



■ Evaluation Framework

EVALUATION FRAMEWORK FOR HEAT-STABLE CARBETOCIN

Implementation Research Design to Inform the Introduction and Scale of a New Medication to Prevent Postpartum Hemorrhage

Heat-stable carbetocin (HSC), a drug to prevent postpartum hemorrhage, was recently added to the World Health Organization (WHO) essential medicines list. HSC is actively being rolled out by Madagascar's Ministry of Public Health in select regions of Madagascar, with the support of the United Nations Population Fund (UNFPA). This evaluation framework, which includes research questions, measurement suggestions, and interpretation guidance, is meant to produce actionable evidence to guide Madagascar's nationwide HSC expansion, which is planned for 2024 to 2026 and aims to optimize postpartum hemorrhage prevention. MOMENTUM Knowledge Accelerator hopes that other ministries of health, UNFPA implementation leaders, and other entities responsible for the rollout of HSC can use this evaluation framework to support similar efforts and facilitate standardized global learning about HSC.

BACKGROUND

Postpartum hemorrhage is a major cause of maternal mortality globally and is a leading cause of maternal death in Madagascar. Maternal mortality has largely stagnated over the last 10 years in Madagascar and is estimated to be 392 deaths per 100,000 live births.¹ Prevention of postpartum hemorrhage is key to reducing maternal mortality. Active management of the third stage of labor, a central component of which is administration of a uterotonic in the first minute after delivery, remains the primary strategy for postpartum hemorrhage prevention recommended by the WHO.²

In 2019, WHO added HSC to the core list of medicines for reproductive health for its ability to prevent postpartum hemorrhage immediately after birth. Typically, in settings where multiple uterotonic options are available, oxytocin remains the recommended drug for the prevention of postpartum hemorrhage for all births. However, oxytocin requires a reliable cold chain to maintain its efficacy, which is often not possible for many health facilities in low-resource countries.³ HSC, however, does not require cold chain infrastructure. Like oxytocin, HSC is an injection that must be administered by a skilled health care provider, unlike misoprostol, another uterotonic, which is a pill. WHO guidance states that when oxytocin is not available, HSC, misoprostol, or ergometrine can be used as a second-line defense for the prevention of postpartum hemorrhage.

There is complexity in the administration of HSC that must be considered to reduce potential for harm. Oxytocin is the recommended uterotonic for preventing *and treating* postpartum hemorrhage, as well as for labor induction and augmentation. In contrast, HSC is indicated only for postpartum hemorrhage *prevention and not for treatment*. (See

Table 1.) The inappropriate use of HSC, similar to other existing uterotonics, can endanger the lives of women and babies, so education of care providers is critical. Currently, there is a dearth of implementation research on the safe or ethical rollout of HSC, particularly in low-resource countries that would benefit most.⁴

Table 1: Recommendations for the Prevention and Treatment of Postpartum Hemorrhage^{5,6}

AVAILABLE FACILITY RESOURCES	RECOMMENDED PREVENTION FOR POSTPARTUM HEMORRHAGE	RECOMMENDED TREATMENT FOR POSTPARTUM HEMORRHAGE
Adequate cold chain and storage, health providers capable of administering injections	<p>Best option: Oxytocin (shelf life: 30 days under frozen/refrigerated conditions)</p> <p>Second choice: If high-quality oxytocin is unavailable, then the second choice is heat-stable carbetocin (shelf life: 48 months) OR misoprostol (shelf life: two years) OR ergometrine (shelf life: 12 weeks)</p>	<p>Best option: Oxytocin AND tranexamic acid</p> <p>Second choice: If high-quality oxytocin is not available or in addition to oxytocin, then misoprostol and/or ergometrine (NOT heat-stable carbetocin)</p>
Insufficient cold chain, health providers capable of administering injections	<p>Best option: Heat-stable carbetocin OR misoprostol</p>	<p>Best option: Misoprostol AND tranexamic acid (NOT heat-stable carbetocin)</p>
Insufficient cold chain, NO health providers capable of administering injections	<p>Best option: Misoprostol (NOT heat-stable carbetocin)</p>	<p>Best option: Misoprostol (NOT heat-stable carbetocin)</p>

The addition of HSC to the WHO essential medications list will enable more and more countries to make this new medication available across relevant or appropriate service providers. While there is potential for HSC to contribute to meaningful reductions in postpartum hemorrhage, its health impact will be limited if it is not used effectively and appropriately and if it is not integrated into existing supply chains and bedside practices. Many settings do not have the resources to implement comprehensive trainings focused solely on HSC; thus, there is an opportunity to learn from settings that are innovating to implement the use of HSC within existing financial and logistical constraints.

