A Roadmap to combat postpartum haemorrhage between 2023 and 2030

World Health Organization

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Contents

Annexes

Tables

Figures

Foreword

Each year, millions of women experience postpartum haemorrhage (PPH), commonly defined as a blood loss of 500 ml or more within 24 hours after birth. This preventable and treatable condition remains the leading cause of maternal death worldwide, despite decades of work and proven life-saving interventions.

The World Health Organization (WHO) has issued comprehensive guidance on PPH prevention and treatment, yet in many parts of the world these recommendations have not translated into meaningful reductions in PPH-related morbidity and mortality. Indeed, the global maternal mortality ratio (estimated at 223 maternal deaths per 100 000 live births as at 2020) remains far above the Sustainable Development Goal (SDG) target 3.1 of not more than 70 maternal deaths per 100 000 live births by 2030. Progress in recent years has stalled.

To reinvigorate efforts, WHO convened a Global Summit on PPH in March 2023. The broad range of participants were drawn from governments (ministries of health), health care professions, research institutions and academia, professional associations, national and international non-governmental organizations, civil society organizations, donor agencies and innovators from the pharmaceutical and medical devices industries and the private sector. Over the months leading up to and following the conclusion of the Summit, participants worked together to establish a shared agenda for ending preventable deaths due to PPH. The result of that collective effort is this *Roadmap to combat postpartum haemorrhage between 2023 and 2030*.

The Roadmap is organized around four strategic areas, which reflects the end-to-end thinking of science and strategic action working synergistically for profound and sustained impact in combatting PPH. It starts with research, which is necessary to establish the evidence base for a new intervention. It then moves into norms and standards – the technical guidance recommending for or against a specific intervention as well as the tools to support implementation. Next, the Roadmap addresses implementation and the myriad factors that shape whether and how a recommended intervention is translated into clinical practice. Finally, the Roadmap paves the way for greater advocacy – a critical component of ensuring the process from research to practice moves smoothly and swiftly, so women and clinicians can access the resources needed to save lives.

The Roadmap contributes to ongoing global efforts to improve maternal health and well-being catalysed by the Global Strategy for Women's, Children's and Adolescents' Health (2016–2030), and the Every Newborn Action Plan and Ending Preventable Maternal Mortality (ENAP-EPMM) acceleration plans in countries. Efforts are underway to ensure integration of the activities in the Roadmap across existing work to support countries to fast-track progress towards achieving universal health coverage (UHC).

Importantly, the Roadmap is not owned by any single organization. Rather, it is a shared plan – developed and held collectively – for building a future where mothers, families and communities thrive. We encourage all relevant stakeholders to join in advancing the activities of the Roadmap.

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Abbreviations

CHNRI	Child Health and Nutrition Research Initiative
CSO	civil society organization
EML	Essential Medicines List
ENAP	Every Newborn Action Plan
EPMM	Ending Preventable Maternal Mortality
FIGO	International Federation of Gynecology and Obstetrics
GDG	Guideline Development Group
GFF	Global Financing Facility
HIC	high-income country
HRP	UNDP-UNFPA-UNICEF-WHO-World Bank Special Programme of Research, Development and Research Training in Human Reproduction (also known as the Human Reproduction Programme)
HSC	heat-stable carbetocin
ICM	International Confederation of Midwives
IM	intramuscular
IMNHC	International Maternal Newborn Health Conference
IV	intravenous
Jhpiego	Johns Hopkins Program for International Education in Gynecology and Obstetrics
LMIC	low- and middle-income country
MMR	maternal mortality ratio
MoH	ministry of health
NGO	nongovernmental organization
PPH	postpartum haemorrhage
SDG	Sustainable Development Goal
SRA	Stringent Regulatory Authority
TB	tuberculosis
TPP	target product profile
TPoP	target policy profile
TXA	tranexamic acid
UHC	universal health coverage
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USA	United States of America
USAID	United States Agency for International Development
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 after birth, is the leading cause of maternal mortality worldwide. It affects millions of women every year and accounts 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. Most maternal deaths from PPH occur in sub-Saharan Africa and south Asia. The estimated global maternal mortality ratio (MMR) of 223 maternal deaths per 100 000 live births in 2020 makes it clear that countries are significantly off track in terms of progress towards achieving the Sustainable Development Goal 3 (SDG 3), target 3.1, which is to reduce the global MMR to less than 70 per 100 000 live births by 2030. Additionally, progress in reducing maternal mortality has stalled over the past 5–10 years and projections for the next several years to 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 efforts to address PPH have failed to gain traction. There are key knowledge gaps regarding how best to prevent, detect and treat PPH. **Research** investments into determining what works and how best to deliver proven PPH interventions are 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 duplication of efforts as well as guidance documents that are not always consistent among the different developers. This can create uncertainties for the intended end-users, especially in LMICs – policy-makers at ministries of health, health managers and health workers – who may struggle to decide 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 context specific 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 nongovernmental organizations (CSOs and NGOs) can be powerful catalysts for global action, but these are generally underutilized for PPH. Concerted efforts 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 PPH prevention and care, the World Health Organization (WHO) worked together with key stakeholders to develop this Roadmap to combat postpartum haemorrhage. The Roadmap outlines goals, activities and milestones for global-level research, normative work (i.e. relating to norms and standards), implementation and advocacy, between 2023 and 2030, to address key PPH priorities and fast-track progress towards SDG target 3.1. This Roadmap establishes an innovative, solution-driven and customized strategic framework that is centred on the maternal health goals and priorities of countries with a high burden of PPH, and which calls for 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,

by pursuing the required technical, investment and policy 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 the Roadmap was based on a detailed review of the state of the field with respect to the four strategic areas (research, norms and standards, implementation and advocacy), and a rich array of contributions and input received through online surveys and in-person discussions among a large group of stakeholders working in these areas at international and country levels. To ensure that the review of 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. WHO established a Steering Committee to provide oversight and methodological guidance for identifying and prioritizing gaps in research, norms and standards, implementation and advocacy. WHO gathered a broad range of stakeholders – drawn from governments (ministries of health), health care professions, research institutions and academia, professional associations, national and international NGOs, CSOs, donor agencies and innovators from the pharmaceutical and medical devices industries and the private sector – to engage 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. To identify research gaps, an initial long list of research questions was developed based on input received from the group of stakeholders, and research priorities derived from WHO and other international guidelines, systematic reviews, analysis of PPH medicines and devices in the pipeline, and unaddressed questions from previous prioritization exercises relating to sexual, reproductive and maternal health. A process of curation and consolidation resulted in a list of 72 research questions divided into three tracks (innovation, implementation and cross-cutting), which were then scored and prioritized by the same stakeholders according to set of five criteria. The 10 top-ranked questions per track (30 questions in total) were then selected to form the basis of further discussions and prioritization during an in-person meeting – the Global Summit on Postpartum Haemorrhage (the PPH Summit).

To address the strategic area of **norms and standards**, 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 existing PPH recommendation was reviewed, and new evidence searches were conducted to identify new impactful evidence and determine the need for new or updated WHO recommendations.

A multipronged strategy was deployed to better understand barriers to **implementation**. To understand contextual challenges responsible for slow uptake of PPH evidence and evidence-based recommendations, as well as country-level implementation bottlenecks, WHO commissioned three country examples representing different contexts – Nigeria, Pakistan and the United Republic of Tanzania. Seven countries that have achieved significant progress in reducing maternal and neonatal mortality were also analysed to identify lessons and best practices for how to address bottlenecks to implementation. In addition, a framework of essential prerequisites for successful implementation of existing PPH recommendations was developed. Then, an online survey was conducted among the group of stakeholders to understand to what extent these pre-requisites were met for recommended interventions. Survey responses were triangulated with data from health care facilities indicating the extent to which each recommended intervention was reaching women in each setting.

To achieve a shared understanding and prioritization of PPH **advocacy** gaps, an overview of the current global PPH advocacy landscape was developed to identify key active organizations and initiatives and to highlight the limitations and critical gaps in the current ecosystem. In parallel, a similar landscape overview of other global health sector ecosystems (e.g. family planning and HIV/AIDS) was conducted to identify successful advocacy efforts that could be replicated for PPH.

The outputs from the above activities underpinned the discussions among the 138 participants at the PPH Summit, convened by WHO from 7 to 10 March 2023 in Dubai, United Arab Emirates. These outputs were presented at the Summit's plenary and breakout sessions to help stakeholders make informed decisions on the highest priority gaps and the corresponding set of solutions, and to develop a clear agenda for collective action to be formulated into a roadmap. This Roadmap that emerged reflects synthesized evidence, stakeholders' input and further refinement of the proposed solutions and courses of action after the PPH Summit.

The Roadmap

The Roadmap set out key priority actions and a timeline for applying them to combat the burden of PPH and the related mortality and morbidity, as agreed by stakeholders at the 2023 PPH Summit. It is informed by and structured around four interlinked strategic areas – research, norms and standards, implementation and advocacy – that are necessary to catalyse efforts and accelerate attainment of country goals to avert maternal deaths. Under each strategic area, the Roadmap describes specific actions and deliverables for time points across the period 2023–2030, and thus serves as a cornerstone reference document for the next seven years. Figure 1 provides an overview of some of these actions and deliverables. Details for each of the strategic areas are summarized below, and more information and a figure for each strategic area can be found in Chapter 3 of this document.

