POLICY BRIEF
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RURAL HEALTH
RESEARCH CENTER

Availability of Higher-Level Neonatal Care Services in Rural US Counties, 2010-2022

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Key Findings

- We examined availability of higher-level neonatal care (intermediate level II or intensive level III or IV care) at short-term acute care hospitals in rural counties of the United States (US), including all hospitals not involved in mergers between 2010 and 2022.
- In the US, availability of any higher-level neonatal care declined from 2010-2022 in rural counties. Overall, 7.5% of rural counties (147/1958) had higher-level neonatal care in 2010, and 6.9% of rural counties (136/1958) had this care in 2022 (Figure 1). In 2022, 93.1% of rural counties (1822/1958) had no higher-level neonatal care.
- Among rural counties, we distinguished between noncore and micropolitan counties. Among noncore counties, the percentage with higher-level neonatal care declined from 2.1% (27/1300) in 2010 to 1.2% (16/1300) in 2022 (Figure 2). In 2010, 18.2% of micropolitan counties (120/658) had higher-level neonatal care, remaining similar in 2022 (18.2%; 120/658).
- Only about 1% of noncore rural counties had higher-level neonatal care availability in 2022; 20 of the 27 noncore counties that had higher-level neonatal care in 2010 lost this service by 2022.

Purpose

Infant mortality is elevated in rural, compared with urban, communities.[1] Neonatal health care includes basic well-infant/level 1 services, available at health care facilities that offer childbirth services, as well as higher-level care (neonatal intermediate and intensive care services, at level II or higher).[2] Access to higher-level neonatal care can be lifesaving for infants with high acuity clinical needs,[3,4] and access to childbirth-related care has been declining in rural communities.[5] The purpose of this policy brief is to show the changes in the availability of higher-level neonatal care in rural US counties from 2010 to 2022, and how this availability differs by rural county type (micropolitan vs. noncore).

Methods

Data came from the 2010-2022 American Hospital Association (AHA) Annual Surveys, the Centers for Medicare & Medicaid Services (CMS) Provider of Services (POS) File, and primary sources (for multiple validation checks). Identification of hospitals providing level II or higher neonatal care was conducted among all short-term acute care hospitals that had obstetric care services (which are inclusive of basic well-infant/level I services) at any point from 2010 to 2022 and were not involved in mergers. Hospitals involved in mergers were excluded from this analysis due to data availability. We followed a validated algorithm to identify hospitals with obstetric services[6] and created a step-by-step process to identify which of those hospitals offered higher-level neonatal care.

We first assessed neonatal care availability using the following AHA variables: reported provision of neonatal intensive care (level III or higher); having at least one neonatal intensive care bed; and having at least one neonatal intermediate care bed. For hospitals that only reported provision of neonatal intermediate care (level II) and none of the other aforementioned AHA

variables, we validated the provision of higher-level neonatal care using data from the POS File. The POS variables for neonatal care included provision of neonatal intensive care unit services and provision of neonatal "nursery" services (intermediate care) for each hospital-year during 2010-2022. For hospitals with inconsistencies between the AHA and POS data or across study years regarding the provision of higher-level neonatal care, we performed validation checks through reviews of primary sources (hospital websites and online news sources).

Rural (non-metropolitan) counties were categorized using 2024 Urban Influence Codes based on population (micropolitan, with a town of 10,000-49,999 residents, and noncore, without a town of at least 10,000 residents).[7]

Results

This analysis found that availability of higher-level neonatal care declined from 2010-2022 in rural counties. Figure 1 shows the annual percentage of all rural US counties with at least one hospital providing higher-level neonatal care between 2010 and 2022. Overall, 7.5% of rural counties (147/1958) had higher-level neonatal care in 2010, and 6.9% of rural counties (136/1958) had this care in 2022. In 2022, 93.1% of rural counties (1822/1958) had no higher-level neonatal care.

