A Roadmap to Combat Postpartum Haemorrhage between 2023 and 2030

World Health Organization

human reproduction programme hrp
research for impact
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Acronyms and abbreviations

CHNRI	Child Health and Nutrition Research Initiative
CSO	Civil society organisation
EML	Essential Medicines List
ENAP	Every Newborn Action Plan
EPMM	Ending Preventable Maternal Mortality
GDG	Guideline development group
HIC	High-income country
HRP	UNDP-UNFPA-UNICEF-WHO-World Bank Special Programme of Research, Development and Research Training in Human Reproduction
HSC	Heat-stable carbetocin
IMNHC	International Maternal Newborn Health Conference
LMIC	Low- and middle-income country
MMR	Maternal mortality ratio
MoH	Ministry of Health
NGO	Non-governmental organisation
PPH	Postpartum Haemorrhage
R & D	Research and development
SDG	Sustainable Development Goal
TPP	Target Product Profile
TPoP	Target Policy Profile
TXA	Tranexamic acid
UHC	Universal Health Coverage
WHO	World Health Organization

Executive Summary

Introduction and rationale

Postpartum haemorrhage (PPH) – commonly defined as a blood loss of 500 ml or more within 24 hours of birth – affects one in every six women giving birth. It remains the leading cause of maternal mortality, accounting for over 20% of all maternal deaths reported globally. Death from PPH is largely preventable and has been nearly eliminated in high-income countries (HICs). Yet women in low- and middle-income countries (LMICs) continue to be disproportionately affected. Nearly all maternal deaths from PPH occur in sub-Saharan Africa and south Asia. The reported global maternal mortality ratio (MMR) of 216 maternal deaths per 100,000 live births in 2020 means that countries are significantly off-track in achieving the 2030 MMR target for sustainable development. Additionally, progress in maternal mortality reduction has stalled over the past 5 to 10 years and future projections through 2030 are concerning. Decisive actions are desperately needed to change this trajectory.

Despite the clear need to tackle the leading cause of maternal death, global PPH efforts have failed to gain traction. There are key knowledge gaps regarding how best to prevent, detect, and treat PPH. The PPH innovation landscape over the last 30 years has been stagnant. **Research** investments on what works and how best to deliver proven PPH interventions are generally scarce and fragmented. This fragmentation complicates efforts to unify global recommendations and support national policies to improve PPH care and outcomes. Developers of **norms and standards** at global, regional, and national levels continue to individually invest in costly and time-consuming evidence syntheses, leading to guidance documents that are not always consistent. This tends to create uncertainties for the intended end-users, especially in LMICs – policymakers at Ministries of Health, health managers, and health care providers – who may struggle with which guidance to adopt. **Implementation** of effective interventions is further hampered by multidimensional barriers that extend beyond adoption of global norms. These barriers are not well understood, as they are often contextual and sometimes dependent on political processes outside the typical remit of those leading PPH efforts. As demonstrated in other disease areas, **advocacy** initiatives by civil society and non-governmental organisations could be powerful catalysts for global action, but these are generally underutilised for PPH. Concerted effort to establish clear agendas for these four strategic areas could lend structure and coherence to the field.

In recognition of the growing need for global action to improve the quality of PPH care, the World Health Organization (WHO) worked together with several stakeholders to develop this Roadmap, outlining global-level research, normative, implementation, and advocacy goals, activities, and milestones from 2023 to 2030, to address key PPH priorities and fast-track progress towards the SDG 3.1 target. This Roadmap establishes an innovative, solution-driven, and customised strategic framework that centres PPH high-burden country maternal health goals and priorities, and points investments into critical areas of health systems, with special emphasis on LMICs. The Roadmap aims to align efforts and foster cooperation among all partners working in the PPH space to deliver PPH agendas, by pursuing the required technical, investment, and political objectives that will deliver on the core priorities of ongoing global initiatives for maternal and newborn health.

How the Roadmap was developed

The development of this Roadmap was based on a scientific review of the status of PPH across four strategic areas (research, norms and standards, implementation, and advocacy), and input received from online and in-person consultations of a large group of stakeholders working in these areas at international and country levels. To ensure that each area was robust and reflected the global community's consensus on key priorities for united action, a systematic multi-step process was applied to independently define future agendas for each of the four strategic areas. A Steering Committee set up by WHO advised on the methods for identifying and prioritising gaps in research, norms and standards, implementation, and advocacy. WHO staff ensured compliance of the methods with WHO internal procedures. WHO established and engaged a broad range of stakeholders – Ministries of Health, research institutions and academia, innovators from industry and private sector, professional associations, non-governmental associations, and donor agencies – in a participatory process that culminated in a global convening to define the future of PPH.

The development process for the research agenda followed WHO's systematic approach for undertaking research priority-setting. An initial set of research questions was developed from input received from a broad range of stakeholders, and research gaps derived from PPH guidelines, systematic reviews, analysis of PPH medicines and devices in the pipeline, and unaddressed questions from previous prioritisation exercises. A total of 72 research questions that emerged after removing duplicates and harmonising similar questions, were then scored by the same stakeholders according to set criteria, to arrive at 30 questions that form the basis of further prioritisation at an in-person convening of stakeholders.

Published international and national guidelines that met specified criteria were systematically reviewed to identify gaps in existing PPH recommendations and assess consistency across guidelines. In addition, the evidence underpinning each PPH recommendation was updated to identify new impactful evidence that justifies updating of existing recommendations.

A multi-pronged strategy was deployed to better understand barriers to implementation. First, a framework of essential pre-requisites for successful implementation of existing PPH recommendations was developed. Then, international and in-country stakeholders were surveyed to understand to what extent these pre-requisites were met for recommended interventions. Survey responses were triangulated with data from health facilities to understand whether recommended interventions were reaching women at the bedside. To understand contextual challenges responsible for slow uptake and deployment of evidence-based recommendations, three country case studies – Nigeria, Pakistan, and Tanzania – were conducted. In addition, exemplar countries that saw remarkable progress in reducing the burden of PPH were studied to identify lessons on how to address implementation bottlenecks.

A stakeholder mapping exercise was conducted to identify key organisations and initiatives across the current global PPH advocacy landscape. This analysis highlighted the limitations and gaps in the current ecosystem. In parallel, other global health advocacy ecosystems were also mapped, to serve as a benchmark and help identify successful advocacy efforts that could be replicated for PPH.

The outputs from the above activities underpinned the discussions among over 130 stakeholders at the Global Summit on PPH, convened by WHO from 7–10 March 2023 in Dubai, United Arab Emirates. These outputs were presented at plenary and breakout sessions to help stakeholders make informed decisions on the highest priority gaps, the corresponding set of solutions, and clear agendas for collective action. This Roadmap reflects synthesised evidence, stakeholders' input, and further refinement of proposed solutions and course of action after the Summit.

Structure of the Roadmap

The Roadmap outlines the key priorities and strategies to combat PPH burden and associated adverse outcomes as agreed by the stakeholders at the 2023 Global PPH Summit, structured around

four interlinked strategic areas (research, norms and standards, implementation, and advocacy) that are necessary to catalyse efforts and fast-track attainment of country goals to avert maternal death. Under each strategic area, the Roadmap describes activities and put forward specific actions and deliverables for the period 2023 to 2030. The figure below provides an overview of these actions and deliverables. Specific details on each of the strategic areas (summarised below) can be found in relevant section of this document.

Strategic area: Addressing priority research gaps

Research is fundamental to achieving progress for any health condition. Stagnancy in research, including implementation research, can have an impact on women's outcomes relating to PPH, and has the potential to impair initiatives for reducing PPH burden and its contribution to maternal mortality. Aligning on priority PPH research gaps along three tracks (innovation, implementation, and cross-cutting) was identified as important to focusing investment to reduce research wastes and shortening the time it takes to meaningfully respond to public health needs. Fifteen research questions were identified as particularly critical for advancing actionable knowledge around PPH through 2030 (and beyond 2030 for research priorities related to innovations which by default tend to take longer). The top question per track called for: research on the comparative effectiveness and safety of alternative routes of tranexamic acid administration for the treatment of PPH [innovation]; identifying barriers and facilitators to the uptake of recommended interventions (and best implementation strategies for addressing those barriers) [implementation]; and determining the effectiveness of a bundle approach for PPH treatment [cross-cutting].The next step will be for WHO to frame the top 15 questions from the perspectives of future policy development or updates, outlining the best research designs and priority outcomes that will drive future policymaking decisions. The funding gaps for this research agenda will be carefully assessed before the agenda is shared with funding agencies. It is expected that funding agencies will use these research priorities as the basis for launching call(s) for research proposals by the first quarter of 2024. Results for the first batch of funded research proposals are anticipated to be published and disseminated by 2027 or sooner, depending on the scope of the individual research. Progress in research and development in the context of these research priorities will be monitored, and by 2030, a review of any pending or new research gaps will be conducted. This strategic area is closely linked to that on addressing normative gaps relating to PPH as results of the prioritised research will be matched with their integration into global and national policies to influence practices on a continual basis.

Strategic area: Addressing priority gaps in norms and standards

To address gaps and inconsistency in guidance issued to end-users by international bodies, enhanced collaboration among key PPH guideline developers is needed, particularly among those working at the international level (WHO, FIGO, ICM). To this end, WHO will establish a Steering Group to explore the feasibility of joint publication of consolidated PPH guidelines that takes into account previously underrepresented topics and evidence from LMICs. The Steering Group will review and agree on the scope of the guidelines and propose membership of the guideline panel by the last quarter of 2023. The collaborating organisations are expected to pool resources to commission evidence synthesis and development of evidence profiles from the first through last quarter of 2024. An ambitious goal was set for the publication of the consolidated PPH guidelines in early 2025. In the interim, WHO and partners will continue to respond to new, impactful evidence on PPH, to issue individual standalone recommendations through their current internal procedures (e.g., WHO living guidelines approach) until the consolidated guidelines are published. Once published, these consolidated guidelines will then be subjected to a living guidelines approach for incorporation of evidence that emerge from the funded research priorities described above. To avoid any delays in translating knowledge into practice, particularly in countries where this is a key bottleneck to progress, WHO and key stakeholders (e.g., USAID, Concept Foundation, MSD for Mothers) will review the PPH policy contexts of countries with high burden of PPH and maternal mortality and provide the

technical and financial support needed to update PPH policies and adapt them for the local context. An ambitious goal of achieving up-to-date PPH policies in at least 20 high-burden countries is set for the last quarter of 2024. This effort is expected to set up a model for engagement of stakeholders and expand to other LMICs on as-need basis through 2030.

Strategic area: Addressing implementation bottlenecks

Implementation of proven interventions and strategies was widely recognized as the most significant challenge to achieving better PPH outcomes. Yet addressing implementation bottlenecks was acknowledged as the singular, potentially most impactful of all strategic areas. The multifactorial and contextual nature of the implementation bottlenecks means that they do not easily lend themselves to global solutions. Recognising that there are many implementation barriers that need addressing at the country level, stakeholders identified and prioritised five categories of implementation barriers for global action. These include **lack of clear national policy and leadership** (including lack of national targets, systematic collection of data to measure progress, or mechanisms to translate global guidelines for country use); **weak procurement and supply chain systems** (PPH commodities suffer from non-availability, stock-out, and substandard quality); **poor staffing, training, and supervision of healthcare providers** (outdated licensing and regulatory infrastructure barring task-sharing of PPH interventions, and lack of trained, empowered and motivated health workforce); **inequities and poor access to good quality care** (persistent disparities, lack of access for disadvantaged populations, and poor engagement of private sector); and **women's limited rights and social status in the society** (unfavourable legal, social, and cultural norms and obstacles limiting women's life choices and options about pregnancy and childbirth).

Priority actions to strengthen national policy and leadership for PPH include creating a PPH framework to structure treatment response and interventions; adapting national guidelines to local context and disseminating them from subnational level through the last mile; and developing and deploying an efficient and sustainable monitoring system at scale in 2025, including common indicators, systematic data collection, and a common measurement platform, to be able to track progress against targets. To enhance procurement and supply chain, proposed actions include scaling-up access to quality-assured commodities through strong coordination between partners, increased investments, and new procurement initiatives. Efforts should cover devices, drugs, and blood products. Other key actions include enhancing training and capacity building to strengthen knowledge and expertise in PPH management and implementing broader human resource strategies to address shortages of competent professionals (midwives, nurses, doctors), focusing on enhancing healthcare infrastructure to strengthen facilities; improving transportation and referral systems; and supporting the development of financing plans that abolish user fees and broaden insurance coverage, reducing out-of-pocket expenses for key PPH products (e.g., expanding health system coverage to PPH medicines/devices). While it was acknowledged that strategies to improve women's rights and social status will have a major impact on overall health outcomes for women, beyond PPH, they were unlikely to be achieved in the short- to medium terms. Nonetheless, priority actions that can be undertaken in the short-term include advocating for women to be at the centre of the political agenda; raising awareness of PPH in the general population to help reduce delays in care-seeking (e.g., through patient information leaflets); and ensuring that maternal care benefits from sustained funding.

Strategic area: Closing advocacy gaps

There is currently no unifying force in the PPH space to drive the PPH agenda and aggregate funding. A strong advocacy push is therefore needed at different levels. PPH needs to be elevated on global political agendas; advocacy towards Ministries of Health must highlight the importance of quality-assured procurement and up-to-date PPH guidelines and tools; adherence to guidelines must be promoted with healthcare workers; and awareness of PPH must be increased in the general

population. By Q4 2024, a global branding strategy and a global advocacy framework for reducing maternal mortality from PPH should be developed. This strategy should include elements such as a strong accountability system, targeted messaging, and tailored materials. All PPH stakeholders need to be involved in the advocacy effort. Governments must play a key role in driving the response, with women and communities at the centre. Finally, PPH efforts should not be implemented in isolation, but rather be used as an entry point to address a broader maternal health agenda to reduce the burden of maternal death and ill-heath.

A Global Call to Action

To amplify the priority actions enumerated above, a consensus-driven Global Call-to-Action that clearly and compellingly articulates the actionable expectations from a wide array of stakeholders and the urgency to act on the Roadmap was developed. This Call-to-Action is meant to publicly outline the rationale for change, show evidence that change is possible, and distil what is required to achieve the goals by each of the following stakeholder groups: women and women's group, Ministries of Health and national regulatory agencies, implementors (including non-governmental organisations and civil society organisations, professional associations, guideline developers, the research community, innovators in industry and private sector , donors, and the overall international community. It outlines the key learnings that emerged from the PPH Summit and call for immediate action to ensure effective and coordinated efforts towards eliminating preventable deaths from PPH.

