs (Hoover, 2012). One analysis found that the approval in Virginia was 51%, in Georgia it was 57%, and in Michigan it was 77% (Stratmann & Monaghan, 2017). Another found that when Georgia competitors object to an application it adds about 520 days to the wait time for a final decision, while each additional party who objects adds another 129 days (Denson & Mitchell, 2023).

3 | METHODS

The goal of this study is to identify and classify every peer-reviewed original empirical analysis of healthcare CON laws. To identify relevant papers, I relied on previous overviews,[4] internet

[1]Some states, such as Wisconsin, cap the total number of pieces of equipment. For example, they may cap the total number of beds in the state at 20,000. If the cap is set low enough it will be *more* restrictive than a CON regulation because there is no way for a provider to request to exceed the cap. If, on the other hand, the cap is set high enough (as is currently the case in Wisconsin), then the cap will be non-binding. Some researchers treat caps as equivalent to CONs. But given the fact that most caps are currently non-binding, I will ignore these regulations for the remainder of this piece.

[2]On October 3, 2023, South Carolina Governor Henry McMaster signed Senate Bill 164. It immediately eliminated the CON requirement for all services except for hospitals and nursing homes. The requirement for hospitals will be phased out over 3 years, though it will not be enforced in counties that currently lack hospitals.

[3]These are Indiana, Louisiana, Michigan, Nebraska, New Jersey, and New York. For more details, see Cavanaugh et al. (2020, 4, 61, 75, 89, 117, 131).

[4]Conover and Bailey's (2020) review was especially helpful.

and library search engines, and helpful suggestions from others.[5] I primarily focused on academic publications, but I also included a handful of academic-quality analyses by government agencies such as the Federal Trade Commission that appeared to have gone through a peer-review process. I only focused on original empirical analyses; I ignored literature reviews or studies that employed previous estimates to illustrate the effects of CON. I made no judgments about the quality of the empirical tests, though by only including peer reviewed material, I believe my approach ensured a minimal threshold for quality.

Most studies included more than one test of CON and so my unit of observation is each empirical test, rather than each paper. This allows me to characterize the literature in more detail and to avoid using the vague catch-all "mixed results" if a paper has multiple regressions, some positive and some negative. I do often code results as "negligible or insignificant," however. In these cases, I rely on the authors' assessments to make these judgments about economic and statistical significance. In some cases, it was not always clear how one can define a distinct "test" and I did have to use some discretion. My general approach was to define a test as a unique dependent and independent variable combination, without regard to mathematical transformation. For example, if a paper reported a regression of the form $Y = a + b$*CON and another regression of the form $\ln(Y) = a + b$*CON, then I just considered this as one test since the underlying variables were identical in both tests.

As the analysis proceeded, it became clear that there were certain patterns to the literature and the patterns that emerged helped inform the organization of this review. Occasionally, some tests fit a pattern without the author's knowing or emphasizing it. For example, some papers assess the effect of CON on efficiency by looking at output/input. In these tests, a higher output/input is generally interpreted as a "good" result because it implies greater technical efficiency. In my own test of bed shortages during COVID, coauthored with Thomas Stratmann, we found that there were higher bed utilization rates in CON states than in non-CON states (Mitchell & Stratmann, 2022). At the time, we did not view this as a "good" result, focusing instead on the fact that hospitals were more likely to run out of beds in CON states than in non-CON states. Nevertheless, since several other authors interpret higher output/input to be a good result, I feel compelled to categorize our finding as such to be consistent.

Finally, I should note that this approach does lead to some double counting. For example, one way that authors assess quality is to see if CON is associated with a costly or unwarranted treatment. If a paper finds that CON encourages an unwarranted treatment then I will code it as being associated with greater utilization of a procedure (good) *and* lower quality (bad), even though there was only one empirical test involved.

4 | RESULTS

My approach identifies 128 papers that together contain 458 tests.[6] The bulk of these tests focus on the four aims of CON identified in the NHPRDA: reducing spending, increasing access,

[5]Angela Erickson of the Pacific Legal Foundation generously shared a quite helpful spreadsheet with many references. If you are aware of any articles that I have missed, please share them with me: matthew.mitchell1@mail.wvu.edu.

[6]For full coding see: https://docs.google.com/spreadsheets/d/1-xZKWcEzqnptxPtkS7h6_EwapMfwub_o/edit?usp=sharing&ouid=102779922122058875161&rtpof=true&sd=true.

enhancing quality, and encouraging care for underserved populations. My summary begins with those four categories. To these we can add one other area of the literature with an obvious normative interpretation: The effects of CON on competition. Then I turn to several sets of tests with less obvious (but still interesting) normative implications. These tests focus on provider volume, provider profits, and the political economy of CON. For the sake of brevity, I will not detail the results of each test in the body of this paper but I do report them in the Table A1.

Before digging into the specific subcategories of the literature, however, let me briefly summarize the broad results of those tests that have relatively obvious normative implications.[7] Figure 1 summarizes these tests. It shows that among 433 tests with an obvious normative implication, a slight majority (212) associate CON with a "bad" outcome. These bad outcomes include higher spending, less access, lower quality, diminished care for underserved populations, or less competition. The next-most-common result, found in 157 tests (36%) was a neutral or insignificant result. Finally, 54 tests (12%) associate CON with a "good" outcome such as less spending or higher quality. Tests associating CON with a bad outcome are four times more common than tests associating CON with a good outcome. With these broad patterns established, I now turn to more specific findings, starting with spending.

4.1 | CON and spending

Do CON laws restrain spending? The first stated aim of CON was to reduce spending. In total, 107 tests assess the effect of CON on spending. But authors approach question in three different ways: spending per service, which I will denote by the shorthand $/Q; spending per person, or $/capita; and efficiency, as measured by output/input. I will take each in turn.

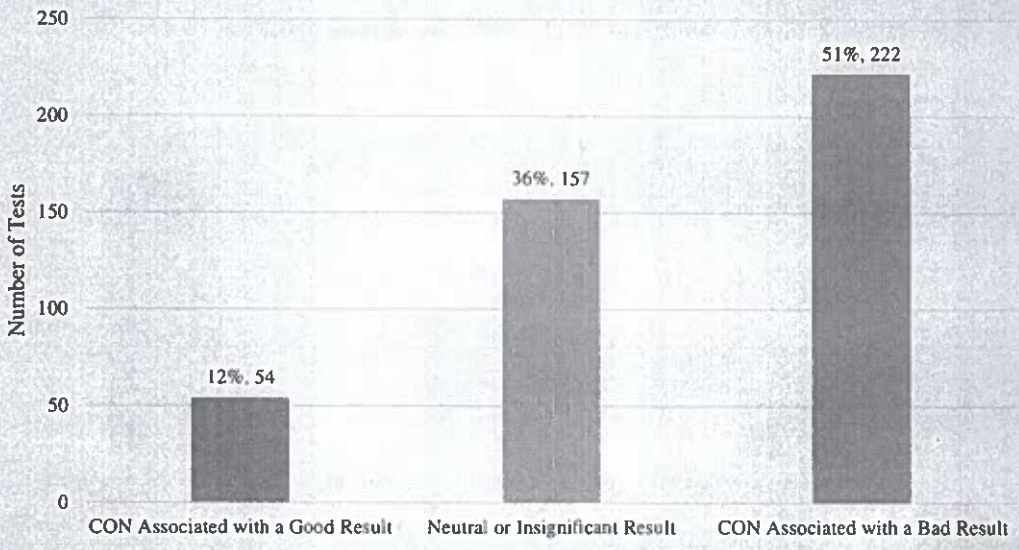


FIGURE 1 Summary of tests with an obvious normative implication. [Color figure can be viewed at wileyonlinelibrary.com]

[7]As will become clear, I don't always agree with the normative interpretations here. But enough researchers evidently do that it is relatively straightforward to categorize results as "good," "bad," or "neutral."

4.1.1 | CON and spending per service rendered ($/Q)

Forty-five tests assess the effect of CON on charges, reimbursements, prices, or per-unit costs. What sets these tests apart from others is that they look at spending *per service rendered*, or $/Q. This is an intuitive way to think about spending because it is analogous to a market price, which is expressed in per-unit or per-service terms. It is also a normatively appealing way to assess the regulation because we typically want to know the financial sacrifice per service rendered.

Standard economic theory offers two reasons to suppose that CON regulation might increase spending per service. First, CON is a supply restriction. As Ford and Kasserman explained nearly three decades ago, "the economic effect [of CON] is to shift the supply curve of the affected service back to the left," and "the effect of such supply shifts is to raise... [the] equilibrium price" (Ford & Kaserman, 1993, pp. 783–784). Second, because of its anticompetitive properties, CON seems likely to permit some degree of pricing power. The empirical literature on spending per service, summarized in Figure 2, is consistent with these expectations.

Among the 45 tests that assess the effects of CON on spending per service, 27 of them—60%—find CON is associated with higher spending per service. Just three tests (7%) associate CON with lower spending per service. Fifteen tests (33%) find insignificant or negligible results. For every test associating CON with lower spending per service, there are nine associating it with higher spending per service.

4.1.2 | CON and spending per capita ($/capita)

Fifty-two tests assess the effect of CON on spending per patient or per person ($/capita). If $/Q is analogous to a market price, then $/capita is analogous to total expenditures, adjusted for the population.[8] That is, it indicates the total amount spent, irrespective of the quantity of services rendered. The $/capita metric seems to align with the initial goals of CON advocates. And in

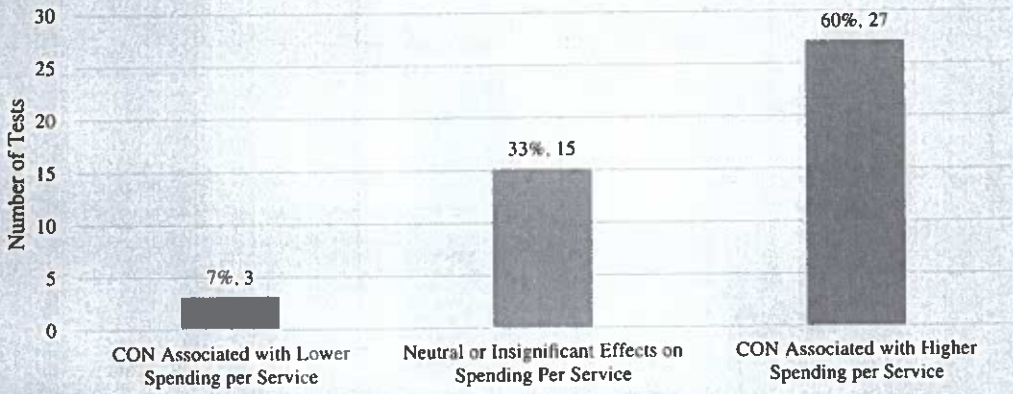


FIGURE 2 Tests assessing the effect of CON on spending per service ($/Q). [Color figure can be viewed at wileyonlinelibrary.com]

[8]In some cases, the line between $/Q and $/capita is not obvious. This is especially true in the case of home health agencies, where the quantity of services rendered is often measured in patient days. In these cases, I coded these as $/capita studies, though others might as easily consider them $/Q studies.

contrast with $/Q, it is more plausible that CON might reduce $/capita. After all, an extremely restrictive CON that did not permit *any* healthcare resources, would result in $0/capita. Under less extreme regimes, we can expect CON to reduce $/capita in cases where the service in question is elastically demanded. In this case, the Q-reducing effect of CON will dominate the $/Q-increasing effect of CON (Bailey, 2018a; Bailey & Hamami, 2019; Ford & Kaserman, 1993; Mitchell, 2016). Most healthcare services, however, are thought to be inelastically demanded (Ringel et al., 2002). So even this theoretically possible effect of CON seems unlikely.

In contrast with the $/Q metric, the $/capita metric has a weaker connection to welfare. A reduction in expenditures per capita is only desirable in cases where marginal services are unwarranted or not cost-effective. As we will see when we consider the quality literature below, this is sometimes the case. However, CON is often applied to procedures and technologies that are thought to be desirable on the margin such as burn care, psychiatric care, substance abuse services, neo-natal intensive care, and hospice care. In short, while less spending per *service* is clearly desirable, it is not always the case that less spending per *person* is desirable. With these caveats in mind, let's turn to the data.

Figure 3 summarizes this subset of the literature. Among the 52 tests, the most-common finding, obtained in 23 tests (44%), associated CON with greater spending per capita. The next-most-common finding is a negligible or insignificant result (21 tests, 40%). Finally, eight tests, representing 15% of the sample, associate CON with lower spending per capita. For each test associating CON with less spending per person there are about three that associate it with more spending per person.

4.1.3 | CON and efficiency (output/input)

Ten tests assess the effect of CON on efficiency as measured by output/input. These tests look at whether inputs such as labor or capital are more intensely used in the presence of the regulation. Theory offers no clear prediction with these tests. On one hand, by limiting the number of healthcare resources, CON might result in greater utilization of each resource, permitting providers to realize economies of scale. On the other, by undermining competition, CON might make providers inattentive to cost containment, resulting in greater x-inefficiency (Leibenstein, 1966; Robinson, 2011; Stensland et al., 2010). Like spending per capita, this metric

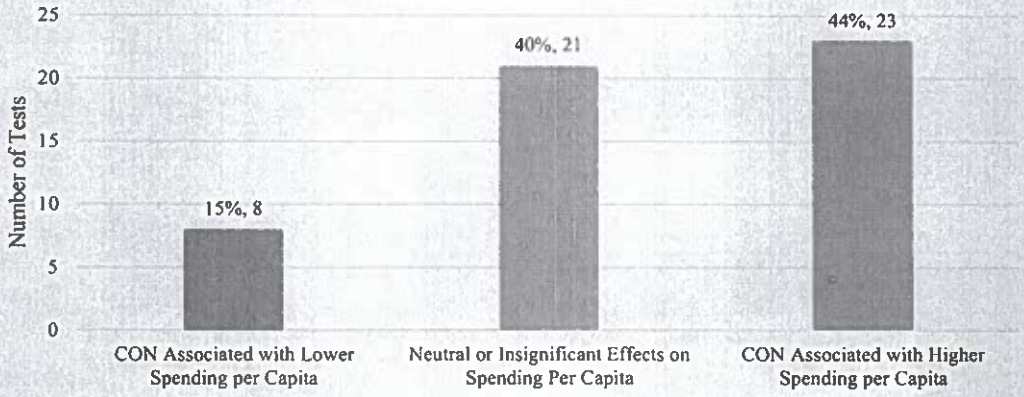


FIGURE 3 Tests assessing the effect of CON on spending per capita ($/Capita). [Color figure can be viewed at wileyonlinelibrary.com]

is also not an especially useful gauge of welfare, but it does give us a sense of how CON affects technical (if not economic) efficiency. The empirical literature, shown in Figure 4, reflects this ambiguity. Four tests associate CON with greater output/input. Four associated it with lower output/input, and two tests find negligible or insignificant results.

