Nursing the Opioid Crisis

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MERCATUS WORKING PAPER

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Benjamin J. McMichael, "Nursing the Opioid Crisis," Mercatus Working Paper, Mercatus Center at George Mason University, Arlington, VA, August 2021.

Abstract

Access to healthcare providers remains a salient problem in the United States. One important policy solution would be to relax state scope-of-practice (SOP) laws that inhibit the ability of many healthcare providers, such as nurse practitioners, to deliver care. Some states have changed their SOP laws to allow nurse practitioners to practice independently; many other states have refused to do so, citing patient safety concerns. This paper examines the impact of relaxing such laws in the context of another public health crisis—the opioid epidemic. The epidemic arose within the healthcare system and is intimately connected with patient safety, thus it is an ideal setting in which to evaluate patient safety concerns. Analyzing a comprehensive dataset of opioid-related deaths between 2005 and 2017, I find no empirical evidence to support the contention that relaxing SOP laws endangers patient safety. Instead, I find consistent and statistically significant evidence that eliminating SOP restrictions reduces opioid-related deaths by 5 to 11 percent. This evidence supports making relaxations of SOP laws permanent and more widespread. This paper offers several state and federal policy options to relax SOP laws and meaningfully improve access to care permanently.

JEL codes: I11, I18, K23, K32

Keywords: Scope of practice, nurse practitioner, health, healthcare, medical, opioids, opioid epidemic, access to care

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Acknowledgment

The University of Alabama Institutional Review Board (IRB) evaluated the protocols and data analysis involved in this project and determined that full IRB approval was not required. The National Center for Health Statistics (NCHS) approved this study and granted permission to analyze the restricted-use data described below (approval number DVS2019-1838). This article is forthcoming in the *Wake Forest Law Review* 56.

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Introduction

For the first time in their lives, many Americans experienced a lack of access to healthcare during the COVID-19 pandemic. By this, I do not mean an inability to pay for healthcare or the problem of being uninsured or underinsured. I instead refer to the more fundamental problem of an inability to obtain any care at all.[1] Many people with private insurance could not access the care they needed because there were simply not enough healthcare providers to supply it.[2] Thus, the COVID-19 pandemic effectively democratized the healthcare access problem. It forced millions of Americans in wealthy, urban areas to (briefly) experience what millions more in rural and impoverished communities have experienced for years: an inability to access care because of a lack of providers.[3]

I do not mean to downplay or understate the problem of access to health insurance. I do, however, mean to draw a sharp distinction that has largely been absent from the health law and policy debate over the past 20 years: the difference between access to *health*

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[1] See Heather Landi, "Doctors Report Patients' Health Declining Due to Delayed or Inaccessible Care during COVID-19 Pandemic," *Fierce Healthcare,* November 19, 2020, https://www.fiercehealthcare.com/practices/patients-health-declining-due-to-delayed-or-inaccessible-care-during-covid-19-pandemic, which states, "56% of surveyed clinicians have seen an increase in negative health burdens due to delayed or inaccessible care."

[2] Olivia Goldhill, "'People Are Going to Die': Hospitals in Half the States Are Facing a Massive Staffing Shortage as Covid-19 Surges," *STAT*, November 19, 2020, https://www.statnews.com/2020/11/19/covid19-hospitals-in-half-the-states-facing-massive-staffing-shortage/.

[3] "Urban counties in large metropolitan areas in the United States are among the most affected by the coronavirus disease 2019 (COVID-19) pandemic." Samrachana Adhikari et al., "Assessment of Community-Level Disparities in Coronavirus Disease 2019 (COVID-19) Infections and Deaths in Large US Metropolitan Areas," *JAMA Network Open* 3, no. 7 (2020): e2016938, https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2768723.

insurance and access to *healthcare*. In the age of the Affordable Care Act, policymakers and scholars have often treated access to healthcare as coextensive with access to health insurance.[4] But the COVID-19 pandemic has demonstrated that access to healthcare necessarily requires access to healthcare providers and the medical resources they need to provide care. The quality of health insurance is irrelevant if the insured cannot find a healthcare provider to deliver the needed care. As the nation solves the specific problems of COVID-19, it could also take the opportunity to address the access-to-care problem within the healthcare system more generally.[5] And the ways to do so can be found within the emergency responses to this most recent pandemic.

These emergency responses have targeted several specific problems, but the most important issue they have addressed is a lack of healthcare providers to care for patients. This problem, which is the root cause of many access-to-care deficiencies, is the focus of this paper. Perhaps the emergency response to receive the most attention came out of New York. In March 2020, Governor Andrew Cuomo issued an executive order suspending or modifying provisions of New York state law that could impede the ability of healthcare providers to deliver care.[6] Many of the provisions selected for suspension concerned the

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[4] See Benjamin J. McMichael, "Occupational Licensing and the Opioid Crisis," *UC Davis Law Review* 54 (2020), which notes that the "treatment of access to healthcare as effectively coextensive with access to health insurance has obscured a more fundamental problem with access to care."

[5] "State full SOP regulation was associated with higher NP supply in rural and primary care HPSA counties. Regulation plays a role in maximizing capacity of the NP workforce in these underserved areas, which are most in need for improvement in access to care." Ying Xue et al., "Full Scope-of-Practice Regulation Is Associated with Higher Supply of Nurse Practitioners in Rural and Primary Care Health Professional Shortage Counties," *Journal of Nursing Regulation* 8, no. 4 (2018): 5.

[6] N.Y. Exec. Order No. 202.10 (March 7, 2020), https://www.governor.ny.gov/news/no-20210-continuing-temporary-suspension-and-modification-laws-relating-disaster-emergency.

scope of practice (SOP) of healthcare providers such as nurse practitioners (NPs) and physician assistants. For example, the order suspended state laws "to the extent necessary to permit a physician assistant to provide medical services appropriate to their education, training and experience without oversight from a supervising physician."[7] A similar law governing NPs was also suspended.[8] Throughout this paper, the focus remains on NPs. While physician assistants are certainly an important class of providers, they have not made as much progress toward independent practice as have NPs. Because physician assistant SOP laws are both different and more nuanced than NP SOP laws, I leave a thorough discussion of the role of physician assistants to future work.

Legal scholars, health policy researchers, and economists alike have long criticized restrictive SOP laws for their propensity to hinder the ability of qualified providers to care for patients and restrict access to care more generally.[9] In particular, these scholars and researchers have emphasized that SOP laws requiring physicians to supervise NPs or physician assistants impede the ability of providers to care for patients and decrease

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[7] N.Y. Exec. Order No. 202.10.

[8] N.Y. Exec. Order No. 202.10. New York's approach to SOP laws has been unique. Although it included a waiver during the COVID-19 pandemic, it ostensibly had relaxed its SOP laws earlier. This has been a matter of debate, and on this point, I follow Benjamin J. McMichael and Sara Markowitz, "Toward a Uniform Classification of Nurse Practitioner Scope of Practice Laws," (National Bureau of Economic Research Working Paper No. 28192, NBER, Cambridge, MA, 2020), 24–29.

[9] See, e.g., Barbara J. Safriet, "Closing the Gap between Can and May in Health-Care Providers' Scopes of Practice: A Primer for Policymakers," *Yale Journal on Regulation* 19 (2002): 306–23; Jeffrey Traczynski and Victoria Udalova, "Nurse Practitioner Independence, Health Care Utilization, and Health Outcomes," *Journal of Health Economics* 58 (2018): 94–103; and Peter Buerhaus, "Nurse Practitioners: A Solution to America's Primary Care Crisis" (American Enterprise Institute, Washington, DC, 2018), 4. All of those note problems with restrictive SOP laws.

access to care.[10] And Cuomo's approach in abrogating restrictive SOP laws embodies the policy changes that many have recommended for the healthcare system on a more permanent basis.[11] For example, the Obama and Trump administrations, the National Academy of Medicine, and other national organizations have urged states to relax their SOP laws.[12]

Relaxing these laws may seem an obvious solution to an important problem that extends beyond the COVID-19 pandemic. But long-term legal changes to this effect have met stiff resistance from physician organizations, whose members stand to benefit economically from laws suppressing the ability of other providers to deliver healthcare.[13] This opposition is rarely framed in such crass economic terms, however. Instead, these organizations often argue that laws requiring physician supervision of NPs and other

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[10] E. Kathleen Adams and Sara Markowitz, "Improving Efficiency in the Health-Care System: Removing Anticompetitive Barriers for Advanced Practice Registered Nurses and Physician Assistants" (Hamilton Project Policy Proposal No. 2018-08, Brookings, Washington, DC, 2018), 11–13.

[11] See Buerhaus, "Nurse Practitioners: A Solution," 4, and Adams and Markowitz, "Improving Efficiency in the Health-Care System," 3, which recommend similar action on a permanent basis.

[12] Department of Health and Human Services et al., *Reforming America's Healthcare System through Choice and Competition,* 2018, 31–36; Department of the Treasury et al., *Occupational Licensing: A Framework for Policymakers*, 2015, 13–14; Institute of Medicine, *The Future of Nursing: Leading Change, Advancing Health* (Washington, DC: National Academies Press, 2011), 3–6. See also, e.g., National Governors Association (NG), "The Role of Nurse Practitioners in Meeting Increasing Demands for Primary Care" (white paper, NGA, Washington, DC, 2012), 1, which notes the National Governors Association's preference for NP independence.

[13] See Resolution 214-I-2017 of the American Medical Association (AMA), https://www.ama-assn.org/sites/ama-assn.org/files/corp/media-browser/public/hod/i17-resolutions.pdf, which states, "Our AMA, in the public interest, opposes enactment of legislation to authorize the independent practice of medicine by any individual who has not completed the state's requirements for licensure to engage in the practice of medicine and surgery in all of its branches." See also Letter from Austin I. King Jr., president, Texas Medical Association, to James W. Johnston, general counsel, Texas Board of Nursing, June 30, 2014, https://www.texmed.org/uploadedFiles/Current/Advocacy/Scope_of_Practice/TBN-APRN-rules-063014.pdf, which articulates physicians' objections to relaxing the SOP laws governing NPs; Pennsylvania Medical Society, "Education and Training Matters" (fact sheet, 2019), 1–2, https://www.pamedsoc.org/docs/librariesprovider2/pamed-documents/advocacy-priorities/425_educationtraingmatters_print.pdf?sfvrsn=eb5e9aae_2, which expresses similar objections.

providers are necessary to ensure patient safety.[14] Recently, proponents of restrictive SOP laws have capitalized on another public health crisis to bolster their arguments—the opioid epidemic. Until the COVID-19 pandemic, the opioid epidemic, which has resulted in the deaths of hundreds of thousands of Americans,[15] was hailed as the defining public health crisis of the current generation.[16] Proponents of restrictive SOP laws have argued that allowing NPs and other providers to practice without physician supervision will deepen this crisis because unsupervised NPs will inappropriately overprescribe opioids.[17] These, and

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[14] See, e.g., California Medical Association, "CMA Objects to Federal Scope Expansion under President's Executive Order" (news release, CMA, Sacramento, October 14, 2019), https://www.cmadocs.org/newsroom/news/view/ArticleId/28183/CMA-objects-to-federal-scope-expansion-under-president-s-executive-order, which notes that the California Medical Association "opposes any attempts to remove physician oversight over [NPs] and believes that doing so would put the health and safety of patients at risk."

[15] Centers for Disease Control and Prevention, COVID Data Tracker, last visited May 1, 2021, https://covid.cdc.gov/covid-data-tracker/#datatracker-home. Throughout this paper, I will refer to the COVID-19 crisis as a "pandemic" and the opioid crisis as an "epidemic." While there is no clear definition that separates pandemic from epidemic, the former generally refers to a disease that affects people throughout multiple regions and the latter generally refers to a disease that affects people within a community. At the risk of abusing these terms, calling the COVID-19 crisis a pandemic and the opioid crisis an epidemic will help separate these two public health crises. See Jamie Ducharme, "World Health Organization Declares COVID-19 a 'Pandemic.' Here's What That Means," *Time*, March 11, 2020, https://time.com/5791661/who-coronavirus-pandemic-declaration/, which discusses the "fuzzy" differences between pandemics and epidemics.

[16] "Drug Overdose Deaths," CDC website, last visited April 4, 2020, https://www.cdc.gov/drugoverdose/data/statedeaths.html. See also Richard J. Bonnie, Morgan A. Ford, and Jonathan K. Phillips, eds., *Pain Management and the Opioid Epidemic: Balance Societal and Individual Benefits and Risks of Prescription Opioid Use* (Washington, DC: National Academies Press, 2017), 187, which notes, "Not since the HIV/AIDS epidemic has the United States faced as devastating and lethal a health problem as the current crisis of opioid misuse and overdose and opioid use disorder."

[17] See Letter from James L. Madara, executive vice president and CEO, American Medical Association, to Hon. Gavin Newsom, governor, State of California, September 10, 2020, https://searchlf.ama-assn.org/letter/documentDownload?uri=%2Funstructured%2Fbinary%2Fletter%2FLETTERS%2FAMA-Letter-to-Governor-Newsom-Oppose-AB890-FINAL.pdf, which argues that granting independence to NPs will increase opioid prescriptions. These arguments have also been discussed in the popular press and in academic literature. For example, see Virgil Dickson, "Expanded Scope: Nurse Practitioners Making Inroads," *Modern Healthcare,* February 20, 2016, https://www.modernhealthcare.com/article/20160220/MAGAZINE/302209981/expanded-scope-nurse-practitioners-making-inroads; Lori Schirle and Brian McCabe, "State Variation in Opioid and Benzodiazepine Prescriptions between Independent and Nonindependent Advanced Practice Registered Nurse Prescribing States," *Nursing Outlook* 64, no. 1 (2016): 86–87; Carole Myers and Jill Alliman, "Updates on the Quest for Full Practice Authority," *Journal for Nurse Practitioners* 14, no. 7 (2018): 561. But see Michael L. Barnett, Dennis Lee, and Richard G. Frank, "In Rural

related arguments, have proved effective in encouraging states to maintain restrictive SOP laws.

Thus, the issues that lie at the heart of the two most salient public health crises that this country has faced in the past several decades establish the conflict that is the focus of this paper. On one hand, the COVID-19 pandemic has elucidated the importance of access to healthcare providers and the ability to increase the capacity of the healthcare workforce by eliminating restrictive SOP laws. On the other hand, the more familiar and longer-standing opioid epidemic, which arose from within the healthcare system itself and is intimately connected with patient safety concerns, has highlighted the importance of maintaining laws that protect patients from dangerous providers.[18]

This paper engages with this conflict in two ways. First, it provides a new, and critically important, empirical analysis of the claims made in connection with SOP laws and the opioid epidemic. By evaluating the claims made about the role of restrictive SOP laws in the context of the opioid epidemic, this paper directly addresses the patient safety arguments made by opponents of relaxing these laws in the context of a crisis rooted in patient safety.

Areas, Buprenorphine Waiver Adoption since 2017 Driven by Nurse Practitioners and Physician Assistants," *Health Affairs* 38, no. 12 (2019): 2048, which states, "From 2016 to 2019 the number of waivered clinicians per 100,000 population in rural areas increased by 111 percent. NPs and PAs accounted for more than half of this increase and were the first waivered clinicians in 285 rural counties with 5.7 million residents. In rural areas, broad scope-of-practice regulations were associated with twice as many waivered NPs per 100,000 population as restricted scopes of practice were."

[18] National Institute on Drug Abuse, "Prescription Opioids and Heroin Research Report" (research report, 2018), 3–4, https://www.drugabuse.gov/download/19774/prescription-opioids-heroin-research-report.pdf?v=fc86d9fdda38d0f275b23cd969da1a1f, which notes that "[p]rescription opioid use is a risk factor for heroin use." See also Jennifer Doleac and Anita Mukherjee, "The Moral Hazard of Lifesaving Innovations: Naloxone Access, Opioid Abuse, and Crime," (unpublished manuscript, March 31, 2019), 2, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3135264, which states, "Individuals are prescribed these drugs to treat pain, but many patients develop addictions that lead them to illegal use of prescription opioids and cheaper substitutes such as heroin."

Because of the breadth of the SOP law debate, it is infeasible to evaluate all SOP laws in a single analysis. Accordingly, the analysis here focuses on the role of NP SOP laws in the opioid epidemic. While the laws governing other healthcare professionals are certainly important, the NP profession has made the most progress toward removing restrictive laws. And the debate over NP SOP laws has become a microcosm of the debate over SOP laws for healthcare providers more generally. Examining a comprehensive dataset that includes information on every opioid-related death in the United States between 2005 and 2017, I find no evidence that relaxing NP SOP laws exacerbates the opioid epidemic. On the contrary, with opioid-related deaths declining by 9.3 percent when states relax their SOP laws, the results demonstrate that removing these barriers ameliorates the effects of the opioid epidemic.

Second, this paper uses the empirical evidence developed in the context of the opioid epidemic to engage with the emergency measures taken to combat the COVID-19 pandemic. It argues that the emergency measures designed to increase access to care by relaxing SOP laws in this pandemic should be extended permanently. Linking the evidence developed from the opioid epidemic to the emergency measures passed in the COVID-19 pandemic suggests that these measures will not endanger patient safety if maintained in the long term. Thankfully, the COVID-19 pandemic will not last forever, but increasing access to care can solve many other problems unrelated to COVID-19. This pandemic, despite the tragic harms it has inflicted, can catalyze meaningful healthcare change going forward if policymakers permanently install the emergency measures that have been implemented.

This paper proceeds in four parts. Part I details the existing state of healthcare workforce regulation and engages with the role of this regulation in access to care. Part II examines the arguments made for and against expanding access to care by relaxing the SOP laws governing NPs. It uses the COVID-19 pandemic and opioid epidemic to sharpen these arguments with examples. Part III reports the empirical analysis of the effect of SOP laws on opioid-related deaths. This analysis reveals that removing physician supervision requirements for NPs reduces opioid-related deaths and thus can directly inform the patient-safety arguments against relaxing SOP laws. Part IV relies on this evidence to develop specific policy recommendations that will increase access to care. These policy recommendations flow directly from the emergency measures implemented to combat the COVID-19 pandemic. A brief conclusion follows.

The Role of Healthcare Workforce Regulation in Access to Care

Traditionally, the American healthcare system has been physician-centric. Physicians have historically provided much of the healthcare in this country and have been the primary decision makers within the healthcare system. Other providers, like registered nurses, have always played indispensable roles in the delivery of care, but physicians have been responsible for the majority of healthcare in the United States. This trend, however, has begun to shift in recent decades. New types of providers like NPs, physician assistants, respiratory therapists, and advanced practice pharmacists have played increasingly important roles in delivering healthcare.[19] NPs, in particular, have played an outsized role in

[19] David I. Auerbach, Douglas O. Staiger, and Peter I. Buerhaus, "Growing Ranks of Advanced Practice Clinicians—Implications for the Physician Workforce," *New England Journal of Medicine* 378 (2018): 2358.

supplementing the physician workforce to ensure access to care. This trend is likely to continue as the growth rate of NPs far outstrips that of physicians.[20] This part discusses the role of NPs within the healthcare system and the role of SOP laws in inhibiting or augmenting their ability to provide care.