Strategic area: research

Research is fundamental to achieving progress for any health condition. Stagnancy in research, including implementation research, has the potential to impair initiatives for reducing the risk of PPH and related maternal mortality and morbidity. Alignment among stakeholders on priority PPH research gaps can focus investment to reduce waste/duplication of funding and research efforts, and enable swifter and more effective responses to public health needs. Fifteen research questions across three tracks (innovation, implementation and cross-cutting) were identified as particularly critical for advancing actionable knowledge around PPH through 2030 (and beyond 2030 for research priorities in the innovation track, which tend to take longer to translate into real-world impact). The top question per track called for: research on the comparative effectiveness and safety of alternative routes of administration (i.e. other than intravenous) of tranexamic acid in the treatment of PPH (innovation); identifying barriers and facilitators affecting the adoption and use of evidence-based recommendations for PPH management (implementation); and determining the effectiveness of a strategy of early detection and first response treatment using a bundle of recommended interventions for improving PPH-related outcomes (cross-cutting). The next steps will be for WHO and partners to refine the framing of the top 15 prioritized research questions to improve clarity, conduct a rapid scan of ongoing research, articulate the ideal research questions, outline the best research designs, develop target policy profiles (TPoPs) that indicate what research is still needed to inform policy decisions, clarify the innovation pathways and data requirements, and assess the funding gaps for the research agenda.

After this process, it is expected that donor agencies will use this information as the basis for launching calls for research proposals in the first quarter of 2024, such that the grantees will start their research in 2024. Results for the first batch of funded research proposals are anticipated to be published and disseminated by 2027 or sooner, and WHO and other guideline developers will update their PPH guidance to reflect the 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 gaps in norms and standards relating to PPH, as results of the prioritized research will be integrated into global and national guidelines and policies to influence practices on a continual basis.

Strategic area: norms and standards

To address gaps and inconsistencies 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, the International Federation of Gynecology and Obstetrics (FIGO) and the International Confederation of Midwives (ICM). To this end, WHO will establish a Steering Group to explore the internal mechanisms across these organizations to determine the feasibility of joint publication of consolidated PPH guidelines, which must also take into account previously underrepresented topics and evidence from women's perspectives and LMIC realities. The Steering Group will review and agree on the scope of the guidelines and propose members for the guideline development panel by the last quarter of 2023. The collaborating organizations are expected to pool resources to commission evidence syntheses and development of evidence profiles during 2024, with the ambitious goal of publishing the consolidated PPH guidelines in early 2025.

In the interim, WHO and partners will continue to respond to new, impactful evidence on PPH in order to issue individual stand-alone recommendations through their current internal procedures (e.g. the WHO "living guidelines" approach) until the consolidated guidelines are published. Once published, these consolidated guidelines and derivative products will be widely disseminated and translated and then will be subject to the living guidelines approach by which evidence that emerges from the priority research described above will be incorporated. 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. the United States Agency for International Development [USAID], Concept Foundation, MSD for Mothers) will review the PPH policy contexts of countries with high burdens of PPH and maternal mortality, and provide the technical and financial support to update PPH policies and adapt them to these local contexts. In addition, an ambitious goal has been set to achieve up-to-date PPH policies in at least 20 high-burden countries by the last quarter of 2024. This effort will then be used as a model for engagement of stakeholders, which can be expanded to other LMICs as needed between 2025 and 2030.

Strategic area: implementation

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 potentially the single most impactful of the four strategic areas. The highly contextual nature of many implementation barriers means that they may not be easily amenable to change in response to global-level campaigns, but will need locally tailored solutions. Aware of the many implementation barriers that need addressing, stakeholders at the PPH Summit prioritized five categories of implementation barriers as those that are amenable to and in critical need of global-level action. Stakeholders further articulated the priority actions that the global community can undertake to address each category of implementation barrier. The five categories of barriers are:

- lack of clear national policy and leadership (including lack of national targets, systematic collection of data to measure progress, and mechanisms to translate global guidelines for in-country use);
- weak procurement and supply chain systems (PPH commodities suffer from stock-outs and substandard quality);
- poor staffing, training and supervision of health workers (not enough well trained, empowered and motivated health workers, outdated licensing and regulatory infrastructure prevents task sharing for PPH interventions);
- inequities and poor access to good quality care (persistent disparities, lack of access for disadvantaged populations); and

- women's limited rights and social status (unfavourable legal, social and cultural norms and obstacles limit women's life choices and options relating to pregnancy and childbirth).

Priority actions to strengthen national policy and leadership for PPH include creating a global PPH framework to structure comprehensive PPH prevention and management programmes; developing and deploying an efficient and sustainable global monitoring system that includes common indicators, systematic data collection, and a common measurement platform, to track country progress against targets; and adapting national guidelines to local contexts and disseminating them to all levels of the health system, from national and subnational levels to community-based health care facilities. To enhance procurement and supply chain systems, proposed actions include collaboration within the international community to ensure strong coordination between partners, increased investments and expansion of existing or new procurement initiatives; and identifying possible solutions to strengthen procurement and supply chains with the aim of launching an initiative in 2026 (efforts must cover devices, medicines and blood products). To address the issues of human resources, the key actions include strengthening pre- and in-service training programmes and professional development relevant to PPH management; and implementing broader human resource strategies to address chronic shortages of qualified health workers (midwives, nurses, doctors). Tackling inequities and barriers to access requires enhancing service-delivery infrastructure to strengthen facilities; improving transportation and referral systems; and supporting the development of government 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 recognized that strategies to improve women's rights and social status will have a major impact on overall health outcomes for women, beyond PPH, it was also acknowledged that these gains were unlikely to be achieved in the short or medium term. Nonetheless, priority actions that can be undertaken in the short-term include tireless advocacy by all stakeholders for women and their rights to be at the centre of the political agenda at all levels; 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 health benefits from sustained funding.

Strategic area: advocacy

There is currently no unifying force in the field of PPH prevention and management to drive the PPH agenda and aggregate funding. A strong advocacy push is therefore needed at different levels, to elevate PPH on global political agendas. Five major areas were prioritized as targets for advocacy efforts: (i) policy-makers and politicians must support the removal of legislative and regulatory barriers hindering access to life-saving care; (ii) ministries of health and relevant national health agencies must update national guidelines; (iii) the role of the midwife should be elevated and adequate training and support ensured; (iv) the importance of the availability, affordability and quality of PPH commodities and technologies should be elevated to ministerial level; and (v) the general population should be targeted with awareness-raising efforts. By the fourth quarter of 2024, a global branding strategy and a global advocacy framework for reducing PPH-related maternal mortality should be developed, to unify advocacy efforts and messaging. The strategy and the framework will include a strong accountability mechanism, evidence-based messaging and materials that can be tailored as needed. During 2024 and 2025, stakeholders will also develop regional- and national-level advocacy frameworks and materials. Finally, a Global PPH Day will be established, and a suitable date will be identified with the aim of holding the first Global PPH Day in 2025, which will also serve as a launch pad for the PPH branding strategy. Advancing this ambitious advocacy agenda requires that all PPH stakeholders be engaged and work synergistically. Ministerial commitment is crucial so that PPH is prioritized and relevant programmes are adequately resourced. Women should be at the centre. PPH efforts should not be implemented in isolation, but rather should be used as an entry point to address a broader maternal health agenda to reduce the burden of maternal death and ill health.

A global Call to Action

To amplify the priority actions summarized above and detailed in the full Roadmap document, a consensus-driven global Call to Action was developed, which clearly and compellingly articulates the actionable expectations from a wide array of stakeholders and emphasizes 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 distil what is required to achieve the goals by each of the following stakeholder groups: the overall international community, women and women's groups, ministries of health, implementers (including NGOs and CSOs), professional associations, guideline developers, the research community, industry and innovators, and donor agencies. It outlines the key learnings that emerged from the PPH Summit and calls for immediate action to ensure effective and coordinated efforts towards eliminating preventable deaths from PPH, as outlined in the Roadmap.

Implementation and monitoring of the Roadmap

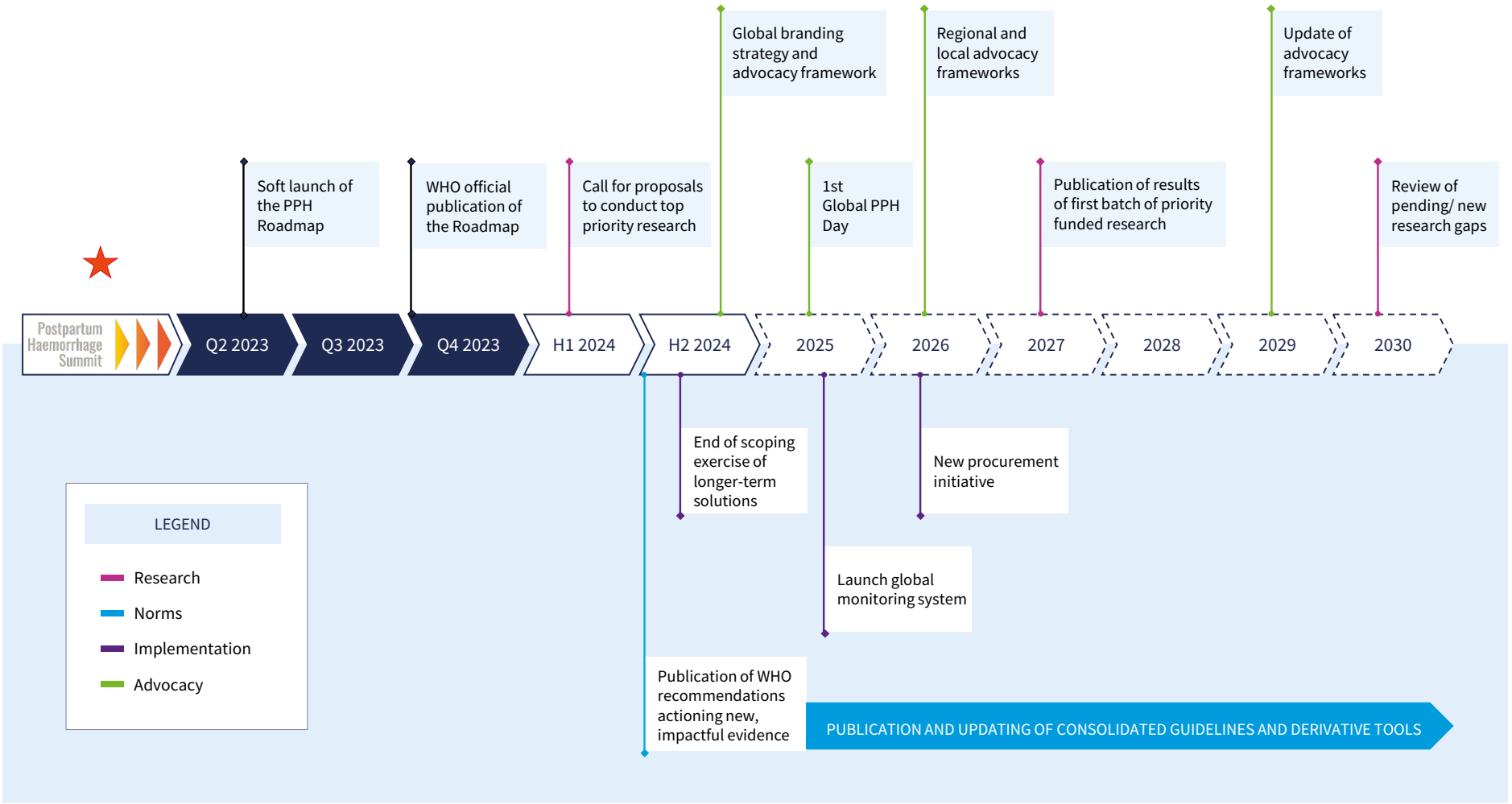
Successful implementation of the Roadmap will require concerted efforts by all stakeholders across the international, national and subnational levels, and sustained donor commitment. WHO will serve as an initial catalyst for key activities in the short-term, including through helping to establish a structure 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.