4.1.4 | Summary of CON and spending

Overall, the results cast doubt on the main rationale for CON. Most tests associate CON with either more spending or less efficiency and for every one test that associates CON with better spending outcomes, there are nearly four that associate it with worse outcomes. What's more, the results are more mixed in the $/capita and output/input tests where the normative interpretation is weakest but more consistently bad in the $/Q tests where the normative implications are clearest.

4.2 | CON and access

Do CON laws improve access to care? This is the most-studied effect of CON. In total, 190 tests examine whether CON laws impede or enhance access to care. The literature takes two distinct approaches to this question, however: "availability tests" and "utilization tests."

4.2.1 | CON and availability of services

Eighty-three tests measure access by looking at the availability of healthcare services. Some count the number of service providers or units of medical technology per capita. Some measure how far patients must travel to obtain care or how long patients must wait until they can be served. The important distinction with these tests is that they look at the availability of healthcare services, not at whether these services are used.

The theoretical expectation here is *relatively* straightforward. As a supply restriction, one would expect CON to reduce the overall availability of healthcare resources. It is possible,

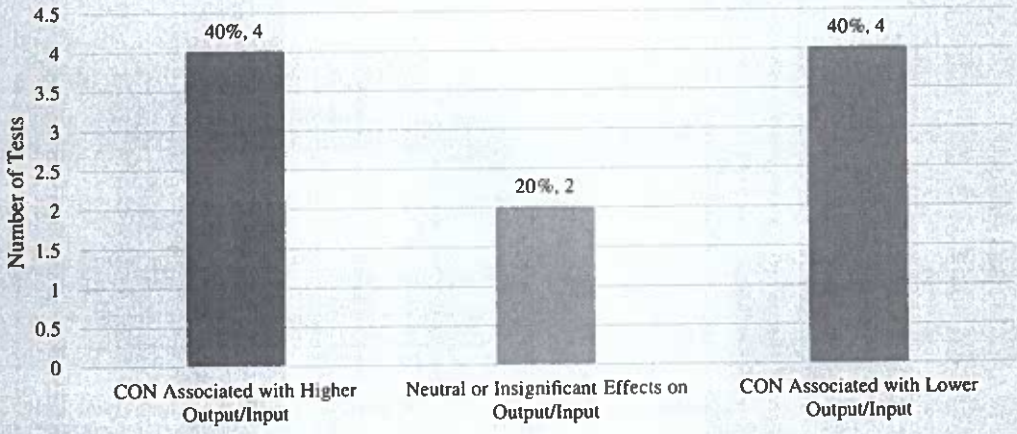


FIGURE 4 Tests assessing the effect of CON on output/input. [Color figure can be viewed at wileyonlinelibrary.com]

however, to imagine scenarios in which CON might increase the availability of *some* specific resources. For example, if CON applies to certain technologies or capital expenditures and not to others, or if regulators are more restrictive with some investments than others, then we might expect to see the latter become more available.

Note that this possibility is consistent with both the public interest theory and the special interest theories of regulation. On the one hand, publicly spirited regulators might throttle costly or ineffective care in hopes of encouraging more efficient or effective modes. On the other, special interests might seek to restrict their competition or raise their rivals' costs and this might make the special interest's services relatively more abundant (Salop & Scheffman, 1983; Tullock, 1967).

As shown in Figure 5, the empirical literature on CON and availability of care is lopsided. Of the 83 tests, 65 (78%) associate CON with diminished availability of services. Twelve tests (14%) find negligible or inconclusive results. And just six tests (7%) associate CON with greater availability of resources.

4.2.2 | CON and the utilization of services

The other common way to assess access is to see if CON correlates with the utilization of services. Here, too, it is reasonable to expect CON will tend to reduce the utilization of services by restraining supply. As with availability, though, it is possible that CON may increase the utilization of some services if it restrains the use of substitutes. Moreover, because healthcare is inelastically demanded, patients may still seek care even if it is costly or difficult to obtain. The results, shown in Figure 6, are consistent with this ambiguity. In total, 107 tests assess the effect of CON on utilization of services, and 60 (56%) find negligible or statistically insignificant effects of CON on utilization. Thirty-four tests (32%) associate CON with diminished utilization of services. And 13 tests (12) associate CON with increased utilization of services.

4.3 | CON and quality

Do CON laws improve the quality of care? CON advocates often make the case that CON ensures quality. How? The most-common rationale relates to the quality-volume relationship.

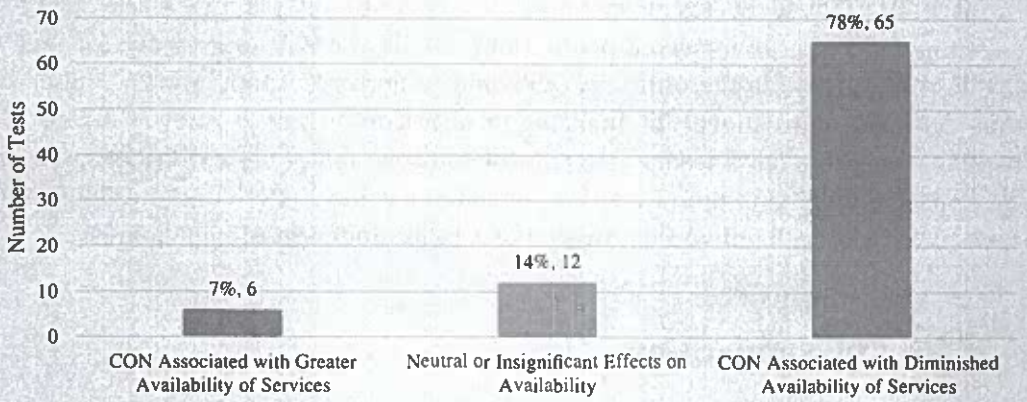


FIGURE 5 Tests assessing the effect of CON on availability of services. [Color figure can be viewed at wileyonlinelibrary.com]

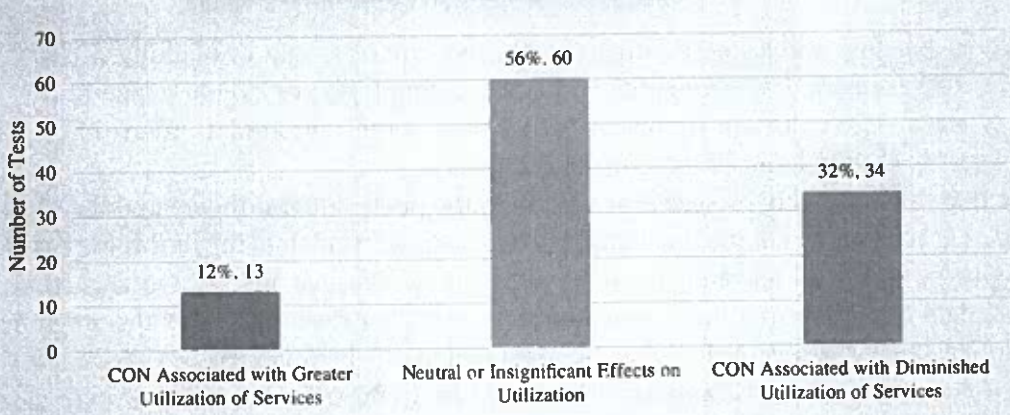


FIGURE 6 Tests assessing the effect of CON on utilization of services. [Color figure can be viewed at wileyonlinelibrary.com]

It is well documented that providers who frequently perform a procedure tend to get better at it (it is possible, of course, that causality could run in the opposite direction; especially competent providers may be in especially high demand). If CON results in fewer providers, and if each provider ends up doing more procedures, then it is possible that it might indirectly enhance quality. On the other hand, competition tends to enhance quality as well. And so it is possible that by undermining competition, CON will undermine quality. What do the data say?

One-hundred-and-fourteen tests assess the effect of CON on quality. One common technique is to see if CON correlates with outcome measures such as mortality rates, readmission rates, or infection rates. Another is to see if CON discourages the use of unwarranted procedures (in this case, what will be coded here as a "good" quality outcome will be coded above as a bad "volume" outcome). Figure 7 summarizes this literature. Of 114 tests, 52 (46%) associate CON with diminished quality of care. Fort-four (39%) find either neutral or insignificant effects of CON on quality. And 18 tests, (16%) associate CON with better quality.

Nearly three times as many tests associate CON with lower quality outcomes as with higher quality.

4.4 | CON and underserved populations

Do CON laws improve the provision of care for underserved populations? Though CON is a supply restriction, CON advocates believe that the regulation diverts healthcare resources from overserved populations to underserved populations. So far, there is no evidence for this.

Figure 8 summarizes the literature on CON and underserved populations. These tests look at whether CON has undermined the financing or provision of care to rural or otherwise underserved populations. There have been 17 tests in this category and of these, 14 (82%) associate CON with weaker provision of care to underserved populations while 3 (18%) find no significant effects. No tests associate CON with enhanced provision of care for underserved populations.

4.5 | CON and competition

The final set of tests with normatively clear implications address the effect of CON on competition. These tests usually measure the degree of competition with the Herfindahl–Hirschman

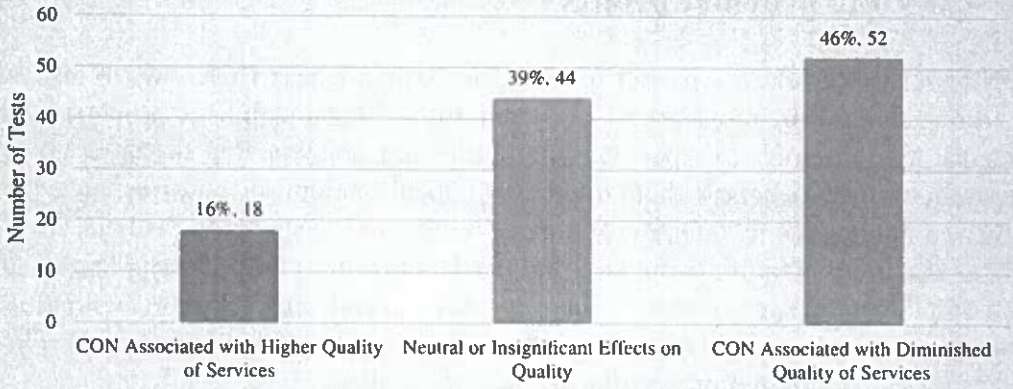


FIGURE 7 Tests assessing the effect of CON on quality of care. [Color figure can be viewed at wileyonlinelibrary.com]

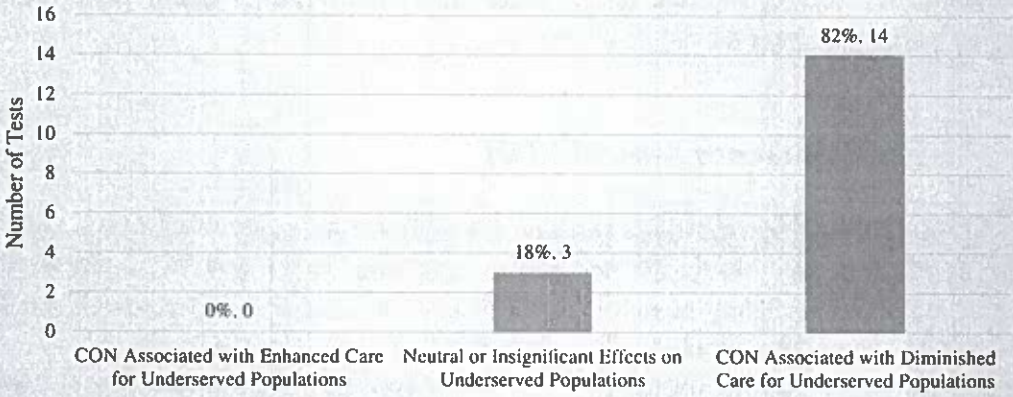


FIGURE 8 Tests assessing the effect of CON on underserved populations. [Color figure can be viewed at wileyonlinelibrary.com]

Index. Among five tests, three associate CON with less competition and two associate it with more competition.

4.6 | CON and provider volume

So far it has been relatively easy to characterize results as "good," "neutral," or "bad." Now I turn to a set of tests that are not so easily characterized. The first of these is provider volume. These tests assess whether CON increases or decreases the average provider's volume of services. By limiting the number of providers, we would expect CON to lead to higher volumes by provider. Some scholars *infer* that this is a good result because it might allow providers to achieve economies of scale or to improve their quality through repetition. These outcomes, however, are better measured directly through the tests summarized above.

Among 20 tests, 17 (85%) associate the regulation with greater provider volume. Two tests find neutral or negligible results and another associates CON with diminished provider volume.