Emerging Members of the Healthcare Workforce

As the supply of physicians has become inadequate to meet the needs of the population,[21] new members of the healthcare workforce have played increasingly prominent roles in the healthcare system.[22] Professions that have a long history, such as registered nurses, have assumed more responsibility for care alongside newer professions that more directly supplement and replace the care delivered by physicians.[23] These professions include NPs, certified registered nurse anesthetists, physician assistants, advanced practice pharmacists, and others.[24] Though they have sometimes been (pejoratively) referred to as "mid-level providers,"[25] members of this group of professions are more accurately called "advanced

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[20] Edward S. Salsberg, "Changes in the Pipeline of New NPs and RNs: Implications for Health Care Delivery and Educational Capacity," *Health Affairs Blog*, June 5, 2018, https://www.healthaffairs.org/do/10.1377/hblog20180524.993081/full/.

[21] See Association of American Medical Colleges, (AAMC), "The Complexities of Physician Supply and Demand: Projections from 2016 to 2030" (report prepared by IHS Markit Ltd. for the AAMC, Washington, DC, 2018), 12, https://aamc-black.global.ssl.fastly.net/production/media/filer_public/85/d7/85d7b689-f417-4ef0-97fb-ecc129836829/aamc_2018_workforce_projections_update_april_11_2018.pdf. The report estimates a shortage of as many as 90,000 physicians by 2025.

[22] See Department of the Treasury et al., *Occupational Licensing*, 31–36, which discusses the various healthcare professions that are increasingly supplying healthcare.

[23] Department of the Treasury et al., *Occupational Licensing*, 31–36.

[24] Department of the Treasury et al., *Occupational Licensing*, 31–36.

[25] Catherine S. Bishop, "Advanced Practitioners Are Not Mid-Level Providers," *Journal of the Advanced Practitioner in Oncology* 3, no. 5 (2012): 287–88.

practice providers."[26] The educational and training requirements vary between individual professions, but all advanced practice providers complete some amount of post-graduate work.[27]

An aspiring NP must first complete a bachelor's degree and the requirements to become a registered nurse.[28] Most future NPs work several years as registered nurses before completing an additional two to four years of education and training to become NPs.[29] This additional education results in a professional master's or doctoral degree and includes clinical and classroom training that prepares future NPs to diagnose and treat patients, order and interpret tests, and prescribe medications.[30] After they complete their training, NPs practice in a wide array of healthcare settings in all 50 states, but their practice choices differ substantially from those of physicians. Unlike medical school graduates who predominantly choose to practice in non–primary-care settings,[31] over 60 percent of NPs choose to practice some form of primary care.[32] NPs care for underserved populations and

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[26] Erin Sarzynski and Henry Barry, "Current Evidence and Controversies: Advanced Practice Providers in Healthcare," *American Journal of Managed Care* 25, no. 8 (2019): 366–68, https://www.ajmc.com/journals/issue/2019/2019-vol25-n8/current-evidence-and-controversies-advanced-practice-providers-in-healthcare.

[27] Sarzynski and Barry, "Current Evidence and Controversies."

[28] Adams and Markowitz, "Improving Efficiency in the Health-Care System."

[29] Buerhaus, "Nurse Practitioners: A Solution," 4.

[30] Buerhaus, "Nurse Practitioners: A Solution," 4.

[31] Julie P. Phillips et al., "Trends in US Medical School Contributions to the Family Physician Workforce: 2018 Update from the American Academy of Family Physicians," *Family Medicine* 51 no. 3 (2019): 245–50.

[32] American Association of Nurse Practitioners, "NP Fact Sheet," last visited April 30, 2021, https://perma.cc/Y2YV-42XJ. Updates available at https://www.aanp.org/about/all-about-nps/np-fact-sheet; Grant R. Martsolf et al., "Employment of Advanced Practice Clinicians in Physician Practices," *JAMA Internal Medicine* 178, no. 7 (2018): 988–90.

Medicaid beneficiaries at higher rates than physicians,[33] and NPs are more likely to provide care in rural and isolated areas than physicians.[34]

The Bureau of Labor Statistics estimates that there are approximately 211,280 NPs practicing in the United States.[35] For comparison, the Kaiser Family Foundation estimates that there are approximately 489,739 primary care physicians practicing in the United States.[36] Given these numbers and the fact that the NP profession is growing more quickly than the medical profession,[37] scholars and policymakers have looked to NPs to fill critical healthcare needs in an era of physician shortages. The Association of American Medical Colleges estimates that the United States will face a physician shortage of 90,000

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[33] See Peter I. Buerhaus et al., "Practice Characteristics of Primary Care Nurse Practitioners and Physicians," *Nursing Outlook* 63, no. 2 (2015): 150. The report states, "Compared with [primary care physicians] who worked with or without [primary care NPs], [primary care NPs] also provided proportionally more care to Medicaid enrollees and vulnerable populations." See also Benjamin J. McMichael, "Beyond Physicians: The Effect of Licensing and Liability Laws on the Supply of Nurse Practitioners and Physician Assistants," *Journal of Empirical Legal Studies* 15, no. 4 (2018): 759–64, which finds that NPs are more likely to practice in health professional shortage areas following the relaxation of SOP laws, and Martsolf et al., "Employment of Advanced Practice Clinicians," 988, which finds that one in three primary care practices employed a primary care NP or physician assistant.

[34] Ying Xue, Joyce A. Smith, and Joanne Spetz, "Research Letter: Primary Care Nurse Practitioners and Physicians in Low-Income and Rural Areas, 2010–2016," *JAMA* 321, no. 1 (2019): 102–04. See Hilary Barnes et al., "Rural and Nonrural Primary Care Physician Practices Increasingly Rely on Nurse Practitioners," *Health Affairs* 37, no. 6 (2018): 908, which notes, "We found increasing NP presence in both rural and nonrural primary care practices in the period 2008–16." See also Buerhaus et al., "Practice Characteristics," 144, which states that primary care NPs "are significantly more likely than [primary care physicians] to practice in urban and rural areas, whereas [primary care physicians] are more likely to practice in suburban locations"; McMichael, "Beyond Physicians," 759–64, which finds that NPs are more likely to practice in health professional shortage areas following the relaxation of SOP laws.

[35] Bureau of Labor Statistics, "Occupational Employment and Wage Statistics: May 2018 Occupation Profiles," last visited August 15, 2019, https://www.bls.gov/oes/current/oes291171.htm.

[36] Kaiser Family Foundation, "Professionally Active Primary Care Physicians by Field," last visited May 5, 2021, https://www.kff.org/other/state-indicator/primary-care-physicians-by-field/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D.

[37] See Association of American Medical Colleges (AAMC), "The Complexities of Physician Supply and Demand: Projections from 2018 to 2033" (report prepared by IHS Markit Ltd. for the AAMC, Washington, DC, 2020), 22–29, https://www.aamc.org/system/files/2020-06/stratcomm-aamc-physician-workforce-projections-june-2020.pdf, which discusses the growth rates among various types of providers.

in the next five years.[38] This shortage will affect the country in general, but research has shown that physician shortages will have the biggest impact in rural areas.[39] Accordingly, states with large rural populations have increasingly relied on NPs to fill gaps in the physician workforce.[40] Currently, NPs outnumber family and general practice physicians[41] and are the principal source of healthcare in many areas.[42] Importantly, however, the ability of NPs to deliver care in these areas depends on the state SOP laws that govern their practices.

Scope of Practice

State SOP laws are a subset of the more familiar occupational licensing laws that govern many professions, not just healthcare professions. While occupational licensing laws generally regulate everything from entry requirements for a profession[43] to continuing education requirements,[44] SOP laws regulate the services that members of a profession can

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[38] Association of American Medical Colleges, "The Complexities of Physician Supply and Demand: Projections from 2016 to 2030," 12.

[39] Lucy Skinner et al., "Implications of an Aging Rural Physician Workforce," *New England Journal of Medicine* 381 (2019): 300.

[40] Buerhaus et al., "Practice Characteristics," 144.

[41] David Auerbach, "Will the NP Workforce Grow in the Future? New Forecasts and Implications for Healthcare Delivery," *Medical Care* 50, no. 7 (2012): 607–8; Auerbach, Staigler, and Buerhaus, "Growing Ranks of Advanced Practice Clinicians," 2358–59.

[42] Auerbach, "Will the NP Workforce Grow?," 607–8; Auerbach, Staigler, and Buerhaus, "Growing Ranks of Advanced Practice Clinicians," 2358–59; Christine M. Everett, Perri Morgan, and George L. Jackson, "Primary Care Physician Assistant and Advance Practice Nurses Roles: Patient Healthcare Utilization, Unmet Need, and Satisfaction," *Healthcare* 4 (2016): 328–31.

[43] The bar examination for attorneys is a familiar example.

[44] See generally Morris M. Kleiner, "Reforming Occupational Licensing Policies" (Hamilton Project Discussion Paper No. 2015-01, Brookings, Washington, DC, 2015), https://www.brookings.edu/research/reforming-occupational-licensing-policies/.

provide and the conditions under which they may practice.[45] Unlike physicians who see, at most, minor differences from state to state in the laws regulating their practices, NPs face substantial variation in the SOP laws that govern them. Prior work has developed several classification schemes to categorize NP SOP laws.[46] These various classification schemes each have advantages and disadvantages.[47]

Throughout this paper, I rely on a classification scheme I developed with Sara Markowitz after extensive statutory and regulatory research.[48] This scheme minimizes the risk of misclassification that may arise when relying on potentially inconsistent secondary sources. Importantly, the scheme adopted here isolates specific statutes and regulations that embody two key aspects of SOP laws: physician supervision requirements and prescription authority. Collectively, these two specific SOP laws have the largest impact on the ability of NPs to deliver care, particularly physician supervision requirements.[49]

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[45] Adams and Markowitz, "Improving Efficiency in the Health-Care System," 6.

[46] See, e.g., Sara Markowitz et al., "Competitive Effects of Scope of Practice Restrictions: Public Health or Public Harm?," *Journal of Health Economics* 55 (2017): 203–4, which categorizes states as imposing "no barriers," "low barriers," "moderate barriers," or "high barriers"; Morris M. Kleiner et al., "Relaxing Occupational Licensing Requirements: Analyzing Wages and Prices for a Medical Service," *Journal of Law and Economics* 59, no. 2 (2016): 266–67, which classifies states on the basis of whether they granted NPs "limited prescription authority," "supervised or delegated prescription authority," or "independent prescription authority."

[47] Benjamin J. McMichael, "Healthcare Licensing and Liability," *Indiana Law Journal* 95, no. 3 (2020): 831n57.

[48] Benjamin J. McMichael and Sara Markowitz, "Toward a Uniform Classification of Nurse Practitioner Scope of Practice Laws," (National Bureau of Economic Research Working Paper No. 28192, NBER, Cambridge, MA, 2020), 24–29.

[49] See McMichael, "Healthcare Licensing and Liability," 828–34, 871–75, which discusses the importance of supervision laws and prescription authority; Ky. Exec. Order No. 2020-215 (March 31, 2020), https://kbn.ky.gov/Documents/Order%20_KBN_APRNs.pdf, which suspends statutes that "require that Advanced Practice Registered Nurses (APRNs) have collaborative agreements with physicians as a prerequisite for the prescribing of legend drugs and controlled substances."

I classify each state in each year analyzed as allowing NPs to practice independently or restricting the practices of NPs. A state allows "independent practice" if it (1) has no requirement that physicians supervise NPs and (2) grants NPs full prescription authority—that is, allows NPs to prescribe the same range of medications as physicians.[50] States that require physician supervision of NPs or restrict their prescription authority fall into the "restricted practice" category. When classifying states on the basis of physician supervision requirements, I treat statutes that require "collaboration" or "collaborative practice agreements" as the equivalent of statutes requiring "supervision." While "supervision" and "collaboration" may have slightly different connotations, their legal effect is the same in that they both prohibit NPs from providing care without physician oversight.[51]

Figure 1 provides an overview of NP SOP laws during the period covered by the dataset analyzed here—2005 through 2017. Twenty-four states restricted the practices of NPs. Of the remaining 26 states and the District of Columbia,[52] 11 allowed NPs to practice independently throughout the entire data period and 16 changed their laws to move from restricted practice to independent practice.[53] The 16 states that changed their laws are key because it is the variation in SOP laws that forms the basis of the empirical analysis detailed below. As indicated by the 16 states that have changed their laws, the trend in NP SOP laws

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[50] McMichael and Markowitz, "Toward a Uniform Classification," 29–33.

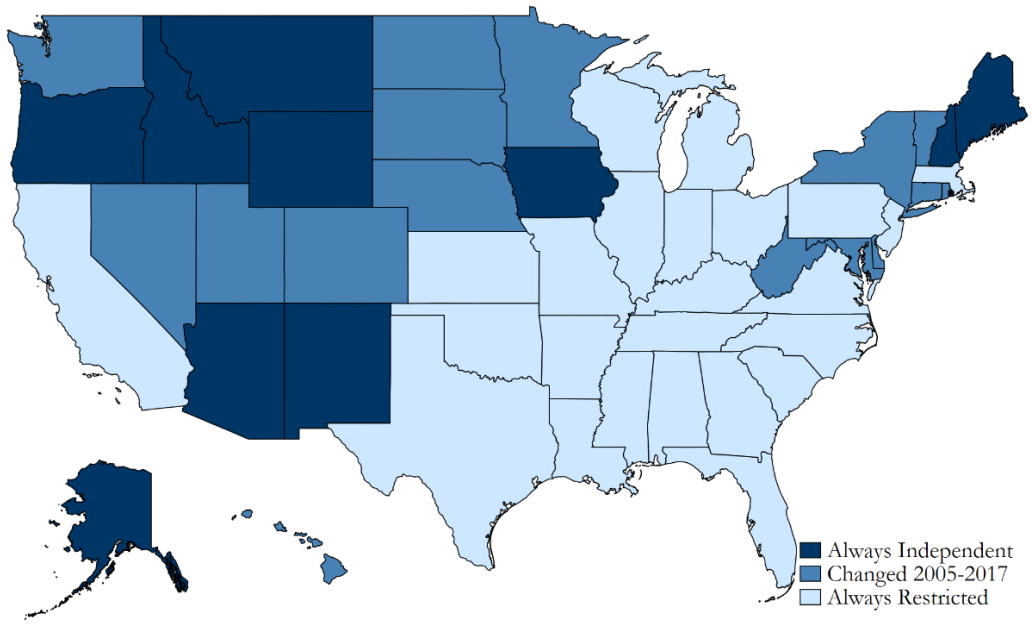
[51] McMichael and Markowitz, "Toward a Uniform Classification," 29–33.

[52] Here and throughout my analysis, I treat the District of Columbia as a state since it is a distinct jurisdiction that determines its own SOP laws separately from all other states.

[53] These states (with the year of the law change) include Washington (2005), Hawaii (2009), Colorado (2010), North Dakota (2011), Vermont (2011), Maryland (2012), Rhode Island (2012), Nevada (2013), Connecticut (2014), Minnesota (2015), New York (2015), Nebraska (2015), Delaware (2015), Utah (2016), West Virginia (2016), and South Dakota (2017). McMichael and Markowitz, "Toward a Uniform Classification," 29–33.

has been decidedly in favor of greater independence. This trend, however, has not continued unopposed, and opponents and proponents of restrictive SOP laws have vigorously pressed their arguments in state capitols across the country. The next part engages with these arguments.

Figure 1: Nurse Practitioner Scope-of-Practice Laws



Scope-of-Practice Arguments and Public Health Crises

The response of various states to the COVID-19 crisis clearly illustrates one of the primary arguments for relaxing SOP laws—increasing access to care. Proponents of liberalizing SOP laws have long made similar access-based arguments, noting that clinical and economic research has demonstrated the ability of independent NPs to increase access to care. The proponents have similarly emphasized evidence that relaxing SOP laws can lower the cost of care. On the other side of the debate, opponents of greater authority and autonomy for NPs have argued that restrictive SOP laws are necessary for the protection of patient safety.

Though opponents have long made general arguments to this effect, these arguments reached their zenith in the context of the opioid epidemic—a public health crisis that began in the healthcare system itself and has patient safety at its core. This part engages with both sides of the SOP law debate, using the COVID-19 pandemic and the opioid epidemic to provide context for the arguments proffered by each side.

COVID-19 and Access to Care

The COVID-19 pandemic began in the United States with the first diagnosed case in Washington on January 20, 2020.[54] The virus rapidly spread across the country, and the World Health Organization declared COVID-19 a global pandemic on March 11, 2020.[55] By the end of April, the number of cases in the United States had crossed the 1 million threshold, with nearly 60,000 of those cases resulting in deaths.[56]

The COVID-19 pandemic and its tragic consequences spurred a number of states to take action. Perhaps the most familiar actions taken by many states concerned orders to shelter in place or self-quarantine. But states also realized that critical shortages of healthcare providers could impede efforts to combat the pandemic and took action to increase access to care by eliminating restrictive SOP laws. For example, in addition to New

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[54] Melissa M. Arons et al., "Presymptomatic SARS-CoV-2 Infections and Transmission in a Skilled Nursing Facility," *New England Journal of Medicine* 382, no. 22 (2020).

[55] Megan L. Ranney, Valerie Griffeth, and Ashish K. Jha, "Critical Supply Shortages—The Need for Ventilators and Personal Protective Equipment during the Covid-19 Pandemic," *New England Journal of Medicine* 382, no. e41 (2020).

[56] Centers for Disease Control and Prevention, COVID Data Tracker, "United States COVID-19 Cases, Deaths, and Laboratory Testing (NAATs) by State, Territory, and Jurisdiction" (search for Cases in the U.S.), last visited April 28, 2020, https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html.

York's elimination of the requirement that NPs practice under physician supervision,[57] Wisconsin suspended the state regulation that requires NPs to "work in a collaborative relationship with a physician."[58] Similarly, Kentucky suspended statutes requiring "that [NPs] have collaborative agreements with physicians as a prerequisite for the prescribing of legend drugs and controlled substances."[59] Louisiana "suspended" all "collaborative practice agreements,"[60] and New Jersey suspended various "statutory provisions that may serve to limit the scope of practice of [NPs]," including a requirement that NPs have a collaborative agreement with a supervising physician.[61]

A robust literature of clinical and economic evidence supports the use of these orders as an effective means to increase access to care. Before the pandemic, states with less restrictive SOP laws "overall had more geographically accessible" NPs[62] because "restrictive licensing laws limit the growth in the supply of [NPs] who could deliver care in communities with relatively few practicing physicians."[63] Even with a fixed supply of NPs, relaxing restrictive SOP laws can increase access to care by "maximizing [the] capacity of the NP

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[57] N.Y. Exec. Order No. 202.10 (March 7, 2020), https://www.governor.ny.gov/news/no-20210-continuing-temporary-suspension-and-modification-laws-relating-disaster-emergency.