This evaluation framework is meant to utilize routinely collected data whenever possible in addition to periodic stakeholder interviews to better understand gaps in correct HSC utilization. We hope that this framework will facilitate systematic learning about HSC use in a low-cost and low-burden way.

HEAT-STABLE CARBETOCIN IN MADAGASCAR

Beginning in February 2021, representatives from Madagascar’s Ministry of Public Health, the United Nations Population Fund (UNFPA), and other stakeholders met to discuss issues with reproductive health commodity security in the country, including the availability and use of HSC. The output from these meetings was the development of an operational action plan that became the Plan d’Action Pour l’Introduction des Nouveaux Produits de la Santé de la Reproduction et de la Planification Familiale Ainsi Que les Produits Peu Utilisés 2021–2023.



Attendees at the workshop on new and less used commodities, October 2023

By April 2021, UNFPA was making efforts to register HSC with the Madagascar Medicines Agency. In August 2022, a training of trainers was at the central level on the introduction of these new products, which was followed by the acquisition of commodities in October 2022. HSC training was embedded in an overall refresher training for labor room staff on postpartum hemorrhage prevention and treatment. Distribution of the new products took place in December 2022 in the regions of Vatovavy, Fitovinany, Androy, Anosy, and Atsimo Andrefana and was accompanied by a technical orientation for the Reproductive Health Program Managers of these regions and districts on the use of these commodities. Monitoring visits took place

in June 2023 to assess how procedures were being followed as well as the use of these new products.

On October 2 and 3, 2023, a workshop was held in Antananarivo to revise the Plan d’Action Pour l’Introduction des Nouveaux Produits de la Santé de la Reproduction et de la Planification Familiale Ainsi Que les Produits Peu Utilisés for 2024 to 2026. Table 2 is a partial list of those in attendance.

Table 2: Attendees at the Workshop on New and Less Used Commodities, October 2023

<p>MINISTRY OF PUBLIC HEALTH DIRECTORATES OF MADAGASCAR</p> <ul style="list-style-type: none"> • Family Health Department • Directorate of Pharmacy, Laboratories and Traditional Medicine • Madagascar Medicines Agency • SALAMA (central purchasing agency for generic medicines)
<p>REGIONAL DIRECTORATES OF PUBLIC HEALTH</p> <ul style="list-style-type: none"> • Analamanga • Androy • Atsimo Andrefana • Fitovinany • Vatovavy
<p>PROFESSIONAL ASSOCIATIONS</p> <ul style="list-style-type: none"> • Order of Physicians • Order of Gynecologists
<p>UNITED NATIONS BODY</p> <ul style="list-style-type: none"> • United Nations Population Fund (UNFPA)
<p>COLLABORATING ORGANIZATIONS</p>

- USAID Improving Market Partnerships and Access to Commodities Together (IMPACT) project
- MOMENTUM Knowledge Accelerator

The rollout of HSC in Madagascar was the primary topic of conversation during this October 2023 workshop. MOMENTUM Knowledge Accelerator drafted the logic model (Appendix 1) to facilitate a clear understanding of the Ministry of Public Health’s HSC rollout plan and to clarify measurement goals for this framework. Currently, in the five regions where the rollout is happening, about 69% of facilities have a reliable cold chain infrastructure while about 31% do not. HSC has been distributed to many facilities, but use has been low as training has not reached many providers. Still, among the workshop participants, there is a strong emphasis on commodity security and the benefit of enabling health care workers to choose which medication they believe is most appropriate, especially given the likelihood of stockouts.

To identify potential measurement strategies, workshop participants discussed existing monitoring and documentation strategies for various commodities (including HSC), and session moderators conducted a short survey to assess participants’ perceptions of data availability and data quality. MOMENTUM Knowledge Accelerator then used this information to inform the measurement details and considerations in the framework.

