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Summary of neonatal and maternal transport and reimbursement policies—a 5-year update

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Abstract

OBJECTIVE: To examine the number of states with neonatal and maternal transport and reimbursement policies in 2019, compared with 2014.

STUDY DESIGN: We conducted a systematic review of web-based, publicly available information on neonatal and maternal transport policies for each state in 2019. Information was abstracted from rules, codes, licensure regulations, and planning and program documents, then summarized within two categories: transport and reimbursement policies.

RESULT: In 2019, 42 states had a policy for neonatal transport and 37 states had a policy for maternal transport, increasing by 8 and 7 states respectively. Further, 31 states had a reimbursement policy for neonatal transport and 11 states for maternal transport, increases of 1 state per category. Overall, the number of states with policies increased from 2014 to 2019.

CONCLUSION: The number of state neonatal and maternal transport policies increased; these policies may support provision of care at the most risk-appropriate facilities.

INTRODUCTION

Risk-appropriate care is a coordinated, tiered system designed to ensure that obstetric and neonatal patients are provided care in facilities with the most appropriate equipment and staff that can best meet their health care needs [1–3]. The concept of regionalized care during the perinatal period, or perinatal regionalization, has been established in publications and guidelines developed by organizations focused on maternal and infant health including

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AUTHOR CONTRIBUTIONS

EMO and CDK conceptualized and designed the study, reviewed the data analysis, and critically reviewed and revised the paper. CLD synthesized and analyzed the data, drafted the initial paper, and led the revision process. WDB critically reviewed and revised the paper. All authors approved the final paper as submitted and agree to be accountable for all aspects of the work.

DISCLAIMER

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

COMPETING INTERESTS

The authors declare no competing interests.

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March of Dimes and clinical membership organizations such as the American College of Obstetricians and Gynecologists and the American Academy of Pediatrics (AAP) [1, 4–6]. A critical part of ensuring deliveries occur in the most appropriate facilities is transfer of patients based on risk assessment [5, 6]. Maternal transport during the antenatal period facilitates care of high-risk (e.g., very preterm or very low birth weight) neonates in facilities with more specialized neonatal intensive care units (NICUs), an established strategy for improving neonatal outcomes [7]. This established strategy includes the identification and appropriate transfer of high-risk maternity patients, followed by transport back to facilities in their community for convalescing neonates and mothers for continued care. Due to the unpredictable nature of neonatal and obstetrical complications, the opportunity to transport the neonate and/or mother after delivery is also crucial to providing the most appropriate care [8, 9].

States have identified funding as an important barrier to improvements in risk-appropriate care [10]. At the advent of perinatal regionalization, regulation was in part maintained by state-developed certificate of need (CON) laws, which allowed states to establish and monitor perinatal costs, quality, and accessibility of services [11]. In the 1970s, states adopted federally funded Section 1122 programs, an early form of state CON programs that required a health facility to obtain state agency review and approval of a proposed capital expenditure in order to obtain Medicare and Medicaid reimbursements for the capital costs [11]. However, during recent decades, many states disbanded their CON programs or made them less restrictive [12, 13]. At the same time, managed care systems developed, which changed state payment systems [14, 15]. As the funding mechanisms shifted, the number of trained and available neonatologists grew alongside an increase in the number of midlevel NICUs [13, 15, 16]. The result has been deregionalization of care for at-risk dyads [13–17]. Due to deregionalization, transport systems between higher and lower levels of care and between different hospital systems may play a more critical role in providing risk-appropriate care [9].

A review of neonatal and maternal transfer policies was conducted in 2014 to provide insight into the organization of perinatal regionalized transport in the United States [18]. That review revealed that more than two-thirds of states (34 states; 68%) had a policy for neonatal transport; of these, 30 (88%) had a policy for maternal transport, 16 (47%) had a back-transport policy, and 23 (68%) had an inter-hospital transport policy [18]. Further, 30 states (60%) had a reimbursement policy for neonatal transport; of these, 10 (33%) had a reimbursement policy for maternal transport, 6 (20%) had a back-transport reimbursement policy, and 19 (63%) had a Medicaid transport reimbursement policy [18].

In 2013, shortly before the previous review was conducted, major parts of the Affordable Care Act went into effect, such as the establishment of Accountable Care Organizations, which highlighted the responsibility of care within regional networks [19]. Since the 2014 review, there have been state efforts to create and refine policies related to risk-appropriate care. A recent analysis found that four states added neonatal levels of care policy between 2014 and 2019, and that many states amended existing policies to be consistent with the minimum neonatal levels of care requirements created by the AAP [20]. Similarly, a 2019 assessment found that 31 states had policies that identified oversight authority with potential

ongoing monitoring of services for neonatal levels of care [21]. Further, a review conducted in 2018 identified 17 states with maternal levels of care guidelines in place [22]. Given these noted expansions in polices related to risk-appropriate care, we conducted an updated review of neonatal and maternal transfer policies in 2019 to assess changes in state transport policies and transport reimbursement policies.

