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Military Spouse Licensing: A Case Study of Registered Nurses within Military Bases Proximity

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Abstract

Military families often experience frequent moves and re-licensing requirements, which can burden military spouses working as registered nurses who want to maintain their professional careers. However, military spouse licensing recognition policies allow nurses to obtain a license in a state where their service member spouse is stationed, as long as their license from their previous state is current and in good standing, rather than going through an entire reeducation process. This policy is crucial for military families and can provide job stability for registered nurses. Our research shows that registered nurses who practice near military bases in states with military spousal licensing recognition are less likely to drop out of the labor force. Our finding highlights the importance of policies supporting military personnel's families and has implications for healthcare workforce planning and recruitment efforts.

Keywords: Registered Nurse, Occupational Licensing, Military Spouses
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1 Introduction

Occupational licensing reform has grown in popularity as the costs associated with licensing laws have become a broad topic of research and discussion for policymakers. While comprehensive reform remains elusive, several more targeted reforms have been implemented to retain the potential benefits of licensure while minimizing the negative consequences, such as mobility restrictions and cost barriers. The most widespread licensing reform attempt, as it is one of the few policies rapidly adopted by several states over ten years, is to simplify the re-licensure process for military spouses. These spouses represent a distinct sub-population that faces significant costs from licensing laws as military families move frequently and are primarily unable to pick where they will be reassigned.

Occupational licensing is one of the most common forms of labor market regulation, with an estimated 22 percent of workers being required to obtain a government-issued license before working in specific industries for pay (Kleiner and Vorotnikov, 2017). States use licensing laws to protect consumers, ensuring the competency of professionals by setting minimum education standards. Unfortunately, they also create barriers to entry into a profession, reducing the supply of workers. It's widely accepted that licensing reduces migration between states. The authority to enact licensing laws rests with individual states instead of the federal government. Because of the need for a single federal standard, states require workers to reapply for licensure when moving from a different state, making it more difficult for professionals to move and begin working. Reapplying for licensure in their new residence state is a long process, which forces the professional out of the labor market and foregoing income until the process is completed. For this reason, licensed professionals will often decide against moving entirely or will choose to leave their licensed profession (Johnson and Kleiner, 2020).

The consequences are more severe for military spouses. The decision to move to a new state is often not theirs, as new station orders for the active duty service member may be given at any time. US military families typically spend two years on an assignment or in a specific location before being transferred (Bradbard et al., 2016). These family

members move more often than civilians, and the trailing spouses are more likely to work in a licensed profession. The re-licensure process commonly takes around nine months for military spouses, causing many to opt out of work during the active duty service member's assignment (Lim and Schulker, 2010).

We focus on analyzing a series of states that passed reforms in the 2010s, which we collectively refer to as military spouse licensing recognition laws, designed to make it quicker and simpler for military spouses to transfer a license to a new state after moving due to their spouse's transfer. Registered Nurses are one of the most commonly licensed professions among military spouses (Bradbard et al., 2016). In surveys, more than 35 percent of military spouse registered nurses considered leaving the nursing field entirely due to constant licensing issues (Brannock and Bradford, 2021). Because so many military spouses work as registered nurses, these reforms designed to ease the transferability of licenses for military spouses may have additional unintended benefits that make life better for the communities surrounding military bases due to removing a barrier facing the healthcare workforce.

Although encouraged by the federal government, states designed and implemented military spouse licensing recognition laws separately, creating considerable differences in how they function; relying on the Department of Labor's classifications, we group them into two categories: reforms that remove nearly all barriers to licensure to limited reforms that do very little and only for specific professions with substantially similar education requirements between states. Doing so allows us to compare the effectiveness of laws with vastly different provisions. We primarily focus on registered nurses using the March month archive of National Plan and Provider Enumeration System (NPPES) data from 2016 to 2022 to identify the universe of registered nurses in the US and the annual changes in practice locations.

We examine the impact of military spouse licensing reforms on the per capita volume of registered nurses in facilities located near military bases, which involves a novel method to identify registered nurses who have undergone interstate practice location changes.

Subsequently, we determine the practice location's proximity to the nearest US military base. Our analysis aims to estimate the influence of military spouse licensing reform on registered nurse employment within varying radii, specifically 25, 50, 75, and 100 miles from military bases. Given the assumption that most military families reside near the base, the effectiveness of these laws should manifest in a significant uptick in registered nurse employment near military bases, which would decrease as the distance from the base increases. Addressing the burden of re-licensure through military spouse licensing reforms should promote increased registered nurse employment close to military bases.

Our paper uses spatial empirical techniques to address the following question: how do licensing reforms designed to increase military spouse employment in licensed professions affect the healthcare workforce in nearby communities after a move? Our purpose is twofold. First, we seek to confirm previous findings that military spouse licensing recognition laws are effective using an alternate data source as a unique case study. Second, we explore how these reforms could have positive unintended benefits—helping improve access to care near military bases.

We find evidence that full recognition, the broadest reform that unilaterally allows for easy transfer of licenses from all states, increases employment for registered nurses near military bases, which extends outwards for the entire state, though at a lesser rate, the further the facility is from the base. We also find evidence of the opposite effect in states with similar requirements that limit recognition to registered nurses with comparable education, which only functionally improves the re-licensure process in rare and unique cases. Our findings confirm past work and highlight the importance of proper design for recognition laws, whether limited to military spouses or all licensed professionals. They also demonstrate how narrowly targeted reforms can improve healthcare access and mobility of the healthcare workforce.