Implementation and monitoring of the Roadmap

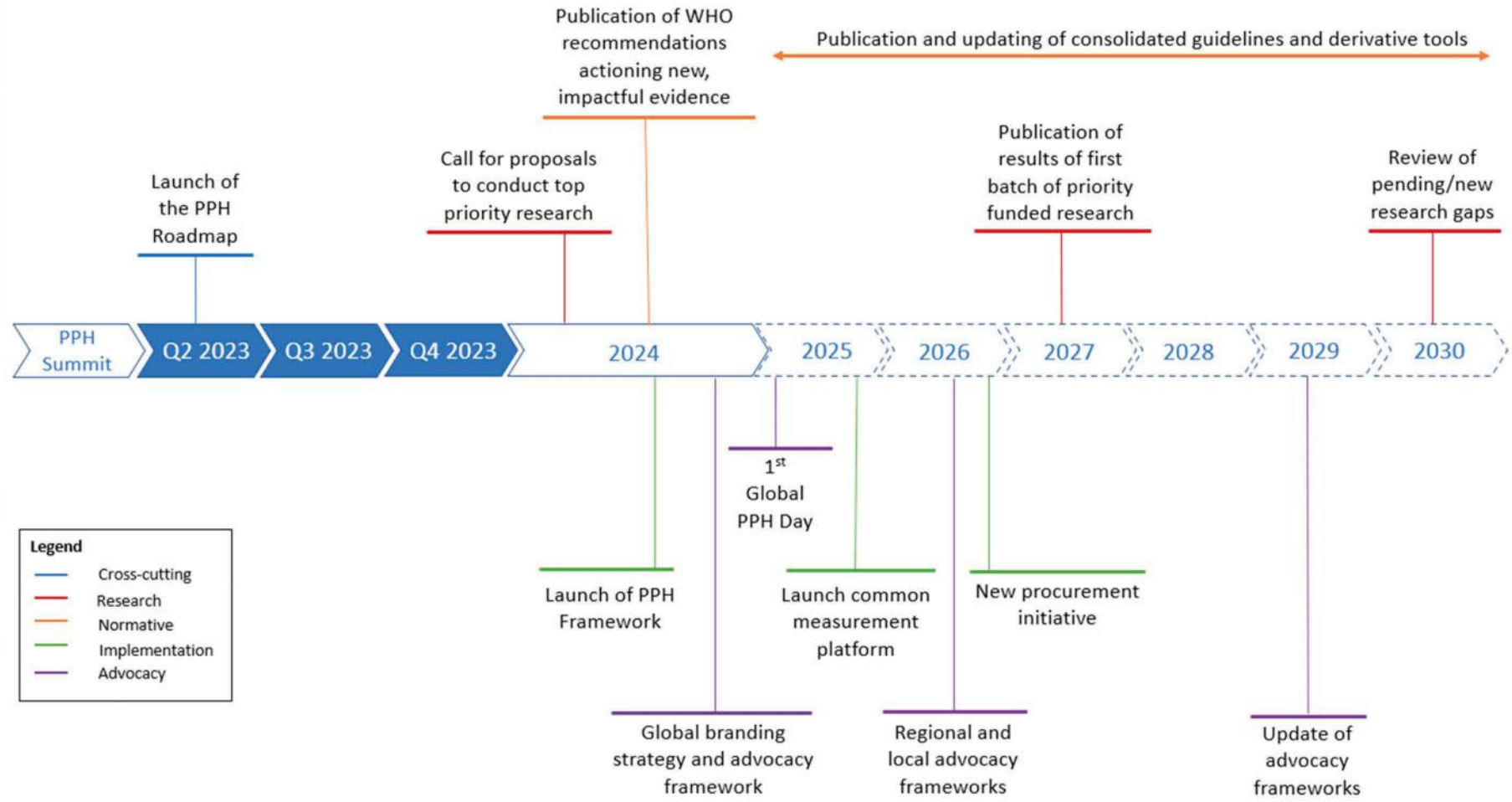
Successful implementation of this Roadmap will require concerted and coordinated efforts from all stakeholders. WHO will serve as an initial catalyst for key activities in the short-term, including through helping to establish structure for global leadership and governance around the Roadmap. WHO will also work closely with Ministries of Health, relevant national agencies, and national professional associations to develop normative materials that are adapted for local contexts to kick-start implementation. However, longer-term actions will require commitments from additional stakeholder groups.

Dissemination of the Roadmap began with the International Maternal newborn Health Conference 8–11 March 2023 in Cape Town, South Africa, and will be continued through the WHO website, other conferences and convenings, WHO regional and country offices, Ministries of Health, professional organizations, WHO collaborating centres, other United Nations agencies, and NGOs, among others. Planned dissemination activities include translation into all six official UN languages and publication in peer-reviewed journal articles. These dissemination activities will help to ensure generalised awareness of the Roadmap among all relevant stakeholder groups.

Implementation of the Roadmap and progress toward key milestones will be monitored through a common measurement platform, to be developed as one of the initial milestones in the Roadmap. This common platform, composed of a monitoring framework and core set of key indicators, will serve as a central accountability mechanism for the Roadmap. Interim monitoring data will be fed into the updates made to the Roadmap in 2026–2027, which will more clearly define key activities and milestones in the final years leading up to 2030.

If nothing changes, an estimated half million women will die from PPH by the close of the SDG era. Millions more will suffer long-lasting consequences of traumatic birth experiences. The Roadmap offers a vision of a different future, one where women no longer must die from a condition that is both preventable and treatable. This future is possible. The Roadmap shows what is needed to get there.

Figure. High-level milestones in the Roadmap to combat PPH between 2023 and 2030



1. Introduction and rationale

1.1 Postpartum haemorrhage: a global public health concern

Postpartum haemorrhage (PPH), commonly defined as a blood loss of 500 ml or more within 24 hours after birth, is the leading cause of maternal mortality worldwide. Each year, about 14 million women experience PPH resulting in about 70,000 maternal deaths globally *[1]*. Even when women survive, they often need urgent surgical interventions to control the bleeding and may be left with long-term consequences, both physical (e.g., life-long reproductive disability, bladder injury, postpartum infection, anaemia), and psychological (e.g., post-traumatic stress disorder). The risk of PPH and PPH-related morbidity and mortality disproportionately affects women in LMICs, especially those who lack access to quality care. Indeed, nearly all maternal deaths (~80%) from bleeding after childbirth occur in LMIC, mostly from sub-Saharan Africa and south Asia *[2]* it is imperative to comprehensively assess progress toward reducing maternal mortality to identify areas of success, remaining challenges, and frame policy discussions. We aimed to quantify maternal mortality throughout the world by underlying cause and age from 1990 to 2015. Methods We estimated maternal mortality at the global, regional, and national levels from 1990 to 2015 for ages 10–54 years by systematically compiling and processing all available data sources from 186 of 195 countries and territories, 11 of which were analysed at the subnational level. We quantified eight underlying causes of maternal death and four timing categories, improving estimation methods since GBD 2013 for adult all-cause mortality, HIV-related maternal mortality, and late maternal death. Secondary analyses then allowed systematic examination of drivers of trends, including the relation between maternal mortality and coverage of specific reproductive health-care services as well as assessment of observed versus expected maternal mortality as a function of Socio-demographic Index (SDI).

1.2 Why is a Roadmap needed to combat postpartum haemorrhage?

Despite the ambition to end preventable maternal deaths by 2030, many countries are not on track to meet their SDG-3 maternal mortality targets. The current global maternal mortality ratio (MMR) of 216 per 100,000 live births in 2020 is far from the 2030 target of not more than 70 per 100,000 live births, and alarmingly, progress has stalled over the past 5 to 10 years *[3]*. This stagnation means that without rethinking the future and taking appropriate actions at global and country levels, the 2030 MMR target will not be met.

Limited progress has been made in the field of PPH care over the last decade. Research is essential to improve understanding of the condition and develop new prevention, diagnosis, and treatment strategies. However, PPH research horizons have remained somewhat stagnant. Heat-stable carbetocin (HSC) and tranexamic acid (TXA) are the only new PPH medicines shown to be effective for PPH management over the last 30 years. Evidence with potential to significantly change policies and modify the landscape of PPH care in LMIC has been scarce. While international developmental partners tend to have similar objectives regarding PPH, efforts are often misaligned because of a lack of cohesive coordination at and between global and country levels. Academic researchers and innovators in industry often are uncertain what type of

evidence to generate and how to connect evidence to policy decision-making, leading to research waste and delays in translating research ideas to impact. Target product profiles (TPPs) *[4]* and target policy profiles (TPoPs) *[5]* are supposed to provide guidance for researchers, product developers, and policymakers. Yet TPPs have not generally been described prior to R & D of PPH interventions and the concept of TPoPs is relatively new to those who make research funding decisions. In short, there is no shared vision on what the ideal future PPH products or interventions should be, what is in the pipeline, and what evidence is needed to influence global recommendations.

Reputable normative documents are available to set standards of care and provide guidance on use of evidence-based interventions. WHO has kept its PPH guideline portfolio up to date using a 'living' approach since 2017 and provided support for inclusion of new PPH medicines in WHO Essential Medicines List. Several international organisations and countries have also independently developed their own PPH guidelines. The evidence base and methodology used by these guideline developers often differ, leading to inconsistencies across guidelines and variability in clinical practices. Consequently, end-users are often uncertain of which guideline to adopt. Delayed or haphazard guideline adoption undermines health care providers' ability to deliver quality evidence-based care.

Interventions that hold potential to significantly reduce PPH-related morbidity and death have proved difficult to embed and scale in health systems in LMICs. For example, while HSC and TXA hold promise to reduce morbidity and deaths in LMICs, country-level uptake has thus far been limited. Implementation of effective interventions is further hampered by multidimensional bottlenecks that stretch beyond guideline adoption. Outdated licensing and regulatory authorisations may bar implementation of evidence-based recommendations (including full scope of task sharing where there are human resource gaps). Healthcare providers often lack the necessary resources and tools, ongoing support, and feedback to implement guidelines in their practice. Financial barriers continue to limit access to life-saving maternity care. Communities are rarely engaged in this process to raise awareness. Effectively addressing these challenges often requires cross- and multi-sector approaches.

Advocacy is crucial for promoting awareness of PPH and generating momentum for action. Raising community awareness of the dangers of PPH and the need for timely response can galvanise local action to improve transportation infrastructure, abolish user fees for maternity care, and develop safe blood systems. Advocacy also encompasses advocating for policies and resources that support research, guideline adoption, and effective implementation of recommended interventions. However, efforts led by civil society organisations (CSOs) and non-governmental organisations (NGOs) are disjointed because of lack of clarity on PPH priorities.

Overall, the research, normative, implementation, and advocacy concerns are crucial components for alleviating the burden of PPH, but there has not been a dedicated agenda for each of these strategic areas until now. In recognition of the growing need for global action to improve the quality of PPH care, the UNDP-UNFPA-UNICEF-WHO-World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP), Department of Sexual and Reproductive Health and Research, World Health Organization (WHO) worked together with several stakeholders to develop this Roadmap, outlining global-level research, normative, implementation, and advocacy goals, activities, and milestones from 2023 to 2030, to address key PPH priorities and fast-track progress towards the SDG 3.1 target.

This Roadmap establishes an innovative, solution-driven, and customised strategic framework that centres PPH high-burden country maternal health goals and priorities, and points investments into critical areas of health systems, with special emphasis on LMICs. The Roadmap aims to align efforts and foster cooperation among all partners working on PPH to deliver PPH agendas, by pursuing the required technical, investment, and political objectives

that will deliver on the core priorities of ongoing global initiatives for maternal and newborn health.

1.3 Target audience

This Roadmap is intended for leading actors in public health and all stakeholders working in the PPH ecosystem: the international community, funders, researchers, innovators and industry, professional associations and guideline developers, implementors (including civil society and non-governmental organisations), Ministries of Health, but also the general population, particularly women. The Roadmap should serve as a valuable resource for governments, ministries, national, regional and local health authorities, directors of public health institutes, public health associations, and other relevant organisations and agencies to adapt to fit the needs of their respective contexts.

1.4 Objective and scope of the Roadmap

This Roadmap serves three key purposes:

(1) Align the field around key priorities and actions required to meet shared goals and objectives;

(2) Focus work on key activities to remove duplication of efforts in the PPH space; and

(3) Engage stakeholders to advance PPH work across countries.

It is a high-level plan with the major milestones that must be attained to achieve the planned impact. It is not a detailed project plan that outlines everything that needs to happen, but rather includes key ingredients to be actionable. These include alignment on the goals to be achieved; a timeline with major milestones and sequencing of activities, roles, and responsibilities; interdependency between topics; and clear indications of how success will be measured.

This Roadmap focuses on a common set of priorities defined during the Global Summit on Postpartum Haemorrhage (PPH Summit) in March 2023. These priorities span four strategic areas: research, norms and standards, implementation, and advocacy. The Roadmap identifies the solutions and catalysing actions needed to resolve lingering challenges and dramatically reduce mortality and severe morbidity from PPH. It builds on – and is not a replacement for – ongoing global, regional, and national initiatives to improve quality and outcomes for leading causes of maternal mortality and morbidity. Additionally, the Roadmap is intended to function as a mechanism to promote collaboration and establishment of coalitions to improve maternal health, not just for PPH, but across the broader maternal and newborn health agenda.

2. How the Roadmap was developed

A systematic process was followed to develop this Roadmap. Briefly, the process included (i) the selection of contributors; (ii) the systematic identification of research, norms, implementation, and advocacy gaps to support prioritisation efforts; (iii) a Global Summit to obtain consensus on the top priority gaps and align on a common set of solutions to address those gaps; and (iv) the translation of the prioritised gaps and solutions into a Roadmap and a Call-to-Action.

2.1 Contributors to the Roadmap

A Steering Committee was established by the WHO to provide oversight and methodological guidance before, during, and after the Global PPH Summit. In parallel, a Scientific Committee was established to conduct and support the landscaping work to identify and map and summarise research knowledge gaps, innovation pathways, PPH products and interventions, PPH guidelines and tools, country-level implementation, and ongoing advocacy initiatives. The development of this Roadmap was based on a scientific review of the status of PPH across the four strategic areas (research, norms and standards, implementation, and advocacy), and rich contributions input received from online and in-person consultations of a large group of stakeholders working in these strategic areas at international and country levels. The list of contributors can be found in Annex 1.

