



## A Snapshot of Occupational Licensing Regulation in the Midwest and Mid-Atlantic States

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Occupational licensing laws mandate that aspiring workers complete minimum levels of education and training, pass exams, and meet a variety of other requirements before they can begin working in their chosen field of employment. Occupational licensing affects more than 20 percent of the workforce.<sup>1</sup> Its prevalence has steadily increased since the 1950s, when just 5 percent of the workforce required a license in order to work in a profession.<sup>2</sup> The expressed purpose of occupational licensing laws is to ensure that professionals are competent and to protect the safety of customers. Research suggests that licensing may also support the development of human capital during a professional's career.<sup>3</sup>

However, licensing has been shown to have drawbacks. By restricting potential new entrants into a field,<sup>4</sup> licensing protects professionals from competition and raises prices for consumers.<sup>5</sup> Because licensing laws are passed at the state level, licensing also reduces interstate mobility.<sup>6</sup> Meanwhile, the evidence that it improves quality is mixed at best.<sup>7</sup>

In this policy brief, we compare the overall stringency of occupational licensing regulations for select states in the Midwest and mid-Atlantic states. This direct comparison allows us to identify states within a region whose level of occupational licensing regulation makes them outliers and states that should serve as a model for reform.

In our comparison group we find that Indiana was the most stringently regulated state, having the most restrictions and total words pertaining to occupational licensing of the states in our sample.

Ohio was a close second with respect to occupational licensing restrictions and word count. Pennsylvania and Maryland were the least restrictive states in our group, with far fewer restrictions and total words than Indiana and Ohio. At the industry level, states also vary considerably in how much licensing burdens the same industry. Some states have relatively few restrictions for an industry, while others heavily regulate that same industry. These large differences in regulations for the same industry should motivate policymakers to reconsider the merits of stringent occupational licensing regulations.

## **DATA SOURCE**

Our primary data source is Occupational Licensing (OL) RegData, a derivative of the RegData series from the Mercatus Center at George Mason University.<sup>8</sup> Introduced in 2012, RegData uses machine learning and text analysis to identify restrictions contained in a jurisdiction's regulations.<sup>9</sup> Restrictions are instances of the words and phrases "shall," "must," "may not," "required," and "prohibited" within a regulation.<sup>10</sup> OL RegData's algorithm works by predicting the probability that a regulation contains language pertaining to occupational licensing. In addition, the algorithm identifies regulated occupations using a similar approach.

Additionally, we map each state's regulations to the occupation categories using the Standard Occupational Classification (SOC) system. The classification of occupational licensing regulations into the SOC system allows for comparisons across states, including a comparison of the level of restrictions within an occupation.

Typical methods of gathering licensing regulations, which do not employ machine learning, have several shortcomings. It is time consuming to have an individual or team of individuals read through every state code to find the relevant information. Methods that rely solely on human effort suffer from possible error and subjectivity. Finally, it is extremely difficult and time consuming for humans to gather information with the level of detail of RegData.

The traditional approach for gathering licensing data is often to focus on one or a small number of occupations and a limited subset of variables. Two organizations, the Knee Center for the Study of Occupational Regulation and the Institute for Justice,<sup>11</sup> have been able to generate datasets that cover a large number of occupations, but they simultaneously face limitations in the variables they can gather because of their labor-intensive approaches. The size of the administrative code of each state makes the collection process difficult for traditional legislative research. This limitation creates an opportunity for software-based approaches, like that of RegData, to gather a substantial amount of information.

## STRENGTHS OF OUR APPROACH

Our method allows us to compare the overall levels of occupational licensing across states, unlike other methods that compare specific variables such as application fees or education requirements. Our data include measures of the stringency of regulations, including the length of the relevant portion of the code, the number of restrictions, and the difficulty of reading the text. We use these measures to compare the overall stance of states' occupational regulatory environments. By comparing these measures across states, we can identify outlier states that need reform and model states with less burdensome regulatory environments.

