

# **Labor Supply Effects of Occupational Regulation: Evidence from the Nurse Licensure Compact\***

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## **ABSTRACT**

There is concern that state licensure requirements impede efficient mobility of licensed professionals to areas of high demand. Nursing has not been immune to this criticism, especially in the context of perceived nurse shortages and large expected future demand. The Nurse Licensure Compact (NLC) was introduced to solve this problem by permitting registered nurses to practice across state lines without obtaining additional licensure and making licensure easier to obtain for nurses moving between member states. We exploit the staggered adoption of the NLC across states and over time to examine whether a reduction in licensure-induced barriers alters the nurse labor market. Using data on over 1.5 million nurses and other health care workers from the 1990 and 2000 Census and the 2006-2012 American Community Surveys as well as data from the 1992-2012 Current Population Survey, we estimate the effects of NLC adoption on labor supply and commuting outcomes. We find no evidence that the labor supply or mobility of nurses increases following the adoption of the NLC, even among the residents of counties bordering other NLC states who are potentially most affected by the NLC. This suggests that nationalizing occupational licensing will not substantially reduce the labor market frictions caused by occupational regulation.

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## **1 Introduction**

Occupational licensing is pervasive in the US and Europe. Nearly 29% of the US workforce requires a federal- or state-granted license to practice or work in their occupation (Kleiner and Krueger 2008; Thornton and Timmons, 2013) and over 800 occupations are licensed by at least one state (Kleiner 2000). While licensing is meant to protect consumers and ensure safety by certifying provider quality, it also may create rents for incumbent members of the occupation.

One mechanism through which licensing could restrict supply is by impeding geographic mobility. Since licensing and certification is primarily at the state level, workers typically must obtain separate licenses for each state in which they work, even if their jobs are identical. In addition, workers typically must obtain a new license whenever they move to another state. Such a barrier to mobility may prevent workers from seeking jobs across state lines, misallocating workers geographically and depressing employment and labor force participation. Moreover, licensed professionals may be less likely to move to areas of high demand. The Department of Treasury Office of Economic Policy, the Council of Economic Advisers, and the Department of Labor recently released a report detailing the best practices of occupational licensing (U.S. Department of the Treasury Office of Economic Policy, Council of Economic Advisers, and the Department of Labor, 2015). The report acknowledges that while licensing improves service quality, it can create economic inefficiencies by restricting worker mobility, reducing employment opportunities for excluded workers, and increasing costs to consumers. The report suggests that states should try to harmonize requirements and recognize licenses from other states.

In this paper, we examine the impact of such a policy on the labor market for nurses, exploiting a unique policy change that made it substantially easier for nurses to work and, to a lesser extent, move across state lines. Nursing is an important occupation to focus on, as the availability of nurses is important for community health, hospital care, and disaster relief. Furthermore, an already acute nursing shortage is expected to increase over the next decade, as more nurses retire and the aging population increases demand for health care services (Buerhaus, Staiger, Auerbach, 2009). Insurance expansions embodied in the Affordable Care Act may only exacerbate this shortage. Removing licensing barriers is one mechanism to better utilize the existing supply of trained nurses. The ability for technology to improve health care delivery is also hampered by cross-state licensing barriers for health care workers, which makes telemedicine

difficult legally (Sulentic 1991) as health providers must be licensed in the states in which their patients reside.

Surprisingly, compelling evidence on the impact of licensing on the geographic scope of labor markets is thin. Several studies, dating back a half-century, document a cross-sectional correlation between licensing restrictions and interstate mobility of professionals (Holen, 1965; Pashigian, 1979; Conrad and Dolan, 1980; Kleiner, Gay, and Greene, 1982). A challenge with this cross-sectional analysis is that licensure practices may correlate with other unobserved state-level attributes that influence migration. Peterson, Pandya, LeBang (2014) address this problem by exploiting changes in residency training requirements for immigrant physicians within states over time, finding that states that impose more stringent requirements receive fewer immigrant physicians. We add to this literature by examining a recent policy change, the Nurse Licensure Compact (NLC), with a compelling research design that lets us control for several sources of bias that may confound previous estimates. This study is the first to provide direct evidence on the likely effects of nationalizing licensure for a large and important occupation.

The NLC was introduced to reduce licensing burdens by permitting registered nurses living in member states to practice across state lines. It also made licensure easier to obtain for nurses moving between member states. Twenty-five states have implemented the NLC since its inception in 2000 and another six states currently have NLC legislation pending. We exploit the staggered adoption of the NLC across states and over time to examine whether a reduction in licensure-induced barriers is associated with a greater labor force participation and hours worked, greater likelihood of cross-state commuting, and longer travel time to work among nurses. We estimate difference-in-differences models, comparing nurses in states adopting the NLC to those in states that do not. While this controls for time-invariant characteristics of states that may correlate with both labor market outcomes and licensure laws, state-specific time-varying factors may still bias estimates of the policy. A unique feature of our setting is that we are able to use non-nurse health workers (who are not affected by the NLC) to construct triple difference models to control for any health care labor market changes that may happen to correlate with NLC adoption. We find that this feature is important, as results from the triple difference models are different than those from the basic difference-in-differences approach for several outcomes, suggesting a time-varying source of bias in the latter. Since many workers may be unaffected by the Compact since they do not live near another Compact state, we also implement a similar

research design focused on residents of counties that border other states. Even within NLC states, some counties share a border with another NLC state, while others do not.

Using data on over 1.5 million nurses and other health care workers from the 1990 and 2000 Census and the 2006-2012 American Community Surveys, we find no effect of NLC adoption on a variety of labor market outcomes of nurses such as labor force participation, employment levels, hours worked, earnings, and likelihood of working across state lines. This null effect persists even when focusing on those workers most likely to be affected by the NLC. That is, we estimate the treatment effect of living in a border county in a Compact state that also borders another Compact state and find no effect on the same labor market outcomes. We do find positive effects of NLC adoption on travel time to work for nurses living in MSAs, but discount this finding as we do not see a similar increase those living in border counties. We supplement our main analysis with data from the Current Population Survey to test if there are systematic pre-trends in workforce characteristics or labor supply outcomes before the introduction of the NLC. We find little evidence to suggest that pre-trends may be biasing our difference-in-difference estimates nor is there any evidence that NLC adoption is associated with greater labor supply.

The paper is organized as follows. We provide background on nurse licensing and the NLC and review the literature on occupational regulation in Section 2. Next, our methods and data are described in Section 3 and results are discussed in Section 4. Finally, Section 5 offers some concluding remarks.

## **2 Background**

### **A. Nurse Licensure and the Nurse Licensure Compact**

In 1947, New York became the first state to require mandatory licenses for nurses. Today, every state requires a nurse to obtain a license to practice within the state (Benefiel, 2011). Obtaining a license typically requires passing a licensing examination and meeting requirements that are set by each state individually. The exams for registered nurses and licensed practical nurses differ from each other and although the exams may differ by state, there has been a trend toward uniformity in recent years (Barnum, 1997). Besides an examination, there are monetary costs associated with obtaining an initial license in a state. For example, in the state of California, the examination registration fee is \$200 plus the fee for verification of licensure (\$60) plus the application fee of \$100. If a nurse is licensed in another state, he/she must pass the California exam

and pay all of the same application fees before obtaining a California nursing license.

The Nurse Licensure Compact (NLC) was first passed in 1999 by Utah and Arkansas, and first implemented by Maryland, Texas, Utah, and Wisconsin in 2000. The compact allows a nurse licensed in one NLC-member state to practice in other NLC states without obtaining a separate license for the other state. Each state that is a member mutually recognizes other member states. Since its introduction, 25 states have implemented the Nurse Licensure Compact and another six states currently have NLC legislation pending.<sup>1</sup> Figure 1 depicts the number of states that are part of the NLC over time. While about half of the states joined the Compact in its first two years of existence, an average of 1-2 states per year have continued to join the compact since. Figure 2 identifies the Compact states in 2000 (its first year) and 2012 (the last year of our analysis). It is worth noting that each member state currently has another member state that is adjacent to it except for Rhode Island (although Massachusetts currently has legislation pending).

In order for a state to join the NLC, they must meet four requirements. First, the bill language drafted by state legislators must mirror that of the “NLC Model Legislation,” which is provided by the National Council of State Boards of Nursing. The model legislation is attached as Appendix B. Second, the state legislature must pass the legislation. Third, the State Board of Nursing must implement the Compact.<sup>2</sup> Finally, the state must pay \$3000 per year to keep their membership in the NLC active. The NLC applies to registered nurses (RNs), licensed practical (LPNs) and licensed vocational nurses (LVNs) only.<sup>3</sup> To be eligible for a multistate license, a nurse’s primary state of residence must be a compact-member state. As long as a nurse declares a compact state as a primary state of residence and the nurse is in good standing, the license automatically becomes a multistate license and the nurse can practice physically or electronically in other compact states. If a nurse works in a compact states but lives (i.e. has a primary state of residence) in a non-compact state, he/she is not eligible for a multistate license.

If a compact-eligible nurse permanently relocates to another compact state, that is, the nurse obtains a new driver’s license, votes, or files taxes in another state, the nurse must apply for licensure by endorsement and declare the new state as his/her primary state of residence. This must be completed within 30 to 90 days of moving (depending on the state), although some states are

<sup>1</sup> Table A1 in the Appendix lists the date of implementation for each Compact state.

<sup>2</sup> The takes approximately one year from the time the bill is passed.

<sup>3</sup> Advanced Practical Registered Nurses (APRNs) do not fall under the NLC, but instead have their own separate APRN Compact that provides for a multistate license.

currently in the process of amending the amount of time a nurse may practice with a license issued by another state. By contrast, nurses moving from or to a non-Compact state must obtain a license in the new state before they can practice in the new state. Thus movement between Compact states provides nurses with a grace period of one to three months in which they can work that is not experienced by residents of non-Compact states. Figure 3 provides a flow chart explaining the process through which a new nursing graduate obtains either a single-state or multi-state license.

Advocates of the NLC cite five main benefits. First, The NLC clarifies the authority to practice for many nurses currently engaged in telenursing or interstate practice. Second, the NLC provides greater mobility for nurses. (They cite the U.S. Department of Health and Human Services Health Resources and Services Administration's 2010 report, "Health Licensing Board Report to Congress" as evidence.) Third, the NLC improves access to licensed nurses during a disaster or other times of great need for qualified nursing services. Fourth, the NLC improves access to nursing care. Finally, the NLC enhances discipline and information-sharing among participating states.

## **B. Related Literature on Occupational Licensing**

Relative to its prevalence, there is little research on the labor market effects of occupational licensing and restrictions.<sup>4</sup> Prior work on the labor market effects have focused primarily on wages, generally finding that restrictive licensing is associated with higher wages (Thornton and Timmons, 2013).<sup>5</sup> Using unique data on the dental health of Air Force recruits, Kleiner and Kudrle (2000) find that restrictive licensing increases dental prices and earnings of dentists. Weeden (2002) finds that licensed occupations have higher wages, controlling for a whole host of other individual- and occupation-specific determinants of earnings, such as the skill and task requirements of the job and education level. Kugler and Sauer (2005) find very large returns to acquiring an occupational license among immigrant physicians in Israel. A unique feature of their study is that they exploit variation in licensing that is driven by a policy that assigns immigrant physicians to different re-training regimes based on their experience. This represents an advance over much of the prior literature, which simply compared licensed with similar unlicensed

<sup>4</sup> Kleiner (2000) and Kleiner (2006) provide an overview of much of the theoretical and empirical literature on occupational regulation.

<sup>5</sup> There is also a very small literature on the effect of licensing on provider and service quality (Kleiner and Kudrle 2000; Angrist and Guryan, 2003) and output markets (Schaumans and Verboven, 2008; Hotz and Xiao, 2011; Kleiner, Marier, Won Park, and Wing 2011; Stange, 2014).

occupations. More recently, Kleiner and Park (2010) and Kleiner, Marier, Won Park, and Wing (2011) find that changes in occupational regulations for dental hygienists and nurse practitioners, respectively, increase wages for these occupations.

While the evidence of licensing's effect of wages is robust, there is little direct evidence on whether reduced labor supply or mobility is the primary channel. Several studies document a cross-sectional correlation between licensing restrictions and interstate mobility. Fifty years ago, Holen (1965) found that the in-migration of dentists, lawyers, judges, physicians, and surgeons was higher in states that had easier re-licensing. Pashigian (1979) found that the in-migration of lawyers was hampered by restrictive licensing. Kleiner, Gay, and Greene (1982) examined mobility in 14 different occupations as it relates to licensure restrictiveness. They found that states with less restrictive licensing and easier endorsement from other states have higher rates of in-migration. Thus restrictive licensing creates a barrier to mobility, misallocating workers across states. Thornton and Timmons (2013) add to this evidence by showing that the occupational regulation of massage therapist through state licensing appears to reduce the number of massage therapists, while Zapletal (2014) finds no effect of occupational licensing on the number of cosmetologists. Conrad and Dolan (1980) showed that reciprocity rules limit the migration of professions into restrictive states. A challenge with these cross-sectional analyses is that licensure practices may correlate with other state-level attributes that influence migration (beyond the variables controlled for). Peterson, Pandya, LeBang (2014) address this problem by exploiting changes in residency training requirements for immigrant physicians within states over time, finding that states that impose more stringent requirements receive fewer immigrant physicians. We add to this literature in four ways. First, the nature of the policy change which affected nurses but not other health workers permits us to estimate triple difference models, which control for time-varying sources of demand for health care workers that may happen to correlate with NLC adoption. Second, our analysis of residents of border counties permits us to narrowly focus on the individuals most likely to be affected by exposure the change in licensure regime. Third, we study a very recent policy change, whereas most of the literature relies on data from forty years ago, when labor market institutions and structures may have been quite different. Finally, we examine nurses, who are the second largest licensed profession behind teachers (Kleiner 2000) and whose supply and geographic distribution are targets of extensive policy deliberation.