[58] Wis. Admin. Code N § 8.10. See Wis. Exec. Order No. 16 (March 27, 2020), https://content.govdelivery.com/attachments/WIGOV/2020/03/27/file_attachments/1413356/DSPS%20_%20Reduced.pdf, which suspends, inter alia, Wis. Admin. Code N § 8.10.

[59] Ky. Exec. Order No. 2020-215 (March 31, 2020).

[60] La. Exec. Order No. 38 JBE 2020 (March 31, 2020).

[61] N.J. Exec. Order No. 112 (April 1, 2020).

[62] John A. Graves et al., "Role of Geography and Nurse Practitioner Scope-of-Practice in Efforts to Expand Primary Care System Capacity: Health Reform and the Primary Care Workforce," *Medical Care* 54, no. 1 (2016): 82–84.

[63] McMichael, "Beyond Physicians," 765.

workforce," which can provide more healthcare services when not burdened by these laws.[64] A recent analysis from the Brookings Institution explained that this increase in capacity stems from "[a]chieving productivity gains" by allowing NPs to provide care within their training and education and allowing physicians to concentrate on providing more complex care.[65] The importance of relaxed SOP laws in increasing the capacity of the healthcare workforce was particularly apparent following Medicaid expansion. Among states that expanded Medicaid, all saw an increase in the use of emergency departments for primary care.[66] However, states that allowed NPs to practice independently saw a significantly smaller increase in emergency department usage because newly insured patients could more readily access healthcare services and obtain the care they needed from NPs.[67]

A recent economic analysis of SOP laws found that liberalization of these laws can meaningfully improve access to care along multiple dimensions. For example, granting NPs independence increases the frequency of routine checkups.[68] Patients are also more likely to obtain an appointment with a healthcare provider when they need one and to receive care when they are sick in states that allow NPs to practice independently.[69] Patients in these states similarly report they are more likely to have a usual source of healthcare than

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[64] Ying Xue et al., "Full Scope-of-Practice Regulation," 5.

[65] Adams and Markowitz, "Improving Efficiency in the Health-Care System," 5–6.

[66] Benjamin J. McMichael, Joanne Spetz, and Peter I. Buerhaus, "The Association of Nurse Practitioner Scope-of-Practice Laws with Emergency Department Use Evidence from Medicaid Expansion," *Medical Care* 57, no. 5 (2019): 362–68.

[67] McMichael, Spetz, and Buerhaus, "Emergency Department Use."

[68] Traczynski and Udalova, "Nurse Practitioner Independence," 97.

[69] Traczynski and Udalova, "Nurse Practitioner Independence," 97.

patients in states restricting the practices of NPs.[70] While some of these effects of NP independence are more germane to a public health emergency than others, the results of this thorough analysis demonstrate the basis for the various state executive orders. Allowing NPs to practice independently increases access to care.[71]

Relaxing SOP laws may increase access to care through various mechanisms, but one important mechanism is a reduction in the cost of care.[72] And multiple studies have found that NP independence reduces the cost of care. One study found that NP independence reduced the price of a common medical examination by between 3 and 16 percent.[73] Separate economic analyses concluded that granting NPs more autonomy could save $543 million and $101 million annually in emergency department visits and childbirth costs across the country, respectively.[74] Not every study has found strong evidence of reductions in the cost of care.[75] Two studies found that NPs may have higher prescribing rates and use

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[70] Traczynski and Udalova, "Nurse Practitioner Independence," 97.

[71] Traczynski and Udalova, "Nurse Practitioner Independence," 97.

[72] Traczynski and Udalova, "Nurse Practitioner Independence," 97. The article notes that "NP independence may increase" access to care by "reducing . . . costs."

[73] Kleiner et al., "Relaxing Occupational Licensing Requirements," 276.

[74] Traczynski and Udalova, "Nurse Practitioner Independence," 100; Markowitz et al., "Competitive Effects of Scope of Practice Restrictions," 211.

[75] See Medicare Payment Advisory Commission (MedPAC), *Report to the Congress: Medicare and the Health Care Delivery System* (June 2019) 149, which discusses evidence that the increased use of NPs may increase costs. But see Hangsheng Liu et al., "The Impact of Using Mid-level Providers in Face-to-Face Primary Care on Health Care Utilization," *Medical Care* 55 (2017): 14–17, which finds no evidence that NPs increase costs; Tomer Begaz et al., "Differences in Test Ordering between Nurse Practitioners and Attending Emergency Physicians When Acting as Provider in Triage," *American Journal of Emergency Medicine* 35, no. 10 (2017): 1427–29, which states the same findings.

of diagnostic services,[76] but later evidence has not supported these results.[77] A later and more thorough analysis by Federal Trade Commission (FTC) economists concluded that NP independence reduces costs and increases access to care.[78] Indeed, this and similar studies by the FTC have led that agency to routinely urge states to relax their SOP laws.[79]

Similarly, after reviewing the available evidence, the National Academy of Medicine concluded "that access to quality care can be greatly expanded by increasing the use of . . . [NPs] in primary, chronic, and transitional care.[80] Both the Obama and Trump administrations have touted the ability of NP independence to increase access to care. For example, an Obama administration report concluded that "easing scope of practice laws for [NPs and others] represents a viable means of increasing access to certain primary care services."[81] Despite these conclusions, many state governments restrict the practices of NPs—and even more of them restrict the practices of other advanced practice providers like physician assistants.[82] These decisions are often rooted in a desire to protect patient safety,

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[76] A. Hemani et al., "A Comparison of Resource Utilization in Nurse Practitioners and Physicians," *Effective Clinical Practice* 2, no. 6 (1999): 258; Danny R. Hughes, Miao Jiang, and Richard Duszak Jr., "A Comparison of Diagnostic Imaging Ordering Patterns between Advanced Practice Clinicians and Primary Care Physicians following Office-Based Evaluation and Management Visits," *JAMA Internal Medicine* 175, no. 1 (2017): 101.

[77] H. Liu et al., "The Impact of Using Mid-level Providers," 12; Begaz et al., "Differences in Test Ordering," 1426.

[78] Daniel J. Gilman and Tara Isa Koslov, "Policy Perspectives: Competition and the Regulation of Advanced Practice Nurses" (Federal Trade Commission, Washington, DC, March 2014), 1–4.

[79] See Gilman and Koslov, "Competition and the Regulation of Advanced Practice Nurses," 18, which notes the FTC's involvement on the side of relaxing SOP laws in Massachusetts, Connecticut, West Virginia, Louisiana, Kentucky, Texas, and Florida.

[80] Institute of Medicine, *The Future of Nursing*, 27.

[81] Department of the Treasury et al., "Occupational Licensing," 30–31. See also Department of Health and Human Services et al., *Reforming America's Healthcare System,* 31–36, which articulates the benefits of relaxed SOP laws.

[82] McMichael, "Healthcare Licensing and Liability," 55.

though lobbying efforts by groups that stand to benefit economically also play a role in states' decisions.

Opioids, Patient Safety, and Quality of Care

The protection of patient safety has served as a motivating factor in many of the statutes and regulations that govern the healthcare system,[83] and SOP laws have been no exception.[84] Proponents of restrictive SOP laws emphasize this aspect of the laws in urging states to maintain them. For example, the California Medical Association has stated that it "opposes any attempts to remove physician oversight over [NPs] and believes that doing so would put the health and safety of patients at risk."[85] Advocates of restrictive SOP laws often use this safety-based argument when responding to evidence that relaxing NP SOP laws will increase access to care. The California Medical Association continues its argument stating, "We must ensure that every American, regardless of age or economic status, has access to a trained physician who can provide the highest level of care. Expanding access to care should not come at the expense of patient safety and we will not support unequal standards of care."[86] In making these arguments, physician organizations often emphasize the difference in training completed by NPs relative to physicians. The Pennsylvania Medical Society has stated, for example,

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[83] See, e.g., Riegel v. Medtronic, Inc., 552 U.S. 312, 323 (2008), which explains that, under federal law, the Food and Drug Administration "may [approve a medical device] after it determines that a device offers a reasonable assurance of *safety* and effectiveness" (emphasis added).

[84] See Department of the Treasury et al., *Occupational Licensing*, 7, which states, "When designed and implemented appropriately, licensing can benefit practitioners and consumers through improving quality and protecting public health and safety."

[85] California Medical Association, "CMA Objects to Federal Scope Expansion."

[86] California Medical Association, "CMA Objects to Federal Scope Expansion."

that NP "education and training fails to provide an adequate clinical foundation for independent practice."[87] And the Texas Medical Association has argued that physicians must supervise NPs "[d]ue to the limited training and experience required in the abbreviated programs leading to licensure of [NPs] (as compared to the required education and training of licensed physicians)."[88]

Physician groups are correct that physicians complete more education and training than NPs and can provide a wider range of services. NPs do not, as one example, perform surgery. However, a difference in education by itself does not demonstrate that when providing services within their education and training, NPs require supervision or provide care of lower quality than physicians.[89] And advocates of greater NP autonomy have responded to this indirect argument that NPs provide lower-quality or unsafe services by pointing to studies that directly address the quality and safety issues.[90] For example, clinical investigations have found that NPs and physicians achieve similar results when providing primary care,[91]

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[87] Pennsylvania Medical Society, "Education and Training Matters," 1–2.

[88] Letter from Austin I. King Jr., to James W. Johnston.

[89] See Kim Curry, Laurie Anne Ferguson, and Sarah L. Livesay, "PAs and NPs Are Not Interchangeable," *Journal of the American Academy of Physician Assistants* 33, no. 5 (2020): 14, which states, "We have often heard physicians cite their more time-consuming educational programs as a rationale for prohibiting those following other educational paths from delivering many types of healthcare. Unfortunately for the people arguing this position, no studies have identified an ideal length of training for any particular type of patient care."

[90] Adams and Markowitz, "Improving Efficiency in the Health-Care System," 7–11; Buerhaus, "Nurse Practitioners: A Solution," 6–10; Miranda Laurant et al., "Nurses as Substitutes for Doctors in Primary Care," Cochrane Database of Systematic Reviews, 2018.

[91] Mary O. Mundinger et al., "Primary Care Outcomes in Patients Treated by Nurse Practitioners or Physicians: A Randomized Trial," *JAMA* 283 (2000): 59–68.

delivering critical care,[92] prescribing medications,[93] managing HIV,[94] and managing diabetes.[95] Large studies of various clinical outcomes have revealed similar evidence. One study of over 30 million patient visits found that NPs achieved outcomes equal to or better than physicians on nine separate quality metrics.[96]

Not every study has found that NPs provide care as good as that provided by physicians. For example, studies have found that physicians rely less on diagnostic tests,[97] make fewer specialist referrals,[98] and prescribe antibiotics more responsibly.[99] And recent reviews of various studies similarly highlighted studies that found that NPs may not always perform at the same level as physicians.[100] However, these studies are relatively few, and

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[92] Herman G. Kreeftenberg et al., "Impact of the Advanced Practice Provider in Adult Critical Care: A Systematic Review and Meta-Analysis," *Critical Care Medicine* 47, no. 5 (2019): 722. See also Ruth M. Leinpell et al., "Nurse Practitioners and Physician Assistants in Acute and Critical Care: A Concise Review of the Literature and Data 2008–2018," *Critical Care Medicine* 47, no. 10 (2019): 1447, which states, "A growing number of studies continue to demonstrate the impact of [NPs and physician assistants] in acute and critical care settings. . . . Collectively, these studies identify the value of [NPs and physician assistants] in patient care management, continuity of care, decreasing costs of care, decreasing resource use, improving quality and safety metrics, patient and staff satisfaction, and enhancing educational experiences of residents and fellows."

[93] Shiyin Jiao et al., "Quality of Prescribing by Physicians, Nurse Practitioners, and Physician Assistants in the United States," *Pharmacotherapy* 38, no. 4 (2018): 420–27.

[94] Ira B. Wilson et al., "Quality of HIV Care Provided by Nurse Practitioners, Physician Assistants, and Physicians," *Annals Internal Medicine* 143. no. 10 (2005): 729.

[95] Yihan Yang et al., "Nurse Practitioners, Physician Assistants and Physicians Are Comparable in Managing the First Five Years of Diabetes," *American Journal of Medicine* 131, no. 3 (2018): 276–83; George L. Jackson et al., "Intermediate Diabetes Outcomes in Patients Managed by Physicians, Nurse Practitioners, or Physician Assistants: A Cohort Study," *Annals of Internal Medicine* 169, no. 12 (2018): 825.

[96] Ellen T. Kurtzman and Burt S. Barnow, "A Comparison of Nurse Practitioners, Physician Assistants, and Primary Care Physicians' Patterns of Practice and Quality of Care in Health Centers," *Medical Care* 55, no. 6 (2017): 618–21. See also Miranda Laurant et al., "Nurses as Substitutes," 10–21, 69-83, which reviews evidence from multiple studies conducted in multiple countries.

[97] Hughes, Jiang, and Duszak, "A Comparison of Diagnostic Imaging Ordering Patterns."

[98] Yong-Fang Kuo et al., "Diabetes Mellitus Care Provided by Nurse Practitioners Vs Primary Care Physicians," *Journal of the American Geriatrics Society* 63, no. 10 (2015), 1983–87.

[99] Johanna E. Bellon, et al., "Comparing Advanced Practice Providers and Physicians as Providers of e-Visits," *Telemedicine and e-Health* 21, no. 12, (2015): 1022–26.

[100] See Sarzynski and Barry, "Current Evidence and Controversies," 367, which states, "Although perceptions of care quality may vary by profession, studies comparing outcomes between physicians and [NPs] offer

analyses by multiple national organizations,[101] federal agencies,[102] and presidential administrations have concluded that NPs can safely provide care and that restrictive SOP laws are generally not necessary to ensure patient safety.[103]

Unfortunately, many of these analyses reached their conclusions before the realization of the depth of the opioid epidemic. And physician groups have recently relied on this crisis in their arguments that granting NPs independence will endanger patient safety.[104] It is important to understand the opioid epidemic before delving into these arguments, however. Unlike the COVID-19 pandemic, which has unfolded along similar lines as previous public health crises stemming from infectious diseases, the origins and progression of the opioid epidemic have proved much more complicated.[105] Rather than arising from natural causes—

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mixed results"; Medicare Payment Advisory Commission (MedPAC), *Report to the Congress,* 149, which discusses some studies that have indicated problems with the increased use of NPs.

[101] See Buerhaus, "Nurse Practitioners: A Solution," 4, which states, "Increasingly, researchers, workforce analysts, and organizations that influence health policy support expanding the role of nurse practitioners (NPs) to fill the void left by the lack of primary care physicians and to improve the uneven geographic distribution of primary care. This report presents results from original research projects that support this view and document the evidence base for an expanded role for NPs in remedying these pressing and growing access problems"; Adams and Markowitz, "Improving Efficiency in the Health-Care System," 2, which states, "We discuss how moving to a fully authorized SOP for these providers can free up labor markets, allowing for a more-cost-effective and more-productive use of practitioners, while potentially fostering innovation and still protecting public health. A key outcome would be improved access to care as gains in productivity [increase] capacity in the health-care system."

[102] Gilman and Koslov, "Competition and the Regulation of Advanced Practice Nurses" 2, which notes that "FTC staff has consistently urged state legislators to avoid imposing restrictions on APRN scope of practice unless those restrictions are necessary to address well-founded patient safety concerns."

[103] Department of the Treasury et al., *Occupational Licensing*, 46–47, which urges states to relax SOP laws; Department of Health and Human Services et al., *Reforming America's Healthcare System,* 35, which states, "Extremely rigid collaborative practice agreements and other burdensome forms of physician . . . supervision are generally not justified by legitimate health and safety concerns."

[104] Letter from James L. Madara to Gavin Newsom; Dickson, "Expanded Scope"; Schirle and McCabe, "State Variation in Opioid and Benzodiazepine Prescriptions," 86–87; Myers and Alliman, "Updates on the Quest for Full Practice Authority," 561.

[105] See generally Elissa Philip Gentry and Benjamin J. McMichael, "Contaminated Relationships in the Opioid Crisis," *Hastings Law Journal* 72, no. 3 (2021), which discusses the development of the opioid crisis.

like the naturally occurring virus that ignited the COVID-19 pandemic—the opioid epidemic arose within the healthcare system itself.[106] It thus provides a useful context in which to test whether relaxing SOP laws endangers patient safety as physician groups have claimed.

Until the COVID-19 pandemic, the opioid epidemic was considered the most significant public health crisis of this generation.[107] Competing narratives of the opioid crisis have arisen in recent years. On one hand, one report to the president has stated that the opioid epidemic "started in doctor[s'] offices and hospitals."[108] The White House Commission that recommended the opioid epidemic be declared a national emergency similarly acknowledged that the "enormous problem" of opioid overuse "is often not beginning on street corners"; instead, "it is starting in doctor's offices and hospitals in every state in our nation."[109] The opioid epidemic began in earnest around 2000, and by 2015 the number of opioid prescriptions had quadrupled,[110] creating "the worst drug crisis in American history."[111]

On the other hand, research from the Substance Abuse and Mental Health Services Administration suggests that the opioid crisis is primarily one of illicit opioids, such as heroin.[112] And clinicians have challenged the prevailing understanding of the opioid

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[106] Gentry and McMichael, "Contaminated Relationships."

[107] Bonnie, Ford, and Phillips, "Pain Management and the Opioid Epidemic," states, "Not since the HIV/AIDS epidemic has the United States faced as devastating and lethal a health problem as the current crisis of opioid misuse and overdose and opioid use disorder."

[108] White House Commission on Combating Drug Addiction and the Opioid Crisis, Interim Report, July 31, 2017, https://trumpwhitehouse.archives.gov/sites/whitehouse.gov/files/ondcp/commission-interim-report.pdf.

[109] White House Commission on Combating Drug Addiction and the Opioid Crisis, *Interim Report*.

[110] Rose Rudd et al., "Increases in Drug and Opioid Overdose Deaths—United States, 2000–2014," *American Journal of Transplantation* 16, no. 4 (2016): 1326.

[111] *New York Times*, "Inside a Killer Drug Epidemic: A Look at America's Opioid Crisis," January 6, 2017, https://www.nytimes.com/2017/01/06/us/opioid-crisis-epidemic.html?mcubz=1.

[112] Substance Abuse and Mental Health Services Administration (SAMHSA), "The National Survey on Drug Use and Health: 2019" (Presentation by Elinore F. McCance-Katz, assistant secretary for mental health and

epidemic from government sources, such as those described earlier, countering that these sources have misconstrued and obfuscated the origins of the opioid epidemic. Instead of starting in doctors' offices and hospitals, some clinicians have argued that the opioid epidemic is primarily a creature of illicit drug use and not overprescription of legal opioids.[113]

Importantly, distinguishing between these narratives is not the goal of this paper. Instead, it uses the existing opioid epidemic only as a relevant context in which to evaluate the claims made by physician groups that NP independence will somehow worsen the opioid epidemic. The origins and continued progression of this epidemic are critically important to understand, and future work focused more narrowly on the opioid epidemic itself (as opposed to using it as a relevant context) should thoroughly investigate both narratives, particularly because the evidence used to support the typical explanation of the opioid crisis has been called into question.[114] For NP independence, however, it is sufficient to understand how the opioid crisis has progressed to evaluate physician groups' claims that the epidemic worsens following grants of independence to NPs.