RegData allows us to examine the data by occupation using the three-, four-, and five-digit codes in the standard SOC system. This approach allows us to compare across occupations within and between states. Similar occupations that pose a similar level of risk for customers yet have substantially different regulatory stances in the same state provide some evidence that the regulations are being driven by professional organizations' rent-seeking rather than by a desire to protect public safety. Another advantage of classifying occupations according to the SOC system is that researchers will be able to directly use data that are collected by agencies such as the Census Bureau and the Bureau of Labor Statistics to examine the effects of occupational licensing on wages, employment, and other labor market outcomes.

## RESULTS

### Comparisons at the State Level

OL RegData has occupational licensing restriction data for 37 states. These states are included in the State RegData data series, which is also based on the RegData project.<sup>12</sup> For this brief, we select four contiguous Midwest and mid-Atlantic states. Table 1 ranks the states in the sample by number of occupational licensing regulatory restrictions. The number of restrictions gives a measure of the burden professionals must bear to meet a state's occupational licensing requirements. The number of words in the licensing code is an alternate measure of a state's stance toward occupational licensing; a greater number of words implies that states are licensing more occupations, placing

**Table 1. Occupational Licensing Restrictions and Words**

STATE	OCCUPATIONAL LICENSING RESTRICTIONS	OCCUPATIONAL LICENSING WORDS	INSTITUTE FOR JUSTICE LICENSING BURDEN RANKING
Indiana	26,152	2,391,508	26
Ohio	25,630	1,638,103	20
Maryland	9,477	776,745	11
Pennsylvania	5,851	538,085	50

Source: Kofi Ampaabeng et al., "State Occupational Licensing RegData" (dataset), QuantGov, Mercatus Center at George Mason University, 2019, <https://www.quantgov.org/>; Dick M. Carpenter II et al., *License to Work: A National Study of Burdens from Occupational Licensing*, 2nd ed. (Arlington, VA: Institute for Justice, 2017).

more requirements on each licensed occupation, or a combination of the two. Combined, occupational licensing restrictions and occupational licensing words provide evidence of the regulatory burden imposed by state licensing laws.

We find a considerable variation between states in terms of OL restrictions, which ranged from a high of 26,152 in Indiana to a low of 5,851 in Pennsylvania. Similarly, Indiana had the most OL words in the region. Ohio was second, with two-thirds the number of OL words as Indiana. Pennsylvania and Maryland have the fewest words.

As a comparison with existing data on occupational licensing, we also include the Institute for Justice licensing burden ranking for each state in our sample.<sup>13</sup> A higher rank (e.g., 50) corresponds with a lower burden. The Institute for Justice measures the barriers to entering low-income occupations using the cost in terms of time and money of licensure requirements. States with higher fees, more days of required education, and more exams have a higher rank.

The results of this comparison suggest that Indiana has the most onerous licensing requirements in this region. Having the most restrictions and number of words, Indiana's regulations are the most numerous and difficult to satisfy, although Ohio is similar. Compared to the nearby states of Pennsylvania and Maryland, the two least restrictive states, Indiana is substantially more restrictive. The differences between our ranking and the Institute for Justice's ranking may be driven by the differences in methodologies. RegData measures the number of restrictions, not the burden of each restriction. Additionally, we include all occupations in our study, not only low-income occupations.

Average sentence length (see table 2) is a measure of the average number of words per sentence. A longer average sentence suggests that a state has more complex regulations or regulations that are more difficult to understand.

Ohio has the longest average sentence length, with 34 words per sentence. Maryland and Indiana have similar average sentence lengths of 28 and 24 words, respectively. Pennsylvania has the shortest average sentence length, making its occupational licensing regulations the most straightforward and easy to read and understand.

Table 2. Average Sentence Length	
STATE	AVERAGE SENTENCE LENGTH
Ohio	34
Maryland	28
Indiana	25
Pennsylvania	18

Source: Ampaabeng et al., "State Occupational Licensing RegData" (dataset).