2.2 Identifying gaps in the strategic areas

Research and development

To identify research gaps, an initial long list of 417 research questions was developed, with questions extracted from research priorities derived from WHO and other international guidelines, Cochrane reviews, analysis of medicines and devices in the pipeline, and unaddressed questions from previous research prioritisation exercises *[6]*. Summit participants were asked to submit additional questions. The long list was curated to reach a consolidated list of 72 research questions (Annex 1). These 72 questions were divided into three tracks: 22 cross-cutting, 26 innovation and 24 implementation questions, building on the existing and validated Child Health and Nutrition Research Initiative (CHNRI) categories (discovery, delivery, description, development) *[7]*, reframed into more salient language. The 72 research questions were scored and prioritised by applying the CHNRI methodology *[8,9]* Switzerland. Its aim was to develop a method that could assist priority setting in health research investments. The first version of the CHNRI method was published in 2007–2008. The aim of this paper was to summarize the history of the development of the CHNRI method and its key conceptual advances. Methods The guiding principle of the CHNRI method is to expose the potential of many competing health research ideas to reduce disease burden and inequities that exist in the population in a feasible and cost-effective way. Results The CHNRI method introduced three key conceptual advances that led to its increased popularity in comparison to other priority-setting methods and processes. First, it proposed a systematic approach to listing a large number of possible research ideas, using the \"4D\" framework (description, delivery, development and discovery research. Summit participants were asked to assess the 72 suggested questions against five criteria (answerability, effectiveness, deliverability, impact, and equity) through an online survey. Each answer was attributed a score based on respondents' assessment for each of the five

criteria. The top-10 ranked questions per track were identified to be further discussed and prioritised during the Summit.

Norms and standards

WHO commissioned a mapping of evidence-based guidelines to determine the level of consistency of PPH recommendations across evidence-based guidelines. After a systematic literature search, nine guidelines which met certain pre-specified criteria and published after 2012 were included in the analysis (Annex 2): WHO, International Federation of Gynecology and Obstetrics (FIGO), Royal College of Obstetricians and Gynaecologists (RCOG), National Institute for Health and Care Excellence (NICE), American College of Obstetrics and Gynaecology (ACOG), The Society of Obstetricians and Gynaecologists of Canada (SOGC), Collège National des Gynécologues et Obstétriciens Français (CNGOF), Japan Society of Obstetrics and Gynecology (JSOG), and Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG). Sixty-nine (69) individual recommendations across all guidelines were identified. For each recommendation, all nine guideline documents were scrutinized to determine whether (1) they recommended in favour of or (2) against the intervention in question, or (3) they considered the evidence as insufficient to make a recommendation, or (4) they simply did not include a recommendation for that specific intervention.

This mapping exercise resulted in the identification of 11 consistent[1] recommendations (out of 69) and four inconsistent[2] recommendations across the guidelines. Several interventions are not currently recommended at all in most of the guidelines. These discrepancies reflect the need to progress to a common core set of global guidelines to facilitate their in-country implementation.

The second phase of preparatory work had two objectives. The first was to conduct an update of the evidence base underpinning existing PPH recommendations and identify which recommendations are high priority for update based on evidence-driven 'intelligence gathering.' This exercise helped to determine whether there is any shift in the evidence base that could impact the existing recommendations. Second, was to review new evidence from the literature and determine its potential to influence new global guidelines on PPH. Based on this work, the following recommendations met the criteria for high priority for update:

- Carbetocin (100 µg, IM/IV) for prevention of PPH for all births in contexts where its cost is comparable to other effective uterotonics (covers two identified interventions related to carbetocin).
- Tranexamic acid (0.5–1.0 g IV), in addition to oxytocin, at caesarean section to reduce blood loss in women at increased risk of PPH.
- Transfusion of 4 units of red blood cells and 12–15 mL/kg fresh frozen plasma in the presence of continuing haemorrhage when blood test results are unavailable.
- Intraoperative cell salvage (autologous blood transfusion) when significant blood loss is anticipated, such as in cases of placenta praevia or placenta accreta.
- Administration of intravenous iron for postpartum anaemia.

Implementation

To understand the contextual challenges responsible for slow uptake of PPH evidence and evidence-based recommendations as well as other country-level implementation bottlenecks, three case studies of countries representing different contexts – Nigeria, Pakistan, and Tanzania – were commissioned by WHO. These case studies generated the necessary information to understand on-the-ground implementation challenges, but also to learn from those who have been successful in tackling these challenges, as they relate to old as well as newly introduced PPH tools in different settings.

Conversely, to assess the contributions of health system policies and programmes, financing,

[1] Consistent: at least 5 out of the 9 guidelines made a recommendation on the intervention and were aligned.
[2] Inconsistent: at least two guidelines had contradicting recommendations.

human resources, intervention coverage, quality of care and contextual factors to declines in maternal mortality ratios and neonatal mortality rates, seven Maternal Mortality and Neonatal exemplar countries were analysed to identify best practices. These are Bangladesh, Nepal, India, Morocco, Ethiopia, Niger, and Senegal. Key drivers identified for maternal mortality decline include increased facility births, improved access to skilled providers, and increased availability of uterotonics.

In parallel, an online survey on barriers to implementation of evidence-based interventions conducted among the Summit participants. Respondents were asked to assess the implementation of 20 clinical interventions recommended by WHO, answering a set of six questions for each intervention and four additional questions if a medicine or device is involved in the intervention (see Annex 3 for the full list of interventions in rows and questions/ barriers in columns). For each recommended intervention, each question was attributed a score based on respondent's assessment. Scores for each pair of (intervention; question) were then summed up across respondents, divided by the total number of responses, and finally positioned to populate a heatmap (see Annex 3) to help visualize priority gaps. During the Summit, participants were presented with the heatmaps, as well as data collected from health facilities in Nigeria, Pakistan, and Tanzania that illustrated the extent to which each clinical intervention was available at bedside in each setting.

Advocacy

To achieve a shared understanding of priority PPH advocacy gaps, an overview of the PPH advocacy landscape was developed to identify the key active organizations and initiatives and to highlight the limitations and critical gaps of the current ecosystem. A benchmark of other health sector ecosystems was also conducted to identify successful advocacy efforts that could be replicated for PPH.

2.3 Building consensus on priority gaps and solutions

The outputs from the above activities underpinned the discussions among over 130 stakeholders at the Global Summit on PPH, convened by WHO from 7-10 March 2023 in Dubai, United Arab Emirates. These outputs were presented at plenary and breakout sessions to help stakeholders make informed decisions on the highest priority gaps, the corresponding set of solutions, and clear agendas for collective action. This Roadmap reflects synthesised evidence, stakeholders' input, and further refinement of proposed solutions and course of action after the Summit.

WHO convened the PPH Summit to review R&D progress for PPH innovations in the pipeline and define the evidence requirements for policy changes, identify and align on top priority research gaps in PPH; identify and align on top priority gaps in PPH norms and standards; identify and align on top priority implementation gaps in PPH and identify strategies for equitable and sustainable access to effective interventions; identify and align on top priority advocacy gaps in PPH and identify sustainable strategies to address these gaps; summarize challenges and develop a clear Roadmap for addressing them; and form strong coalitions and boost funding streams to address PPH challenges.

Summit discussions were organised around the product introduction value chain, starting with research and development, then moving to norms and standards, implementation, and advocacy.

Research and development

The top ten research questions for each track were further prioritised to reach a list of top five questions per track. For each track, the top ten research questions were reviewed through explanatory briefs that included the rationale and problem statement for the research questions. Based on the additional information provided, participants had the opportunity to individually select a set of five questions to prioritize and rank-order them from 1 to 5. After the initial vote, the results were discussed,

and changes were sometimes made to reach consensus on a list of top five research questions per track (e.g., second vote after clarification of some misunderstanding around wording, swap between questions).

Norms and standards

A panel of representatives from professional associations discussed alignment of priorities for PPH recommendations. A plenary Q&A session also helped to surface priorities for new recommendations and updates for WHO and other international bodies.

Implementation

A panel of representatives from Ministries of Health discussed challenges in implementing life-saving interventions in their respective countries. The challenges raised included poor supply management (especially regarding uterotonics), weak referral systems, and issues with retention and training of health care providers helped to inform the prioritisation of implementation bottlenecks.

Out of a longer list of implementation barriers categorised into four key themes (national context, programme and investment, commodities, and service delivery (Figure 2), participants discussed and consensually agreed on five categories of implementation barriers that are amenable to global solutions and actions; and laid out future concrete steps.

Advocacy

A panel discussion brought together NGOs and CSOs to share their on-the-ground experience. Panel participants shared examples of successful initiatives implemented at local level and learnings from their experience. Further contributions from Summit participants built on the key lessons shared by the panelists and led to consensus on future priority actions.

2.4 Integrating priority solutions into the Roadmap and Call-to-Action

During the Summit, the concept of a Roadmap, key ingredients to make a Roadmap actionable and why one is needed were presented. Participants were then asked to develop high level agendas for each of the four strategic areas – research, norms and standards, implementation, and advocacy, discussing (1) milestones and sequencing (what to do and by when), and (2) roles and responsibilities (who will do it) – based on the outputs from the previous sessions.

The complementary key deliverable of the Summit was a consensus-driven Call-to-Action that clearly and compellingly articulates the actionable expectations from a wide array of stakeholders and the urgency to act on the Roadmap. This Call-to-Action is meant to publicly outline the rationale for change, show evidence that change is possible, and outline what is required from different stakeholders. The ingredients for the Call-to-Action were collated electronically from all participants following a presentation and discussion of the case for change, proof of the possibility, right ask of the right people, and evidence that this is the right time to act. Summit participants agreed to all be signatories of the Call-to-Action.

Immediately following the Summit, work began to further elaborate the Roadmap across the four agendas, leveraging inputs from Summit participants, feedback from the Steering and Scientific Committees on the meeting report, targeted interviews, meeting with donors, and additional desk research. Similarly, the Call-To-Action document was developed based on the numerous contributions made by Summit participants and was then refined based on feedback from the Steering and Scientific Committees.

Table 1. Categories of implementation barriers

Implementation theme	Category of implementation barriers
A. National context 	▸ **A1. Women's rights and social status** (e.g., lack of education, low social status, constrained women's choices around pregnancy and childbirth) ▸ **A2. Legislative and non-health policy measures** (e.g., lack of laws protecting women from gender-based violence, early marriages, women's political power) ▸ **A3. Emergency situations** (e.g., conflict or humanitarian setting, COVID19) ▸ **A4. National health policy and leadership** (e.g., health sector governance, leadership skills, health policies, policy advocacy)
B. Programme and Investment 	▸ **B1. Technical PPH guidelines** (e.g., guidelines out of date, requiring local data, not linked to subnational implementation) ▸ **B2. Programme Development from pilot to scale up** (e.g., no handover/exit strategy, vertical programmes) ▸ **B3: Equity and access to care** (e.g., persistent disparities, limited data, lack of access to care for vulnerable and marginalized groups, lack of engagement with the private sector) ▸ **B4: Investment** (stagnant government expenditure, lack of sustainability of externally funded programmes)
C. Commodities 	▸ **C1. Regulatory** (e.g., poor post-marketing surveillance, non-harmonized regulatory pathways, complex or inexistent regulatory pathways for devices) ▸ **C2. Procurement and supply chain** (e.g., lack of availability of blood or blood products, weak procurement systems in lower-level facilities, lack of communication between hospital management and healthcare providers in terms of stockouts) ▸ **C3. Quality** (e.g., poor quality products, cold chain difficult to maintain, little incentive for manufacturers to obtain WHO PQ or SRA) ▸ **C4. Affordability and out of pocket expenditures** (e.g., lack of free delivery care, unaffordable private sector when the only provider available, certain commodities not provided by government)
D. Service delivery 	▸ **D1. Job aids for guideline implementation** (e.g., lack of expertise for guideline adaptation to clinical protocols; clinical protocols not available, accessible, usable or appropriate) ▸ **D2. Referral pathways between levels of care and community** (e.g., unclear when and where to go/refer for delivery or emergency (women and providers), transport issues, referral pathways not used effectively) ▸ **D3. Staffing, training & supervision of healthcare providers** (e.g., acquiring and maintaining skills, roles/status of midwives and nurses, human resources for health in remote areas) ▸ **D4. Audit and feedback** (e.g., private providers not regulated, accountable; limited local capacity to use data for decision-making)

3. Structure of the Roadmap

This Roadmap sets out key priority actions to combat PPH burden and associated adverse outcomes as agreed by stakeholders at the 2023 Global PPH Summit. It is informed by and structured around four interlinked strategic areas (research, norms, implementation, and advocacy) that are necessary to catalyse efforts and fast-track attainment of country goals to avert maternal death. Under each strategic area, the Roadmap describes activities and put forward specific actions and deliverables for the period 2023 to 2030, and thus presents a cornerstone and reference document over the next 7 years. The Roadmap identified shared priorities and potential synergistic actions at country and regional levels to make a difference to the stagnated maternal mortality ratio over the last 5-10 years. It sets out essential activities that are result-oriented which need to be implemented by a range of actors, including ministries of health, implementers, research institution and academia, professional organizations, women and women's groups, government and non-government actors.

The following section details out the priority actions for each of the four strategic areas which are then consolidated into the Roadmap.

3.1 Strategic area: Addressing priority research gaps

Research is fundamental to achieving progress for any health condition. Stagnancy in research, including implementation research, can have an impact on women's outcomes relating to PPH, and has the potential to impair initiatives for reducing PPH burden and its contribution to maternal mortality. Aligning on priority PPH research gaps along three tracks (innovation, implementation, and cross-cutting) was identified as important to focusing investment to reduce research wastes and shortening the time it takes to meaningfully respond to public health needs. Fifteen research questions were identified as particularly critical for advancing actionable knowledge around PPH through 2030 (and beyond 2030 for research priorities related to innovations which by default tend to take longer).

There is need for fully funded joint research agenda to support the top 15 priority research questions identified by stakeholders (Table 1). This does not mean that research questions that did not make it to the top 15 should not be researched, but rather that these 15 are time-sensitive questions that need to be answered for the field to progress. Should all prioritised 15 questions be answered, then the next in line should be prioritised, pursuant to the needs of the evolving context.

As the field moves to execute on the top priority questions, several considerations should be applied. First, the short-term priority should be to focus on where PPH-related mortality are clustered, with particular focus on temporising measures and strengthening referral systems. Second, the feasibility and utility of establishing a research network for PPH should be assessed (for example, through the launch of WHO multi-country trial platforms, as done for COVID-19). Third, women and CSOs should be included in the process of implementing the research agenda (e.g., development of the research protocol through interpretation of the research findings). Lastly, transparency should be improved, especially on innovation pathways – providing more clarity on what evidence is required for both drugs and devices, to influence global guidance – and what is expected from the innovators.