2 Background

2.1 Occupational Licensing and Mobility

Licensing laws set minimum standards of education, experience, examinations, fees, and displays of good moral character that professionals must meet before they are legally allowed to practice. While some licensure exists at the national and local levels, the vast majority of licensing regulations are set by state legislatures to guarantee a minimum quality level and protect consumers from harm. Most requirements focus on quality and safety concerns and must be completed before a professional can provide goods and services to consumers for pay. Occupational licensing is an example of self-regulation by members of a profession, relying on their ability to distinguish quality to provide a filtering mechanism for those entering the profession and oversight of active professionals through partnering with government entities to develop regulatory barriers for themselves and any perceived competition (Gehrig and Jost, 1995).

However, the quality signaling mechanism comes at a cost. Education programs can take years and cost tens of thousands of dollars. Practical experience adds additional time until the professional can begin drawing a paycheck. Meeting the requirements can be difficult for aspiring professionals and cause us to reflect on which hurdles are necessary for maintaining safety versus which are protective of incumbents, with costs instead deferred to new laborers and consumers alike. As a result, barriers to entry are created and discourage some from entering the profession as some skilled would-be professionals can only afford the education, defer their income once all hurdles are met, and instead choose a profession with lower or no entry requirements. Increases in licensing standards tend to immediately impact entry into a licensed profession (Jacob and Murray, 2006), while decreases can have the opposite effect (Chung, 2023). Depending on the data source and professions included, we estimate that licensing reduces the supply of civilian workers by between 17 and 29 percent (Kleiner and Soltas, 2019; Blair and Chung, 2019). Licensing also makes professions less responsive to a change in demand; licensed professions grow more slowly than unlicensed professions (Kleiner, 2006), so significant changes in demand

by consumers may go unsatisfied.

Licensing laws do not just create barriers to entry into a profession; once professionals obtain a license, they still create barriers to interstate migration. A worker in an unlicensed profession can begin working immediately after moving to a new state. However, licensed workers must reapply for licensure before legally working, which may take months in the healthcare profession, making it a complex process. Licensed professionals must submit documents like their current state license, exam scores, and education transcripts as a part of their application. The length of time for this process varies based on the state and licensing board, which may require board approval of an applicant, but the board may only meet a few times a year. When licensing requirements differ between states, this issue compounds. For instance, many states will have their licensing exams, require different lengths of hands-on training, or even require different educational curricula. For example, some states require an additional college-level course on behavioral health interventions for registered nurses, while others may require an additional course on sexual health and wellness. When licensed professionals move to a state with different or higher standards, they must retake exams, undergo training, or reenroll in education programs. These additional costs discourage interstate migration, which is particularly difficult for military spouses where family relocation is often not a choice.

The early literature finds evidence that licensing reduces geographic mobility. Looking at universally licensed professions, Johnson and Kleiner estimate that licensing reduces interstate migration by seven percent (Johnson and Kleiner, 2020). Additionally, they find evidence that the effect on migration varies depending on the uniformity of licensing requirements across states. For instance, professions with a single nationally accepted exam and the exact degree requirements saw little to no reduction in migration, whereas occupations with the highest costs of re-licensure, like state-specific exams and different education requirements in healthcare, saw the most significant decreases in mobility. Importantly, they do not find evidence that licensing affects registered nurses' migration behavior. This may result from standardized initial licensing requirements for registered

nurses.

However, continuing education is considered by nursing boards when a registered nurse is applying for a license in a new state, and this differs between states. Nursing is among the most dispersed professions, offering flexibility in location (Benson, 2014). The lack of reduction in migration for those continuously employed is also likely tied to the fact that registered nurses are one of the most in-demand professions with demand in nearly all major healthcare facilities, but does not account for individuals who may leave the labor market because they decide not to undertake the re-licensure process. Along similar lines, Mulholland and Young (2016) focus on licensing laws for professions that do not require a typical four-year college degree, relying on the occupations included in License to Work. They estimate that states with 10 percent fewer licensed professions experience a 6.5 percent increase in noncollege-educated residents moving into the state (Mulholland and Young, 2016). Combined, these suggest that licensing laws hurt interstate migration by increasing the cost of working after a move, and this effect may be seen through a difference in employment after moving.

An alternate strategy to estimate the impact effect of occupational licensing on geographic mobility is to leverage recent licensing reforms designed to improve mobility. There is currently mixed evidence that the Nurse Licensure Compact (NLC) improves geographic mobility. Among its provisions, the NLC allows registered nurses (and several other forms of nursing) to move between member states to practice on a temporary license to prevent a disruption in practice while waiting on a new permanent license. Using the exact data source for registered nurses, Shakya et al. (2022) estimates that the NLC increases migration for registered nurses by 11 percent. Note that this is a temporary license, and the practitioner must still go through the licensure process, even if the speed of that process is meant to be faster with the NLC in place. DePasquale and Stange, relying on a different data source and focusing on earlier years of the NLC, find evidence that it does not impact migration (DePasquale and Stange, 2016). Instead of an expedited licensure process for a single profession, universal recognition is an alternate reform that

recognizes all licenses from other states. Universal recognition, an expanded version of the military spouse recognition laws, tells a more consistent story. Universal recognition is associated with increased migration into a state (Deyo and Plemmons, 2022; Bae and Timmons, 2023).

