



Following Labor and Delivery Unit Closures in Rural New Hampshire, Driving Time to the Nearest Unit Doubled

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Key Findings

- The median driving time to the nearest labor and delivery (L&D) unit increased from 18 to 39 minutes after closures across eight hospitals.
- The share of pregnant women* who lived more than 30 minutes from an open L&D unit increased from 20.2 percent in 2000 to 27.3 percent in 2018.
- Mothers living more than an hour from the nearest open unit were younger, more likely to have a high school degree or less educational attainment, and more likely to be insured by Medicaid than mothers living closer to an open unit.
- Reduced proximity to an open unit was associated with an increased probability of attending fewer prenatal care visits than is recommended and giving birth *en route* to the hospital or having an unplanned home birth.

Background

Nine out of 16 rural hospitals in New Hampshire have closed their L&D units since 2000, largely because of financial pressures and quality concerns associated with declining birth rates.¹ Closures

* Consistent with the documentation of the New Hampshire birth records data, we use the terms “women” and “mothers” throughout this analysis, but we recognize that not all birthing people identify as such.

reduce delivery options for pregnant women and result in increased travel time to an open unit, which can place women at risk of delivering in transit or arriving at the hospital without time for optimal care. Increased travel time may result in transportation, child care, or employment costs for women and their families and may increase stress and anxiety, which have implications for maternal and infant health. Closures can also affect access to prenatal care and continuity of care if providers relocate in response to closures or if local providers are no longer affiliated with available delivery hospitals. Closures may also be associated with some positive changes. For instance, women may be redirected to higher-volume hospitals, which can provide higher-quality care (Kozhimannil et al. 2014).

To better understand the consequences of L&D unit closures for women in rural New Hampshire, we explored how the driving time to open units has changed and examined the association between proximity to an open unit and women's health and socioeconomic characteristics. This study provides important information for providers and policymakers as they seek to ensure women in rural communities maintain access to high-quality maternity services.

Methods

We analyzed more than 230,000 records of births to New Hampshire residents from 2000 to 2018, including information on mothers' home addresses. We calculated the driving distance and time between a mother's address and the nearest open L&D unit for each record using OpenTripPlanner.² We assigned women to hospital service areas (HSAs) based on their zip codes,³ and we calculated the median driving time to the nearest open unit before and after unit closures among approximately 30,000 women in eight HSAs that lost L&D services.

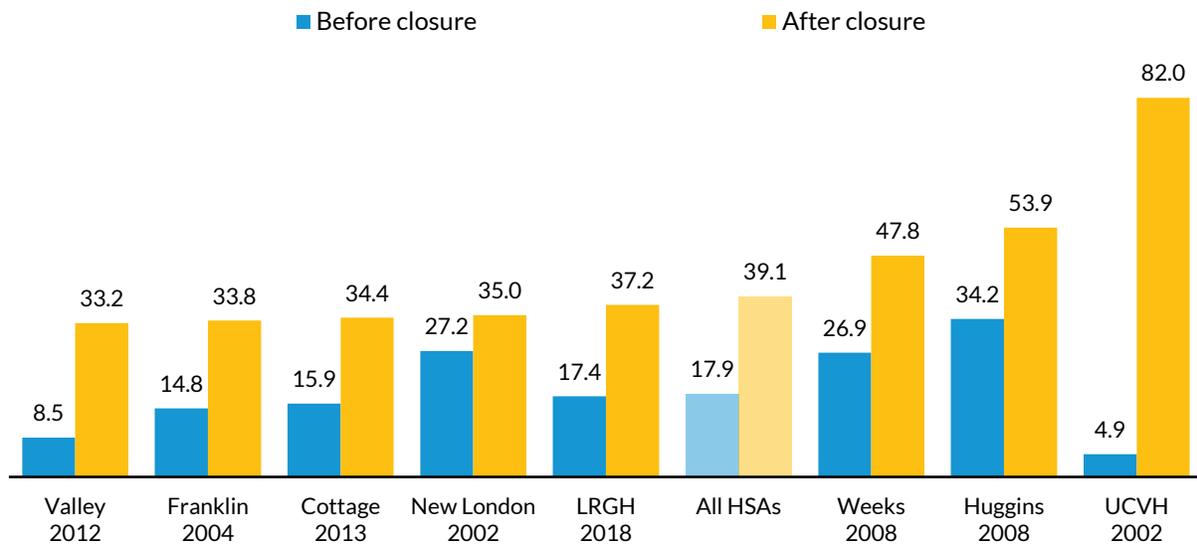
Based on access guidelines from the American College of Obstetricians and Gynecologists, we identified women who lived 30 or fewer minutes, 31 to 60 minutes, and more than 60 minutes from the nearest open unit (Rayburn, Richards, and Elwell 2012). Within 30 minutes was considered a reasonable travel time, whereas 60 minutes was deemed the maximal safe travel time for maternity patients. We then compared maternal and infant health and birth outcomes as well as demographic and socioeconomic characteristics for women across these categories. Outcomes included giving birth *en route* to a hospital or having an unplanned home birth, attending 10 or fewer prenatal care visits, delivering preterm (before 37 weeks), and having a cesarean delivery. Demographic and socioeconomic characteristics included age, educational attainment, and payer at delivery, as well as county-level poverty and unemployment rates. In a forthcoming brief, we describe our analysis of patient and provider interviews and focus groups, and findings from that analysis also inform the results and interpretations presented here.⁴

