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Abstract

Objective: This study investigates the pandemic's impact on newborn hearing screening (NBHS) and access to hearing services for children in a statewide context. Specifically, it explores the disparities in NBHS rates, diagnostic hearing testing, early intervention referrals, and cytomegalovirus (CMV) screening before and during the pandemic.

Methods: Utilizing a comprehensive statewide Early Hearing Detection and Intervention (EHDI) database, we analyzed births logged from January 2017 to December 2021, excluding a 6-month period preceding March 16, 2020, to eliminate potential confounders related to follow-up during pandemic onset. We assessed NBHS completion rates, time to diagnose hearing loss, early intervention (EI) referrals, and CMV screening. Multivariable logistic regression analysis was employed to identify factors influencing timely auditory brainstem response (ABR) testing. Additionally, a retrospective chart review was conducted on 202 pediatric patients who received cochlear implants between 2018 and 2023 to investigate the rate of infants diagnosed with congenital CMV who subsequently received cochlear implants.

Results: Our study included 192,161 newborns in Utah. Although over 99% of newborns underwent NBHS throughout the study period, disparities were noted among those born in small towns, rural locations, home births, and self-pay situations. Births in metropolitan areas and small towns witnessed an increased proportion of NBHS and timely diagnostic ABR during the pandemic. While home births increased steadily every year from 3% of births in 2017 to 5% in 2021, the proportion of home births who received NBHS increased during the pandemic. The rate of timely ABR testing and EI services increased during the pandemic. Among children born from 2017 to 2021, 14 children were identified with congenital CMV-induced hearing loss and received cochlear implantations between 2018 and 2023.

Conclusion: The COVID-19 pandemic did not considerably alter NBHS rates, but disparities were alleviated in timely diagnostic hearing testing for home births. The rate of timely ABR diagnosis and timely EI services in the state of Utah increased during the pandemic. These results highlight the importance of addressing access to care problems.

Introduction

- To optimize a timely intervention for infants with congenital hearing loss, the EHDI 1-3-6 guidelines mandate NBHS by one month of age, diagnosis of hearing loss by 3 months, and initiation of early intervention (EI) services by 6 months of age [1].
- The expanded targeted CMV screening program in Utah recommends CMV testing for newborns who meet criteria indicative of a higher risk for congenital CMV infection [2].
- This study seeks to explore statewide repercussions of the COVID-19 pandemic on Utah's newborn hearing screening practices. This presentation also investigates the outcomes of CMV-deafened children who received cochlear implantations (CI) within the study period.
- We hypothesize that the pandemic worsened the EHDI 1-3-6 follow-up in home births, rural settings, minority races and ethnicities.