2.2 Military Spouses

Military spouses are those married to active duty service members stationed in the US and abroad, composing 0.5 percent of the population (Bradbard et al., 2016). Military spouses differ from the average US resident on a range of characteristics. For instance, military spouses are much younger, with an average age of 33, and two-thirds have children (Bradbard et al., 2016). The vast majority, 93 percent, are female. On average, they move every two years when their spouse receives a permanent change of station order (Bradbard et al., 2016). Frequent moves have a negative impact on career outcomes. Not only are military spouses more likely to be unemployed than the general public, but when they can work, they suffer a wage penalty (Burke and Miller, 2018). Regular interruptions and moves to places independent of their career progression or prospects make establishing a career more difficult for military spouses (Burke and Miller, 2018). This has resulted in several concerning trends, such as non-trivial rates of military families experiencing food insecurity and becoming reliant on social assistance programs as often one or more family members are unable to maintain consistent skilled-employment in the civilian labor market (London and Heflin, 2014; Wax and Stankorb, 2016).

Compounding the difficulties of frequent moves, military spouses are more likely to work in a licensed profession than the civilian population, likely due to the shorter length of education programs for some skilled or technical professions. Registered nurses are one of the most popular professions among military spouses. Meanwhile, more than 35 percent of the surveyed registered nurses indicated they considered leaving the nursing field due to constant licensing issues (Brannock and Bradford, 2021). Regular moves combined with months of forgoing income for re-licensure in each state create employment

barriers for military spouse registered nurses. The wait time to receive a license via endorsement (with a recommendation from the previous state licensing board) after a move can last over six months (Brannock and Bradford, 2021). Employers will not review an application frequently until the applicant has an active state license, which adds even longer wait periods for military spouses to find work after a move, even for highly in-demand professions such as nursing.

Eighty-nine percent of spouses who worked in licensed professions did not re-license after a permanent change of station order move. Recognizing the difficulty faced by military spouses, states began implementing reforms in the 2010s. Preliminary evidence suggests that recognition programs, like military spouse licensing recognition, can reduce barriers to licensure (Deyo and Plemmons, 2022). After an active duty service member receives a transfer order, the choice for military spouses is not between moving and not moving, like most professions. For military spouses, the choice is whether to work after moving. So, evidence that the reforms are effective will not be observed through an increase in migration; rather, it will be an increase in employment in areas directly affected by the policy change, most of which will occur near a military base. These recognition policies vary by state, and we have categorized them into two groups- full recognition and recognition for those with similar training and experience or who only offer recognition for a limited set of licenses in the case of substantially identical requirements. Our results find that full recognition of military spouse licenses is associated with increased employment in the county where an army base is located.

2.3 Nursing

Registered nurses are qualified professionals graduating from an accredited nursing program housed in a college or university with 2 to 4 years of education. Most state licensing requirements set the minimum education for a registered nurse as an associate degree in nursing but also offer licensure through a bachelor of science degree in nursing and passing a national certification examination. Registered nurses assist during

treatments and examinations, as well as administer medications.

Although registered nurses only need an associate's degree for licensure, hospitals increasingly require registered nurses to obtain a bachelor's degree as a prerequisite for employment (Perez-Pena, 2012). Hospitals are ratcheting education requirements for registered nurses upwards and reducing staffing of licensed practical nurses to improve the chances of obtaining "Magnet" status from the American Nursing Association, a vital quality designation that influences the payment hospitals receive. Today, more than 70 percent of registered nurses hold a bachelor's degree.

The primary difference in registered nurse licensing requirements between states is continuing education. States not only require a different number of continuing education hours, but they can also require specific courses and subjects that differ significantly between states. For most professions, differences in continuing education do not represent an issue when applying as an out-of-state applicant. However, most state boards of nursing choose to include continuing education in their assessment of similar training and education. This limits registered nurses' ability to transfer a license between states.

The Nurse Licensure Compact (NLC) was designed to reduce barriers to interstate practice for registered nurses, which includes permanent migration, but the current evidence is mixed as it does not promote immediate recognition but instead shorter timetables to re-licensure, which may still require additional education and training (Shakya et al., 2022; DePasquale and Stange, 2016). Several non-NLC states with large military installations, like California, Washington, and Nevada, have not joined the NLC. As a result, many military spouses registered nurses move to or from a non-NLC state. Additionally, military spouses report difficulty navigating the NLC licensure by endorsement process and experience delays with paperwork and license verification from their state's board of nursing. If a recognition system is already in place, military spouses would be more likely to seek out that route, as it would recognize a current in good standing license rather than just making a pathway for licensure in the new state. While the NLC may be effective for nurses in general, it is not adequate for military spouses, which can explain

why the difficulties with re-licensure persist despite past reforms and why the NLC is not a large concern for our discussion of military spouse licensing recognition.

Shortages of healthcare providers are widespread, impacting patients across the US. A growing shortage of physicians is a concern for policymakers and clinicians (IHS Markit, 2021). Healthcare Professional Shortage Areas, defined as areas where the number of physicians falls below a minimum threshold, affect over 98 million residents (Bureau of Health Workforce, 2023). Literature shows a clear impact of the physician shortage, especially for primary care physicians, worsening patient outcomes (Basu et al., 2019). One way legislators, hospital administrators, and professional associations have attempted to address these shortages is by using care team models, including registered nurses, as a vital part of care provision.