METHODS

A systematic review of web-based, publicly available information on neonatal and maternal transport policies was conducted for each state in 2019, similar to the methods of the review conducted in 2014 [18]. In brief, a standardized search strategy was implemented using multiple search terms (Appendix) in internet search engines (e.g., Google) and within state websites. Results of the initial search were used to expand the search strategy. Only policies published by state agencies or state governments were examined for inclusion in the study; we excluded policies that were designated by a single facility or hospital system, city, tribe, or territory. We identified statutes, rules, codes, hospital licensure regulations, health planning documents (e.g., state health plans), state agency program descriptions (e.g., high-risk perinatal programs within state health departments), and statewide non-governmental perinatal health entity (e.g., perinatal quality collaboratives) web publications as possible sources of descriptions of state policies and used these for data extraction.

Identified documents were reviewed to assess if each state had policies for neonatal transport, maternal transport, back-transport, and inter-hospital transport; reimbursement policies for neonatal transport, maternal transport, and back-transport; and a Medicaid transport reimbursement policy. Transport policies were defined as any policies including specific language on neonatal, maternal, or back transport. Inter-hospital transport policies could include policies that mentioned neonatal or maternal transport (or back-transport) to a different state, hospital system, or perinatal region. Reimbursement policies were defined as any policies including language on the reimbursement of the transport by a state program or by insurance companies, including Medicaid. Medicaid transport reimbursement policies were any neonatal or maternal transport reimbursement policies specific to Medicaid. Information was captured by two abstractors and independently verified by a third person. Discrepancies were reconciled during meetings among study authors. A list of the included documents and the data produced from the assessment are available by written request to the first author.

Data were summarized using descriptive statistics. This study was determined to not require Institutional Review Board review at the Centers for Disease Control and Prevention because it did not include human subjects.

RESULTS

State-level transport policies

In 2019, 42 states (84%) had a neonatal transport policy, eight additional states since 2014 (Table 1). A total of 37 (74%) had a maternal transport policy, 23 (46%) had a back-transport policy, and 39 (78%) had a policy for inter-hospital transport. All eight

states that did not have a neonatal transport policy were also lacking maternal transport policies, back-transport policies, and policies for inter-hospital transport. Seven, eight, and 16 states, respectively, added policies for maternal transport, back-transport, and inter-hospital transport between 2014 and 2019. One state that had a back-transport policy in 2014 no longer had this policy in 2019. Five states (Alaska, Maine, Maryland, Massachusetts, and Wyoming) had language specific for coordinating out of state transport.

State-level transport reimbursement

In 2019, 31 states (62%) had a reimbursement policy for neonatal transport, one additional state since 2014 (Table 2). A total of 11 (22%) had a reimbursement policy for maternal transport, 6 (12%) had a reimbursement policy for back-transport, and 30 (60%) included a reimbursement policy specific to Medicaid.

Seven states that had reimbursement policies for neonatal transport in 2014 no longer had these policies in 2019 (data not shown), but eight states added neonatal transport reimbursement policies during this time frame, for a net gain of one state (Table 2). Similarly, four states that had reimbursements for maternal transport in 2014 no longer had these policies in 2019 (data not shown), but five states added maternal transport reimbursement policies during this period, for a net gain of one state. Two states that had reimbursement policies for back-transport in 2014 no longer had these policies in 2019 (data not shown), but two other states added back-transport reimbursement policies, leading to no overall change in the number of states with these policies. Seven states that had a Medicaidrelated payment option for transport reimbursement in 2014 no longer had these policies in 2019 (data not shown), but 18 states added Medicaid-specific reimbursement policies during this time frame, yielding an overall gain of 11 states with Medicaid transport reimbursement policies.