## Individual State Results

Indiana has the highest number of regulated occupations, with 48 of the 50 being regulated (see table 3). The most heavily regulated occupation is health diagnosing and treating practitioners. Healthcare workers have the most words and restrictions, and also the longest average sentence length, of any occupation regulated in the state. Counselors, social workers, and other community and social service specialists are the next most heavily regulated occupation, followed closely by architects, surveyors, and cartographers. The occupation with the fourth-most occupational licensing restrictions, private detectives and investigators, has the second-greatest average sentence length.

**Table 3. Indiana Occupational Licensing Restrictions by Occupation**

OCCUPATION (SOC CODE)	RESTRICTIONS	WORD COUNT	AVERAGE SENTENCE LENGTH
<b>Total</b>	<b>26,152</b>	<b>2,391,508</b>	<b>110</b>
Health diagnosing and treating practitioners (29-1000)	5,476	445,289	1,046
Counselors, social workers, and other community and social service specialists (21-1000)	3,340	330,175	370
Architects, surveyors, and cartographers (17-1000)	3,000	270,816	201
Private detectives and investigators (33-9020)	1,678	145,384	463
Life scientists (19-1000)	1,459	137,948	194
Real estate brokers and sales agents (41-9020)	1,211	98,755	268
Animal trainers (39-2010)	942	98,619	197
Lawyers, judges, and related workers (23-1000)	765	67,874	170
Supervisors of farming, fishing, and forestry workers (45-1000)	723	54,764	218
Securities, commodities, and financial services sales agents (41-3030)	704	55,626	38
Barbers, hairdressers, hairstylists, and cosmetologists (39-5010)	544	45,302	207
Hazardous materials removal workers (47-4040)	506	59,322	70
Miscellaneous healthcare support occupations (31-9090)	486	40,996	154
Painting workers (51-9120)	378	40,239	25
Ambulance drivers and attendants, except emergency medical technicians (53-3010)	297	19,987	20
Graders and sorters, agricultural products (45-2040)	272	24,570	121
Appraisers and assessors of real estate (13-2020)	255	27,207	70
Dental hygienists (29-2020)	254	22,615	127
Construction and building inspectors (47-4010)	244	23,322	70
Environmental engineers (17-2080)	235	21,136	55
Business operations specialists (13-1000)	231	24,391	60

<b>Table 3 (continued)</b>			
<b>OCCUPATION (SOC CODE)</b>	<b>RESTRICTIONS</b>	<b>WORD COUNT</b>	<b>AVERAGE SENTENCE LENGTH</b>
Psychologists (19-3030)	220	16,741	54
Geological and petroleum technicians (19-4040)	219	16,311	26
Massage therapists (31-9010)	215	22,056	66
Gaming cage workers (43-3040)	214	33,018	25
Electricians (47-2110)	212	24,135	90
Accountants and auditors (13-2010)	206	22,030	56
Miscellaneous entertainment attendants and related workers (39-3090)	191	18,697	26
Pest control workers (37-2020)	176	18,581	24
Morticians, undertakers, and funeral directors (39-4030)	165	14,274	149
File clerks (43-4070)	161	11,856	29
Butchers and other meat, poultry, and fish processing workers (51-3020)	152	16105	25
Clinical laboratory technologists and technicians (29-2010)	152	22,561	51
Tax examiners, collectors and preparers, and revenue agents (13-2080)	126	12,942	50
Security guards and gaming surveillance officers (33-9030)	107	11,172	59
Diagnostic-related technologists and technicians (29-2030)	77	10,409	24
Librarians (25-4020)	75	7,012	24
Pipelayers, plumbers, pipefitters, and steamfitters (47-2150)	75	6,505	54
Explosives workers, ordnance handling experts, and blasters (47-5030)	69	4,999	17
Environmental scientists and geoscientists (19-2040)	67	7,250	28
Dispatchers (43-5030)	65	6,666	20
Landscaping and groundskeeping workers (37-3010)	62	7,816	43
Telemarketers (41-9040)	42	6,679	66
Fire inspectors (33-2020)	41	2,839	25
Postsecondary teachers (25-1000)	28	5,087	23
Miscellaneous health practitioners and technical workers (29-9090)	22	5,049	52
Detectives and criminal investigators (33-3020)	10	2,016	19
Bailiffs, correctional officers, and jailers (33-3010)	3	4,365	22

Note: SOC = Standard Occupational Classification.