There needs to be more work focusing on the shortage of nurses, but it is also a growing concern. By 2030, 37 states are projected to suffer from a shortage of registered nurses, reaching 510,394 nationwide (Zhang et al., 2018). Maintaining adequate staffing ratios of registered nurses is essential to providing high-quality, team-based patient care. When registered nurse-to-patient ratios fall, patient outcomes suffer (Needleman et al., 2011; Li and Cimiotti, 2021). Because the role of registered nurses within the healthcare team involves frequent patient interaction, registered nurse staffing shortfalls put pressure on the remaining healthcare workers to minimize patient time to cover more patients. Adequate time with patients is essential to ensuring patient compliance with treatment (Thomas-Hawkins et al., 2008). However, more than simply mandating minimum nurse-to-patient ratios is needed to improve the quality of care as it does not address the underlying issue, the shortage of nurses (Bowblis and Lucas, 2012).

With the knowledge of the approaching nursing shortage, it is essential to build effective policies that address opportunities for increasing and retaining the nursing workforce. Military spouses, who have high rates of training in registered nursing but low rates of maintaining licensure after moving, provide one such example of a population where regulatory barriers may be adjusted to ensure that registered nurses can have reasonable

access to the healthcare labor market rather than leaving the labor force, increasing total available care providers.

3 Data

We utilize a differencing and event study framework to observe and empirically analyze the effect of military spouse licensing recognition reforms on registered nurse employment, especially concerning the healthcare workforce near military bases. Ideally, we would have data for each registered nurse and whether they are a military spouse moving to accompany an active duty service member. Yet, we cannot identify military spouses among the individuals in our data. Instead, we focus on aggregate county-level per capita change of registered nurses and the corresponding distance of their practice location from a military base. Despite lacking individual martial records, our data is well-suited to our research question through unique variation because the military entity makes mobility decisions and is plausibly exogenous to spouse licensure. We combine data from three sources for our analysis.

3.1 Military Spouse Recognition Laws

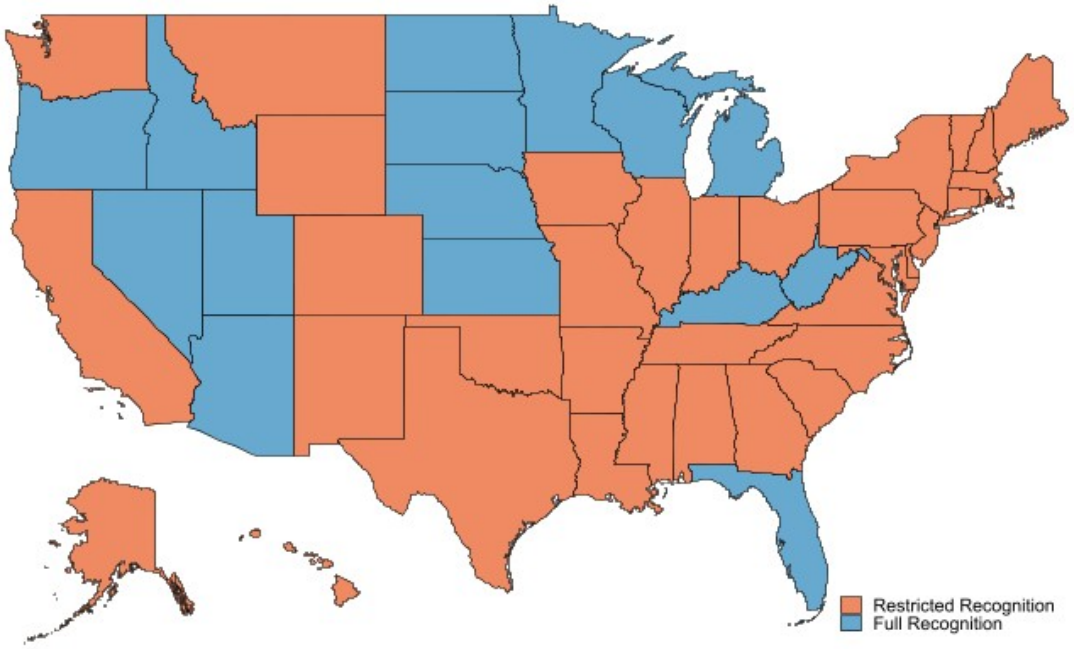
We obtained information on the military spouse licensing recognition laws from the US Department of Labor. While each military spouse recognition law aims to simplify the licensure process for military spouses after a move, states choose to do so through different means. They classify these reforms into four categories based on the provisions for each law.

- **Full Recognition:** All licensing boards must issue licenses to military spouses with an active license from another state.
- **Similar Training:** All licensing boards must issue licenses to military spouses with an active license from another state, provided their training and education are "substantially similar."

- **Situational Recognition:** Licensing boards can issue licenses to military spouses with an active license but are not required to do so.
- **Limited Recognition:** Only licensing boards defined in legislation can issue licenses to military spouses with an active license.

States with Full Recognition have the lowest barriers for military spouses seeking relicensure as the military spouse's license is recognized for any occupation with very limited exceptions, as long as their license is active and in good standing within the previous state. Recognition for substantially similar training and education provides licensing boards some discretion over who is eligible, which can be used to exclude some military spouses. Situational Recognition and Limited Recognition are the weakest reforms, allowing boards to maintain broader discretion over the choice to accept licenses or limiting recognition to a handful of specific professions. The education and training requirements are standardized mainly for registered nurses across states, except for continuing education. As a result, full recognition and substantially similar training requirements function differently, as similar training includes continuing education. For our analysis, we divide the reforms into two separate categories. The first category is Full Recognition. Restricted Recognition represents the three weaker versions of recognition where state boards retain considerable discretion in recognizing an out-of-state license. Similar training, situational recognition, and limited recognition all allow state licensing boards to limit entry for military spouses who are registered nurses and function quite similarly in their treatment of this profession. The only state without a licensing recognition policy during our sample period is Connecticut, which does not have an Army base and is not included in our sample. Figure 1 below provides a map of military spouse recognition by classification.