Results

Driving times to the nearest open unit among women living in HSAs that lost L&D services increased following closures. Across all HSAs, the median driving time more than doubled from 18 to 39 minutes (figure 1). The postclosure median driving time was more than 30 minutes in every area that lost L&D

services, and some women in New Hampshire’s most rural region, the North Country, were left with driving times to the nearest open unit of more than an hour.

FIGURE 1
The Median Driving Time to the Nearest Open Labor and Delivery Unit Ranged from 33 to 82 Minutes after Closures at Eight New Hampshire Hospitals
In minutes



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Source: Authors’ calculations using New Hampshire vital records birth data among rural New Hampshire residents in health services areas with a labor and delivery unit closure from 2000 to 2018.

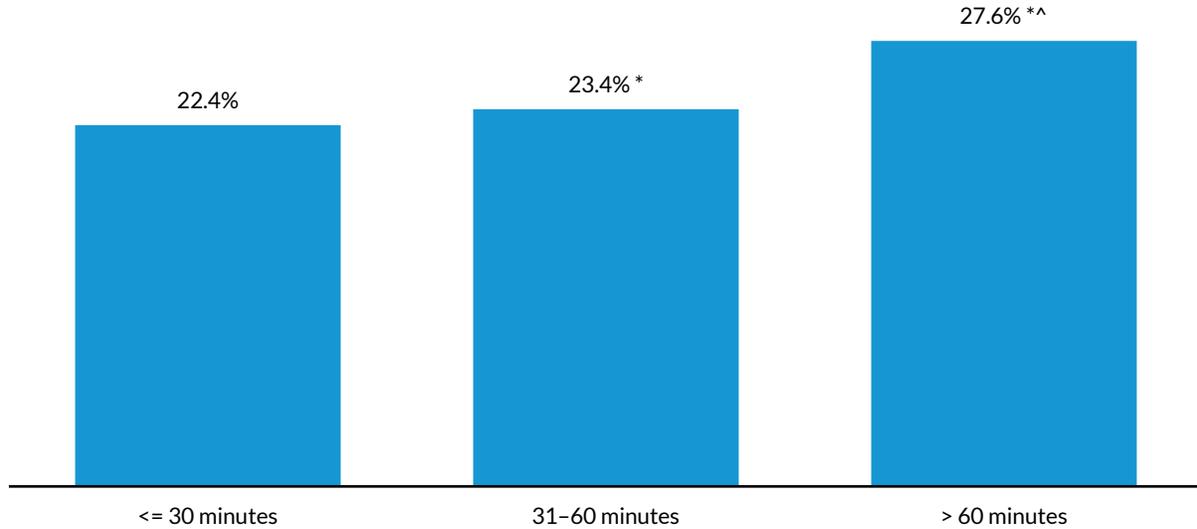
Notes: LRGH is Lakes Region General Hospital. HSAs are hospital service areas. UCVH is Upper Connecticut Valley Hospital. Except for “all HSAs,” labels reflect the name of the hospital service area that lost labor and delivery services and the year in which the unit closed.