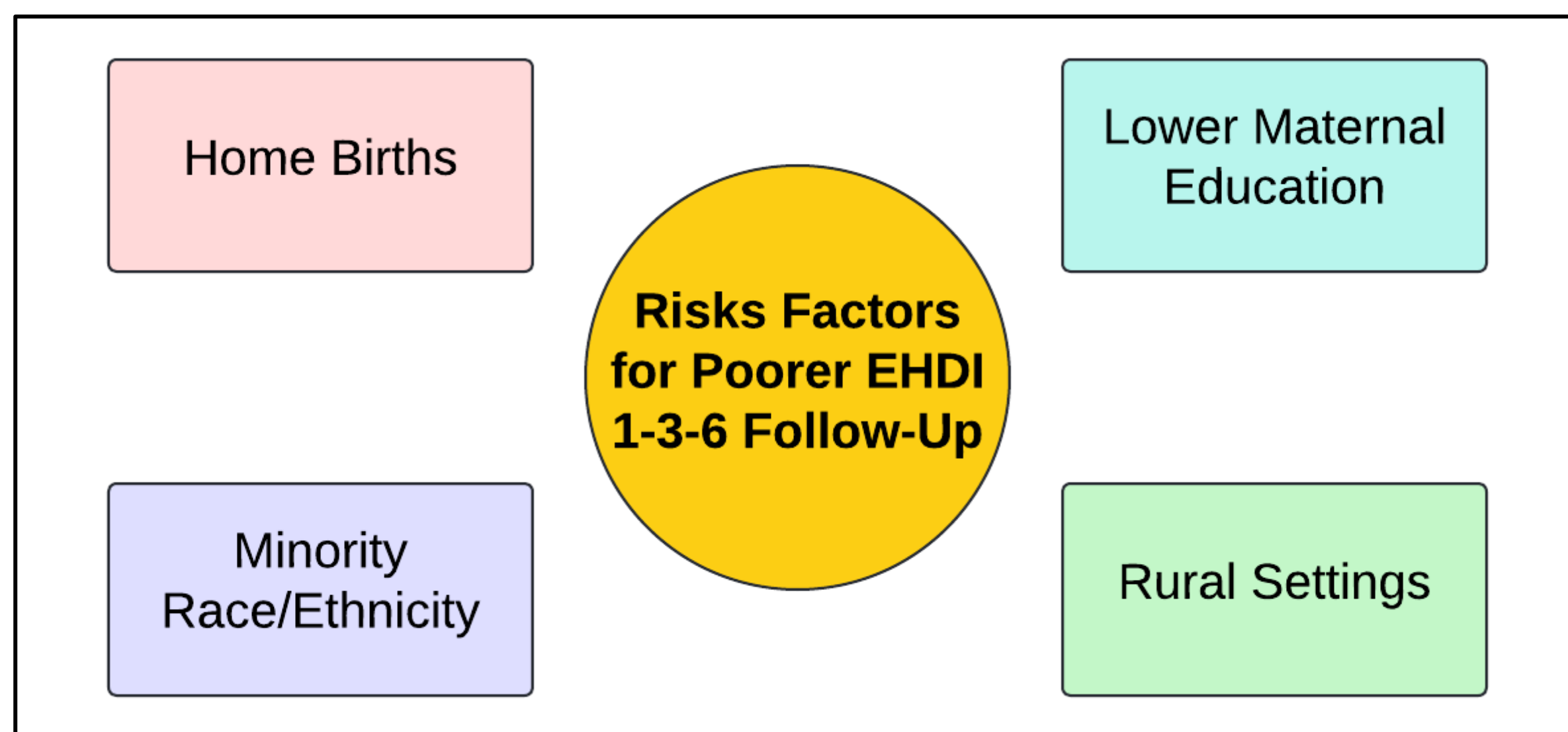


Figure 1 – Demographic Risk Factors for Low EHDI 1-3-6 Follow-Up [3-4].

Methods

- Utilizing a comprehensive statewide EHDI database, we analyzed data retrospectively from January 2017 to December 2021, excluding a 6-month period preceding March 16, 2020.
- Exclusion criteria covered newborns lacking a state file number, infants deceased before six months old, admission into intensive care, and those born within 180 days of the pandemic.
- A retrospective chart review was conducted on 202 pediatric patients who received cochlear implants at Primary Children's Hospital and University of Utah CI center from 2018 to 2023.

Results

- Almost all newborns in Utah underwent NBHS, exceeding a 99% rate throughout the study.
- Approximately 7% of infants born at home did not undergo NBHS.
- While home births increased steadily every year from 3% of births in 2017 to 5% in 2021, the proportion of home births who received NBHS increased during the pandemic (Figure 2).
- The rate of timely NBHS, ABR testing, and EI services increased during the pandemic (Figure 3).
- Forty-one children were diagnosed with congenital CMV, 14 (34%) of whom underwent cochlear implantation (CI) between 2018 and 2023. Nine of them originally had single-sided deafness and underwent unilateral CI.

