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MATERNITY CARE DESERTS IN RURAL NEW HAMPSHIRE

PRESENTED TO THE CENTER FOR ADVANCING RURAL HEALTH EQUITY PLANNING COMMITTEE

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EXECUTIVE SUMMARY

The closure of labor and delivery units across New Hampshire poses numerous problems for the state's mothers and newborns, leaving large numbers of rural residents without easy access to maternity care services. These closures are the product of a variety of factors including a shrinking patient base, financial issues, and staffing challenges. If labor and delivery units continue to close, many parts of the state may become large maternity care deserts. To address this problem, New Hampshire must develop new initiatives and policies to ensure that residents have continued access to quality prenatal, delivery, and postnatal services. In this report, we first describe the factors driving the closure of these units and the effects of the closures. Next, we focused on conducting state-by-state comparisons, analyzing how other states (Alaska, Arkansas, Maine, and Vermont) have responded to their own maternity care crises along different dimensions that can help provide a model for New Hampshire's path forward. Lastly, we provide policy recommendations for the state of New Hampshire based on this analysis and the interviews of select stakeholders.

1 INTRODUCTION: MATERNITY UNIT CLOSURES

New Hampshire has lost nine labor and delivery units over the past 20 years.[1] As these units continue to close their doors and residents lose access to important maternity care services, the state faces the risk of growing maternity care deserts. Maternity care deserts, defined by the March of Dimes as counties "in which access to maternity health care services is limited or absent," can result either from a lack of maternity care services or from barriers to reaching those services.[2] Residents in maternity care deserts do not have access to obstetric providers or to hospitals with labor and delivery units.[3]

Many large swaths of New Hampshire without labor and delivery units either meet the criteria for maternity care deserts or may become full deserts in the near future. In central New Hampshire, for example, the closure of five maternity units from Claremont to Wolfeboro has left the residents that live there in a maternity care desert.[4] Residents in other areas, particularly northern New Hampshire, also face extremely limited access to essential maternity care services. The closure of so many obstetric units has meant that pregnant and postpartum women must travel increasingly long distances to reach the maternity units that remain.[5] If units continue to close, more counties across New Hampshire may officially become maternity care deserts.

As seen in Figure 1, maternity unit closures have disproportionately affected the state's rural residents. Resulting from a combination of low birth totals, financial pressures, and staffing challenges, these closures have created a particularly precarious situation for mothers and newborns in rural areas. Rural patients, many of whom already had to travel greater distances to reach sparsely distributed maternity care services, now face even greater challenges in accessing those services. Remaining services are further constrained by staff shortages and patient overload. Without the ability to access quality prenatal, delivery, and postnatal care, mothers living in these areas and their babies face a higher risk of labor and delivery complications that may put their health and lives in jeopardy.[6]