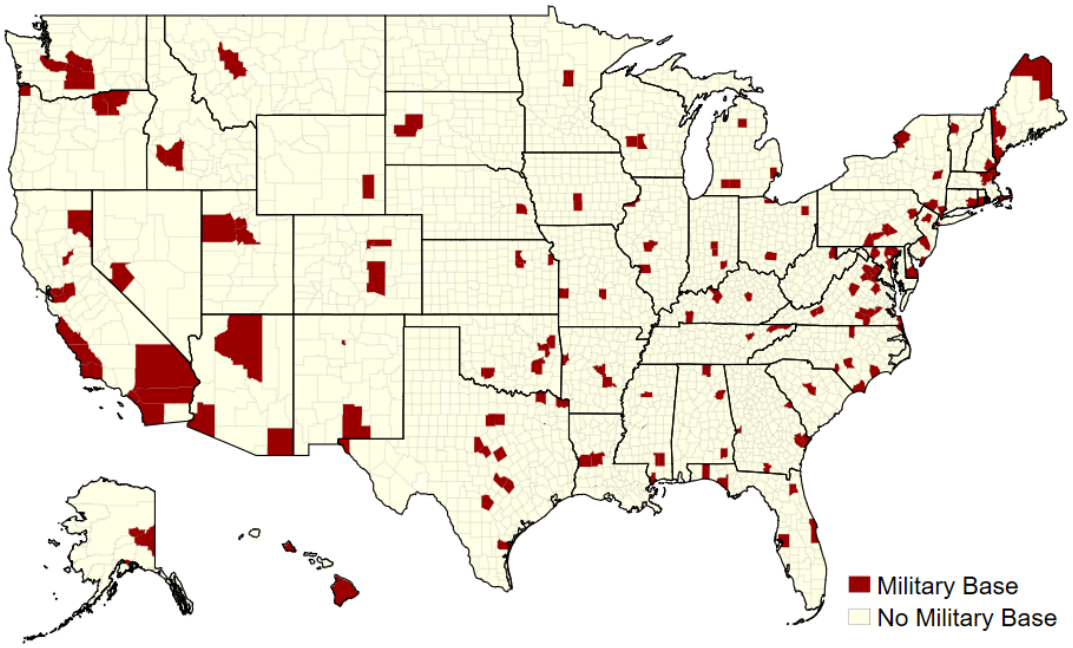
Figure 1: Military Spouse Recognition Category



3.2 Military Base Location Data

We then obtained the list of domestic military bases from the US Marine Corps, which compiled a list of military bases for each US military branch. We limit military bases of interest to the US Army, US Army Reserve, and other branches with a US Army presence. We excluded Navy and Air Force bases because both branches include many bases located overseas, and their domestic bases are highly influenced by geographic features such as proximity to the ocean. Because of this restriction, any results should not be considered causal, as they are a lower-bound estimation of the total effect size, which may be more prominent when including all military branches. Figure 2 below shows the military bases that we included, highlighting the county they are located in.

Figure 2: Counties with US Military Bases with Army Presence



3.3 Registered Nurse Mobility

We obtained information on healthcare providers and their practice locations from the National Plan and Provider Enumeration System (NPPES) public use file from 2016 to 2022 through the Centers for Medicare & Medicaid Services. This dataset has collected healthcare providers' national provider identifiers and NPI numbers since May 23, 2007, the standard identifier for HIPAA-covered entities. The NPPES data files include all FOIA-disclosable data for active and deactivated providers. Beginning in 2016, we started collecting snapshots of this dataset each year in March. Using this database, we extracted the complete set of registered and licensed practical/vocational nurses based on taxonomy codes. These taxonomy codes for registered nurses licensed practical nurses, and vocational nurses were obtained from the NPI dashboard website. While we focus on registered nurses, these other healthcare occupations are also collected for additional robustness testing.

We create a repeated cross-sectional panel dataset by merging NPI data for consecutive years: 2016/17, 2017/18, 2018/19, 2019/20, 2020/21, and 2021/22. By matching

NPI and nursing practice location, we determine if a nurse moved between two consecutive years, defining this variable as "Mobility," that is how we identify movers. We adopt a skill mobility assumption rather than person mobility because registered nurses sometimes practice in multiple locations, accounting for variations in skill rather than individuals. Shakya and Plemmons (2020) and Shakya et al. (2022) utilize a similar methodology to identify mobility of the healthcare workforce.[1]

After subsetting the registered nurses, licensed practical nurses, and vocational nurses, we utilized the NPPES public use file from 2016 to 2022 to identify the providers' practice locations for each year. These locations are then geocoded into latitude and longitude coordinates. By comparing the latitude and longitude pairs of the nurses' practice locations with those of military bases, we determine the distance between the nurses' practice locations and the nearest military base using standard geographic and spatial mapping methods.