As part of the next three-year iteration of the Plan d’Action Pour l’Introduction des Nouveaux Produits de la Santé de la Reproduction et de la Planification Familiale Ainsi Que les Produits Peu Utilisés, there are plans to expand activities to all health facilities in the current five regions by 2024, add an additional seven regions in 2025, and then expand to the entire country in 2026. This presents an excellent opportunity to learn from current implementation efforts to inform the upcoming larger rollout across Madagascar in the coming years, as well as to inform implementation in other countries that will be rolling out HSC.

EVALUATION FRAMEWORK AND MEASURES

While studies demonstrating the effectiveness of HSC in preventing postpartum hemorrhage are well documented, information on locally led implementation strategies, typical use patterns, and sustainability of HSC use in low-resource settings is lacking.⁷ From a practical standpoint, this information is important as efforts within a country shift from ensuring appropriate administrative approvals for the import and registration of HSC towards scale-up of HSC availability within health facilities. This evaluation framework suggests measures that could be used at multiple points in time to identify barriers and optimize the limited resources available for the HSC rollout and for related postpartum hemorrhage prevention activities.

In consultation with stakeholders in Madagascar, this evaluation framework was developed to evaluate the current use of HSC, guide the planned nationwide expansion of HSC implementation in Madagascar, and assess the sustainability of use over time, given the available implementation resources.* As such, we focus on three main questions for this framework:

1. How has the introduction of HSC affected uterotonic use for postpartum hemorrhage prevention at facilities where HSC was introduced?
2. Were there any cases of incorrect use or patient harm associated with the introduction of HSC?
3. What implementation support is needed to ensure sustained adoption and proper use?

* The Ministry of Public Health has agreed to a three-year plan that will result in scale-up nationwide. This evaluation framework does not consider scale up costs at this point given the Ministry’s commitment to rolling out HSC.

In a survey of 47 participants from facilities across the implementation regions conducted during the workshop on new and less used commodities, nearly 60% said that reporting on uterotonic use for PPH prevention is excellent or very good at facilities. As part of this evaluation, efforts will be made to capture which uterotonic is being administered and other pertinent details.

To systematically explore these questions and to address current information gaps about HSC implementation, we use the RE-AIM framework.⁸ The RE-AIM framework is a planning and evaluation model that is robust enough to guide research studies, yet straightforward enough for quality improvement and demonstration projects in both high- and low-resource settings.⁹ This framework has been used to support mid-course evaluation efforts related to service delivery, which is relevant to the HSC rollout.¹⁰ The RE-AIM framework suggests that health interventions consider five key dimensions when considering translation of research into practice, as presented in Table 3.

Table 3: RE-AIM Evaluation Dimensions

DIMENSION	DESCRIPTION	RELEVANCE TO HEAT-STABLE CARBETOCIN ROLLOUT
Reach	Proportion of the target population that participated in the intervention, measured at the individual level	Proportion of women correctly receiving HSC immediately after delivery for postpartum hemorrhage prevention at each facility Incorrect use of HSC at each facility (e.g., use of HSC during labor or to treat active postpartum hemorrhage)
Effectiveness	Success rate if used as expected, measured at the individual level	Effects of HSC on number of cases of postpartum hemorrhage Adverse health effects of HSC, particularly related to unindicated use
Adoption	Proportion of settings that adopted the intervention, measured at the organizational level	Facility uptake of the heat-stable carbetocin implementation package at a regional level (i.e., among facilities that were supposed to start using HSC, how many received the planned intervention of HSC supply, training, job aid, and HSC monitoring)
Implementation	Consistency of the intervention components, cost, and variations of the intervention, measured at the organizational level	Consistency, cost, and variation in the main inputs for the intervention, including: <ul style="list-style-type: none"> • Training of birth attendants • Availability of HSC in facilities • Job aids Data collection and monitoring
Maintenance	Maintenance of intervention effects in individuals and settings over time	Sustained availability, adoption, and correct use of HSC over time

The suggested timing of and frequency of measurement reflects critical inflection points in the planned multi-year roll-out plan for HSC. **At 3 months after HSC is introduced** at a site, there is an opportunity to understand if the roll-out went as expected, if any useful changes were made, and if any gaps persist that need to be addressed. **At 12 months after HSC is introduced** at a site, there is an opportunity to learn about the first year of HSC use in order to inform the plan to scale HSC introduction to additional regions in the following year. **At 24 months after HSC is**

introduced, there is an opportunity to understand if HSC use is sustained over time and to make adjustments accordingly. The timing of the measurement is flexible based on available resources and logistics.