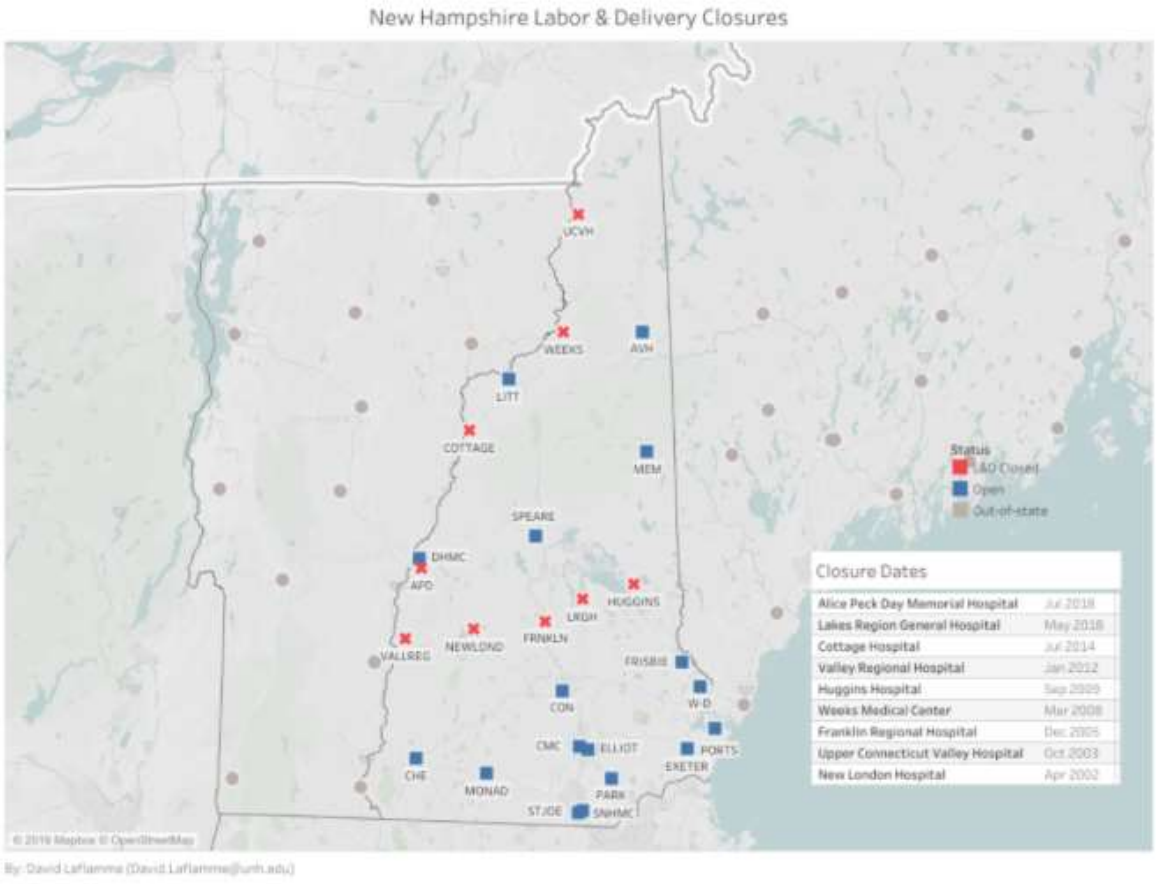

Figure 1: New Hampshire labor and delivery unit closures, 2019[7]

2 PURPOSE STATEMENT

New Hampshire's primarily rural status hinders the state's ability to sustain reliable care options across the state. Though there is only one reported maternity care desert in the state, the purpose of this project is to investigate policies and conditions that can help prevent additional obstetric unit closures. New Hampshire's rural and aging populations make the Granite state more susceptible to maternity care deserts. Therefore, it is critical to take early, evidence-based, and preventative measures. The Center for Advancing Rural Health Equity at Dartmouth Hitchcock Health is particularly well-suited to guide the creation and implementation of programs and policies that will meet the unique needs of New Hampshire's patients.

It is important to compile information that can identify the causes of maternity unit closures and any patterns or trends that have led to these closures. Identifying key data and information is critical in considering possible policy solutions that can help maintain the viability of rural birthing hospitals. In this project we aim to understand numerous dimensions of maternity care in greater depth. These

dimensions include, but are not limited to, midwifery, staff licensure, insurance funding, telemedicine, and the usage of adjunct workforces.

Furthermore, this project aims to identify what policies other states that are similar to New Hampshire have implemented to improve the quality of their prenatal, delivery, and postnatal care. The closures of maternity care units are not unique to New Hampshire. We aim to understand how policies developed elsewhere can be applied to or adapted for New Hampshire. State-by-state comparisons offer new perspectives and approaches for addressing issues related to maternity care.

This project will account for the reasons why rural birthing hospitals are closing, and how other states have created policies to address these reasons and result in improved quality care. We will investigate how these policies can be adapted to the specific conditions found in New Hampshire.

3 FACTORS DRIVING CLOSURE OF LABOR AND DELIVERY UNITS

There are many factors driving the closure of labor and delivery units across rural New Hampshire. These factors include a shrinking patient base, funding and reimbursement issues, and staffing challenges. Any response to the increasingly urgent problem of growing maternity care deserts should ideally address each of these problems.

3.1 A SHRINKING PATIENT BASE

New Hampshire's shrinking patient base for maternity care, largely the result of a declining state fertility rate, has contributed to the closure of rural labor and delivery units. A major factor driving New Hampshire's declining fertility rate is the state's rapidly aging population. The state's median age is 43, making the state the second-oldest in the country.[8] The state's bell-shaped age distribution is skewed by a high number of older adults and a noticeably lower share of younger residents.[9] This skewed distribution is the product of a decline in both natural increase and net migration. Natural increase, or the difference between total births and deaths, has dropped since 1980,[10] with deaths exceeding births for the past four years.[11] Net migration has also declined in recent decades.[12] As a result of these changes, there is a markedly low number of adults in the 25-40 age range. This age range overlaps heavily with women's prime childbearing years, meaning that there are fewer women of childbearing age living in New Hampshire.[13]

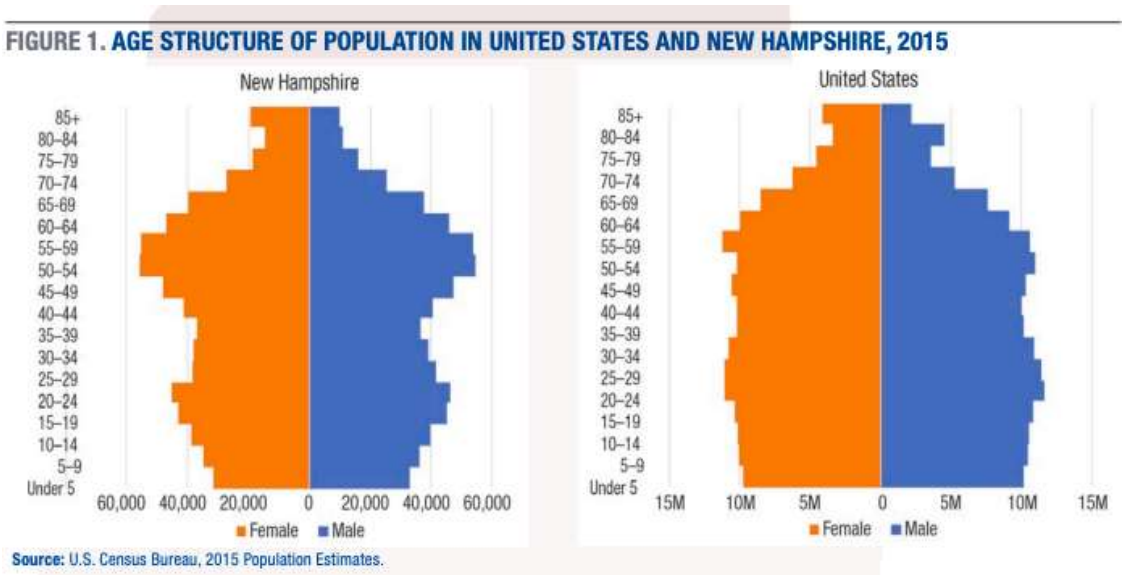

Figure 3.1: Age Structure of Population in United States and New Hampshire, 2015[14]