The immediate step to address these priorities is for WHO and partners to start the preparatory work that will lead to the launch of calls for proposals in the first quarter of 2024 to implement the research agenda. Preparatory activities will include refining the framing of the 15 prioritized research questions to improve clarity. In parallel, WHO and partners will conduct a rapid scan of ongoing research to understand whether there are ongoing studies poised to respond to the priority research questions. WHO and partners will also articulate the ideal research for each priority question and provide guidance on research design. Additionally, WHO will draft target policy profiles (TPoPs) to give an indication of the research

Table 2. Top 15 priority research questions by track

Track	Ranking	Research question
Innovation	1	What is the comparative effectiveness and safety of alternative routes of administration of tranexamic acid (TXA) in the treatment of PPH?
	2	What is the effectiveness and safety of heat-stable carbetocin for PPH treatment in women who received heat-stable carbetocin for PPH prevention?
	3	What is the comparative effectiveness of uterine balloon tamponade devices compared to other tamponade interventions (such as suction devices) in the reduction of PPH-related maternal morbidity and mortality?
	4	Can clinical criteria for haemodynamic instability facilitate earlier PPH diagnosis and improved PPH outcomes compared to blood loss measurement alone?
	5	What strategies are most effective for engaging the private sector in the development of new PPH medicines, devices, and diagnostics in low- and middle-income countries?
Implementation	1	What are the implementation barriers and facilitators affecting the adoption and use of evidence-based recommendations for PPH management?
	2	What are the optimal strategies to ensure access to quality-assured PPH medicines (including Universal Health Coverage/Essential Packages for Health Services and Health Benefit Package) in low- and middle-income countries?
	3	What are the most effective advocacy strategies to improve the uptake and ensure sustainment of evidence-based practices for PPH management at the country level?
	4	What is the effectiveness and cost of pre-service and in-service training programmes for frontline healthcare workers (paramedics, general practice doctors, community health workers, midwives, nurses) to manage and refer women with PPH?
	5	What are the most effective implementation strategies to improve uptake and sustainment of recommended evidence-based interventions for PPH management, including in humanitarian settings?
Cross-cutting	1	What is the effectiveness of a strategy of early detection and first response treatment using a bundle of recommended interventions for improving PPH-related outcomes?
	2	What is the effectiveness and safety of a diagnostic algorithm (e.g. shock index) and early detection strategies (e.g. Modified Early Obstetric Warning Score) in improving clinical detection and management of PPH?
	3	What is the effectiveness of checklists in improving PPH quality of care and PPH-related outcomes compared to current standard of care?
	4	What is the effectiveness of Maternal and Perinatal Death Surveillance and Response programmes in the reduction of maternal deaths due to PPH?
	5	What is the effectiveness and safety of tranexamic acid (TXA) in the prevention of PPH in general obstetric population and in women at high risk of PPH (e.g. anaemic women)?

requirements for future policy decision-making and what guidance could potentially look like if a given research question were to be addressed.

To ensure appropriate data and evidence are generated, WHO will clarify innovation pathways and the type of data required to inform a WHO recommendation as well as for populating a dossier for WHO Prequalification listing. WHO and partners will conduct a rapid funding need assessment to determine the high-level budget required to execute the research agenda. As part of that assessment, existing funding commitments and resulting funding gaps will be mapped. As the detailed research agenda is developed, it will be socialised with donors for input and feedback. It is expected that donors will prepare calls for proposals to conduct priority research. Donors are expected to coordinate in a donor coordination forum to ensure that the full research agenda is captured in their calls for proposals and that there is no duplication.

Donors are expected to launch the calls for proposals in the first quarter of 2024 and research grantees will execute the research agenda starting in 2024. While some results will become available earlier than others, most research should take from 2–4 years to complete, with the bulk of new evidence expected by 2027. As research results are published, WHO will conduct iterative updates of its PPH guideline portfolio to reflect emerging evidence. Progress in research and development in the context of these research priorities will be monitored, and by 2030, a review of any pending or new research gaps will be conducted. This strategic area is closely linked to that on addressing normative gaps relating to PPH as results of the prioritised research will be matched with their integration into global and national policies to influence practices on a continual basis.

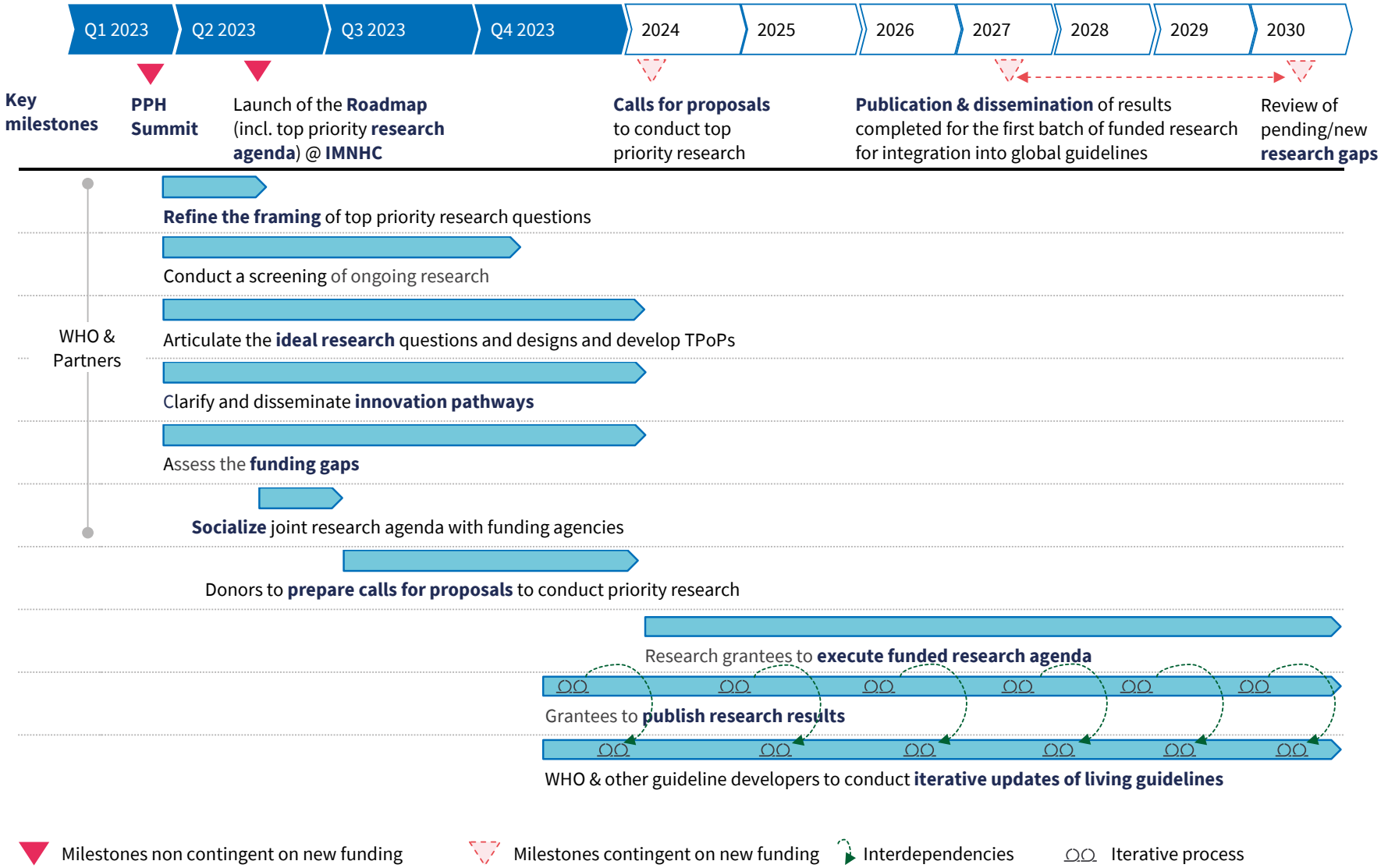
3.2 Strategic area: Addressing priority gaps in norms and standards

Three levels of guidance are required for an optimal translation of evidence into practice. The first level is global guidelines, that are published by different guideline developers such as WHO and FIGO/ICM. These global guidelines could focus on a joint core set of high-level recommendations that are consistent across guideline developers, with details placed as remarks to those recommendations. There is a strong need for enhanced collaboration across international guideline developers. A good first step would be sharing evidence synthesis work to avoid duplication of efforts, with a longer-term objective of jointly publishing consolidated global guidelines (notably across WHO, FIGO and ICM). The second level of guidance is national guidelines, that adopt, adapt, and contextualise global guidelines to individual country settings. The third level is the translation of recommendations into guidance on evidence-based clinical practice, through guideline derivatives (such as protocols, job aids, toolkits, or handbooks). It should be noted that women's perspectives and LMIC realities must be better included in the process of guideline development.

The risk of PPH can be lowered through preventative interventions to reduce PPH risk factors during preconception and antenatal care but these areas are largely absent from current sets of PPH guidelines (which focus on the intrapartum and immediate postpartum periods). Instead, relevant recommendations (for example, on treatment of anaemia) are usually included in guidelines pertaining to these other periods. To facilitate the development of comprehensive PPH programmes and policies, relevant recommendations in these other guidelines could be incorporated in the PPH guidelines. In addition, there are critical topics with limited to no recommendations in current set of guidelines. These include detection of PPH, use of blood transfusion for PPH treatment (when significant blood loss is anticipated, as in cases of placenta praevia or placenta accreta), and administration of intravenous iron for postpartum anaemia. There is also a need for further guidance on uterine tamponade devices, implementation considerations, and health system aspects (including emergency response).

The evidence base underpinning current recommendations, especially those related to established practices, is dominated by evidence

Figure 1. Key activities and milestones for the research agenda



derived from high-income countries which may not always be generalisable to LMIC. The research community should make deliberate efforts to design and conduct future trials in LMIC and should focus evidence generation on the parts of the patient pathway where most deaths occur and where there is a dearth of sufficient data (i.e., in the community, around referral and emergency transport, and emergency caesarean section).

Starting from the third quarter of 2023, WHO will establish a Steering group comprising of nominees of global guidelines developers to explore internal mechanisms across organisations to decide on the feasibility of joint publication of consolidated guidelines, considering the organisations different operating models, guideline development processes, and guideline methodologies. By the end of the third quarter of 2023, provided a joint publication of consolidated guidelines is feasible, the Steering Group will review existing PPH recommendations to agree on the scope of the recommendations to be included in the consolidated guidelines. A standard guideline development procedure, that comply with and respect internal approval procedures of all participating organizations, will be followed to develop these joint guidelines. The Steering group will propose the membership of the consolidated guidelines panel, and other potential contributors, such as guideline methodologists, systematic review teams, external peer review group, and observers. From the last quarter of 2023 and during the course of 2024, the participating organisations will pool resources and commission systematic evidence syntheses for priority questions and development of evidence profiles (including evidence domains covering efficacy/effectiveness, importance of priority outcomes driving the recommendations, acceptability, feasibility, impact on equity, resource use and cost-effectiveness). By the fourth quarter of 2024, it is expected that the evidence profiles will be ready for the guideline panel to review the evidence and formulate new and update existing recommendations. These will then undergo peer-review and external consultation. The target launch date for these joint guidelines is the first quarter of 2025.

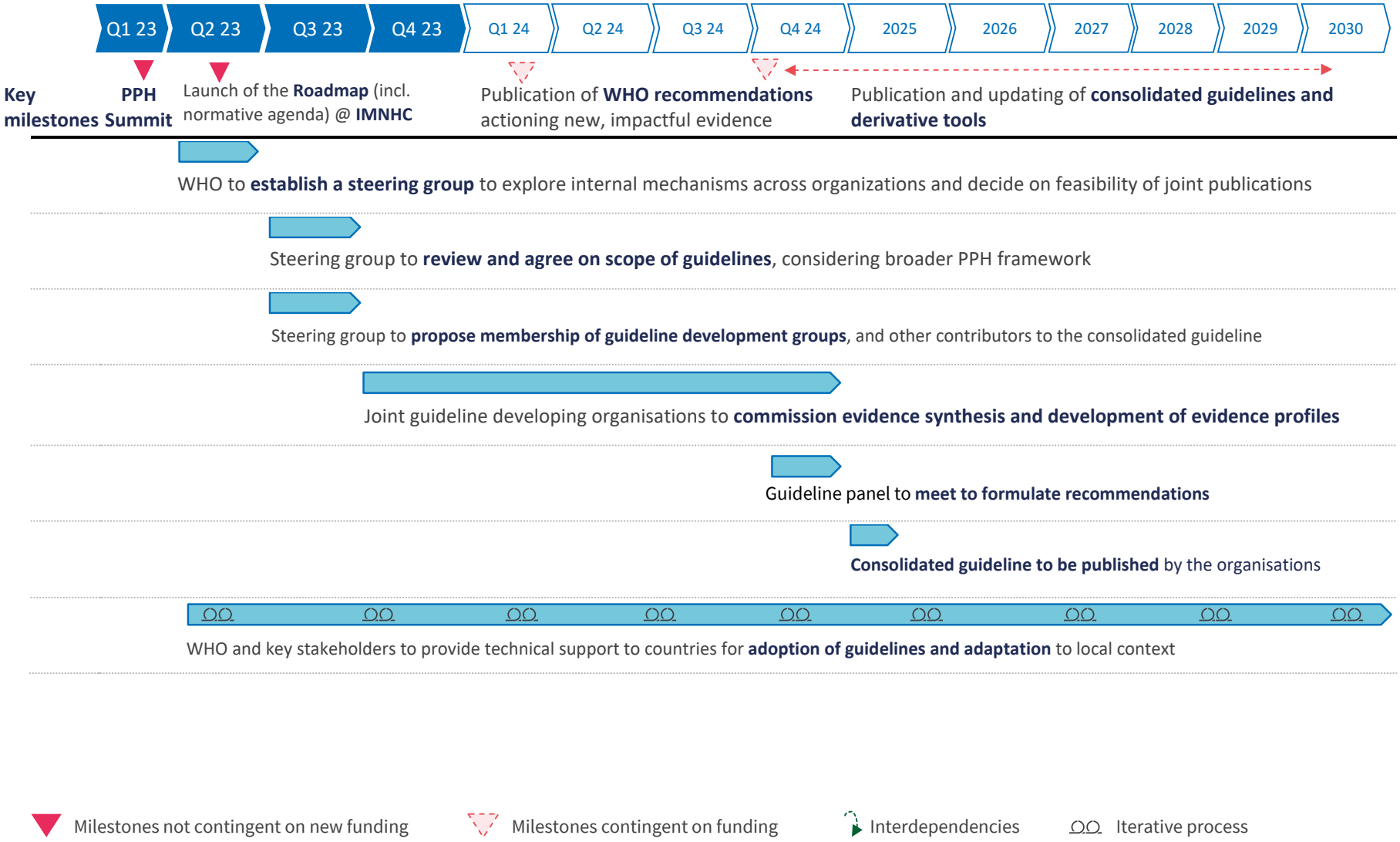
Once the consolidated guidelines have been published, they will need to be widely disseminated for implementation. A global launch campaign will be organized in 2025 with webinars and regional workshops. During the same year, guideline derivatives (e.g., policy briefs) will be developed by the organizations participating in the process in conjunction with WHO Regional Offices. WHO Regional Offices will also coordinate the translation of guidelines into all WHO official languages and implement other language requests on a case-by-case basis.