In Madagascar, HSC introduction has been embedded in an overall refresher training for labor room staff on postpartum hemorrhage prevention and treatment. Given the growing ecosystem of prevention and treatment options available, the indicators that are proposed in this framework seek to understand both HSC-specific use and the associated impact on the use of other hemorrhage-prevention medications such as oxytocin and misoprostol. The scope of this current framework does not include medications related to treatment of postpartum hemorrhage, although that is an important consideration for the future.

TABLE 4: RESEARCH QUESTION #1: HOW HAS THE INTRODUCTION OF HSC AFFECTED UTEROTONIC USE FOR POSTPARTUM HEMORRHAGE PREVENTION AT FACILITIES WHERE HSC WAS INTRODUCED?

GENERAL MEASURE	MEASUREMENT DETAILS AND CONSIDERATIONS	POSSIBLE DATA SOURCES (TYPE OF DATA)	RECOMMENDED FREQUENCY	RE-AIM FRAMEWORK
<p>Proportion of women receiving any uterotonic for postpartum hemorrhage prevention at each facility, stratified by drug type</p>	<ul style="list-style-type: none"> • Individual-level uterotonic administration (Indicator #1.1): <ul style="list-style-type: none"> – Denominator: Total number of women giving birth at an HSC rollout facility during the past month – Numerator: Total number of women giving birth at an HSC rollout facility during the last month who received any uterotonic after delivery for postpartum hemorrhage prevention, stratified by type of drug (HSC vs. oxytocin vs. misoprostol vs. other uterotonics) • Additional details to capture about HSC, if available: <ul style="list-style-type: none"> – Timing of administration – Dose administered • Additional details on facility characteristics, to stratify results, if available: <ul style="list-style-type: none"> – Availability of cold chain at facility – Type of facility (e.g., primary, secondary, tertiary; private vs. public) – Number of deliveries at the facility – Number and type of health care providers at the facility who help with childbirth on a typical shift – Facilities that have received the HSC implementation package vs. those that have not – Availability of each type of uterotonic drugs (HSC, oxytocin, misoprostol, other uterotonics) 	<p>Register data (Quantitative)</p>	<p>Monthly summary of register data</p> <p>If registers do not regularly document this indicator, intentional data collection at 3 months, 12 months, and 24 months after HSC implementation</p>	<p>Reach</p>
<p>Health effects of HSC implementation</p>	<ul style="list-style-type: none"> • Postpartum hemorrhage: Indicator #1.2 <ul style="list-style-type: none"> – Denominator: Total number of births in a region where HSC rollout occurred within a 3-month period 	<p>Indicator 1.2: Register data (Quantitative)</p>	<p>Indicator 1.2: Quarterly aggregation of register data from</p>	<p>Effectiveness and adverse outcomes</p>

<p>package[†] on postpartum hemorrhage</p>	<ul style="list-style-type: none"> – Numerator: Number of cases of postpartum hemorrhage within a region where HSC rollout occurred within a 3-month period • Timing: Since postpartum hemorrhage is relatively rare, recommend measuring trends over time (multiple months) as HSC implementation rolls out within a district • Sentinel events (Indicator #1.3): <ul style="list-style-type: none"> – Review of sentinel events: Flag maternal and perinatal death reviews or near-miss reviews involving HSC for deeper inquiry; document the number of events that had exposure to HSC 	<p>Indicator 1.3: TBD</p> <p>(Quantitative)</p>	<p>each facility within a region</p> <p>Indicator 1.3: Reviewed at 3 months, 12 months, and 24 months after HSC implementation</p>	
<p>Facility uptake of HSC implementation package at a regional level</p>	<ul style="list-style-type: none"> • Facility received implementation package (Indicator #1.4): <ul style="list-style-type: none"> – Denominator: Total number of government health facilities within a region where the HSC rollout is happening – Numerator: Number of facilities that have received the full HSC implementation package (medication available, training complete, job aid, HSC added to ordering systems) within that region • Recommended additional details on facility characteristics, to stratify results: <ul style="list-style-type: none"> – Facilities with and without cold chain – Type of facility (e.g., primary, secondary, tertiary; private vs. public; community) – Number of deliveries at the facility – Number and type of health care providers at the facility 	<p>Regional training records, medication orders, job aid orders (if separate from medication orders); can confirm data during periodic sites visits</p> <p>(Quantitative)</p>	<p>Monthly summary, until all eligible facilities within a region receive the HSC implementation package</p>	<p>Adoption</p>
<p>Variation and adaptation of the HSC implementation package across different regions; cost variations</p>	<ul style="list-style-type: none"> • Training (Indicators #1.5–#1.7): <ul style="list-style-type: none"> – Variation (Indicator #1.5): <ul style="list-style-type: none"> ▪ Document training content and strategy during rollout to assess variation across facilities and regions. Includes central training of trainers and decentralized training of birth attendants and midwives. Key aspects to document: who the trainer was; where the training took place; how 	<p>Site visits at a random sample of facilities within a region. Site visits would include a short questionnaire for staff about</p>	<p>Conducted at 3 months, 12 months, and 24 months after HSC implementation</p>	<p>Implementation</p>