This shift can help explain the declining fertility rate seen in the state. Total fertility rate (TFR) is defined by the U.S. Department of Health and Human Services as "the expected number of lifetime births per 1,000 women given current birth rates by age."[15] New Hampshire has one of the lowest TFRs in the country, with just 1515.0 births per 1000 women.[16] Just three areas—the District of Columbia, Massachusetts, and Rhode Island—have an even lower fertility rate.[17] A TFR of 2,100.0 births per 1,000 women is accepted as the rate necessary to ensure full population replacement.[18] New Hampshire's TFR lags that rate by over 500 births.

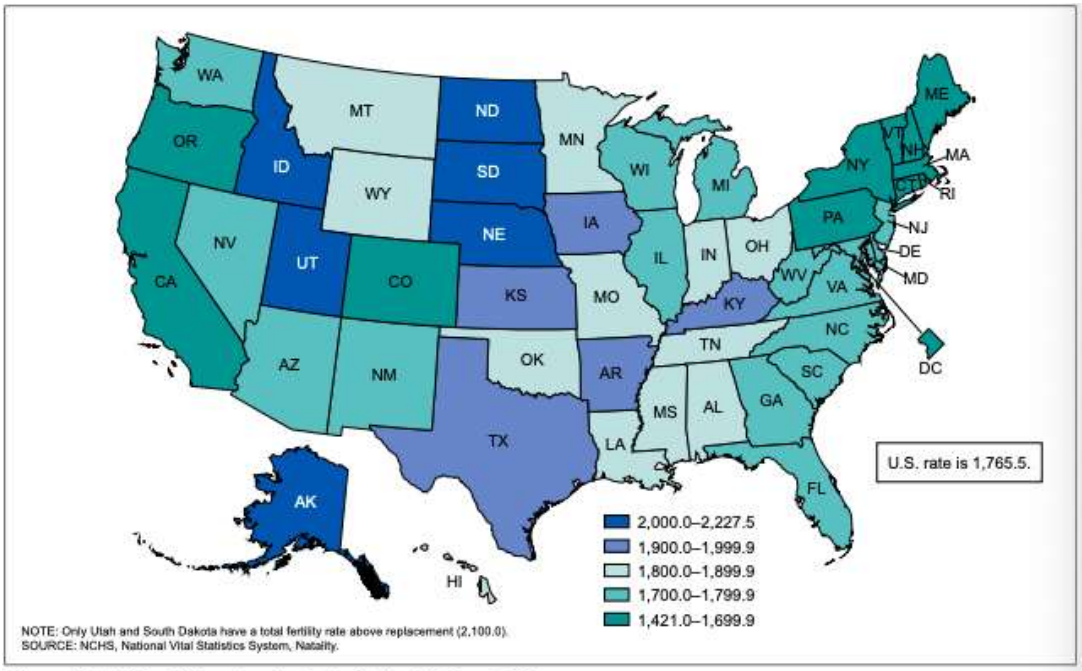

Figure 1. Total fertility rates, by state: United States, 2017

Figure 3.2: Total fertility rates, by state: United States, 2017[19]

While New Hampshire's low TFR independently prompts concern, this problem has worsened in recent years. The state's number of births has dropped significantly over the past two decades. In 1990, there were 17,519 births in the state.[20] This number fell to 14,590 in 2000,[21] to 12,862 in 2010,[22] and to a low of 12,105 births in 2017.[23] Declining birth totals have been particularly pronounced in New Hampshire's rural northern counties. From 2005 to 2017, Carroll County and Coos County saw a 26.5 percent and a 26.3 percent drop, respectively, in birth totals. These were the largest declines seen by any county.

New Hampshire Resident Birth Totals by County

COUNTY	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Belknap	586	605	617	564	598	586	571	517	544	511	517	518	498
Carroll	422	386	406	365	398	378	365	370	344	368	344	334	310
Cheshire	680	794	731	765	759	731	726	704	652	633	667	668	647
Coos	300	321	293	300	257	264	291	235	274	253	252	246	221
Grafton	800	807	875	824	817	752	781	759	722	789	751	708	712
Hillsborough	5,005	4,962	4,908	4,790	4,641	4,477	4,529	4,259	4,241	4,190	4,177	4,238	4,174
Merrimack	1,497	1,605	1,572	1,482	1,439	1,402	1,380	1,345	1,337	1,279	1,434	1,283	1,306
Rockingham	3,240	3,063	2,937	2,759	2,679	2,557	2,536	2,549	2,597	2,676	2,665	2,649	2,664
Strafford	1,421	1,365	1,342	1,351	1,401	1,284	1,268	1,221	1,277	1,199	1,222	1,210	1,177
Sullivan	468	468	489	483	401	442	414	388	391	389	389	401	396
Unknown	0	0	0	2	0	0	1	1	1	0	2	4	0
NH Total	14,419	14,376	14,170	13,685	13,390	12,873	12,862	12,348	12,380	12,287	12,420	12,259	12,105

