



AN INTEGRATED HEALTH SYSTEMS APPROACH TO INCREASE THE USE OF CHLORHEXIDINE FOR NEWBORN CARE IN MADAGASCAR

Background

While Madagascar has made progress in reducing its newborn mortality rate from 31 deaths within the first 28 days of life per 1,000 live births in 2000 to 24 in 2020,¹ more efforts are needed to improve newborn survival by addressing underlying causes of newborn mortality, including preventable infections and sepsis, which account for around 7% of these newborn deaths.² Umbilical cord care with the application of 7.1% Chlorhexidine Digluconate (CHX) is recommended by the World Health Organization (WHO) to reduce risk of infection and prevent life-threatening cases of sepsis, particularly in areas with high neonatal mortality, where poor hygiene at birth or use of harmful umbilical cord care practices (i.e., application of alcohol to the umbilical cord) are prevalent.³ In Madagascar, this standard was adopted by the Ministry of Public Health (MOPH) in 2017, but implementation has been hindered by certain cultural traditional practices and health system bottlenecks. Faced with low and stagnating rates of CHX administration in health facilities, over several months and ending in November 2020, the USAID-funded ACCESS program supported the MOPH to identify root causes behind low uptake of this high-impact practice, which included reluctance by health workers to provide CHX (in preference for using an alcohol-based solution), hesitancy by mothers to accept CHX (perception that CHX delays the fall of the cord and strong smell of CHX), limited financial accessibility (USD \$0.23 per prescription, which is paid for out-of-pocket), and supply chain unreliability (multiple pharmaceutical presentations of CHX can cause confusion in quantification and prescription, and frequent stock-outs at the community and health facility levels, including almost non-existence in hospitals).

PROJECT OVERVIEW

The Accessible Continuum of Care and Essential Services Sustained (ACCESS, 2018-2025) is an integrated health project funded by the United States Agency for International Development (USAID) and led by Management Sciences for Health. The goal of the program is to accelerate sustainable health impacts for the Malagasy population through three primary objectives:

- Quality health services are sustainably available and accessible to all Malagasy communities in the program's target regions
- Health systems function effectively to support quality service delivery
- The Malagasy people sustainably adopt health behaviors and social norms

¹ The World Bank Group. "Mortality rate, neonatal (per 1,000 live births) - Madagascar." UN Inter-agency Group for Child Mortality Estimation. Accessed April 7, 2023. <https://data.worldbank.org/indicator/SH.DYN.NMRT?locations=MG>.

² Save the Children Federation, Inc. "Umbilical Cord Care." Healthy Newborn Network. Accessed April 7, 2023. <https://www.healthynetwork.org/issue/umbilical-cord-care/>.

³ World Health Organization. WHO Recommendations on Maternal and Newborn Care for a Positive Postnatal Experience. Licence: CC BY-NC-SA 3.0 IGO. Geneva: World Health Organization, 2022. <https://www.who.int/publications/i/item/9789240045989> (accessed April 7, 2023).

Intervention

After the root cause analysis exercise, ACCESS, the MOPH, and other partners worked together to identify context-specific solutions and issued a series of recommended programmatic interventions that included:

- 1 training and re-orienting community health volunteers (CHVs) and health workers on the importance of CHX, its proper use, and countering misconceptions;
- 2 developing and implementing job aids to strengthen counselling skills of health workers in its provision;
- 3 supporting CHVs and other community health actors in educating the community to promote CHX use among pregnant women and their families;
- 4 advocating with stakeholders for sustainable procurement and distribution;
- 5 encouraging women to purchase CHX through support from Savings and Internal Lending Communities (a program to increase the purchasing power of women).

ACCESS supported the MOPH to implement these interventions in 11 regions: Analanjirifo, Atsimo Andrefana, Atsinanana, Boeny, Diana, Fitovinany, Menabe, Melaky, SAVA, Sofia, and Vatovavy. The MOPH also led and coordinated (with other partners) the implementation of many of these interventions (training of CHVs and continuing training for health workers on the importance and use of CHX, supporting community engagement, and streamlined national CHX distribution processes) in the country's other 12 regions starting in November 2020. Interventions are ongoing as of April 2023.

Methods

We assessed changes in CHX administration before and after the intervention package was implemented at the national level and in ACCESS-supported and non-ACCESS-supported regions. Using national District Health Information Software II (DHIS2) data from the 4,495 health facilities across the 23 regions, we compared the percentage of newborns who received CHX cord care at birth between January-June 2020 and

January-June 2022 using a paired t-test. We also used paired t-tests to compare the percentage of newborns who received CHX cord care at birth between the same two time periods in 2,121 health facilities in the 11 ACCESS-supported regions and in 2,374 health facilities in the 12 non-ACCESS-supported regions (all health facilities reporting into DHIS2 in the periods of analysis were included).

Results

After the intervention, 64.4% (95% Confidence Interval [CI]: 62.3% to 66.4%) of newborns in the 4,495 health facilities across all 23 regions received CHX cord care immediately after birth, compared to 19.1% (95% CI: 17.8% to 20.3%) before the intervention. There was a significant increase in the percentage of babies who received CHX cord care at birth between the two time periods at the national level ($t = 40.05$, $df = 2,668$, $p < 0.0001$).

Significant increases in CHX cord care between before and after the intervention were also seen when the analysis focused on ACCESS-supported and on non-ACCESS-supported regions. For the 1,350 health facilities in the 11 ACCESS-supported regions, CHX cord care for newborns increased from 15.6% (95% CI: 14.1% to 17.1%) before the intervention to 67.2% (95% CI: 65.3% to 69.0%) after the intervention ($t = 44.38$, $df = 1,349$, $p < 0.0001$). The same analysis conducted among the 1,319 health facilities in the 12 non-ACCESS-supported regions found an increase from 22.6% (95% CI: 20.7% to 24.6%) before the intervention to 61.6% (95% CI: 57.9% to 65.2%) after the intervention ($t = 20.05$, $df = 1,318$, $p < 0.0001$).

Discussion and conclusions

CHX cord care improved at the national level in Madagascar, both in ACCESS-supported and non-ACCESS-supported regions. These results suggest that the implementation of needs-based, multi-level (community, health facility, national), holistic health system interventions tailored to address local root causes may have been effective in improving CHX cord care. Additionally, this underscores the importance of person-centered care – or targeting interventions that address the challenges, preferences, and needs of the patient and consider provider behavior – and collaborating with partners to harmonize efforts and standardize processes.

However, our analyses did not control for potential confounding factors such as demographic characteristics of mothers, type of health facility, or patient volume; we also could not estimate the contributing effects of specific interventions within the intervention package.

Ultimately, working with and through local systems and building local capacities to identify and address local problems has potential to scale up CHX cord care, a WHO recommendation for reducing sepsis at birth and neonatal mortality. Further analyses that control for confounders are needed to better understand the effect of the program intervention on reducing preventable newborn mortality from infection complications in Madagascar and other settings.

“I firmly believe in the effectiveness of CHX in preventing umbilical infections and promoting the well-being of newborns. In fact, I supply chlorhexidine to all community health volunteers at every monthly meeting, so that even remote communities can benefit from it.” – RAMANIVOSON Mialiarisoa Lycia, Midwife at the CSB2 Beheloka, Atsimo Andrefana, Madagascar.