The key goals and milestones of this Roadmap were presented at the International Maternal Newborn Health Conference, 8–11 March 2023, in Cape Town, South Africa, to obtain initial feedback. Following publication, the Roadmap (this document) and related tools to aid local adaptation will be disseminated through conferences and webinars, through WHO regional and country offices, ministries of health, professional organizations, WHO collaborating centres, other United Nations agencies, CSOs and NGOs, among others. The Roadmap will be translated into the six United Nations languages, and journal articles presenting each strategic area and key implementation considerations will be prepared for publication in peer-reviewed journals. These dissemination activities will help to ensure generalized awareness of the Roadmap among all relevant stakeholder groups.

Implementation of the Roadmap and progress toward key milestones will be monitored through a global accountability platform that is open and accessible to the public. This global accountability platform will be developed as one of the initial activities in the Roadmap.

If nothing changes, an additional half a million women will die due to 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 die from a condition that is both preventable and treatable. This future is possible. The Roadmap shows us how to get there.

Fig. 1. Top-level milestones in the Roadmap to combat postpartum haemorrhage (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, millions of women experience PPH, resulting in about 70 000 maternal deaths globally, which is over 20% of all maternal deaths *(1)*. Women who survived life-threatening PPH are likely to have undergone 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 low- and middle-income countries (LMICs), especially those who lack access to quality care. Approximately 80% of deaths from PPH occur in LMICs, mostly in sub-Saharan Africa and south Asia, even while deaths from PPH have been nearly eliminated in high-income countries (HICs) *(2)*. Persistent disparities and inequities in maternity care often underlie deaths from PPH where they occur in HICs *(3, 4)*.

1.2 Why is a Roadmap needed to combat PPH?

Despite the ambition to end preventable maternal deaths by 2030, many countries are not on track to meet their maternal mortality targets, which are part of Sustainable Development Goal 3 (SDG 3). The global maternal mortality ratio (MMR) in 2020 was estimated at 223 maternal deaths per 100 000 live births. This is still very far above SDG target 3.1 of not more than 70 per 100 000 live births by 2030 and, alarmingly, progress in reducing maternal mortality has stalled over the past 5–10 years *(5)*. This stagnation means that without rethinking the future and taking appropriate actions at global and national 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 and interventions. 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 the pharmaceutical and medical devices industries are often uncertain what type of research is needed and how to connect evidence to decision-making and policy-making, leading to wasted research efforts and/or excessive delays in translating research ideas and evidence into impact (improved health outcomes). Target product profiles (TPPs) *(6)* and target policy profiles (TPoPs) *(7)* are supposed to provide guidance for researchers, product developers and policy-makers. Yet, TPPs have not generally been described prior to research and development of PPH interventions and the concept of TpoPs is relatively new to those who make funding decisions about research. In short, there is no shared vision on what the ideal future PPH products or interventions should be, or what evidence WHO and other global guideline developers would need on new products to develop new or updated global recommendations.

Reputable normative documents (i.e. relating to norms and standards) are available to set standards of care and provide guidance on the use of evidence-based interventions. The World Health Organization (WHO) has kept

its PPH guideline portfolio (8-14) up to date using a "living guidelines" approach since 2017 and provided support for inclusion of new PPH medicines in the WHO Essential Medicines List (EML) *(15)*. Several other international organizations 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 recommended clinical practice. Consequently, end-users are often uncertain of which guideline to adopt. Delayed or haphazard guideline adoption undermines health workers' ability to deliver quality, evidence-based care.

Interventions that hold potential to significantly reduce PPH-related morbidity and deaths have proved difficult to embed and scale up within health systems in LMICs. For example, while heat-stable carbetocin (HSC) and tranexamic acid (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 authorizations may bar implementation of evidence-based recommendations (including appropriate task sharing among different cadres of health workers where there are gaps in human resources). Health workers often lack the necessary resources and tools, ongoing support and feedback to implement guidelines in their practice. Financial barriers continue to limit provision of and access to life-saving maternity care. Effective efforts are rarely made to engage communities in the process, which would help to raise awareness. Effectively addressing these challenges often requires cross- and multisectoral 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 galvanize local action to improve transportation infrastructure, abolish user fees for maternity care and develop safe blood bank 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 organizations (CSOs) and nongovernmental organizations (NGOs) are disjointed because of lack of clarity on PPH priorities.

Overall, research, normative, implementation and advocacy efforts are all 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) at the WHO Department of Sexual and Reproductive Health and Research worked together with many international stakeholders to develop a Roadmap to combat postpartum haemorrhage (hereafter referred to as the Roadmap), outlining global-level research, normative, implementation and advocacy goals, activities and milestones from 2023 to 2030, to address key PPH priorities and accelerate progress towards SDG target 3.1.

This Roadmap establishes an innovative, solution-driven and customized strategic framework that is centred on the maternal health goals and priorities of countries with a high burden of PPH, and which calls for 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 policy 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, implementers (including

CSOs and NGOs), ministries of health, and also the general public – particularly women. The Roadmap should serve as a valuable resource for governments, relevant ministries, and national, regional and local health authorities, as well as directors of public health institutes, public health associations and other relevant organizations and agencies, which they can adapt to fit the needs of their respective contexts.

1.4 Objective and scope of the Roadmap

This Roadmap has three key objectives.

i. Align all stakeholders in the field around key priorities and actions required to meet shared goals and objectives.

ii. Focus work on key activities to remove duplication of efforts.

iii. Engage stakeholders to urgently advance PPH work across countries.

The Roadmap is a high-level plan, with major milestones that must be attained to achieve the necessary impact. It is not a detailed project plan that outlines every step that needs to be taken, but rather it includes key ingredients to be actioned. These include alignment on: the goals to be achieved; a timeline with major milestones and sequencing of activities, and allocation of roles and responsibilities; 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), which was convened by WHO in March 2023 (further details are in Chapter 2). 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 of care and health outcomes by addressing leading causes of maternal mortality and morbidity. Additionally, the Roadmap is intended to function as a mechanism to promote collaboration and establish 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, centred around the PPH Summit.

WHO convened the PPH Summit, 7–10 March 2023 in Dubai, United Arab Emirates, with the following objectives:

i. to review the progress of research and development for PPH innovations in the pipeline and define the evidence requirements for policy changes;
ii. to identify and forge alignment on top priority research gaps in PPH;
iii. to identify and forge alignment on top priority gaps in PPH norms and standards;
iv. to identify and forge alignment on top priority implementation gaps in PPH and identify strategies for equitable and sustainable access to effective interventions;
v. to identify and forge alignment on top priority advocacy gaps in PPH and identify sustainable strategies to address these gaps;
vi. to summarize the challenges and develop a clear Roadmap for addressing them; and
vii. to form strong coalitions and boost funding streams to address PPH challenges.

Briefly, the steps for developing the Roadmap included: (i) selection of participants/ contributors; (ii) systematic identification of research, normative, implementation and advocacy gaps to support prioritization efforts; (iii) convening the PPH Summit to obtain consensus on the top priority gaps and forge alignment on a common set of solutions to address those gaps; and (iv) translation of the prioritized gaps and solutions into a Roadmap and a Call to Action. These four steps are elaborated in the four sections of this chapter.

2.1 PPH Summit participants and contributors to the Roadmap

WHO established a Steering Committee to provide oversight and methodological guidance before, during and after the PPH Summit. In parallel, in advance of the Summit, a Scientific Committee was established to identify research gaps, review the pipeline for novel PPH medicines and devices, map existing PPH recommendations across reputable guidelines, and develop country examples in high-burden countries. The development of the Roadmap was based on a detailed review of the state of the field with respect to the four strategic areas (research, norms and standards, implementation and advocacy), and a rich array of contributions and input received through online surveys and in-person discussions among the Summit participants, including the members of these two committees. WHO staff provided coordination and ensured that the methods used complied with WHO internal procedures.

The 138 Summit participants were stakeholders whose work relates to the four strategic areas at international and country levels. They were drawn from governments (ministries of health), health care professions, research institutions and academia, professional associations, national and international NGOs, CSOs, donor agencies and innovators from the pharmaceutical and medical devices industries and the private sector. Participants attended the Summit in their own individual capacity, not as delegates of organizations. The members of the Steering and Scientific Committees were selected from across the participants, ensuring regional and gender balance. The list of contributors can be found in Annex 1.