Figure 3.3: New Hampshire Resident Birth Totals by County, 2005-2017[24]

Changes in these populations are partially responsible for their lower birth totals. New Hampshire's population is increasingly concentrated in the state's southern tier, while the state's rural areas have failed to experience the same growth.[25] Coos County, for example, lost five percent of its population from 2010 to 2020.[26] This decline is partly the result of young people leaving the state to find work elsewhere.[27] The loss of young people across the state has meant that even rural counties that have enjoyed slight population increases, like Carroll County, have seen this increase come from migration, not from additional births.

These changes and their effects on birth totals, particularly in rural areas, help explain the closure of labor and delivery units across the state. Without a large enough patient base to sustain their operations, labor and delivery units have been forced to close. Lakes Region General Hospital in Laconia, for example, shut its labor and delivery unit after the number of births at the hospital dropped from over 500 in 2005 to 262 in 2017.[28] Obstetric units without enough patients to serve have been unable to keep their doors open.

3.2 FINANCIAL ISSUES

Financial issues have also posed a challenge to labor and delivery units in New Hampshire. Obstetric units are expensive to run and require high staffing and equipment levels.[29] Facing declining birth totals and low reimbursement rates, rural hospitals are increasingly operating their maternity units at a loss.[30]

Without enough births each year, labor and delivery units are unable to cover their costs. Given the unique nature of obstetric health care, labor and delivery units must remain open 24 hours a day, 365 days a year.[31] Many costs remain fixed regardless of how many babies are delivered.[32] As birth rates drop, obstetric units cannot offset enough of those costs. For example, at Lakes Region General Hospital, operated by LRGHealthcare, there were only 283 births in the year before the hospital shuttered its maternity unit.[33] This number was far below the 1,000 births that the CEO of LRGHealthcare said were needed to maintain a financially sustainable model.[34]

The issues stemming from declining birth rates are compounded by the low Medicaid reimbursement rates for births. Medicaid reimburses hospitals at rates far below the actual cost of labor and delivery services[35] and pays significantly less than private insurance does.[36] This problem is particularly acute for New Hampshire. The state has the fifth-lowest Medicaid reimbursement rate in the nation for obstetric care.[37]

Hospitals serving populations with a high percentage of patients with Medicaid insurance lose more money on their labor and delivery units.[38] These labor and delivery units face a higher risk of closure. In New Hampshire, of the hospitals that continue to operate their labor and delivery units, 23 percent of the new mothers served have Medicaid insurance.[39] This number increases to 39 percent at hospitals that have closed their obstetric units.[40]

Rural Granite Staters have borne the brunt of these closures. They are more likely to have Medicaid insurance[41] and have thus lost many of the labor and delivery units that once served their regions. Low Medicaid reimbursement rates for childbirth are a major factor driving the closure of rural obstetric units.

3.3 STAFFING CHALLENGES

Issues with staffing attraction, retention, and competency have further challenged New Hampshire's rural maternity units. Many rural hospitals have struggled to attract and retain the staff needed to operate their labor and delivery units. Without enough doctors and nurses moving to these regions, hospitals face staffing shortages that undermine their ability to care for their patients.

Hospitals have found it challenging to recruit and keep medical professionals that are willing to work in small, rural obstetric units.[42] One reason is that obstetric professionals must perform a specific annual number of deliveries to retain their professional certification.[43] At rural hospitals where births are increasingly rare, doctors must be on call much more frequently.[44] This may disincentivize doctors from moving to New Hampshire's rural regions.

A related issue pertains to staff competency. Doctors and nurses that deliver more babies have more opportunities to practice important skills and hone their abilities.[45] When delivery rates are low, it is harder for these professionals to develop expertise. Mothers and babies may suffer worse birthing outcomes as a result.

4 EFFECTS OF CLOSURES

The closure of maternity care units across the state has meant that an increasing number of residents face reduced access to prenatal, birth, and postpartum care. Around 50,000 women experience life-threatening labor and delivery complications each year in the United States, and around 700 of those women die during childbirth.[46] According to Maternal Mortality Review Committees around the country, approximately two-thirds of these deaths are preventable.[47] The closure of hospital maternity care units, particularly in rural areas, creates barriers that hinder residents' access to prenatal and obstetric services. These barriers include fewer available services, difficulties with transportation to and from services, and overburdened facilities.[48] Many of the deaths that result annually from childbirth could be prevented by ensuring that women can access essential obstetric care services.[49]