Source: Ampaabeng et al., "State Occupational Licensing RegData" (dataset).

Table 4. Maryland Occupational Licensing Restrictions by Occupation			
OCCUPATION (SOC CODE)	RESTRICTIONS	WORD COUNT	AVERAGE SENTENCE LENGTH
<b>Total</b>	<b>9,477</b>	<b>776,745</b>	<b>67</b>
Health diagnosing and treating practitioners (29-1000)	4,265	374,078	382
Heating, air conditioning, and refrigeration mechanics and installers (49-9020)	1,103	88,749	165
Counselors, social workers, and other community and social service specialists (21-1000)	1,051	91,178	122
Dental hygienists (29-2020)	840	73,174	29
Private detectives and investigators (33-9020)	720	46,373	90
Morticians, undertakers, and funeral directors (39-4030)	513	32,871	28
Psychologists (19-3030)	250	17,117	29
Massage therapists (31-9010)	142	12,258	30
Barbers, hairdressers, hairstylists, and cosmetologists (39-5010)	137	6,688	23
Accountants and auditors (13-2010)	127	11,198	26
Architects, surveyors, and cartographers (17-1000)	110	7,844	47
Appraisers and assessors of real estate (13-2020)	69	6,916	25
Aircraft pilots and flight engineers (53-2010)	61	3,140	21
Tax examiners, collectors and preparers, and revenue agents (13-2080)	40	2,391	19
Life scientists (19-1000)	35	1,226	19
Miscellaneous healthcare support occupations (31-9090)	14	1,544	22

Note: SOC = Standard Occupational Classification.

Source: Ampaabeng et al., "State Occupational Licensing RegData" (dataset).

Maryland regulates 16 of the 50 occupation codes on our list (see table 4). Health diagnosing and treating practitioners are the most heavily regulated professionals in Maryland, with roughly half of the restrictions and total words of all the occupations. Their average sentence length is also 382 words, more than 300 words longer than for the average occupation. Heating, air conditioning, and refrigeration mechanics and installers and counselors, social workers, and other community and social service specialists are the next most heavily regulated professionals.

In Ohio, 11 of the 50 occupations are regulated (see table 5). Health diagnosing and treating practitioners are the most heavily regulated occupation, with nearly half the total restrictions and total words. Their average sentence length is 609, almost five times the average sentence length for all occupations. Private detectives and investigators are the second most heavily regulated occupation. Counselors, social workers, and other community and social service specialists and barbers, hairdressers, hairstylists, and cosmetologists are also heavily regulated.

Table 5. Ohio Occupational Licensing Restrictions by Occupation			
OCCUPATION (SOC CODE)	RESTRICTIONS	WORD COUNT	AVERAGE SENTENCE LENGTH
<b>Total</b>	<b>25,630</b>	<b>1,638,103</b>	<b>125</b>
Health diagnosing and treating practitioners (29-1000)	12,258	810,348	609
Private detectives and investigators (33-9020)	5,548	340,600	315
Counselors, social workers, and other community and social service specialists (21-1000)	1,980	114,075	67
Barbers, hairdressers, hairstylists, and cosmetologists (39-5010)	1,412	69,519	62
Psychologists (19-3030)	1,128	74,375	75
Dental hygienists (29-2020)	1,052	85,187	37
Architects, surveyors, and cartographers (17-1000)	875	51,465	60
Construction and building inspectors (47-4010)	643	37,186	56
Accountants and auditors (13-2010)	458	38,671	34
Landscaping and groundskeeping workers (37-3010)	241	14,659	31
Real estate brokers and sales agents (41-9020)	35	2,018	34

Note: SOC = Standard Occupational Classification.  
Source: Ampaabeng et al., "State Occupational Licensing RegData" (dataset).