Availability of higher-level neonatal care is more common in micropolitan counties, and losses were concentrated in the few noncore counties that had higher-level neonatal care in 2010. Figure 2 presents the percentage of all micropolitan and noncore rural counties with at least one hospital

Figure 1. Percentage of all rural counties with higher-level neonatal care, 2010-2022 (N=1958)

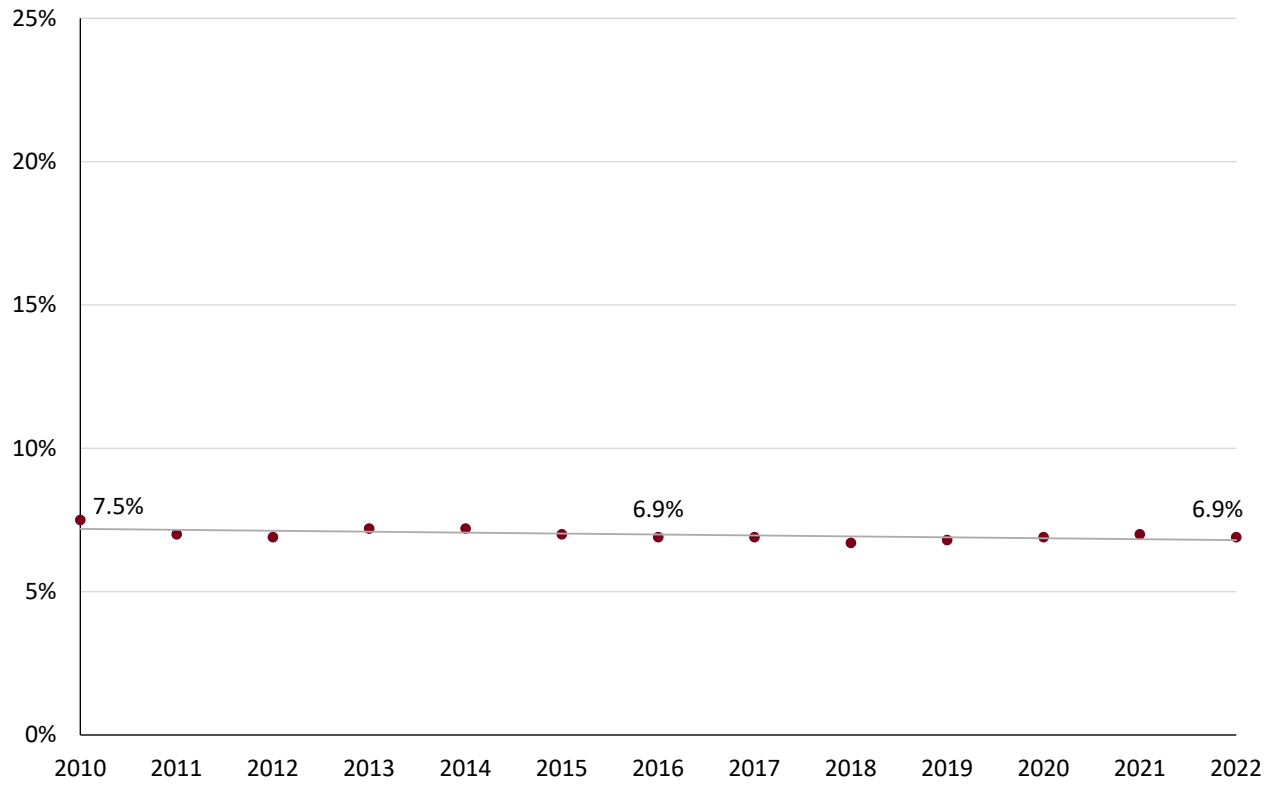
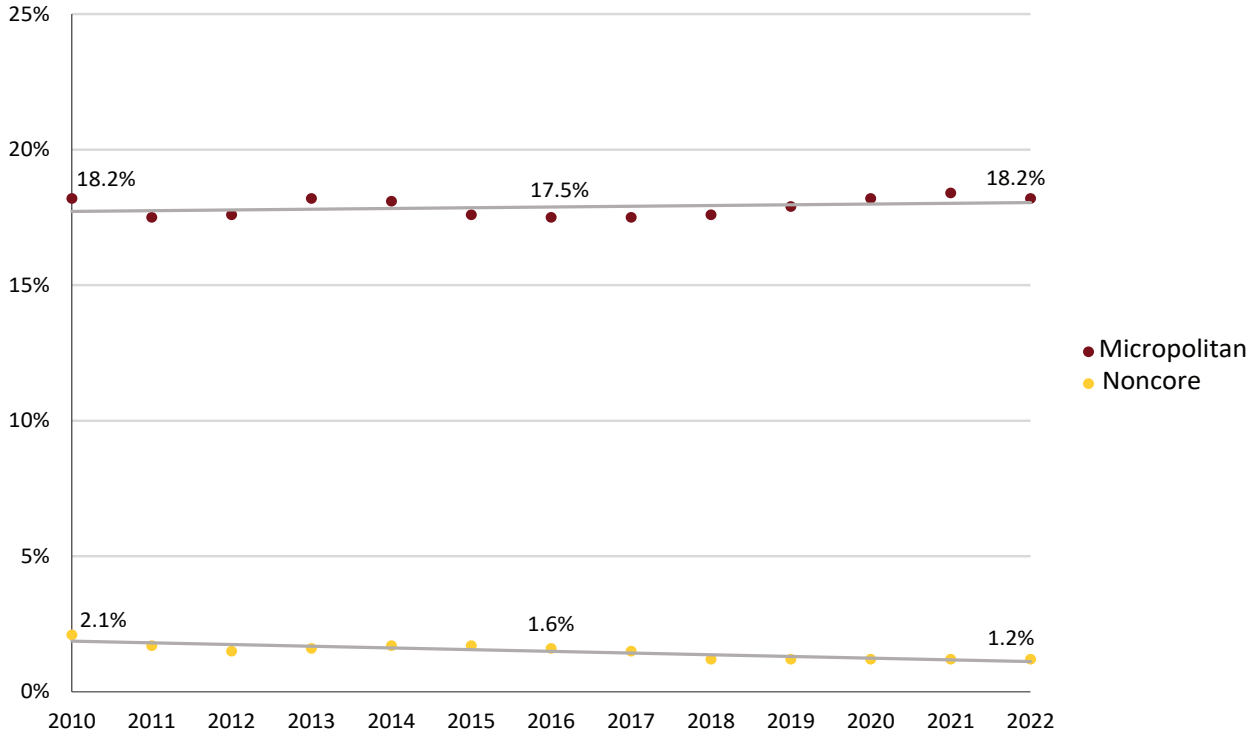