### **3. Empirical Approach**

#### **A. Data and Samples**

We analyze nurses and other health care workers surveyed in the public use micro surveys of the 1990 and 2000 U.S. Census and the 2006 to 2012 American Community Survey (ACS) harmonized by IPUMS-USA.<sup>6</sup> The ACS is an ongoing survey that provides yearly information about communities in the years between the Decennial Censuses. Detailed information is collected about age, sex, race, income, education, where one works, commuting distance, where one lives, as well as occupation. Current labor force participation and employment status are collected, as is the usual hours worked and wage or salary income from the prior year. The Census data provides similar information, albeit on a ten-year basis and for larger samples. While the ACS helps provide additional information in the years when states are joining the NLC, the Census data provides information before the advent of the NLC. Both identify Registered Nurses (RNs) and Licensed Practical Nurses (LPNs) specifically, who are both subject to the NLC.

Our data include all workers in health occupations, including nurses, physicians, medical assistants, home health aids, and several other smaller occupational categories.<sup>7</sup> Non-nurse health care workers are not subject to the Nurse Licensure Compact but work in similar settings and thus potentially form a good control group with which to compare RNs and LPNs. Locational information allow us to identify whether an individual lives and/or works in a NLC state as well as whether they live in an MSA. Our full sample includes 1.5 million health workers, about 38% of which are nurses.

For some of our analysis we focus on individuals residing in counties on state borders. Of the 3142 counties in the U.S., approximately one-third border at least one other state. However, the county of residence is identifiable for only a subset of the sample in the Census/ACS. Specifically, respondents are assigned to census-constructed areas of 100,000 residents called Public Use Micro Areas (PUMAs), which do not cross state lines. Thus county of residence is identifiable in cases where the PUMA uniquely identifies a county (i.e. county is coterminous with a single PUMA or is composed of multiple PUMAs that do not extend into other counties). Approximately 380

<sup>6</sup> We also estimated some models using the National Sample Survey of Registered Nurses (NSSRN) for years 1980-2008. This data does not allow us to compare nurses to other health workers, which we find is important. These results are available upon request.

<sup>7</sup> Occupation is collected for all persons age 16+ who had worked within the previous five years, excluding new workers with no experience. Since our sample is based on occupation, we necessarily exclude individuals who have not worked for five years. Thus, our analysis should be interpreted as conditional on having some reasonable amount of attachment to the labor force.

counties are identifiable in our sample each year, accounting for 57% of the full sample. Across all years, the sample includes 186 border counties in 44 states. Identifiable counties are necessarily larger than average, so conclusions from our border county analysis may not necessarily apply to residents of small or rural communities. Our border county sample represents 21% of the full sample and includes 327,590 health workers, 37% of which are nurses.

Table 1 provides summary statistics for our full and border county samples of nurses and all health workers across all years. Statistics are shown separately by whether the individual currently lives in a compact state. Across all states and years, 3-4% of nurses and other health workers commute across state lines to work, with an average travel time of 23 to 24 minutes (among those that work). Cross-state commuting and travel time are both higher among workers living in Compact states. Eighty-seven percent of the nurses in the sample are currently in the labor force, with almost all of those who are labor force participants being currently employed, working an average of 34 hours and earning \$32,600 the previous year.<sup>8</sup> Unsurprisingly, residents of border counties are much more likely to commute across state lines to work, with the average rising to 6% for all health workers and 7% for nurses. Labor force participation, earnings, and travel time to work is also higher among these individuals, though hours worked are quite similar to the full sample.

Interestingly, nurses are more mobile and have greater labor force participation rates when the Compact is in place. This pattern is most striking for nurses in border counties: individuals residing in and bordering a Compact state are about twice as likely to commute across state lines than individuals that do not. However, many of these patterns are also observed for the broader sample of health workers, even though two-thirds of them should be unaffected by the Compact. Furthermore, there are some observed differences between nurses and other health workers residing in Compact states or treated counties that could also relate to labor market outcomes. Workers exposed to the NLC are slightly older, have smaller families, and are less likely to be immigrants (naturalized citizens or not). These differences underscore the need to more carefully control for observed and unobserved characteristics of workers and locations that may correlate with NLC exposure.

For supplemental analysis, we also analyze nurses and other health care workers included

<sup>8</sup> Nurses have among the lowest unemployment rates of any occupation. The implied unemployment rate of 2% in our sample is consistent with official rates reported by the Bureau of Labor Statistics.

in the March Current Population Surveys from 1992 to 2012, harmonized by IPUMS-CPS. The CPS is a monthly labor force survey of the U.S. population; the March supplement collects detailed information about family characteristics, household composition, marital status, education attainment, and prior year work experience, among others. A limitation of the CPS is that occupation is only collected for individuals that are currently in the labor force and a small share of people not in the labor force. Thus the CPS is not useful for examining labor force participation. Furthermore, small sample sizes limit the inferences that can be drawn using CPS data. However, the CPS is available annually, which permits us to test for pre-trends leading up to the adoption of the NLC for some of our outcome variables and many worker characteristics. Summary statistics for the CPS sample are presented in Appendix Table A2.

## B Identification Strategy and Method

The raw summary statistics suggest that nurses have greater labor supply and are more mobile when the NLC is in place. However, this raw correlation is unlikely to provide a good estimate of the causal effect of the policy on labor supply or worker mobility. Time trends, state characteristics, worker characteristics, or labor market shocks that happen to correlate with the presence of the NLC are likely to bias estimates of its effect. To address these, we exploit the fact that states adopted the NLC at different times and that it only pertained to nurses to construct several difference-in-difference estimates of the effect of exposure to the Compact.

### State-Level Analysis

Our first approach is to compare changes in outcomes of nurses between states that adopted the NLC with those that did not during the same time period. We begin by estimating simple difference-in-difference models on the sample of registered and licensed practical nurses using regressions of the form:

$$Y_{ist} = \beta_0 + \beta_1 Compact_{st} + \beta_x X_{ist} + \gamma_s + \gamma_t + \varepsilon_{ist} \quad (1)$$

Our dependent variable,  $Y_{ist}$ , is the outcome (indicators for labor force participation, employed, usual hours worked, log of wage or salary income, works in different state and the the natural log of the average commute time to work) for individual  $i$  residing in state  $s$  during year  $t$ .  $Compact_{st}$  is an indicator for whether state  $s$  is a compact state in year  $t$ . Aggregate time trends in the

prevalence of cross-state commuting and employment are accounted for by year fixed effects  $\gamma_t$ . State fixed effects control for average differences in commuting and employment prevalence across areas that may be related to the adoption of the NLC. For instance, states that typically have many nurses commuting across the border may have a greater incentive to join the compact. In some specifications, we also control for time-varying individual  $X_{ist}$  characteristics, such as worker demographics that may influence outcomes and also happen to correlate with adoption of the compact. The coefficient of interest  $\beta_1$  is the change in outcomes following the adoption of the NLC relative to the time pattern experienced by other states. Standard errors are clustered at the state level, to address the possibility that observations within states are not independent.

The simple difference-in-differences specification assumes that outcomes for treatment and control states would trend similarly in the absence of treatment. Labor market trends and shocks could violate this assumption if, for instance, states adopt the NLC in anticipation of growing demand for nurses or as a response to declining supply. The typical approach to ruling out this form of violation is to look for evidence of differential trends between Compact and non-Compact states before the former enact the NLC. Unfortunately we do not have enough high frequency data to evaluate pre-trends in the Census/ACS data. However, several features of the NLC naturally facilitate variations on the basic specification to probe the validity of this main identifying assumption. Most importantly, we exploit the fact that only nurses (registered and licensed vocational/practical) are affected by the compact while other health professionals (physicians, medical assistants, etc.) are not to construct a triple difference estimator. We first estimated (1) on the sample of non-nurse health workers and test whether there is any “effect” on these workers when there should not be. We then explicitly use these workers as a control group, and estimate the following model of the form:

$$Y_{ist} = \beta_0 + \beta_1 Compact_{st} + \beta_2 Nurse_{ist} + \beta_3 Compact_{st} * Nurse_{ist} + \beta_x X_{ist} + \gamma_s + \gamma_t + \varepsilon_{ist} \quad (2)$$

The coefficient on  $Compact_{st}$  captures any change in commuting patterns among non-nurse health care workers that are correlated with NLC adoption. The coefficient on the interaction term  $Compact_{st} * Nurse_{ist}$  captures the differential impact on nurses and is our coefficient of interest.

This specification controls for any time-varying labor market shocks that similarly affect nurses and other health care workers.

### **Border County Analysis**

Since Compact states likely include many individuals that are minimally affected by the Compact because they do not live close to another Compact state, our second approach focuses specifically on residents of the 186 border counties identified in the data. For each county in each year, we construct the variable  $Treatment_{ct}$  which equals one if county  $c$  is in a Compact state and borders at least one other compact state in year  $t$ . We then compare changes in outcomes of nurses between border counties that experienced this treatment with those that did not during the same time period. Figure 4 depicts this strategy graphically. Border counties are categorized by whether they are in a Compact state and whether they border another Compact state in 2000 and 2012. Treatment counties are marked in black – they are both in a state that is part of the Compact and border another state that is also part of the Compact. The experience of these counties over time is compared to all other border counties, including those in the same state that happen not to border another Compact state (dark grey) and those in non-Compact states (light grey).

This approach is implemented by estimating regressions of the form:

$$Y_{ict} = \beta_0 + \beta_1 Treatment_{ct} + \beta_x X_{ict} + \gamma_c + \gamma_t + \varepsilon_{ict} \quad (3)$$

Aggregate time trends in the prevalence of cross-state commuting and employment among residents of border counties are accounted for by year fixed effects  $\gamma_t$ . County fixed effects control for average differences in commuting and employment prevalence across counties that may be related to the adoption of the NLC by the own or bordering state. Standard errors are clustered at the state level, though we also estimate models clustering by county. In addition, we estimate several alternative specifications to rule out various forms of bias. First, we include state-specific year fixed effects, exploiting variation across counties within the same state. Counties that border states that are not part of the NLC serve as the counterfactuals for the counties in the same state that happen to border a NLC state. For example, counties along South Carolina’s border with North Carolina (a Compact state) are compared to those along its southern border with Georgia (not a Compact state). We also restrict analysis only to border counties in NLC states or just to the treated counties, thus letting the time trends be estimated from counties that are arguably more similar to the treated counties.

Following our state-level analysis, we also estimate triple difference models using non-nurse health workers as a control group to account for any changes in employment or commuting that happen to correlate with treatment:

$$Y_{ict} = \beta_0 + \beta_1 Treatment_{ct} + \beta_2 Nurse_{ist} + \beta_3 Treatment_{ct} * Nurse_{ist} + \beta_x X_{ict} + \gamma_c + \gamma_t + \varepsilon_{ict} \quad (4)$$

The coefficient on the interaction term  $Treatment_{ct} * Nurse_{ist}$  captures the differential impact of exposure to the NLC on nurses and is our coefficient of interest. This specification controls for any time-varying labor market shocks that similarly affect nurses and other health care workers in border counties exposed to the NLC.

### Supplemental Analysis with CPS

It is possible that there are systematic pre-trends in workforce characteristics and labor supply outcomes before the introduction of the NLC. To test for such pre-trends in several of our outcome variables we estimate event-study models using the Current Population Survey (CPS). The CPS provides information on employment, labor force participation, migration of workers, as well as an extensive variety of demographic characteristics of survey participants. Using data from 1992-2012, we estimate the following model for all registered nurses and licensed practical nurses:

$$Y_{ist} = \beta_0 + \sum_{n=-N}^N Compact_{ist}^n \beta_n + \beta_x X_{ist} + \gamma_s + \gamma_t + \varepsilon_{ist} \quad (5)$$

where  $Y_{ist}$ , is the outcome for individual  $i$  residing in state  $s$  during year  $t$ , including hours worked the week before the survey date, usual hours worked, weeks worked in the prior year, whether the individual moved to a different state last year, and whether the individual moved for his or her job.  $Compact_{ist}^n$  are a set of dummy variables indicating each observation's timing relative to the introduction of the compact. The omitted category is the year prior to the Compact's implementation.  $X_{ist}$  is a vector of demographic controls (race, gender, age, age<sup>2</sup>, marital status, education, household size, and number of children in household),  $\gamma_s$  and  $\gamma_t$  are state and time fixed-effects, respectively, and standard errors are clustered at the state level.

We also estimate a modified specification on all health workers, using non-nurses as a within-Compact control group for nurses. In other words, we estimate:

$$Y_{ist} = \beta_0 + \sum_{n=-N}^N Compact_{ist}^n \beta_n + \sum_{n=-N}^N Compact_{ist}^n * Nurse_{ist} \beta_n + \beta_x X_{ist} + \gamma_s + Nurse * \gamma_t + \varepsilon_{ist} \quad (6)$$

where  $Compact_{ist}^n * Nurse_{ist}$  is a set of indicators for the interaction term and, again, indicate

relative timing to the introduction of the compact.  $Nurse * \gamma_t$  are nurse-year fixed effects, and standard errors are clustered at the state level.