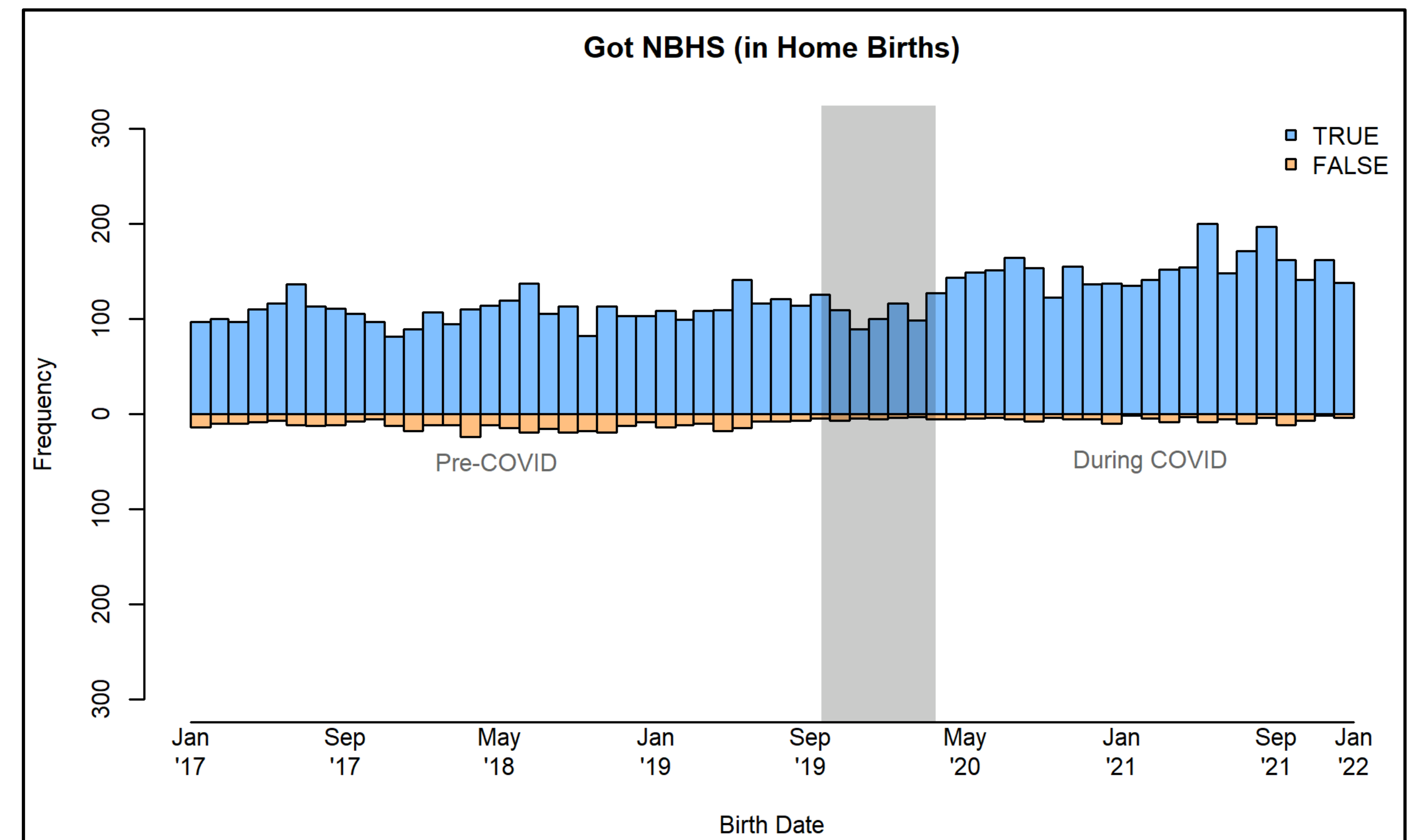


Figure 2 – Monthly Frequency of Home Births with and without NBHS.