Since the beginning of the crisis, the opioid epidemic has unfolded in three separate waves. Figure 2, developed by the Centers for Disease Control and Prevention (CDC),

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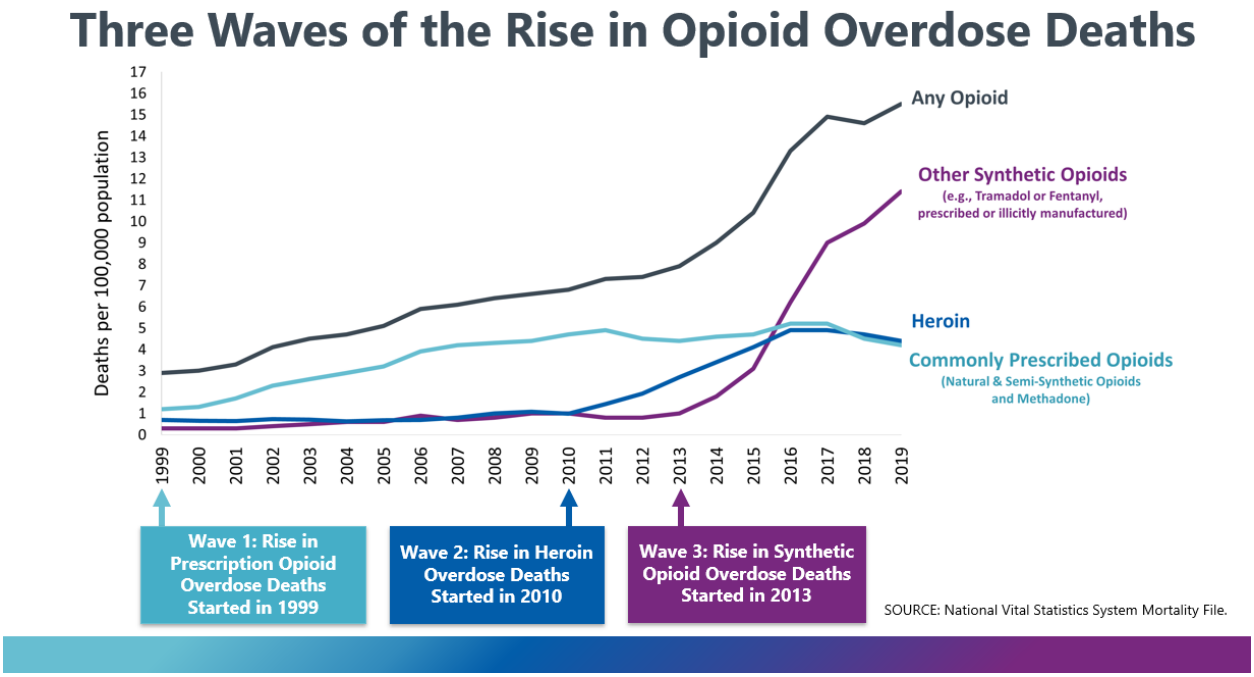
substance use, September 2020), https://www.samhsa.gov/data/sites/default/files/reports/rpt29392/Assistant-Secretary-nsduh2019_presentation/Assistant-Secretary-nsduh2019_presentation.pdf, provides evidence that misuse of illicit drugs is more common than misuse of prescription opioids.

[113] See John F. Peppin and John J. Coleman, "CDC's Efforts to Quantify Prescription Opioid Overdose Deaths Fall Short," *Pain and Therapy* 10, no. 1 (2021), 28–38, which challenges the prevailing governmental narrative on the opioid epidemic as one rooted in prescription opioids.

[114] Peppin and Coleman, "CDC's Efforts Fall Short."

illustrates the development of these three waves.[115] The first wave began around 2000 as deaths involving commonly prescribed opioids sharply increased.[116] In 2010, prescription opioid deaths remained high, but the second wave of the epidemic began with an explosive increase in deaths involving illegal opioids like heroin.[117] The third wave began around 2013 as deaths involving synthetic opioids, like fentanyl, began to increase exponentially.[118]

Figure 2: The Development of the Opioid Epidemic



Source: "Understanding the Epidemic," CDC website, accessed August 3, 2021, https://www.cdc.gov/drugoverdose/epidemic/index.html.

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[115] It is important to note that the data used by the CDC to create this figure have been questioned by clinicians. Specifically, clinicians have highlighted issues with double counting certain deaths and with an inability to separate deaths involving multiple causes into appropriate opioid-related categories. See, for example, Michael E. Schatman and Stephen J. Ziegler, "Pain Management, Prescription Opioid Mortality, and the CDC: Is the Devil in the Data?," *Journal of Pain Research* 10 (2017): 2489–95. No administrative dataset is perfect, but it is still useful to understand how official sources characterize public health crises.

[116] "Understanding the Epidemic," Centers for Disease Control and Prevention (CDC website), accessed March 17, 2021, https://www.cdc.gov/drugoverdose/epidemic/index.html.

[117] "Understanding the Epidemic," CDC.

[118] "Understanding the Epidemic," CDC.

Physician groups opposed to NP independence have used this crisis as an important illustration of their argument that NPs should not be allowed to practice without physician supervision. The reasoning offered by these groups is simple. If NPs could prescribe opioids without physician supervision, then they would inappropriately overprescribe opioids and deepen the ongoing opioid epidemic.[119] Given the severity of the opioid epidemic, these arguments have attracted the attention of state legislators keen to avoid exacerbating an already debilitating crisis. Unfortunately, existing empirical evidence on the critically important claim that relaxing SOP laws will deepen the opioid crisis is scant, and the evidence that does exist is conflicting.

One early study found evidence that relaxing NP SOP laws reduces the number of opioid prescriptions by between 9.8 and 15 percent.[120] A more recent study that evaluated nearly the universe of opioid prescriptions between 2011 and 2018 concluded that relaxing NP SOP laws reduces opioid prescriptions by 4.4 percent.[121] However, these results contrast with a third study that found evidence that relaxing NP SOP laws increases opioid prescriptions by about 5 percent.[122] Two studies focused on opioid prescriptions written by

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[119] Dickson, "Expanded Scope"; Schirle and McCabe, "State Variation in Opioid and Benzodiazepine Prescriptions," 86–87; Myers and Alliman, "Updates on the Quest for Full Practice Authority," 561.

[120] Morris Hamilton III, "Three Essays in Health Economics" (unpublished Ph.D. dissertation, University of Michigan, 2017, on file with the University of Michigan Library).

[121] McMichael, "Occupational Licensing and the Opioid Crisis," 32.

[122] Diane Alexander and Molly Schnell, "Just What the Nurse Practitioner Ordered: Independent Prescriptive Authority and Population Mental Health," *Journal of Health Economics* 66 (2019): 159. See also Ulrike Muench et al., "Opioid-Prescribing Outcomes of Medicare Beneficiaries Managed by Nurse Practitioners and Physicians," *Medical Care* 57, no. 6 (2019): 482; Anca M. Grecu and Lee C. Spector, "Nurse Practitioner's Independent Prescriptive Authority and Opioids Abuse," *Health Economics* 28, no. 10 (2019): 1220, which finds that relaxing NP SOP laws was "associated with an increase in treatment admissions for opioid misuse and a decrease in opioid related mortality only when Mandatory Prescription Drugs Monitoring Programs are in place."

NPs but did not consider the impact of SOP laws on these prescriptions. The first of these considered opioids prescribed to Medicare beneficiaries. The study found that NPs were less likely to prescribe opioids to beneficiaries but were more likely to prescribe a higher dose than physicians.[123] The second study examined 20 percent of Medicare enrollees and found that "NPs/PAs practicing in states with independent prescription authority were [more than] 20 times more likely to overprescribe opioids than NPs/PAs in prescription-restricted states."[124] Because this study considered only a single year of data, it could not account for the effect of different SOP laws on NPs and was limited to examining associations between these laws and prescribing patterns at a snapshot in time.[125] It also suffers from other severe methodological flaws. With only one year of data, the study could not isolate the effect of myriad other factors that influence opioid prescribing. Any association observed in a single year of data, without further analysis, provides little, if any, information. The study failed to account, in any meaningful way, for endogeneity bias that is the focus of well-executed observational studies.[126] The study's analysis also failed to account for the specialty of the providers under consideration,[127] which is highly

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[123] Muench et al., "Opioid-Prescribing Outcomes of Medicare Beneficiaries," 482.

[124] M. James Lozada et al., "Opioid Prescribing by Primary Care Providers: A Cross-Sectional Analysis of Nurse Practitioner, Physician Assistant, and Physician Prescribing Patterns," *Journal of General Internal Medicine* 35, no. 9 (2020): 2584.

[125] Lozada et al., "Opioid Prescribing," 2590, reports, "Limitations include analysis of only 2015 Medicare claims data, a time near the peak of opioid prescribing in the USA."

[126] One way to address the threat of endogeneity bias is to use multiple years of data and examine changes in trends of the relevant outcome variable in states that did and did not adopt the relevant law. That is the approach used here. Failing to account for endogeneity bias is often fatal for studies. Because the Lozada et al. study did not do so, its results are, at best, unreliable and, at worst, actively misleading.

[127] There are multiple methods for accounting for the role of specialty in opioid prescribing. One is to simply separate providers by specialty, assuming accurate specialty information is available. If the goal is to obtain a general estimate of the effect of a law across providers of multiple specialties, then including provider-level

problematic because providers in different specialties prescribe opioids differently.[128] These salient problems render the study's results unreliable at best.

Only one study has systematically evaluated outcomes beyond opioid prescriptions. It concluded that relaxing NP SOP laws was "associated with an increase in treatment admissions for opioid misuse and a decrease in opioid related mortality only when Mandatory Prescription Drugs Monitoring Programs are in place."[129] However, that study was limited to state-level data and did not evaluate different types of opioid-related deaths separately—for example, it did not evaluate deaths involving a prescription opioid separately from deaths involving an illegal opioid.

Overall, the existing evidence on the role of NP SOP laws in the opioid epidemic is mixed. Given the importance of understanding this role generally as well as the fact that states may be relying on a misunderstanding of this role to maintain restrictive SOP laws, it is critically important to better understand the effect of NP independence on the opioid epidemic. If NP independence does, in fact, worsen the opioid epidemic, then physician groups may be right to oppose relaxing SOP laws. On the other hand, if NP independence has no effect on or improves opioid-related outcomes, then states should be more willing to expand on their emergency orders in connection with the COVID-19 pandemic and to grant

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fixed effects in the relevant models is a preferred strategy. See McMichael, "Occupational Licensing and the Opioid Crisis," which includes provider-level fixed effects in a series of empirical models.

[128] The study made some attempts to identify primary care providers. In doing so, however, it ignored the admonition of MedPAC that NP specialty coding is not currently sufficient to unambiguously discern the practice area of individual NPs. MedPAC, *Report to the Congress*, 162–64.

[129] Grecu and Spector, "Nurse Practitioner's Independent Prescriptive Authority," 1220.

NPs independence in the long term. The next part provides an empirical analysis geared toward resolving this important dispute.

Empirical Analysis

To examine the effect on the opioid epidemic of allowing NPs to practice independently, I conduct an empirical analysis of opioid-related deaths. Prior work has focused on opioid prescriptions, and the analysis here extends that work by examining the outcome that has defined the opioid epidemic as a public health crisis—deaths. To be sure, opioid prescriptions are important, and these prescriptions have been recognized as igniting the opioid crisis. However, the opioid epidemic gained the "crisis" moniker through the number of deaths it has caused. By focusing on opioid-related deaths, the following analysis provides new important evidence. This part begins by distilling the evidence on the opioid crisis and various arguments about the effect of relaxing SOP laws on the crisis into testable hypotheses. It then outlines the dataset and empirical methodology used to test those hypotheses before reporting the results of the analysis.

Testing Competing Hypotheses

Distilling the available evidence and arguments on NP independence and the opioid crisis into testable hypotheses first requires considering the effect of this independence on healthcare delivery and the healthcare system generally. Granting NPs more autonomy may affect the healthcare system in many (potentially interacting) ways, but overall, more autonomy means NPs will treat more patients. This increase in patients treated may occur via two separate mechanisms. First, the "substitution effect" describes the substitution of NPs for physicians as patients' healthcare providers once the former can practice

independently.[130] Once granted independence, NPs can better meet patients' demand for care, and the supply of NPs overall will increase.[131] This mechanism may result in some patients switching from physician-supplied care to NP-supplied care. Second, the "access effect" describes the greater ability of individuals to access care when NPs can practice independently.[132] A larger supply of NPs who can provide more services may facilitate patients' ability to access NP-supplied care.[133] Relatedly, physician-supplied care may also be easier to access because some patients who previously obtained care from physicians may switch to NPs, freeing up capacity among the physician workforce for new patients.

Combined, these two effects mean that NPs will treat more patients following a grant of independence. Whether that translates into a deepening of the opioid crisis depends on which group is correct about NPs and the need for supervision. If proponents of restrictive SOP laws are correct, then an increase in the number of patients treated by NPs will translate into more opioid-related deaths. Groups in favor of restrictive laws argue that NPs will inappropriately overprescribe opioids without physician supervision.[134] Overprescription of opioids should lead to more deaths involving prescription opioids and may lead to more deaths involving illegal or synthetic opioids as patients who initially become addicted to prescription opioids progress to these other types and die as a result.[135]

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[130] See Hamilton, "Three Essays in Health Economics," which defines the substitution effect.

[131] McMichael, "Beyond Physicians," 744–55; Gilman and Koslov, "Competition and the Regulation of Advanced Practice Nurses," 20–35.

[132] See Hamilton, "Three Essays in Health Economics," which discusses the access effect.

[133] Gilman and Koslov, "Competition and the Regulation of Advanced Practice Nurses," 20–35.

[134] See note 17 and accompanying text.

[135] Moreover, these types of deaths may increase if NPs inappropriately discontinue prescription opioids without physician supervision, causing those already addicted to seek opioids from other sources.

On the other hand, if those in favor of relaxing SOP laws are correct, then opioid-related deaths will remain steady or decrease when NPs treat more patients. Studies in various medical contexts have found evidence that NPs choose fewer and less intensive treatments than physicians with equal or better patient outcomes.[136] In the context of opioids, this means that NPs should prescribe fewer opioids than physicians.[137] With fewer opioids prescribed, the number of deaths involving prescription opioids should not increase and may decline. Similarly, fewer patients becoming addicted to prescription opioids may mean that fewer individuals become addicted to illegal or synthetic opioids, decreasing opioid-related deaths generally. Additionally, with the increased capacity of the healthcare system following NP independence, those addicted to opioids may be better able to access treatment for this dependence.[138] And this treatment may avert some deaths that otherwise would have occurred.

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[136] See Jennifer Perloff, Catherine M. DesRoches, and Peter Buerhaus, "Comparing the Cost of Care Provided to Medicare Beneficiaries Assigned to Primary Care Nurse Practitioners and Physicians," *Health Services Research* 51, no. 4 (2016): 1407, 1412–20, which finds that payments for outpatient patients cared for by NPs were 29 percent less than those for patients cared for by physicians and that payments for inpatient patients cared for by NPs were 18 percent less; Kimberly Groover, "Effects of Occupational Licensing for Nurse Practitioners on Prescription Use and Quality" (working paper, October 26, 2018), 1 https://drive.google.com/file/d/1ThQr4daEvmKyZwkytopcHekz7VnDZGvX/view. Groover notes, "I find that expanded prescriptive authority for nurse practitioners reduces the number of prescriptions filled per year by 8% and the number of unique medications received by 9%." See also Markowitz et al., "Improving Efficiency in the Health-Care System," 209–14, which finds that relaxing the SOP laws governing certified nurse midwives reduces the use of caesarean sections with no change in health outcomes.

[137] Hamilton, "Three Essays in Health Economics"; McMichael, "Occupational Licensing and the Opioid Crisis," 32–39. But see Alexander and Schnell, "Independent Prescriptive Authority and Population Mental Health," 153–55, which finds that NP independence may increase opioid prescriptions.

[138] See Joanne Spetz et al., "Nurse Practitioner and Physician Assistant Waivers to Prescribe Buprenorphine and State Scope of Practice Restrictions," *JAMA* 321, no. 14 (2019): 1408, which notes, "The results of this study suggest that states in which NP practice is restricted may be less able to expand the opioid treatment workforce"; Barnett, Lee, and Frank, "In Rural Areas, Buprenorphine Waiver Adoption since 2017 Driven by Nurse Practitioners and Physician Assistants," 2050.

In general, the overall change in opioid-related deaths depends on whether advocates of restrictive SOP laws or those in favor of relaxing these laws are correct about the various aspects of healthcare delivery affected by NP independence. The next section details the data and empirical methodology used to determine whether proponents or opponents of NP independence are correct in their assertions about the effect of NP independence on patient safety and opioid-related deaths.

Data and Empirical Methodology

The dataset analyzed here comes from the United States' National Vital Statistics System, which is maintained by the National Center for Health Statistics (NCHS) and CDC. Because the opioid epidemic has unfolded very differently in different parts of the country—indeed, it has unfolded differently in different counties within the same state—I obtained permission from the NCHS to examine the restricted-use mortality files.[139] These files contain detailed information on all deaths occurring in the United States between 2005 and 2017 at the county level.[140] Thus, I can examine the role of NP independence in opioid-related deaths in specific geographic areas. Each observation represents an individual death, and information on that death appearing in the dataset comes directly from the certificate of death issued by the relevant state.

Included among the information available for each death are the decedent's year of death, state and county of death, and cause of death as indexed by the International Classification of Diseases (Tenth Revision) (ICD-10) codes. The ICD-10 coding system

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[139] Documentation to this effect is on file with the author.

[140] At the time I submitted the data request, 2017 was the most recently available year of data.

provides a standardized method for categorizing causes of death and offers a comprehensive scheme to isolate specific causes of death. Using this system and guidance from the CDC,[141] I isolate all deaths associated with opioid overdoses.[142] In addition to a general opioid-related category for deaths, I also isolate all deaths associated with prescription opioids,[143] illegal opioids,[144] and synthetic opioids.[145] Doing so allows me to separately analyze the class of opioids associated with each of the three waves of the opioid epidemic as identified by the CDC.[146]

With these different categories of opioid-related deaths isolated from all other deaths, I construct counts of opioid-related deaths for each county and year in the dataset. I then match this dataset of county-level counts of opioid-related deaths to information derived from the Area Health Resources Files (AHRFs).[147] The AHRFs are compiled by the Health Resources and Services Administration and contain demographic and health information at

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[141] See CDC, "Prescription Drug Overdose Data & Statistics: Guide to ICD-9-CM and ICD-10 Codes Related to Poisoning and Pain" (prepared for "From Epi to Policy: Prescription Drug Overdose," State Health Department Training and Technical Assistance Meeting, 2013), https://www.cdc.gov/drugoverdose/pdf/pdo_guide_to_icd-9-cm_and_icd-10_codes-a.pdf.