2.2 Before the PPH Summit: identifying gaps in the strategic areas

In advance of the PPH Summit, several activities were undertaken by the Steering and Scientific Committees to identify gaps in all four of the strategic areas.

Research and development

The development process for the research agenda followed WHO's systematic approach for undertaking research priority-setting *(16)*. 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, systematic reviews, analysis of PPH medicines and devices in the pipeline, and unaddressed questions from previous research prioritization exercises relating to sexual, reproductive and maternal health *(17)*. Summit participants were asked to submit additional questions. The full list was then curated to reach a consolidated list of 72 research questions (a flowchart for the process is provided in Annex 2). These 72 questions were divided into three tracks: innovation (26 questions), implementation (24 questions) and cross-cutting (22 questions), building on the existing and validated Child Health and Nutrition Research Initiative (CHNRI) categories (discovery, delivery, description, development) *(18)*, reframed into clearer language. The 72 research questions were scored and prioritized by applying the CHNRI methodology *(19)*. First, Summit participants were asked to assess the 72 questions against five criteria: answerability, effectiveness, deliverability, impact and equity. Each question was assigned a score based on respondents' assessments, which were submitted using an online survey (120 participants submitted assessments out of 126 who were pre-registered for the PPH Summit). The 10 top-ranked questions per track (30 in total) were then selected to be further discussed and prioritized during the PPH Summit.

Norms and standards

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

This mapping exercise resulted in the identification of 11 consistent recommendations (out of 69) and four inconsistent recommendations across the guidelines. Recommendations were considered consistent if at least five of the nine guidelines made similar recommendations on the intervention of interest and inconsistent if at least two guidelines had contradicting recommendations. Several interventions are not currently recommended at all in most of the guidelines (i.e. categories iii and iv above). These discrepancies reflect the need for a common core set of global recommendations to facilitate in-country implementation.

The second phase of preparatory work had two objectives: (i) to conduct a review and update of the evidence base underpinning existing WHO PPH recommendations and identify which recommendations are highest priority for updating, based on any shifts in the

evidence base that could impact the existing recommendations; and (ii) to review the updated evidence underpinning recommendations from other guideline developers and determine the need for new WHO recommendations.

Based on this work, the following recommendations were prioritized for updating:

- Carbetocin (100 µg, intramuscular or intravenous [IM/IV]) for prevention of PPH for all births in contexts where its cost is comparable to other effective uterotonics.
- Tranexamic acid (TXA) (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 IV iron for postpartum anaemia.

Implementation

A multipronged strategy was deployed to better understand barriers to 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, WHO commissioned three country examples representing different contexts – Nigeria, Pakistan and the United Republic of Tanzania. The countries were selected from the two regions with highest burden of PPH (Sub-Saharan Africa and South Asia), considering their absolute number of maternal deaths per year, latest estimates on maternal mortality ratio (MMR), and slow progress in MMR reduction over the last decade. *(5)* These country examples generated the necessary information to understand on-the-ground implementation challenges, and also provided useful lessons from settings where there has been success in tackling these challenges, as they relate to old as well as newly introduced PPH interventions in different settings.

Seven countries that have achieved significant progress in reducing maternal and neonatal mortality – Bangladesh, Ethiopia, India, Morocco, Nepal, the Niger and Senegal *(5)* – were also analysed to identify lessons and best practices for how to address bottlenecks to implementation. The contributions of positive shifts in health system policies and programmes, financing, human resources, intervention coverage, quality of care and contextual factors were examined in detail to understand how they led to observed declines in maternal and neonatal mortality. Key drivers identified for reductions in MMRs included increased facility-based births, improved access to skilled health personnel to provide care during childbirth, and increased availability of uterotonics.

In parallel, a framework was developed articulating the essential prerequisites for successful implementation of PPH recommendations. Based on this framework, an online survey on bottlenecks to implementation of evidence-based interventions was conducted, aimed at understanding to what extent the essential prerequisites for successful implementation have been met for recommended interventions. PPH Summit participants were asked, in advance of the summit, to assess the implementation of 20 clinical interventions recommended by WHO, by responding to a set of six questions for each intervention and four additional questions if a medicine or device is involved in the intervention (see Annex 4 where the full list of interventions is given in the rows and the questions/barriers are shown in columns); 102 participants submitted responses out of 126 who were already pre-registered for the Summit. For each recommended intervention, scores were assigned based on respondents' answers to the questions and these scores (for each question for each intervention) were then summed up across respondents, divided by the total number of responses to create a percentage, and these were finally used to populate a heatmap (see Annex 4) to help visualize priority gaps. During

the PPH Summit, participants were presented with the heatmaps, as well as data collected from health care facilities in Nigeria, Pakistan and the United Republic of Tanzania indicating the extent to which each recommended intervention was available and used in each setting.

Advocacy

To achieve a shared understanding and prioritization of PPH advocacy gaps, an overview of the current global PPH advocacy landscape was developed to identify the key active organizations and initiatives and to highlight the limitations and critical gaps in the current ecosystem. In parallel, a similar landscape overview of other global health sector ecosystems (i.e. family planning, HIV/AIDS, vaccines, tuberculosis, malaria, neglected tropical diseases, nutrition and health systems) was also conducted to identify successful advocacy efforts that could be replicated for PPH.

2.3 During the PPH Summit: building consensus on priority gaps and solutions

The outputs from the above activities to identify gaps underpinned the discussions among the stakeholders participating during the PPH Summit. These outputs were presented at the Summit's plenary and breakout sessions to help stakeholders make informed decisions on the highest priority gaps and the corresponding set of solutions, and to develop a clear agenda for collective action to be formulated into a roadmap. The PPH Summit discussions were organized around the product introduction value chain, starting with research and development, then moving to norms and standards, implementation and advocacy.

Research and development

The 10 top-ranked research questions for each track (innovation, implementation, cross-cutting) were further prioritized to reach a short list of five top-priority questions per track. For each track, the 10 research questions were reviewed through explanatory briefs that included the rationale and problem statement for the research questions, after which each participant had the opportunity to select their five top priority questions and rank them from 1 to 5. After the participants had made these initial selections and rankings, the results were discussed and changes were made in some cases to reach consensus on a list of the top five research questions per track and their ranking (a second vote or selection was made after clarification of some misunderstandings around wording). The set of 15 questions in presented in Table 3.1 in section 3.1 in the next chapter.

Norms and standards

A panel of representatives from professional associations discussed alignment of priorities for PPH recommendations. A plenary question-and-answer session also provided an opportunity for participants to raise additional items for consideration as priority issues or as subjects for new recommendations and updates to guidelines to be undertaken by WHO and other international bodies (further information is presented in section 3.2 in the next chapter).

Implementation

A panel of representatives from ministries of health discussed the challenges in implementing life-saving interventions in their respective countries. The challenges raised included poor supply management (especially for uterotonics), weak referral systems and issues with retention and training of health workers. These discussions helped to inform the prioritization of implementation bottlenecks.

Out of a longer list of implementation barriers categorized into four key themes – national context, programme and investment, commodities and service delivery (Table 2.1) – participants discussed and reached consensus on five categories of implementation barriers that are amenable to global solutions and actions, and then laid out concrete steps for the future. These are presented in Table 3.2 in section 3.3 in the next chapter.

Table 2.1 Categories of implementation barriers

Implementation theme	Category of implementation barriers
 **National context**	▶ **Women's rights and social status** (e.g. lack of education, low social status, constrained choices around pregnancy and childbirth) ▶ **Legislative and non-health policy measures** (e.g. lack of laws protecting women from gender-based violence and early marriages, lack of women's political power) ▶ **Health emergencies** (e.g. natural disasters, armed conflict, outbreaks of infectious diseases) ▶ **National health policy and leadership** (e.g. health sector governance, leadership skills, health policies, policy advocacy)
 **Programme and investment**	▶ **Technical postpartum haemorrhage (PPH) guidelines** (e.g. out of date, lacking local data, not linked to subnational implementation) ▶ **Programme development from pilot to full scale** (e.g. no handover/exit strategy, vertical programmes) ▶ **Equity and access to care** (e.g. persistent disparities, limited data, lack of access for vulnerable and marginalized groups, lack of engagement with the private sector) ▶ **Investment** (e.g. stagnant government expenditure, lack of sustainability of externally funded programmes)
 **Commodities**	▶ **Regulatory** (e.g. poor post-marketing surveillance, non-harmonized regulatory pathways, complex or non-existent regulatory pathways for devices) ▶ **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 health workers to prevent stock-outs) ▶ **Quality** (e.g. poor-quality products, cold chain difficult to maintain, little incentive for manufacturers to obtain WHO Prequalification or Stringent Regulatory Authority approval) ▶ **Affordability and out of pocket expenditures** (e.g. lack of free maternity care, unaffordable private-sector health-service provider is the only provider available, certain commodities not provided by government)
 **Service delivery**	▶ **Job aids for guideline implementation** (e.g. lack of expertise for adapting guidelines into clinical protocols and job aids; clinical protocols not available, accessible, usable or appropriate) ▶ **Referral pathways between levels of care and community** (e.g. unclear when and where women should go/where providers should refer women for childbirth or emergency care, transport issues, referral pathways not used effectively) ▶ **Staffing, training and supervision of health workers** (e.g. acquiring and maintaining skills, roles/status of midwives and nurses, human resources for health in remote areas) ▶ **Audit and feedback** (e.g. private-sector health-service providers not regulated or accountable, limited local capacity to use data for decision-making)

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 the local level and learnings from their experience. Further contributions from PPH Summit participants built on the key lessons shared by the panellists and led to consensus on future priority actions (further information is presented in section 3.4 in the next chapter).