[†] The HSC Implementation Package refers to availability of HSC as well as necessary consumables, training, other job aids, and documentation process for its safe administration.

	<p>long was spent on training (qualifications); what information was included in the training; if the training was in-person vs. virtual, hands-on vs. classroom model, and multiple vs. single sessions and if multiple sessions, how much time between sessions</p> <ul style="list-style-type: none"> - Training coverage (Indicator #1.6): <ul style="list-style-type: none"> ▪ Training coverage within each facility. N/A: given that there are only 1 or 2 medical staff members at each basic health centers, we will omit this variable for Madagascar - Knowledge assessment (Indicator #1.7): <ul style="list-style-type: none"> ▪ Short training evaluations to assess health workers' knowledge gained during the training. Assessment could focus on three areas: <ul style="list-style-type: none"> • Recommended management of third stage of labor, including uterotonic use within one minute of delivery • Dose, route of administration for HSC • Correct HSC use (i.e., HSC cannot be used for induction or augmentation of labor and cannot be used to treat hemorrhage) • Availability of HSC (Indicator #1.8): <ul style="list-style-type: none"> - Denominator: Number of health facilities where HSC has been introduced - Numerator: Number of health facilities where HSC has been introduced and HSC is present at the time of the evaluation - Recommended additional details on facility characteristics, to stratify results: <ul style="list-style-type: none"> ▪ Facilities with and without cold chain - Recommended additional details: <ul style="list-style-type: none"> ▪ Availability, quantity of uterotonic and postpartum hemorrhage medications other than HSC, including oxytocin, misoprostol, and tranexamic acid; Other routinely-collected stock-out indicators collected at 	<p>training and costs, a 3 to 5 question knowledge assessment, visual observation of HSC, job aid, and ordering and reporting forms.</p> <p>(Quantitative and qualitative)</p>		
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	<p>the facility and regional levels may be incorporated into the assessment, as available.</p> <ul style="list-style-type: none"> ● Job aid (Indicators #1.9 and #1.10): <ul style="list-style-type: none"> – Job aid availability (Indicator #1.9): <ul style="list-style-type: none"> ▪ Denominator: Number of health facilities where HSC has been introduced ▪ Numerator: Number of health facilities where HSC job aid is present at the time of the evaluation ▪ Recommended additional details on facility characteristics, to stratify results: <ul style="list-style-type: none"> ● Facilities with and without cold chain – Job aid understanding (Indicator #1.10): <ul style="list-style-type: none"> ▪ Short qualitative interviews can be conducted in a subset of CSBs (approximately 20%) asking about awareness of the job aid and the content and clarity of the HSC job aid ● Data collection and monitoring (Indicators #1.11 and #1.12): <ul style="list-style-type: none"> – Drug ordering (Indicator #1.11): <ul style="list-style-type: none"> ▪ Denominator: Number of districts where HSC has been introduced ▪ Numerator: Number of districts where HSC has been introduced and where HSC has been incorporated into the usual drug management system for medications used to assess stockouts for each district – Reporting of uterotonic use (Indicator #1.12): <ul style="list-style-type: none"> ▪ Denominator: Number of districts where HSC has been introduced ▪ Numerator: Number of districts where HSC has been introduced and where HSC use has been incorporated into the usual facility reporting on uterotonic use – Documentation of uterotonic use (Indicator #1.13): 			
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	<ul style="list-style-type: none"> ▪ Denominator: Number of facilities where HSC has been introduced ▪ Numerator: Number of facilities where HSC has been introduced and where HSC was administered for postpartum hemorrhage prevention <ul style="list-style-type: none"> • Perceived cost and cost-related barriers/incentives for health care workers and facilities for HSC vs. oxytocin vs. misoprostol (Indicator #1.14): <ul style="list-style-type: none"> – Perceived administration cost of additional materials, e.g., syringe, alcohol swab, refrigeration (oxytocin only), etc. – Health care workers and facility administrators perceived cost considerations of procuring meds (HSC) through UNFPA vs. procuring other uterotonics through Salama (allows for sale/profit from other uterotonics) – Other cost-related barriers/ incentives that may influence use of specific uterotonics 			
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TABLE 5: RESEARCH QUESTION #2: WERE THERE ANY CASES OF INCORRECT USE OR PATIENT HARM ASSOCIATED WITH THE INTRODUCTION OF HSC?