3.4 Summary Statistics

Our location data for registered nurses and other types of nurses in our robustness checks spans from 2016 to 2022. Most military spouse licensing recognition laws were passed in 2012 and 2013; however, nine additional states introduced some form of military spouse recognition during our sample period. New York passed the reform in 2016 but is excluded from the analysis for a lack of pretreatment period. Four states passed Full Recognition (Utah, Idaho, North Dakota, and Nebraska), and four passed some form of Restrictive Recognition (Georgia, Iowa, Montana, and Pennsylvania). Of the remaining

[1]NPPES data comprises nurses who are also practicing in multiple locations. For example, say a nurse is practicing in 2016 in two states, SC and NC, but next year, if a nurse is practicing in SC and other states, say TN, we define NC to TN as $mobility = 1$ and SC to SC as $mobility = 0$. It seems we are double accounting for the nurse, but we have to assume skill mobility rather than a person's mobility implicitly. There are two reasons to do so. First, a nurse can reside in one state and practice in different states. Hence, skill mobility appears adequate to model rather than a person's mobility. Second is that, for example, in 2016, we had 181,401 nurses, and that's the number which gets reported in https://www.npidashboard.com/taxonomy/163W00000X, and other agencies use such numbers from npidashboard.com. However, when we look closely at the National Plan and Provider Enumeration System (NPPES) public-use data file, we see only 167,286 unique individuals or unique NPIs of registered nurses. So, it seems that standard practice is to count skills rather than count people.

states, Connecticut did not have a military spouse recognition policy, and all other states had already enacted their military recognition policy in the early 2010s. Table 1 shows the treatment states by year and reform implementation.

Table 1

Year	Full Recognition	Restricted Recognition
2016		New York*
2017		Georgia
2018	Utah	
2019	Idaho, North Dakota	Iowa, Montana, Pennsylvania
2020	Nebraska	

Note: * Excluded from analysis.

4 Methodology

Our empirical strategy first compares the probability of migration of nurses who remain in the labor force in states with Full Recognition of military spouse licenses compared to mobility towards states with Restricted Recognition. If more registered nurses move across state lines to a county near an army base and continue working, this would be a sign of reduced barriers to expanding the healthcare workforce. We exploit the staggered adoption of the military spouse recognition laws across states and over time to examine whether such law is associated with lower mobility among nurses. We perform a regression on the universe of registered and licensed practical nurses using the following regressions.

$$Mobility_{ist} = \beta MilSpouse_{st-1} + \nu_{s,originstates} + \gamma_t + \epsilon_{ist} \quad (1)$$

Our data is constructed at the individual level by year. Indices i, s, and t represent the individual practitioner, practicing state, and time.

We consider two mobility variables within $Mobility_{it}$. The first is a binary indicator and takes a value of 1 if nurses move from one zip-code to another (Zip mobility$_t$) and 0 otherwise. Second is also a binary indicator, but this it takes a value of 1 if nurses

move inter-state (State mobility$_t$), and 0 otherwise, isolating the movers who would move to states where they must be re-licensed. $MilSpouse_{st-1}$ is a binary indicator variable, which takes a value of 1 for state s if there is a relevant military spouse license recognition policy and 0 otherwise. The coefficient of interest is β, which estimates the probability of mobility among nurses who move to states with the military recognition law after recognition, compared to nurses who do not move to a state that did not experience a policy change. A positive and statistically significant β coefficient represents a positive association between military spouse relevant laws and mobility, while a negative coefficient would represent adverse effects on mobility and participation in the workforce of recognition expansions.

Equation 1 also includes $\nu_{s,originstates}$ and γ_t, which are nurses' origin state-level and year-level fixed effects, respectively, which capture origin-invariant and time-invariant unobservables such as other state policies within the state the practitioner is leaving which may affect their labor market decisions.

We perform a separate analysis for Full Recognition and Restricted Recognition to compare the effect magnitudes and to observe if one policy type is more efficient or if both contribute to the healthcare workforce and military spouse mobility. Because the laws function differently across our two categories, we expect some differences to be present. Full Recognition allows registered nurses(as well as other types of nurses) to transfer their licenses despite differences in requirements. Therefore, it should be more effective than Restricted Recognition, which require substantially similar continuing education and allow for board discretion when approving recognition applications.

This also poses the question: if state-level licensing compacts for registered nurses do not reduce migration, why should we expect to find an effect for military spouse reforms? This is two-fold. First, as found in compacts, military spouse license recognition is just that of an active license rather than an expedited licensure process. Also, there is an essential empirical function of the military spouse registered nurses question, which allows us to estimate the effect size without endogeneity concerns, in that mobility deci-

sions are made by the military branch and are not directly affected or influenced by the spouse's employment opportunities, as is the case in the civilian workforce. While the migration decision is not made based on spousal employment, delays in licensing caused by state oversight would result in a longer duration of unemployment or individuals leaving the labor force. Universal recognition has been shown to decrease the duration of unemployment, suggesting that reducing the barriers to re-licensure can be effective at increasing employment (Bae and Timmons, 2023). We expect to see a similar effect for military spouses, but more pronounced, because their frequent moves and inability to choose their destination base make delays much more costly (Burke and Miller, 2018).

We expect that the military spouse licensing recognition laws will have heterogeneous effects within a state, as the effect would likely be largest near military bases within commuting distance of military spouses living on or near the base. Therefore, practice locations near military bases should see the most substantial effects, as that is where most military spouses will live and work, though certainly some may be willing to travel further commuting distances for employment opportunities. Therefore, we also provide figures of coefficient estimates at different distances from the base centroid, including 25, 50, 75, 100, and 125 miles.

5 Results

The tables and figures below present our results on the relationship between military spouse licensing recognition and the probability that a registered nurse will move into a county near an army base and continue working rather than leaving the labor market. Table 2 shows that states that pass Full Recognition see a higher probability of mobility into the state for RNs. However, this increased probability is not just concentrated near military bases; it spreads out over a 100-mile radius. This makes intuitive sense as we begin our estimation from the base centroid. As bases are large, the nearest healthcare facility may be dozens of miles away. Also, sixty miles is within commuting distance.