In the interim, WHO and partners will continue to respond to new, impactful evidence on PPH, to issue individual standalone recommendations through their current internal procedures (e.g., WHO living guidelines approach) until the consolidated guidelines are published. To avoid any delays in translating knowledge into practice particularly in countries where this is a key bottleneck to progress, WHO and key stakeholders (e.g., USAID, Concept Foundation, MSD for Mothers) will review the PPH policy contexts of countries with high burden of PPH and maternal mortality and provide the technical and financial support to update PPH policies and adapt them to local context. An ambitious goal of achieving up to date PPH policies in at least 20 high-burden countries is set for the last quarter of 2024. This effort is expected to set up a model for engagement of stakeholders and expand to other LMIC on as-need basis through 2030.

3.3 Strategic area: Addressing implementation bottlenecks

While there are substantial gaps in research and there is room for improvement in existing norms and standards development processes, implementation bottlenecks are perhaps the most challenging of the four strategic areas. At the PPH Summit, failure in implementation of evidence-based interventions was widely recognized by stakeholders as the most significant challenge to achieving better PPH outcomes. Addressing barriers to implementation was acknowledged as the

Figure 2. Key activities and milestones for the normative agenda



singular, potentially most impactful out of the four strategic areas.

Implementation of proven interventions requires input from several actors and multiple layers of collaboration to be successful. For example, implementing of an effective clinical practice requires not just the training of health care providers, but also could include reconfiguring of clinical workflows, integrating multidisciplinary teams, engaging facility leadership, broadening legal authorisations regarding scope of practice, and adjusting health sector budgets. The highly contextual nature of many implementation barriers means that they are not easily amenable to global action.

In acknowledgment of the many implementation barriers that need addressing, stakeholders at the PPH Summit prioritised five categories of implementation barriers as those that are critical for global action. The priority actions to address these key barriers were also enumerated as summarised below.

Key barriers	Priority actions
a. Lack of clear national health policy and leadership: In most instances, specific national PPH targets do not exist, and data are not collected systematically to measure progress. There is also a disconnect between global and national guidelines. Strengthened national health policy and leadership is needed to ensure PPH is included in national agendas with clear leadership and champions at national and subnational levels.	Priority actions for building clear national health policy and leadership should start with creating a PPH framework to structure treatment response and interventions. This global framework can help to organise and coordinate national efforts. In parallel, an efficient and sustainable global monitoring system needs to be developed that includes common indicators, systematic data collection, and a common measurement platform, to track country progress against targets. As WHO updates global normative guidance, national guidelines need to be adapted to local context and disseminated to all levels of the health system, from national and subnational levels through to last mile health facilities. WHO and other key stakeholders will lead an ongoing network of Ministry of Health champions who will spearhead this work.
b. Weak procurement and supply chain systems: PPH commodities face availability issues, and frequent stockouts lead to unnecessary referrals from one health facility to another. The focus on affordability tends to come at the expense of quality. The availability of blood and blood products is also an issue that needs to be addressed to allow for rapid transfusion when required. Activities undertaken within this category should ensure that quality commodities are available and affordable at all levels of the health system.	As national leadership infrastructure is being built, the international community needs to collaborate to improve access to quality-assured PPH commodities. This will require strong coordination between partners, increased investments, and expansion of existing or new procurement initiatives. Efforts should cover devices, drugs, and blood products. In addition, national- and subnational-level procurement and supply chain systems need to be strengthened (e.g., setting up adequate blood banks). As a first step, WHO and partners (e.g., UNFPA and the Global Fund) will scope possible solutions (both new and existing procurement mechanisms), with the objective of a focused procurement initiative to be launched in 2026.
c. Poor staffing, training, and supervision of healthcare providers: Many countries do not have sufficient well-trained, empowered, and motivated healthcare workers – essential to the delivery of quality care. Pre-service training may not adequately cover PPH detection, prevention and management, and in-service training opportunities are often limited to select staff. Insufficient numbers, distributions, and poor retention of healthcare workers also pose an ongoing challenge, with remote areas most acutely affected. Lastly, in many settings, the suboptimal roles, social, and regulatory status of nurses and midwives does not permit this cadres of health care worker to offer lifesaving care within their competency.	Ensuring availability of quality commodities will only result in meaningful change if there are competent health care providers available to deliver relevant services. Ongoing efforts are needed to strengthen current pre- and in-service training programmes, and bolster them with supportive supervision, mentoring, and other professional development opportunities. These activities must be supplemented by broader human resource strategies to address chronic shortages of qualified health professions (midwives, nurses, doctors).

Key barriers	Priority actions
d. Inequities and poor access to care: There are persistent and unjust disparities in access to care, for instance between rural and urban populations, or within a given setting (e.g., in urban slums). There is a human rights imperative to address the stark inequities that vulnerable and marginalised populations face. For example, in some settings, public sector health facilities are not readily accessible because of distance and women must patronise private sector facilities where user fees are not covered by national insurance schemes.	Healthcare infrastructure also needs to be enhanced to strengthen facilities (this may include renovations to modernise aging structures or building additions to meet greater demand) and improve transportation and referral systems, which are woefully underdeveloped in many places. Governments must also take bold seps to develop financing plans that abolish user fees and broaden insurance coverage, reducing out-of-pocket expenses for key PPH products (e.g., expanding health system coverage to PPH medicines/devices) and improving equity.
e. Women's rights and social status in the society: There are several unfavourable legal, social, and cultural norms and obstacles that limit women's life choices and options about pregnancy and childbirth. These include women's low social status, limited access to education or educational opportunities, and limited opportunity to participate in the workforce in some settings, as well as inadequate state support for paid maternity leave in other settings. Cultural norms may also constrain women's choices around pregnancy and childbearing, for instance by valorising rapid repeat pregnancy, discouraging or delaying care-seeking, and allowing insufficient recovery time after birth before resumption of household chores.	All stakeholders must come together as tireless advocates for women's rights. Women must be at the centre of the political agenda, be it at subnational, national, or international level. Several upstream contributory factors to PPH, such as anaemia and grandmultiparity, can be directly traced to women's lack of rights and low social status. Further, many of the implementation challenges to PPH reduction persist because of long-standing passivity around women's health and wellbeing. Ongoing advocacy can help to ensure maternal health is no longer overlooked and benefits from sustained funding.

Key activities and milestones

Establishment of clear national health policy and leadership

Development of a PPH framework: By the third quarter of 2023, WHO and key stakeholders will draft a first version of a PPH framework. Unlike high-burden communicable diseases such as HIV, TB, and malaria, no holistic framework has ever been formalised for PPH. This can lead to a response that is not addressing all contributory factors (e.g., limited guidance on antenatal and intrapartum prevention; overlooking risk factors such as anaemia, placenta praevia, and placenta accreta). In addition, it results in a fragmented approach to prevention and treatment that may not be comprehensive. Effective interventions will need to be mapped against this framework, which will expose areas that require new recommendations. There will also be an opportunity to use this framework to structure future iterations of the WHO guidelines and report progress on health outcomes along the patient journey. The PPH framework will then be refined based on the feedback received.

Measurement platform: Between now and the end of Q4 2024, WHO, FIGO, ICM, Ministries of Health, and national professional societies will work jointly on a scoping exercise to define the contours of a global measurement platform for monitoring changes in practice performance, health outcomes, and inequities with sustainability plans for in-country leadership. This scoping exercise could include, for instance, the mapping of existing PPH indicators collected by different archetype countries, to be then able to define and agree on a joint list of PPH indicators. To increase the likelihood of these indicators being measured by the highest number of countries, existing metrics and data collection efforts should be leveraged to the extent possible. Defining concrete PPH targets will also be critical to provide countries with an aspirational objective and targets to reach. As an example, UNAIDS HIV targets (90/90/90) were instrumental in raising awareness on "what good looks like" and creating momentum to adequately resource national strategies to reach ambitious yet realistic targets. The scoping phase should also focus on determining data reporting frequency; data disaggregation

levels (e.g., by population strata, level of health system); and roles and responsibilities for data curation, analysis, and production of regular progress reports. A high-level budget should be developed, for both building and managing the measurement platform.

The scoping phase will be followed by a design and pilot phase. The design phase will focus on further developing elements of design that will have been discussed in the scoping phase. These will also include technological design choices for the platform and specifics on data management (e.g., where data should be stored, data privacy considerations). Before launching at full scale, it will be helpful to pilot the measurement platform in a few representative geographies. The design and pilot phase will likely run until Q4 2024, with a global launch planned for 2025. The global measurement platform will also be a critical tool to measure progress against the priorities set out in this Roadmap.

Guideline adoption and adaptation: To support guideline dissemination and implementation in-country, WHO and key stakeholders will continuously lead a network of Ministries of Health Summit champions. This network will oversee collecting country needs on what WHO and other guideline developers need to do to support country adoption and adaptation of global guidance. When new guidelines are issued by WHO and other global guideline developers, the network will organize regional workshops and webinars to present the guidelines and offer dedicated support to help countries contextualize new recommendations. Specifically, WHO will produce user-friendly compilations of guidelines to increase adherence to recommendations including an updated and electronically available version of the 'Managing Complication in Pregnancy' handbook. The network will leverage WHO Regional and Country Offices to support the translation of global documents into non-English languages, the development of derivative products such as policy briefs that give further detail on the recommended interventions and their rationale or operational manuals that serve as practical implementation handbooks for health practitioners. A particular focus will be placed on high-burden countries, and WHO Country Offices will play an instrumental role in supporting local workshops and the development of contextualized materials.

Strengthening procurement and supply chain systems

Pooled procurement and market shaping: WHO and global partners who currently play a role in pooled procurement such as the Global Fund and UNFPA will conduct a scoping exercise by Q4 2023 to assess potential solutions to nudge procurement of PPH commodities towards higher quality products and to increase international financing for these commodities. Even within existing pooled procurement initiatives, multiple models exist. For HIV, TB and malaria, Global Fund-eligible countries can use Global Fund grant funding to procure commodities through Global Fund's Pooled Procurement Mechanism (PPM). Products available through PPM are sources by a dedicated Global Fund team that optimizes market shaping objectives including affordability, availability and quality. Importantly, all of these commodities have been approved by a global stringent regulatory authority (e.g., WHO Prequalification or US FDA). Countries may also use Global Fund grant funding to procure commodities through their own national procurement channels. Lastly, countries may use domestic funds to procure Global Fund-listed commodities on PPM and benefit from the commercial conditions negotiated by the Global Fund and therefore take advantage of lower prices achieved through pooled procurement. Various regional pooled procurement initiatives were also launched during the COVID-19 pandemic, in particular in Africa. These processes go beyond mere procurement and are critical contributors to deliberate market shaping through activities such as multi-year tender-based sourcing, supplier relationship management, and the enforcement of quality assurance and quality control requirements. During the scoping phase, all of these mechanisms will be analysed. This will inform a discussion on the relative merits of potential solutions to increase international financing to procure higher-

quality PPH commodities. Currently most PPH medicines and devices are procured by domestic governments using domestic funds. Trade-offs between promoting regional or global pooling of demand and procurement and reinforcing country procurement capabilities should therefore be carefully assessed and consider key dimensions such as country ownership. In terms of scope, the exercise might be more meaningful if taking into account maternal health commodities more broadly, or even more generally essential medicines. After the scoping phase and depending on which solutions have been prioritized, WHO and global partners will launch a full design phase that will define specific elements of design based on the preferred solution. This will be followed by a pilot phase in 2024-2025 before full-scale roll-out in 2026.

Quality-assurance of commodities: Between now and the end of 2024, WHO and key stakeholders, including Ministries of Health, will set standards for in-country regulators to expedite the approval of commodities, both medicines and devices, which have Stringent Regulatory Authority (SRA) approval or WHO Prequalification status. WHO and partners will provide support to Ministries of Health to develop supply chain guidance that mandates the procurement of quality-assured commodities. Recognizing that the regulation of medical devices and blood/blood products can be complex and difficult to navigate, WHO and partners will also map, suggest improvements, and fill gaps in global supply chain guidance on quality procurement of devices and blood products, also to improve clarity and ensure a consistent level of stringency across global guidance.

Enhancing staffing, training, and supervision of healthcare providers

Expanded role of midwifery: From now until the end of 2024, WHO, along with FIGO, ICM, Ministries of Health, and national professional societies will support a push for the expansion of the legislation and regulation governing midwifery and other cadres such as nurses. ICM published a scope of practice and competencies for midwives (including for instance the ability to provide intravenous medication) but legislative and regulatory change has lagged. WHO and partners will continuously advocate for the need to have an established evidence-based regulatory framework at country level for skilled birth attendants and for countries to implement a national competency and standards framework that recognizes the key role played by midwives.

Support to training: WHO along with FIGO, ICM, Ministries of Health, and national professional societies will continuously work to strengthen pre- and in-service training of healthcare workers as part of continuous professional development, by developing and maintaining a full suite of tools to support enhanced quality of care, leveraging in-person training and digital tools as required. This will involve developing mentoring networks and creating communities of practice to share experiences and learnings, hosting webinars on a regular basis, promoting remote coaching, organising hands-on teamwork training and simulation exercises, particularly as part of obstetric emergency response teams.

Engendering equity and improving access to care

Reduction of out-of-pocket expenses: By the end of Q4 2023, WHO and key stakeholders will conduct a scoping exercise to define potential options for innovative ways of reducing out-of-pocket expenses for pregnancy and childbirth care. The scoping exercise will include a rapid landscaping phase that will investigate current successful models in select exemplar countries where out-of-pocket expenses are limited. It will also detail some of the key financial barriers hampering access to care in select high-burden countries, such as user fees or restrictive insurance schemes which can be localized, time-bound or contributory, thereby leaving out large portions of unemployed or marginalised populations. Best practices and solutions will be assessed based on feasibility of implementation and expected impact. In 2024, WHO and key stakeholders will codify these best practices and innovative ways of reducing out-of-pocket expenses and formalise the circumstances under which each solution should be deployed,

as part of a broader Universal Health Coverage (UHC) agenda. In 2025, WHO and partners will pilot some of these initiatives, for instance at subnational level in some priority geographies.