Maternity unit closures also have a disproportionate effect on members of marginalized communities such as communities of color and patients living in rural areas. Maternity unit closures have been concentrated in rural and low-income areas, meaning that the decrease in level of care available has increased disparities among minority populations. Black women die from pregnancy complications at a rate 2.4 to 3.3 times higher than the mortality rate for white women.[50] As seen in Figure 4, infant

mortality rates are highest in rural areas. Women living in rural areas also already experience a higher incidence of negative maternal health outcomes.[51] Hospital closures exacerbate these problems by increasing patient volume at the labor and delivery units that remain, putting more pressure on an already stressed healthcare infrastructure.[52]

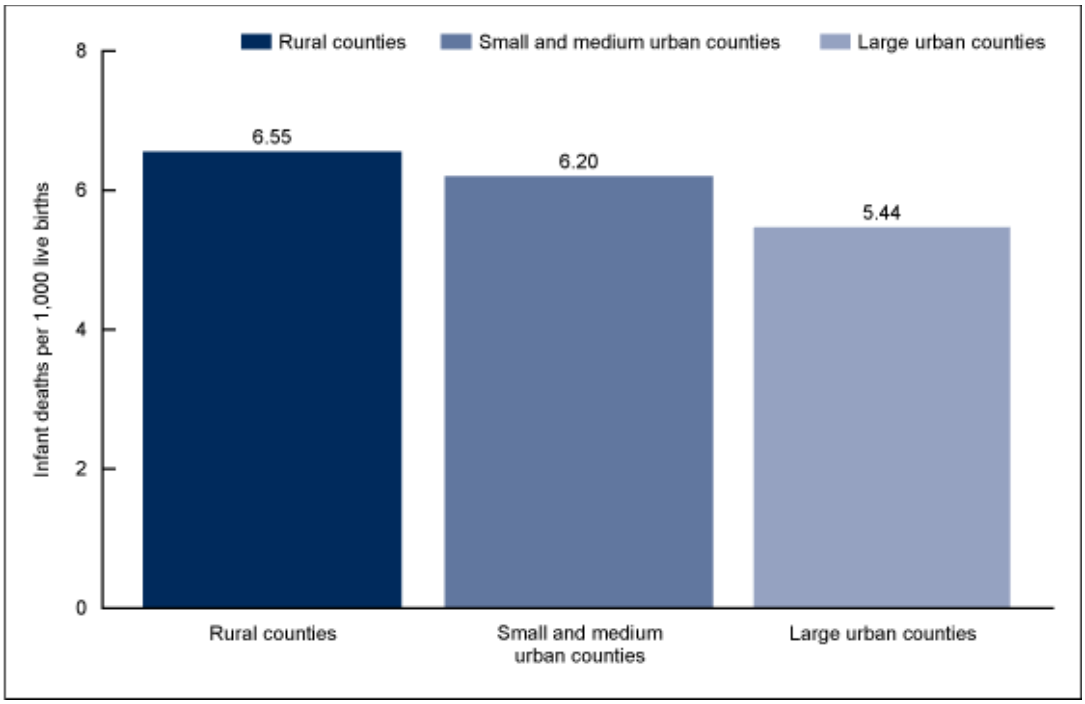

Figure 4: Infant Mortality Rates in Rural and Urban Areas in the United States, 2014[53]

Additionally, maternity unit closures have affected the number of maternity care providers available to a given population. Obstetricians, family physicians, certified nurse-midwives, and certified midwives are distributed unevenly across the United States, with less than 10 percent of maternity care providers practicing in rural areas in communities with greater need.[54] More than half of all rural counties do not have a single obstetrician.[55] These disproportionate closures and access inequities force women living in rural communities to travel much greater distances for maternity care.[56] Even if patients are able to reach these services, they then face longer waiting times for appointments at the sites that do provide care.[57] All of these effects of the closures of obstetric units underscore the urgency of developing solutions to combat the expansion of maternity care deserts.

5 STATE-BY-STATE COMPARISONS

The closure of labor and delivery units across rural New Hampshire and the growth of maternity care deserts in the state poses significant problems for the state's mothers and newborns. To begin to address these problems, it is important to understand how other states have tackled similar issues and how New Hampshire's unique institutions and individuals can be part of the solution.

5.1 COMPARISON STATES

State-by-state comparisons that analyze how other states have responded to gaps in rural maternity care may help provide a path forward for New Hampshire. States that share New Hampshire's rural landscape and skewed age distribution offer particularly useful opportunities for comparison. Understanding the challenges these states have faced and the solutions they have developed can help New Hampshire design policies and initiatives that will make quality maternity care accessible to all state residents.

The growth of rural maternity care deserts is a multifaceted issue, so solutions will need to be many and varied. State-by-state comparisons should therefore consider the following dimensions of maternity care to understand the range of opportunities for innovation and improvement:

- Midwife standards and benefits
- How private insurance and Medicaid funding reimbursement rates affect the financial solvency of labor and delivery units
- The advantages and disadvantages of expanding birth centers
- Staff licensure, training, and attraction
- Transportation to labor and delivery units and birth centers
- The benefits and disadvantages of integrating telemedicine into maternity care
- The utilization of adjunct workforces
- Partnerships with EMTs and other paraprofessional organizations

The states that have been selected for comparison are Vermont, Maine, Arkansas, and Alaska. Below is a brief explanation for the selection of each state.