DISCUSSION

Between 2014 and 2019, the number of states with neonatal and maternal transport and reimbursement policies increased to varying extents. The largest net gains in policies were for inter-hospital transport and Medicaid transport reimbursement. While some of the gains in neonatal and maternal transport and reimbursement policies were modest and occurred at the same time as some states removed their policies, the overall increases have happened as more states have created and refined neonatal levels of care, levels of maternal care, and designated authority policies [20–22]. Although not all states have publicly available policies, the absolute change in the number of these policies suggests that many states have been working to strengthen risk-appropriate care in the past several years. Notably, of the 42 states with neonatal transport policies, 25 had neonatal risk-appropriate care policies in 2019 [20] and 18 had levels of maternal care policies in 2018 [22]. Similarly, of the 37 states with maternal transport policies, 23 had neonatal risk-appropriate care policies in 2019 [20] and 18 had levels of maternal care policies in 2018 [22].

The gains in inter-hospital transport policies represent progress by states because these policies play a key role in perinatal regionalization [23, 24]. There is an association between increased duration of transport and increased neonatal mortality [25], suggesting

that outcomes may improve when a neonate is transferred to the closest appropriate level facility by decreasing travel time. However, the closest appropriate level facility may be out of state. In our analysis, five states had language specific for coordinating out of state inter-hospital transport. A study examining transfers of very low birth weight infants in the United States found that while transfers are organized around regional communities, and largely within state boundaries, most of these communities contain at least two hospitals in different states [26]. A geospatial study of perinatal critical care found that most states have women of reproductive age living closer to a critical care facility in a neighboring state than one in their state of residence [27]. Therefore, coordinating policies for out of state inter-hospital transport may be a consideration to facilitate access to the most appropriate care for mothers and neonates.

The increase in Medicaid transport reimbursement policies is also noted. Medicaid, which finances about 42% of births in the United States [28], is a key payor for risk-appropriate care. Although policies from private insurers are not included in this review, some private insurance companies have aligned with state neonatal and maternal transport policies to reimburse for transport services [29]. In general, health insurance coverage, whether it is Medicaid or a private insurance company, improves access to health services [30].

The concept of returning convalescing neonates to lower-level facilities for recovery care and community support is another key part of risk-appropriate care [31]. In 2019, fewer than half of states had policies for back-transport and only six states had reimbursement policies for the back-transport of convalescing neonates; the latter was the smallest net gain in policies observed in our analysis. Back-transport can support familial bonding, ease financial and emotional stress on parents and caregivers, promote earlier involvement of primary care providers, improve efficiency of NICU bed utilization, and generate net cost savings [32–37]. However, lack of back-transport policy development in states may reflect the reimbursement structure. For example, a hospital that is caring for a sick infant may not be incentivized to back-transport the infant to a lower-level facility, since convalescing care reimbursement would be received by the receiving institution rather than the initiating facility [32].

Neonatal and maternal transport policies may create opportunities to improve health equity. In the United States, non-Hispanic Black families experience more than two times the rates of both preterm delivery at less than 32 weeks' gestation and infant mortality compared with non-Hispanic White families [28, 38]. Preterm birth substantially increases the risk of infant mortality [39], but delivering very preterm infants in a Level III + NICU increases their likelihood of survival [7]. Compared with non-Hispanic White infants, non-Hispanic Black infants are more likely to receive lower-quality care in NICUs [40–42], which is at least partially explained by lower-quality ratings of NICUs providing care to a high proportion of non-Hispanic Black infants [40, 41]. While the reasons for racial disparities in these outcomes are complex [43], transporting patients to the most appropriate facilities based on risk assessment is an established strategy for improving outcomes [6].Therefore, policies for transport may help address these disparities and improve health outcomes. Given the documented mistreatment of women of color within the healthcare system [44, 45], these systems-level opportunities to reduce disparities, such as policies for transport, could be

coupled with quality improvement initiatives focused on the provision of person-centered, respectful health care [46, 47].

In rural and frontier areas with smaller, widely distributed populations that are disproportionately affected by hospital closures and shortages of specialty physicians, neonatal and maternal transport policies are vital for increasing access to care [48, 49]. These policies may be especially critical for American Indian/Alaska Native (AI/AN) families living in isolated areas with limited access to services [50] as a result of generations of social injustice [51]. AI/AN women disproportionately suffer from severe maternal morbidity and mortality compared with other women in most other racial or ethnic groups and may especially need rapid transport to higher level facilities [52, 53]. In some regions, especially those that have long distances between hospitals, air transport may be prioritized over ground transport [54]. Future research might further assess air and ground transport policies and maternal and infant health outcomes. Telehealth has also been considered as a strategy in rural communities to improve maternal and infant health outcomes by providing more access to specialists [55, 56]. Telehealth may complement and inform the decision to transport [57]. Future research could investigate the impact of telehealth policies on appropriate neonatal and maternal transport and delivery outcomes to provide more information about the complementary roles of transport and telemedicine in availability of quality services.