In Pennsylvania, 20 of the 50 occupations are regulated (see table 6). Health diagnosing and treating practitioners is the most heavily regulated occupation, with nearly half of the total restrictions and words for all the occupations in the state, and their average sentence length is nearly double that of the next-highest occupation. Counselors, social workers, and other community and social service specialists is the second most heavily regulated occupation. Dental hygienists are the next most heavily regulated occupation.

Table 6. Pennsylvania Occupational Licensing Restrictions by Occupation			
OCCUPATION (SOC CODE)	RESTRICTIONS	WORD COUNT	AVERAGE SENTENCE LENGTH
<b>Total</b>	<b>5,851</b>	<b>538,085</b>	<b>30</b>
Health diagnosing and treating practitioners (29-1000)	2,722	222,626	176
Counselors, social workers, and other community and social service specialists (21-1000)	1,090	92,272	85
Dental hygienists (29-2020)	349	35,419	17
Private detectives and investigators (33-9020)	220	14,170	18
Appraisers and assessors of real estate (13-2020)	197	24,690	15
Psychologists (19-3030)	175	21,180	20
Securities, commodities, and financial services sales agents (41-3030)	139	13,287	55



Table 6 (continued)			
OCCUPATION (SOC CODE)	RESTRICTIONS	WORD COUNT	AVERAGE SENTENCE LENGTH
Ambulance drivers and attendants, except emergency medical technicians (53-3010)	138	15,459	23
Architects, surveyors, and cartographers (17-1000)	135	13,810	17
Construction and building inspectors (47-4010)	129	13,197	16
Accountants and auditors (13-2010)	122	16,077	16
Environmental engineers (17-2080)	115	18,389	20
Massage therapists (31-9010)	99	7,306	18
Landscaping and groundskeeping workers (37-3010)	64	8,462	14
Clinical laboratory technologists and technicians (29-2010)	48	2,781	15
Real estate brokers and sales agents (41-9020)	31	11,613	30
Barbers, hairdressers, hairstylists, and cosmetologists (39-5010)	28	2,593	16
Heating, air conditioning, and refrigeration mechanics and installers (49-9020)	21	2,178	19
Miscellaneous healthcare support occupations (31-9090)	21	2,124	10
Supervisors of farming, fishing, and forestry workers (45-1000)	8	452	13

SOC = Standard Occupational Classification.

Source: Ampaabeng et al., “State Occupational Licensing RegData” (dataset).

## Cross-Occupation Comparison

Breaking our results down by SOC code allows us to compare results across occupations and states. The occupations that consistently face the greatest number of restrictions across states are health diagnosing and treating practitioners and counselors, social workers, and other community and social service specialists. The most heavily restricted occupation is health diagnosing and treating practitioners. Their average number of restrictions is 6,180, with an average of 463,085 separate licensing restrictions. Counselors, social workers, and other community and social service specialists have an average of 1,865 restrictions in our sample and an average of 156,925 words.

For many occupations in our sample, the regulatory stance differs considerably across the four states. For instance, Indiana places more than 2,400 restrictions on architects, while Ohio places fewer than 900, and Maryland and Pennsylvania place fewer than 150. Dental hygienists are regulated inconsistently between states. The number of restrictions on dental hygienists ranges from 1,052 in Ohio to 254 in Indiana.<sup>14</sup> Even for occupations that are regulated more consistently between states, we observe outlier states. Ohio is unusually restrictive for health diagnosing and treating practitioners and private detectives, while the other states have consistent regulatory stances. Ohio also strictly regulates psychologists, while Indiana, Maryland, and Pennsylvania

place fewer restrictions on professionals in that industry. Maryland places many more restrictions on morticians than comparison states.