[142] The following ICD-10 codes are associated with fatal opioid overdoses: T40.0 (opium), T40.1 (heroin), T40.2 (other opioids), T40.3 (methadone), T40.4 (other synthetic narcotics), and T40.6 (other/unspecified narcotics). CDC, "Guide to ICD-9-CM and ICD-10 Codes Related to Poisoning and Pain."

[143] ICD-10 codes for prescription opioid overdoses include T40.2 (other opioids), T40.3 (methadone), T40.4 (other synthetic narcotics). CDC, "Guide to ICD-9-CM and ICD-10 Codes Related to Poisoning and Pain."

[144] ICD-10 codes for illegal opioid overdoses include T40.0 (opium) and T40.1 (heroin). CDC, "Guide to ICD-9-CM and ICD-10 Codes Related to Poisoning and Pain."

[145] The ICD-10 code T40.4 identifies deaths involving synthetic opioids. CDC, "Guide to ICD-9-CM and ICD-10 Codes Related to Poisoning and Pain."

[146] See figure 2 and accompanying text. The categories of deaths described here are not mutually exclusive. A death may involve multiple types of opioids—e.g., heroin and synthetic opioids—and I count fatalities involving a specific type of opioid in each relevant category described earlier.

[147] Area Health Resources Files (AHRF), Health Resources and Services Administration (HRSA), last visited April 1, 2020, https://data.hrsa.gov/topics/health-workforce/ahrf.

the county level.[148] Using the AHRFs, I add the following information to the dataset of opioid-related deaths: county population, number of hospitals, median income, unemployment rate, and rural status.

Using this combined dataset, I construct the following measures of opioid-related deaths: opioid-related deaths per 100,000 county residents, prescription-opioid-related deaths per 100,000 county residents, illegal-opioid-related deaths per 100,000 county residents, and synthetic-opioid-related deaths per 100,000 county residents. These four measures are the primary outcomes of interest throughout my empirical analysis. The first corresponds to the opioid epidemic generally and captures all opioid-related deaths that have been reported to the CDC. The other three outcomes correspond to the three separate waves of the opioid crisis.[149] I use the remaining information from the AHRFs to construct a series of control variables for use in my empirical analysis.

That analysis consists of a series of difference-in-differences regression models. These econometric models can isolate the causal impact of NP SOP laws on opioid-related deaths from other factors that may influence these deaths. In an ideal world, I would conduct a laboratory-like experiment in which some providers were randomly assigned to practice under NP independence and some providers were assigned to a restricted practice regime. While this approach would facilitate a straightforward analysis, randomly assigning providers to different SOP laws is not possible for a variety of ethical, legal, logistical, and financial reasons. I cannot conduct a laboratory experiment, but the goal of my empirical

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[148] Area Health Resources Files, HRSA.

[149] See the section "Opioids, Patient Safety, and Quality of Care," in this paper.

analysis is to closely mimic such an experiment by eliminating as many potential confounding factors as possible to isolate the effect of NP SOP laws. Prior work has shown that difference-in-differences models can accomplish this goal.[150]

Difference-in-differences models rely on state variation in the adoption of NP independence to estimate the impact of these laws on opioid-related deaths. Instead of simply comparing states with NP independence to those with restricted practice or comparing states before and after the adoption of NP independence, difference-in-differences models compare trends in opioid-related deaths in states adopting NP independence to trends in states that did not. This allows the models to account for how death rates would have trended over time as a result of many other factors and thereby isolate the role of NP independence from those other factors. Thus, these models effectively use the states that did not adopt NP independence as a control group to provide a valid counterfactual of what would have happened in the states that did adopt NP independence if they had continued to restrict the practices of NPs. In doing so, these models effectively "net out" the effect of unobservable factors that may influence opioid-related deaths.[151] Thus, the models can estimate the causal effect of NP SOP laws on opioid-related deaths.

More technically, the difference-in-differences models I estimate are a specific type of regression model and take a specific form to effectively net out the effects of other

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[150] See Marianne Bertrand, Esther Duflo, and Sendhil Mullainathan, "How Much Should We Trust Difference-in-Differences Estimates?," *Quarterly Journal of Economics* 119, no. 1 (2004): 249–52, which discusses the conditions under which difference-in-differences models can provide reliable estimates of causality.

[151] Michael D. Frakes, "The Surprising Relevance of Medical Malpractice Law," 82 *University of Chicago Law Review.* 82, no. 1 (2015): 365, which discusses difference-in-differences models.

confounding factors.[152] The dependent variable in these models is one of the four measures of opioid-related deaths.[153] The independent variable of interest is an indicator variable for whether NPs are allowed to practice independently in a given county and year. The coefficient on this indicator variable represents the causal effect of NP independence on the relevant measure of opioid-related deaths.

In addition to the independent variable of interest, each model includes several control variables. Prior work has demonstrated that local economic conditions can impact substance abuse disorder,[154] so I include control variables for the county-level median household income and unemployment rate.[155] I also control for the number of hospitals in each county to account for differential access to acute care.[156] In addition to controlling for

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[152] Throughout the analysis, I estimate ordinary least squares regression models with the following general specification:
$Y_{cst} = \beta(NP\ Independence_{st}) + x_{cst} + \delta_c + \tau_t + \varepsilon_{cst}$. In this model, *c* indexes counties, *s* indexes states, and *t* indexes time as measured in years. The dependent variable, Y, is one of the four outcome variables for opioid-related deaths described in this section. The variable, *NP Independence*, is an indicator variable that equals one in counties located in states that allowed NPs to practice independently. The vector x_{cst} includes control variables described in the text. The vectors δ_c and τ_t include county and year fixed effects.

[153] All four measures of opioid-related deaths exhibit substantial right skews. It is standard practice in the literature to take the natural logarithm of a variable and transform it from a skewed distribution to a more normal distribution. Frakes, "The Surprising Relevance of Medical Malpractice Law," 368; John Shahar Dillbary, Griffin Edwards, and Fredrick E. Vars, "Why Exempting Negligent Doctors May Reduce Suicide: An Empirical Analysis," *Indiana Law Journal* 93, no. 2 (2018): 481; Benjamin J. McMichael, R. Lawrence Van Horn, and W. Kip Viscusi, "Sorry Is Never Enough: How State Apology Laws Fail to Reduce Medical Malpractice Liability Risk," *Stanford Law Review* 71, no. 2 (2019): 375n155. I follow that practice here. I also follow the practice of adding one to each variable prior to applying the natural logarithmic transformation. This is necessary because the natural logarithm is undefined at zero, and it is also standard practice in the literature. Joni Hersch and W. Kip Viscusi, "Punitive Damages: How Judges and Juries Perform," *Journal of Legal Studies* 33 (2004): 14n14.

[154] See, e.g., Christopher S. Carpenter, Chandler B. McClellan, and Daniel I. Rees, "Economic Conditions, Illicit Drug Use, and Substance Abuse Disorders in the United States," *Journal of Health Economics* 52 (2107): 68–73, which finds that local economic conditions affect drug abuse; Alex Hollingsworth, Christopher J. Ruhm, and Kosali Simon, "Macroeconomic Conditions and Opioid Abuse," *Journal of Health Economics* 56 (2017): 225–33, which has the same findings.

[155] Both of these variables are derived from information in the AHRFs.

[156] I transform this variable to the logarithm of the number of hospitals per capita.

economic and healthcare conditions, I also include several variables to control for different legal regimes that may affect opioid-related deaths. For example, prior work has found that cannabis access laws,[157] prescription drug monitoring programs,[158] and pain clinic legislation[159] can affect the opioid crisis in various ways. I include a series of indicator variables for whether a county is located in a state that allows access to medical cannabis, allows access to recreational cannabis, maintains a "must-access" prescription drug monitoring program, and has enacted pain clinic legislation.[160] I also include an indicator variable for whether a state has expanded Medicaid because access to insurance may influence opioid-related deaths.[161]

In addition to these variables of interest and control variables, every model includes a full set of indicator variables for individual counties and years. The county variables control for observed and unobserved characteristics of individual counties. Counties may differ in their health outcomes for many reasons other than SOP laws, and including those

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[157] Benjamin J. McMichael, R. Lawrence Van Horn, and W. Kip Viscusi, "The Impact of Cannabis Access Laws on Opioid Prescribing," *Journal of Health Economics* 69 (2020): 1, which states that "we find that recreational and medical cannabis access laws reduce the number of morphine milligram equivalents prescribed each year by 11.8 and 4.2 percent"; Hefei Wen and Jason M. Hockenberry, "Association of Medical and Adult-Use Marijuana Laws with Opioid Prescribing for Medicaid Enrollees," *JAMA Internal Medicine* 178, no. 5 (2018): 675–78, which finds that medical and recreational cannabis access laws reduce opioid prescriptions among Medicaid beneficiaries.

[158] Thomas C. Buchmueller and Colleen Carey, "The Effect of Prescription Drug Monitoring Programs on Opioid Utilization in Medicare," *American Economic Journal: Economic Policy* 10, no. 1 (2018): 109, which states, "we do find evidence that 'must access' [prescription drug monitoring programs] have the desired effect of curbing certain types of extreme [opioid] utilization."

[159] See Buchmueller and Carey, "The Effect of Prescription Drug Monitoring Programs," 102, which discusses pain clinic legislation.

[160] These variables are defined exactly the same as in McMichael, Van Horn, and Viscusi, "The Impact of Cannabis Access Laws," 8. Each takes the value one in a state and year that had the relevant law in place.

[161] This variable is also defined the same as in previous work (McMichael, Van Horn, and Viscusi, "The Impact of Cannabis Access Laws).

indicator variables allows the models to net out those other factors. Year fixed effects control for any linear or nonlinear trends in health outcomes over time. The county and year variables absorb much of the idiosyncratic variation present in opioid-related deaths and therefore allow the models to isolate the role of NP SOP laws. The inclusion of these county and year variables obviates the need for many other control variables.[162]

My primary analysis relies on the econometric models described here. I conduct a secondary analysis designed to estimate the impact of NP independence in rural areas that have less access to healthcare because prior work has demonstrated that NPs are particularly important to these underserved areas.[163] To do so, I rely on information in the AHRFs that identifies rural and urban counties, and this secondary analysis is described in more detail following the primary analysis. Following that secondary analysis, I discuss several sensitivity analyses designed to probe the robustness of the primary results.

Results and Discussion

This section begins by presenting the primary results before turning to the secondary analysis. In the interest of clarity and succinctness, all results from individual regression models are presented in graphical form.[164] Each graph reports the effect of NP independence in terms of the percentage change in the relevant measure of opioid-related deaths.[165]

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[162] Throughout the analysis, I calculate standard errors clustered at the county level to correct for serial autocorrelation.

[163] Buerhaus et al., "Practice Characteristics," 144–50, which finds that NPs are more likely to care for Medicaid patients, vulnerable populations, and rural populations.

[164] An appendix follows the main text and reports full regression results for all results reported in graphical form.

[165] Because all models are log-linear models, the coefficients can be interpreted as the percent change in the dependent variable that results from allowing NPs to practice independently. The marginal effect of an indicator variable with coefficient β is approximately $((\exp(\beta) - 1)(100))$ percent. See generally Robert

Relaxing scope-of-practice laws. Figure 3 reports the results from four separate regression models—one each for deaths involving any opioids, deaths involving prescription opioids, deaths involving illegal opioids, and deaths involving synthetic opioids. Each bar represents the percentage change in the indicated outcome caused by NP independence.[166] For example, the first bar indicates that allowing NPs to practice independently reduces all opioid-related deaths by approximately 9.3 percent. In 2018, the CDC calculated that the opioid-related death rate in the United States was 20.7 per 100,000 people.[167] Combined with the results from figure 3, this suggests that allowing NPs to practice independently could avert approximately 2 deaths for every 100,000 people. In a state of 10 million people, this would translate into approximately 200 lives saved each year.

Figure 3 reports similar evidence for the types of opioid-related deaths that have driven each of the separate phases of the opioid crisis. NP independence reduces prescription-opioid-related deaths by approximately 7.6 percent, illegal-opioid-related deaths by approximately 5.5 percent, and synthetic-opioid-related deaths by approximately 10.7 percent. In general, none of the evidence reported in figure 3 supports the contentions that allowing NPs to practice independently endangers patient safety or exacerbates the opioid crisis. Instead, the evidence consistently demonstrates that granting NPs independence has statistically

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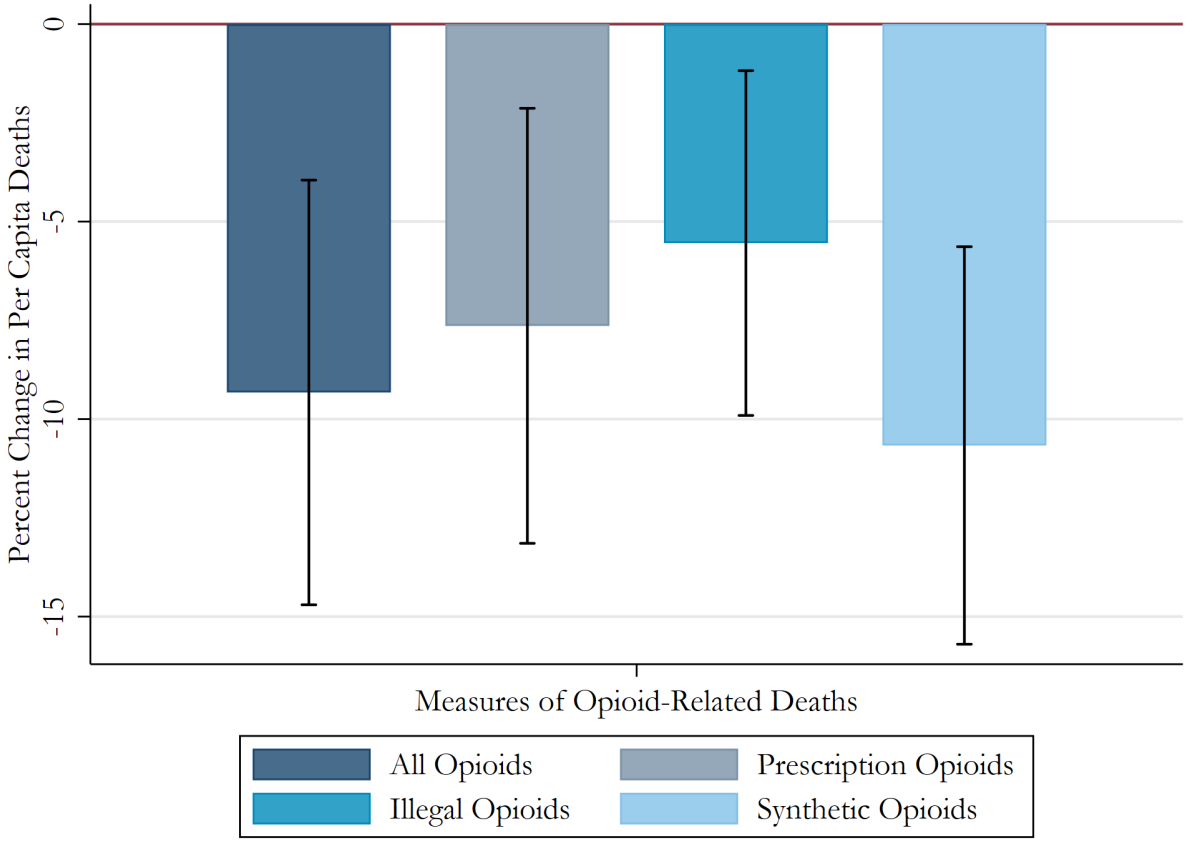
Halvorsen and Raymond Palmquist, "The Interpretation of Dummy Variables in Semilogarithmic Equations," *American Economic Review* 70, no. 3 (1980): 274.

[166] The error bars represent the 95 percent confidence intervals for the effect of NP independence on different outcomes. If an error bar does not cross the zero line, then the associated effect is statistically significant. In the primary analysis reported in figure 3, all effects are statistically significant.

[167] "Drug Overdose Deaths," CDC (website), last visited March 31, 2020, https://www.cdc.gov/drugoverdose/data/statedeaths.html.

significant effects directly contrary to these contentions. Depending on the type of opioid-related deaths, NP independence reduces the death rate by between 5 and 11 percent.

Figure 3: Effect of Eliminating Scope-of-Practice Laws on Opioid-Related Deaths



Notes: Each bar represents the marginal effect of NP independence on the dependent variable listed in the legend. Each dependent variable is the logarithmic transformation of the per capita opioid-related deaths for the type of opioid indicated in the key below the graph. Ninety-five percent confidence intervals are reported as capped lines for each bar. Each estimate is derived from a separate regression model. All regression models include a full set of county and year fixed effects and control variables for median household income, unemployment rate, and the number of hospitals. Additionally, each model includes indicator variables for whether a state has a mandatory prescription drug monitoring program, allows access to recreational cannabis, allows access to medical cannabis, or has a law regulating pain clinics.

While the available data on opioid-related deaths do not allow me to disaggregate the effect of NP independence into different mechanisms, several back-of-the-envelope calculations are nonetheless illuminating. In general, allowing NPs to practice

independently may reduce opioid-related deaths by reducing the number of opioid prescriptions and by facilitating access to treatment for opioid addiction. The results presented in figure 3 represent the joint effect of these two mechanisms, but examining prescription-opioid-related deaths and illegal-opioid-related deaths can elucidate the separate effects of these mechanisms. Both a reduction in opioid prescribing and providing access to opioid-addiction treatment work to reduce prescription-opioid-related deaths. Fewer opioid prescriptions mean a lower likelihood of overdose, and greater access to treatment similarly means fewer deaths. However, because NPs do not prescribe illegal opioids, only the effect of NP independence in increasing access to treatment operates to reduce illegal-opioid-related deaths.

Assuming that the 5.5 percent reduction in illegal-opioid-related deaths stems almost entirely from increasing access to opioid treatment programs and comparing the reduction in these deaths to the reduction in prescription-opioid-related deaths would suggest that 5.5 of the 7.6 percent reduction in prescription-opioid-related deaths is similarly due to increased access to addiction treatment. This would imply that the remaining 2.1 percent reduction in prescription-opioid-related deaths is due to decreased opioid prescribing in the wake of NP independence.[168] Interestingly, prior work has found that allowing NPs to

[168] Under the assumption that the entirety of the illegal-opioid death rate is due to increased access to treatment programs, this would imply that 5.5 of the total 7.6 percent reduction in the prescription-opioid death rate is similarly due to increased access to treatment programs. This leaves 2.1 percent—i.e., 7.6 – 5.5 = 2.1—attributable to a reduction in opioid prescribing as a result of NP independence.

practice independently results in exactly a 2.1 percent reduction in the total days' supply of prescription opioids.[169]

Of course, the percentage reductions are not directly comparable, but these simple back-of-the-envelope calculations demonstrate a remarkable consistency in results across multiple studies. While future work with different data should disaggregate the mechanisms of the effect of NP independence more precisely, the consistency observed between the results presented here and those in prior studies provides greater confidence in both sets of results. In general, this consistency indicates that allowing NPs to practice independently has a meaningful impact on ameliorating the opioid epidemic.