Column (1) shows that within 20 miles of a military base, passing Full Recognition increases the probability of mobility into the area by 12 percent, which is significant at the 1 percent level. This not only reflects more military spouses, as relocation decisions are reasonably random and determined by the military branch, but shows that near military bases, there was a growth in the proportion of these incoming movers who choose to continue work as RNs, with other policies held equal.

Each subsequent column increases the distance from the military base. Column (2) reports a similar point estimate, still significant at the 1 percent level. This pattern continues through 100 miles of an army base, shown in (3)-(5). Column (6) reports migration into the entire state. After a state introduces Full Recognition for military spouse licensing, there are significantly higher rates of movers choosing to work as registered nurses throughout the state, with the largest concentration within 60 miles of the base. Enacting Full Recognition increases the probability of mobility into the entire state by 12 percent for RNs, implying that Full Recognition may be an effective policy lever to encourage greater retention and participation in the healthcare workforce.

Table 2: Probability of mobility into full recognition

	Probability of mobility into full recognition					
	0-20	0-40	0-60	0-80	0-100	all inter-state
	(1)	(2)	(3)	(4)	(5)	(6)
Post Treatment	0.120***	0.116***	0.131***	0.125***	0.116***	0.120***
	(0.034)	(0.023)	(0.019)	(0.018)	(0.017)	(0.014)
Observations	3,232	6,195	8,320	9,633	10,724	13,073
R^2	0.082	0.052	0.043	0.039	0.039	0.041
Adjusted R^2	0.068	0.044	0.037	0.034	0.034	0.037

Note: The 1%, 5%, and 10% levels of significance are given as ***, **, and * respectively.

Next, we turn to the weaker forms of military spouse recognition. These Restrictive Recognition policies allow the licensing board to have discretion over approving applications and can require substantial hurdles that may prevent a license from being recog-

nized, such as similar continuing education requirements. Table 3 repeats the estimation above but finds the opposite relationship. Here, it is essential to remember the control group against which these treated states are compared. Compared to the average rate of registered nurse employment near military bases for states with some form of recognition since the early 2010s, introducing a restrictive recognition policy decreases the probability that an army spouse registered nurse will move and continue in their licensed profession. These effects are most prominent near the base, by upwards of a 21 percent probability reduction, as shown in column (2), and dissipate in magnitude the further away the practice location is from the base, shown in columns (3) to (6). All results are significant at the 1 percent level and robust to the inclusion of other nursing categories.

Table 3: Probability of mobility into restricted recognition

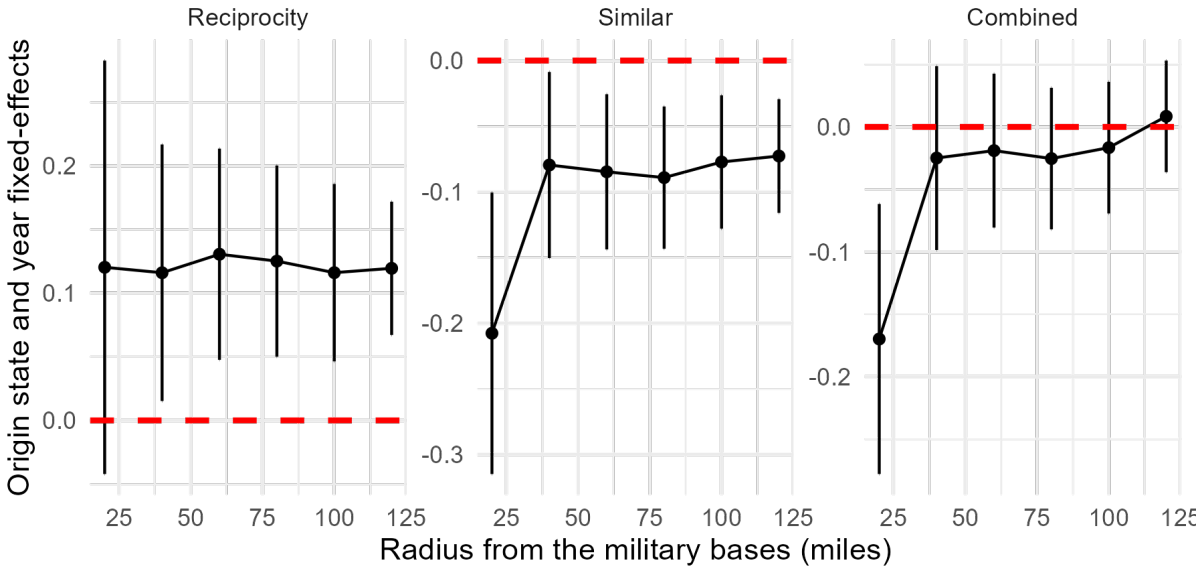
	Probability of mobility into similar recognition					
	0-20	0-40	0-60	0-80	0-100	all inter-state
	(1)	(2)	(3)	(4)	(5)	(6)
Post Treatment	−0.208***	−0.080***	−0.085***	−0.089***	−0.077***	−0.073***
	(0.023)	(0.016)	(0.014)	(0.013)	(0.012)	(0.011)
Observations	3,232	6,195	8,320	9,633	10,724	13,073
R^2	0.103	0.052	0.042	0.039	0.038	0.038
Adjusted R^2	0.089	0.044	0.036	0.034	0.033	0.034

Note: The 1%, 5%, and 10% levels of significance are given as ***, **, and * respectively.