2.4 Outputs of the PPH Summit: integrating priority solutions into a Roadmap and Call to Action

During the PPH Summit, the concept of a roadmap, key ingredients to make a roadmap actionable and why a roadmap is needed for PPH 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 milestones and sequencing, and assigning roles and responsibilities based on the outputs from the previous sessions.

Immediately following the PPH Summit, work began to further elaborate the **Roadmap** across the four strategic areas, leveraging inputs from the participants, feedback from the Steering and Scientific Committees, targeted interviews, meetings with donors and additional desk research. The Roadmap that emerged reflects synthesized evidence, stakeholders' input and further refinement of the proposed solutions and courses of action after the PPH Summit. This work is presented in the next chapter of this document.

The complementary key deliverable of the PPH Summit – in addition to the Roadmap – was a consensus-driven Call to Action. This **Call to Action** is intended to publicly outline the rationale for change, show evidence that change is possible, and articulate what is required from different stakeholder groups. The ingredients for the Call to Action were collated electronically from all Summit participants following a presentation and discussion of the case for change, the proof of the possibility, proposed calls to different stakeholder groups, and evidence that this is the right time to act. 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. All Summit participants agreed to be signatories of the final Call to Action, which is presented in Chapter 4.

2.5 Declaration of interests by external contributors

In accordance with WHO regulations, all external contributors were asked to declare in writing their competing interests prior to their engagement in the processes and meetings that led to the development of the Roadmap. All external contributors completed and signed a standard WHO Declaration of Interest (DOI) form and sent it to the responsible technical officer at the WHO. All contributors were instructed to notify the WHO responsible technical officer of any change in relevant interest during the course of their engagement, in order to review and update conflicts of interest accordingly. The WHO coordination team reviewed all declarations to determine whether any declared conflict of interest was serious enough to pose any risk to the process of developing the Roadmap or reduce its credibility. All findings from the received DOI statements were managed in accordance with the WHO DOI guidance on a case-by-case basis. Conflicts of interest arising from academic research, normative activities, implementation, advocacy, or private sector participation in the area of PPH were noted but not considered serious enough to preclude contribution to the development of the Roadmap. During meetings, all external contributors were required again to openly state any conflicts of interest to all meeting participants. A summary of the DOI statements can be found in Annex 1.

3. The Roadmap

This Roadmap sets out key priority actions and a timeline for applying them to combat the burden of PPH and the related mortality and morbidity, as agreed by stakeholders at the 2023 PPH Summit. It is informed by and structured around four interlinked strategic areas – research, norms and standards, implementation and advocacy – that are necessary to catalyse efforts and accelerate attainment of country goals to avert maternal deaths. Under each strategic area, the Roadmap describes specific actions and deliverables for time points across the period 2023–2030, and thus serves as a cornerstone reference document for the next seven years. The Roadmap identifies shared priorities and potential synergistic actions at country and regional levels that will make a positive impact on global MMR, which has stagnated over the last 5–10 years. It sets out essential activities that are results-oriented and which need to be implemented by a range of actors, including ministries of health, implementers, research institutions and academia, professional organizations, women and women's groups, governments and nongovernmental actors.

Sections 3.1–3.4 in this chapter detail the priority actions for each of the four strategic areas. Interdependencies and interlinkages between the four strategic areas are described in section 3.5.

3.1 Strategic area: research

Research is fundamental to achieving progress for any health condition. Stagnancy in research, including implementation research, has the potential to impair initiatives for reducing the risk of PPH and related maternal mortality and morbidity. Alignment among stakeholders on priority PPH research gaps can focus investment to reduce waste/duplication of funding and research efforts, enabling swifter and more effective responses to public health needs.

Fifteen research questions across three tracks (innovation, implementation, cross-cutting) were identified by stakeholders during the PPH Summit as particularly critical for advancing actionable knowledge around PPH through 2030 (and beyond 2030 for the innovation track, as this type of research tends to take longer). There is need for a fully funded joint research agenda to support the 15 priority research questions, which are listed in Table 3.1. 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.

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

3.1.1 Key activities and milestones

The immediate step needed to address these priorities is for **WHO and partners** to start the preparatory work that will lead to calls for proposals being issued in the first quarter of 2024 to implement the research agenda. Preparatory activities will include:

- **in the second quarter of 2023**, refining the framing of the 15 prioritized research questions to improve clarity;
- **in the second quarter of 2023**, conducting a rapid scan of ongoing research to understand whether there are ongoing studies poised to respond to the priority research questions;
- **in the third quarter of 2023**, articulating the ideal research questions for each priority question and providing guidance on research design;
- **in the third quarter of 2023**, drafting target policy profiles (TPoPs) to give an indication of the research requirements for future policy-making decisions, and what guidance could potentially look like if a given research question were to be addressed;
- **in the last quarter of 2023**, conducting a rapid assessment of funding needs to determine the high-level budget required to execute the research agenda, including mapping of existing funding commitments and resulting funding gaps; and
- **in the first quarter of 2024**, clarifying the innovation pathways and the types of data required to inform a WHO recommendation as well as for populating a dossier for WHO Prequalification listing, to ensure appropriate data and evidence are generated.

As the detailed research agenda is developed, it will be socialized with **donor agencies** for input and feedback. Donor agencies are expected to:

- prepare calls for proposals to conduct priority research;
- coordinate with each other 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; and
- launch the calls for proposals in the first quarter of 2024, such that **research grantees** will execute the research agenda starting in 2024.

While some results will become available earlier than others, most research should take 2–4 years to complete, with the bulk of new evidence expected by 2027. As research results are published, WHO and other guideline developers will conduct iterative updates of their PPH guidance 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 gaps in norms and standards relating to PPH (see section 3.2), as results of the prioritized research will be integrated into global and national guidelines and policies to influence practices on a continual basis.

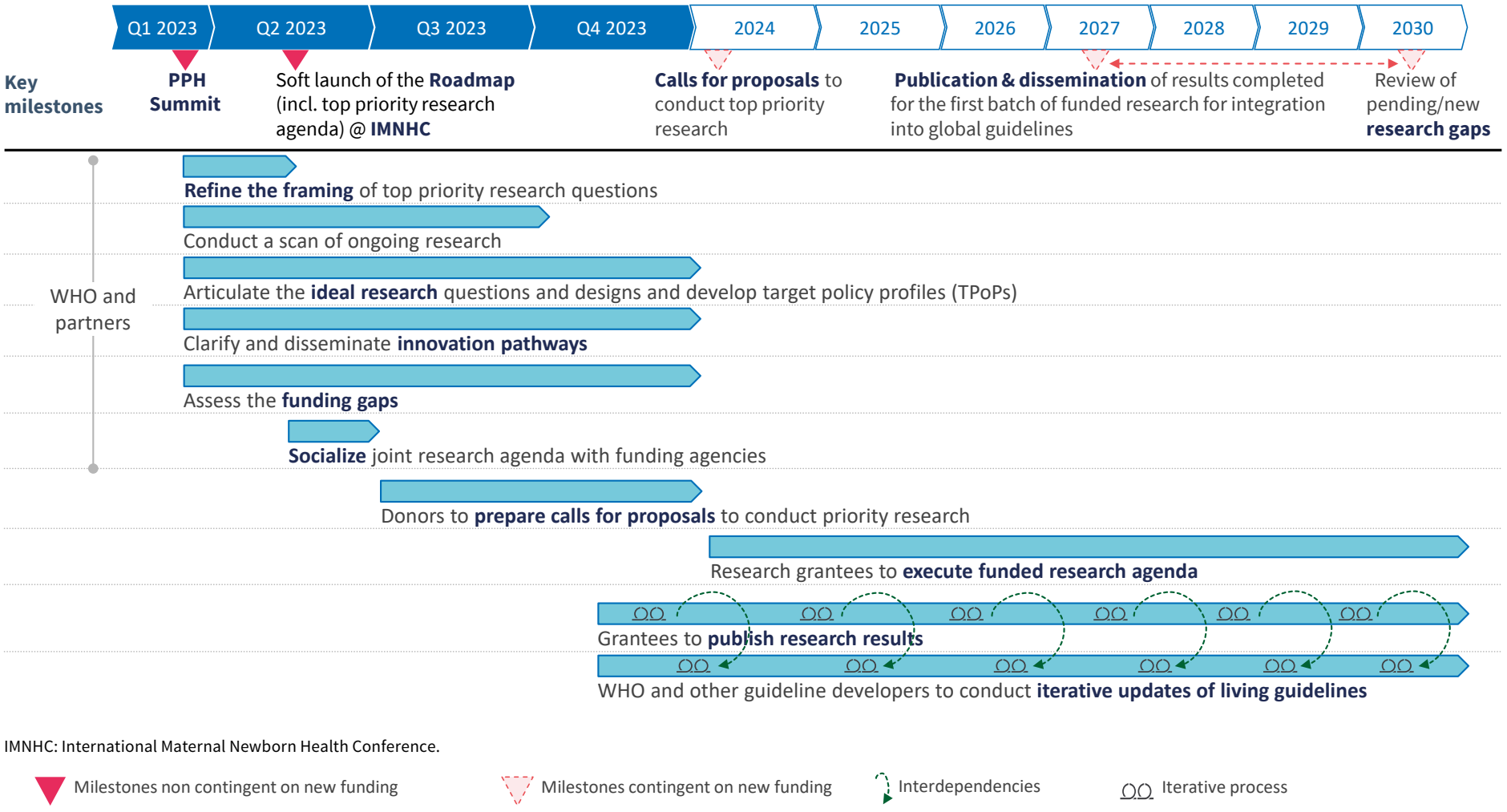
3.2 Strategic area: norms and standards

Three levels of guidance are required for optimal translation of evidence into practice. The first level is **global guidelines**, which are published by guideline developers, such as WHO, FIGO and ICM. These global guidelines could focus on a joint core set of high-level recommendations on PPH 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 contextualize global guidelines to individual country settings. The third level of guidance is presented in **guideline derivatives** (e.g. protocols, job aids, toolkits or handbooks), which translate recommendations into clinical practice. It should be noted that women's perspectives and LMIC realities must be better included in the process of guideline development.