The role of laws in rural and urban areas. To further investigate the role of NP independence in opioid-related deaths, I extend the analysis to examine rural areas separately. As previously noted, NPs often play larger roles in delivering healthcare in more rural communities, with some rural communities relying primarily on NPs for care. This suggests that granting NPs independence may have a different effect in rural communities. To investigate this possibility, I separately reestimate all of the previous models for rural areas.

To define a particular county as rural, I rely on the United States Department of Agriculture's (USDA's) rural-urban continuum codes.[170] Under this system, the USDA assigns a code between 1 and 9 to each county in the United States based on population

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[169] McMichael, "Occupational Licensing and the Opioid Crisis," 34. This work showed slightly larger and smaller reductions in other measures of prescription opioid use.

[170] "Rural-Urban Continuum Codes: Documentation," US Department of Agriculture (USDA website), last visited April 24, 2020, https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/documentation/.

density and proximity to urban areas.[171] In general, more rural counties receive higher codes. Metropolitan counties receive codes between 1 and 3, and nonmetropolitan counties receive codes between 4 and 9.[172] While more counties receive a nonmetropolitan designation, metropolitan counties include a greater percentage of the US population.[173] Counties with the highest rural-urban continuum codes—i.e., 7 or above—are the most rural. While NPs may have an impact in these counties, they are so sparsely populated that any results for these counties may suffer from problems. Accordingly, the analysis here focuses on counties that receive a rural-urban continuum code of 4, 5, or 6. Although the USDA classifies these counties as rural, they may contain suburban areas or small towns.

Figure 4 reports the results from a series of models limited to rural counties with a mid-range rural-urban continuum code. These models are identical to those estimated in the primary analysis, but they include only counties with a specified rural-urban continuum code.[174] As before, each bar reports the result from a separate regression model—figure 4 reports the results from 12 separate models. The type of opioid-related death captured by each model is reported, and the models are grouped by rural-urban continuum codes.

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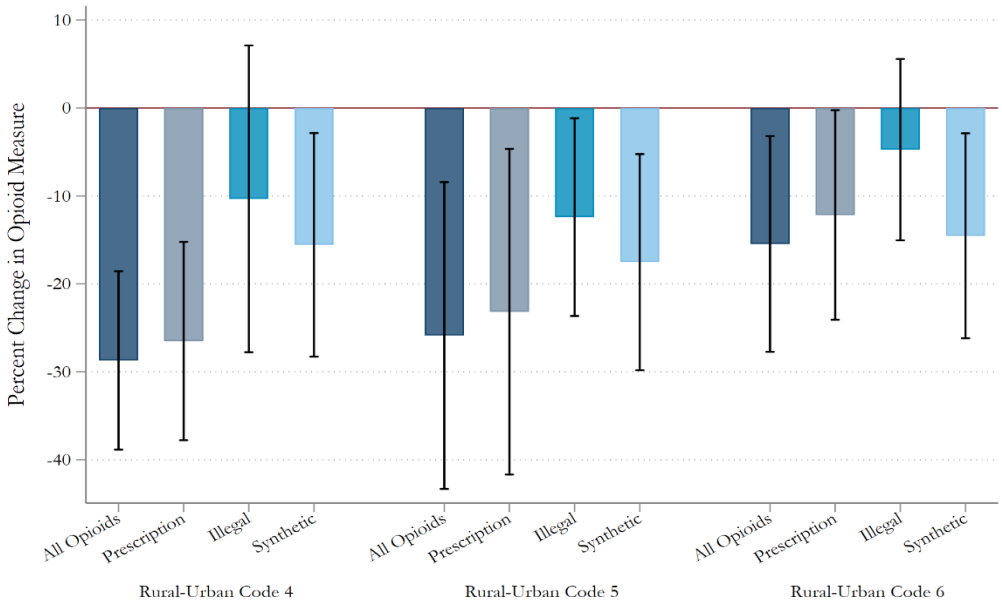
[171] "Rural-Urban Continuum Codes: Documentation," USDA.

[172] The codes and the counties to which they apply are as follows: 1, "Counties in metro areas of 1 million population or more"; 2, "Counties in metro areas of 250,000 to 1 million population"; 3, "Counties in metro areas of fewer than 250,000 population"; 4, "Urban population of 20,000 or more, adjacent to a metro area"; 5, "Urban population of 20,000 or more, not adjacent to a metro area"; 6, "Urban population of 2,500 to 19,999, adjacent to a metro area"; 7, "Urban population of 2,500 to 19,999, not adjacent to a metro area"; 8, "Completely rural or less than 2,500 urban population, adjacent to a metro area"; 9, "Completely rural or less than 2,500 urban population, not adjacent to a metro area." "Rural-Urban Continuum Codes: Documentation," USDA.

[173] "Rural-Urban Continuum Codes: Documentation," USDA.

[174] The error bars represent the 95 percent confidence intervals for the effect of NP independence on different outcomes. If an error bar does not cross the zero line, then the associated effect is statistically significant.

Figure 4: Effect of Eliminating Scope-of-Practice Laws on Opioid-Related Deaths in Rural Areas



Notes: Each bar represents the marginal effect of NP independence on the outcome listed below the bar. Each dependent variable is the logarithmic transformation of the per capita opioid-related deaths for the type of opioid indicated. Ninety-five percent confidence intervals are reported as capped lines for each bar. Each estimate is derived from a separate regression model. Each regression is limited to only counties that fall into the rural-urban continuum code listed below each group of results. All regression models include a full set of county and year fixed effects and control variables for median household income, unemployment rate, and the number of hospitals. Additionally, each model includes indicator variables for whether a state has a mandatory prescription drug monitoring program, allows access to recreational cannabis, allows access to medical cannabis, has a law regulating pain clinics, or has expanded Medicaid. Rural-Urban Code 4 = urban population of 20,000 or more, adjacent to a metro area; Rural-Urban Code 5 = urban population of 20,000 or more, not adjacent to a metro area; Rural-Urban Code 6 = urban population of 2,500 to 19,999, adjacent to a metro area.

Except for deaths related to illegal opioids, the effect of NP independence on opioid-related deaths is uniformly statistically significant in figure 4. Importantly, the magnitudes of these effects are considerably larger than those reported in figure 3. For example, NP independence reduces all opioid-related deaths by between 14 and 28 percent in rural counties. Across all counties, NP independence reduces all opioid-related deaths by 9.3 percent. In other words, NP independence has a stronger effect in rural counties than in counties generally.

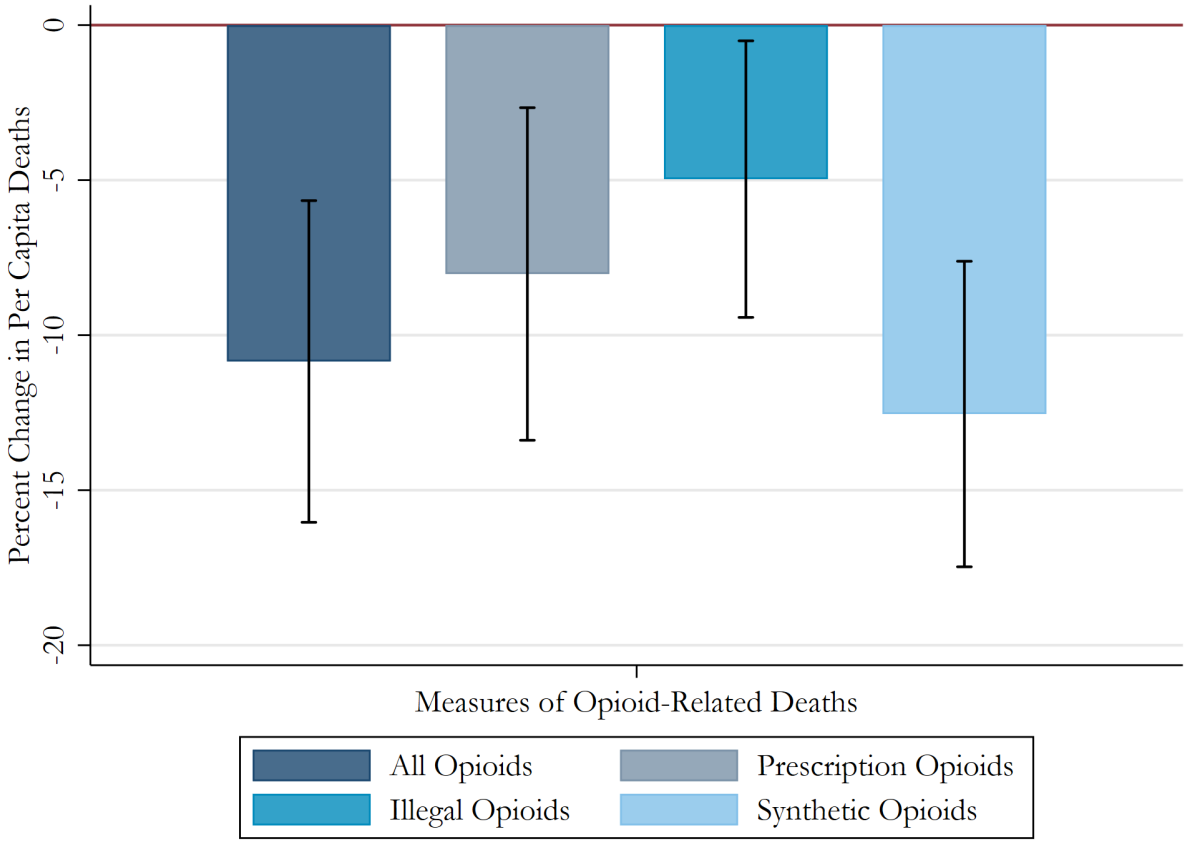
Overall, the results for rural counties conform to prior studies of NP SOP laws. NP independence has a more salient effect in nonmetropolitan counties, consistent with these counties relying more on NPs for healthcare services than metropolitan counties. In the context of the opioid epidemic, this pattern of effects is particularly relevant and suggests that allowing NPs to practice independently may alleviate the rural-urban divide in healthcare access. Before delving into this and other policy implications in detail, however, the next section discusses a series of robustness checks designed to probe the validity of the results reported earlier.

Robustness of the results. No empirical study (including this one) is perfect, and none can control for all potential confounders. While the difference-in-differences strategy will control for state-specific factors and national trends (including the adoption of policies at the national level) that may influence opioid-related deaths, it is nevertheless important to consider the potential impact of other factors or problems with the models themselves that may undermine the validity of the results. This section reports a series of robustness checks designed to probe the sensitivity of the results reported earlier. In the interest of succinctness, this section reports the results from the primary robustness checks.

First, to test the sensitivity of the estimated effects to the inclusion of control variables, I reestimated the primary models but omitted all control variables. Figure 5 reports the results of these models. In general, the results are remarkably similar to the primary results reported previously. Though the point estimates change slightly, all effects remain statistically significant. I also reestimated all of the rural-urban models without control variables. Though these are omitted in the interest of brevity, they also similarly track the

earlier results. The point estimates change somewhat, but the qualitative nature of the results and the conclusions that can be drawn from them remain the same.

Figure 5: Effect of Eliminating Scope-of-Practice Laws on Opioid-Related Deaths (with Control Variables Omitted)



Notes: Each bar represents the marginal effect of NP independence on the dependent variable listed in the key below the graph. Each dependent variable is the logarithmic transformation of the per capita opioid-related deaths for the type of opioid indicated in the legend. Ninety-five percent confidence intervals are reported as capped lines for each bar. Each estimate is derived from a separate regression model. All regression models include a full set of county and year fixed effects.

Second, and more relevant to my empirical strategy, I test the validity of the key assumption underlying the difference-in-differences models that form the core of that strategy. In particular, all difference-in-differences models require that the trend in the

outcome of interest is the same in the control group and treatment group. If the treatment group exhibits a change in opioid deaths before the adoption of NP independence that the control group does not experience, that could suggest that the results of my analysis simply reflect differences in the relevant underlying trends, as opposed to the true effects of NP independence.

The underlying trends in opioid-related deaths in states that did and did not adopt NP independence may differ for many reasons. Particularly problematic is the possibility that states have previously adopted NP independence to reduce opioid-related deaths or for similar reasons.[175] However, extensive research has found evidence that political idiosyncrasies and not reasons related to healthcare policy have driven states to change their NP SOP laws.[176] Consistent with this evidence, multiple studies have employed difference-in-differences models to estimate the impact of NP independence on various healthcare outcomes.[177] While this consistent approach offers some comfort in the reliability of the results, I nonetheless formally test the validity of the assumptions underlying my empirical models.

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[175] See Markowitz et al., "Competitive Effects of Scope of Practice Restrictions," 207, which notes, "Policy endogeneity is another potential concern. This endogeneity can be either statistical (correlation with the error term) or structural (when laws are altered as a result of the outcomes under consideration)."

[176] See Markowitz et al., "Competitive Effects of Scope of Practice Restrictions," 207, which states, "Using our data, we conducted an event study analysis and found no evidence of policy endogeneity"; Traczinsky and Udalova, "Nurse Practitioner Independence," 93, which states, "As discussed above, state laws on NP practice are often the result of state board regulatory decisions made by political appointees, attorney general opinions, or other factors related to political bargaining rather than health concerns"; McMichael, "Healthcare Licensing and Liability," 313–14, which states, "The findings presented here suggest that political spending by professional interest groups plays a role in states' choices of occupational licensing laws."

[177] See the section "COVID-19 and Access to Care," in this paper, which discusses these studies.

In particular, I follow the econometric methodology outlined by Clément de Chasiemartin and Xavier D'Haultfœuille.[178] Their approach provides a specific test for whether the parallel trends assumption is satisfied and relaxes the assumption that NP independence has a constant effect across states and over time. The results of the de Chasiemartin and D'Haultfœuille event-study model for opioid-related deaths are reported in figure 6. Each point along the line represents the effect of NP independence at the given time before or after enactment, and each error bar represents the 95 percent confidence interval around each estimated effect. The focus of this analysis is not the statistical significance of any single-point estimate but the overall trend of the effect of NP independence.[179]

The line tracing the coefficient estimates for the years leading up to NP independence is clearly flat, suggesting that the trends in the treatment and control groups were parallel. Indeed, the coefficient estimates before the adoption of NP independence are remarkably stable. The flat line before adoption demonstrates that the parallel trends assumption is not violated and that the use of difference-in-differences models throughout my analysis is appropriate. The clear decline following the enactment of NP independence elucidates a

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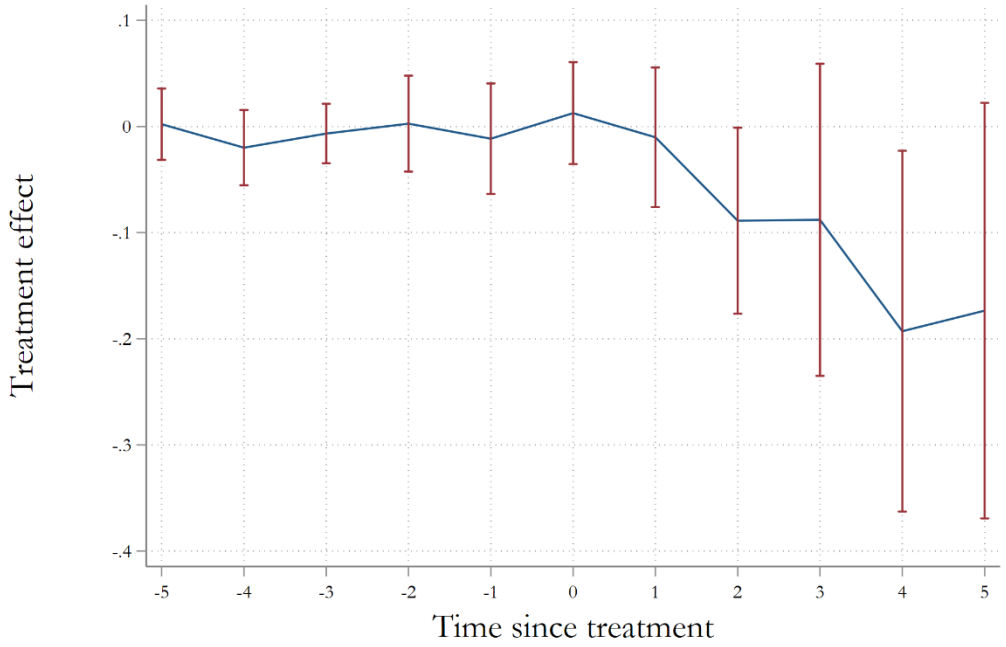
[178] See Clément de Chasiemartin and Xavier D'Haultfœuille, "Two-Way Fixed Effects Estimators with Heterogeneous Treatment Effects," *American Economic Review* 110, no. 9 (2020), which states that "we propose a new estimator . . . that is valid even if the treatment effect is heterogeneous over time or across groups. It estimates the average treatment effect across all the (g, t) cells whose treatment changes from $t-1$ to t. It relies on common trends assumptions on both potential outcomes. Those conditions are partly testable, and we propose a test that amounts to looking at pre-trends, as in a standard DID analysis.

[179] See, e.g., Ronen Avraham and Max Schanzenbach, "The Impact of Tort Reform on Intensity of Treatment: Evidence from Heart Patients," *Journal of Health Economics* 39 (2015): 278–82, which focuses similarly on the nature of the trend in their event study models as opposed to the statistical significance of any single effect.

phasing-in period. This is not surprising, as it may be expected that it would take time for newly independent NPs to meaningfully affect opioid-related deaths.

Figure 6: Event-Study Results for the Effect of Scope-of-Practice Laws on Opioid-Related Deaths



Notes: Each point represents the coefficient on *NP independence* for the indicated time period relative to the enactment of NP independence, which occurs at time zero. The dependent variable is the natural logarithm of opioid-related deaths. Ninety-five percent confidence intervals are reported as capped lines for each point. All estimates are derived from the same model. That model includes a full set of county and year fixed effects and control variables for median household income, unemployment rate, and the number of hospitals. It also includes indicator variables for whether a state has a mandatory prescription drug monitoring program, allows access to recreational cannabis, allows access to medical cannabis, or has a law regulating pain clinics.

In addition to testing the parallel trend assumption, the approach developed by de Chasiemartin and D'Haultfœuille addresses a separate concern with traditional difference-in-differences models. Recent research focused on the econometric properties of these

regression models has highlighted potential problems with their design.[180] For example, in addition to assuming that the outcome of interest followed a parallel trend in the treatment and control groups, standard difference-in-differences models assume that the treatment effect of the relevant law is constant across states and over time. The de Chasiemartin and D'Haultfœuille approach relaxes this assumption.[181] With this assumption relaxed, the main effect of NP independence elucidated in the primary analysis remains robust as illustrated in figure 6. The next part explores the policy implications of this effect.