Finally, it is possible that demographic characteristics of the sample are systematically changing over time. For instance, suppose education or family size changes in conjunction with the introduction of compact. This could lead to changes in workforce trends that are incorrectly attributed to the introduction of the compact. To examine how worker characteristics change in relation to the start of the compact, we also estimate (5) using various control variables as outcomes (but excluding control variables on the right hand side). As a parsimonious way of examining changes in worker characteristics, we also construct an index of workers' propensity to participate in the labor force based on observed characteristics and estimate (5) with this index as the outcome. This index was constructed by estimating (via a Probit model) the relationship between labor force participation and our full set of control variables in the Census/ACS sample, then predicting out of sample in the CPS.

### **Threats to Identification**

Since occupational licensing regimes are not experimentally assigned, there are several possible threats to identification that confound estimates of the effect of NLC participation. First, it is possible that other policies are adopted simultaneously with the NLC that only impact nurse labor markets (but not other health workers). We are not aware of any such policies, but cannot rule this out entirely. We think this type of bias is unlikely to affect our border county analysis since treatment depends on the actions of multiple states. Second, our approach takes residency location decisions as exogenous. If the NLC also impacts where nurses choose to live, our estimates may confound true causal effects with changes in the composition of nurses who work in compact states. We explore the robustness of our results to including or excluding observed worker attributes such as education, sex, age, nativity, and family structure and also specifically examine trends in these characteristics leading up to and following states' adoption of the Compact. Finally, we take workers' occupational classification as given, ignoring movements between nursing and other occupations. If the NLC actually alters who enters or remains in nursing (vs. other occupations), then this could create selection bias of unknown direction. Our labor supply results should be interpreted as conditional on choosing to become or remain a nurse.

## 4. Results

### A. State-level analysis

Tables 2 and 3 present our main results for the full sample and each of our labor supply and commuting outcomes, respectively. All specifications include year fixed effects, state fixed effects, and the full set of demographic and background controls. The first column for each outcome presents difference-in-difference estimates on the sample of nurses, as described by equation (1).<sup>9</sup> Contrary to expectation, these difference-in-difference estimates imply that NLC adoption is actually associated with lower levels of labor force participation, employment, and labor supply among nurses (and lower wage income, though the estimate is insignificant). The inclusion of demographic controls has little impact on diff-in-diff point estimates (not reported), suggesting that worker composition does not change dramatically when the NLC is adopted. We only report estimates with controls included, as these are more precise.<sup>10</sup> In Table 3 we find that cross-state employment and commute time (among the employed) has minimal association with the adoption of the Compact, though the likelihood of working in a different state that is also part of the Compact does increase significantly following adoption.

These basic difference-in-difference estimates are biased if nurses are subject to other policy or labor market shocks or trends that coincide with NLC adoption, such as states adopting the NLC in response to a declining supply of nurses. In this case, states that do not join the NLC would be an inappropriate control for the states that do. The typical approach to ruling out this form of bias is to look for evidence of differential trends between Compact and non-Compact states before the former enact the NLC. Unfortunately the Census/ACS data is not available at a high enough frequency to evaluate pre-trends. However, the second column for each outcome presents a placebo test, repeating the difference-in-difference specification but for the sample of non-nurse health workers. Though subject to many of the same labor market and economic shocks as nurses, these workers should be unaffected by the adoption of the NLC. In fact, many estimates are qualitatively similar for nurses and non-nurses, suggesting that NLC adoption may be

<sup>9</sup> The full set of estimates, including the controls, is reported in the Appendix Table A3. Many relationships are as expected: nurses that are more educated have higher labor force attachment and earnings; nurses with young children or larger families work fewer hours.

<sup>10</sup> State and year fixed effects do have a material impact on estimates, suggesting that states adopting the NLC have different labor market characteristics than those that do not and that participation and labor supply are trending over time. Inclusion of demographic controls has little impact on diff-in-diff point estimates (but does improve precision), suggesting that worker composition does not change dramatically when the NLC is adopted.

coinciding with other trends. The third column for each outcome presents triple difference estimates (equation 2), explicitly using non-nurse health workers as a control group that should be unaffected by NLC adoption. In these specifications the parameter of interest is the the interaction between living in a compact state and being a nurse. Estimates are reduced towards zero and tend to be insignificant for almost all outcomes.

Triple difference point estimates suggest that labor force participation, employment, hours worked, or wage income of nurses are unaffected (relative to non-nurse health workers) by the adoption of the NLC. In addition, this result implies that the coefficient on equation (1) is biased downward as those states that join the NLC have declining labor supply following NLC adoption for all health workers, not just nurses. Estimates are sufficiently precise that we can rule out small positive effects on labor force participation (95% CI = -0.007 to 0.004), employment (-0.010 to 0.004), and hours worked of (-0.317 to 0.912). Estimated effects on cross-state employment are positive but small and imprecise, though we do find nurses spend approximately 4% more time commuting to work (significant at the 1% level) than other health workers when the NLC is adopted.

Since workers in urban areas may have different commuting and labor supply patterns than workers in rural areas, it is possible that NLC effects could vary with the size of the market . To examine this, we estimate equations (1) and (2) but stratify by nurses and health workers living in an MSA and those who are not assigned to an MSA. Table 4 presents the results. Estimates of equation (1) suggest that workers in urban areas have different work force patterns than workers in rural areas. Specifically, the coefficients on *Compact* for labor force participation, employment, usual hours worked last year, and commuting time are negative and statistically significant for those living in an MSA. Estimates for non-MSA residents tend to be smaller and insignificant.. Furthermore, when estimating whether a nurse works in a different state, the coefficient on *Compact* for nurses living in an MSA is negative and statistically insignificant, implying no effect, while it is positive and statistically significant for those not living in an MSA.

The estimates of equation (1) imply that NLC is associated with a reduction in labor supply for workers in MSAs, but not for those outside of MSAs. However, once we expand our sample to include all health-workers and estimate the triple difference specification in equation (2), most of these patterns attenuate. The only statistically significant treatment effect (indicated by the interaction term) is on comuting time for those living in MSAs. The coefficient indicates that the

introduction of the compact increased commuting time by approximately 3.7% (significant at the 1% level) for nurses living in MSAs. Estimates are insignificant for every other outcome, for both MSAs and non-MSAs, similar to the full (unstratified) sample. These results imply that the estimates from equation (1) are biased downward and those states that join the NLC have declining labor supply following NLC adoption for all health workers.

## **B. Border County Analysis**

One limitation of the state-level analysis presented in Tables 2 and 3 is that the benefits of the NLC likely accrue to only a modest share of nurses in each Compact state. Many may not have opportunities to work in another Compact state, either because of prohibitive distance or because the nearest state is not part of the Compact. In order to focus on nurses most likely to be affected by participation in the Compact, we estimate difference-in-difference and triple difference models exclusively on residents of the 186 border counties identified in our data. Our main explanatory variable is now an indicator for whether the individual resides in a Compact state and borders at least one other state that is also a Compact member. Thus variation in treatment arises both because individuals' own state joins the NLC and bordering states do.

Tables 5 and 6 report border county estimates for labor supply and commuting outcomes, respectively. Even for nurses for whom the NLC expands the geographic reach of their credential the most, we see no increase in labor supply, measured by labor force participation, employment, or hours worked. In fact, point estimates for these outcomes are all negative (and insignificant). Triple difference models, using non-nurse health workers as a within-Compact control group, yield similarly null results. Precision is such that for the triple difference estimates, we can rule out small positive effects for labor force participation (95% CI = -0.015 to 0.007), employment (-0.020 to 0.003), hours worked (-0.440 to 0.497), and wage/salary income (-0.087 to 0.019). In Table 6, estimated effects on cross-state employment and commute time are insignificant in the triple difference model, though imprecision prevents us from ruling out modest positive effects.

Table 7 explores the robustness of the border county difference-in-differences estimates to alternative specifications and controls. Column (1) repeats our base model, which includes county and year fixed effects and full controls. In specification (2) we demonstrate that the inclusion of an extensive vector of observed characteristics have virtually no impact on our point estimates. The characteristics are quite predictive of each outcome (e.g. the R-squared improves from 0.01 to 0.13

when controls are included in the model for hours worked), but do not alter the estimated relationship between treatment and outcomes. The implication is that NLC implementation is uncorrelated with observed changes in nurse characteristics.

Our base specification uses the experience of all border counties to form the counterfactual time path for counties exposed to the NLC treatment. The next three columns relax this feature and use the experience of counties that are arguably more similar to treated counties to construct counterfactuals. In (3) we include state-specific year fixed effects, which implicitly compares treated border counties to border counties in the same state that happen to not border another Compact state. For example, counties along South Carolina's border with North Carolina (a Compact state) are compared to those along its southern border with Georgia (not a Compact state). Similar comparisons can be made in Arizona, Arkansas, Colorado, Iowa, Maryland, Mississippi, Nebraska, New Hampshire, Tennessee, and Texas. Specifications (4) and (5) restrict analysis to only states that had ever joined the NLC and only to treated counties, respectively. In these specifications time trends are estimated from counties that are part of states that have chosen to join the NLC, so should experience a similar policy environment. With a few exceptions, the (mostly null) results from the base model are quite robust to these alternative ways of constructing the counterfactuals. We find no obvious evidence that exposure to the NLC expanded nurse labor supply on either the extensive or intensive margin. The only consistent and significant result we observe is that NLC exposure is associated with a greater likelihood of working in another compact state (Panel F), though we discount this finding as it is not seen in the triple difference model in Table 6. Lastly, our decision to cluster standard errors at the state (rather than county) level has minimal impact on our inference (specification 6).

### **C. CPS Analysis**

The key assumption of the difference-in-difference approaches above is that the treatment counties and states would have followed similar trends as non-treatment counties/states in the absence of exposure to the NLC. While inherently not testable, this assumption is more plausible in cases where outcomes and sample characteristics are trending similarly for treated and non-treated groups in the years leading up to NLC adoption. A weakness of the Decennial Census/ACS data is that it is not available at a sufficiently high level of frequency to do such a test for pre-trends. For this we turn to the CPS, which is available annually, albeit with smaller samples.

Figure 5 presents event-study estimates of NLC introduction on the characteristics of nurses. As a parsimonious way of combining many covariates, we construct an index which captures individuals' propensity to participate in the labor force. This index was constructed by estimating (via a Probit model) the relationship between labor force participation and our set of control variables in the Census/ACS sample, then predicting out of sample in the CPS.<sup>11</sup> As measured by this index, there is no obvious change in nurse characteristics leading up to and following the adoption of the NLC by states. Some individual characteristics do experience modest changes (see Appendix Figure A1), but taken together these have no systematic pattern with labor force participation. This echoes our earlier finding that controlling for observed characteristics of nurses has minimal impact on estimates of the effect of the NLC.

Figures 6 and 7 present event-study estimates for several measures of labor supply.<sup>12</sup> Figure 6 reports event-study estimates for the sample of just nurses. Neither hours or weeks worked are systemically trending in Compact states relative to non-Compact states in the years leading up to NLC adoption. There is a marginally significant 2-hour increase in hours worked in the prior week immediately following NLC implementation, but this does not persist in subsequent years. Figure 7 presents event-study estimates that use non-nurse health workers as a within-Compact control, as described by equation (6). These estimates reveal similar patterns as in Figure 6. There is little evidence suggesting pre-trends that may bias our difference-in-difference estimates nor is there any evidence that NLC adoption is associated with increased labor supply.

## 5. Conclusion

The Nurse Licensure Compact was first introduced in 2000 and allows Registered Nurses and Licensed Practical Nurses with licenses in one NLC-member state to practice in other NLC states without obtaining a separate license. The Compact was created with the intention of providing greater mobility for nurses, clarifying the authority to practice for nurses currently engaged in telenursing or interstate practice, improving access to nursing care in general and during a disaster or other times of great need, and enhancing information-sharing among member

<sup>11</sup> Estimates from the first stage model are reported in Appendix Table A4. It is not possible to perform this procedure exclusively in the CPS sample, as it mostly excludes workers that are not in the labor force.

<sup>12</sup> We do not report estimates for labor force participation, employment, or inter-state migration as these are uninformative because there is minimal variation due to the sampling frame (labor force participation and employment) or imprecision (inter-state migration).

NLC states While only four states joined the Compact in its first year, currently 25 states are now members and a few more have pending legislation.

In this paper, we use data from the American Community Survey and the U.S. Census for years 1990-2012 to estimate the effects of the Compact on labor force and commuting outcomes. In comparison to other health workers who were not affected by the Compact, we find little evidence that the labor supply or mobility of nurses increased following the adoption of the Compact in the nurses' home state. Specifically, we find no effect on labor force participation, employment levels, hours worked, wages or the probability of working across state lines. When limiting our sample to nurses that live in border counties and examining the effect of living in a Compact state and bordering another member state, we similarly find no effect on labor market outcomes, including commuting times. We also use data from the annual Current Population Survey to rule out the possibility that pre-trend differences in labor market outcomes or worker characteristics between NLC and non-NLC states are biasing our estimates.

While this is the first study to empirically look at the effect of the Nurse Licensure Compact, we recognize that this is only a first step towards fully identifying the consequences of inter-state licensing. To get a fuller picture of the effect of the NLC, it is necessary to test whether access to care increased following the adoption of the Compact in a patient's home state, and how this has affected the prevalence and scope of telenursing throughout the United States. Furthermore, it is possible that the benefits of a cross-state system of occupational licensing will only accrue if the licensing regime is truly national. Even with the Compact, nurses still face licensing barriers when moving across states (even within the Compact) or working in non-Compact states. Though the NLC provides the best evidence to date on the likely effects of a nationalized licensing system, it still may not go far enough to generate measurable impacts on the nurse labor market.