Our results are subject to several important limitations. First, we only included publicly available policies identified via internet search strategies. Therefore, states might have policies in place that are not captured because they are not publicly available. We did not contact states directly to confirm state policies or ask whether they had policies in place that were not publicly available on the internet. Further, it is possible that we misclassified states as adding policies since 2014 if a previously existing policy only became publicly available between 2014 and 2019 or that we misclassified states as no longer having policies in 2019 if they were simply no longer publicly available. Additionally, states may have updated information since the time of data collection, and these updates would not be captured in this review. Also, we did not assess policies developed at the sub-state level, such as policies developed by cities or hospital systems, or those developed by private insurance plans. Further, this was not a robust legal epidemiology study. Finally, we were unable to determine if the policies included in this analysis could overcome certain barriers to providing timely risk-appropriate care, such as global obstetric reimbursement (i.e., bundled maternity care payments) to the provider attending the delivery [58]. Despite these limitations, our policy update provides a current snapshot of transport and transport reimbursement policies across the United States, a summary that may be helpful to states considering policy implementation.

CONCLUSION

This review provides a summary of publicly available neonatal and maternal transport and reimbursement policies in place in 2019 for all 50 US states. We found the number of states with these policies increased between 2014 and 2019. Continued progress in developing and refining neonatal and maternal transport policies by states, including

transport reimbursement policies, may support the improvement of perinatal outcomes, especially among high-risk maternity and neonatal patients. Such policies may help improve health equity by facilitating the most appropriate care provision to all mothers and their infants.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Summary of states with policies for neonatal and maternal transport in place in 2019 and that were added since 2014.

	In place in 2019		Added since 2014	
	n **(%)**	**States**	***n***	**States**
Neonatal transport policy	42 (84%)	AL, AK, AZ, AR, CA, CO, CT, DE, FL, GA, HI, IL, IN, IA, KY, LA, ME, MD, MA, MI, MS, MO, MT, NV, NH, NJ, NM, NY, NC, ND, OH, OK, PA, RI, SC, TN, TX, UT, VA, WA, WI, WY	8	AL, AR, CT, HI, IN, ME, NH, WA
Maternal transport policy	37 (74%)	AL, AK, AZ, AR, CA, CO, CT, DE, FL, GA, HI, IL, IN, IA, KY, LA, MD, MA, MI, MS, NV, NH, NJ, NM, NY, ND, OH, OK, PA, SC, TN, TX, UT, VA, WA, WI, WY	7	AL, AR, CT, HI, IN, NH, WA
Policy for back-transport of infants	23 (46%)	AZ, AR, GA, IL, IN, KY, LA, ME, MD, MA, MI, MS, MT, NV, NJ, NY, OH, SC, TN, TX, VA, WA, Wl	8	AR, IN, KY, ME, MT, TN, WA, WI
Policy for inter-hospital transport	39 (78%)	AK, AZ, AR, CA, CO, CT, DE, FL, GA, HI, IL, IN, IA, KY, LA, ME, MD, MA, MI, MS, MO, NV, NH, NJ, NM, NY, NC, ND, OH, OK, PA, RI, SC, TN, TX, VA, WA, WI, WY	16	AR, CA, CT, HI, IN, KY, ME, MS, MO, NH, NC, ND, OK, PA, TX, WA

Table 2

Summary of states with reimbursement policies for neonatal and maternal transport in place in 2019 and that were added since 2014.

	In place in 2019		Added since 2014	
	n **(%)**	**States**	***n***	**States**
Reimbursement policy for neonatal transport	31 (62%)	AL, AK, AZ, AR, CA, CO, DE, GA, ID, IL, IN, ME, MD, MI, MN, MT, NV, NM, NY, NC, OK, OR, RI, SC, SD, TN, TX, UT, WV, WI, WY	8	AK, AR, IL, NM, NC, SC, TX, WV
Reimbursement policy for maternal transport	11 (22%)	AK, AZ, AR, GA, MD, MN, MT, NM, TX, UT, WY	5	AK, AR, NM, TX, UT
Reimbursement policy for back-transport	6 (12%)	AZ, MI, MN, MT, NY, NC	2	MT, NC
Medicaid transport reimbursement policy	30 (60%)	AL, AK, AZ, AR, CA, CO, DE, GA, ID, IL, IN, ME, MD, MI, MN, MT, NV, NM, NY, NC, OK, OR, RI, SC, SD, TN, TX, UT, WV, WI	18	AL, AK, AZ, AR, DE, IL, ME, MD, MN, NV, NM, NC, OK, OR, RI, SC, TX, WV