Figure 3 displays the results visually for ease of interpretation and discussion. Each dot represents the point estimate of the probability of migration into the area near a military base with a 95 percent confidence interval depicted by the black bar. The distance from the military base is shown on the x-axis. For Full Recognition, the probability is steady at around 12 percent for any distance within 100 miles of a base. This implies that states that moved to a Full Recognition policy, when compared to states that already had some recognition policy, saw an immediate boost in the probability that a mover would continue to work as an registered nurse after moving across states. For Restrictive Recognition compared to states with established policies, we see the large negative effect

closest to a military base, which moderates as we move from the military bases. This implies that moving RNs, particularly those closest to bases and most likely to be military spouses, are far less likely to be retained and continue working in the registered nurse labor force after moving to a new state.

Figure 3



The pattern between the different types of military spouse licensing recognition reforms is consistent with barriers to re-licensure being removed. We would expect more significant point estimates from states with Full Recognition. We would also expect poorer performance by states which allow for discretion and additional barriers of substantially similar continuing education requirements, often resulting in registered nurses having to return to an educational program and foregoing wages before being able to restart working after a move. As expected, these effects are most prominent when considering practice locations within a reasonable driving distance of a military base and reduce in magnitude the further the practice location is from the base. Note that there are wide standard errors on the effect size at 25 miles, likely caused by a subset of bases that are so large that the nearest medical facility is greater than 25 miles away or still within the base property. The combined chart represents when both Full Recognition

and Restrictive Recognition are considered, and the states with changing policy changes on average saw similar probabilities of registered nurse retention as the average of states with some policy already in place. This test serves as a check to ensure the differences we notice are driven by policy structure differences rather than some other state-specific variation.

Compared to the more extensive literature, which has focused primarily on universal recognition laws and healthcare workforce interstate compacts, we find similar benefits from removing barriers to having licenses recognized in other states using a unique case study with exogenous mobility—military spouse license recognition policies. Our work addresses limitations in previous work where causal justifications were challenging to make as it may always be the case the licensed worker chooses to move to a specific location because of job attributes; military spouse mobility does not factor their jobs into the relocation decision.

Our work is consistent in terms of expected employment effects. For example, Bae and Timmons (2023) specifically find evidence that the unemployment rate is reduced through shorter unemployment durations when a recognition policy is put into place, which is evidence of licenses being accepted much more quickly. We believe that the same mechanism is occurring here, but the shorter duration also encourages more military spouses to seek work and retain their positions in the labor force rather than sitting out for their stay. This has crucial implications for the healthcare workforce, as this case study provides evidence that recognition policies may help retain and attract providers during severe healthcare provider shortages.

6 Conclusion

Recognition of licensure across state lines, especially for industries with growing shortages such as healthcare, can be a critical lever for retaining licensed workers by lowering the barriers to continue working after a mobility change. While there are some recog-

nition policies introduced over the last few years on universal recognition for civilians, understanding the full impact of these policies on worker mobility is difficult because we are unaware if the individual is moving for a job-related reason, such as to have more job autonomy (Shakya and Plemmons, 2020).

We explore this question of licensure recognition within healthcare using a unique and understudied policy environment—military spouse licensing recognition laws. These laws, put in place decades before universal recognition policies, affect interstate licensure recognition for a targeted population where interstate moves are exogenous and decided by the military branch of the service member and not for attributes of the worker's job.

This analysis shows that movers in counties near military bases who are registered nurses are more likely to remain in the workforce and continue working as registered nurses in their new residence states. This is important because registered nurses are one of the most common occupations for military spouses, but interstate licensure problems have caused many moving or trailing spouses to leave the labor force or switch professions away from healthcare.

This implies potential policy impacts for two critical questions. First is retaining the spousal workforce in the armed forces, which has significant rates of leaving the labor force due to interstate licensure issues, causing several military households to experience food insecurity and reliance on social assistance programs. Recognizing licensure, rather than simply creating an expedited pathway, is more likely to keep spouses employed, reducing government expenditures and raising the well-being of military households.

Second, this unique policy environment allows us to develop insights into interstate license recognition policy lever without the bias of movers deciding their destination state due to job attributes. This does help promote retention and employment in the healthcare workforce, a critical sector on the edge of provider shortages. We find that full recognition laws substantially increase the probability of retaining workers, while more limited or restricted recognition laws that require similar continuing education or are at the discretion of the licensing board are not effective and, instead, may negatively impact

the rates of military spouses staying in the labor market. The growth in retention is felt throughout the states but is largest around military bases, which is expected since they are the most common residential areas for military families.

A significant limitation of this work is an inability to identify military spouses directly, so instead, we must analyze the aggregate behavior of all RNs. While employment effects near military bases are likely military spouses, and our results for combined policies having no discernible effects give us confidence, we cannot definitively rule out others. We also only analyze a select section of the military spouse labor force. Though registered nurses are one of the most common spousal professions for active duty military service members, these results may not represent trends for the more significant licensed military spouse population.

Our results support the literature in that not all reforms are created equal. As states seek to mitigate the adverse effects of licensing, ensuring their proper design is essential. We find evidence that increasing license portability between states in a way that tangibly helps professionals requires vital reforms that recognize all licenses, not just ones deemed equivalent by licensing boards. These findings can be extended from military spouse licensing recognition laws to universal licensing recognition laws and are an excellent area of future research for economists and policymakers.

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