Several occupations are licensed and heavily regulated in some states but unlicensed in other states. Heating, air conditioning, and refrigeration mechanics and installers are licensed and regulated in Maryland and Pennsylvania, but not in Ohio and Indiana. Supervisors of farming, fishing, and forestry workers are subject to licensing in Indiana and Pennsylvania, but not in Maryland and Ohio.

Healthcare professionals face very stringent regulations, and this is perhaps unsurprising, given the risk to the health and safety of patients posed by receiving substandard care. However, by designing such complex and disparate regulatory systems, states make it difficult for professionals to move between states. This creates rigidity in the healthcare system and limits the system's ability to respond to shocks in demand.<sup>15</sup> Outside healthcare, it is worth pondering the health and safety rationale for Maryland placing 513 restrictions on morticians—more than eight times the number of restrictions the state places on aircraft pilots and flight engineers. Discrepancies like these highlight the need for a careful reconsideration of occupational licensing restrictions.

## **CONCLUSION**

In this policy brief, we use a novel dataset generated using OL RegData to explore differences in the stringency of occupational licensing for select states in the Midwest and mid-Atlantic region. Indiana has more occupational licensing restrictions and words than any other state in our comparison group, and Ohio is a close second. Pennsylvania has the fewest occupational licensing restrictions and words and the shortest average sentence length. Perhaps not surprisingly, occupational licensing restrictions are most prevalent in healthcare. More granular comparisons of occupational licensing across states suggest that there are significant differences in the burden of state regulation. It is not immediately clear why regulations should differ to this degree for professions that do not greatly differ across states. With this additional information in hand, policymakers should carefully reconsider occupational licensing laws and make sure that those laws are not overly burdensome and are providing the right mix of consumer protection and flexibility.

## **ABOUT THE AUTHORS**

Kofi Ampaabeng is a research fellow and data scientist at the Mercatus Center at George Mason University. He specializes in curating data and generating policy-relevant insights from data. Before joining the Mercatus Center, he worked for IMPAQ International, where he evaluated the efficacy of government programs.

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Established in 2016, The Knee Center for the Study of Occupational Regulation (CSOR) is an academic research center within the Shields School of Business at Saint Francis University in Loretto, PA. CSOR’s mission is to provide information to citizens, policymakers, and other researchers about the extent, scope, and effects of occupational regulation. CSOR aims to enhance public awareness regarding the impact of occupational licensing and encourage more discussion and research on the topic, by producing, updating, and maintaining a national database of occupational regulation that will be freely available to the public. In addition to creating a national database, CSOR also organizes educational panels at national research conferences across the nation, and prepares additional research reports for members of the academic community, policymakers, and citizens.

## **APPENDIX: REGDATA METHODOLOGY**

This brief uses data from the Mercatus Center’s OL RegData database. OL RegData is part of the suite of RegData products from the Mercatus Center based on the QuantGov platform.

OL RegData identifies occupational licensing regulations in two steps. The first step is identifying occupational licensing regulations. Next, it applies text analysis to identify the total number of restrictions and determine the complexity of the identified occupational licensing code.

It does so by using QuantGov’s text analysis and machine learning capabilities to count the regulatory restrictions within those regulations. QuantGov defines regulatory restrictions as instances of the words and phrases “shall,” “must,” “may not,” “required,” and “prohibited.” After counting these restrictions, OL RegData uses QuantGov’s machine learning algorithms to classify bodies of text. The classification is defined during the training of the algorithm. OL RegData in particular relies on a binary classification: Does a unit of regulation pertain to occupational licensing or not? Classifying units of regulation by occupation uses a similar approach (that is, each unit has a probability of pertaining to a given occupation).