Elevating women's rights and social status

Advocacy for women's rights and increased awareness: Elevating women's health on political agendas will require coordinated advocacy efforts at all levels. WHO and key stakeholders will support ongoing efforts and join new initiatives to increase decision-makers' awareness of PPH, why it matters, how to minimise the risk of PPH, and how to adequately manage PPH. These efforts will insist on the need to have up-to-date national guidelines, reflective of the latest evidence available, but also the need to procure quality commodities (e.g., uterotonics) and strengthen referral systems. In the general population, advocacy efforts will focus on communicating what PPH is and why timely care matters, to help reduce delays in seeking care. Advocacy campaigns will also raise awareness on how to minimize the risk of death due to PPH, for instance by giving birth in health facilities. To that effect, WHO and partners will support global, regional, and local campaigns, and develop blueprints of patient leaflets that can then be tailored to local needs.

3.4 Strategic area: Closing advocacy gaps

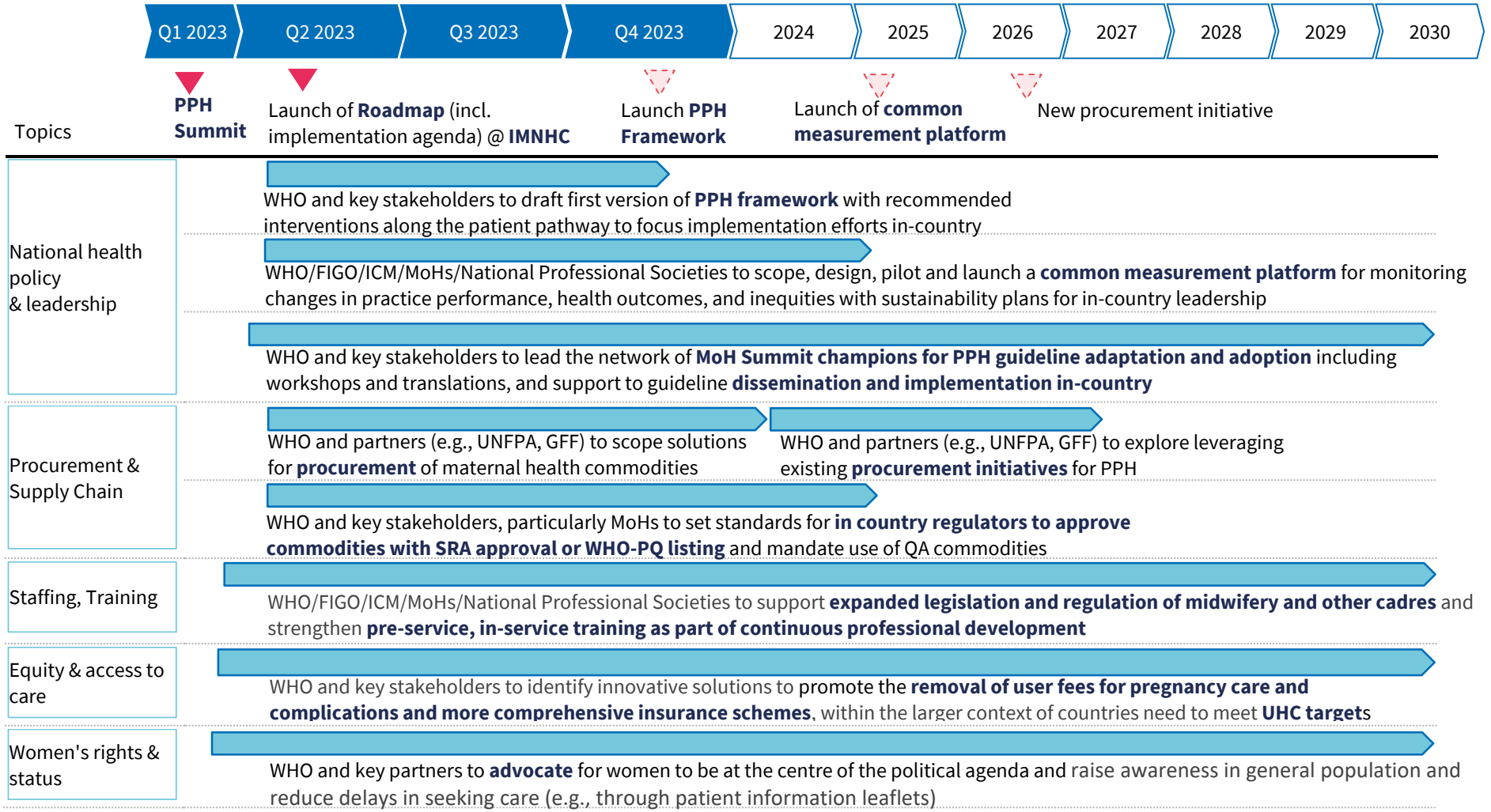
Advocacy efforts can help raise awareness about the importance of timely and effective management of PPH, as well as the availability and accessibility of lifesaving interventions such as uterotonics, blood transfusions, and surgical procedures. Advocates can work to ensure that healthcare providers are trained in the prevention and management of PPH, that facilities have the necessary supplies and equipment, and that policies and guidelines prioritise maternal health and safety.

Specifically, advocacy efforts should be focused on five major areas. First, they should be targeted at policymakers and politicians to support the removal of legislative and regulatory barriers hindering access to lifesaving care. In some settings, frontline workers such as midwives are not permitted to administer certain drugs (e.g., intravenous oxytocin or TXA). A strong advocacy push is therefore needed so that all skilled birth attendants can participate in the delivery of care to their fullest capacity. Second, advocacy efforts should focus on Ministries of Health and relevant national health agencies to promote the need to update national guidelines to reflect the latest global guidance and best available evidence. Third, strong advocacy is needed to advance the role of the midwife and ensure adequate training and support. Fourth, the critical importance of the availability, affordability, and quality of PPH medicines, supplies, and technologies should be elevated to ministerial level. Lastly, within the broader population, awareness around recognising PPH, addressing risk factors, and the need for timely care seeking should be reinforced.

Advancing this ambitious advocacy agenda requires that all stakeholders be engaged and work synergistically to gain traction. Critically, women should be at the centre of the advocacy agenda. Women's movements can help drive attention to PPH and hold governments accountable. Civil society and communities can raise general awareness and foster political leadership. Ministerial commitment is particularly important so PPH is identified as a priority and adequately resourced. Evidence and data generation are helpful catalysts for governmental action, so researchers, too, have a part to play. Such joint and coordinated action can drive meaningful change.

To be most effective, advocacy approaches will need to be tailored to each setting, prioritising those with the greatest burden (e.g., marginalised and rural communities). Advocacy activities can include, among others, an international "PPH day" and regional convenings (e.g., PPH Summit in Africa). However, advocacy efforts must reach beyond the PPH ecosystem, targeting other ministries (e.g., transport, finance) and involving a broader set of stakeholders from across maternal and newborn health. The PPH community should also leverage connections with other health priorities and investments made in support of other programmatic priorities (e.g., vaccine cold chain capacity). Sustainable financing to support

Figure 3. Key activities and milestones for the implementation agenda



PPH advocacy is critical to achieve gains and maintain them in the long run.

Key activities and milestones

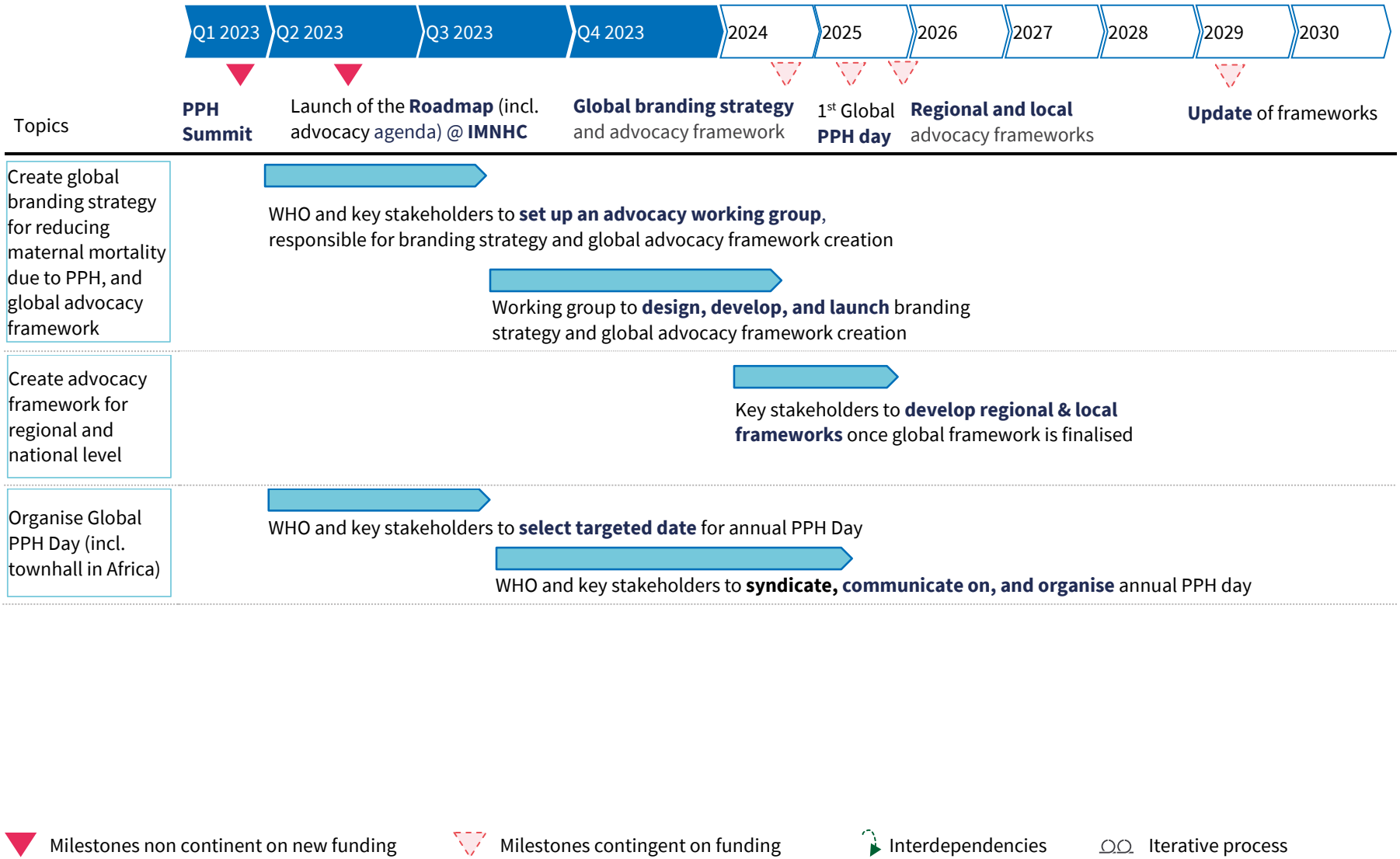
In the immediate term, three main initiatives will be launched. First, a global branding strategy for reducing maternal mortality due to PPH alongside a global advocacy framework will be developed. Second, an advocacy framework for the regional and national levels will be created. Third, an international PPH Day will be established.

Global branding strategy and advocacy framework for reducing PPH-related maternal mortality: A joint, coordinated global PPH advocacy strategy can help to unify fragmented advocacy efforts and conflicting or confusing messaging. This strategy should be seen as an umbrella under which global, regional, and local efforts can be amplified. It will provide important guidance on how to advocate to different stakeholder groups and will build on years of successful advocacy efforts and lessons learnt from other areas in health. A first step will be to set up an advocacy working group by the third quarter of 2023 with WHO, other multilaterals, civil society organisations (CSOs), non-governmental organisations (NGOs), and, importantly, grassroots organisations. This working group will be responsible for developing the branding strategy and advocacy framework over the course of 2024. The strategy and advocacy framework will contain several building blocks. They will articulate compelling and evidence-based messaging to advocate for the update and adaptation of national guidelines, legislative and regulatory changes that remove barriers to quality care (for example, on the role of midwifery), and faster delivery of innovations to LMICs. This comprehensive toolbox will also contain tailored messaging that captures powerful stories from the voices of young generations and which can be used for targeted messaging to key populations. To ensure sustained results, the framework will outline roles and responsibilities as well as accountability mechanisms. Global and local champions such as high-profile goodwill ambassadors will be designated to support advocacy efforts. Importantly, the working group will design specific PPH branding that can be used to visually support all PPH advocacy efforts going forward. This will include a recognizable logo and colour scheme. Materials to support awareness campaigns, whether they be through workshops, webinars, or training sessions, will use the new PPH branding. These materials will be tailored to different audiences.

Advocacy framework for regional and local levels: The global advocacy strategy and framework will serve as a comprehensive toolbox of pre-designed materials, tailored messaging, and compelling visuals that can serve advocacy objectives at all levels. However, messaging will be more powerful if it is tailored to local contexts and situations. The global framework will provide modular content that can be adapted as needed. Over the course of 2024–2025, the advocacy working group, along with other interested stakeholders, will work towards developing content and materials that can serve regional and local advocacy efforts. There will be an iterative process whereby regional and local actors will provide feedback that will help adjust and refine the global framework.

Global PPH Day: World Malaria Day and World Immunization Day have been crucial to raise the profile and awareness of these public health concerns. The PPH community has expressed interest in establishing a Global PPH Day that can be used to raise awareness, communicate and celebrate achievements, announce new discoveries, share learnings and testimonies, mobilise the community to address outstanding challenges, and support resource mobilisation efforts. A Global PPH day can also raise the profile of PPH and elevate it on political agendas. In Q3 2023, UN agencies and partnerships will work with the UN Secretariat to find a suitable date for a Global PPH Day. Once a date has been identified, WHO and partners will prepare a dossier that addresses all the requirements to apply for the creation of a global PPH Day. This will happen over the course of 2024. WHO and partners will then prepare the organisation of a first PPH Day, with 2025 as a target launch year. The first PPH Day will also serve as a launch pad for the PPH branding strategy. That event and associated preparatory activities will be repeated on an annual basis.