Our results imply the following for licensing and health care policy. First, while we do not find that the multistate licensing provided by the NLC reduces labor market frictions caused by occupational licensing, it is important to note that we necessarily focus on nurses. The results may not generalize to other licensed professionals, such as lawyers, therapists, physicians and teachers. Second, from a healthcare delivery perspective, our results indicate that the NLC is likely not to increase the labor supply of nurses. We find no evidence that reducing licensing barriers will increase the pool of workers from which hospitals draw or that it will bring nurses into the labor

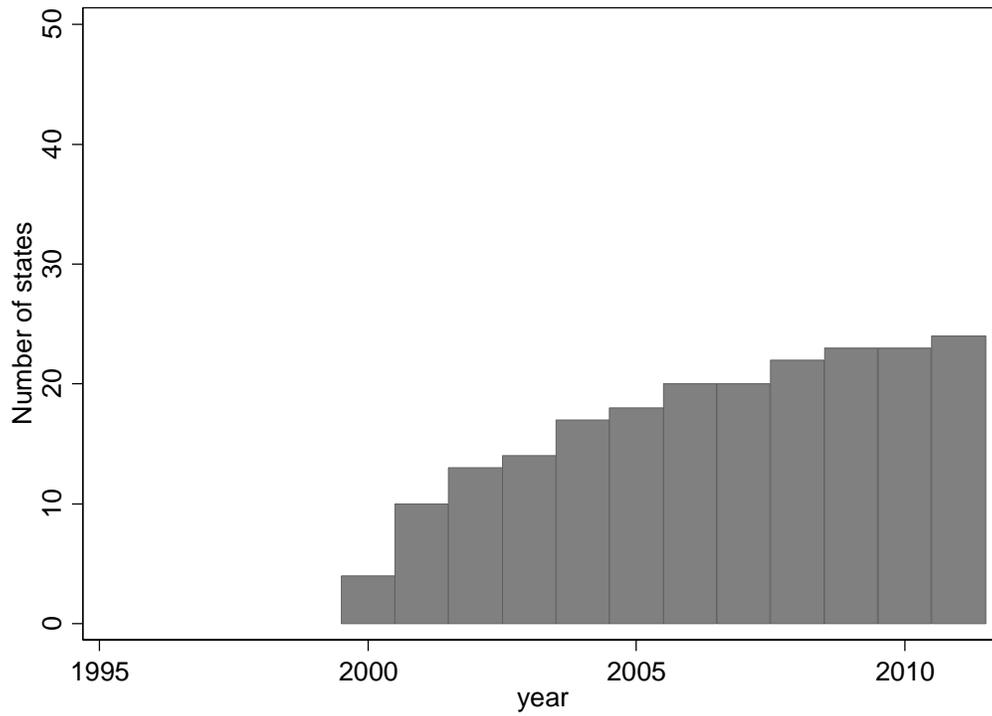
force. As a result, this reduction in licensing barriers does not appear to be a solution to an aggregate shortage of nurses.

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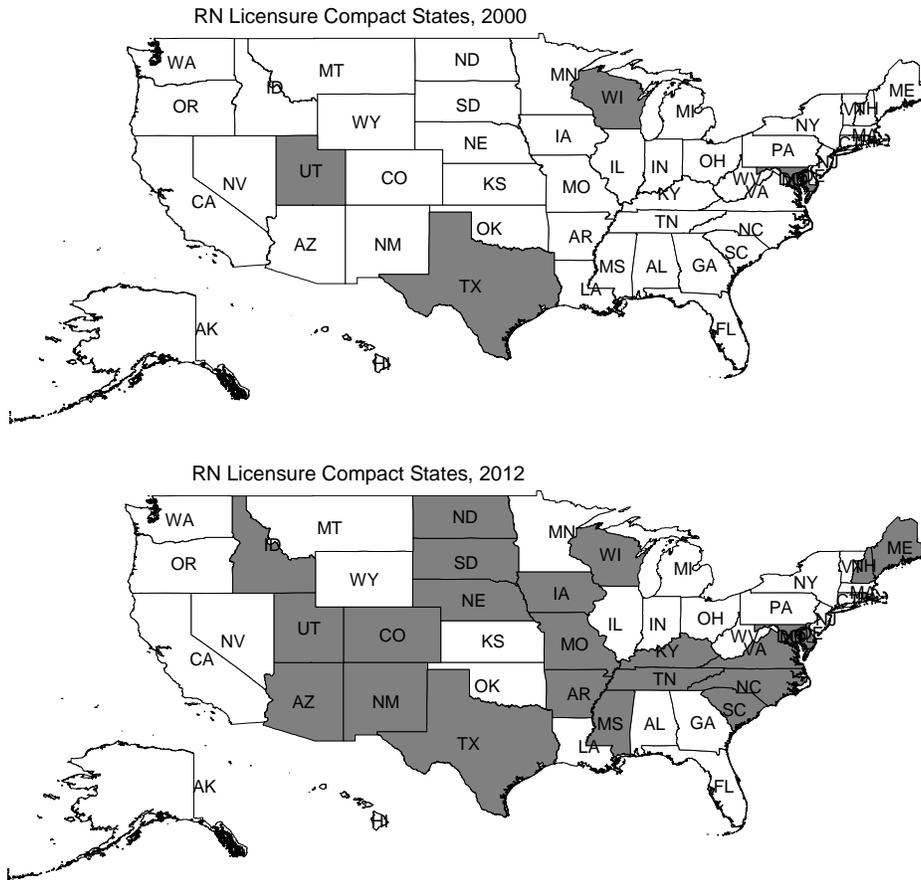
**Figure 1. Number of States Participating in NLC, 1995 to 2011**



Notes: States are considered to be participating in the NLC during a given year if the implementation date is in February of that year or earlier.

Source: <https://www.ncsbn.org/nurse-licensure-compact.htm>

**Figure 2. Nurse Licensure Compact States, 2000 and 2012**



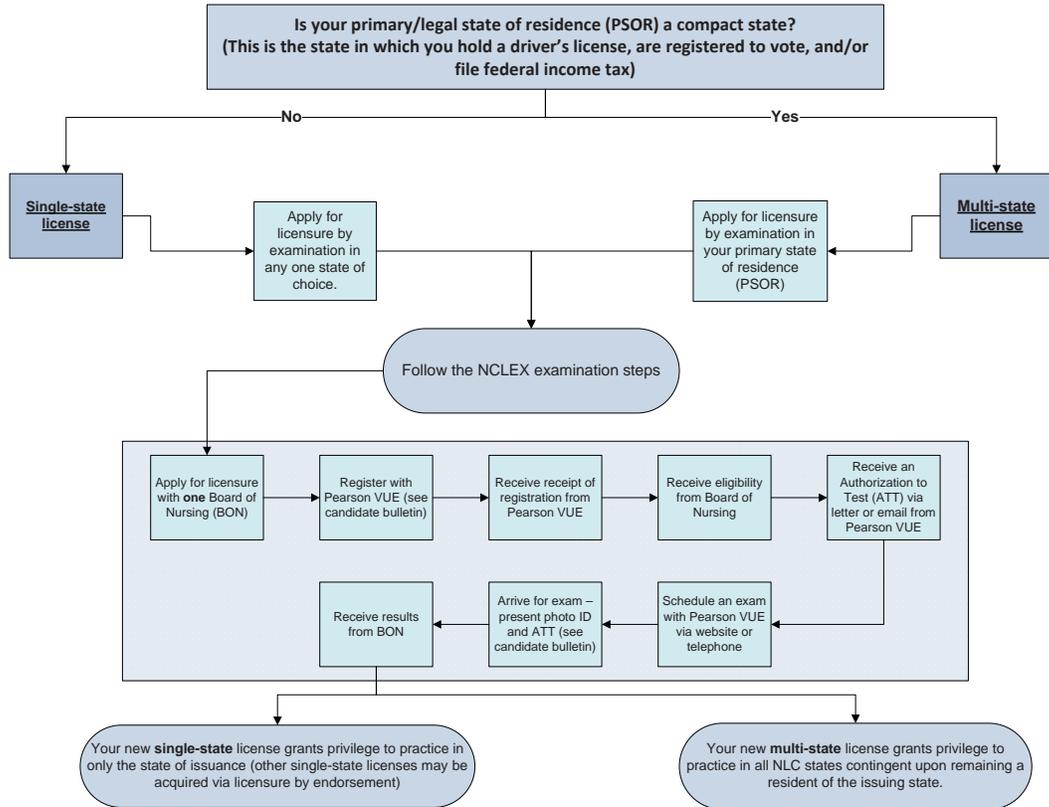
Notes: States are considered to be participating in the NLC during a given year if the implementation date is in February of that year or earlier.

Source: <https://www.ncsbn.org/nurse-licensure-compact.htm>

Figure 3. Flow Chart for Obtaining Nurse License

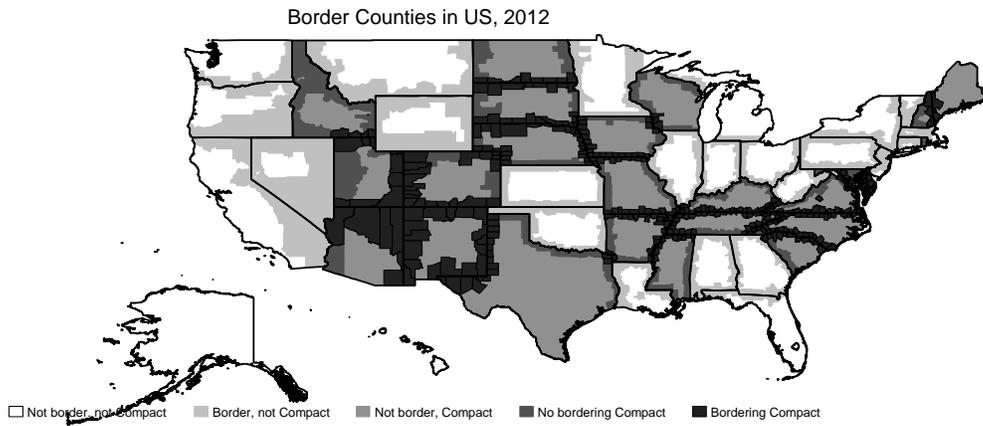
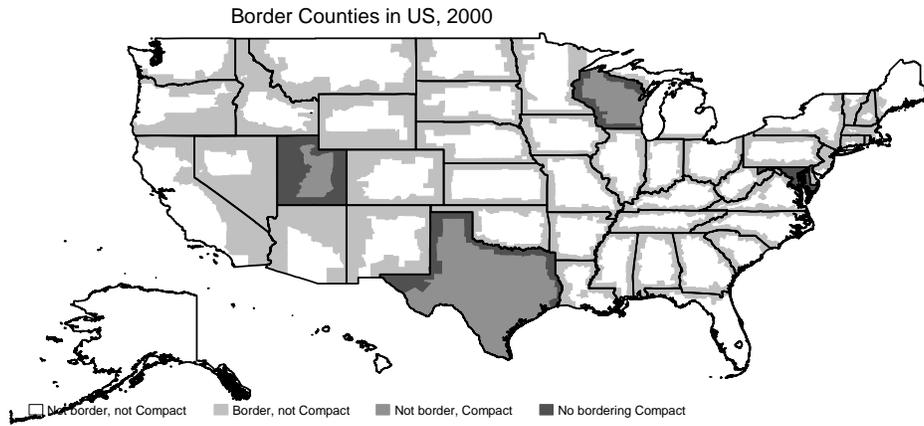


Navigating the Nurse Licensure Compact:  
Initial Licensure by Examination for New Graduates