1. **Vermont** borders New Hampshire and shares its rural geography and other defining features. The state and its approaches to maternity care challenges therefore provide an optimal focus for comparison and analysis. Vermont has more midwives than the national average, and the University of Vermont Medical Center boasts the only full-time certified nurse-midwifery practice in the region.[58] Vermont's approach to midwifery could be replicated in New Hampshire. It would also be beneficial to understand how maternity care programs are funded in the state, and particularly how the Vermont Medicaid reimbursement rate for insurance compares to that of New Hampshire.

2. **Maine** faces many of the same demographic challenges that New Hampshire has experienced. Its population is aging and young people are increasingly leaving the state.[59] The closure of maternity services forces patients to travel significant distances to get to the nearest center.[60] Maine has also struggled to attract staff to its rural labor and delivery units.[61]

3. **Arkansas** is another state that must ensure that its high proportion of rural residents—41 percent of Arkansans live in rural counties—can access maternity care services.[62] Arkansas has

established multiple programs to increase access to maternal health services and improve the quality of these services. For example, The Antenatal and Neonatal Guidelines education Learning System (ANGELS) has set up a 24/7 call center for patients experiencing perinatal complications, expanded teleconferencing services, and improved the capacity and readiness of rural providers to respond to obstetric emergencies.[63]

4. **Alaska** is the largest state geographically, and 33 percent of its residents live in rural regions. Residents in these areas struggle to reach maternity care services—residents in rural southwest Alaska face the highest maternal mortality of any region in the state.[64] It would be beneficial to explore the programs that this state has put in place to improve maternity care services and access.

5.2 INTERVIEWS WITH NEW HAMPSHIRE HEALTHCARE PROFESSIONALS

In addition to evaluating these states along our defined dimensions of maternity care, it is critical to understand these dimensions within the specific context of New Hampshire. To compile more information on these topics, we interviewed select New Hampshire healthcare professionals who have direct experience with the hospital systems and with research on perinatal care.

We had the beneficial opportunity to interview the Chief of New Hampshire EMS Department, Justin Romanello, to understand its ability to assist with the expansion of maternity care services in the state. Furthermore, we interviewed State Senator Sue Prentiss in order to further understand maternal care in the context of New Hampshire and also identify new funding needs.

6 RESULTS

The results of the state-by-state comparisons are included below.

6.1 VERMONT

Vermont borders New Hampshire and shares many of its rural features. Therefore, it is interesting to compare the maternity care offered here. In Vermont, about 57 percent of those covered by Vermont's adult Medicaid are women.[65] Since Medicaid in Vermont offers services dedicated to important health services, reproductive health services are a vital component. In fact, Medicaid covers 48 percent of all births in Vermont.[66] Prenatal visits, vitamins, ultrasounds and amniocentesis screenings, childbirth by vaginal or cesarean delivery, and 60 days of postpartum care are able to be covered by this insurance. Vermont law requires that health insurance plans providing maternity benefits also have coverage for the services of certified nurses or midwives for home births.[67] Moreover, coverage for services provided by these professionals are not able to pose greater co-pays, deductibles, or co-insurance charges than those for similar services.[68] However, this plan may require that the midwife be a provider

in their network. In 1995, Vermont created VHAP, or Vermont Health Access Plan. This was intended to provide coverage to children and pregnant women, and adults with household incomes up to the 150 percent of poverty.[69] With this plan, there was a 44 percent reduction in the uninsurable rate in 2010 to 2019 and a 10 percent increase in total Medicaid/CHIP enrollment in Vermont since Medicaid expansion took effect.[70]

Birthing centers are becoming increasingly affordable and popular in Vermont. In a study conducted with 2,400 mothers in the United States, two thirds of them would be considering a birth center separate from a hospital.[71] Furthermore, 98.8 percent of those in this study would recommend birthing centers and/or would return to a center for a subsequent birth.[72] In Vermont, most freestanding birth centers are owned and staffed by Certified Nurse Midwives (CNMs) and Certified Professional Midwives (CPMs).[73] Auxiliary staff including registered nurses, nursing assistants, doulas, midwife assistants, and administrators are also commonly employed at these centers. However, Vermont Medicaid needs to amend Medicaid regulations to officially recognize birth centers as facilities that can bill facility fees because this is the primary income for birthing centers and they are not financially viable without it. For scope of practice issues, it is best for providers to be regulated under those practitioners' individual licensing boards and not in birth center regulations.[74] For example, like most states Vermont does not require physician oversight for CNMs. Consequently, it would not make sense to require physician oversight for CNM-run birth center.

6.2 MAINE

Maine has a similar demographic to New Hampshire in regards to the aging population and young people leaving the state. Maternity services are vanishing in the state, inconveniencing those in labor who have to travel large distances to get to the nearest center. Additionally, Maine is also suffering from staffing shortages.