4.7 | CON and provider profits

Are CON laws profitable? As a barrier to entry, one would expect CON laws to lead to higher profits among incumbent providers in the short run. These incumbent providers vigorously lobby against any proposals to repeal CON, and this, too, suggests that the laws are profitable (or at least that providers believe them to be so). Political economists, however, have long noted that contrived privileges only offer above-normal returns in the short run (Tullock, 1975). Competition can occur along multiple margins and barriers to entry rarely succeed in covering all of these margins. Over longer periods, providers may expend costly resources seeking CONs, opposing the CONs of their competitors, and maintaining the CON process itself. These costs may erode the extra-normal profits conferred by CON (Tullock, 1967, 1980).

This is a relatively understudied phenomenon. There have only been three papers assessing the effect of CON on profitability and together they contain four tests. Among the four tests, three associate CON with diminished profitability while one associates it with enhanced profitability. Together, the results suggest that, if anything, CON depresses rather than enhances hospital profitability. But we should be cautious with these results given how limited this subcategory of the literature is.

4.8 | The political economy of CON

A small but interesting subset of tests examine the political economy of CON laws. These tests are idiosyncratic and their results are not easy to aggregate. Teske and Chard (2004) study the factors that make a state likely to retain its CON law, making this paper one of the few that study CON as a dependent variable.[9] They find that CON laws were more likely to be retained in states with more Democrats in the upper and lower houses, higher hospital costs, more affluent and better-educated citizens, fewer physicians, and stronger hospital interests. Eichmann and Santerre (2011) study the degree to which hospital executives capture the rents generated by CON laws, finding that urban CEOs earn $91,000 more in CON than in non-CON states. Finally, Stratmann and Monaghan (2017) study whether political action committee (PAC) contributions affect CON approval rates in three states. They find that a 1% increase in PAC contributions from an applicant firm is associated with 6.7% greater odds of approval in Georgia, 1.8% greater odds of approval in Michigan, and 3.6% greater odds of approval in Virginia.

5 | DISCUSSION AND CONCLUSION

The state experiment with CONs in healthcare began in New York in 1964. A decade later, federal legislators encouraged the regulation through the National Health Planning and Resources Development Act of 1974. The federal inducement was eliminated in the mid-1980s, however, and since then about a third of states have repealed their health care CON laws and others have pared their programs back.

[9]Note that because they find that CON is positively related to hospital costs and negatively related to the number of physicians, I have included this paper in the previous sections and coded it as indicating CON is associated with higher $/Q and lower availability of healthcare.

Few state policy experiments have been as thoroughly examined as CON laws in healthcare. I have identified and coded 128 papers that together contain over 450 tests. The bulk of these address the stated goals of the regulation, assessing the effect of CON on spending, access, quality, and underserved populations. Other tests assess the effect of CON laws on competition, provider volume, and profits. And others assess the political economy of CON laws.

The balance of research suggests that CON laws do not achieve their stated goals. There is little evidence that they restrain spending, increase access, enhance quality, or improve the provision of care to underserved populations. In fact, the most-common finding is that CON laws undermine each of these goals. For every test associating CON with a "good" outcome, there are more than 4 that associate it with a "bad" outcome.

These findings are consistent with standard economic theory. They suggest that CON laws are barriers to entry that enhance the business of incumbent providers, increase costs, and limit access to care. These barriers likely enhance the profits of incumbent providers in the short run but not necessarily in the long run.

Though CON laws have been exhaustively studied, there are some understudied aspects of the regulation. First, CON law data is fragmentary and inaccessible. Though there have been hundreds of tests assessing the effect of CON laws, the data that these researchers have collected largely remains private. Future researchers would make a mighty contribution to the public good simply by collecting and posting their panel data on CON laws.

Second, while there have been some attempts to measure the stringency of CON laws, these tests have been relatively rare. Here again, it would be helpful if future researchers collected and disseminated data on approval rates, thresholds, and wait times. Though more difficult, it would be especially helpful to know the compliance and opportunity costs involved in seeking a CON. How much revenue is forgone in the CON process? How many patients are not served while providers navigate the process? And how many providers are discouraged by these costs and fail to even apply? In some cases, qualitative case studies may be better at answering these questions than large cross section time series data analyses.

Third, little is known about the political economy of CON laws. To my knowledge, no one has studied whether the institutional environment affects CON decisions. For example, are CON applications more likely to be granted in states where the decisionmaker is a board rather than an administrator? Does the composition of the board make a difference? Do regulatory guidelines make a difference? We have some data that suggests that politically active applicants are more likely to be successful in seeking CONs (Stratmann & Monaghan, 2017). Does the applicant's size, profitability, employment, nonprofit status, location, or political connections matter? Though one study (Teske & Chard, 2004) has examined why states retain their CON laws, it is now nearly two decades old and it may be time to revisit this question. This area is especially ripe for investigation given several high-profile proposals to eliminate or pare back CON programs in several states in recent years.

Finally, while the "public interest" theory of CON has been well studied (and found lacking), the "special interest" theory of CON has been relatively understudied. Which interests benefit from CON laws? And which interests benefit from their repeal? How do CON laws affect employment and compensation in different health sectors? In many states, boutique consulting firms profit by shepherding providers through the CON process. To my knowledge, these entities have been entirely unstudied.

ACKNOWLEDGMENTS

I thank Jaimie Cavanaugh, Angela Erickson, Thomas Stratmann, Edward Timmons, participants at the Certificate-of-Need Research Conference held at West Virginia University on June 2nd–3rd, 2023, and two anonymous reviewers for numerous helpful suggestions. I am solely responsible for any remaining errors or omissions.

FUNDING INFORMATION

I received no financial support for the production of this article.

REFERENCES

Anderson, K.B. (1991) Regulation, market structure, and hospital costs: comment. *Southern Economic Journal*, 58(2), 528–534. Available from: https://doi.org/10.2307/1060194

Anderson, K.B. & Kass, D.I. (1986) *Certificate of need regulation of entry into home health care: a multi-product cost function analysis*. Washington, DC: Federal Trade Commission.

Antel, J.J., Ohsfeldt, R.L. & Becker, E.R. (1995) State regulation and hospital costs. *The Review of Economics and Statistics*, 77(3), 416–422. Available from: https://doi.org/10.2307/2109904

Ashby, J.L. (1984) The impact of hospital regulatory programs on per capita costs, utilization, and capital investment. *Inquiry*, 21(1), 45–59.

Auster, R.D. & Oaxaca, R.L. (1981) Identification of supplier induced demand in the health care sector. *The Journal of Human Resources*, 16(3), 327–342. Available from: https://doi.org/10.2307/145624

Averett, S.L., Terrizzi, S. & Wang, Y. (2019) Taking the CON out of Pennsylvania: did hip/knee replacement patients benefit? A retrospective analysis. *Health Policy and Technology*, 8(4), 349–355. Available from: https://doi.org/10.1016/j.hlpt.2019.09.006

Bailey, J. (2016) *Can health spending be reined in through supply constraints? An evaluation of certificate-of-need laws.*" Mercatus Working Paper. Arlington, VA: Mercatus Center at George Mason University. https://www.mercatus.org/publications/certificate-need/can-health-spending-be-reined-through-supply-constraints-evaluation

Bailey, J. (2018a) Does 'excess supply' drive excessive health spending? The case of certificate-of-need laws. *The Journal of Private Enterprise*, 33(4), 91–109.

Bailey, J. (2018b) The effect of certificate of need laws on all-cause mortality. *Health Services Research*, 53(1), 49–62. Available from: https://doi.org/10.1111/1475-6773.12619

Bailey, J. (2019) Can health spending be reined in through supply restraints? An evaluation of certificate-of-need laws. *Journal of Public Health*, 27(6), 755–760. Available from: https://doi.org/10.1007/s10389-018-0998-1

Bailey, J. & Hamami, T. (2019) *Competition and health-care spending: theory and application to certificate of need laws.*" Working Paper 19–38. Philadelphia, PA: Federal Reserve Bank of Philadelphia. http://www.philadelphiafed.org/the-economy/competition-and-health-care-spending-theory-and-application-to-certificate-of-need-laws

Bailey, J. & Hamami, T. (2023) Competition and health-care spending: theory and application to certificate of need laws. *Contemporary Economic Policy*, 41(1), 128–145. Available from: https://doi.org/10.1111/coep.12584

Bailey, J., Hamami, T. & McCorry, D. (2017) Certificate of need laws and health care prices. *Journal of Health Care Finance*, 43(4), 1–7. http://healthfinancejournal.com/index.php/johcf/article/view/128

Bailey, J. & Lewin, E. (2021) Certificate of need and inpatient psychiatric services. *The Journal of Mental Health Policy and Economics*, 24(4), 117–124.

Bailey, J., Lu, T. & Vogt, P. (2022) Certificate-of-need laws and substance use treatment. *Substance Abuse Treatment, Prevention, and Policy*, 17, 1–7. Available from: https://doi.org/10.1186/s13011-022-00469-z

Baker, M.C. & Stratmann, T. (2021) Barriers to entry in the healthcare markets: winners and losers from certificate-of-need laws. *Socio-Economic Planning Sciences*, 77, 101007. Available from: https://doi.org/10.1016/j.seps.2020.101007

Bates, L.J., Mukherjee, K. & Santerre, R.E. (2006) Market structure and technical efficiency in the hospital services industry: a DEA approach. *Medical Care Research and Review*, 63(4), 499–524. Available from: https://doi.org/10.1177/1077558706288842

Browne, J.A., Cancienne, J.M., Casp, A.J., Novicoff, W.M. & Werner, B.C. (2018) Certificate-of-need state laws and total knee arthroplasty. *The Journal of Arthroplasty*, 33(7), 2020–2024.

Cancienne, J.M., Browning, R., Haug, E., Browne, J.A. & Werner, B.C. (2020) Certificate-of-need programs are associated with a reduced incidence, expenditure, and rate of complications with respect to knee arthroscopy in the Medicare population. *HSS Journal: The Musculoskeletal Journal of Hospital for Special Surgery*, 16-(Supplement 2), 264–271. Available from: https://doi.org/10.1007/s11420-019-09693-z

Cantor, J.C., DeLia, D., Tiedemann, A., Stanley, A. & Kronebusch, K. (2009) Reducing racial disparities in coronary angiography. *Health Affairs*, 28(5), 1521–1531. Available from: https://doi.org/10.1377/hlthaff.28.5.1521

Carlson, M.D.A., Bradley, E.H., Qingling, D. & Sean Morrison, R. (2010) Geographic access to hospice in the United States. *Journal of Palliative Medicine*, 13(11), 1331–1338. Available from: https://doi.org/10.1089/jpm.2010.0209

Casp, A.J., Durig, N.E., Cancienne, J.M., Werner, B.C. & Browne, J.A. (2019) Certificate-of-need state laws and total hip arthroplasty. *The Journal of Arthroplasty*, 34(3), 401–407. Available from: https://doi.org/10.1016/j.arth.2018.11.038

Caudill, S.B., Ford, J.M. & Kaserman, D.L. (1995) Certificate-of-need regulation and the diffusion of innovations: a random coefficient model. *Journal of Applied Econometrics*, 10(1), 73–78.

Cavanaugh, J., Brothers, C.G., Griffin, A., Hoover, R., LoPresti, M. & Wrench, J. (2020) *Conning the competition: a nationwide survey of certificate of need laws*. Arlington, VA: Institute for Justice. https://ij.org/wp-content/uploads/2020/08/Conning-the-Competition-WEB-08.11.2020.pdf

Chen, C.-C. (2005) Estimating nursing home cost and production functions: application of stochastic frontier models for the analysis of efficiency. *ProQuest Dissertations and Theses*. PhD, Tulane University. http://www.proquest.com/docview/305399421/abstract/F9AE5D67757C4ACAPQ/1

Chiu, K. (2021) The impact of certificate of need laws on heart attack mortality: evidence from county borders. *Journal of Health Economics*, 79, 102518. Available from: https://doi.org/10.2139/ssrn.3678714

Chui, P.W., Parzynski, C.S., Ross, J.S., Desai, N.R., Gurm, H.S., Spertus, J.A. et al. (2019) Association of statewide certificate of need regulations with percutaneous coronary intervention appropriateness and outcomes. *Journal of the American Heart Association*, 8(2), e010373. Available from: https://doi.org/10.1161/JAHA.118.010373

Chui, P.W., Parzynski, C.S., Ross, J.S., Ho, V., Spertus, J.A., Gurm, H.S. et al. (2015) Association of state certificate of need regulations with the appropriateness of PCI procedures. *Circulation*, 132(Supplement 3), A18805. Available from: https://doi.org/10.1161/circ.132.suppl_3.18805

Coelen, C. & Sullivan, D. (1981) An analysis of the effects of prospective reimbursement programs on hospital expenditures. *Health Care Financing Review*, 2(3), 1–40.

Conover, C.J. & Bailey, J. (2020) Certificate of need laws: a systematic review and cost-effectiveness analysis. *BMC Health Services Research*, 20(1), 748. Available from: https://doi.org/10.1186/s12913-020-05563-1

Conover, C.J. & Sloan, F.A. (1998) Does removing certificate-of-need regulations lead to a surge in health care spending? *Journal of Health Politics, Policy and Law*, 23(3), 455–481. Available from: https://doi.org/10.1215/03616878-23-3-455

Conover, C.J. & Sloan, F.A. (2003) *Evaluation of certificate of need in Michigan. Volume II: technical appendices*. Raleigh, NC: Duke University Center for Health Policy, Law and Management.

Cosby, C. (2011) *Analyzing the association of certificate of need regulationson volume and quality indicators for heart and kidney transplantation*. Richmond, VA: Virginia Commonwealth University. https://scholarscompass.vcu.edu/etd/2357

Cromwell, J. & Kanak, J.R. (1982) The effects of prospective reimbursement programs on hospital adoption and service sharing. *Health Care Financing Review*, 4(2), 67–88.