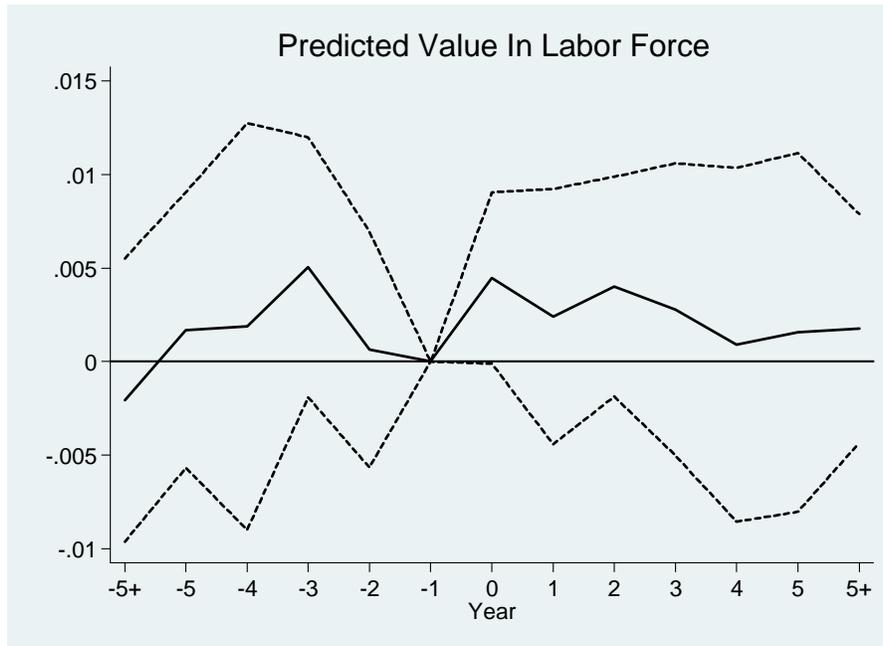


Source: <https://www.ncsbn.org/nurse-licensure-compact.htm>

**Figure 4. Border Counties Exposed to Compact**

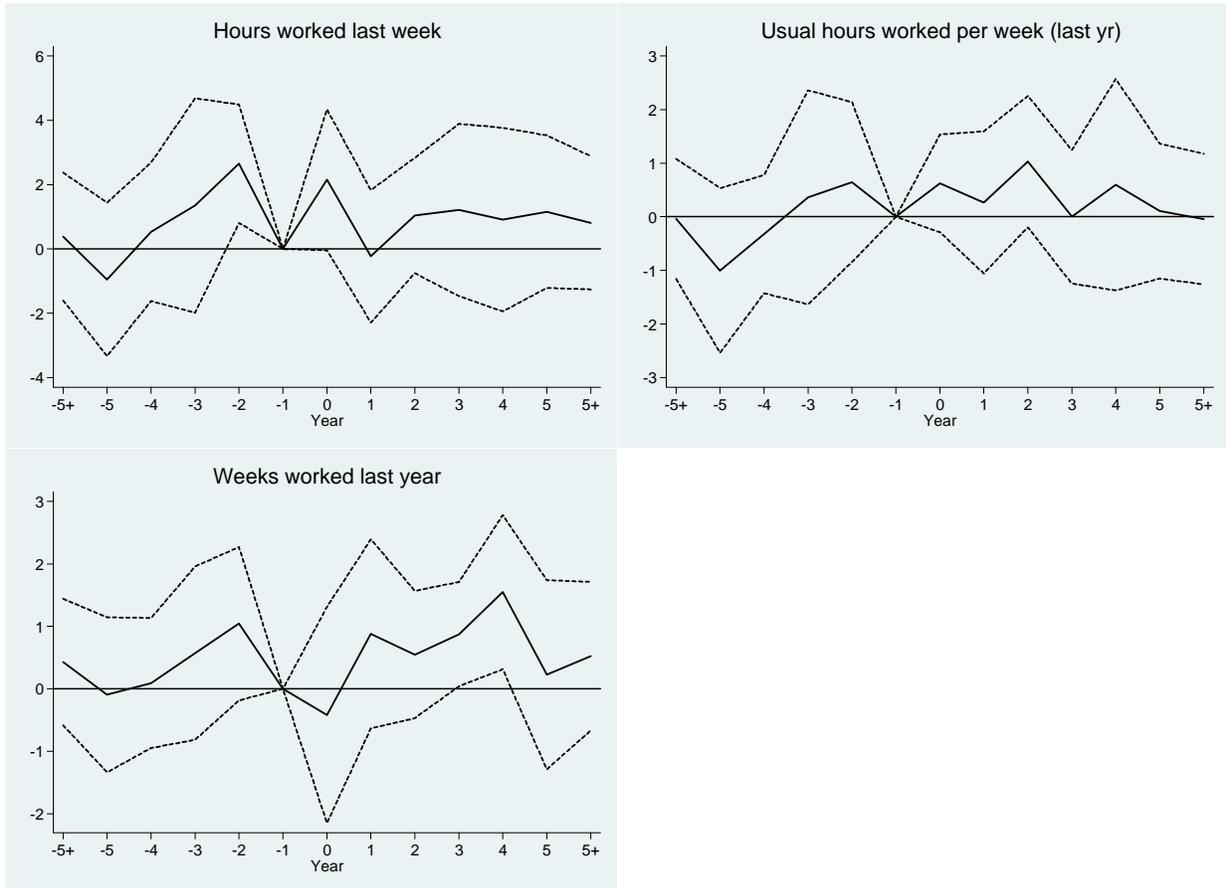


**Figure 5. Changes in Worker Characteristics Leading up to and Following NLC Adoption**



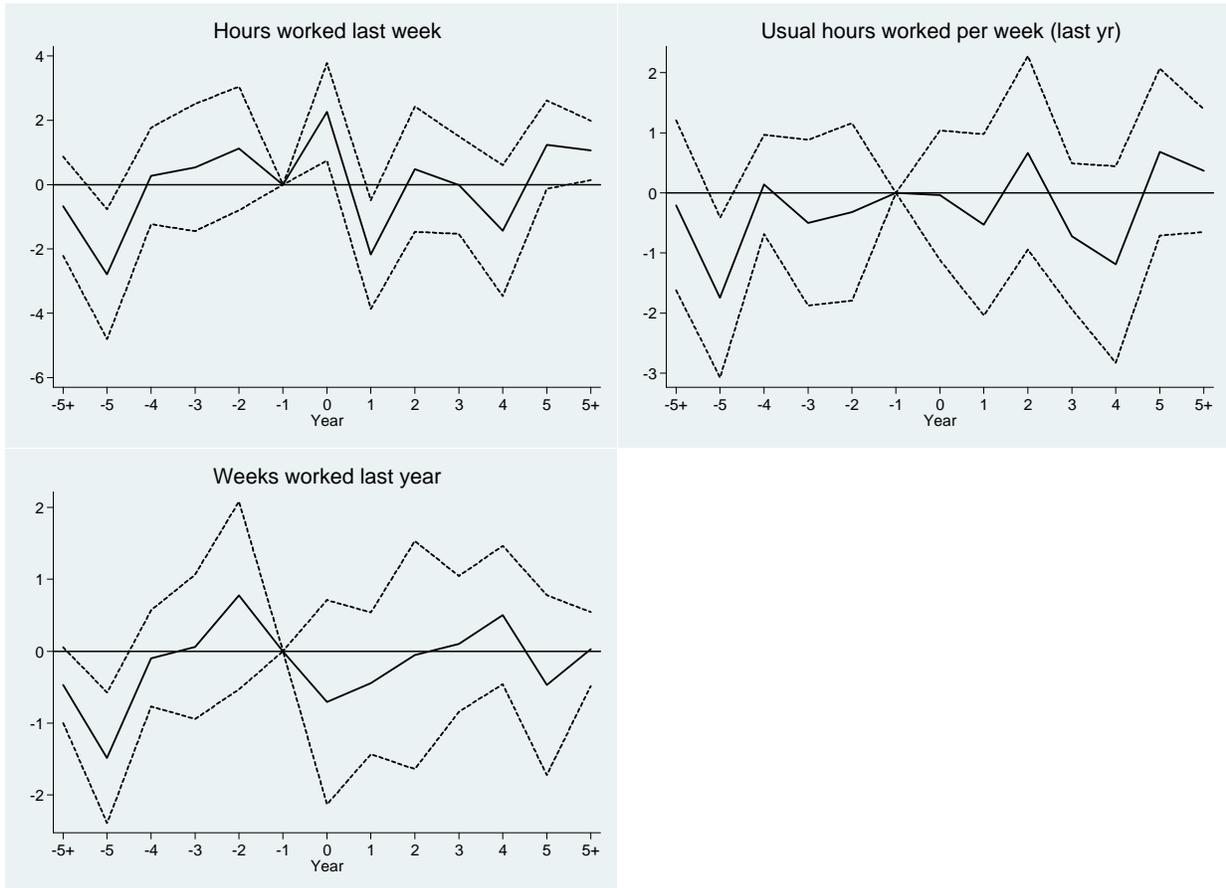
Notes: Outcome is labor force participation as predicted with covariates from a two-sample approach. First, labor force participation is regressed on covariates using the full Census/ACS sample. Second, model estimates are then used to predict labor force participation based on the same covariates, but in the full CPS sample. Figure plots coefficients on indicators for time until or since NLC adoption. Model includes state and year fixed effects. Dashed lines represent 95% confidence interval. Standard errors clustered by state. Sample includes all nurses in the March CPS, 1992-2012.

**Figure 6. Changes in Labor Supply Leading up to and Following NLC Adoption (Nurses only with Controls)**



Notes: Figure plots coefficients on indicators for time until or since NLC adoption. Model includes state and year fixed effects and a full set of control variables. Dashed lines represent 95% confidence interval. Standard errors clustered by state. Coefficients normalized to zero in the year before adoption. Year zero is first year of adoption. Sample includes all nurses in the March CPS, 1992-2012.

**Figure 7. Changes in Labor Supply Leading up to and Following NLC Adoption (Triple Difference with Controls)**



Notes: Figure plots coefficients on interaction between time until or since NLC adoption with indicator for nurse. Model includes state and year fixed effects and a full set of control variables. Dashed lines represent 95% confidence interval. Standard errors clustered by state. Coefficients normalized to zero in the year before adoption. Year zero is first year of adoption. Sample includes all nurses in the March CPS, 1992-2012.

**Table 1. Summary Statistics, Census and ACS Sample**

	Nurses only						All health workers					
	All counties			Border counties only			All counties			Border counties only		
	Full sample	Currently part of Compact	Not currently in Compact	Full sample	State and border compact	Not state and border compact	Full sample	Currently part of Compact	Not currently in Compact	Full sample	State and border compact	Not state and border compact
In labor force	0.87	0.88	0.87	0.88	0.89	0.87	0.86	0.87	0.86	0.87	0.89	0.87
Employed	0.86	0.86	0.85	0.86	0.87	0.86	0.84	0.84	0.84	0.84	0.86	0.84
Work in different state	0.03	0.04	0.03	0.07	0.14	0.06	0.03	0.04	0.03	0.06	0.12	0.06
Travel time to work	24.13	24.79	23.97	25.12	25.60	25.09	23.37	23.37	23.37	25.47	24.61	25.53
Usual hours worked (last year)	33.83	34.35	33.70	33.71	34.54	33.64	34.42	34.30	34.45	34.61	34.72	34.60
Wage/salary income, \$1999 (last year)	32,611	32,962	32,527	35,568	35,791	35,551	31,992	30,442	32,366	34,930	33,425	35,038
Registered nurse	0.79	0.79	0.79	0.83	0.83	0.83	0.30	0.29	0.30	0.30	0.33	0.30
LPN	0.21	0.21	0.21	0.17	0.17	0.17	0.08	0.08	0.08	0.06	0.07	0.06
Male	0.07	0.08	0.07	0.07	0.09	0.07	0.19	0.17	0.20	0.20	0.17	0.21
White	0.82	0.83	0.82	0.73	0.71	0.73	0.79	0.79	0.78	0.69	0.67	0.69
Black	0.10	0.11	0.10	0.16	0.21	0.16	0.12	0.13	0.11	0.19	0.23	0.19
American Indian	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.00
Asian	0.05	0.04	0.06	0.08	0.05	0.08	0.05	0.03	0.06	0.07	0.05	0.07
Other	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.02	0.03
Less than high school	0.01	0.00	0.01	0.01	0.00	0.01	0.04	0.04	0.04	0.04	0.03	0.04
High school	0.09	0.09	0.10	0.09	0.08	0.09	0.21	0.22	0.21	0.20	0.19	0.21
Some college	0.48	0.49	0.48	0.42	0.41	0.42	0.36	0.38	0.36	0.32	0.35	0.32
College graduate	0.31	0.33	0.30	0.35	0.39	0.35	0.21	0.21	0.21	0.23	0.26	0.23
Graduate degree	0.11	0.09	0.11	0.12	0.12	0.12	0.18	0.15	0.18	0.20	0.18	0.21
Age	44.62	45.55	44.39	44.58	45.83	44.48	42.30	42.83	42.17	42.36	43.28	42.30
Single household	0.18	0.18	0.18	0.19	0.20	0.19	0.19	0.20	0.19	0.20	0.21	0.20
Family size	2.88	2.80	2.90	2.94	2.79	2.95	2.90	2.84	2.91	2.95	2.82	2.96
Naturalized citizen	0.07	0.05	0.07	0.11	0.10	0.11	0.07	0.05	0.08	0.12	0.10	0.12
Not citizen	0.04	0.03	0.04	0.05	0.05	0.11	0.04	0.03	0.05	0.07	0.06	0.07
Observations	582,578	112,387	470,191	120,113	8,596	111,517	1,547,920	300,880	1,247,040	327,590	21,883	305,707
Number of states	51	24	51	44	16	43	51	24	51	44	16	43
Number of counties	All	All	All	186	37	183	All	All	All	186	37	183

Notes: All counties sample includes all nurses or health professionals in the 1990 and 2000 Census (5% sample) and 2006-2012 ACS. Border county sample includes those in the 186 counties on state borders that are identified in the Census and ACS. Compact classification refers to the status during the year of the observation; observations for states or counties that eventually become treated are included in the "Not currently in Compact" and "Not state and border Compact" columns.