Figure 4. Key activities and milestones for the advocacy agenda

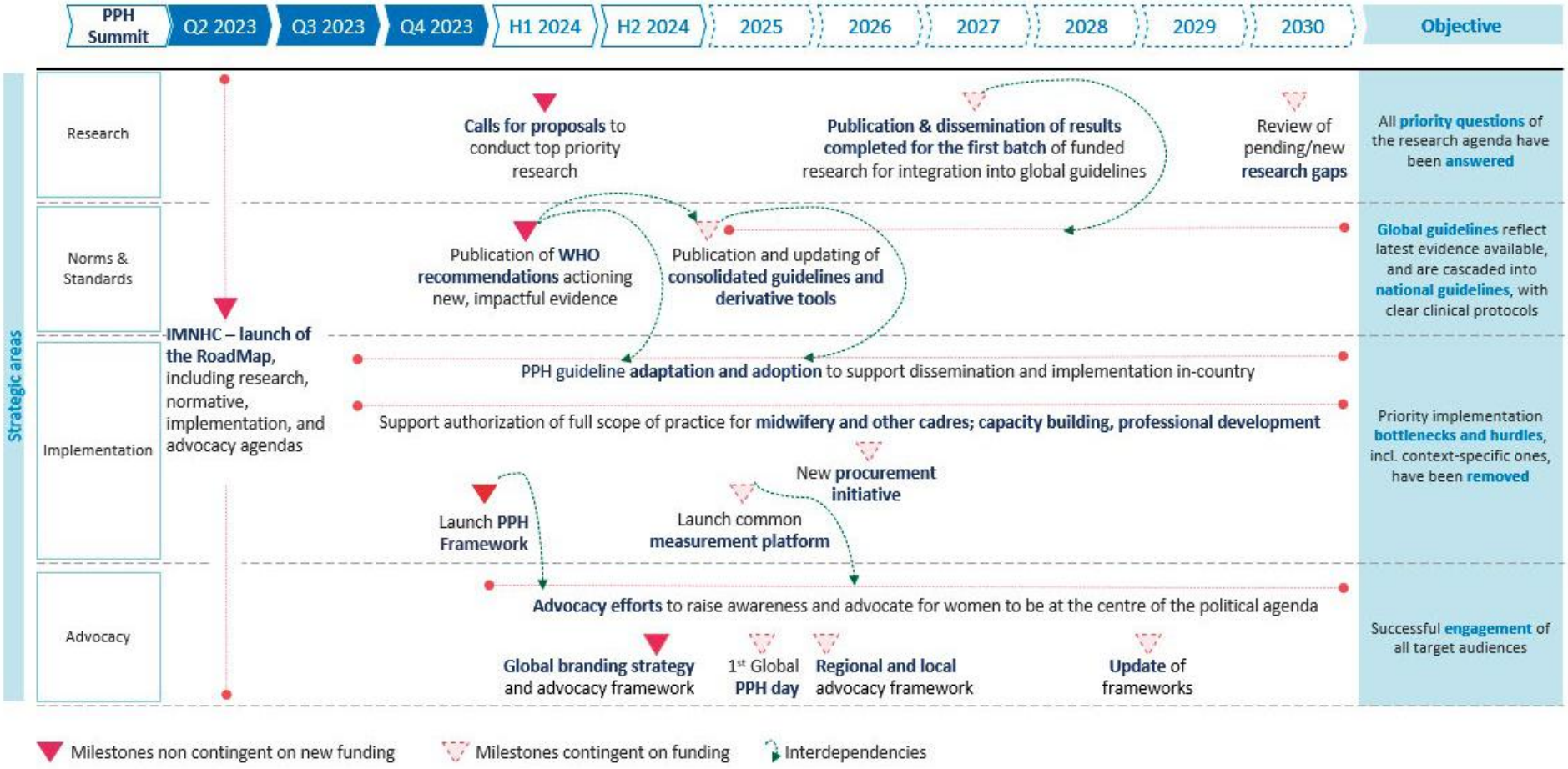


3.5 Consolidated Roadmap

The subsections above describe key activities and milestones for each of the four strategic areas. Yet the strategic areas are not envisioned as distinct workstreams running in parallel. Rather, they are interdependent, and activities in one strategic area feed into and advance activities in other strategic areas. For example, emerging research evidence informs the development and publication of new global norms and standards, which in term must be adapted for local contexts and implemented. The global PPH framework and common measurement platform for monitoring and evaluation both contribute to data-driven advocacy efforts, which can then garner needed political support to drive further normative and implementation efforts.

Figure 5 provides a high-level overview of some of the anticipated interdependencies and synergies between the activities in each of the four strategic areas. This is not intended as a comprehensive accounting of all the ways the strategic areas may interlink and support one another, but instead offers several illustrative examples from 2023 to 2030.

Figure 5. Overall high-level milestones to reduce the PPH burden and associated maternal deaths from 2023 through 2030



4. A Global Call-to-Action

Ensuring the audacious agenda outlined in this Roadmap is achieved will require concerted action from all stakeholders. This Global Call to Action outlines key learnings from the PPH Summit and describes concrete activities for each stakeholder group and demonstrates that everyone has a role to play.

The following key learnings emerged from the PPH Summit:

- **Women and community voices need to be included in all steps** – from defining the research agenda to developing guidelines, removing implementation bottlenecks, and supporting advocacy efforts, so that services better serve their needs.
- **PPH causes are well known and can be prevented** through interventions across the continuum of care starting from preconception care to antenatal, childbirth and postpartum care. While lots of interventions are known to be effective, there are many barriers to implementation of existing tools that need addressing (e.g., fully capacitated workforce, reduction of out-of-pocket expenditure).
- PPH challenges cannot be solved in isolation, but rather as **part of a broader maternal and newborn health** agenda. Other sectors must be involved, including transport and finance.
- **There is a need for a unifying force in the PPH space to drive the PPH agenda and aggregate funding**. Donors committed to stronger coordination of their PPH investments which could be achieved through a coordination forum. Existing initiatives such as the Every Newborn Action Plan and the Ending Preventable Maternal Mortality initiative could be leveraged.
- **A strong advocacy push is required at all levels to elevate the profile of PPH**, to improve care, strengthen collaboration across facilities and promote facility births, and ensure women are managed at the right level of care. This will require effective collaboration among all PPH stakeholders and strong political leadership.
- The international community should come together to **improve the availability and affordability of quality PPH commodities** (including medicines, devices, and blood products). While there are many barriers to implementation of existing tools that need addressing (e.g., fully capacitated workforce, reduction of out-of-pocket expenditure), this is a prerequisite for improved quality of care at all levels of the health system.
- **A fully funded joint research agenda** should be developed around the 15 priority research questions that emerged from the Summit, including determining the effectiveness of a bundle approach to early detection and treatment, identifying barriers and facilitators to the uptake of evidence (and assessing implementation strategies for addressing those barriers), and evaluating the safety and effectiveness of alternative routes of administration for tranexamic acid (TXA) and heat-stable carbetocin (HSC) for PPH treatment in women who had already received it for PPH prevention. It should focus on generating quantitative and qualitative evidence in low- and middle-income countries' settings and the most critical points of the woman's pathway where deaths and disabilities occur.
- **Global PPH guideline developers should align on a core set of recommendations**, consistent across guidelines, that can be

contextualised into national guidelines and further translated into clinical practice tools (e.g., protocols and job aids). A first step will be to reduce duplication of efforts by sharing the evidence synthesis work underpinning PPH recommendations.

- **Guideline updates should address current gaps** such as recommendations to address antenatal and intrapartum risk factors for PPH (e.g., anaemia prevention and treatment, diagnosis of abnormally situated (praevia) or morbidly adherent (accreta) placenta), accuracy of PPH detection methods (incl. blood loss measurement), and aspects of health systems such as referral, transport and task shifting.
- An effective PPH response to change the projected adverse outcomes by 2030 requires an **efficient and sustainable monitoring system at scale** – including common measurement indicators, systematic data collection, and a common measurement platform – to track progress against targets. This measurement platform will be instrumental to provide the tools and data to be able to track progress against the milestones included in the Roadmap.

Summit Participants call on the international community to acknowledge the consensus that emerged from the Summit, which is reflective of a broad and inclusive participation by all stakeholders. They specifically call for the following actions:

Stakeholder	Key actions to ensure effective and coordinated efforts towards eliminating preventable deaths from postpartum haemorrhage
 International community	▸ **Identify a leading organisation**, consortium, or collaboration, that will be responsible for driving a unified PPH agenda and aggregating funding as part of a broader maternal and newborn health agenda. ▸ **Launch coordinated and unified initiatives** to strengthen advocacy and increase PPH awareness.
 Women & Women's groups	▸ Share learnings from experience, take part in advocacy campaigns ▸ **Participate in solution design**, especially women from low-income settings ▸ **Seek safe delivery and demand social accountability** for maternal and newborn services (e.g., facility based antenatal, childbirth, and postnatal care services)
 Ministries of Health	▸ **Strengthen country leadership and accountability on PPH** (incl. detailed targets, monitoring system, domestic financing, advocacy) **and coordinate efforts** with partners ▸ **Ensure national guidelines are updated**, contextualised to local settings, and well disseminated ▸ **Steer national procurement to quality-assured** medicines & devices, ensure appropriate staffing, training, and equipment of health facilities, and work to improve supply chain reliability and efficiency
 Implementers (incl. NGOs & CSOs)	▸ Develop new approaches to address priority gaps ▸ **Increase advocacy on PPH** through unified voice or platform ▸ Form coalitions with governments and professional organizations to develop action plans for national and subnational levels

Stakeholder	Key actions to ensure effective and coordinated efforts towards eliminating preventable deaths from postpartum haemorrhage
 Professional associations	▶ **Promote adherence** to recommended interventions ▶ **Support collaboration**, knowledge dissemination, and communities of practice (incl. across countries), acting as convening bodies ▶ Support coordinated ongoing and continuous locally led capacity building for health workers, with accountability measures
 Guideline developers	▶ **Ensure and maintain alignment between PPH recommendations** through enhanced collaboration between guideline developers (starting with sharing the evidence synthesis work and jointly building the evidence ecosystem for PPH) ▶ **Consconsolidate PPH recommendations**, and continuously update or develop new recommendations as new, impactful evidence emerges, addressing all opportunities to intervene in the 'natural history' of PPH ▶ Support development of national guidelines on PPH, consistent with global recommendations
 Research community	▶ **Execute the PPH research agenda** and focus efforts on research priorities that address **implementation barriers** and bottlenecks, and on better coordinating **innovation research** ▶ **Ensure research is contextualised** and directed towards least served communities, via the engagement of women and frontline health workers, especially midwives ▶ **Strengthen global collaboration** across researchers, industry, and innovators to accelerate impact
 Industry & innovators	▶ **Focus PPH R&D efforts on fit-for-purpose, demand-driven**, innovations that will address unmet public health needs, via strengthened involvement of health workers, especially midwives ▶ **Make commodities more affordable and accessible**, especially for low-income settings, where their effectiveness should also be tested ▶ **Commit to generating the evidence required** to inform health policy development processes at global and country levels
 Donors	▶ **Increase financial commitments**, channelling investments to identified priority gaps (incl. implementation and scale up of proven PPH commodities, strengthening of safe blood systems, and advocacy). ▶ **Strengthen coordination across donors** to avoid duplication of efforts and amplify impact. Contemplate creating a consortium to allow a single point of contact for countries. ▶ **Reinforce engagement and alignment with governments** to better address local needs and secure their commitment to reach agreed targets.

Signatories: Participants at the Global Summit on PPH, 7–10 March, Dubai, UAE

5. Implementation of the Roadmap

The activities laid out in this Roadmap are ambitious and illustrate the urgent need for transformational change. Successful implementation will require concerted effort by all stakeholders across the international, national, and subnational levels. Successful implementation will also require sustained donor commitment as many of the priority activities outlined in the Roadmap are contingent on additional funding to support their execution.

As part of the development process of the Roadmap, implementation considerations were identified for each strategic area. Below are some key pointers, which may help stakeholders prepare for implementation.

5.1 Global leadership and governance

The Roadmap is multi-faceted, requiring coordinated actions across a wide range of stakeholders over the next seven or more years. Strong leadership and governance are essential.

During the development of the Roadmap, WHO was identified as the responsible body for many immediate next steps. While WHO will act as a catalyst and drive the launch of these initial activities, other organisations will need to be to identified to spearhead efforts, assure progress, and rally support for the key priority actions. Roles and responsibilities will need to be further articulated. It should be noted that a lot of the priority activities included in the Roadmap will be contingent on additional funding to support their execution.

It will be important to establish a governance structure that clearly delineates which stakeholders will lead activities across each of the four strategic areas in the Roadmap. Roles and responsibilities will need to be further defined, as will concrete accountability mechanisms.

The PPH landscape is complex, and many stakeholders are responsible for advancing multiple agendas outside of PPH, while remaining accountable to varied constituencies. Roadmap leadership and governance must reflect this reality.

5.2 Adaptation for local context

Successful translation of the Roadmap into national health policies and health services depends on well-planned, participatory, consensus-driven processes of adaptation. Countries may choose to, for example, define national-level versions of the global goals and milestones outlined in the Roadmap, and integrate them into existing national strategies. WHO will support national and subnational efforts to integrate the Roadmap into new and existing strategies. Any adaptations to country goals and milestones should be reflected in the monitoring and evaluation platform, to reduce reporting burden.

The Roadmap specifies top global research priorities. However, specific contexts may have different, more pressing research concerns (e.g., managing PPH in conflict and humanitarian settings). National research funding agencies may need to adapt the list of research priorities to address local needs. The Roadmap should not be interpreted as a binding list of approved research items, but rather a snapshot of current global research needs.

Similarly, global guidelines provide high-level norms and standards around PPH prevention and treatment, based on the best available research evidence. Yet national guidelines, clinical protocols, and job aides need to be adapted and tailored for local context. WHO

will support efforts to update national norms and standards, as well as develop appropriate protocols and job aids. National professional associations and implementors are key partners in this work and should be actively involved in developing these materials.

Local stakeholders will need to identify the most pressing barriers and bottlenecks to implementation in their contexts, and work together to develop effective solutions. Ministries of Health may be particularly well-positioned to convene relevant local stakeholders. The global leadership and governance structure for the Roadmap provides one option for how to organise local efforts, but other structures may be more appropriate given existing norms and institutions.

Partial contextualisation of advocacy efforts is already anticipated in the Roadmap, through the development of regional and local advocacy frameworks. Yet these will still need to be tailored further for and within national settings. Advocates will also need to translate the frameworks into concrete messages with local salience and determine the best routes for dissemination. Market segmentation and targeted messaging can help to improve the impact of advocacy efforts. Advocates should also pay attention to messenger effects and select the most appropriate type of communicator and venue to assure impact.