OL RegData classifies a unit of regulation as pertaining to occupational licensing if the text contains requirements that potential workers obtain a license before they enter an occupation. A unit of regulation is typically the body of text that is coherently related to a topic. Usually, states

organize their administrative codes in such a manner. However, not all states use this approach. For example, it is common for states to organize all licensing regulations into a single section. Others sprinkle licensing regulations all over the topic-based sections of their regulatory code, as appropriate. OL RegData defines a body of text as a unit if it contains language that regulates participation in an occupation, including licensing requirements, disciplinary procedures, and scope of practice, among others.

Algorithm development begins with the creation of units of regulations for all 37 states. After identifying these units, researchers identify a selection that regulates occupations. This forms the *training set*, in machine language nomenclature. The training set includes 200 occupational licensing regulations (positive) and 1,000 nonoccupational licensing regulations (negative). After training the algorithm on these positive documents, the algorithm was deployed to the full text of all regulations across the states. The algorithm results in probabilities that units of regulation pertain to occupational licensing. Each state records a bimodal distribution—as is to be expected—of the probability that a unit of regulation pertains to occupational licensing. The performance of the algorithm differs for each state, leading to different thresholds for inclusion in the database.

The inclusion thresholds for each state are determined statistically by subtracting twice the standard deviation of the high predicted probability documents from the mode. With this threshold established, all regulations whose occupational license probability exceed this threshold are included in OL RegData.

## NOTES

1. Data on certifications and licenses come from “49. Certification and Licensing Status of the Civilian Noninstitutional Population 16 Years and over by Employment Status, 2016 Annual Averages,” Labor Force Statistics from the Current Population Survey, Bureau of Labor Statistics, last modified February 8, 2018, <https://www.bls.gov/cps/aa2016/cpsaat49.htm>.
2. Morris M. Kleiner, “Reforming Occupational Licensing Policies” (Discussion Paper 2015-01, Hamilton Project at the Brookings Institution, Washington, DC, January 2015).
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4. Conor Norris and Edward J. Timmons, “Restoring Vision to Consumers and Competition to the Marketplace: Analyzing the Effects of Required Prescription Release,” *Journal of Regulatory Economics* 57 (2020): 1–19.
5. Milton Friedman and Simon Kuznets, *Income from Independent Professional Practice* (Cambridge, MA: National Bureau of Economic Research, 1945); Morris M. Kleiner and Evan J. Soltas, “Occupational Licensing, Labor Supply, and Human Capital” (working paper, 2018).
6. Janna E. Johnson and Morris M. Kleiner, “Is Occupational Licensing a Barrier to Interstate Migration?,” *American Economic Journal: Economic Policy* 12, no. 3 (2020): 347–73.
7. US Department of the Treasury, Council of Economic Advisers, and US Department of Labor, *Occupational Licensing: A Framework for Policymakers*, July 2015.

8. Omar Al-Ubaydli and Patrick A. McLaughlin, “RegData: A Numerical Database on Industry-Specific Regulations for All United States Industries and Federal Regulations, 1997–2012,” *Regulation and Governance* 11, no. 1 (2015): 109–23.
9. Please see the appendix for details about RegData and the methodology used for this brief.
10. Al-Ubaydli and McLaughlin, “RegData: A Numerical Database.”
11. CSOR Occupational Regulation Database (database), Knee Center for the Study of Occupational Regulation, accessed June 19, 2020, <https://csorsfu.com/find-occupations/>; Dick M. Carpenter II et al., *License to Work: A National Study of Burdens from Occupational Licensing*, 2nd ed. (Arlington, VA: Institute for Justice, 2017).
12. Upcoming updates to OL RegData will include all states covered by State RegData.
13. Carpenter et al., *License to Work*.
14. Dental hygienists are an interesting case since their primary supervisors (dentists) play a significant role in mandating requirements.
15. Ethan Bayne, Conor Norris, and Edward J. Timmons, “A Primer on Emergency Occupational Licensing Reforms for Combating COVID-19” (Mercatus Policy Brief, Mercatus Center at George Mason University, Arlington, VA, March 2020).