**Table 2. Main Labor Supply Results for Full Sample**

	In labor force (current)			Employed (current)			Usual hours worked (last year)			Log(Wage income) (last year)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Compact state	-0.0106*** (0.0037)	-0.0062* (0.0036)	-0.0071** (0.0032)	-0.0113*** (0.0041)	-0.0053 (0.0049)	-0.0064 (0.0046)	-0.4139** (0.1549)	-0.2128 (0.1991)	-0.3956 (0.2429)	-0.0089 (0.0137)	0.0013 (0.0138)	-0.0097 (0.0157)
Nurse			0.0219*** (0.0015)			0.0314*** (0.0019)			0.9564*** (0.0988)			0.3425*** (0.0139)
Compact state X Nurse			-0.0014 (0.0027)			-0.0021 (0.0039)			0.2976 (0.3058)			0.0189 (0.0290)
Observations	582,543	965,245	1,547,788	582,543	965,245	1,547,788	582,543	965,245	1,547,788	528,021	830,675	1,358,696
R-squared	0.1406	0.0735	0.0933	0.1267	0.0687	0.0852	0.1275	0.1286	0.1231	0.1597	0.3345	0.3018
Sample	Non-nurse			Non-nurse			Non-nurse			Non-nurse		
	Nurses	health	All health	Nurses	health	All health	Nurses	health	All health	Nurses	health	All health
Outcome mean	0.890	0.875	0.880	0.872	0.840	0.852	34.42	34.50	34.47	10.32	9.89	10.05

Notes: All specifications include state fixed effects, year fixed effects, and full controls. Controls include indicators for LPN, male, race category, education category, a quadratic in age, indicators for single family household, number of children, and no children under the age of 5, family size (linear), naturalized citizen, and non-citizen. Standard errors clustered by state in parentheses. Sample includes all nurses or health professionals in the 1990 and 2000 Census (5% sample) and 2006-2012 ACS. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 3. Main Commuting Results for Full Sample**

	Work in different state (current)			Work in different compact state (current)			Log(Commute time) (current)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Compact state	-0.0002 (0.0028)	0.0005 (0.0023)	-0.0003 (0.0027)	0.0056* (0.0031)	0.0036 (0.0022)	0.0039* (0.0023)	-0.0103 (0.0077)	0.0022 (0.0067)	-0.0168** (0.0079)
Nurse			0.0057*** (0.0020)			0.0009 (0.0005)			0.0540*** (0.0092)
Compact state X Nurse			0.0015 (0.0036)			0.0014 (0.0016)			0.0378*** (0.0135)
Observations	484,534	778,872	1,263,406	484,534	778,872	1,263,406	480,234	763,198	1,243,432
R-squared	0.0380	0.0316	0.0336	0.0181	0.0220	0.0198	0.0304	0.0456	0.0405
Sample		Non-nurse			Non-nurse			Non-nurse	
	Nurses	health	All health	Nurses	health	All health	Nurses	health	All health
Outcome mean	0.035	0.029	0.031	0.010	0.008	0.009	2.99	2.91	2.94

Notes: All specifications include state fixed effects, year fixed effects, and full controls. Controls include indicators for LPN, male, race category, education category, a quadratic in age, indicators for single family household, number of children, and no children under the age of 5, family size (linear), naturalized citizen, and non-citizen. Standard errors clustered by state in parentheses. Sample includes all nurses or health professionals in the 1990 and 2000 Census (5% sample) and 2006-2012 ACS. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 4. Main Labor Supply Results for Full Sample, by MSA**

	In labor force (current)		Employed (current)		Usual hours worked (last year)		Log(Wage income) (last year)		Work in different state		Work in different compact state		Log(Commute time) (current)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<b>Panel A. MSA</b>														
Compact state	-0.0101**	-0.0112***	-0.0127***	-0.0110**	-0.4686**	-0.5502**	-0.0064	-0.0133	-0.0028	-0.0003	0.0029	0.0029	-0.0168*	-0.0248**
	(0.0040)	(0.0036)	(0.0044)	(0.0045)	(0.1768)	(0.2619)	(0.0155)	(0.0163)	(0.0043)	(0.0037)	(0.0030)	(0.0024)	(0.0089)	(0.0102)
Nurse		0.0221***		0.0323***		1.0288***		0.3610***		0.0048*		-0.0000		0.0384***
		(0.0014)		(0.0018)		(0.0948)		(0.0162)		(0.0024)		(0.0005)		(0.0102)
Compact state X Nurse		0.0010		-0.0003		0.3946		0.0243		-0.0018		-0.0006		0.0374**
		(0.0037)		(0.0049)		(0.3756)		(0.0345)		(0.0037)		(0.0014)		(0.0150)
Observations	378,229	1,034,563	378,229	1,034,563	378,229	1,034,563	343,505	909,059	314,830	844,958	314,830	844,958	312,013	831,428
Sample	Nurses	All health	Nurses	All health	Nurses	All health	Nurses	All health	Nurses	All health	Nurses	All health	Nurses	All health
Outcome mean	0.892	0.881	0.875	0.852	34.570	34.465	10.363	10.064	0.029	0.026	0.005	0.005	3.012	2.980
<b>Panel B. Non-MSA</b>														
Compact state	-0.0084*	0.0035	-0.0070	0.0039	-0.2741	-0.2781	-0.0249	-0.0284	0.0065*	0.0030	0.0045	0.0019	-0.0284**	-0.0256*
	(0.0046)	(0.0044)	(0.0049)	(0.0068)	(0.2336)	(0.2693)	(0.0165)	(0.0205)	(0.0038)	(0.0040)	(0.0041)	(0.0028)	(0.0138)	(0.0142)
Nurse		0.0220***		0.0294***		0.8083***		0.3029***		0.0074***		0.0034**		0.0939***
		(0.0024)		(0.0027)		(0.1265)		(0.0112)		(0.0019)		(0.0014)		(0.0074)
Compact state X Nurse		-0.0050		-0.0039		0.2445		0.0297		0.0057		0.0030		0.0090
		(0.0033)		(0.0041)		(0.2161)		(0.0197)		(0.0041)		(0.0027)		(0.0113)
Observations	204,314	513,225	204,314	513,225	204,314	513,225	184,516	449,637	169,704	418,448	169,704	418,448	168,221	412,004
Sample	Nurses	All health	Nurses	All health	Nurses	All health	Nurses	All health	Nurses	All health	Nurses	All health	Nurses	All health
Outcome mean	0.885828	0.879	0.867	0.852	34.118	34.471	10.222	10.028	0.048	0.043	0.018	0.015	2.945	2.864

Notes: All specifications include state fixed effects, year fixed effects, and full controls. Controls include indicators for LPN, male, race category, education category, a quadratic in age, indicators for single family household, number of children, and no children under the age of 5, family size (linear), naturalized citizen, and non-citizen. Standard errors clustered by state in parentheses. Sample includes all nurses or health professionals in the 1990 and 2000 Census (5% sample) and 2006-2012 ACS. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5. Labor Supply Results for Border County Sample**

	In labor force (current)		Employed (current)		Usual hours worked (last year)		Log(Wage income) (last year)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Resident & border state both Compact	-0.0092 (0.0083)	-0.0086 (0.0075)	-0.0120 (0.0086)	-0.0092 (0.0096)	-0.5984 (0.3571)	-0.6337 (0.3784)	-0.0486** (0.0234)	-0.0127 (0.0159)
Nurse		0.0191*** (0.0024)		0.0279*** (0.0026)		0.8044*** (0.1459)		0.3441*** (0.0175)
Resident & border state both Compact X Nurse		-0.0040 (0.0054)		-0.0088 (0.0057)		0.0282 (0.2324)		-0.0338 (0.0264)
Observations	120,107	327,576	120,107	327,576	120,107	327,576	109,117	288,633
R-squared	0.1423	0.0913	0.1270	0.0836	0.1341	0.1234	0.1550	0.2952
Sample	Nurses	All health	Nurses	All health	Nurses	All health	Nurses	All health
Outcome mean	0.895	0.887	0.877	0.857	34.45	34.68	10.39	10.12

Notes: All specifications include county fixed effects, year fixed effects, and full controls. Controls include indicators for LPN, male, race category, education category, a quadratic in age, indicators for single family household, number of children, and no children under the age of 5, family size (linear), naturalized citizen, and non-citizen. Standard errors clustered by state in parentheses. Sample includes all nurses or health professionals in the 186 counties on state borders that are identified in the 1990 and 2000 Census and 2006-2012 ACS and that have nurses or other health professionals included in the sample. Among these, 37 counties were treated. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 6. Commuting Results for Border County Sample**

	Work in different state		Work in different compact state		Log(Commute time) (current)	
	(1)	(2)	(3)	(4)	(5)	(6)
Resident & border state both Compact	-0.0182 (0.0139)	-0.0173 (0.0142)	0.0262*** (0.0075)	0.0336*** (0.0080)	-0.0514* (0.0278)	-0.0565*** (0.0165)
Nurse		0.0060 (0.0049)		-0.0002 (0.0011)		0.0274* (0.0143)
Resident & border state both Compact X Nurse		0.0081 (0.0090)		-0.0065 (0.0046)		0.0304 (0.0239)
Observations	100,164	268,182	100,164	268,182	99,294	264,351
R-squared	0.1728	0.1411	0.1518	0.1200	0.0774	0.0952
Sample	Nurses	All health	Nurses	All health	Nurses	All health
Outcome mean	0.067	0.061	0.012	0.012	3.06	3.05

Notes: All specifications include county fixed effects, year fixed effects, and full controls. Controls include indicators for LPN, male, race category, education category, a quadratic in age, indicators for single family household, number of children, and no children under the age of 5, family size (linear), naturalized citizen, and non-citizen. Standard errors clustered by state in parentheses. Sample includes all nurses or health professionals in the 186 counties on state borders that are identified in the 1990 and 2000 Census and 2006-2012 ACS and that have nurses or other health professionals included in the sample. Among these, 37 counties were treated. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 7. Effect of Residing in and Bordering Compact State, Robustness**

	Base model (1)	No controls (2)	State X Year FE (3)	Only NLC states (4)	Only treated counties (5)	Cluster by county (6)
<u>Panel A. In labor force (mean = .895)</u>						
Coeff	-0.0092	-0.0078	0.0145	0.0001	0.0109	-0.0092
(SE)	(0.0083)	(0.0079)	(0.0103)	(0.0082)	(0.0542)	(0.0067)
<u>Panel B. Employed (mean = .877)</u>						
Coeff	-0.0120	-0.0110	0.0087	-0.0048	0.0032	-0.0120*
(SE)	(0.0086)	(0.0079)	(0.0118)	(0.0083)	(0.0484)	(0.0069)
<u>Panel C. Usual hours worked (mean = 34.45)</u>						
Coeff	-0.5984	-0.4603	-0.0326	-0.4158	-1.0990	-0.5984*
(SE)	(0.3571)	(0.3746)	(0.6788)	(0.4689)	(2.2408)	(0.3082)
<u>Panel D. Log (wage income) (mean = 10.39)</u>						
Coeff	-0.0486**	-0.0517*	-0.0483	-0.0341	-0.1159	-0.0486**
(SE)	(0.0234)	(0.0280)	(0.0396)	(0.0338)	(0.1986)	(0.0241)
<u>Panel E. Work in different state (mean = .0674)</u>						
Coeff	-0.0182	-0.0182	-0.0452***	-0.0162	-0.0121	-0.0182
(SE)	(0.0139)	(0.0140)	(0.0137)	(0.0126)	(0.0289)	(0.0140)
<u>Panel F. Work in different compact state (mean = .012)</u>						
Coeff	0.0262***	0.0262***	0.0474***	0.0337***	0.0409	0.0262***
(SE)	(0.0075)	(0.0075)	(0.0152)	(0.0069)	(0.0323)	(0.0087)
<u>Panel G. Log(Commute time) (mean =3.056 )</u>						
Coeff	-0.0514*	-0.0462	0.0435***	-0.0157	-0.1526**	-0.0514**
(SE)	(0.0278)	(0.0305)	(0.0134)	(0.0266)	(0.0657)	(0.0200)
Observations	120,107	120,107	120,107	34,686	17,119	120,107
Number of states	44	44	44	22	16	44
Number of counties	186	186	186	70	37	186

Notes: Each cell presents the coefficient and standard error on an indicator for living in and bordering a compact state from a separate regression. All specifications include year fixed effects, county fixed effects, and (except column 3) full controls. Controls include indicators for LPN, male, race category, education category, a quadratic in age, indicators for single family household, number of children, and no children under the age of 5, family size (linear), naturalized citizen, and non-citizen. Standard errors clustered by state (county in specification 6) in parentheses. Sample includes all nurses in the 186 counties on state borders that are identified in the Census and ACS and have nurses in the sample. Reported sample size is for Panels A and B. Subsequent panels have smaller sample sizes as they are conditional on being employed or having positive income. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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**Table A1. Implementation Dates for Nurse Licensure Compact States**

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	Date of implementation
Arizona	7/1/2002
Arkansas	7/1/2000
Colorado	10/1/2007
Delaware	7/1/2000
Idaho	7/1/2001
Iowa	7/1/2000
Kentucky	6/1/2007
Maine	7/1/2001
Maryland	7/1/1999
Mississippi	7/1/2001
Missouri	6/1/2010
Montana	10/1/2015
Nebraska	1/1/2001
New Hampshire	1/1/2006
New Mexico	1/1/2004
North Carolina	7/1/2000
North Dakota	1/1/2004
Rhode Island	7/1/2008
South Carolina	2/1/2006
South Dakota	1/1/2001
Tennessee	7/1/2003
Texas	1/1/2000
Utah	1/1/2000
Virginia	1/1/2005
Wisconsin	1/1/2000

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States with legislation pending include Illinois, Massachusetts, Minnesota, New Jersey, New York, and Oklahoma.