Custer, W.S., Ketscche, P., Sherman, B., Landers, G.M., Zhou, M., Ujamaa, D. et al. (2006) Report of data analyses to the Georgia Commission on the efficacy of the CON program. *Aysps.Gsu.Edu*. https://www.academia.edu/81395977/Report_of_Data_Analyses_to_the_Georgia_Commission_on_the_Efficacy_of_the_CON_Program

Cutler, D.M., Huckman, R.S. & Kolstad, J.T. (2010) Input constraints and the efficiency of entry: lessons from cardiac surgery. *American Economic Journal: Economic Policy*, 2(1), 51–76.

D'Aunno, T., Succi, M. & Alexander, J.A. (2000) The role of institutional and market forces in divergent organizational change. *Administrative Science Quarterly*, 45, 679–703.

DeLia, D., Cantor, J.C., Tiedemann, A. & Huang, C.S. (2009) Effects of regulation and competition on health care disparities: the case of cardiac angiography in New Jersey. *Journal of Health Politics, Policy and Law*, 34(1), 63–91. Available from: https://doi.org/10.1215/03616878-2008-992

Denduluri, S.K., Roe, A., Bala, A., Fogel, N., Ziino, C. & Kamal, R.N. (2021) The impact of certificate of need status on the utilization and reimbursement of open and endoscopic carpal tunnel release. *Journal of Surgical Orthopaedic Advances*, 30(2), 90–92.

Denson, C. & Mitchell, M.D. (2023) *Economic report on Georgia's certificate of need program*. Atlanta, GA: Georgia Public Policy Foundation.

DiSesa, V.J., O'Brien, S.M., Welke, K.F., Beland, S.M., Haan, C.K., Vaughan-Sarrazin, M.S. et al. (2006) Contemporary impact of state certificate-of-need regulations for cardiac surgery: an analysis using the Society of Thoracic Surgeons' National Cardiac Surgery Database. *Circulation*, 114(20), 2122–2129. Available from: https://doi.org/10.1161/CIRCULATIONAHA.105.591214

Dobson, A., Pete Welch, W., Bender, D., Ko, K.D., Sen, N., El-Gamil, A. et al. (2007) *An evaluation of Illinois' certificate of need program*. Springfield, IL: State of Illinois Commission on Government Forecasting and Accountability.

Drug Export. Amendments Act of 1986 Pub. L. 99-660, § 701, 100 Stat. 3799. (1986).

Eakin, B.K. (1991) Allocative inefficiency in the production of hospital services. *Southern Economic Journal*, 58(1), 240–248. Available from: https://doi.org/10.2307/1060045

Eastaugh, S.R. (1982) The effectiveness of community-based hospital planning: some recent evidence. *Applied Economics*, 14(5), 475–490. Available from: https://doi.org/10.1080/00036848200000043

Eichmann, T.L. & Santerre, R.E. (2011) Do hospital chief executive officers extract rents from certificate of need laws. *Journal of Health Care Finance*, 37(4), 1–14.

Ettner, S.L., Zinn, J.S., Haiyong, X., Ladd, H., Nuccio, E., Sorkin, D.H. et al. (2020) Certificate of need and the cost of competition in home healthcare markets. *Home Health Care Services Quarterly*, 39(2), 51–64. Available from: https://doi.org/10.1080/01621424.2020.1728464

Falchook, A.D. & Chen, R.C. (2015) Association between certificate of need legislation and radiation therapy use among elderly patients with early cancers. *International Journal of Radiation Oncology, Biology, Physics*, 91(2), 448–450. Available from: https://doi.org/10.1016/j.ijrobp.2014.10.033

Fayissa, B., Alsaif, S., Mansour, F., Leonce, T.E. & Mixon, F.G. (2020) Certificate-of-need regulation and healthcare service quality: evidence from the nursing home industry. *Healthcare (Basel, Switzerland)*, 8(4), E423. Available from: https://doi.org/10.3390/healthcare8040423

Ferrier, G.D., Leleu, H. & Valdmanis, V. (2010) The impact of CON regulation on hospital efficiency. *Health Care Management Science*, 13(1), 84–100.

Ford, J.M. & Kaserman, D.L. (1993) Certificate-of-need regulation and entry: evidence from the dialysis industry. *Southern Economic Journal*, 59(4), 783–791. Available from: https://doi.org/10.2307/1059739

Fric-Shamji, E.C. & Shamji, M.F. (2010) Effect of US state certificate of need regulation of operating rooms on surgical resident training. *Clinical and Investigative Medicine. Medecine Clinique et Experimentale*, 33(2), E78. Available from: https://doi.org/10.25011/cim.v33i2.12345

Gaines, A.G. & Cagle, J.G. (2023) Associations between certificate of need policies and hospice quality outcomes. *The American Journal of Hospice & Palliative Care*, 41(5), 10499091231180613. Available from: https://doi.org/10.1177/10499091231180613

Gertler, P.J. (1985) A latent variable model of quality determination. Working Paper 1750. National Bureau of Economic Research. https://doi.org/10.3386/w1750

Grabowski, D.C., Ohsfeldt, R.L. & Morrisey, M.A. (2003) The effects of CON repeal on Medicaid nursing home and long-term care expenditures. *Inquiry: A Journal of Medical Care Organization, Provision and Financing*, 40(2), 146–157.

Granderson, G. (2011) The impacts of hospital alliance membership, alliance size, and repealing certificate of need regulation, on the cost efficiency of non-profit hospitals. *Managerial and Decision Economics*, 32(3), 159–173. Available from: https://doi.org/10.1002/mde.1524

Gulley, O.D. & Santerre, R.E. (2003) The effect of public policies on nursing home care in the United States. *Eastern Economic Journal*, 29(1), 93–104.

Gutierrez, C., Lindor, R.A., Baker, O., Cutler, D. & Schuur, J.D. (2016) State regulation of freestanding emergency departments varies widely, affecting location, growth, and services provided. *Health Affairs*, 35(10), 1857–1866. Available from: https://doi.org/10.1377/hlthaff.2016.0412

Harrington, C., Swan, J.H., Nyman, J.A. & Carrillo, H. (1997) The effect of certificate of need and moratoria policy on change in nursing home beds in the United States. *Medical Care*, 35(6), 574–588.

Hellinger, F.J. (1976) The effect of certificate-of-need legislation on hospital investment. *Inquiry*, 13(2), 187–193.

Hellinger, F.J. (2009) The effect of certificate-of-need laws on hospital beds and healthcare expenditures: an empirical analysis. *The American Journal of Managed Care*, 15(10), 737–744.

Herb, J.N., Wolff, R.T., McDaniel, P.M., Mark Holmes, G., Royce, T.J. & Stitzenberg, K.B. (2021) Travel time to radiation oncology facilities in the United States and the influence of certificate of need policies. *International Journal of Radiation Oncology, Biology, Physics*, 109(2), 344–351. Available from: https://doi.org/10.1016/j.ijrobp.2020.08.059

Ho, V. (2004) Certificate of need, volume, and percutaneous transluminal coronary angioplasty outcomes. *American Heart Journal*, 147(3), 442–448. Available from: https://doi.org/10.1016/j.ahj.2003.05.002

Ho, V. (2007) Does certificate of need affect cardiac outcomes and costs? *International Journal of Health Care Finance and Economics*, 6(4), 300–324. Available from: https://doi.org/10.1007/s10754-007-9008-9

Ho, V. & Ku-Goto, M.-H. (2013) State deregulation and Medicare costs for acute cardiac care. *Medical Care Research and Review*, 70(2), 185–205. Available from: https://doi.org/10.1177/1077558712459681

Ho, V., Ku-Goto, M.-H. & Jollis, J.G. (2009) Certificate of need (CON) for cardiac care: controversy over the contributions of CON. *Health Services Research*, 44(2 Pt 1), 483–500. Available from: https://doi.org/10.1111/j.1475-6773.2008.00933.x

Ho, V., Ross, J.S., Nallamothu, B.K. & Krumholz, H.M. (2007) Cardiac certificate of need regulations and the availability and use of revascularization services. *American Heart Journal*, 154(4), 767–775. Available from: https://doi.org/10.1016/j.ahj.2007.06.031

Hoover, K. (2012) Doctors challenge Virginia's certificate-of-need requirement. *The Business Journals*. http://www.bizjournals.com/bizjournals/washingtonbureau/2012/06/05/doctors-challenge-virginias.html

Horwitz, J., Nichols, A., Colla, C. & Cutler, D. (2024) Technology regulation reconsidered: the effects of certificate of need policies on the quantity and quality of diagnostic imaging. NBER Working Paper 32143. National Bureau of Economic Research. https://econpapers.repec.org/paper/nbrnberwo/32143.htm

Horwitz, J.R. & Polsky, D. (2015) Cross border effects of state health technology regulation. *American Journal of Health Economics*, 1(1), 101–123. Available from: https://doi.org/10.1162/ajhe_a_00005

Jacobs, B.L., Zhang, Y. & Hollenbeck, B.K. (2012) 131 certificate of need Laws and the diffusion of intensity-modulated radiotherapy. *Journal of Urology*, 187(4S), e54. Available from: https://doi.org/10.1016/j.juro.2012.02.180

Jacobs, B.L., Zhang, Y., Skolarus, T.A., Wei, J.T., Montie, J.E., Schroeck, F.R. et al. (2012) Certificate of need regulations and the diffusion of intensity-modulated radiotherapy. *Urology*, 80(5), 1015–1020. Available from: https://doi.org/10.1016/j.urology.2012.07.042

Jacobs, B.L., Zhang, Y., Skolarus, T.A., Wei, J.T., Montie, J.E., Schroeck, F.R. et al. (2013) Certificate of need legislation and the dissemination of robotic surgery for prostate cancer. *Journal of Urology*, 189(1), 80–85. Available from: https://doi.org/10.1016/j.juro.2012.08.185

Joskow, P.L. (1980) The effects of competition and regulation on hospital bed supply and the reservation quality of the hospital. *The Bell Journal of Economics*, 11(2), 421–447. Available from: https://doi.org/10.2307/3003372

Kahn, J.M., Werner, R.M., Carson, S.S. & Iwashyna, T.J. (2012) Variation in long-term acute care hospital use after intensive care. *Medical Care Research and Review*, 69(3), 339–350. Available from: https://doi.org/10.1177/1077558711432889

Khanna, A., Hu, J.C., Xiangmei, G., Nguyen, P.L., Lipsitz, S. & Palapattu, G.S. (2013) Certificate of need programs, intensity modulated radiation therapy use and the cost of prostate cancer care. *The Journal of Urology*, 189(1), 75–79. Available from: https://doi.org/10.1016/j.juro.2012.08.181

Kim, S., Patel, A.N., Nelson, C., Shen, S., Mayer, T., Moore, D.F. et al. (2016) Does certificate of need minimize intensity modulated radiation therapy use in patients with low risk prostate cancer? *Urology Practice*, 3(5), 342–348. Available from: https://doi.org/10.1016/j.urpr.2015.09.001

Kolstad, J.T. (2009) *Essays on information, competition and quality in health care provider markets*. PhD Dissertation. Boston, MA: Harvard University. https://healthpolicy.fas.harvard.edu/people/jonathan-kolstad

Kosar, C.M. & Rahman, M. (2021) Early acceleration of COVID-19 in areas with larger nursing homes and certificate of need laws. *Journal of General Internal Medicine*, 36(4), 990–997. Available from: https://doi.org/10.1007/s11606-020-06518-2

Lanning, J.A., Morrisey, M.A. & Ohsfeldt, R.L. (1991) Endogenous hospital regulation and its effects on hospital and non-hospital expenditures. *Journal of Regulatory Economics*, 3(2), 137–154. Available from: https://doi.org/10.1007/BF00140955

Lee, J.A., Birnbaum, H. & Bishop, C. (1983) How nursing homes behave: a multi-equation model of nursing home behavior. *Social Science & Medicine (1982), Social Science & Medicine*, 17(23), 1897–1906. Available from: https://doi.org/10.1016/0277-9536(83)90167-3

Leibenstein, H. (1966) Allocative efficiency vs. 'X-efficiency'. *The American Economic Review*, 56(3), 392–415.

Li, S. & Dor, A. (2015) How do hospitals respond to market entry? Evidence from a deregulated market for cardiac revascularization. *Health Economics*, 24(8), 990–1008. Available from: https://doi.org/10.1002/hec.3079

Lorch, S.A., Maheshwari, P. & Even-Shoshan, O. (2012) The impact of certificate of need programs on neonatal intensive care units. *Journal of Perinatology*, 32(1), 39–44. Available from: https://doi.org/10.1038/jp.2011.47

Lu-Yao, G.L., Nelson, C., Shen, S., Shao, Y.-H., Li, H., Mayer, T.M. et al. (2013) Certificate of need and use of IMRT in elderly patients with low-risk prostate cancer. *Journal of Clinical Oncology*, 31(6 Supplement), 204. Available from: https://doi.org/10.1200/jco.2013.31.6_suppl.204

Malik, A.T., Phillips, F.M., Retchin, S., Wendy, X. & Khan, S.N. (2019) Certificate-of-need state laws and elective posterior lumbar fusions: a Medicare trends, costs and outcomes analysis. *The Spine Journal*, 19(9, Supplement), S45. Available from: https://doi.org/10.1016/j.spinee.2019.05.106

Mayo, J.W. & McFarland, D.A. (1989) Regulation, market structure, and hospital costs. *Southern Economic Journal*, 55(3), 559–569. Available from: https://doi.org/10.2307/1059572

Mayo, J.W. & McFarland, D.A. (1991) Regulation, market structure, and hospital costs: reply. *Southern Economic Journal*, 58(2), 535–538. Available from: https://doi.org/10.2307/1060195

McGinley, P.J. (1995) Beyond health care reform: reconsidering certificate of need laws in a 'managed competition' system. *Florida State University Law Review*, 23(1), 147. http://papers.ssrn.com/abstract=2671862

Miller, N.A., Harrington, C. & Goldstein, E. (2002) Access to community-based long-term care: Medicaid's role. *Journal of Aging and Health*, 14(1), 138–159.