The Maine Medical Direction and Practices Board (MDPB) includes the state EMS medical director, the associate state medical director, six regional medical directors, a pharmacist/toxicologist, a pediatric physician, a Maine licensed BLS provider and a representative from the Maine Chapter of the American College of Emergency Medicine.[75] The MDPB evaluates EMS protocol. In 2021, the MDPB amended the Childbirth protocol and added a section focused on the care of women experiencing childbirth emergencies.[76] This includes reference material and management steps for the following conditions: 1) Shoulder dystocia 2) Prolapsed umbilical cord 3) Breech birth 4) Excessive bleeding, and 5) Maternal cardiac arrest.[77] Furthermore, The 2021 Maine EMS Protocols added a new protocol to the gold section titled Obstetric Emergencies. This protocol focuses on prenatal and postnatal emergencies, such as vaginal bleeding/abdominal pain in pregnancy and postpartum hemorrhage. These protocols add a new layer of dedication and focus on maternity care. Rather than general EMS protocols, these new specifications provide an emphasis and commitment to assisting child-bearing individuals in emergencies.

Similar to New Hampshire, Maine is a state affected by the opioid epidemic. Additionally, seven percent of infants in Maine are born having been exposed to substances.[78] Maine has a program called MaineMOM (Maine maternal opioid misuse), which is dedicated to supporting pregnant and postpartum individuals who suffer from substance abuse. MaineMOM offers services that include, but are not limited to, access to maternity care, early family planning counseling, screening for health-related social needs, and more.[79]

6.3 ARKANSAS

Arkansas is a rural state, in which 41 percent of Arkansans live in rural counties. It also suffers from an acute maternal health crisis: 50 percent of counties qualify as maternity care deserts, and 20 percent of counties have low or moderate access. That means that almost 190,000 women who reside in these counties have little to no care.[80] To expand rural care, Arkansas has established multiple programs that may be of interest to New Hampshire stakeholders.

The Antenatal and Neonatal Guidelines Education Learning System (ANGELS) provides telemedicine training to physicians on the management of rural and high-risk pregnancies.[81] It also establishes a 24/7 call center for patients experiencing perinatal complications, expands teleconferencing services, and improves the capacity and readiness of rural providers to and obstetric emergencies. This call center is staffed by OB nurses who can provide immediate support for rural providers, connecting them maternal medicine specialists, and arrange transport to the labor and delivery unit at the University of Arkansas Medical Center if needed. As a result of this care, the ANGELS program has experienced the following results: a decrease in the distance women must travel to be seen by an obstetric expert, an increase in deliveries at the University of Arkansas Medical Sciences (rather than at hospitals less equipped for special needs of maternal care), a decrease in complications for high-risk women, and an increase in cost savings for Arkansas' Medicaid program due to fewer complications.

Arkansas has also introduced important cost-saving initiatives that benefit rural access. First, their Medicaid programs works with ANGELS to identify gaps in funding that can be filled by the University of Arkansas. Second, the state has worked with the federal government to expand broadband services to rural areas and providers, which extends its telemedicine services across the state. Third, the state has introduced perinatal episode payments under the Arkansas Health Care Payment Improvement Initiative.[82] This statewide program sets spending targets for each episode of care, covering prenatal care, labor and delivery, and postpartum care. This payment structure reduced spending by 3.8 percent relative to other states, and ensures mothers receive quality care at every step of the process.

6.4 ALASKA

Alaska is the largest state in the United States geographically, housing 238,379 residents in areas of Alaska classified as rural. Although in a different part of the country than New Hampshire with some different features and challenges, Alaska's large rural population makes it a state worth observing for solutions to distanced maternity care. Like New Hampshire, Alaska boasts extreme weather challenges in the winter that hinder transportation, leading them to innovating alternative solutions for maternal health emergencies. But Alaska is in a position more dire than New Hampshire; southwest Alaska ranks the highest for maternal mortality.[83] Therefore, it is useful to explore the programs that this state has been forced to put in place to increase positive maternal health outcomes under such circumstances.

Rural healthcare providers in Alaska are plagued by the same problems as those in New Hampshire, as well as other parts of the country. But the brutal winters, particularly in the northernmost parts of the state, provide additional complications. It is difficult to connect rural mothers to labor and delivery units within the state, worsening maternal health outcomes. Due to these challenges, Alaskan policymakers are forced to look to alternative solutions for women to give birth. For example, a policy that was in effect but has since been repealed due to coronavirus restrictions was one created in conjunction with the government of Canada. Canada permitted women in labor to cross the Canadian border to give birth if the nearest labor and delivery facility was located in Canada.[84] Due to New Hampshire's location along the Canadian border, this may be a policy worth examining after border closures due to coronavirus concerns diminish.

Another way that Alaska has sought to bridge the gap between rural health outcomes is through the utilization of adjunct workforces. For example, there is a pre-maternal home in Bethel, Alaska where pregnant women from rural regions can live for a month before their due date. This policy is, of course, more costly to the state than others, and is unlikely to be feasible for everybody, especially rural women who likely don't have enough money to not work. The use of birth centers in Alaska, however, is practical and effective. For example, Matsu Midwifery in Wasilla, Alaska has seen great success in improving maternal health outcomes in the community it serves. Integrated into the nearby hospital network, the birth center is able to provide maternity services to the region in light of nearby labor and delivery unit hospital closures, and has been able to facilitate successful transfers to nearby hospitals in the event of an emergency.[85]

One policy that Alaska aimed to implement has to do with midwife licensure. Alaska has been able to combat some maternal healthcare staffing challenges by reforming midwife licensing policies. One way in which Alaska does this is through apprentice direct-entry midwives, as well as emergency courtesy licenses. In an emergency or dire circumstance, the state may issue an emergency courtesy license to a midwife already registered to practice in another state. This policy ameliorates some of the staffing issues that Alaska suffers by making it easier for midwives to practice in the state.[86] Finally, Alaska expanded Medicaid reimbursement rates with the goal of improving maternal health outcomes, as well as all rural health outcomes more broadly. The expansion of Medicaid reimbursement rates,

however, did not achieve its intended results. In an observational study of 15,631,174 births from 2011 to 2016, state Medicaid expansion was not significantly associated with differences in birth outcomes overall.[87] This is an important case study to take into account when considering Medicaid expansion in New Hampshire.