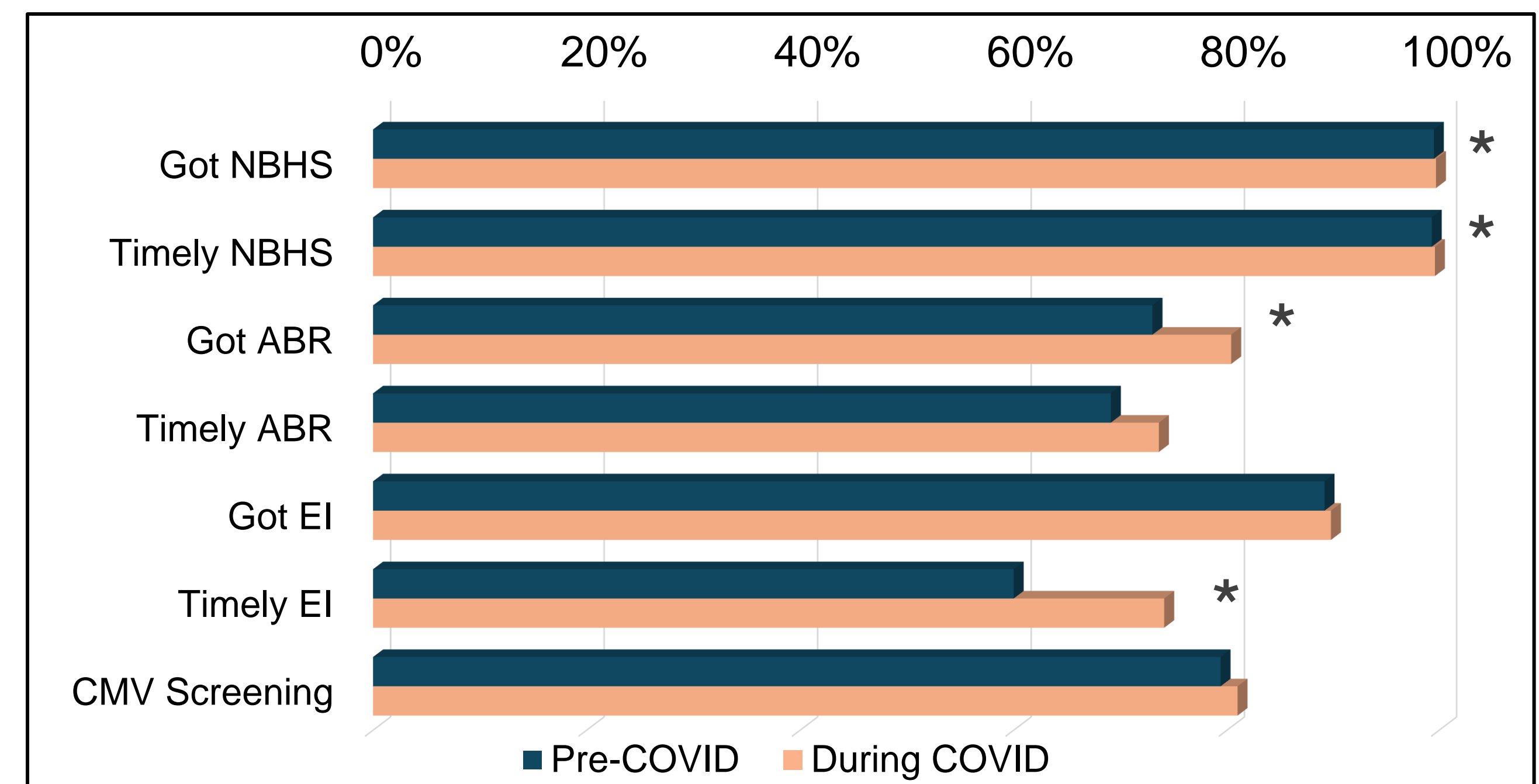


Figure 3 – Percentage of Eligible Children who Completed EHDI 1-3-6 milestones. * $p < 0.05$

Discussion

- Despite data indicating decreases in diagnostic evaluation and early intervention, and an increase in loss to follow-up nationally [5], our findings indicate a significant improvement in timely NBHS, ABR, and EI delivery in Utah.
- In Utah, infants born at home, without insurance, or whose families are under Medicaid coverage or living in micropolitan and rural areas are less likely to receive NBHS or a timely diagnostic ABR test.
- During the pandemic, there has been a decrease in NBHS conducted in rural areas, but it has not affected the rate of timely diagnostic ABR follow-up.
- Our improvement in EHDI-related follow-up during the pandemic was largely due to the state allowing us to text parents and communicate with hospitals about the essential nature of NBHS and its follow-up.
- Providing education and equipment to midwives ensures compliance with the law in Utah requiring NBHS within 10 days old [6].
- The expanded targeted screening program in Utah detected 41 infants with congenital CMV within the study period, 34% of whom underwent cochlear implantation within 4 years of age.