Rethinking Regulation in an Age of Epidemics

The results of my empirical analysis support eliminating restrictive SOP laws and allowing NPs to practice independently.[182] More specifically, the evidence developed in this paper undermines the arguments that allowing NPs to practice independently will endanger patient safety. Of course, this evidence was developed in a single context—opioid-related deaths. But the failure to find support for these arguments in the opioid epidemic, which is more intimately connected with patient safety than any other healthcare context, means that such evidence is not likely to appear in other contexts. By this, I mean that failing to find evidence consistent with patient-safety arguments in the context in which these arguments are most likely to be relevant implies that these arguments are not a valid reason for continuing

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[180] See generally de Chasiemartin and D'Haultfœuille, "Two-Way Fixed Effects Estimators," 3, which identifies potential econometric issues; Also see Kirill Borusyak and Xavier Jaravel, "Revisiting Event Study Designs" (Harvard University Working Paper), https://scholar.harvard.edu/borusyak/publications/revisiting-event-study-designs; and Andrew Goodman-Bacon, "Difference-in-Differences with Variation in Treatment Timing" (NBER Working Paper 25018, National Bureau of Economic Research, Cambridge, MA), https://www.nber.org/papers/w25018, both of which also identify potential econometric issues.

[181] See de Chasiemartin and D'Haultfœuille, "Two-Way Fixed Effects Estimators."

[182] Of course, policymakers and researchers will want to continually evaluate various outcomes in connection with changing SOP laws as they do with many aspects of the healthcare system.

current restrictions on NP practices. Additionally, I do not mean to imply that patient safety should be verified in all contexts before NPs are allowed to practice independently. The evidence developed in this paper joins mounting evidence that NPs can safely care for patients independently. Thus, the burden of proof must shift to those who argue that NPs cannot do so safely and who desire to maintain restrictive licensing laws. Failing to carry this burden should result in the elimination of restrictive laws.

Without evidence that NP independence risks patient safety, there is little reason not to make permanent the temporary eliminations of restrictive SOP laws that states have used to increase access to care during the COVID-19 pandemic. This pandemic has affected hundreds of millions of people and has made access to healthcare providers a priority. However, even in the absence of a pandemic, lack of access to care can result in the deaths of many. For people dying of disease because they cannot access a healthcare provider, it makes little difference whether that disease is the cause of a novel pandemic or a more mundane disease like diabetes or cardiovascular disease.

This part explores the policy implications of the empirical results in detail, tracing the connections between the opioid-related evidence developed earlier and the emergency responses to the COVID-19 pandemic. It concludes that extending independence to NPs permanently is warranted. It then details specific legal paths to achieving this reform on a nationwide basis. In doing so, it does not advocate these reforms to the exclusion of parallel reforms that would increase the number of practicing physicians. Indeed, these reforms could provide important benefits to patients across the country, and there is no reason that state governments and the federal government should ignore reforms to promote growth in

physician supply. Reforms designed to increase the physician workforce can and should be pursued in conjunction with reforms to the SOP laws governing the NP workforce.

Evidence in the Context of the Current Public Health Crises

As noted previously, many states have responded to the COVID-19 crisis by taking immediate action to expand the capacity of their healthcare systems.[183] This response has included attempts to procure additional medical equipment, such as ventilators, but among the most important actions taken have been changes designed to increase the capacity of healthcare providers. Many states, such as New York, New Jersey, Louisiana, and Kentucky, have issued executive orders suspending restrictive SOP laws to better enable NPs and other healthcare providers to care for patients.[184] These states have correctly recognized that dealing with a pandemic requires increasing the capacity of their healthcare workforces, and they have acted accordingly.

Indeed, this capacity is important to address the direct pressure exerted on the healthcare system by COVID-19 patients as well as the indirect pressure of this pandemic. Patients suffering from conditions developed before the pandemic continue to require care, patients continue to develop conditions unrelated to COVID-19, and the emergency responses to the pandemic may cause independent problems (e.g., exacerbating mental health conditions by requiring individuals to isolate themselves from others). When states remove restrictive SOP laws, they create new capacity to handle these problems. NPs (along with physician assistants and other professionals who have seen restrictive SOP laws

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[183] See "COVID-19 and Access to Care" in this paper.

[184] See "COVID-19 and Access to Care" in this paper.

relaxed) can aid in the treatment of COVID-19 patients and provide many of the other healthcare services that continue to be necessary in times of pandemic.

The number of states that have suspended restrictive SOP laws and the alacrity with which they did so to address the capacity problems brought on by the COVID-19 pandemic invite an obvious question: Why limit the capacity of the healthcare workforce in the first place? To be sure, many parts of the country hadn't felt these capacity constraints. Patients in many urban and suburban areas may have little difficulty making an appointment with a healthcare professional or otherwise accessing the care they need. In such areas, restrictive SOP laws may have little impact from the patient's perspective.

In many other parts of the country, including many rural areas and parts of certain urban areas, patients acutely feel the impact of restrictive SOP laws. In these areas, patients may face long waiting periods before being able to see a healthcare provider or may find it impossible to access a provider at all. Patients in these parts of the country may constantly face the healthcare capacity constraints that the COVID-19 pandemic has made real for everyone else. These patients may live under semi-constant pandemic conditions if they cannot receive care for diabetes, cardiovascular disease, HIV, asthma, mental illness, and the myriad other diseases and conditions that kill as many people every year as COVID-19 will during the course of the current pandemic.[185]

As discussed extensively, eliminating restrictive SOP laws can increase access to care and address many of the problems faced by individuals across the country. If states are

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[185] See the section "Opioids, Patient Safety, and Quality of Care" in this paper, which discusses the ability of states to address these problems by relaxing their SOP laws.

willing to remove restrictions on NPs and others to provide access to care when that access is strained by a pandemic, then why should they maintain those restrictions when many people face access problems for other reasons? To ask the question is not to assume an answer, and there may be legitimate justifications for restrictive SOP laws. If groups in favor of such laws are correct that eliminating restrictive SOP laws outside the context of a pandemic will endanger patient safety, then states have correctly refused to do so. And many states explicitly justify their SOP laws as necessary to protect patient safety.

The problem is that this justification is not based on sound evidence. Expert evaluators of all political persuasions have yet to find compelling evidence that restricting the practices of NPs and other similarly situated professionals protects patient safety.[186] And nearly all evaluations have concluded that access to care and patient safety alike would be well served by eliminating restrictive SOP laws.[187] The analysis reported earlier and conducted in the context of the opioid epidemic represents novel and particularly compelling evidence that the patient safety justification for restrictive SOP laws is without merit.

The opioid epidemic arose from practices within the healthcare system itself that ultimately endangered patient safety by risking opioid use disorder and all of the harms that such a disease entails. Thus, the epidemic is more tightly connected with patient safety than

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[186] See Gilman and Koslov, "Competition and the Regulation of Advanced Practice Nurses," 18–34, which reviews the available evidence and concludes that restrictive SOP laws are not well supported by that evidence.

[187] Institute of Medicine, *The Future of Nursing,* 27, which notes that "access to quality care can be greatly expanded by increasing the use of . . . [NPs] in primary, chronic, and transitional care"; Department of the Treasury et al., *Occupational Licensing*, 30–31,which states that "easing scope of practice laws for APRNs represents a viable means of increasing access to certain primary care services"; Department of Health and Human Services et al., *Reforming America's Healthcare System through Choice and Competition,* 31–36, which articulates the benefits of relaxed SOP laws.

any large-scale problem affecting the healthcare system. In the context of that epidemic, granting NPs independence has exactly the opposite effect as that predicted by the arguments in favor of restrictive SOP laws. Instead of exacerbating that epidemic, giving NPs more autonomy has reduced opioid-related deaths and thereby ameliorated the worst impact of that crisis.

The analysis thus far cannot unambiguously separate the different mechanisms by which NP independence may work to reduce opioid-related deaths. Combined with prior work, however, the evidence suggests that NPs both prescribe fewer opioids and expand access to opioid addiction treatments when granted independence. The first mechanism is consistent with NPs promoting patient safety in the first instance,[188] and the second mechanism is consistent with NPs addressing existing failures of patient safety.[189] In either case, granting NPs independence improves, not endangers, patient safety.

The failure of the primary argument against granting NPs independence combined with the benefits that will inure to patients as a result of this independence suggest a clear problem with the current approach to regulating NPs (and other professionals) and invite a new paradigm. The next section explores potential paradigms in detail.

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[188] McMichael, "Occupational Licensing and the Opioid Crisis," 1, which states, "An analysis of these data reveals that allowing nurse practitioners to practice independently reduces the quantity of opioids prescribed."

[189] Spetz et al., "Nurse Practitioner and Physician Assistant Waivers," 1408, which states, "The results of this study suggest that states in which NP practice is restricted may be less able to expand the opioid treatment workforce."

Paths to Reform

I join a large cadre of scholars, policymakers, government institutions, and policy think tanks in calling for NP independence.[190] While such a call, by itself, is relatively easy to make, defining a clear path to independence is less so. States that relaxed SOP laws on an emergency basis in connection with the COVID-19 pandemic can simply make those relaxations permanent via state statute. The same approach would work in states that did not relax their SOP laws, though these states would not have existing emergency orders as templates for legislative action. While the primary goal in states that continue to restrict the practices of NPs would be to eliminate these restrictions, focusing exclusively on COVID-19 emergency orders may result in an overly narrow approach. Thus, this section systematically explores the various options available to make permanent the changes in these orders. It begins with the most straightforward options before delving into increasingly difficult paths to pursue.

Before presenting the analysis, two caveats are relevant. First, in offering these potential solutions, the paper does not advocate for any particular reform option. Second, this discussion is necessarily an overview, and it is important to acknowledge that it does not address the many legal nuances that are associated with different policy options. Overhauling SOP laws across the country will be a massive undertaking, and no single paper could address all the nuances of that undertaking. Instead, the goal here is to spark discussion and move the conversation forward by outlining the options available to pursue emergency SOP-law relaxations on a permanent basis. As the debate coalesces around

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[190] For a discussion of these various calls, see "COVID-19 and Access to Care" in this paper.

specific policy options, future work can address the specific issues connected with those preferred options.

Litigation. Perhaps the most obvious option—and one that, conveniently, does not require further government action—is litigation. Current SOP laws confer monopoly power on physicians, and many state laws grant physicians the ability to control entry into healthcare services markets by withholding supervision from NPs (and other providers).[191] The fact that these laws not only allow physicians to control the entry of NPs into certain markets but also charge them thousands of dollars in supervision fees as a condition of continuing to participate in these markets suggests that antitrust laws may offer a solution. Though antitrust laws may be appealing in this context, they cannot offer a remedy. Because almost all SOP restrictions of the type discussed in this paper come from state statutes, they fit neatly into the state-action immunity articulated in *Parker v. Brown*.[192] Some marginal SOP restrictions are regulatory and may be subject to an antitrust challenge, but the most salient restrictions are beyond the reach of antitrust law.[193]

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[191] Adams and Markowitz, "Improving Efficiency in the Health-Care System," 6, which states, "Currently, there are strong anticompetitive barriers to making more use of [NPs] in the health-care sector."

[192] 317 U.S. 341, 350–51 (1943), which states, "We find nothing in the language of the Sherman Act or in its history which suggests that its purpose was to restrain a state or its officers or agents from activities directed by its legislature." See also Aaron Edlin and Rebecca Haw, "Cartels by Another Name: Should Licensed Occupations Face Antitrust Scrutiny?," *University of Pennsylvania Law Review* 162, (2015): 1118–27, which explains that SOP laws are not subject to antitrust scrutiny because they are based on state statutes.

[193] N. Carolina State Bd. of Dental Examiners v. F.T.C., 574 U.S. 494 (2015), which states, "An entity may not invoke *Parker* immunity unless the actions in question are an exercise of the State's sovereign power. State legislation and 'decision[s] of a state supreme court, acting legislatively rather than judicially,' will satisfy this standard, and 'ipso facto are exempt from the operation of the antitrust laws' because they are an undoubted exercise of state sovereign authority. (citations omitted)."

Beyond antitrust law, state constitutional law may offer some hope for the elimination of restrictive SOP laws. Some states have clauses in their constitutions that prohibit the legislature from conferring monopoly power.[194] These clauses may provide a basis for challenging state SOP laws, which provide monopoly power to certain groups, but such challenges are not likely to succeed. In a recent case, the Supreme Court of Georgia rejected a challenge to Georgia's certificate-of-need law under the "Anti-Competitive Contracts Clause of the Georgia Constitution."[195] The challenged law required healthcare providers to obtain a certificate of need from the state before offering certain types of healthcare services and thus functioned similarly to SOP laws.[196] The court concluded that this clause was "limited expressly to contracts and agreements" and therefore did not prohibit the legislature from requiring providers to obtain a certificate of need.[197] While SOP laws differ from certificate-of-need laws and may therefore violate state constitutions, no state supreme court has suggested that SOP laws are unconstitutional. That leaves legislative action as the more viable path to eliminating restrictive SOP laws.

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[194] Ga. Const. art. III, § 6, ¶ V ("The General Assembly shall not have the power to authorize any contract or agreement which may have the effect of or which is intended to have the effect of encouraging a monopoly, which is hereby declared to be unlawful and void").

[195] Women's Surgical Ctr., LLC v. Berry, 806 S.E.2d 606, 610 (2017).

[196] See Matthew D. Mitchell, Elise Amez-Droz, and Anna K. Parsons, "Phasing Out Certificate-of-Need Laws: A Menu of Options" (Mercatus Policy Brief, Mercatus Center at George Mason University, Arlington, VA, February 2020), https://www.mercatus.org/system/files/mitchell_amez-droz_and_parsons_-_policy_brief_-_repealing_con_laws_a_menu_of_options_for_state_policymakers_-_v11.pdf, which discusses certificate-of-need laws generally.

[197] Women's Surgical Ctr, 806 S.E.2d at 611.

Individual state action. The ideal legal path to independence across the country runs through state capitols, because states have historically maintained primary responsibility for regulating the healthcare workforce.[198] The statutes that formed the foundation of the empirical analysis explained earlier were all passed by state legislatures, and state legislative action can remove impediments to independent NP practice. Indeed, nothing prevents state legislatures from enacting statutes to grant NPs independence tomorrow. State-based reform in each state capitol represents an attractive and straightforward option because such reform does nothing to upset the historical approach to healthcare workforce regulation.[199]

While state legislation offers the easiest legal path to independence, it may not be the most politically feasible. The American Medical Association (AMA) and other physician groups have opposed the relaxation of state SOP laws to grant NPs more independence.[200] These groups expend substantial resources to prevent NPs from gaining independence, and the evidence suggests that their efforts have been successful.[201] Given the benefits of restrictive SOP laws that flow to physicians in the form of supervision fees and higher

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[198] While other members of the healthcare workforce, such as physician assistants, were not the focus of my empirical analysis, states have eliminated restrictive SOP laws governing these providers as well. Here, I maintain my focus on NPs, but the call to eliminate restrictive SOP laws extends to these other healthcare providers as well.

[199] See Gabriel Scheffler, "Unlocking Access to Health Care: A Federalist Approach to Reforming Occupational Licensing," *Health Matrix* 29, no. 1 (2019): 337–53, which weighs the merits of state versus federal action.

[200] See Resolution 214-I-2017 of the AMA, https://www.ama-assn.org/sites/ama-assn.org/files/corp/media-browser/public/hod/i17-resolutions.pdf, which states, "Our [American Medical Association], in the public interest, opposes enactment of legislation to authorize the independent practice of medicine by any individual who has not completed the state's requirements for licensure to engage in the practice of medicine and surgery in all of its branches."

[201] McMichael, "Healthcare Licensing and Liability," 314, which states, "An increase in spending by physician [political interest] groups decreases . . . the probability that states impose less restrictive physician supervision requirements on NPs."

pay,[202] continued opposition to relaxing NP SOP laws at the state level should be expected. The COVID-19 pandemic may affect the effectiveness of this opposition, however. Many of the states that restrict the practices of NPs quickly and effectively eliminated these restrictions as part of their emergency responses to the pandemic.[203] This willingness to expand the autonomy of NPs combined with new evidence undermining the justifications for restrictive SOP laws such as those presented earlier, may prove sufficient to overcome lobbying efforts and other opposition to NP independence. If so, making the current emergency SOP measures permanent via legislation represents the simplest, most effective path to NP independence in those states that have adopted such measures. In states that have not, straightforward legislation to the same effect would be the best outcome.

Collective state action. Collective state action, in which multiple states act in conjunction to reform NP SOP laws, may take various forms,[204] but the most appealing action concerns interstate compacts. These compacts facilitate the movement of professionals across states by allowing someone licensed in one state to practice in another state. These compacts exist

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[202] See Brendan Martin and Maryann Alexander, "The Economic Burden and Practice Restrictions Associated with Collaborative Practice Agreements: A National Survey of Advanced Practice Registered Nurses," *Journal of Nursing Regulation* 9, no. 4 (2019): 25, which states that "the median fee to maintain a [collaborative practice agreement] was $500 per month; Kleiner et al., "Relaxing Occupational Licensing Requirements," 274–77, which finds that NP independence reduces physician wages.

[203] See "COVID-19 and Access to Care" in this paper.

[204] For example, Arizona, Montana, New Jersey, Pennsylvania, and Idaho have passed laws that facilitate the recognition of out-of-state licenses. Tatiana Follett, Zach Herman, and Iris Hentze, "Universal Licensure Recognition," National Conference of State Legislatures (website), March 2, 2021, https://www.ncsl.org/research/labor-and-employment/universal-licensure-recognition.aspx. While useful, these laws do not directly address SOP issues.

for many professions, including both registered nurses and physicians.[205] The National Council of State Boards of Nursing established a framework for the interstate compact for NPs in 2020.[206] That framework includes, as a condition of joining the compact, adopting the Advanced Practice Registered Nurse Compact.[207] While only two states, North Dakota[208] and Delaware,[209] have enacted the legislation to become part of the compact, that legislation takes an important step that other professional compacts do not.[210] It requires states to grant NPs independence as a condition of joining the compact.

The model legislation requires that the "[i]ssuance of [a] multistate license shall include prescriptive authority for noncontrolled prescription drugs"—i.e., full prescriptive authority.[211] It further provides that an NP "issued a multistate license is authorized to assume responsibility and accountability for patient care independent of any supervisory or collaborative relationship"—i.e., practice independently.[212] Including a grant of NP

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[205] Interstate Medical Licensure Compact, website last visited Jan. 16, 2021, https://www.imlcc.org/a-faster-pathway-to-physician-licensure/. The website states, "The Interstate Medical Licensure Compact is an agreement among participating U.S. states to work together to significantly streamline the licensing process for physicians who want to practice in multiple states."; Kathleen Gaines, "Compact Nursing States List 2021," Nurse.org, August 19, 2020, https://nurse.org/articles/enhanced-compact-multi-state-license-eNLC/, which states, "The Nursing Licensure Compact (NLC) is an agreement between states that allows nurses to have one license but the ability to practice in other states that are part of the agreement."