Mitchell, M.D. (2016) *Do certificate-of-need Laws limit spending? Mercatus Working Paper*. Arlington, VA: Mercatus Center at George Mason University. https://www.mercatus.org/system/files/mercatus-mitchell-con-healthcare-spending-v3.pdf

Mitchell, M.D., Philpot, A. & McBirney, J. (2021) *The state of certificate-of-need Laws in 2020*. Arlington, VA: Mercatus Center at George Mason University. https://www.mercatus.org/publications/healthcare/con-laws-2020-about-update

Mitchell, M.D. & Stratmann, T. (2022) The economics of a bed shortage: certificate-of-need regulation and hospital bed utilization during the COVID-19 pandemic. *Journal of Risk and Financial Management*, 15(1), 10. Available from: https://doi.org/10.3390/jrfm15010010

Mitchell, M.D., Stratmann, T. & Bailey, J. (2020) *Raising the Bar: ICU beds and certificates of need*. Arlington, VA: Mercatus Center at George Mason University. https://www.mercatus.org/publications/covid-19-crisis-response/raising-bar-icu-beds-and-certificates-need

Myers, M.S. & Sheehan, K.M. (2020) The impact of certificate of need laws on emergency department wait times. *Journal of Private Enterprise*, 35(1), 59–75.

Nelson, C., Kim, S., Shen, S., Shao, Y., Mayer, T., Moore, D. et al. (2012) Certificate of need (CON) status and its impact on overtreatment of low-risk prostate cancer in the elderly. *International Journal of Radiation Oncology, Biology, Physics*, 84(3), S123–S124. Available from: https://doi.org/10.1016/j.ijrobp.2012.07.121

NHPRDA. (1975) U.S.C. https://www.gpo.gov/fdsys/pkg/STATUTE-88/pdf/STATUTE-88-Pg2225.pdf

Ni, H., Paul, J.A. & Bagchi, A. (2017) Effect of certificate of need law on the intensity of competition: the market for emergency care. *Socio-Economic Planning Sciences*, 60, 34–48. Available from: https://doi.org/10.1016/j.seps.2017.02.002

Noether, M. (1988) Competition among hospitals. *Journal of Health Economics*, 7(3), 259–284. Available from: https://doi.org/10.1016/0167-6296(88)90028-8

Noh, S. & Brown, C.H. (2018) Factors associated with the number of substance abuse nonprofits in the U.S. states: focusing on Medicaid expansion, certificate of need, and ownership. *Nonprofit Policy Forum*, 9(2), 20170010. Available from: https://doi.org/10.1515/npf-2017-0010

Ohlhausen, M. & Luib, G. (2015) Brother, may I?: the challenge of competitor control over market entry. *Journal of Antitrust Enforcement*, 4, jnv028. Available from: https://doi.org/10.1093/jaenfo/jnv028

Ohsfeldt, R.L. & Li, P. (2018) State entry regulation and home health agency quality ratings. *Journal of Regulatory Economics*, 53(1), 1–19. Available from: https://doi.org/10.1007/s11149-018-9351-4

Page, D. (2001) Obituary: Milton I. Roemer, pioneering UCLA Health services professor and professional who defined health policy in U.S., abroad. *UCLA School of Public Health Press Release*. https://web.archive.org/web/20120304021055/http://www.ph.ucla.edu/pr/miroemer.html

Paul, J.A., Ni, H. & Bagchi, A. (2019a) A study of the effects of certificate of need law on inpatient occupancy rates. *Service Science*, 11(1), 1–15. Available from: https://doi.org/10.1287/serv.2018.0228

Paul, J.A., Ni, H. & Bagchi, A. (2019b) Does certificate of need law enhance competition in inpatient care market? An empirical analysis. *Health Economics, Policy and Law*, 14(3), 400–420. Available from: https://doi.org/10.1017/S1744133117000184

Paul, J.A., Ni, H. & Bagchi, A. (2014) Effect of certificate of need law on emergency department length of stay. *The Journal of Emergency Medicine*, 47(4), 453–461. Available from: https://doi.org/10.1016/j.jemermed.2014.04.027

Perry, B. (2017) Certificate of need regulation and hospital behavior: evidence from MRIs in North Carolina. *Radiology & Medical Imaging*. Available from: https://doi.org/10.2139/ssrn.3225741

Polsky, D., David, G., Yang, J., Kinosian, B. & Werner, R.M. (2014) The effect of entry regulation in the health care sector: the case of home health. *Journal of Public Economics*, 110, 1–14. Available from: https://doi.org/10.1016/j.jpubeco.2013.11.003

Popescu, I., Vaughan-Sarrazin, M.S. & Rosenthal, G.E. (2006) Certificate of need regulations and use of coronary revascularization after acute myocardial infarction. *The Journal of the American Medical Association*, 295(18), 2141–2147. Available from: https://doi.org/10.1001/jama.295.18.2141

Rahman, M., Galarraga, O., Zinn, J.S., Grabowski, D.C. & Mor, V. (2016) The impact of certificate-of-need laws on nursing home and home health care expenditures. *Medical Care Research and Review: MCRR*, 73(1), 85–105.

Ringel, J.S., Hosek, S.D., Vollaard, B.A. & Mahnovski, S. (2002) The elasticity of demand for health care: a review of the literature and its application to the military health system. RAND Corporation. https://www.rand.org/pubs/monograph_reports/MR1355.html

Rivers, P.A., Fottler, M.D. & Frimpong, J.A. (2010) The effects of certificate of need regulation on hospital costs. *Journal of Health Care Finance*, 36(4), 1–16.

Rivers, P.A., Fottler, M.D. & Younis, M.Z. (2007) Does certificate of need really contain hospital costs in the United States? *Health Education Journal*, 66(3), 229–244. Available from: https://doi.org/10.1177/0017896907080127

Robinson, J. (2011) Hospitals respond to Medicare payment shortfalls by both shifting costs and cutting them, based on market concentration. *Health Affairs (Project Hope)*, 30(7), 1265–1271. Available from: https://doi.org/10.1377/hlthaff.2011.0220

Robinson, J.L., Nash, D.B., Moxey, E. & O'Connor, J.P. (2001) Certificate of need and the quality of cardiac surgery. *American Journal of Medical Quality*, 16(5), 155–160. Available from: https://doi.org/10.1177/106286060101600502

Rosko, M.D. & Mutter, R.L. (2014) The association of hospital cost-inefficiency with certificate-of-need regulation. *Medical Care Research and Review*, 71(3), 280–298.

Ross, J.S., Ho, V., Wang, Y., Cha, S.S., Epstein, A.J., Masoudi, F.A. et al. (2007) Certificate of need regulation and cardiac catheterization appropriateness after acute myocardial infarction. *Circulation*, 115(8), 1012–1019. Available from: https://doi.org/10.1161/CIRCULATIONAHA.106.658377

Roy, C., Agnitra, S.G. & Plemmons, A. (2022) Certificate of need laws and health care use during the COVID-19 pandemic. *Journal of Risk and Financial Management*, 15(2), 76. Available from: https://doi.org/10.3390/jrfm15020076

Salkever, D.S. & Bice, T.W. (1976) The impact of certificate-of need controls on hospital investment. *The Milbank Memorial Fund Quarterly. Health and Society*, 54(2), 185–214. Available from: https://doi.org/10.2307/3349587

Salkever, D.S. & Bice, T.W. (1979) *Hospital certificate-of-need controls: impact on investment, costs, and use*. Washington, DC: American Enterprise Institute. https://www.aei.org/research-products/book/hospital-certificate-of-need-controls-impact-on-investment-costs-and-use/

Salop, S.C. & Scheffman, D.T. (1983) Raising rivals' costs. *The American Economic Review*, 73(2), 267–271. Available from: https://doi.org/10.2307/1816853

Sandefur, T. (2015) State 'Competitor's Veto' laws and the right to earn a living: some paths to federal reform. *Harvard Journal of Law and Public Policy*, 38(June), 1009–1072.

Schultz, O.A., Shi, L. & Lee, M. (2021) Assessing the efficacy of certificate of need laws through total joint arthroplasty. *Journal for Healthcare Quality*, 43(1), e1–e7. Available from: https://doi.org/10.1097/JHQ.0000000000000286

Shain, M. & Roemer, M.I. (1959) Hospital costs relate to the supply of beds. *Modern Hospital*, 92(4), 71–73.

Sherman, D. (1988) *The effect of state certificate-of-need laws on hospital costs: an economic policy analysis | Federal Trade Commission*. Staff report of the Bureau of Economics. Washington, DC: Federal Trade Commission. https://www.ftc.gov/reports/effect-state-certificate-need-laws-hospital-costs-economic-policy-analysis

Short, M.N., Aloia, T.A. & Ho, V. (2008) Certificate of need regulations and the availability and use of cancer resections. *Annals of Surgical Oncology*, 15(7), 1837–1845. Available from: https://doi.org/10.1245/s10434-008-9914-1

Shortell, S.M. & Hughes, E.F. (1988) The effects of regulation, competition, and ownership on mortality rates among hospital inpatients. *The New England Journal of Medicine*, 318(17), 1100–1107. Available from: https://doi.org/10.1056/NEJM198804283181705

Silveira, M.J., Connor, S.R., Goold, S.D., McMahon, L.F. & Feudtner, C. (2011) Community supply of hospice: does wealth play a role? *Journal of Pain and Symptom Management*, 42(1), 76–82. Available from: https://doi.org/10.1016/j.jpainsymman.2010.09.016

Sloan, F.A. (1981) Regulation and the rising cost of hospital care. *The Review of Economics and Statistics*, 63(4), 479–487. Available from: https://doi.org/10.2307/1935842

Sloan, F.A. (1983) Rate regulation as a strategy for hospital cost control: evidence from the last decade. *The Milbank Memorial Fund Quarterly. Health and Society*, 61(2), 195–221. Available from: https://doi.org/10.2307/3349905

Sloan, F.A. & Steinwald, B. (1980) Effects of regulation on hospital costs and input use. *The Journal of Law & Economics*, 23(1), 81–109.

Sridharan, M., Malik, A.T., Phillips, F.M., Retchin, S., Wendy, X., Elizabeth, Y. et al. (2020) Certificate-of-need state laws and elective posterior lumbar fusions: is it time to repeal the mandate? *World Neurosurgery*, 144, e495–e499. Available from: https://doi.org/10.1016/j.wneu.2020.08.201

Stensland, J., Gaumer, Z.R. & Miller, M.E. (2010) Private-payer profits can induce negative Medicare margins. *Health Affairs*, 29(5), 1045–1051. Available from: https://doi.org/10.1377/hlthaff.2009.0599

Stratmann, T. (2022) The effects of certificate-of-need laws on the quality of hospital medical services. *Journal of Risk and Financial Management*, 15(6), 272. Available from: https://doi.org/10.3390/jrfm15060272

Stratmann, T. & Baker, M. (2020) *Examining certificate-of-need laws in the context of the rural health crisis. Mercatus Working Paper*. Arlington, VA: Mercatus Center at George Mason University. https://www.mercatus.org/publications/healthcare/examining-certificate-need-laws-context-rural-health-crisis

Stratmann, T. & Koopman, C. (2016) *Entry regulation and rural health care: certificate-of-need laws, ambulatory surgical centers, and community. Working Paper*. Arlington, VA: Mercatus Center at George Mason University. http://mercatus.org/sites/default/files/Stratmann-Rural-Health-Care-v1.pdf

Stratmann, T. & Monaghan, S. (2017) *The effect of interest group pressure on favorable regulatory decisions: the case of certificate-of-need Laws*." Mercatus Working Paper. Arlington, VA: Mercatus Center at George Mason University. https://www.mercatus.org/publications/interest-group-pressure-favorable-regulatory-decisions-certificate-of-need

Stratmann, T. & Russ, J. (2014) *Do certificate-of-need laws increase indigent care? Working Paper 14–20*. Arlington, VA: Mercatus Center at George Mason University. http://mercatus.org/sites/default/files/Stratmann-Certificate-of-Need.pdf

Swan, J. & Harrington, C. (1990) Certificate of need and nursing home bed capacity in states. *Journal of Health & Social Policy*, 2(2), 87–105. Available from: https://doi.org/10.1300/j045v02n02_06

Teske, P. & Chard, R. (2004) Hospital certificates-of-need. In: Teske, P. (Ed.) *Regulation in the states*. Washington, DC: Brookings Institution, pp. 125–132.

Tullock, G. (1967) The welfare costs of tariffs, monopolies, and theft. *Western Economic Journal [Economic Inquiry]*, 5(3), 224–232. Available from: https://doi.org/10.1111/j.1465-7295.1967.tb01923.x

Tullock, G. (1975) The transitional gains trap. *The Bell Journal of Economics*, 6(2), 671–678. Available from: https://doi.org/10.2307/3003249

Tullock, G. (1980) Efficient Rent Seeking. In: Buchanan, J.M., Tollison, R.D. & Tullock, G. (Eds.) *Toward a theory of the rent-seeking society*. College Station: Texas A&M University Press, pp. 97–112.

Vaughan, S., Mary, S., Bayman, L. & Cram, P. (2010) Trends during 1993-2004 in the availability and use of revascularization after acute myocardial infarction in markets affected by certificate of need regulations. *Medical Care Research and Review*, 67(2), 213–231. Available from: https://doi.org/10.1177/1077558709346565

Vaughan-Sarrazin, M.S., Hannan, E.L., Gormley, C.J. & Rosenthal, G.E. (2002) Mortality in Medicare beneficiaries following coronary artery bypass graft surgery in states with and without certificate of need regulation. *JAMA*, 288(15), 1859–1866.

Wu, B., Jung, J., Kim, H. & Polsky, D. (2019) Entry regulation and the effect of public reporting: evidence from home health compare. *Health Economics*, 28(4), 492–516.