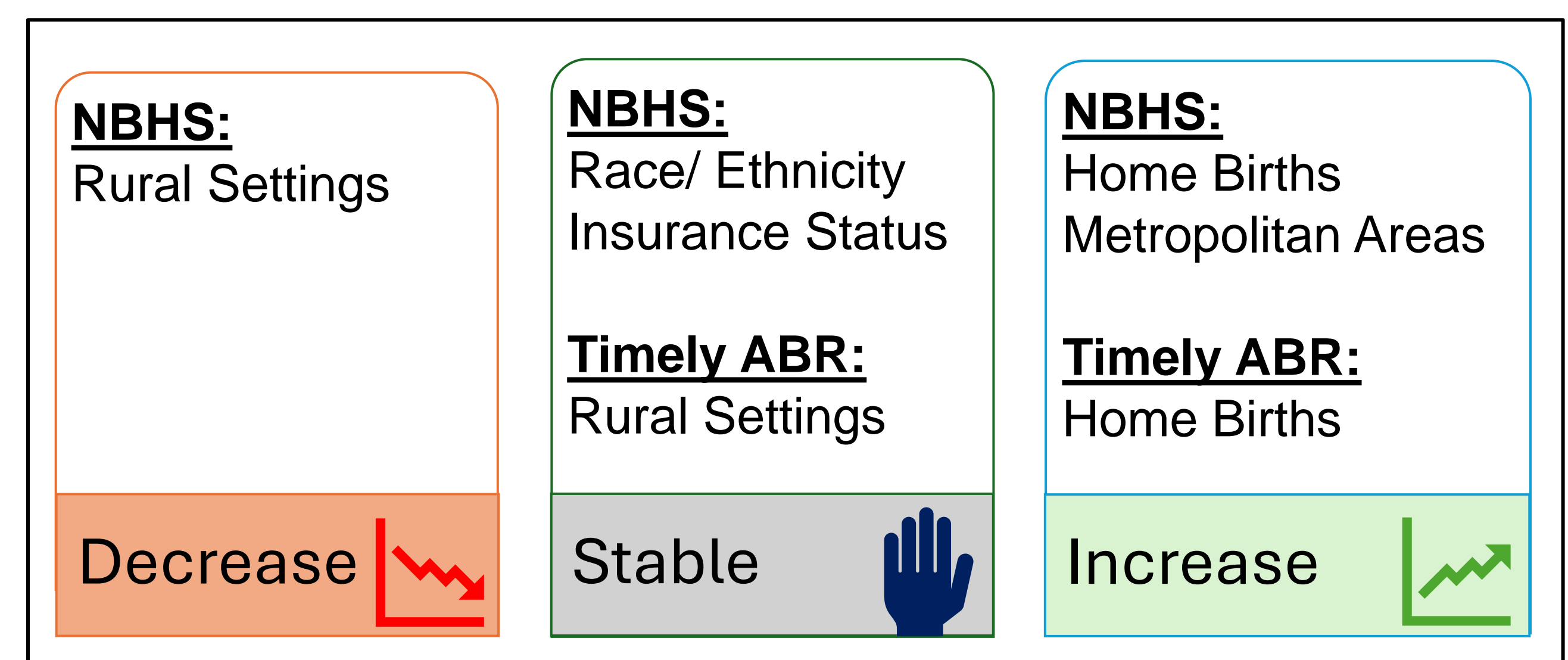


Figure 4 – Effects of the COVID-19 Pandemic on the EHDI 1-3-6 Follow-up Protocols.

Summary Statements

- The COVID-19 pandemic did not adversely affect EHDI 1-3-6 compliance rates in Utah, as evidenced by consistently high NBHS rates, and increased rates of timely NBHS, ABR testing, and EI services during the pandemic.
- Enhancing EHDI 1-3-6 compliance should focus on improving access in rural areas, equipping midwives with the necessary tools, and fostering community partnerships.
- CMV screening and intervention are crucial as they enable the timely identification and treatment of congenital CMV-induced hearing loss, significantly improving the outcomes for affected children, including those requiring cochlear implants.

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