From 2000 to 2018, the share of pregnant women in New Hampshire who lived more than 30 minutes from the nearest open L&D unit increased from 20.2 to 27.3 percent (data not shown). In 2018, the vast majority of these women lived 31 to 60 minutes from the nearest open unit, and only 1.5 percent lived more than an hour from the nearest unit (data not shown).

We find some evidence of less desirable outcomes among mothers who live farther from an open unit. The share of women who attended 10 or fewer prenatal visits increased with longer drive times to the nearest unit; 22.4 percent of those living within 30 minutes reported low levels of prenatal care, compared with 27.6 percent of women more than 60 minutes away from an L&D unit (figure 2).

FIGURE 2

The Share of Mothers with 10 or Fewer Prenatal Visits Increases with Longer Driving Times to the Nearest Open Labor and Delivery Unit



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Source: Authors' calculations using New Hampshire vital records birth data among New Hampshire residents from 2000 to 2018.

Notes: * Estimate is statistically different from estimate for <= 30 minutes at $p < 0.05$.

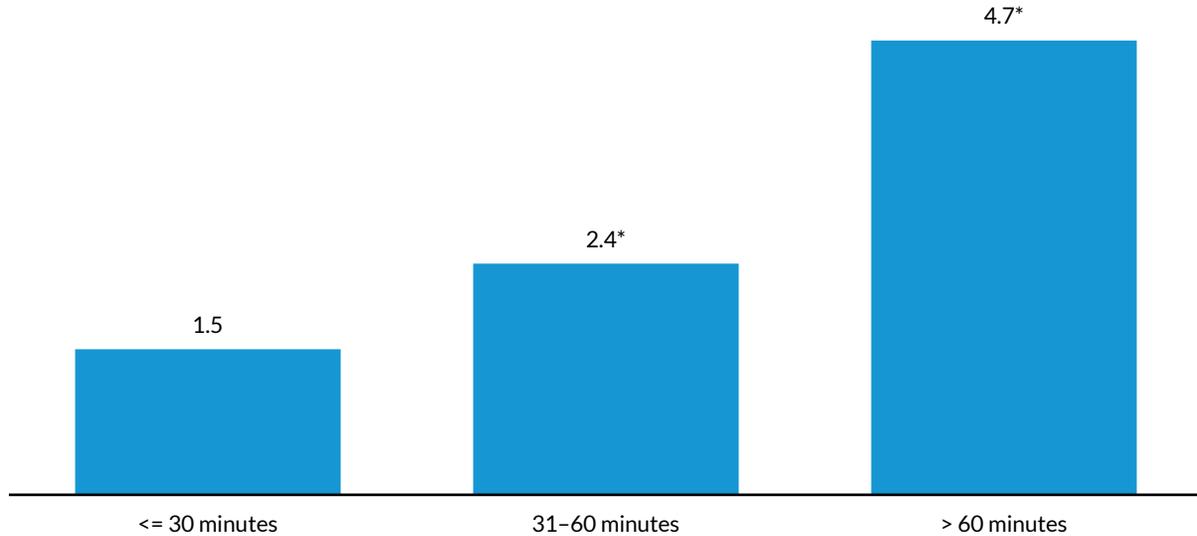
^ Estimate is statistically different from estimate for 31-60 minutes at $p < 0.05$.

The rate of *en route* or unplanned home births was also significantly higher among women who lived farther from the nearest open unit; such rates were 4.7 births per 1,000 births among women who lived more than 60 minutes away versus 1.5 births per 1,000 births among those within 30 minutes (figure 3). The patterns for cesarean delivery and preterm births were less consistent.