Table 3.1 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 (i.e. other than intravenous) of tranexamic acid (TXA) in the treatment of postpartum haemorrhage (PPH)?
	2	What is the effectiveness and safety of heat-stable carbetocin (HSC) for PPH treatment in women who received HSC for PPH prevention?
	3	What is the comparative effectiveness of uterine balloon tamponade devices versus other tamponade interventions (e.g. 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 with 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 (LMICs)?
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 [UHC]/essential packages of health services [EPHS] and health benefit packages) in LMICs?
	3	What are the most effective advocacy strategies to improve uptake and ensure sustainment of evidence-based interventions for PPH management at the country level?
	4	What are the effectiveness and cost of pre-service and in-service training programmes for frontline health workers (paramedics, general practice doctors, community health workers, midwives, nurses) to train them to competently manage and refer women with PPH?
	5	What are the most effective implementation strategies to improve uptake and ensure sustainment of 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 for improving PPH quality of care and PPH-related outcomes compared with current standard of care?
	4	What is the effectiveness of maternal and perinatal death surveillance and response (MPDSR) programmes in the reduction of maternal deaths due to PPH?
	5	What is the effectiveness and safety of TXA in the prevention of PPH in the general obstetric population and in women at high risk of PPH (e.g. anaemic women)?

Fig. 3.1 Key activities and milestones for strategic area one: research



IMNHC: International Maternal Newborn Health Conference.

Milestones non contingent on new funding

Milestones contingent on new funding

Interdependencies

Iterative process

The risk of PPH can be lowered through preventative interventions to reduce PPH risk factors during preconception and antenatal care, but these preventive measures are largely absent from current sets of PPH guidelines, which focus on the intrapartum and immediate postpartum periods. Instead, preventive recommendations to address broader determinants and risk factors are usually presented in other guidelines (e.g. on anaemia or antenatal care). To facilitate the development of comprehensive PPH programmes and policies, relevant recommendations from a range of guidelines could be incorporated into a single, consolidated PPH guideline. In addition, there are other critical topics with limited to no recommendations in current guidelines. These include strategies for diagnosis 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 and health system aspects (including emergency response), as well as implementation considerations.

The evidence base underpinning current recommendations, especially those related to established practices, is dominated by evidence derived from HICs, which may not always be generalizable to LMICs. The **research community** should make deliberate efforts to design and conduct future trials in LMICs, focusing on the parts of the continuum of care where most deaths occur and where there is a dearth of data (i.e. in the community, around referral and emergency transport, and emergency caesarean section).

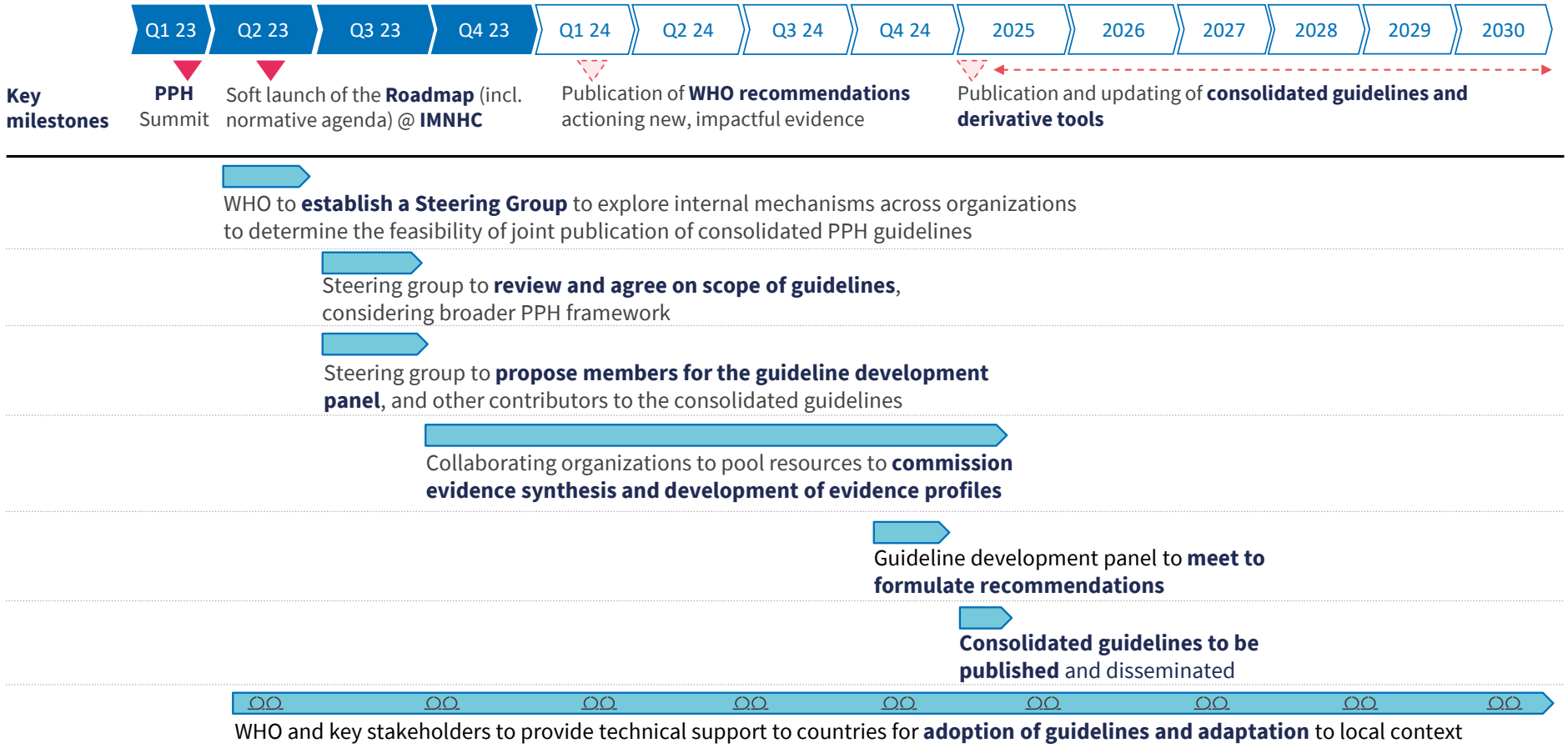
3.2.1 Key activities and milestones

With a view to potentially publishing a joint WHO–FIGO–ICM consolidated PPH guideline, the following is planned.

- **Starting from the third quarter of 2023**, WHO will establish a Steering Group comprising nominees from developers of global guidelines to explore internal mechanisms across organizations to determine the feasibility of joint publication of consolidated PPH guidelines, considering the organizations' different operating models, guideline development processes, and guideline methodologies.
- **By the end of the third quarter of 2023**, if a joint publication of consolidated guidelines has been deemed 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 complies with and respects the internal approval procedures of all participating organizations, will be followed to develop these joint guidelines. USAID will provide financial support for the development of the joint consolidated guidelines. The Steering Group will propose the membership of the consolidated guideline development panel and identify other potential contributors, such as guideline methodologists, systematic review teams, external peer reviewers and observers by the last quarter of 2023.
- **From the last quarter of 2023 and during the course of 2024**, the participating organizations 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 formulate new and update existing recommendations. These will then undergo peer-review and external consultation.
- **The first quarter of 2025** is the target launch date for the joint global guidelines on PPH.

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

Fig. 3.2 Key activities and milestones for strategic area two: norms and standards



IMNHC: International Maternal Newborn Health Conference; PPH: postpartum haemorrhage

▼ Milestones non contingent on new funding ▽ Milestones contingent on new funding Interdependencies ○○ Iterative process

webinars and regional workshops. During the same year, guideline derivatives (e.g. policy briefs) will be developed by the organizations participating in the joint 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 in order to issue individual stand-alone recommendations through their current internal procedures (e.g. the 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 burdens of PPH and maternal mortality;
- provide the technical and financial support to update PPH policies and adapt them to these local contexts;
- aim to achieve up-to-date PPH policies in at least 20 high-burden countries by the last quarter of 2024;
- use this effort as a model for engagement of stakeholders, which can be expanded to other LMICs as needed between 2025 and 2030.

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3.3 Strategic area: implementation

While there are substantial gaps in research and there is room for improvement in the process for developing norms and standards, as discussed in the previous sections, implementation bottlenecks are perhaps the most challenging of the four strategic areas. At the PPH Summit, failure to implement evidence-based interventions was widely recognized as the most significant challenge to achieving better PPH outcomes. Addressing barriers to implementation was acknowledged as potentially the single most impactful 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 an effective clinical practice requires not just training health workers, but also reconfiguring clinical workflows, integrating multidisciplinary teams, engaging facility leadership, broadening legal authorizations regarding the scope of practice, and/or adjusting health sector budgets. The highly contextual nature of many implementation barriers means that they may not be easily amenable to change in response to global-level campaigns, but will need locally tailored solutions.

Aware of the many implementation barriers that need addressing, stakeholders at the PPH Summit prioritized five categories of implementation barriers as those that are amenable to and in critical need of global-level action, and articulated the priority actions that the global community can undertake to address each, as summarized in Table 3.2.

3.3.1 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 what has been done for high-burden communicable diseases such as HIV, tuberculosis (TB) and malaria, no holistic framework has ever been formalized for PPH. The lack of such a coordinating framework can lead to a fragmented approach or response to prevention or treatment, instead of addressing all contributory determinants and risk factors (e.g. providing limited guidance on antenatal prevention, and overlooking risk factors such as anaemia, placenta praevia and placenta accreta). Effective interventions will need to be mapped against this new framework, which will expose areas that require new recommendations. There will also be an opportunity to use this PPH framework to structure future iterations of WHO guidelines and report progress on health outcomes along the continuum of care. The PPH framework will be refined based on the feedback received.