Source: <https://www.ncsbn.org/nurse-licensure-compact.htm>

**Table A2. CPS Summary Statistics**

	Nurses only			All health workers		
	Full sample	Currently part of Compact	Not currently in Compact	Full sample	Currently part of Compact	Not currently in Compact
In Labor Force	0.99	1.00	0.99	0.99	1.00	0.99
Employed	0.98	0.98	0.98	0.98	0.98	0.98
Weeks worked last year	49.05	49.23	48.99	48.82	49.02	48.76
Hours worked last week	35.09	35.05	35.10	36.70	36.41	36.79
Usual hours worked per week (last yr)	36.94	36.81	36.98	38.72	38.50	38.79
Moved because of Job	0.02	0.02	0.01	0.02	0.03	0.02
Moved to a Different State	0.02	0.02	0.02	0.03	0.02	0.03
Race is White	0.84	0.86	0.84	0.84	0.86	0.83
Race is Black	0.08	0.09	0.08	0.08	0.08	0.08
Race is Asian	0.06	0.03	0.07	0.07	0.04	0.08
Race is American Indian	0.01	0.01	0.01	0.01	0.01	0.01
Other Race	0.01	0.01	0.01	0.01	0.01	0.01
Less than High School Education	0.00	0.00	0.00	0.01	0.01	0.01
High School Diploma	0.04	0.02	0.04	0.08	0.07	0.08
Some Education beyond HS	0.41	0.41	0.41	0.33	0.34	0.32
Has College Degree	0.44	0.46	0.43	0.30	0.31	0.30
Post-Graduate Education	0.11	0.11	0.11	0.29	0.27	0.29
Single, Never Married	0.13	0.10	0.13	0.16	0.14	0.17
Married	0.70	0.72	0.69	0.69	0.71	0.69
Separated	0.02	0.02	0.02	0.02	0.02	0.02
Divorced	0.13	0.13	0.13	0.11	0.11	0.11
Widowed	0.02	0.02	0.02	0.02	0.02	0.02
Male	0.10	0.08	0.10	0.27	0.25	0.27
Age	42.83	42.85	42.82	41.86	41.98	41.82
Household Size	3.09	3.15	3.08	3.06	3.11	3.05
Number of Children in Household	1.21	1.28	1.19	1.15	1.21	1.13
Observations	36,405	8,100	28,305	87,104	19,779	67,325

Notes: The sample covers years 1992-2012. Compact classification refers to the status during the year of the observation; observations for those in states that eventually become treated are included in the "Not currently in Compact." Note that of the total amount of observations for the entire sample (87,104), only 80,702 observations are non missing for "Moved because of Job" and 83,705 are non missing for "Moved to a Different State." A similar total of observations are missing for these two variables in the subsamples as well.

**Table A3. Complete Labor Supply Results for Full Sample, Nurses Only**

	In labor force (current)	Employed (current)	Usual hours worked (last year)	Log(Wage income) (last year)	Work in different state (current)	Work in different compact state	Log(Commute time) (current)
Compact state	-0.0106*** (0.0037)	-0.0113*** (0.0041)	-0.4139** (0.1549)	-0.0089 (0.0137)	-0.0002 (0.0028)	0.0056* (0.0031)	-0.0103 (0.0077)
LPN	-0.0223*** (0.0023)	-0.0324*** (0.0025)	-0.5661*** (0.1003)	-0.3568*** (0.0075)	-0.0059*** (0.0016)	-0.0010 (0.0006)	-0.0609*** (0.0075)
Male	0.0193*** (0.0017)	0.0169*** (0.0025)	3.4772*** (0.1795)	0.1752*** (0.0141)	0.0088*** (0.0026)	0.0012 (0.0010)	0.0571*** (0.0088)
White	0.0151*** (0.0044)	0.0259*** (0.0049)	-0.6777*** (0.2389)	-0.0036 (0.0121)	-0.0118** (0.0055)	-0.0037 (0.0032)	-0.0490*** (0.0176)
Black	0.0270*** (0.0053)	0.0274*** (0.0060)	1.0182*** (0.1675)	0.0262 (0.0181)	-0.0070 (0.0060)	-0.0057* (0.0031)	0.0561** (0.0240)
Amer. Indian	-0.0103 (0.0105)	-0.0134 (0.0116)	0.7121 (0.4306)	-0.0135 (0.0265)	0.0088 (0.0077)	0.0037 (0.0060)	-0.0302 (0.0372)
Asian	0.0178*** (0.0052)	0.0294*** (0.0067)	0.6515 (0.4039)	0.1439*** (0.0154)	-0.0110* (0.0064)	-0.0055* (0.0031)	-0.0752*** (0.0220)
Other race	0.0198*** (0.0067)	0.0243** (0.0097)	0.4049 (0.5028)	-0.0138 (0.0267)	-0.0078** (0.0035)	-0.0045 (0.0034)	-0.0390 (0.0305)
Less than HS	-0.0980*** (0.0105)	-0.1427*** (0.0113)	-4.4644*** (0.3714)	-0.4206*** (0.0247)	-0.0096 (0.0069)	0.0030 (0.0036)	-0.0897** (0.0344)
High school	-0.0455*** (0.0037)	-0.0575*** (0.0038)	-2.8143*** (0.1531)	-0.2914*** (0.0126)	-0.0129*** (0.0038)	-0.0028** (0.0012)	-0.0907*** (0.0112)
Some college	-0.0092*** (0.0018)	-0.0107*** (0.0019)	-1.6409*** (0.0919)	-0.1886*** (0.0061)	-0.0069** (0.0027)	-0.0007 (0.0008)	-0.0603*** (0.0078)
College	-0.0070*** (0.0019)	-0.0040* (0.0020)	-1.6730*** (0.1299)	-0.0959*** (0.0080)	-0.0047*** (0.0012)	-0.0010 (0.0007)	-0.0334*** (0.0064)
Age	0.0301*** (0.0006)	0.0300*** (0.0006)	1.3096*** (0.0235)	0.1074*** (0.0013)	0.0005* (0.0003)	0.0001 (0.0001)	0.0095*** (0.0013)
Age-squared	-0.0004*** (0.0000)	-0.0004*** (0.0000)	-0.0172*** (0.0003)	-0.0012*** (0.0000)	-0.0000** (0.0000)	-0.0000 (0.0000)	-0.0001*** (0.0000)
Single household	0.0113*** (0.0024)	0.0047* (0.0028)	1.2077*** (0.0993)	0.0349*** (0.0068)	-0.0003 (0.0015)	-0.0005 (0.0009)	-0.0329*** (0.0062)
Family size	-0.0025*** (0.0009)	-0.0044*** (0.0010)	-0.4046*** (0.0675)	-0.0399*** (0.0043)	0.0004 (0.0006)	0.0002 (0.0003)	0.0224*** (0.0023)
No children in household	0.0200** (0.0090)	0.0092 (0.0084)	0.1319 (0.3695)	-0.0350 (0.0336)	0.0062 (0.0055)	0.0006 (0.0031)	0.1383*** (0.0266)
One child in household	0.0417*** (0.0084)	0.0331*** (0.0077)	1.2959*** (0.3365)	0.0227 (0.0326)	0.0031 (0.0055)	0.0007 (0.0031)	0.1015*** (0.0264)
Two children in household	0.0273*** (0.0078)	0.0233*** (0.0076)	-0.2823 (0.3208)	-0.0113 (0.0286)	0.0004 (0.0054)	0.0001 (0.0031)	0.0667*** (0.0244)
3-5 children in household	0.0155* (0.0081)	0.0116 (0.0078)	-0.9529*** (0.3416)	-0.0420 (0.0252)	0.0006 (0.0054)	-0.0005 (0.0028)	0.0329 (0.0239)
No children under 5	0.0668*** (0.0019)	0.0683*** (0.0022)	4.1069*** (0.1167)	0.0429*** (0.0071)	0.0004 (0.0014)	0.0010 (0.0008)	-0.0438*** (0.0052)
Nationalized citizen	0.0147*** (0.0029)	0.0217*** (0.0033)	1.6452*** (0.1667)	0.0926*** (0.0124)	0.0063 (0.0058)	-0.0021** (0.0010)	0.0906*** (0.0306)
Not citizen	-0.0274*** (0.0048)	-0.0273*** (0.0050)	0.1119 (0.2371)	-0.0760*** (0.0125)	0.0015 (0.0035)	-0.0024** (0.0010)	-0.0073 (0.0308)
Observations	582,543	582,543	582,543	528,021	484,534	484,534	480,234
R-squared	0.1406	0.1267	0.1275	0.1597	0.0380	0.0181	0.0304
Outcome mean	0.890	0.872	34.416	10.315	0.035	0.010	2.989

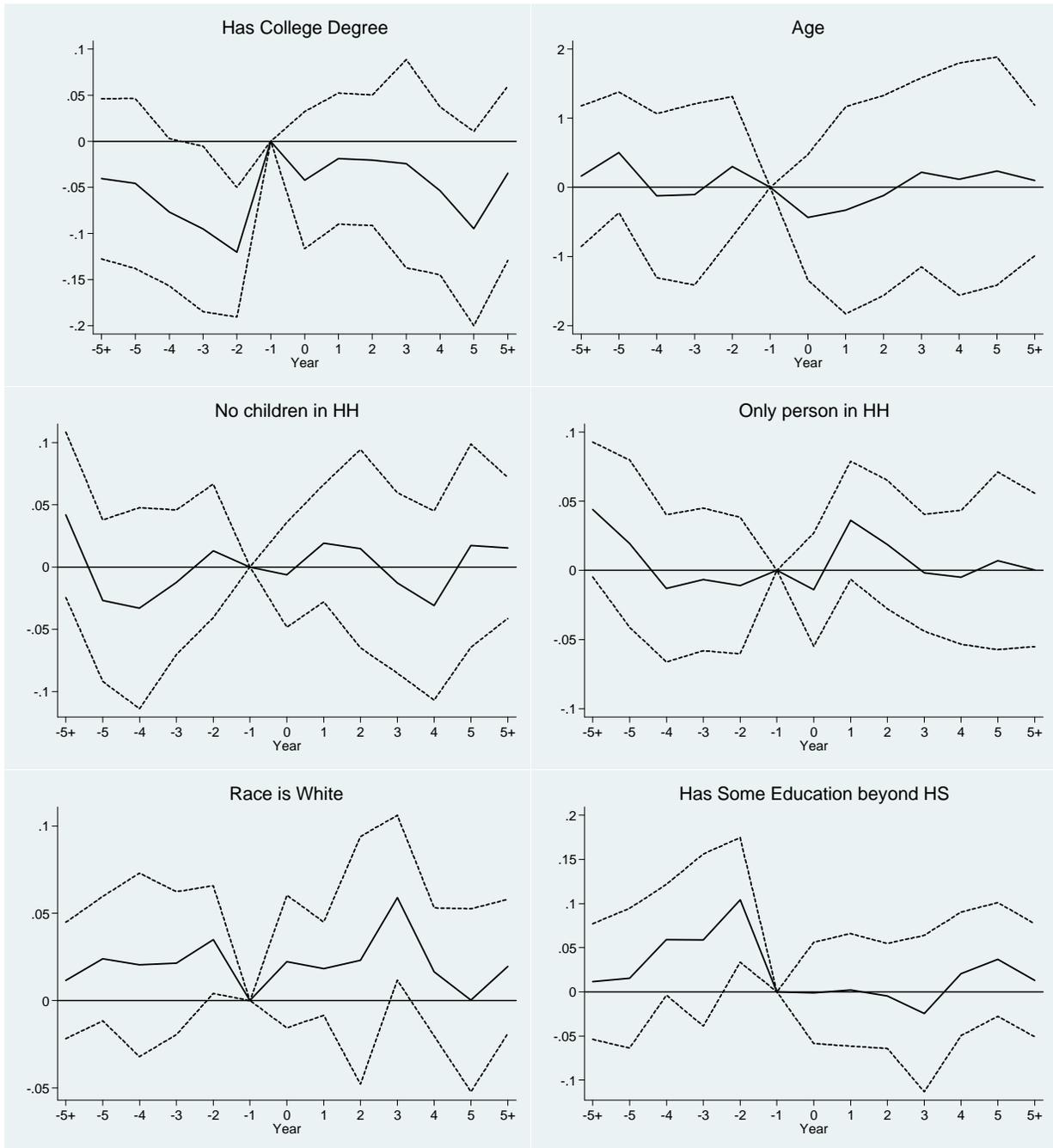
Notes: All specifications include state fixed effects and year fixed effects. Standard errors clustered by state in parentheses. Sample includes all nurses in the 1990 and 2000 Census (5% sample) and 2006-2012 ACS. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table A4. First Stage Estimates of Correlates of Labor Force Participation**

	Probit coeff
Male	0.2278 (0.0038)
White	0.1027 (0.0068)
Black	0.0789 (0.0075)
Asian	0.0475 (0.0089)
American Indian	-0.0126 (0.0163)
Less than high school	-0.6130 (0.0067)
High school	-0.3899 (0.0047)
Some college	-0.1956 (0.0044)
College	-0.1529 (0.0048)
Age	0.1034 (0.0006)
Age-squared	-0.0013 (0.0000)
Single household	-0.0191 (0.0045)
Family size	0.0045 (0.0016)
No children in house	-0.0896 (0.0049)
Number of children i	-0.0793 (0.0025)
Constant	-0.4094 (0.0156)
Observations	1,547,920
Pseudo R-squared	0.0956

Notes: Sample includes all nurses or health professionals in the 1990 and 2000 Census (5% sample) and 2006-2012 ACS. Robust standard errors in parentheses.

**Figure A1. Changes in Worker Characteristics Leading up to and Following NLC Adoption (Nurses Only)**



Notes: Figure plots coefficients on indicators for time until or since NLC adoption. Model includes state and year fixed effects. Dashed lines represent 95% confidence interval. Standard errors clustered by state. Coefficients normalized to zero in the year before adoption. Year zero is first year of adoption. Sample includes all nurses in the March CPS, 1992-2012.