GENERAL MEASURE	MEASUREMENT DETAILS AND CONSIDERATIONS	POSSIBLE DATA SOURCES	RECOMMENDED FREQUENCY	RE-AIM FRAMEWORK
Incorrect use of HSC at each facility	<ul style="list-style-type: none"> • Incorrect use (Indicator #2.1): <ul style="list-style-type: none"> – Incorrect use is rarely documented and difficult to measure. Thus, short qualitative interviews and, if possible, observations of third stage of labor at facilities where HSC is the primary prophylactic uterotonic can be conducted in a subset of facilities (approximately 20%) asking about: <ul style="list-style-type: none"> ▪ Typical use of HSC in the facility ▪ Management strategies for women who have labor delays 	<p>Site visits at a random sample of facilities. Site visits would include short interviews and observations.</p> <p>(Qualitative, Quantitative)</p>	<p>Conducted at 3 months, 12 months, and 24 months after HSC implementation</p>	<p>Reach</p>

	<ul style="list-style-type: none"> ▪ Management strategies for women experiencing hemorrhage ▪ Any instances where they feel that HSC was used incorrectly or caused harm <p>– NOTE: Monitoring whether HSC is available in pharmacies outside of Salama/CSBs through phone calls or in-person visits that correspond with site visits is recommended. If HSC is available in these additional venues, additional qualitative interviews with pharmacists or matrones exploring misuse may be warranted.</p>			
<p>Adverse health effects of HSC, particularly related to unindicated use</p>	<ul style="list-style-type: none"> • Adverse perinatal outcomes (Indicator #2.2): <ul style="list-style-type: none"> – Denominator: Total number of births in a region where HSC rollout occurred, aggregated quarterly (over each 3 month period) – Numerator: Number of cases of potentially related perinatal outcomes (e.g., stillbirth, neonatal asphyxia, etc.) in a region where HSC rollout occurred, aggregated quarterly (over each 3 month period) – Timing: Since adverse outcomes are relatively rare, recommend measuring trends over time (multiple months) as HSC implementation rolls out within a district • Adverse maternal outcomes (Indicator #2.3): <ul style="list-style-type: none"> – Denominator: Total number of women giving birth at a facility – Numerator: Number of cases of potentially related adverse maternal outcomes at a facility (e.g., uterine rupture, cesarean) – Timing: Since adverse outcomes are relatively rare, recommend measuring trends over time (multiple months) as HSC implementation rolls out within a district • Review of sentinel events (Indicator #2.4): <ul style="list-style-type: none"> – Flag maternal and perinatal death reviews or near-miss reviews involving HSC for deeper inquiry. Document the number of events that had exposure to HSC 	<p>Register data (if available); maternal and perinatal death or near-miss reviews (if available)</p>	<p>Indicators #2.2 and #2.3: Quarterly aggregation of register data from each facility within a region during the first 24 months following HSC introduction</p> <p>Indicator #2.4: Reviewed at 3 months, 12 months, and 24 months after HSC implementation</p>	<p>Effectiveness and adverse outcomes</p>

Facility uptake of HSC implementation package at a regional level	<ul style="list-style-type: none"> • Private sector use (Indicator #2.5): <ul style="list-style-type: none"> – Monitor HSC availability and uptake at private facilities, by private midwives, and at pharmacies. If available, consider if the HSC implementation package should be extended to these settings as well – Measurement strategy: ask 10% of private facilities, private midwives, and pharmacies in a region if they have used or stocked HSC in the last three months. If there are any positive responses, expand the sample and investigate further to understand what is needed to ensure correct use of HSC in the community 	Short questionnaire for private facilities and practitioners	Inquiry at 3 months, 12 months, and 24 months after HSC implementation	Adoption
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TABLE 6: RESEARCH QUESTION #3: WHAT IMPLEMENTATION SUPPORT IS NEEDED TO ENSURE SUSTAINED ADOPTION AND PROPER USE?