FIGURE 3

The Number of Births *En Route* to the Hospital and Unplanned Home Births Increases with Longer Driving Times to the Nearest Open Labor and Delivery Unit

Number per 1,000 births



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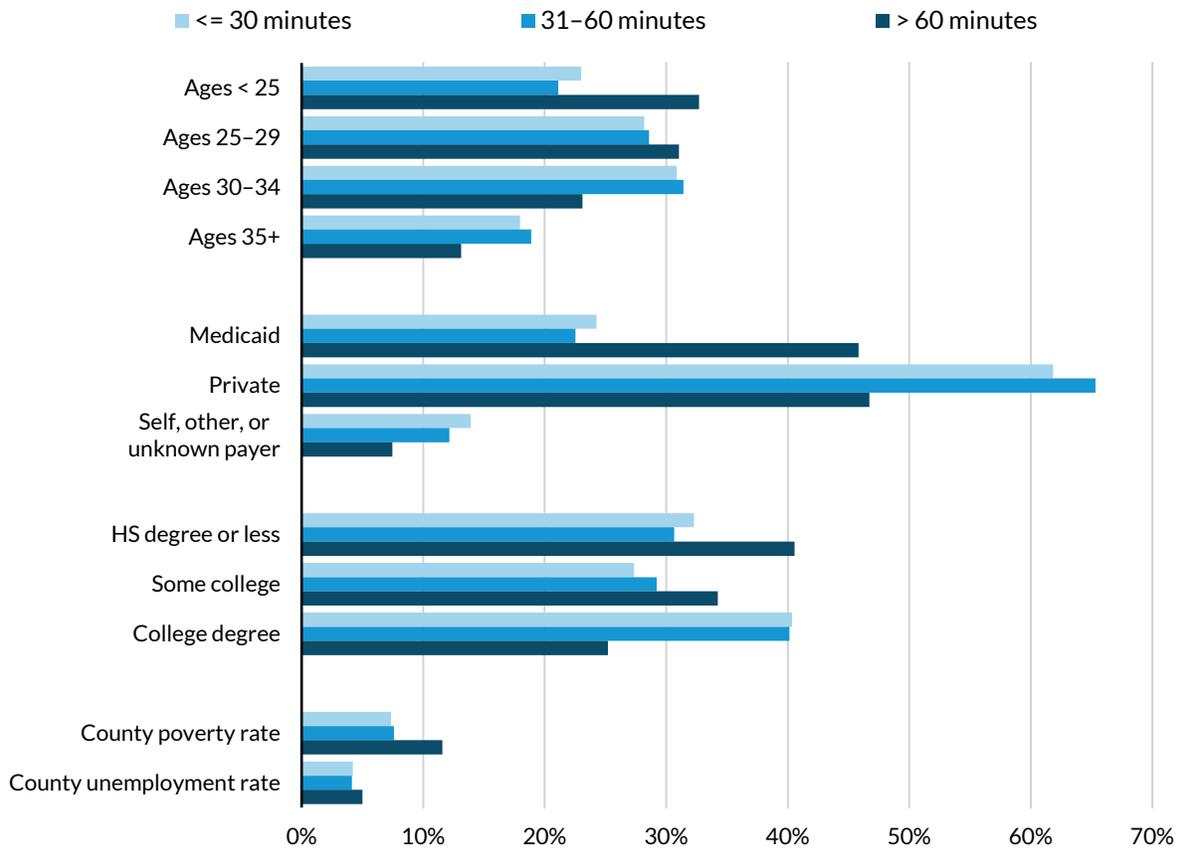
Source: Authors' calculations using New Hampshire vital records birth data among New Hampshire residents from 2000 to 2018.

Note: * Estimate is statistically different from estimate for <= 30 minutes at $p < 0.05$.