## Appendix B



# Nurse Licensure Compact

*Final Version, November 6, 1998*

## ARTICLE I

### Findings and Declaration of Purpose

- a. The party states find that:
  1. the health and safety of the public are affected by the degree of compliance with and the effectiveness of enforcement activities related to state nurse licensure laws;
  2. violations of nurse licensure and other laws regulating the practice of nursing may result in injury or harm to the public;
  3. the expanded mobility of nurses and the use of advanced communication technologies as part of our nation's healthcare delivery system require greater coordination and cooperation among states in the areas of nurse licensure and regulation;
  4. new practice modalities and technology make compliance with individual state nurse licensure laws difficult and complex;
  5. the current system of duplicative licensure for nurses practicing in multiple states is cumbersome and redundant to both nurses and states.
- b. The general purposes of this Compact are to:
  1. facilitate the states' responsibility to protect the public's health and safety;
  2. ensure and encourage the cooperation of party states in the areas of nurse licensure and regulation;
  3. facilitate the exchange of information between party states in the areas of nurse regulation, investigation and adverse actions;
  4. promote compliance with the laws governing the practice of nursing in each jurisdiction;
  5. invest all party states with the authority to hold a nurse accountable for meeting all state practice laws in the state in which the patient is located at the time care is rendered through the mutual recognition of party state licenses.

## ARTICLE II

### Definitions

As used in this Compact:

- a. "Adverse Action" means a home or remote state action.
- b. "Alternative program" means a voluntary, non-disciplinary monitoring program approved by a nurse licensing board.
- c. "Coordinated licensure information system" means an integrated process for collecting, storing, and sharing information on nurse licensure and enforcement activities related to nurse licensure laws, which is administered by a non-profit organization composed of and controlled by state nurse licensing boards.
- d. "Current significant investigative information" means:
  1. investigative information that a licensing board, after a preliminary inquiry that includes notification and an opportunity for the nurse to respond if required by state law, has reason to believe is not groundless and, if proved true, would indicate more than a minor infraction; or
  2. investigative information that indicates that the nurse represents an immediate threat to public health and safety regardless of whether the nurse has been notified and had an opportunity to respond.
- e. "Home state" means the party state which is the nurse's primary state of residence.
- f. "Home state action" means any administrative, civil, equitable or criminal action permitted by the home state's laws which are imposed on a nurse by the home state's licensing board or other authority including actions against an individual's license such as: revocation, suspension, probation or any other action which affects a nurse's authorization to practice.

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- g. "Licensing board" means a party state's regulatory body responsible for issuing nurse licenses.
- h. "Multistate licensure privilege" means current, official authority from a remote state permitting the practice of nursing as either a registered nurse or a licensed practical/vocational nurse in such party state. All party states have the authority, in accordance with existing state due process law, to take actions against the nurse's privilege such as: revocation, suspension, probation or any other action which affects a nurse's authorization to practice.
- i. "Nurse" means a registered nurse or licensed practical/vocational nurse, as those terms are defined by each party's state practice laws.
- j. "Party state" means any state that has adopted this Compact.
- k. "Remote state" means a party state, other than the home state,
  - 1. where the patient is located at the time nursing care is provided, or,
  - 2. in the case of the practice of nursing not involving a patient, in such party state where the recipient of nursing practice is located.
- l. "Remote state action" means
  - 1. any administrative, civil, equitable or criminal action permitted by a remote state's laws which are imposed on a nurse by the remote state's licensing board or other authority including actions against an individual's multistate licensure privilege to practice in the remote state, and
  - 2. cease and desist and other injunctive or equitable orders issued by remote states or the licensing boards thereof.
- m. "State" means a state, territory, or possession of the United States, the District of Columbia or the Commonwealth of Puerto Rico.
- n. "State practice laws" means those individual party's state laws and regulations that govern the practice of nursing, define the scope of nursing practice, and create the methods and grounds for imposing discipline. "State practice laws" does not include the initial qualifications for licensure or requirements necessary to obtain and retain a license, except for qualifications or requirements of the home state.

### ARTICLE III

#### General Provisions and Jurisdiction

- a. A license to practice registered nursing issued by a home state to a resident in that state will be recognized by each party state as authorizing a multistate licensure privilege to practice as a registered nurse in such party state. A license to practice licensed practical/vocational nursing issued by a home state to a resident in that state will be recognized by each party state as authorizing a multistate licensure privilege to practice as a licensed practical/vocational nurse in such party state. In order to obtain or retain a license, an applicant must meet the home state's qualifications for licensure and license renewal as well as all other applicable state laws.
- b. Party states may, in accordance with state due process laws, limit or revoke the multistate licensure privilege of any nurse to practice in their state and may take any other actions under their applicable state laws necessary to protect the health and safety of their citizens. If a party state takes such action, it shall promptly notify the administrator of the coordinated licensure information system. The administrator of the coordinated licensure information system shall promptly notify the home state of any such actions by remote states.
- c. Every nurse practicing in a party state must comply with the state practice laws of the state in which the patient is located at the time care is rendered. In addition, the practice of nursing is not limited to patient care, but shall include all nursing practice as defined by the state practice laws of a party state. The practice of nursing will subject a nurse to the jurisdiction of the nurse licensing board and the courts, as well as the laws, in that party state.
- d. This Compact does not affect additional requirements imposed by states for advanced practice registered nursing. However, a multistate licensure privilege to practice registered nursing granted by a party state shall be recognized by other party states as a license to practice registered nursing if one is required by state law as a precondition for qualifying for advanced practice registered nurse authorization.
- e. Individuals not residing in a party state shall continue to be able to apply for nurse licensure as provided for under the laws of each party state. However, the license granted to these individuals will not be recognized as granting the privilege to practice nursing in any other party state unless explicitly agreed to by that party state.

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### **ARTICLE IV**

#### **Applications for Licensure in a Party State**

- a. Upon application for a license, the licensing board in a party state shall ascertain, through the coordinated licensure information system, whether the applicant has ever held, or is the holder of, a license issued by any other state, whether there are any restrictions on the multistate licensure privilege, and whether any other adverse action by any state has been taken against the license.
- b. A nurse in a party state shall hold licensure in only one party state at a time, issued by the home state.
- c. A nurse who intends to change primary state of residence may apply for licensure in the new home state in advance of such change. However, new licenses will not be issued by a party state until after a nurse provides evidence of change in primary state of residence satisfactory to the new home state's licensing board.
- d. When a nurse changes primary state of residence by:
  1. moving between two party states, and obtains a license from the new home state, the license from the former home state is no longer valid;
  2. moving from a non-party state to a party state, and obtains a license from the new home state, the individual state license issued by the non-party state is not affected and will remain in full force if so provided by the laws of the non-party state;
  3. moving from a party state to a non-party state, the license issued by the prior home state converts to an individual state license, valid only in the former home state, without the multistate licensure privilege to practice in other party states.

### **ARTICLE V**

#### **Adverse Actions**

In addition to the General Provisions described in Article III, the following provisions apply:

- a. The licensing board of a remote state shall promptly report to the administrator of the coordinated licensure information system any remote state actions including the factual and legal basis for such action, if known. The licensing board of a remote state shall also promptly report any significant current investigative information yet to result in a remote state action. The administrator of the coordinated licensure information system shall promptly notify the home state of any such reports.
- b. The licensing board of a party state shall have the authority to complete any pending investigations for a nurse who changes primary state of residence during the course of such investigations. It shall also have the authority to take appropriate action(s), and shall promptly report the conclusions of such investigations to the administrator of the coordinated licensure information system. The administrator of the coordinated licensure information system shall promptly notify the new home state of any such actions.
- c. A remote state may take adverse action affecting the multistate licensure privilege to practice within that party state. However, only the home state shall have the power to impose adverse action against the license issued by the home state.
- d. For purposes of imposing adverse action, the licensing board of the home state shall give the same priority and effect to reported conduct received from a remote state as it would if such conduct had occurred within the home state. In so doing, it shall apply its own state laws to determine appropriate action.
- e. The home state may take adverse action based on the factual findings of the remote state, so long as each state follows its own procedures for imposing such adverse action.
- f. Nothing in this Compact shall override a party state's decision that participation in an alternative program may be used in lieu of licensure action and that such participation shall remain non-public if required by the party state's laws. Party states must require nurses who enter any alternative programs to agree not to practice in any other party state during the term of the alternative program without prior authorization from such other party state.

### **ARTICLE VI**

#### **Additional Authorities Invested in Party State Nurse Licensing Boards**

Notwithstanding any other powers, party state nurse licensing boards shall have the authority to:

- a. if otherwise permitted by state law, recover from the affected nurse the costs of investigations and disposition of cases resulting from any adverse action taken against that nurse;

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- b. issue subpoenas for both hearings and investigations which require the attendance and testimony of witnesses, and the production of evidence. Subpoenas issued by a nurse licensing board in a party state for the attendance and testimony of witnesses, and/or the production of evidence from another party state, shall be enforced in the latter state by any court of competent jurisdiction, according to the practice and procedure of that court applicable to subpoenas issued in proceedings pending before it. The issuing authority shall pay any witness fees, travel expenses, mileage and other fees required by the service statutes of the state where the witnesses and/or evidence are located.
- c. issue cease and desist orders to limit or revoke a nurse's authority to practice in their state;
- d. promulgate uniform rules and regulations as provided for in Article VIII(c).

### **ARTICLE VII**

#### **Coordinated Licensure Information System**

- a. All party states shall participate in a cooperative effort to create a coordinated data base of all licensed registered nurses and licensed practical/vocational nurses. This system will include information on the licensure and disciplinary history of each nurse, as contributed by party states, to assist in the coordination of nurse licensure and enforcement efforts.
- b. Notwithstanding any other provision of law, all party states' licensing boards shall promptly report adverse actions, actions against multistate licensure privileges, any current significant investigative information yet to result in adverse action, denials of applications, and the reasons for such denials, to the coordinated licensure information system.
- c. Current significant investigative information shall be transmitted through the coordinated licensure information system only to party state licensing boards.
- d. Notwithstanding any other provision of law, all party states' licensing boards contributing information to the coordinated licensure information system may designate information that may not be shared with non-party states or disclosed to other entities or individuals without the express permission of the contributing state.
- e. Any personally identifiable information obtained by a party states' licensing board from the coordinated licensure information system may not be shared with non-party states or disclosed to other entities or individuals except to the extent permitted by the laws of the party state contributing the information.
- f. Any information contributed to the coordinated licensure information system that is subsequently required to be expunged by the laws of the party state contributing that information, shall also be expunged from the coordinated licensure information system.
- g. The Compact administrators, acting jointly with each other and in consultation with the administrator of the coordinated licensure information system, shall formulate necessary and proper procedures for the identification, collection and exchange of information under this Compact.

### **ARTICLE VIII**

#### **Compact Administration and Interchange of Information**

- a. The head of the nurse licensing board, or his/her designee, of each party state shall be the administrator of this Compact for his/her state.
- b. The Compact administrator of each party state shall furnish to the Compact administrator of each other party state any information and documents including, but not limited to, a uniform data set of investigations, identifying information, licensure data, and disclosable alternative program participation information to facilitate the administration of this Compact.
- c. Compact administrators shall have the authority to develop uniform rules to facilitate and coordinate implementation of this Compact. These uniform rules shall be adopted by party states, under the authority invested under Article VI (d).

### **ARTICLE IX**

#### **Immunity**

No party state or the officers or employees or agents of a party state's nurse licensing board who acts in accordance with the provisions of this Compact shall be liable on account of any act or omission in good faith while engaged in the performance of their duties under this Compact. Good faith in this article shall not include willful misconduct, gross negligence, or recklessness.

### **ARTICLE X**

#### **Entry into Force, Withdrawal and Amendment**

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- a. This Compact shall enter into force and become effective as to any state when it has been enacted into the laws of that state. Any party state may withdraw from this Compact by enacting a statute repealing the same, but no such withdrawal shall take effect until six months after the withdrawing state has given notice of the withdrawal to the executive heads of all other party states.
- b. No withdrawal shall affect the validity or applicability by the licensing boards of states remaining party to the Compact of any report of adverse action occurring prior to the withdrawal.
- c. Nothing contained in this Compact shall be construed to invalidate or prevent any nurse licensure agreement or other cooperative arrangement between a party state and a non-party state that is made in accordance with the other provisions of this Compact.
- d. This Compact may be amended by the party states. No amendment to this Compact shall become effective and binding upon the party states unless and until it is enacted into the laws of all party states.

### **ARTICLE XI**

#### **Construction and Severability**

- a. This Compact shall be liberally construed so as to effectuate the purposes thereof. The provisions of this Compact shall be severable and if any phrase, clause, sentence or provision of this Compact is declared to be contrary to the constitution of any party state or of the United States or the applicability thereof to any government, agency, person or circumstance is held invalid, the validity of the remainder of this Compact and the applicability thereof to any government, agency, person or circumstance shall not be affected thereby. If this Compact shall be held contrary to the constitution of any state party thereto, the Compact shall remain in full force and effect as to the remaining party states and in full force and effect as to the party state affected as to all severable matters.
- b. In the event party states find a need for settling disputes arising under this Compact:
  1. The party states may submit the issues in dispute to an arbitration panel which will be comprised of an individual appointed by the Compact administrator in the home state; an individual appointed by the Compact administrator in the remote state(s) involved; and an individual mutually agreed upon by the Compact administrators of all the party states involved in the dispute.
  2. The decision of a majority of the arbitrators shall be final and binding.