Figure 2. Percentage of micropolitan (n=658) and noncore (n=1300) rural counties with higher-level neonatal care, 2010-2022



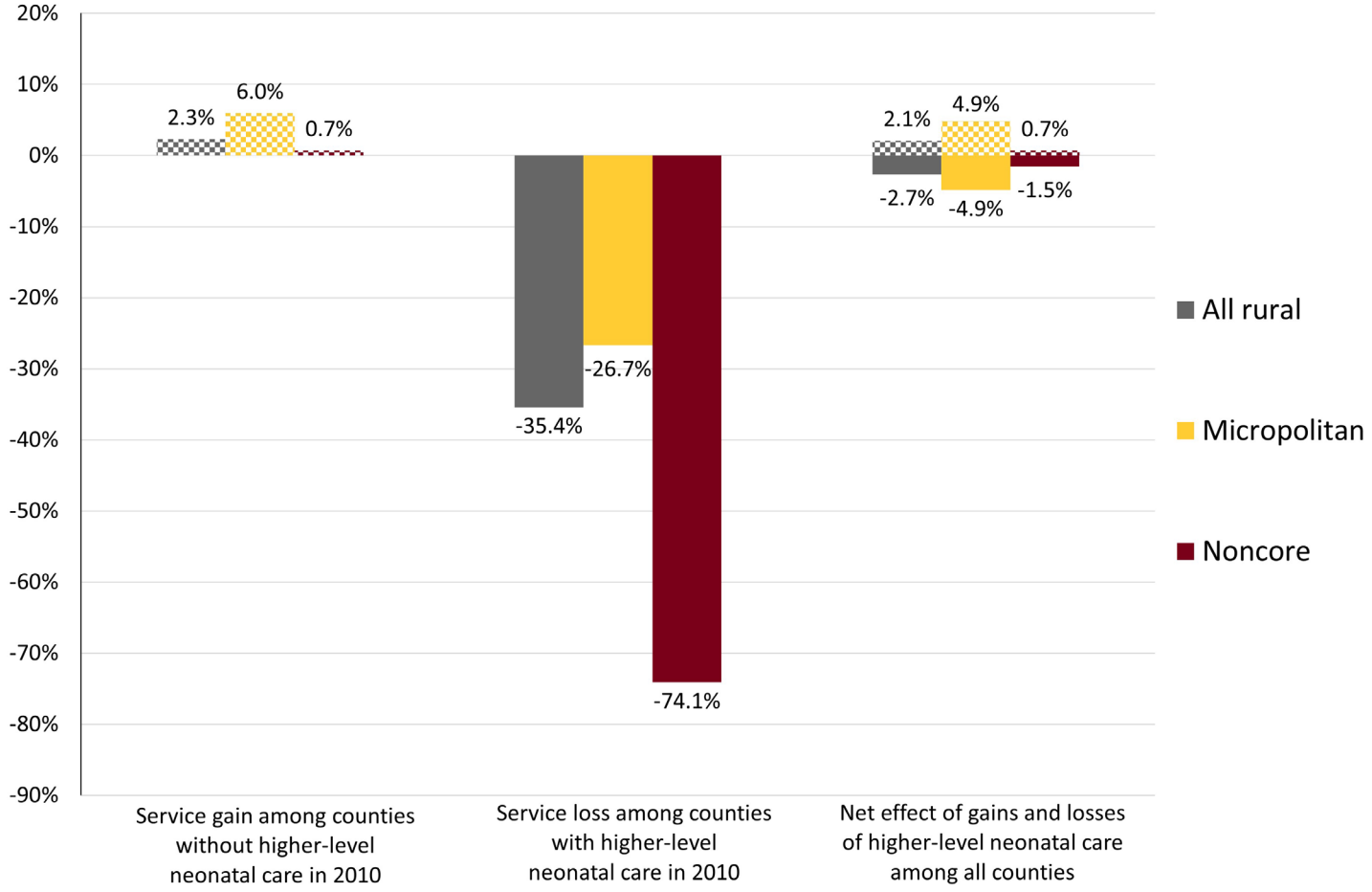
providing higher-level neonatal care between 2010 and 2022. Among noncore counties, the percentage with higher-level neonatal care declined from 2.1% (27/1300) in 2010 to 1.2% (16/1300) in 2022 (Figure 2). In 2010, 18.2% of micropolitan counties (120/658) had higher-level neonatal care, remaining similar in 2022 (18.2%; 120/658). Very few (1.2%) noncore rural counties had higher-level neonatal care availability in 2022 because 20 of the 27 noncore counties that had higher-level neonatal care in 2010 no longer had a hospital providing these services by 2022, either because the hospital closed or stopped providing this service line.

It is possible that rural counties could have either gained or lost higher-level neonatal care between 2010 and 2022. Figure 3 shows county-level changes in higher-level neonatal care, overall (all rural counties) and by rural county type (micropolitan or noncore). Gains of higher-level neonatal care (indicated by checkered bars) were minimal and concentrated in micropolitan rural counties, whereas losses of higher-level neonatal care (indicated by solid bars) were substantial and concentrated in noncore rural counties. On average, gains and losses in micropolitan counties resulted in minimal net effect between 2010 and 2022. In contrast, losses outpaced gains in noncore rural counties during the study period, which had very limited availability of higher-level neonatal care in 2010 and even less availability in 2022.

Conclusion

This analysis shows that availability of higher-level neonatal care declined between 2010 and 2022 in rural US counties. As of 2022, more than 93% of rural counties did not have a hospital that provided level II or higher neonatal care, among the short-term acute care hospitals in these counties that were

Figure 3. Changes in higher-level neonatal care by rural county type (all rural, micropolitan, and noncore), 2010-2022 (N=1958)



not involved in mergers during the study period. Availability of higher-level neonatal care is more common in micropolitan counties, but losses were concentrated in the few noncore counties that had higher-level neonatal care in 2010. While rural noncore counties have the highest infant mortality rates,[1] almost all noncore rural counties were without higher-level neonatal care in 2022.

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