The composition of mothers by proximity to the nearest open unit also showed significant differences. Though small in number, mothers living more than an hour from the nearest open unit had several characteristics that could mean they have more challenges accessing care. They were younger, more likely to have a high school degree or less educational attainment, and more likely to be insured by Medicaid than mothers living within 30 minutes and 31 to 60 minutes from an open unit (figure 4). Consistent with these findings, their communities also had higher poverty and unemployment rates than those of women who had better access to L&D services.

FIGURE 4

Women Living Farthest from an Open Labor and Delivery Unit Are More Likely to be Under Age 25, to be Covered by Medicaid, and to Have a High School Degree or Less Educational Attainment



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Source: Authors' calculations using New Hampshire vital records birth data among New Hampshire residents from 2000 to 2018.

Note: All estimates for mothers living more than 60 minutes from the nearest unit were statistically different from those for mothers living 30 or fewer minutes and 31 to 60 minutes from the nearest unit at $p < 0.05$. All estimates for mothers living 31 to 60 minutes from nearest unit were statistically different from those for mothers living 30 or fewer minutes from the nearest unit at $p < 0.05$, except for the shares ages 25 to 29 and with a college degree.

Implications

Though all L&D closures in rural New Hampshire increased driving times to the nearest open unit among pregnant women, some closures had more dramatic impacts on access than others. As providers and policymakers discuss options for improving access to L&D services, they could consider prioritizing areas with the longest travel times to an open unit. This could include increasing Medicaid reimbursement to providers in these areas or supporting transportation options for women who need to access distant hospitals.

Women living more than an hour from the nearest open unit had worse outcomes than their counterparts on several measures, but these findings likely understate the importance of travel time. Even if it does not result in objectively worse birth outcomes, travel can place both time-related and monetary burdens on women and their families. Moreover, those living farthest from open units also faced significant socioeconomic disadvantages, making them even less able to bear those costs. Targeting financial support in the form of gas gift cards, child care, or paid time off to those facing long travel times and limited resources could be important.

The relationship between proximity to the nearest open L&D unit and the share of women receiving 10 or fewer prenatal care visits suggests unit closures affect more than just delivery. They can disrupt long-term patient-provider relationships, which may affect many aspects of pregnancy, delivery, and the postpartum experience. Maintaining prenatal and postpartum care in the community when a unit closes is critical, but it is also important to consider provider continuity from prenatal care through delivery care. Transferring care late in pregnancy or at delivery can create challenges. However, a local prenatal care option in a community with a closure that is staffed by providers from a distant delivery hospital could help establish needed trust for both patients and providers.

These findings have highlighted some of the potential challenges and opportunities associated with rural L&D closures, but they have some limitations. First, our analysis is purely descriptive, and further research is needed to establish the causal relationship between L&D closures and maternal and infant outcomes. Second, our analysis is limited to closures in New Hampshire and findings may not be generalizable to other states. Moreover, even within New Hampshire, the implications of closures vary widely across HSAs, so solutions will also need tailoring to local circumstances.

Ultimately, ensuring equitable access to safe and secure pregnancy and delivery services will require listening to communities experiencing closures and developing targeted strategies to support women, their families, and their providers.

Notes

- ¹ Josie Albertson-Grove, "Labor and Delivery Unit Still Struggling in Rural New Hampshire," *New Hampshire Union Leader*, March 4, 2021, https://www.unionleader.com/news/health/labor-and-delivery-units-still-struggling-in-rural-new-hampshire/article_ba996cea-2b19-52f8-8334-d5e5aa5f1081.html.
- ² See <https://www.opentripplanner.org/>.
- ³ "ZIP Code Crosswalks," Dartmouth Atlas Data, accessed September 29, 2021, <https://data.dartmouthatlas.org/supplemental/#crosswalks>.
- ⁴ "Labor and Delivery Unit Closures in Rural New Hampshire," Urban Institute, accessed September 29, 2021, <https://www.urban.org/policy-centers/health-policy-center/projects/labor-and-delivery-unit-closures-rural-new-hampshire>.

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