[206] This compact includes other types of advanced practice registered nurses as well. "APRN Compact," National Council of State Boards of Nursing, last visited January 17, 2021, https://www.ncsbn.org/aprn-compact.htm.

[207] "APRN Compact," National Council of State Boards of Nursing.

[208] "APRN Compact," National Council of State Boards of Nursing.

[209] National Council of State Boards of Nursing (NCSBN), "Delaware Enacts Advanced Practice Registered Nurse (APRN) Compact," news release, August 5, 2021, https://www.ncsbn.org/16027.htm.

[210] "APRN Compact," National Council of State Boards of Nursing.

[211] Advanced Practice Registered Nurse Compact § III(b)(13)(f), National Council of State Boards of Nursing official draft 2020, https://www.ncsbn.org/FINAL_APRNCompact_8.12.20.pdf.

[212] Advanced Practice Registered Nurse Compact, § III(b)(13)(h).

independence in the legislation required to join the interstate compact may encourage grants of independence to a greater extent than would otherwise occur. By joining the compact, states could quickly access a large pool of healthcare providers who could quickly begin caring for a state's population. This benefit may be particularly appealing during a pandemic (or under threat of future pandemics) and may encourage otherwise recalcitrant states to grant NPs independence as a condition of enjoying it. States may also wish to offer additional benefits to NPs within their borders. By joining the compact, a given state's NP license becomes more valuable in the sense that it provides an avenue to practice in many other states across the country.

While using the interstate compact to promote the adoption of NP independence across the country is a clever strategy, medical associations have organized against it.[213] The AMA and many state and specialty medical associations support licensure compacts generally, but they "strongly object to the use of interstate licensure compacts as a mechanism through which to expand scope of practice laws."[214] In other words, the same problems that have derailed attempts at individual state action will likely also hinder collective state action via interstate compacts designed to address SOP laws. The persistence of these problems suggests that stronger measures may be required.

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[213] Letter from American Medical Association et al., to Katherine Thomas, president, National Council of State Boards of Nursing, May 10, 2018, https://www.aafp.org/dam/AAFP/documents/advocacy/workforce/scope/LT-NCSBN-APRNCompact-051018.pdf.

[214] Letter from American Medical Association et al., to Katherine Thomas.

Federalism. Given the continued recalcitrance of many states and the vigorous defense of restrictive SOP laws mounted by medical associations, state-based reform alone may prove insufficient. That insufficiency suggests a potential role for the federal government. As discussed in the next subsection, the federal government has the authority to preempt state SOP laws and replace them with a federal scheme. This approach, though extreme, may be required given the existing need to extend access to care as demonstrated by the problems associated with the COVID-19 pandemic. Despite this need, Congress may nonetheless balk at preempting a traditional domain of state control. This congressional hesitance suggests that an approach rooted in federalism may prove more appealing.[215]

The federal government already shares some responsibility for regulating the healthcare workforce and could build on this existing role incrementally to assume a greater share of responsibility alongside states.[216] For example, the Department of Veterans Affairs (VA) exercises some control over the providers it employs. In 2016 the VA amended the regulations governing providers in VA hospitals by administrative action to allow NPs to practice independently. It did so to increase its "capacity to provide timely, efficient, effective and safe primary care" and to "mak[e] the most efficient use of [NP] staff capabilities."[217]

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[215] See Scheffler, "A Federalist Approach to Reforming Occupational Licensing," 347, which states, "Despite the intuitive appeal of federal preemption, a federalist approach to occupational licensing reform is more feasible than outright preemption."

[216] See Scheffler, "A Federalist Approach to Reforming Occupational Licensing," 350–51, which advocates an incremental approach for Congress.

[217] Department of Veterans Affairs, "VA Grants Full Practice Authority to Advance Practice Registered Nurses" (news release, VA, Washington, DC, December 14, 2016), https://www.va.gov/opa/pressrel/pressrelease.cfm?id=2847. The VA's policy change extended to all advanced practice registered nurses—not just NPs.

Congress could build on these changes in the VA by leveraging its control over other federal programs like Medicare. Congress could, for example, enact a statute providing that when caring for Medicare beneficiaries, NPs may practice independently regardless of state laws to the contrary. Such a statute would avoid preempting state SOP laws completely and would maintain an important role for states in regulating their healthcare workforces. While maintaining some state authority, this statute would still take important steps toward NP independence. To eliminate confusion around this new statute and to eliminate any lingering chilling effect on NPs from current state SOP laws, this statute would likely need to include a provision that NPs are exempt from any state SOP laws mandating physician supervision when they believe in good faith that they are treating a Medicare beneficiary or an individual eligible for Medicare. If Congress wished to provide a more robust statutory framework, it could consider providing that states may impose no more restrictions on NPs than those imposed by the VA when NPs treat (or believe in good faith they are treating) Medicare beneficiaries.

Congress, of course, exercises authority over more than just the Medicare program and could similarly leverage its authority over Medicaid or other federal programs to move toward NP independence while maintaining a role for states. In the Medicaid context, Congress could authorize higher levels of federal matching funds for those states that allow NPs to practice independently. Congress used the same tactic in the Affordable Care Act to entice states to expand Medicaid.[218] Unlike the Medicare option just discussed, which would

[218] See Robin Rudowitz, "Understanding How States Access the ACA Enhanced Medicaid Match Rates" (Kaiser Family Foundation issue brief, September 29, 2014), https://www.kff.org/medicaid/issue-

require Congress to act under its commerce power, Congress could accomplish change via the Medicaid program under its spending power. In doing so, it could allow an even more robust role for states than that contemplated earlier in this paper. If Congress prefers to avoid tampering with existing federal programs, it could encourage states to relax their SOP laws by conditioning the receipt of funds related to either the opioid epidemic or COVID-19 pandemic on the relaxation of restrictive SOP laws.

A full review of all federal programs that Congress may consider altering to encourage states to grant NPs independence is beyond the scope of this paper. Choosing one of these options, however, offers important benefits over individual state action or collective state action as described earlier. First, Congress could encourage a relatively uniform adoption of NP independence. Second, an incremental approach that involves changing SOP laws in connection with specific federal programs may invite less vigorous opposition from physician groups. This may make such an approach more politically feasible than others described earlier. If, however, Congress decides to take a more heavy-handed approach, it need not rely on the states at all.

Federal action. Congress may decide that the time has come to replace state-based healthcare workforce regulation with a federal scheme. Preempting state laws on healthcare workforce regulation would not require complicated constitutional justifications. Doing so is almost certainly within Congress's commerce power. Physicians, NPs, and other

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brief/understanding-how-states-access-the-aca-enhanced-medicaid-match-rates/, which outlines this congressional strategy.

healthcare providers already complete national certifications,[219] and the provision of healthcare certainly crosses state lines (particularly when considering activities like telehealth).[220]

The primary question in connection with a federal healthcare workforce regulation is not whether Congress has the authority to enact one but what form it should take. One option is to create simple tiers of providers. The first tier would include physicians, NPs, physician assistants, and other healthcare providers who are capable of providing independent care to patients. The second tier could include professions such as registered nurses that provide high-quality healthcare but primarily do so in connection with other providers. Other tiers could include additional providers who receive less training and play other roles in the healthcare system.

Grouping providers in this way would avoid unnecessarily imposing restrictive SOP requirements on them and would essentially treat NPs the same as physicians in terms of their ability to provide care. This is not to suggest, however, that NPs and physicians are equivalent to one another. They are not, and NPs do not advocate otherwise.[221]

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[219] See, e.g., "Family Nurse Practitioner (FNP)," American Academy of Nurse Practitioners, last visited January 21, 2020, https://www.aanpcert.org/certs/fnp, which describes the national exam completed by family NPs; "Certification by the American Board of Internal Medicine," American Board of Internal Medicine, last visited January 21, 2020, https://www.abim.org/about/mission.aspx, which describes board certification in internal medicine.

[220] See generally Amar Gupta and Deth Sao, "The Constitutionality of Current Legal Barriers to Telemedicine in the United States: Analysis and Future Directions of Its Relationship to National and International Health Care Reform," *Health Matrix* 21, no. 2 (2012), 385, which discusses telemedicine and the national nature of healthcare provision.

[221] Maureen Cahill, senior policy adviser for the National Council of State Boards of Nursing, has explained, "these are not folks who want to be physicians, they want to be advanced providers in nursing. . . . It's a different thing than medical practice. There's a lot of overlap, but it's a different focus."; Jan Greene, "Nurse Practitioners to Docs, Lawmakers: Give Us Our Independence," *Managed Care* 27, no. 9, (September 3,

Additionally, NPs as a profession are not trained to provide the same range of services that physicians are. Within their education and training, however, both NPs and physicians (as well as other professions) can care for patients independently, even if physicians as a group provide a wider range of services than NPs as a group.

Creating a new healthcare professional licensing system like the one described here would almost certainly require the creation of a new agency with the Department of Health and Human Services. This new agency would be responsible for confirming that applicants have completed the requisite training, passed the required examinations, and obtained the necessary certifications to obtain a license within a given tier. Assuming these duties traditionally performed by state licensing boards would require substantial resources. However, Congress could build on existing capabilities when forming a new federal licensing agency. For example, the National Plan and Provider Enumeration System already exists to track healthcare providers across the country.[222] Congress could expand this system to accept initial licensing applications and license renewals while relying on professional organizations, such as medical testing organizations, to test the substantive knowledge of applicants as state boards have always done.[223]

2018), https://www.managedcaremag.com/archives/2018/9/nurse-practitioners-docs-lawmakers-give-us-our-independence.

[222] National Plan and Provider Enumeration System, last visited Jan. 19, 2021, https://nppes.cms.hhs.gov/#/.

[223] See US Medical Licensing Examination, last visited January 19, 2021, https://www.usmle.org/. The website explains the examination (USMLE) "is a three-step examination for medical licensure in the U.S. The USMLE assesses a physician's ability to apply knowledge, concepts, and principles, and to demonstrate fundamental patient-centered skills, that are important in health and disease and that constitute the basis of safe and effective patient care."

The type of federal scheme describe here could greatly simplify healthcare licensing in the United States and would address problems beyond restrictive SOP laws.[224] While this option may be attractive for its simplicity and its ability to effect independence across the country, it assumes a degree of political feasibility that may not exist. Such an approach would also destroy any semblance of federalism in the regulation of healthcare providers. Congress has proved unwilling to employ such an annihilative strategy in the past,[225] and even the COVID-19 pandemic may not be enough to encourage Congress to act. Groups opposed to this independence have been successful in lobbying state legislatures,[226] so even if Congress does decide to act, congressional action may simply give those groups a single target for their efforts.

In general, these problems and limitations may counsel in favor of a collective state action approach or an approach that emphasizes federalism. Future scholarship could dive into these problems that are ripe for solutions as the country continues to address the fallout of both the COVID-19 pandemic and the opioid epidemic. Neither these public health crises nor the myriad other problems (including chronic diseases like diabetes) are likely to yield to simplistic solutions, and future work could engage these problems by building on the empirical evidence reported and the reform paths outlined here.

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[224] For example, Medicare reimbursement rates differ across different types of providers, and standardizing types of providers could address the problems associated with differential reimbursement. See "The Integrity of MACRA May Be Undermined by 'Incident to Billing' Coding," *Health Affairs Blog,* January 8, 2018, https://www.healthaffairs.org/do/10.1377/hblog20180103.135358/full/, which describes one issue with Medicare reimbursement that occurs when NPs and physicians treat patients.

[225] Scheffler, "A Federalist Approach to Reforming Occupational Licensing," 350–51, which states that "Congress has historically proven unwilling to repeal important areas of state regulation wholesale, especially in health care."

[226] McMichael, "Healthcare Licensing and Liability," 306–11.

Conclusion

As access to healthcare has become a real problem for many more Americans in the wake of the COVID-19 pandemic, understanding the solutions to this temporary problem can elucidate ways to address the chronic and pervasive problem of access to care that many face outside the context of COVID-19. Many states have responded to these novel access problems by relaxing the SOP laws governing NPs, suggesting that this approach represents a viable policy option to increase access to care outside of the current pandemic. That so many states have proved willing to allow NPs greater autonomy implies that the safety concerns that have inhibited wider adoption of NP independence may not be well founded.

Evaluating the concern that granting NPs independence will systematically endanger patient safety, this paper offers novel evidence from an empirical analysis of NP independence. The opioid epidemic is intimately connected with patient safety concerns, and an empirical analysis of the impact of relaxing NP SOP laws on the most tragic consequences of this epidemic—opioid-related deaths—undermines the patient safety concerns raised by certain groups. Not only does allowing NPs to practice independently not exacerbate the opioid epidemic, but it also ameliorates the consequences of that crisis. Depending on which types of opioids are considered, death rates fall by between 5 and 11 percent.

The results of my empirical analysis, combined with the demonstrated willingness of many states to grant NPs independence temporarily, suggest that governments should investigate NP independence on a permanent basis. State legislative action is the most obvious and, for many reasons, the most desirable path to long-term independence. With many states balking at the opportunity to relax their SOP laws, however, the time has come

for policymakers and legal scholars to more seriously consider federal options for independence. Much work remains to be done on this front, but the empirical analysis reported in this paper has laid the groundwork for a data- and law-driven resolution to the SOP debate—a solution that can meaningfully improve access to care for millions of people.

Appendix

Table A1: Effect of Scope-of-Practice Laws on Opioid-Related Deaths

	(1)	(2)	(3)	(4)
	ln(opioid deaths per capita)	ln(prescription opioid deaths per capita)	ln(illegal opioid deaths per capita)	ln(synthetic opioid deaths per capita)
NP Independence	−0.098***	−0.079***	−0.057**	−0.113***
	(0.030)	(0.030)	(0.024)	(0.029)
Recreational Cannabis	−0.114***	−0.091**	0.127***	0.006
	(0.044)	(0.043)	(0.033)	(0.037)
Medical Cannabis	0.227***	0.243***	0.230***	0.308***
	(0.026)	(0.026)	(0.022)	(0.026)
PDMP	0.271***	0.275***	0.334***	0.423***
	(0.025)	(0.026)	(0.021)	(0.024)
Pain Clinic Legislation	−0.011	−0.022	−0.034**	0.008
	(0.022)	(0.022)	(0.016)	(0.019)
Medicaid Expansion	0.038	0.057**	0.035*	0.040*
	(0.025)	(0.025)	(0.019)	(0.024)
Median Household Income	0.000**	0.000**	−0.000	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Unemployment Rate, 16+	−0.011**	−0.013***	−0.016***	−0.018***
	(0.005)	(0.005)	(0.003)	(0.003)
ln(Number of Hospitals)	0.004	−0.000	−0.111***	−0.009
	(0.012)	(0.012)	(0.009)	(0.009)
Observations	40,822	40,822	40,822	40,822
R-squared	0.512	0.510	0.543	0.382

Notes: Dependent variables are listed above each results column. All regression models include a full set of county and year fixed effects. Standard errors clustered at the county level are reported in parentheses.

* significant at the $p < 0.1$ level
** significant at the $p < 0.05$ level
*** significant at the $p < 0.01$ level

Table A2: Effect of Scope-of-Practice Laws on Opioid-Related Deaths in Areas Falling within Rural-Urban Code 4

	(1)	(2)	(3)	(4)
	ln(opioid deaths per capita)	ln(prescription opioid deaths per capita)	ln(illegal opioid deaths per capita)	ln(synthetic opioid deaths per capita)
NP Independence	−0.338***	−0.308***	−0.109	−0.169*
	(0.086)	(0.093)	(0.118)	(0.092)
Observations	2,782	2,782	2,782	2,782
R-squared	0.543	0.544	0.510	0.411

Notes: Dependent variables are listed above each results column. All regression models include a full set of county and year fixed effects and control variables for median household income, unemployment rate, and the number of hospitals. Additionally, each model includes indicator variables for whether a state has a mandatory prescription drug monitoring program, allows access to recreational cannabis, allows access to medical cannabis, or has a law regulating pain clinics. Regressions include only counties that have a rural-urban continuum code of 4. Counties with this code have an "[u]rban population of 20,000 or more, adjacent to a metro area." Standard errors clustered at the county level are reported in parentheses.

* significant at the $p < 0.1$ level
** significant at the $p < 0.05$ level
*** significant at the $p < 0.01$ level

Table A3: Effect of Scope-of-Practice Laws on Prescription-Opioid-Related Deaths in Areas Falling within Rural-Urban Code 5

	(1)	(2)	(3)	(4)
	ln(opioid deaths per capita)	ln(prescription opioid deaths per capita)	ln(illegal opioid deaths per capita)	ln(synthetic opioid deaths per capita)
NP Independence	−0.299**	−0.264*	−0.133*	−0.193**
	(0.143)	(0.146)	(0.078)	(0.091)
Observations	1,196	1,196	1,196	1,196
R-squared	0.532	0.547	0.455	0.325

Notes: Dependent variables are listed above each results column. All regression models include a full set of county and year fixed effects and control variables for median household income, unemployment rate, and the number of hospitals. Additionally, each model includes indicator variables for whether a state has a mandatory prescription drug monitoring program, allows access to recreational cannabis, allows access to medical cannabis, or has a law regulating pain clinics. Regressions include only counties that have a rural-urban continuum code of 5. Counties with this code have an "[u]rban population of 20,000 or more, not adjacent to a metro area." Standard errors clustered at the county level are reported in parentheses.

* significant at the $p < 0.1$ level
** significant at the $p < 0.05$ level
*** significant at the $p < 0.01$ level

Table A4: Effect of Scope-of-Practice Laws on Illegal-Opioid-Related Deaths in Areas Falling within Rural-Urban Code 6

	(1)	(2)	(3)	(4)
	ln(opioid deaths per capita)	ln(prescription opioid deaths per capita)	ln(illegal opioid deaths per capita)	ln(synthetic opioid deaths per capita)
NP Independence	−0.168*	−0.130	−0.049	−0.157*
	(0.088)	(0.082)	(0.066)	(0.083)
Observations	7,696	7,696	7,696	7,696
R-squared	0.411	0.415	0.309	0.274

Notes: Dependent variables are listed above each results column. All regression models include a full set of county and year fixed effects and control variables for median household income, unemployment rate, and the number of hospitals. Additionally, each model includes indicator variables for whether a state has a mandatory prescription drug monitoring program, allows access to recreational cannabis, allows access to medical cannabis, and has a law regulating pain clinics. Regressions include only counties that have a rural-urban continuum code of 6. Counties with this code have an "[u]rban population of 2,500 to 19,999, adjacent to a metro area." Standard errors clustered at the county level are reported in parentheses.

* significant at the $p < 0.1$ level
** significant at the $p < 0.05$ level
*** significant at the $p < 0.01$ level