7 POLICY RECOMMENDATIONS

The research analyzed when conducting the state-by-state comparison was used to produce the policy recommendations. These policies are found within state structures that have been successful in other states and that we believe would be successful in New Hampshire.

7.1 IDENTIFY NEW FUNDING NEEDS

As previously stated, a main factor of birthing center closures in New Hampshire is due to funding and insurance. Birthing centers are difficult to fund when care is dispersed across rural populations and state budgets cut into care. Following Arkansas' payment schemes, introducing perinatal episode payments would reduce New Hampshire's overall care spending while expanding access. Furthermore, working with hospitals such as the DHMC to match payment needs and take on more labor and delivery responsibilities would reduce strain on rural hospitals and lower costs associated with maternal complications, a program also introduced by Arkansas.

7.2 EXPANDED TELEMEDICINE CARE

Since birthing centers may inevitably close, rural mothers and providers must maintain access to immediate and high-quality care. Telemedicine is a useful solution to this problem because it does not necessitate physical infrastructure across the state, and can access even the most rural counties. We recommend the state seriously consider a program similar to Arkansas' ANGELS program, which would both expand care and lower costs in the long term (see the Arkansas case study for additional information). Even without undertaking this comprehensive program, New Hampshire should utilize federal funding to expand broadband access and ensure existing programs such as those in the DHMC can provide consultation to rural providers and coordinate transportation for rural maternal care. New Hampshires' Family and Friends Mileage Reimbursement Program already pays the mileage from home to the Medicaid-covered service and back. Coordinating transportation would therefore incur little additional cost and provide families who lose birthing centers the ability to still receive high quality care.

7.3 INTEGRATION OF MIDWIVES

With birthing centers closing and the rural nature of New Hampshire affecting the access of child-bearing individuals to travel to hospitals, midwives may be an increasingly viable option for New Hampshire centers. Vermont offers a model for the extensive usage of midwives. We recommend

New Hampshire consider expanding the use of midwifery and consider expanding funding needs to require insurance to cover the full costs of midwives.

7.4 EXPANDING EMS SERVICES

As discussed during our interview with the Chief of New Hampshire's EMS department, Chief Justin Romanello, New Hampshire's EMS department is already prepared and equipped to handle a wide variety of emergencies related to maternal care. We recommend that the department outline and develop a similar protocol, as Maine has, in order to specify and prioritize maternal care.

7.5 ENCOURAGE FREE-STANDING BIRTH CENTERS

Birth centers that require oversight of physicians limit the amount of birthing centers in a region. New Hampshire currently owns four free-standing birthing centers, and we recommend that there is stronger encouragement for these centers.[88] Allowing CNMs and CPMs to operate birthing centers will increase flexibility of opening the centers, and therefore the amount of centers available to individuals in rural areas. The benefits to these centers also include more personalized attention and likely affordability for patients.

7.6 ADVERTISE EXISTING PROGRAMS

MaineMOM is a service that is relevant and coincides with New Hampshire's version of the MOM. We recommend advertising existing New Hampshire programs in order to increase awareness of current resources in order to provide multiple outlets to patients who seek to acquire services. Increasing knowledge of these programs can assist in recognition of the program and a wider distribution of services.

8 CONCLUSIONS: A PATH TO IMPROVED MATERNITY CARE

This report has outlined the problems associated with maternity unit closures and the steps needed to begin remedying these issues. An increasing number of labor and delivery units have closed across the state in recent years. As a result, many women face limited access to essential maternity care services and daunting commutes to the facilities that remain. These closures have come as the result of a number of different factors. New Hampshire's patient base is shrinking as the state population ages, leading to lower birth totals that cannot sustain the same number of maternity care units. Labor and delivery units face financial issues associated with these low birth totals and low Medicaid reimbursement rates for childbirth. The state has also struggled to attract and retain skilled obstetricians and other medical staff. These factors have combined to produce a precarious situation for the state's mothers and newborns. In the absence of adequate maternity care services, pregnant and postnatal mothers and babies face higher risks of labor and delivery complications. These risks

disproportionately affect minority and rural populations and may lead to higher maternal and infant mortality rates. To respond to these problems, New Hampshire must adopt new policies and programs that can combat the growth of maternity care deserts. We recommend that New Hampshire identifies new funding needs and use Arkansas' perinatal episode payment as a model. Additionally, we recommend that state consider programs similar to Arkansas' ANGELS program to improve telemedicine. Furthermore, we recommend the state adapt to Vermont's model of freestanding birthing centers and the standards of midwives. Lastly, we recommended that the EMS department develop a protocol dedicated to maternal care and that maternity care resources be further advertised.

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