5.3 Anticipated impact of the Roadmap

In 2022, an estimated 70,000 women died due to PPH. If nothing changes, an additional half a million women will die by the close of the SDG era, from a condition that is both preventable and treatable. These women will leave behind families and communities that are weaker for their absence. Millions of women will suffer from long-lasting consequences of traumatic birth experiences and the inability of their health systems to respond effectively. Alarmingly, data from some countries suggest that rates of PPH are increasing, painting an even bleaker picture of the years ahead.

The Roadmap offers a vision of a different future. In this future, countries have taken strong action to address upstream risk factors for PPH and to prepare health systems to respond quickly and effectively when PPH does occur. Frontline health workers are trained and capacitated to detect and treat PPH, and supported by robust referral and transport systems that get women to higher-level care in a timely fashion. Women no longer die because a needed drug is stocked out or of poor quality. This future is possible. The Roadmap shows what is needed to get there.

This Roadmap cannot eliminate PPH entirely – no plan can. Yet timely and coordinated action on each of the strategic areas in the Roadmap can help reduce the impact of PPH on women's health and wellbeing. Women and families who are currently among the most marginalised in the world stand to gain the most from implementation of the Roadmap, with important dividends for community-wide development and empowerment.

6. Disseminating the Roadmap and Call-to-Action

The Roadmap was launched, along with the WHO Call-to-Action at the International Maternal Newborn Health Conference held 8–11 May 2023 in Cape Town, South Africa. Dissemination will continue through future conferences and webinars organized by WHO and other stakeholders, including Summit participants.

WHO will also develop tools to aid adaptation of the Roadmap to local contexts, including an evidence brief on implementation of the Roadmap in the most affected regions and countries. The Roadmap and tools will be disseminated through WHO regional and country offices, Ministries of Health, professional organizations, WHO collaborating centres, other United Nations agencies, and NGOs, among others. The Roadmap will be published on the WHO/HRP website, and highlighted as part of the monthly WHO/HRP News. This newsletter currently reaches over 8000 subscribers including clinicians, programme managers, policymakers, and health service users from around the world. WHO documents are also routinely disseminated during meetings and scientific conferences attended by WHO maternal and perinatal health staff.

The Roadmap documents will be translated into the six UN languages for dissemination through the WHO regional and country offices and during meetings organized by, or attended by, WHO coordinating staff. Technical assistance will be provided to any WHO regional office willing to translate the full Roadmap into any of these languages. In addition, journal articles presenting each strategic areas (including development and identification of priorities) and key implementation considerations will be considered, in compliance with WHO's open access and copyright policies. Relevant WHO clusters, departments, and partnerships, such as the Partnership for Maternal, Newborn and Child Health (PMNCH), will also be part of this dissemination process.

To ensure this recommendation has an impact on maternal health at country level, coordinated action between international agencies, Ministries of Health, and key maternal and perinatal health stakeholders is required. WHO staff at Headquarters, Regional, and Country level, as well as international agency partners and international professional societies (e.g., FIGO and ICM, national professional associations) can support national stakeholders in developing or revising existing national guidelines or protocols, and optimising their implementation in response to the Roadmap. Context-specific tools and toolkits may be required in addition to standard tools to support the implementation of the Roadmap recommendations in humanitarian emergencies by stakeholders.

7. Monitoring and evaluating impact

In 2015, Ending Preventable Maternal Mortality (EPMM), a global multi-partner initiative to improve maternal health and wellbeing and achieve the SDG target for MMR, outlined broad strategies for maternal health programmes *[10]*. As part of its monitoring framework, EPMM has established coverage targets and milestones to track progress to 2030. EPMM's monitoring framework aligns with the targets and milestones in the Every Newborn Action Plan (ENAP) launched in September 2020. The PPH Roadmap complements these efforts by focusing efforts related to PPH as the major contributor to maternal mortality.

The PPH Roadmap outlines an ambitious agenda to accelerate action on PPH. To maintain momentum, it will be critical to define a core set of indicators and comprehensive monitoring framework to track progress and evaluate impact.

Developing the core set of indicators presents a unique opportunity for monitoring and evaluation professionals. Indicators need to be both granular enough to track implementation outputs and outcomes along the theory of change toward proposed impact in reducing MMR, while also general enough to draw from existing data collection efforts to reduce monitoring and reporting burden. Moreover, indicators should be common across geographies and time, to allow for consistent monitoring and benchmarking.

Establishing the monitoring framework is challenging, in no small part because there are few universal indicators for PPH. However, research studies on PPH (for example, the E-MOTIVE Trial *[11]*) have developed monitoring frameworks around access and quality of PPH care that could provide useful examples for developing the core set of indicators, as well as providing important insight into data collection burden and feasibility of different proposed indicators. Newly emergent evidence on the validity and feasibility of indicators included within the EPMM monitoring framework may also prove useful *[12, 13]*. Given the challenge and opportunity presented here, establishing the core set of indicators and common measurement platform is a key milestone early in the Roadmap. As an immediate next step, WHO, FIGO, ICM, Ministries of Health, and national professional societies will need to convene to scope potential indicators for a common measurement platform for monitoring changes in practice performance, health outcomes and inequities. Scoping efforts should include definition clear sustainability plans for country leadership.

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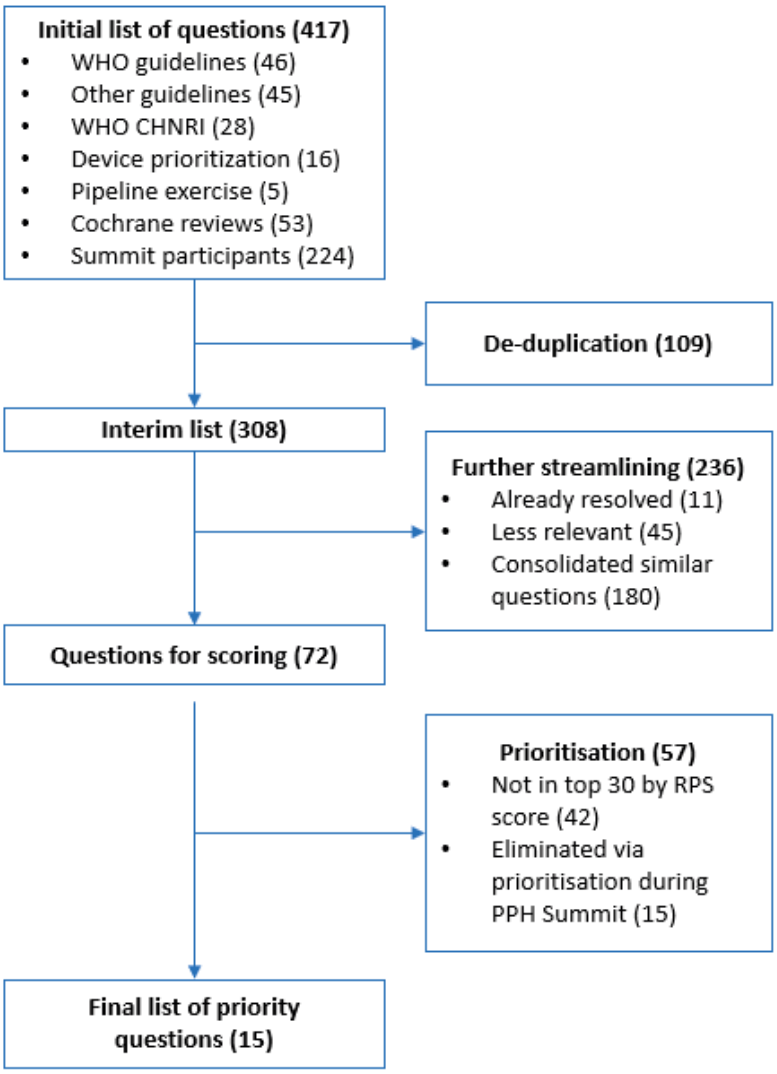
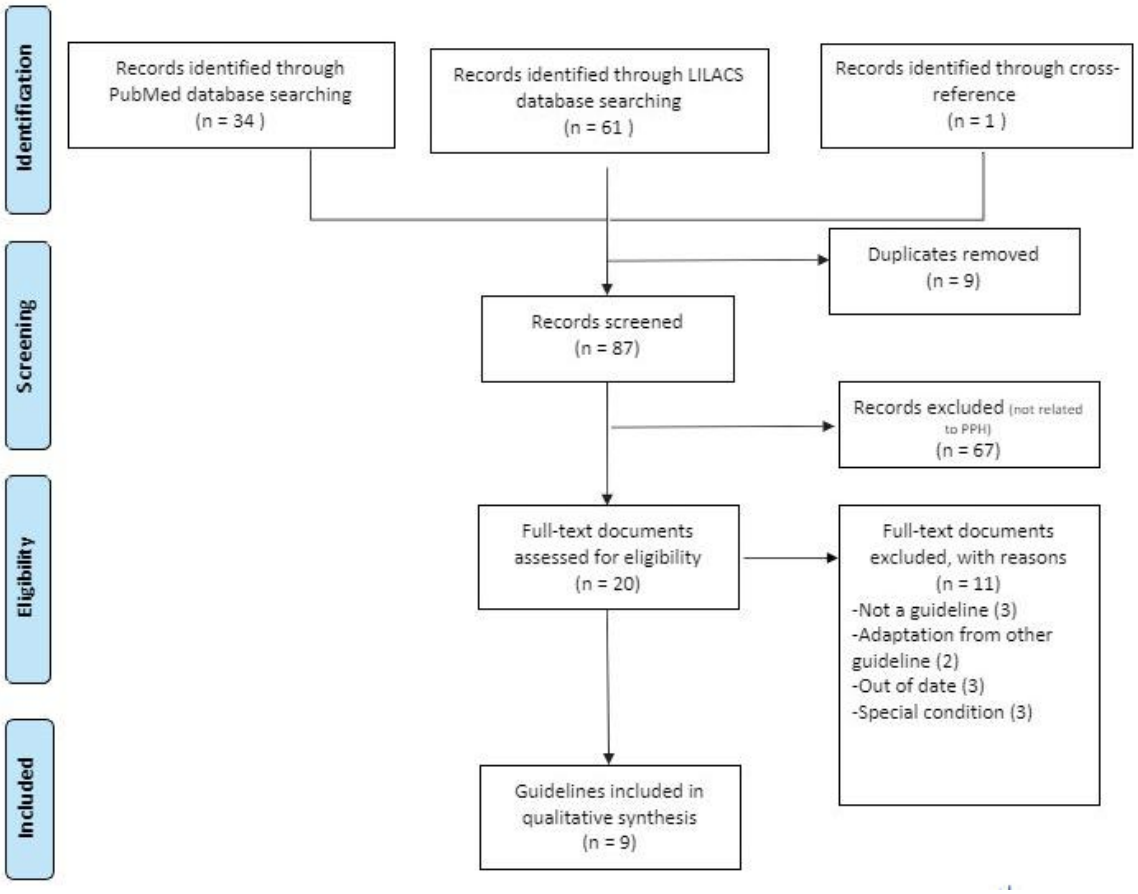
Annex 2.

Research prioritization flowchart



Annex 3.

Mapping of PPH recommendations



Annex 4. Heatmap of results from barriers to implementation survey

Score scale | Low | <45% | <65% | <75% | <85% | +85% | High

		Inclusion in national **guidelines**	**Local support** from stakeholders acting as Champions	Registration and licence	Inclusion in **national EMLs** or equivalents?	**Availability** / Procurement	**Job aids** available at facility level	Healthcare workers awareness & trust in effectiveness	Affordability & quality	**Training** & **experience** of healthcare workers	Healthcare facilities staffing & equipment
Q01	Oxytocin injection for PPH prevention and treatment	89%	83%	91%	90%	72%	79%	88%	73%	82%	68%
Q02	Ergometrine injection for PPH prevention and treatment (if oxytocin is unavailable)	63%	56%	67%	63%	44%	52%	59%	52%	55%	48%
Q03	Fixed-dose oxytocin and ergometrine combination injection for PPH prevention and treatment (if oxytocin is unavailable)	55%	52%	57%	56%	40%	48%	52%	45%	50%	44%
Q04	Heat-stable carbetocin injection for PPH prevention (if oxytocin is unavailable or quality cannot be guaranteed)	46%	49%	50%	47%	34%	39%	45%	43%	40%	38%
Q05	Oral misoprostol for PPH prevention and treatment (if oxytocin is unavailable or did not stop the bleeding)	84%	80%	81%	82%	74%	77%	81%	77%	78%	72%
Q06	Isotonic crystalloids for fluid resuscitation of women with PPH	84%	81%	83%	82%	75%	77%	82%	79%	79%	73%
Q07	Tranexamic acid injection plus standard care for PPH treatment	79%	79%	80%	78%	70%	72%	75%	75%	71%	71%
Q08	Oxytocin in combination with controlled cord traction for retained placenta	85%	82%	85%	85%	78%	78%	82%	78%	78%	73%
Q09	Uterine balloon tamponade (UBT) for refractory PPH treatment	62%	62%	60%	58%	49%	52%	57%	52%	49%	46%

Q10	Non-pneumatic anti-shock garment (NASG) as temporizing measure for definitive PPH care	55%	54%	54%	52%	39%	44%	48%	44%	42%	41%
Q11	Uterine artery embolization for refractory PPH treatment	56%	52%				44%	52%		39%	38%
Q12	Bimanual uterine compression as temporizing measure before definitive PPH care	75%	72%				69%	71%		66%	62%
Q13	External aortic compression as temporizing measure for definitive PPH care	61%	57%				52%	54%		47%	49%
Q14	Surgical interventions (laparotomy or compressive sutures or hysterectomy) for refractory PPH treatment	76%	74%				68%	75%		61%	57%
Q15	Abdominal uterine tonus assessment for early identification of uterine atony for all women postpartum	80%	78%				76%	78%		77%	72%
Q16	Controlled cord traction is the recommended method for removal of the placenta in caesarean section	74%	75%				73%	75%		74%	70%
Q17	Uterine massage for conservative treatment of PPH	87%	86%				84%	86%		85%	79%
Q18	Formal protocols at health facilities for prevention and treatment of PPH	80%	79%				76%	79%		75%	69%
Q19	Formal protocols for referral of women to a higher level of care for treatment of PPH	79%	78%				73%	79%		73%	67%
Q20	Simulations of PPH treatment for pre-service and in-service training programmes	69%	70%				66%	71%		66%	61%

Score represents aggregate level of agreement. For instance, there is general agreement (82%) that healthcare workers are trained and experienced to give oxytocin injection for PPH prevention and treatment; however, there is little agreement (39%) that healthcare workers are trained and experienced to perform uterine artery embolization for refractory PPH treatment.

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