Table 3.2 Key categories of implementation barriers and priority actions to address them

Key categories of implementation barriers	Priority actions to address the barriers
Lack of clear national health policy and leadership: In most instances, specific national targets relating to PPH 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 are needed to ensure PPH is included in national agendas and that there are clear leadership and champions at the national and subnational levels.	**Build clear national health policy and strengthen leadership at national and subnational levels:** ▶ First create a global PPH framework to structure comprehensive PPH prevention and management programmes to help organize and coordinate national efforts. ▶ In parallel, develop an efficient and sustainable global monitoring system that includes common indicators, systematic data collection, and a common measurement platform, to track country progress against targets. ▶ As WHO updates global normative guidance, adapt national guidelines to local contexts and disseminate these to all levels of the health system, from national and subnational levels to community-based health care facilities. ▶ WHO and other key stakeholders will lead an ongoing network of ministry of health champions who will spearhead this work.
Weak procurement and supply chain systems: Frequent stock-outs of PPH commodities lead to unnecessary referrals from one health care facility to another. Affordability tends to be the focus, at the expense of quality. The availability of blood and blood products also needs to be addressed.	**Improve availability of and access to quality-assured and affordable PPH commodities at all levels of the health system:** ▶ As national leadership infrastructure is being built, the international community needs to collaborate to ensure strong coordination between partners, increased investments, and expansion of existing or new procurement initiatives. ▶ Strengthen national- and subnational-level procurement and supply chain systems. As a first step, WHO and partners (e.g. UNFPA, the Global Financing Facility [GFF] and the Reproductive Health Supplies Coalition) will identify possible solutions (both new and existing procurement mechanisms), with the aim of launching a focused procurement initiative in 2026. Efforts should cover devices, medicines and blood products (e.g. by setting up adequate blood banks).
Poor staffing, training and supervision of health workers: Many countries do not have enough well trained, empowered and motivated health workers, who are essential for 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, inappropriate distribution and poor retention of health workers also pose ongoing challenges, with remote areas most acutely affected. Lastly, in many settings, the suboptimal roles, social and regulatory status of nurses and midwives prevents these cadres of health workers from offering life-saving care that is within their competency/skill set.	**Ensure availability of competent health workers to deliver relevant good-quality services and commodities:** ▶ Strengthen current pre- and in-service training programmes, and bolster them with supportive supervision, mentoring and other professional development opportunities relevant to PPH management. ▶ Supplement these activities with broader human resource strategies to address chronic shortages of qualified health workers (midwives, nurses, doctors).

Key categories of implementation barriers	Priority actions to address the barriers
Inequities and poor access to good quality 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. lack of care in urban slums). There is a human rights imperative to address the stark inequities that put vulnerable and marginalized populations at a further disadvantage. For example, in some settings, public-sector health care facilities are too far away so women must use private-sector facilities where user fees are not covered by national insurance schemes. Also, transportation and referral systems are woefully underdeveloped in many places.	**Improve equity by improving access to quality care and removing user fees:** ▶ Enhance service-delivery infrastructure to strengthen facilities (e.g. renovations to modernize ageing structures, or building additions to meet greater demand). ▶ Improve transportation and referral systems. ▶ Governments must also take bold steps 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).
Women's limited rights and social status: There are several unfavourable legal, social and cultural norms and obstacles that limit women's life choices and options relating to 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 valorizing rapid repeat pregnancy, discouraging or delaying care-seeking, and not allowing sufficient recovery time after birth before resumption of household chores. Several risk factors for 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 well-being.	**Advocate for women's health and rights:** ▶ Place women at the centre of the political agenda, at the subnational, national and international levels. ▶ All stakeholders must come together as tireless advocates for women's rights. ▶ Raise awareness of PPH in the general population to help reduce delays in care seeking (e.g. through patient information leaflets). ▶ Continue advocacy work to ensure maternal health is no longer overlooked and benefits from sustained funding.

Design of a global monitoring system:
Between now and the end of the fourth quarter of 2024, WHO, FIGO, ICM, ministries of health and national professional associations will work jointly on a **scoping exercise** to define the contours of a global monitoring system for tracking 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 countries, in order to ultimately 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, providing countries with an objective and targets that they can aspire to reach. As an example, the UNAIDS HIV treatment 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 or level of health system); and roles and responsibilities for data curation, analysis, and for production of regular progress reports. A high-level budget should be developed, for both building and managing the global monitoring system.

The scoping phase will be followed by a **design and pilot phase**. This phase will focus on further developing elements of design that will have been discussed during the scoping phase. These will also include technological design choices for the common measurement platform and specifics on data management (e.g. data storage and data privacy considerations). Before launching at full scale, the common measurement platform will be piloted in a few representative geographies. The design and pilot phase will likely run until the fourth quarter of 2024, with a global launch planned for 2025. The global monitoring system will also be a critical tool for measuring progress against the priorities set out in this Roadmap.

Guideline adoption and adaptation: To support in-country guideline dissemination and implementation, WHO and key stakeholders will continuously lead a network of Summit champions representing ministries of health from around the world. This network will oversee the collection of information on what countries need WHO and other guideline developers 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 help improve adherence to recommendations, including an updated and electronically available version of the *Managing Complications in Pregnancy handbook (20)*. The network will leverage WHO regional and country offices to support the translation of global documents into languages other than English, as well as the development of derivative products, such as policy briefs providing further detail on the recommended interventions and their rationales, or operational manuals that serve as practical implementation handbooks for health workers. A particular focus will be placed on countries with a high burden of PPH, and WHO country offices will play an instrumental role in supporting local workshops and the development of contextualized materials. In addition, Laerdal Global Health and Jhpiego will partner to develop training materials and job aids to support in country-implementation.

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 Financing Facility (GFF), Reproductive Health Supplies Coalition and UNFPA, will conduct a scoping exercise by the fourth quarter of 2023 to assess potential solutions that will 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, countries that are eligible for funding from The Global Fund to Fight AIDS, Tuberculosis and Malaria can use this grant funding to procure commodities through the Global Fund's Pooled Procurement Mechanism (PPM). Products available through the PPM are sourced 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 (SRA) (e.g. WHO Prequalification Programme or the U.S. Food and Drug Administration [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 through the PPM and benefit from the commercial conditions negotiated by the Global Fund and therefore take advantage of lower prices.

Various regional pooled procurement initiatives were also launched during the COVID-19 pandemic, in particular, across 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. The results of the scoping 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 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, considering key dimensions such as country ownership. The exercise may be more meaningful if broadly considering maternal health commodities or essential medicines instead of PPH commodities alone. 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: WHO will lead a process to prioritize key maternal and newborn health commodities, including those identified in the PPH Roadmap, for facilitating implementation and scale-up of the necessary interventions. An expert meeting will be held in October 2023 to finalize a short list of WHO recommended commodities and this will be followed by development of implementation guidance which will provide strategies for addressing procurement bottlenecks and for overcoming barriers faced by health workers, women and their families. By 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 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 the gaps in global supply chain guidance on procurement of quality devices and blood products, with a view to also improving clarity and ensuring a consistent level of stringency across global guidance.

Enhancing staffing, training and supervision of health workers

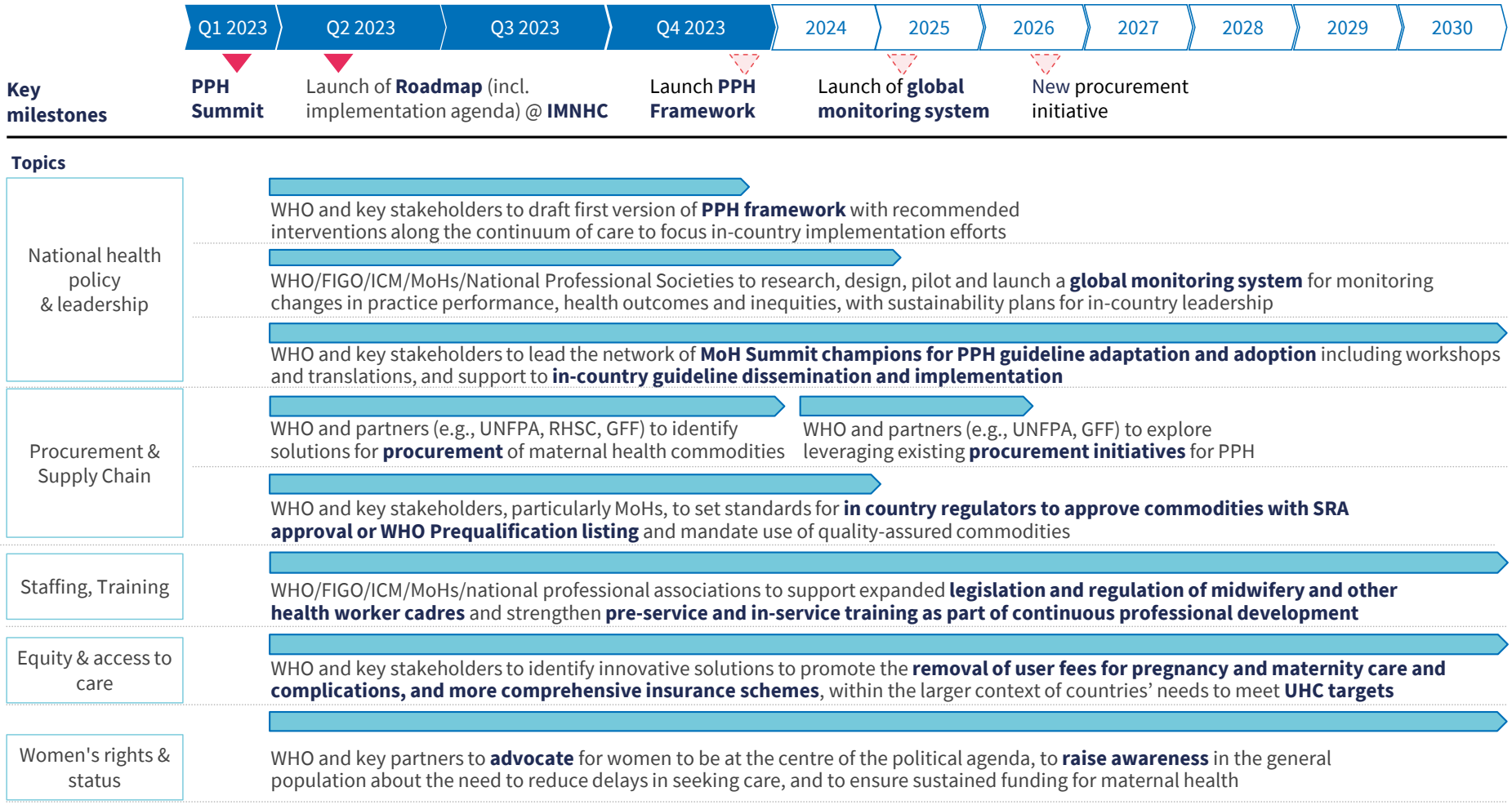
Expanded role of midwifery: From now until the end of 2024, WHO, along with FIGO, ICM, ministries of health and national professional societies will support a push for the expansion of the legislation and regulation governing midwifery and other cadres of health workers, such as nurses. ICM published a scope of practice and competencies for midwives (including, for instance, the ability to provide intravenous medication) *(21)* 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 the country level for skilled health personnel providing care during childbirth 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, Jhpiego, Laerdal Global Health, ministries of health and national professional societies will continuously work to strengthen pre- and in-service training of health workers as part of continuing 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, using the global PPH Community of Practice, and creating local communities of practice to share experiences and learnings, hosting webinars on a regular basis, promoting remote coaching, organizing hands-on teamwork training and simulation exercises, particularly for obstetric emergency response teams.