Yuce, T.K., Chung, J.W., Barnard, C. & Bilimoria, K.Y. (2020) Association of state certificate of need regulation with procedural volume, market share, and outcomes among Medicare beneficiaries. *JAMA*, 324(20), 2058–2068. Available from: https://doi.org/10.1001/jama.2020.21115

Zhang, L. (2008) *Uncompensated care provision and the economic behavior of hospitals: the influence of the regulatory environment*. PhD Dissertation. Atlanta, GA: Georgia State University. http://scholarworks.gsu.edu/pmap_diss/19

Ziino, C., Bala, A. & Cheng, I. (2020a) Does certificate-of-need status impact lumbar microdecompression reimbursement and utilization? A retrospective database review. *Current Orthopaedic Practice*, 31(1), 85–89. Available from: https://doi.org/10.1097/BCO.0000000000000828

Ziino, C., Bala, A. & Cheng, I. (2020b) Does ACDF utilization and reimbursement change based on certificate of need status? *Clinical Spine Surgery*, 33(3), E92–E95. Available from: https://doi.org/10.1097/BSD.0000000000000914

Ziino, C., Bala, A. & Cheng, I. (2021) Utilization and reimbursement trends based on certificate of need in single-level cervical discectomy. *The Journal of the American Academy of Orthopaedic Surgeons*, 29(10), e518–e522. Available from: https://doi.org/10.5435/JAAOS-D-19-00224

Zinn, J.S. (1994) Market competition and the quality of nursing home care. *Journal of Health Politics, Policy and Law*, 19(3), 555–582. Available from: https://doi.org/10.1215/03616878-19-3-555

How to cite this article: Mitchell, M. D. (2024). Certificate-of-Need laws in healthcare: A comprehensive review of the literature. *Southern Economic Journal*, 1–38. https://doi.org/10.1002/soej.12698

APPENDIX

TABLE A1 Summary of all direct tests of CON.

Paper	Summary
Hellinger (1976)	CON legislation induced hospitals to increase investments before CON took effect. He interprets this as a bad result. I code it as increasing access (in the short run).
Salkever and Bice (1976)	CON does not decrease investment but does change its composition.
Salkever and Bice (1979)	They assess the effect of CON on a cross section, time series data set cover all states from 1968 to 1972. They find that CON is associated with: (1) At best, a modest reduction in total spending per capita, (2) A small increase in average inpatient cost per inpatient day, (3) Reduced inpatient days per capita.
Sloan and Steinwald (1980)	Comprehensive CON programs have no effect on hospital expenditures per patient day, while noncomprehensive programs increase hospital expenditures by 5% per patient day.
Joskow (1980)	CON reduces bed supply by about 6% and makes it more likely that a hospital will turn away patients.
Coelen and Sullivan (1981)	Though their primary interest is in prospective reimbursement programs, they also included CON as a covariate. They find no evidence that CON reduces spending per patient day, per admission, or per capita, and some evidence that it increases expenditures. In about half the states they find evidence that it is associated with higher spending per patient day, per admission, and per capita.
Sloan (1981)	He studies the effects of both mature and new CON regulations on hospital costs and profits. He finds: (1) Total expense per admission was lower in the years after CON was implemented for part of the period studied, (2) Expense per adjusted admission was not statistically significantly different after CON was implemented, (3) Expense per patient day was not statistically significantly different after CON was implemented, (4) Expense per adjusted patient day was not statistically significantly different after CON was implemented, and (5) Profits were lower after CON was implemented.
Eastaugh (1982)	He finds CON has: (1) A marginally significant, positive effect on change in plant assets (percentage and log), which he interprets as a negative result, (2) No statistically significant effect on change in beds (percentage and log), which he interprets as a negative result, and (3) A significant, positive effect on change in plant assets per bed (percentage and log), which he interprets as a negative result.
Cromwell and Kanak (1982)	Their primary focus is on prospective reimbursement programs and their effect on the diffusion of services, but they use CON as a control variable and find that it has no effect on the diffusion of services.

TABLE A1 (Continued)

Paper	Summary
Lee et al. (1983)	The paper assesses the effect of various policies on nursing home behavior using the 1973 National Nursing Home Survey. Of relevance here, they find that CON is associated with: (1) Higher operating costs per patient day, and (2) Higher average annual occupancy.
Sloan (1983)	His primary interest is the effect of rate regulation on hospital costs, but he includes CON as a control. His measures of spending are total hospital expense per admission, per "adjusted" admission (adjusted for hospital outpatient activity), per patient day, per adjusted patient day, and per length of stay. He finds no evidence that CON reduces spending per patient.
Ashby (1984)	He assesses the effect of CON and other regulatory programs on five outcomes. His unit of analysis is each state in each year from 1971 to 1977. He finds that: (1) CON is associated with statistically significant positive growth in hospital costs per capita, (2) CON has no statistically significant effect on percentage change in average length of stay, (3) CON has no statistically significant effect on percentage change in total admissions per capita, and (4) CON has no statistically significant effect on percentage change in plant assets.
Gertler (1985)	He finds that under a binding CON capacity constraint, increases in Medicaid rates are associated with lower quality in New York state nursing home facilities.
Anderson and Kass (1986)	They examined the effect of CON on economies of scale and cost in the home healthcare industry. They find: (1) Costs are 2% higher in CON states relative to non-CON states, (2) No substantial economies of scale in the home health industry overall, and (3) No difference in economies of scale in CON and non-CON states.
Noether (1988)	CON increases the average price and expense for several disease categories including: (1) Diabetes mellitus, (2) Cataract surgery, (3) Acute myocardial infarction, (4) Congestive heart failure, (5) Acute, cerebrovascular disease, (6) Pneumonia, (7) Respiratory system disease, other, (8) Inguinal hernia, (9) Diverticula of intestine, (10) Hyperplasia of prostate, and (11) Fracture of neck and femur.
Sherman (1988)	He estimates the effects of CON on cost functions using a sample of 3708 hospitals using data from 1983 to 1984. Though he uses the term costs, he is actually measuring operating expenditures. He finds that spending would fall by 1.4% if states relaxed CON by raising the thresholds at which it is applied.

(Continues)

TABLE A1 (Continued)

Paper	Summary
Shortell and Hughes (1988)	They examined the effect of CON (among other factors) on hospital quality, finding that the ratio of actual to predicted mortality rates among Medicare patients is 5%–6% higher in states with stringent CON regulation.
Mayo and McFarland (1989)	They study the effect of variation in CON approval in different service areas of Tennessee on the number of beds, finding it is associated with fewer beds. They also find that larger hospital size is associated with more spending and infer that CON is associated with lower average spending per patient day, though they do not directly measure it.
Swan and Harrington (1990)	They assess the effect of nursing home CONs on nursing home bed stock using cross-section, time-series data from 1981 to 1984. They find that: (1) Nursing home CONs constrain the bed stock, and (2) The greater the dollar amount of CON approvals per aged population (a measure of CON stringency), the greater the bed stock.
Eakin (1991)	CON hospitals are less efficient than non-CON hospitals.
Anderson (1991)	A reply to Mayo and McFarland's (1989) paper, he estimates the effects of CON (and the number of years it has been in effect) on average variable costs among 2069 general acute hospitals with 100 or more beds. He uses CON age as a measure of CON stringency under the theory that "the effect should increase the longer the regulation has been around." It enters the equation linearly and multiplied by the number of beds to see if CON has a different effect on large hospitals. He finds: (1) CON is associated with 10% higher variable costs, and (2) CON is associated with greater probability of a hospital having 100 or fewer beds.
Lanning et al. (1991)	They measure the effect of CON on hospital expenditures, finding that it is associated with 20.6% higher spending per capita.
Mayo and McFarland (1991)	This is a reply to Anderson's (1991) critique of their 1989 paper. Anderson worried CON might constrain hospitals on one dimension (say beds), but then cause them to substitute into other areas of spending (say labor). They tested this possibility and found mixed results. In a larger panel data set, they found support for Anderson's concern (CON increases spending) while in a 1984 cross-section they found support for their initial (implied) conclusion (CON decreases spending).
Ford and Kaserman (1993)	They assess the effect of CON on the number of dialysis clinics and stations, finding that it has limited new firm entry and total capacity.
Zinn (1994)	She examined the determinants of nursing home quality. One of her explanatory variables is nursing home construction moratoria. She finds these to be associated with lower RN staffing ratios and greater use of physical restraint.
Caudill et al. (1995)	They examine the effect of CON on the diffusion of hemodialysis, an effective and practical treatment for chronic renal failure. Their data span 50 states and 14 years. They find that CON regulation slows the spread of hemodialysis.
Antel et al. (1995)	They find that CON increases per-day and per-admission hospital expenditures but has no relationship to per capita hospital expenditures.

TABLE A1 (Continued)

Paper	Summary
Harrington et al. (1997)	In a two-stage least squares regression, they assess the effect of CON, and/or moratoria on the growth of nursing home beds and Medicaid nursing home reimbursement rates. They find: (1) CON has no effect on Medicaid nursing home reimbursement rates, and (2) CON reduces growth of beds.
Conover and Sloan (1998)	CON has no effect on total per capita health expenditures; there is no evidence of a surge in spending after repeal.
D'Aunno et al. (2000)	They study the market and institutional determinants of radical organizational change in rural hospitals. In particular, they study the factors that make a rural hospital likely to change to provide other types of services. They find that stronger CON regulation makes a rural hospital 8% less likely to change.
Robinson et al. (2001)	They examine the effect of CON elimination in PA (comparing it with NJ, which maintained CON), finding: (1) Open-heart surgery programs increased 25% following elimination of CON, (2) The total volume of CABG surgeries were unchanged following repeal, (3) Provider volume shifted from programs that had been established before CON repeal to programs that were established after CON repeal, and (4) The mortality rate was unchanged following repeal.
Miller et al. (2002)	They find that CON increases per capita Medicaid community-based care expenditures.
Vaughan-Sarrazin et al. (2002)	They assess the effect of CON on coronary artery bypass graft (CABG) surgery, finding: (1) Mean annual hospital volume is lower in states without CON, (2) More patients undergo CABG surgery in low-volume hospitals in states without CON, and (3) Mortality following CABG is higher in states without CON.
Grabowski et al. (2003)	CON repeal: (1) Has no statistically significant effect on per diem Medicaid nursing home charges, (2) No effect on per diem Medicaid long-term-care charges, (3) No effect on days.
Gulley and Santerre (2003)	They look at the effects of several public policies on nursing home residents and nursing home beds per persons 65 years old and older. Their data are from a cross section of counties in 1991. Their measure of CON is the number of years in which a CON law has been in effect. They find that in states where CON has been in effect for longer: (1) There are fewer nursing home beds per persons 65 years old and older, but the effect is not statistically significant, and (2) There are fewer nursing home patients per persons 65 and older, but this effect is also statistically insignificant.
Conover and Sloan (2003)	Dropping CON has 0% effect on all expenditures.
Teske and Chard (2004)	This study examines several political factors to determine the likelihood of a state retaining CON regulation. They find that the following factors are associated with CON regulation:

(Continues)

TABLE A1 (Continued)

Paper	Summary
	(1) Democrats in upper and lower houses, (2) Higher hospital costs, (3) More affluent and better-educated citizens, (4) Fewer physicians (which implies CON may reduce the number of physicians), and (5) A variable measuring hospital interests: the number of hospital industry-related interest groups active in a particular state multiplied by their average political action committee spending. This was found to be significantly associated with retention of CON, but legislative party makeup is more important.
Ho (2004)	She compares Florida, where there is a CON for percutaneous transluminal coronary angioplasty (PTCA) with California, where there is no such CON. She finds: (1) CON is associated with higher in-hospital volume for PTCA, and (2) There is a positive relationship between PTCA volume and mortality outcomes (though note that she does not directly study the relationship between CON and PTCA mortality outcomes).
Chen (2005)	Nursing home CONs are associated with greater cost efficiency, but diminished technical efficiency.
DiSesa et al. (2006)	They study CON, volume, and mortality in coronary artery bypass grafting (CABG). They find: (1) CON is positively associated with CABG volume within hospitals, and (2) There is no direct relationship between CON and mortality.
Bates et al. (2006)	CON hospitals are not any less efficient than non-CON hospitals.
Custer et al. (2006)	They use a cross-border design to study the effect of CON in hospital markets. This allows them to control for unobservable factors. They also used interviews and public information to develop an index measuring CON rigor based on fees, administrative requirements, reviewability, appeals, and administrative complexity. They assess the effects of CON on acute care, long term care, and home health markets. They find: (1) CON is associated with higher private inpatient acute care costs, (2) Acute care costs rise with the rigor of the CON program for the most resource-intensive acute care diagnoses, (3) Some evidence that CON is associated with higher Medicaid costs for home health services, (4) There is weak evidence that CON is associated with higher private long term care costs, (5) There is weak evidence that CON is associated higher Medicaid long term care costs, (6) Some evidence that CON is associated with higher per-capita costs for home health services, (7) CON is associated with fewer hospitals, (8) CON is associated with fewer hospital beds, (9) CON is associated with fewer home health agencies per 1000 residents, (10) CON is associated with fewer Medicare beneficiaries receiving home health services, (11) There is no significant relationship between the percent of hospital admissions that are self-pay, though when controlling for the number of

TABLE A1 (Continued)