GENERAL MEASURE	MEASUREMENT DETAILS AND CONSIDERATIONS	POSSIBLE DATA SOURCES	RECOMMENDED FREQUENCY	RE-AIM FRAMEWORK
Maintenance of HSC availability, correct administration, and health effects over time	<ul style="list-style-type: none"> • The above-mentioned measures from Research Question #1 should be measured over time, ideally at months 3, 12, and 24 after the introduction of the HSC implementation package in a region to assess the ongoing use of this new commodity • Recommendations for next regions (Indicator #3.1): <ul style="list-style-type: none"> – Short stakeholder interviews can be conducted in a subset of facilities (approximately 20%) asking about: <ul style="list-style-type: none"> ▪ Recommendations to improve the HSC rollout in the next group of targeted regions, including changes to the training, job aid, documentation process, etc. ▪ Recommendations of how to maintain postpartum hemorrhage prevention practices despite challenges such as staff turnover 	Site visits at a random sample of facilities. Site visits would include short interviews (Qualitative)	At approximately 1 year after HSC rollout in a region, to inform the next planned round of HSC rollout	Maintenance

Incorrect use of HSC and associated health effects over time	<ul style="list-style-type: none"> The above-mentioned measures from Research Question #2 should be measured over time, ideally at months 6, 12, and 24 after the introduction of the HSC implementation package in a region 	See Table 5, above	See Table 5, above	Maintenance
Leadership commitment	<ul style="list-style-type: none"> Short stakeholder interviews to assess reported levels of commitment of the local Ministry of Public Health (MOPH) administrators and other interested parties in supporting the institutionalization of the use of HSC 	Stakeholder interviews with local government	Conducted at the start of the HSC rollout in a region, repeated 12 months and 24 months later	Maintenance

CONDUCTING THE EVALUATION

DATA COLLECTION

In addition to existing regional commodity- and health-related monitoring activities, this evaluation framework can be used to bolster learning around HSC during the initial rollout period. While some measures would ideally include data from every health facility involved in each phase of the HSC rollout (for example, all facilities that have received the full HSC implementation package), other measures could be assessed sufficiently with a random sample of facilities (for instance, short interviews on the incorrect use of HSC). In Madagascar, this evaluation framework will be operationalized and utilized by an existing evaluation partner that has familiarity with commodity management and health facilities. This framework can be used as part of the planned evaluation noted in the Plan d'Action Pour l'Introduction des Nouveaux Produits de la Santé de la Reproduction et de la Planification Familiale Ainsi Que les Produits Peu Utilisés for 2024 to 2026 or as part of a wider HSC evaluation strategy to inform nationwide roll out in the coming years.

RECOMMENDED ANALYSES

- Descriptive statistics, including medians, ranges, and differences over time, could be calculated for quantitative measures to summarize key findings from the rollout, to identify both positive exemplars who could be positioned to lead peer-learning or to identify lagging facilities that may need additional resources to ensure and sustain the correct use of HSC.
- Key informant interviews could be summarized thematically and shared to inform additional implementation activities.
- Health trends for regions over time could be assessed using rolling averages to account for the relatively rare occurrence of complications.
- Run charts/trend analyses for data on routine care and service attendance disaggregated by health facility type and district (to analyze provision of prophylactic uterotonic, number of births, etc.).

STRATEGIC USE OF THE FINDINGS FROM THIS EVALUATION

HSC is one tool in the postpartum hemorrhage-prevention toolbox. Examples of locally led introduction and integration of HSC into public health supply chains and bedside use remain scarce. Thus, learnings from this evaluation can help the global community better understand bedside use patterns, variations in the HSC implementation package, differences in uptake and interest across facility types, health trends, and potential harms associated with misuse. A special focus on facilities without cold chain capabilities is a particular gap in the current literature, as most studies to date have taken place in facilities with a cold chain.⁴ Specific adjustments to the HSC rollout may be recommended based on the findings. Documentation and analysis of this information during the rollout can help identify what is working well and what adaptations are needed to avoid misuse, minimize adverse events, and properly target resources. See Table 7 for examples.