Paper	Summary
	uninsured and family income, CON is positively related to self-pay admission per uninsured, (12) There is no apparent difference in acute care quality in CON and non-CON markets, (13) In long-term care, CON is associated with better quality on two measures but worse quality on six measures, (14) In home health markets, they find no evidence that CON affects any of 10 outcome measures of quality, (15) They find that acute care markets are less competitive when CON is rigorous, (16) CON is associated with lower levels of competition in home health agency markets.
Popescu et al. (2006)	They studied access and quality outcomes in revascularization. They found that patients in CON states: (1) Were less likely to be admitted to hospitals offering revascularization, (2) Were less likely to undergo revascularization, and (3) Had no difference in 30-day mortality rates relative to patients in non-CON states.
Dobson et al. (2007)	They find that safety-net hospitals in non-CON states had higher margins than those in CON states.
Ho (2007)	They study the association between cardiac CON regulations, availability of revascularization facilities, and revascularization rates, focusing on differences between the general population and the elderly and on differences between procedures (coronary artery bypass graft surgery [CABG] or a percutaneous coronary intervention [PCI]). They find that: (1) CON is associated with fewer hospitals offering CABG and PCI, (2) CON has no effect on overall CABG utilization, and (3) CON is associated with 19.2% fewer PCIs per 1000 elderly.
Ho et al. (2007)	The study assesses the effect of CON on cardiac costs and outcomes. She finds: (1) While CON is associated with lower average costs per patient, it also seems to be associated with more procedures and this is enough to offset the savings from lower average costs, (2) CON is associated with greater volume within hospitals, and (3) CON does not seem to be related to inpatient mortality.
Rivers et al. (2007)	They find CON laws increase hospital expenditures per adjusted admission.
Ross et al. (2007)	They examine the effect of CON on the volume of cardiac catheterization after admission for acute myocardial infarction. While CON did not seem to decrease the volume of strongly-indicated catheterization, it did reduce the volume of equivocally and weakly indicated catheterization. Because their interest is both overall volume and rates of catheterization when it is not warranted, I categorize in both the volume and the quality sections.
Short et al. (2008)	They studied Medicare data on beneficiaries treated with one of six cancer resections and an associated cancer diagnosis from 1989 to 2002. They find: (1) CON is associated with fewer hospitals per cancer incident for colectomy, rectal resection, and pulmonary lobectomy, (2) CON has no effect on the number of procedures per cancer incident, and

(Continues)

TABLE A1 (Continued)

Paper	Summary
	(3) CON is associated with greater hospital volume.
Zhang (2008)	He examined the effect of three regulatory policies—CON laws, uncompensated care pools, and community benefit requirement laws. CON is associated with small increases in uninsured admissions, though the results were small (0.07%) and not statistically significant when he attempted to control for endogeneity. Furthermore, he found that in the presence of all three policies, the number of uninsured admissions by nonprofit hospitals fell.
Cantor et al. (2009)	The authors studied a 1996 New Jersey reform that created a pilot program to license additional hospitals to perform coronary angiography. They find that the number of angiography facilities doubled following reform and a large black-white disparity disappeared after the reform.
DeLia et al. (2009)	This builds off of the authors' previous study, confirming the result (the reforms eliminated the black-white disparity) using additional techniques (weighting zip codes by the number of black and white residents). They also study the mechanism by which the disparity was eliminated, finding that incumbent hospitals served more black patients as new entrants cut into their market share for white patients.
Ho et al. (2009)	They use difference-in-difference regression analysis to compare states that dropped CON during the sample period with states that kept the regulation. They find that in states that dropped CON: (1) The number of hospitals in the state performing CABG and PCI went up following repeal, (2) Statewide procedural volume for CABG and PCI were unchanged, (3) Mean hospital volume declined for both procedures, and (4) Procedural CABG mortality declined after repeal, though the difference was not permanent.
Kolstad (2009)	He examined how the 1996 repeal of CON legislation in Pennsylvania affected the market for CABG surgery in the state, finding: (1) The number of CABG facilities increased 46%, and (2) Surgeries were more likely to be performed by high quality surgeons.
Hellinger (2009)	CON is associated with fewer hospital beds, which in turn are associated with slower growth in aggregate health expenditures per capita. But there is no direct relationship between CON and health expenditures per capita.
Ferrier et al. (2010)	CON hospitals are more efficient than non-CON hospitals.
Carlson et al. (2010)	This is a cross-sectional study of geographic access to U.S. hospices using multivariate logistic regression to identify gaps in hospice availability (measured by distance to hospice facilities) by community characteristics. CON was associated with longer travel distance to hospice care.
Cutler et al. (2010)	They assess the 1996 repeal of CON in Pennsylvania on CABG. They find: (1) Repeal of CON reduced travel distanced by 9%, (2) There was no statistically significant effect on total volume following CON repeal, (3) There were mixed results on scale; following CON repeal, fewer surgeries were performed by high-volume hospitals, but more were performed by high-volume surgeons,

TABLE A1 (Continued)

Paper	Summary
	(4) CON repeal led to a shift from standard quality to high quality surgeons, and (5) Incumbent hospital margins initially fell following repeal but these hospitals had regained profitability and were the most profitable by 2002.
Vaughan et al. (2010)	In a study design that exploits the fact that some markets cross boundaries between CON and non-CON states, they find: (1) A greater increase in coronary artery bypass graft surgery programs in states that reduced CON regulation, and (2) No change in percutaneous coronary intervention programs in states that reduced CON.
Rivers et al. (2010)	They find that stringent CON programs increase hospital expenditures per admission.
Fric-Shamji and Shamji (2010)	They evaluate the mean per capita rates of 26 diverse surgical procedures in 21 CON and 5 non-CON states between 2004 and 2006. The proportion of procedures performed in teaching facilities was also assessed. They find no significant difference in procedural rates between CON and non-CON states.
Silveira et al. (2011)	They study the number of hospice programs per county. Among other things, they find that CON regulations is associated with fewer hospice programs.
Cosby (2011)	She studies the effect of solid organ transplant CON regulations, finding: (1) CON is associated with fewer transplant centers, (2) CON has no statistically significant effect on provider volume, (3) CON has no statistically significant effect on graft failures or deaths.
Granderson (2011)	He studies the effect of hospital alliance membership, alliance size, and CON on hospital cost efficiency among 144 urban Midwest hospitals from 1996 to 1999. He finds that repeal of CON resulted in greater hospital efficiency, as measured by a stochastic cost frontier.
Eichmann and Santerre (2011)	They study the effects of CON on access and rents. They find CON is associated with: (1) 12% fewer beds per capita, (2) 48% fewer hospitals per capita, and (3) $91,000 more in urban hospital CEO pay.
Kahn et al. (2012)	They examine factors affecting utilization of long-term acute care (LTAC) hospitals. Among other things, they find that utilization is lower in the presence in CON laws.
Jacobs, Zhang, and Hollenbeck (2012)	They study the effect of CON on utilization of intensity-modulated radiotherapy (IMRT), an expensive procedure with unproven benefits. They find that CON does not reduce utilization of the procedure, which they interpret as a negative quality result.
Jacobs et al. (2012)	They examine whether CON reduces the use of a questionably warranted procedure, radiotherapy, for prostate cancer. They find no difference in use of the procedure in CON and non-CON health service areas. In fact, in HSAs with high-stringency CONs, they find greater use of the procedure.
Lorch et al. (2012)	They studied NICU CONs. They found: (1) CON is associated with fewer units; (2) CON is associated with fewer beds;

(Continues)

TABLE A1 (Continued)

Paper	Summary
	(3) CON is unrelated to very low birth weight (VLBW) infant mortality and low birth weight (LBW) infant mortality. (4) CON is associated with lower rates of all-infant mortality in states with a large metropolitan area.
Nelson et al. (2012)	They examine whether CON reduces the use of a questionably warranted procedure, definitive intensity modulated radiation therapy (IMRT), among 155,379 men between 2004 and 2007. They find no evidence that CON limits the use of the procedure.
Ho and Ku-Goto (2013)	Removing CON decreases the cost of coronary artery bypass grafts, but not for percutaneous coronary intervention. In Ohio, reimbursements fell 2.8% following repeal of CON and in Pennsylvania, they fell 8.8% following repeal.
Khanna et al. (2013)	The authors focus on intensity modulated radiation therapy. They find that: (1) CON is not associated with any difference in cost growth (2) CON is associated with greater growth in intensity modulated radiation therapy which is an expensive and no more effective treatment, so they interpret this as a negative quality result.
Jacobs et al. (2013)	They study whether CON restrains the use of a questionable procedure—robotic prostatectomy. They find that CON stringency had no effect on the use of the procedure.
Lu-Yao et al. (2013)	They study whether CON limits the use of IMRT in a population that would likely benefit from it the least: older or debilitated men with low-risk prostate cancer. They find that CON laws actually encourage the procedure.
Rosko and Mutter (2014)	CON hospitals are more efficient than non-CON hospitals.
Polsky et al. (2014)	They assess the effect of CON on home health agencies, using a research design that focuses on markets that straddle CON and non-CON states. They find that: (1) Medicare expenditures are not statistically significantly different between CON and non-CON states, (2) Non-CON states have roughly twice as many home health agencies per Medicare beneficiary, (3) CON states have 13.7% fewer home health admissions from hospitals, (4) 60 day (total) readmission rates are 5% higher in CON states than in non-CON states, though the effect is not sustained, (5) 60 day preventable readmission rates are 13% higher in CON states than in non-CON states, though the effect is not sustained. (6) In CON states there are fewer home health visits, fewer visits per week, and a lower proportion of visits by skilled nurses, but the effects are small and not statistically significant, (7) The Herfindahl Index in the home health market is approximately 1000 points lower in non-CON states.
Stratmann and Russ (2014)	They study the effects of CON on the supply and provision of services to indigent populations. They find: (1) CON programs are associated with 99 fewer hospital beds per 100,000 people, (2) Bed-specific CONs are associated with 131 fewer beds per 100,000 people,

TABLE A1 (Continued)

Paper	Summary
	(3) There are 4.7 fewer beds per 100,000 persons for each additional service covered by CON, (4) CON programs reduce the number of hospitals with MRI machines by 1–2 hospitals per 500,000 people, (5) CON programs that require charitable care are uncorrelated with uncompensated care.
Paul et al. (2014)	They assess the effect of CON and CON stringency on emergency department length of stay. They find that CON laws are associated with shorter stays, which they interpret as an indication of higher quality, but the effect diminishes with the stringency of CON laws (as measured by expenditure thresholds).
Chui et al. (2015)	To see if CON limits the use of inappropriate percutaneous coronary interventions, they looked at the share of procedures considered appropriate, uncertain, or inappropriate in CON and non-CON states. They found that states with CON have a lower proportion of inappropriate PCIs, but the differences were small.
Falchook and Chen (2015)	They examined utilization of radiation therapy when it is not warranted in CON and non-CON states, concluding that in CON states there is greater use of this treatment on elderly patients who may not need it.
Horwitz and Polsky (2015)	They use a cross-border design to estimate the effect of CON on MRI machines. They find that in a CON county that borders a non-CON county there are 6.4 fewer MRIs per million people.
Li and Dor (2015)	Removal of CON was associated with: (1) A substantial increase in the number of hospitals performing cardiac revascularization procedures, (2) An overall downward trend in CABG and an overall upward trend in the alternative procedure, PCI, (3) Entry led to a significant increase in the likelihood of CABG, relative to trend, but it did not contribute to the increase in PCI after adjusting for patient traits, market characteristics, and area-specific trends, (4) The probability of receiving PCI specifically at incumbent hospitals decreased with market entry, suggesting a volume shift from incumbents to entrants, (5) Entry shifted a disproportionate volume of low-severity patients from incumbent hospitals to entrants, and (6) Entry by new cardiac surgery centers tended to sort high-severity patients into the more invasive CABG procedure and low-severity patients into the less invasive PCI procedures, potentially improving quality of care.
Gutierrez et al. (2016)	They study the effect of CON on freestanding emergency departments, finding that those states that require a CON for EDs have fewer EDs per capita.
Bailey (2016)	Removing CON reduces hospital charges by 5.5% 5 years after repeal.
Kim et al. (2016)	They study the effect of CON laws on the use of intensity modulated radiation therapy when it is not warranted. They find that the therapy was actually used more often in CON states than in non-CON states, concluding that it failed to achieve its goal.
Stratmann and Koopman (2016)	They study the effect of CON on overall supply of services as well as rural supply of services. In particular, they find:

(Continues)

TABLE A1 (Continued)

Paper	Summary
	(1) CON programs are associated with 30% fewer hospitals per 100,000 residents across the entire state, (2) ASC-specific CONs are correlated with 14% fewer total ASCs per 100,000 residents, (3) CON programs are associated with 30% fewer rural hospitals per 100,000 rural residents, and (4) ASC-specific CONs are correlated with 13% fewer rural ASCs per 100,000 rural residents.
Rahman et al. (2016)	CON increases the growth in Medicare and Medicaid expenditures on nursing home care but decreases growth in home healthcare expenditures.
Bailey et al. (2017)	They find that prices are higher in CON states relative to non-CON states, but the difference isn't statistically significant.
Ni et al. (2017)	They assess the effect of CON on market concentration (as measured by the Herfindahl–Hirschman Index [HHI]) in emergency departments. They measure CON two ways—using a simple binary measure and a stringency measure based on the dollar threshold at which investments are subject to review. They use 2SLS to address concerns of endogeneity. Their (somewhat dubious) IVs in the binary tests are an index of science and technology and the unemployment rate, and in the stringency model, they are the CPI and the unemployment rate. They find that CON laws are associated with greater competition in emergency departments, concluding that they serve as a sort of anti-trust tool.
Perry (2017)	Service areas in NC are allocated a new machine when the number of MRI procedures performed in the area crosses a predetermined threshold. He compares service areas that are just below the threshold to areas just above the threshold to see the effect of a binding CON constraint. He finds: (1) By limiting the use of scanners, CON laws reduce spending on patients with low back pain by about $400 in the first month of diagnosis, (2) CON limits the number of MRI scanners in an area. When an area is allowed to obtain a scanner, they almost always do, (3) Providers get around this constraint, to some degree, by utilizing unregulated mobile scanners, (4) Patients in a region constrained by CON receive 34% fewer scans in the first month after diagnosis, (5) Medicare patients are disproportionately crowded out by CON; their fraction of MRIs performed jumps 10 percentage points after CON approval, and (6) CON seems to limit cancer patient access to scans, but not musculoskeletal disorder patient access to scans.
Bailey (2018b)	He uses fixed- and random-effects regressions to test how the effect of CON on all-cause mortality within US counties. Though he finds a positive relationship between CON laws and all-cause mortality, the results are not statistically significant.
Browne et al. (2018)	They examine the effect of CON on total knee arthroplasty (TKA) by comparing states with and without CON. They find: (1) Average Medicare reimbursements were 5%–10% lower in non-CON states,