Table 7: Potential Actions That Can Be Taken From Evaluation Findings

RE-AIM FRAMEWORK	POTENTIAL FINDINGS (EXAMPLES)	POTENTIAL ACTIONS (EXAMPLES)
Reach	Heat-stable carbetocin is available but rarely or never administered	Assess reasons for lack of administration; adjust current and future HSC rollout to optimize postpartum hemorrhage-prevention activities
	Heat-stable carbetocin is being incorrectly used for labor augmentation or treatment of postpartum hemorrhage	Adjust training to reinforce messages on correct use of HSC and health dangers of incorrect use; consider if refresher trainings or other reinforcement strategies are needed
Effectiveness	Trend indicates a decrease in postpartum hemorrhage	Celebrate the trend; consider the role of HSC in this trend
	Trend indicates increase in poor perinatal or maternal outcomes in rollout areas	Pause expansion of HSC into new regions; investigate the role of HSC in this trend
Adoption	Heat-stable carbetocin implementation package is introduced at only a few facilities in a region	Assess causes of limited introduction of HSC; adjust current and future rollout to optimize postpartum hemorrhage-prevention activities
Implementation	Training strategies and materials differ across regions	Varied training strategies and materials could be standardized with contextual variation by region as HSC implementation expands
	Job aid is poorly understood	Consider further local adaptation to ensure clarity
Maintenance	Staffing changes make it difficult to maintain skills and appropriate use of HSC	Consider the need for refresher training or reminders, especially during the first year of implementation within a region
	Cost factors make heat-stable carbetocin less desirable for health care workers to administer, compared to other uterotonics	Consider how to overcome the cost factors to achieve desired level of use of HSC

PROPOSED TIMELINE

Table 8: Example Timeline for Heat-Stable Carbetocin Evaluation in Madagascar, 2023-2024

Activity	2023			2024											
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Training of trainers in five regions															
Decentralized training of health workers at facilities															
Start of full implementation in five regions															
First round of data collection															
Analysis of data, revision of implementation as needed															
Second round of data collection															
Analysis of data, revision of implementation as needed															
Begin expansion of HSC into additional seven regions															

Note: The timeline for the evaluation of the HSC expansion in 2025–2026 could follow a similar data collection and evaluation cadence as is laid out for 2024, depending on availability of funding.

ADDITIONAL CONSIDERATIONS FOR EVALUATION IN MADAGASCAR

RESEARCH

Publishable research would need Ethics Board approval and a consent process, which would potentially require additional time. This may not be feasible with the currently envisioned timeline of the evaluation for 2024. If Ethics Board approval and formal study is not possible for 2024, it may be considered for future years of the rollout (2025 and 2026).

ADDITIONAL AREAS OF INQUIRY FOR FUTURE YEARS

Baseline data collection would expand our understanding of the impact of PPH prevention training and HSC implementation package. This is not currently included in the plan due to timeline constraints (for example, the HSC roll-out has already started in the initial regions at the time that this evaluation plan is being written) but could be helpful to add to the plan in the coming years.

For the current evaluation framework for Madagascar, two areas of inquiry have been deprioritized due to the early stages of the rollout and the current limited availability of HSC in Madagascar. However, as HSC becomes more widely available and recognized, it would be important to explore these areas:

- **Community availability and knowledge of HSC.** If and when HSC availability and use expands to private pharmacies, private practitioners, or community matrones, additional monitoring to ensure correct use is warranted.
- **Use patterns of HSC by individual providers at a facility.** At most CSB facilities in Madagascar, there are only one or two providers, so a deeper evaluation of which providers opt to administer HSC versus not would be limited. In regions or countries with larger numbers of labor room staff, evaluating the uptake of HSC by providers may yield information to inform overall uptake of the new medication.

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Appendix 1. LOGIC MODEL FOR HEAT-STABLE CARBETOCIN IMPLEMENTATION

Note: This logic model was developed for the workshop on Plan d'Action Pour l'Introduction des Nouveaux Produits de la Santé de la Reproduction et de la Planification Familiale Ainsi Que les Produits Peu Utilisés for 2024 to 2026 held in Antananarivo, Madagascar, on October 2-3, 2023, for the purpose of creating a shared understanding of the current HSC rollout strategy that can inform this evaluation framework.