TABLE A1 (Continued)

Paper	Summary
	(2) CON is associated with lower TKA utilization per capita, but faster growth in utilization per capita, (3) CON is associated with TKA in higher-volume hospitals, and (4) Examination of adverse event rates did not reveal any strong associations between adverse outcome and CON.
Ohsfeldt and Li (2018)	They examine the effect of CON on home health agency quality ratings from the Centers for Medicare and Medicaid Services (CMS). They find that: (1) HHAs in CON states were about 58% less likely to be rated as "High" quality ($p < .01$), (2) HHAs in CON states were about 30% more likely to be rated as "Medium" quality compared to HHAs in states without CON for HHAs.
Noh and Brown (2018)	The study the effects of CON on substance abuse facilities, finding: (1) CON laws are negatively associated with the number of nonprofit substance abuse facilities, but (2) In states with both CON laws and Medicaid expansion, the number of nonprofit substance abuse facilities tended to increase.
Casp et al. (2019)	They study the effect of CON on total hip arthroplasty. They find: (1) CON is associated with a lower volume of total hip arthroplasty, (2) CON is associated with more care in high-volume hospitals, and (3) No difference in postoperative complications between CON and non-CON states.
Chui et al. (2019)	Like their 2015 paper, this one assesses whether CON limits inappropriate percutaneous coronary interventions. And as with the other paper, they find a small but economically insignificant effect.
Averett et al. (2019)	They analyzed the effects of the expiration of Pennsylvania's CON law on hip and knee replacement surgeries. They assessed the effect of deregulation on one measure of cost per service (charges) and four measures of quality. They found that deregulation had: (1) No effect on total charges, (2) Increased the length of stay, (3) No effect on hospital acquired infections, and (4) Decreased mortality.
Paul et al. (2019a)	States with CON laws have lower bed occupancy rates. The authors speculate that while CON reduces the number of beds, it may also shorten the length of patient stay and the net effect is to reduce the occupancy rate. Note that this is the opposite of the intention (which was to reduce unused capacity).
Paul et al. (2019b)	They study the effect of CON on market concentration in the inpatient care market, as measured by a normalized Herfindahl–Hirschman Index (HHI) built using inpatient volume data of acute care hospitals in each health referral region (HRR). They find that CON is associated with less market concentration.
Malik et al. (2019)	The examined the effect of CON on elective posterior lumbar fusions (PLFs) from 2005 to 2014, finding: (1) Average 90-day reimbursements were slightly higher (1.4% higher) in non-CON states ($22,115 vs. $21,802), (2) CON laws are associated with lower per capita utilization of PLFs, (3) CON laws are associated with more high-volume facilities,

(Continues)

TABLE A1 (Continued)

Paper	Summary
	(4) CON laws are not associated with significant reduction in 90-day readmissions, and (5) CON laws are not associated with significant reduction in 90-day complications.
Bailey (2019)	States that eliminate CON experience 4% reductions in real per capita healthcare spending.
Wu et al. (2019)	They assess the effect of CON regulation on several measures of quality in home healthcare, using a cross-border design to control for endogeneity. They find that CON is uniformly associated with worse outcomes including: (1) Patients perform worse on functional improvement measures (bathing, ambulating, transferring to bed, managing oral medication, and less pain interfering with activity), (2) They are more likely to be admitted to the ER, and (3) More likely to be admitted to an acute care hospital.
Sridharan et al. (2020)	They study the effect of CON on elective posterior lumbar fusions. They find: (1) CON is associated with reduced utilization of the procedures, (2) CON has no statistically significant effect on reimbursements, (3) CON is associated with more high-volume facilities, and (4) CON has economically insignificant effects on readmissions or complications.
Fayissa et al. (2020)	In an IV study, they find that CON is associated with: (1) 18%–24% lower nursing home survey scores computed by healthcare professionals, and (2) The substitution of lower-quality certified nursing assistance care for higher-quality licensed practical nurse care.
Mitchell et al. (2020)	They studied the relationship between CON and projected ICU bed shortages over the course of the COVID-19 pandemic. They found that compared with non-CON states, in CON states, expected shortages were more than twice as likely and the shortages were about nine times greater in per capita terms.
Myers and Sheehan (2020)	They examine the effect of CON laws on wait times. They find CON programs: (1) Increase median wait times for medical examinations, (2) Increase wait times for pain medication administration, (3) Increase wait times for hospital admittance and (4) Increase wait times for hospital discharge.
Cancienne et al. (2020)	They examine the effect of CON on knee arthroscopy, assessing its effect on: (1) Charges and reimbursements: in t-tests without controls they found that charges (which are the prices set before any negotiation) were lower in CON states, while reimbursements (which are actual payments) were not statistically significantly different, (2) Total volume: total volume and growth in total volume was lower in CON states than in non-CON states, (3) Volume within facilities: CON is associated with the presence of more high-volume facilities, and (4) Quality: There were more ER visits within 30 days of operation and more infections within 6 months of operation in CON than in non-CON states;

TABLE A1 (Continued)

Paper	Summary
	there were no differences in in-hospital deaths or readmissions within 30 days of the operation between CON and non-CON states.
Ettner et al. (2020)	They examine the effects of home health agency CONs and nursing home CONs on home health agencies. They find that in states with home health agency CONs there are: (1) Lower per patient expenditures (they don't know if this is due to skimping or to economies of scale), (2) Higher expenditures per agency, (3) Higher expenditures per resident, (4) Slightly fewer home health agencies per capita, and (5) Higher caseloads (volume) within agencies (this is what drives the higher expenditures per agency).
Stratmann and Baker (2020)	They examine the effect of CON on two measures of spending and two measures of quality (all four are indicators of "overutilization or waste"): (1) Medicare spending per rural beneficiary (they found this was $295 higher in CON states than in non-CON states), (2) Ambulance spending per beneficiary ($2.54 higher in CON states), (3) Hospital readmission rates (1.2 percentage points higher in CON states), and (4) Emergency room visits per 1000 beneficiaries (35.1 more emergency department visits per 1000 beneficiaries in CON states).
Ziino et al. (2020b)	The paper looks at reimbursements for spinal surgery in CON and non-CON states, finding that reimbursements fell the most in non-CON outpatient settings (−11% compound annual growth) in non-CON states.
Yuce et al. (2020)	The assess the effect of CON on measures of volume and of quality. They find: (1) No significant difference between CON and non-CON states in county-level procedures per 10,000 persons, (2) No significant difference between CON and non-CON states for hospital procedural volume, (3) No difference in hospital market share, (4) No difference in risk-adjusted 30-day postoperative mortality, (5) No difference in surgical cite infection, and (6) No difference in readmission
Ziino et al. (2020a)	They examined the effect of CON in lumbar micro decompressions in both in-patient and out-patient settings, focusing on growth in utilization of the procedure over time and changes in reimbursement over time. These were simple comparisons, not regressions with controls. They found: (1) CON status did not affect overall reimbursement rates ("The ability of outpatient surgery to lower costs may, in fact, be more powerful than CON programs.") (2) Utilization of the procedure increased more in CON states than in non-CON states.
Denduluri et al. (2021)	They study the effect of CON on open and endoscopic carpal tunnel release finding that the regulation has no effect on utilization or spending on the procedures.

(Continues)

TABLE A1 (Continued)

Paper	Summary
Chiu (2021)	He uses a cross-border discontinuity design to study the effect of CON on heart attack mortality. He finds that it is associated with 6 to 10% higher mortality 3 years after enactment.
Kosar and Rahman (2021)	They study the effect of CON regulation on the size of nursing homes, positing that larger nursing homes may facilitate the spread of COVID. They find that counties with CON laws had more COVID cases.
Bailey and Lewin (2021)	They examine the effect of psychiatric service CONs. They find that psychiatric service CONs: (1) Reduce the number of psychiatric hospitals by 20%, (2) Reduce the likelihood that a hospital will accept Medicare by 5.35 percentage points, and (3) Reduce the number of psychiatric clients per capita by 56%.
Baker and Stratmann (2021)	They examine the effect of medical imaging CONs on medical imaging providers. They find: (1) CON laws are associated with 20%–33% fewer providers, (2) Residents of CON states are 3.4–5.3 percentage points more likely to travel out of state to obtain these services, (3) CON laws are associated with 27%–53% fewer scans by nonhospital providers per beneficiary, 23%–70% fewer scans by new hospitals, and 6 to 21% more scans by older hospitals.
Herb et al. (2021)	They measure the effect of CON on travel time to radiation oncology facilities, breaking down the effect by region. They find CON: (1) Has no association with prolonged travel in the West, (2) Is associated with lower odds of prolonged travel in both urban and rural tracts in the South, and (3) Is associated with increased odds of prolonged travel in both urban and rural tracts in the Midwest and Northeast.
Schultz et al. (2021)	They examined the effect of CON on total knee (TKA), hip (THA), and shoulder arthroplasty (TSA), finding: (1) TKA and TSA costs were higher in CON states than in non-CON states (and these results were statistically significant), THA costs were lower in CON states but these results were not statistically significant, (2) CON is associated with a lower volume of TKA and TSA procedures, though it was not statistically significant in the case of hip arthroplasty, and (3) CON has no statistically significant effect on complications (deep vein thrombosis and pulmonary embolism).
Ziino et al. (2021)	They studied inpatient cervical discectomy in CON and non-CON states in inpatient and outpatient setting. It appears that they did not use any controls, however. Regarding reimbursements, they find: (1) In the inpatient setting, reimbursement was lower in non-CON states ($1128.40) than in the CON states ($1223.56). But reimbursements in the CON states were falling faster over time. (2) In the outpatient setting reimbursement was higher in Non-CON states ($4237.01) than in CON states ($3859.31) and reimbursements were growing in the non-CON states but falling in the CON states. Regarding access:

TABLE A1 (Continued)

Paper	Summary
	(3) In the inpatient setting, there were more patients in the CON setting than in the non-CON setting (657 compared with 231) and utilization of the procedure was growing faster in CON than in non-CON states but this does not appear to control for the larger population of CON states than non-CON states. (4) Similarly, in the outpatient setting, there were more patients in the CON setting than in the non-CON setting (435 compared with 257) and utilization of the procedure was growing faster in CON than in non-CON states but again this does not appear to control for the larger population of CON states than non-CON states.
Roy et al. (2022)	They examined the relationship between CON and mortality associated with illnesses that require similar medical equipment as COVID. They find that: (1) There are higher mortality rates in CON states than in non-CON states, and (2) States with high healthcare utilization that reformed their CON laws during the pandemic saw lower mortality rates resulting from natural death, septicemia, diabetes, chronic lower respiratory disease, influenza or pneumonia, Alzheimer's, and COVID.
Stratmann (2022)	He studies the effect of CON on 9 measures of hospital quality: (1) Death among surgical inpatients with serious treatable complications, (2) Postoperative pulmonary embolism or deep vein thrombosis, (3) Percent of patients giving their hospital a 9 or 10 overall rating, (4) Pneumonia readmission rate, (5) Pneumonia mortality rate, (6) Heart failure readmission rate, (7) Heart failure mortality rate, (8) Heart attack readmission rate, (9) Heart attack mortality rate, Hospitals in CON states performed worse than those in non-CON states in 8 of the 9 categories, the exception being postoperative pulmonary embolism.
Bailey et al. (2022)	They measure how CON affects the number of substance abuse facilities and beds per capita in a state, and the effect of CON on the forms of payment that treatment facilities accept. They find that CON reduces the acceptance of private insurance but has no statistically significant effect on the number of facilities, beds, or clients and no significant effect on the acceptance of Medicare or Medicaid.
Mitchell and Stratmann (2022)	They examine the effect of bed CON on statewide bed utilization rates and on individual hospital shortages. They find: (1) States that require CONs for beds had 12% higher bed utilization rates, (2) States that require CONs for beds had 58% more days with more than 70% of their beds in use, (3) Hospitals in these states were 27% more likely to run out of beds, and (4) States that relaxed these rules for COVID saw no difference in utilization rates or shortages.
Gaines and Cagle (2023)	They study the effects of CON laws in a cross-sectional analysis of hospice quality outcomes using the hospice item set metric (HIS) developed by CMS. Controlling for ownership and size, they found hospice CON states had higher HIS ratings than those from Non-CON states along four dimensions:

(Continues)

TABLE A1 (Continued)

Paper	Summary
	(1) Beliefs and values addressed ($\beta = .05$, $p = .009$), (2) Pain assessment ($\beta = .05$, $p = .009$), (3) Dyspnea treatment ($\beta = .08$, $p < .001$), and (4) The composite measure ($\beta = .09$, $p < .001$). They also found that along four additional measures, the differences were statistically insignificant ($p > .05$): (5) Treatment preferences, (6) Pain screening, (7) Dyspnea screening, and (8) Opioid bowel treatment
Bailey and Hamami (2023)	CON causes spending on those with less than excellent health to be as much as 20% higher, though it has no statistically significant effect on spending on those in good health.
Horwitz et al. (2024)	They use a border discontinuity design to study the effect of CON on availability and utilization of CT and MRI imaging in both low-value and high-value settings. They find: (1) Moving across the border from a non-CON state to a CON state reduces the odds that the Census tract will have an MRI by 14%, (2) Moving across the border from a non-CON state to a CON state has no effect on the availability of CT scanners, (3) There is a 20%–26% reduction in seven measures of low-value imagining utilization, which they interpret as a potentially positive result, (4) There is no difference in high-value MRI utilization across the border, and (5) There is a 6% difference in high-value CT utilization across the border.