Engendering equity and improving access to care

Reduction of out-of-pocket expenses: By the end of the fourth quarter of 2023, WHO and key stakeholders will initiate a scoping exercise to define potential options for innovative ways of reducing out-of-pocket expenses for pregnancy and childbirth care. The scoping exercise

Fig. 3.3 Key activities and milestones for strategic area three: implementation



FIGO: International Federation of Gynecology and Obstetrics; GFF: Global Financing Facility; ICM: International Confederation of Midwives; IMNHC: International Maternal Newborn Health Conference; MoH: ministry of health; PPH: postpartum haemorrhage; SRA: Stringent Regulatory Authority; UHC: universal health coverage; UNFPA: United Nations Population Fund.

Milestones non contingent on new funding

Milestones contingent on new funding

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 marginalized 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 formalize the circumstances under which each solution should be deployed, as part of a broader UHC agenda. In 2025, WHO and partners will pilot some of these initiatives, for instance at the subnational level in some priority settings.

Elevating women's rights and social status

Advocacy for women's rights and increased awareness about PPH: Raising the priority of 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 minimize the risk of PPH, and how to adequately manage PPH. These efforts will insist on the need to have up-to-date national guidelines, reflecting the latest evidence available, and also the need to procure quality commodities (e.g. uterotonics, tranexamic acid) and strengthen referral systems. In the general population, awareness-raising efforts will focus on communicating what PPH is and why prompt care matters, to help reduce delays in seeking care. Advocacy campaigns will also raise awareness on how to reduce the risk of death due to PPH, for instance by giving birth in health care facilities. To that end, WHO and partners will support global, regional and local campaigns, and develop blueprints of patient outreach that can then be tailored to local needs.

3.4 Strategic area: advocacy

There is currently no unifying force in the field of PPH prevention and management to drive the PPH agenda and aggregate funding. A strong advocacy push is therefore needed at different levels, to elevate PPH on global political agendas. Advocacy efforts can help raise awareness about the importance of timely and effective management of PPH, as well as the availability and accessibility of life-saving interventions, such as uterotonics, blood transfusions and surgical procedures. Advocates can work to ensure that health workers are trained in the prevention and management of PPH, that health care facilities have the necessary supplies and equipment, and that policies and guidelines prioritize maternal health and safety.

Specifically, strong advocacy efforts should be focused on five major areas.

i. They should be targeted at policy-makers and politicians to support the removal of legislative and regulatory barriers hindering access to life-saving 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 health personnel providing care during childbirth can participate in the delivery of care to their fullest capacity.

ii. They 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.

iii. They should aim to advance the role of the midwife and ensure adequate training and support.

iv. They should highlight the critical importance of the availability, affordability and quality of PPH medicines, supplies and technologies – this should be elevated to ministerial level.

v. They should target the broader population with efforts to raise awareness around recognizing PPH and addressing risk factors, and should reinforce the need to seek care promptly.

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 call for political commitment from government leaders. Ministerial commitment is particularly important so that PPH is prioritized and relevant programmes are 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, prioritizing those with the greatest burden (e.g. marginalized and rural communities). Advocacy activities can include, among others, a global "PPH Day" and regional conferences (e.g. an African PPH Summit). However, advocacy efforts must reach beyond the PPH ecosystem, targeting other ministries (e.g. transport and 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 PPH advocacy is critical to achieve gains and maintain them.

3.4.1 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 will be developed along with a global advocacy framework. Second, an advocacy framework for the regional and national levels will be created. Third, a global PPH Day will be established.

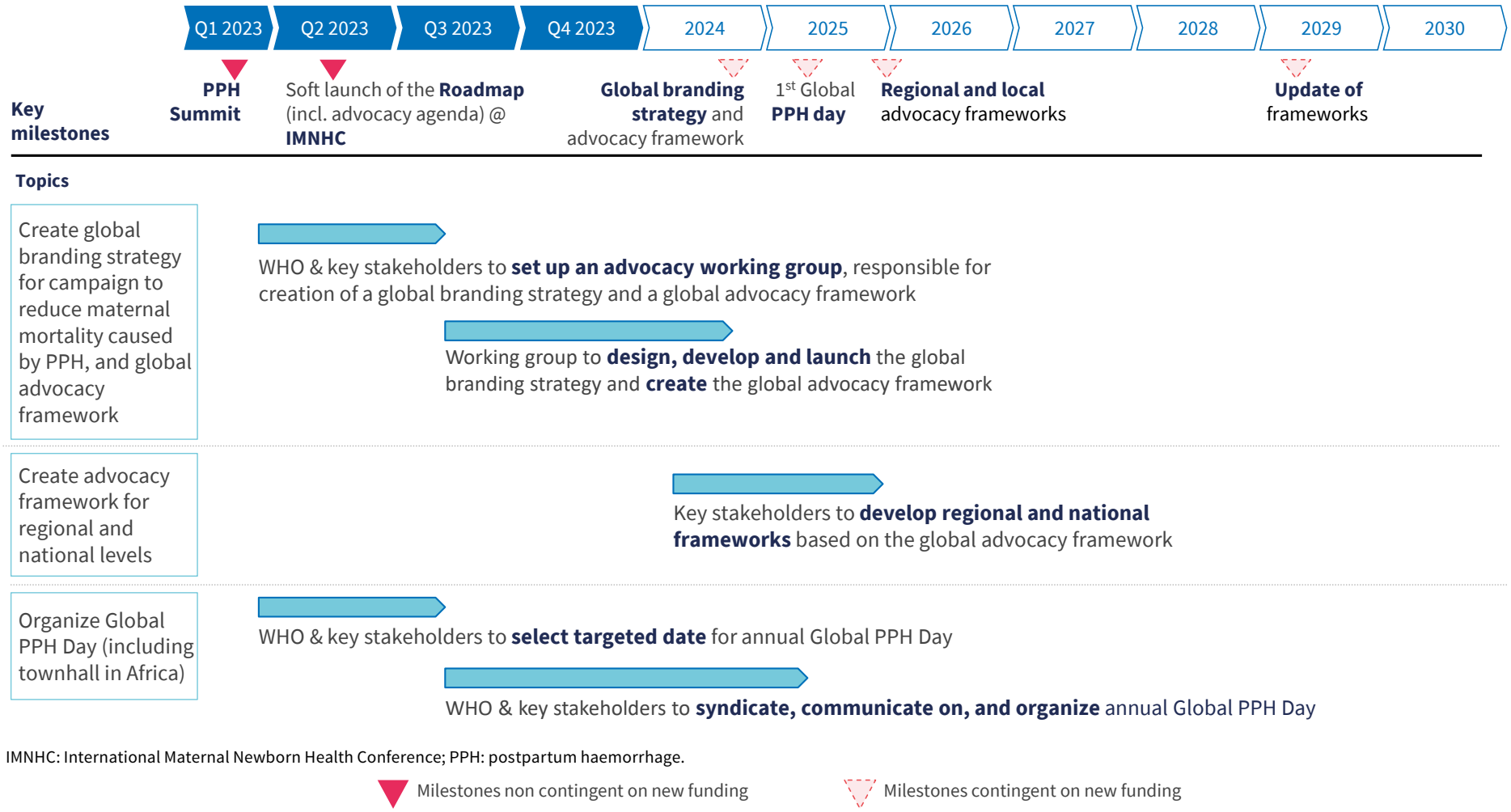
Global branding strategy and advocacy framework for reducing PPH-related maternal mortality

A joint, coordinated global PPH branding 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 national efforts can be amplified. It will provide important guidance on how to target advocacy efforts to different stakeholder groups and will build on years of successful advocacy efforts and lessons learned 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 multilateral organizations, CSOs, NGOs, and PPH Community of Practice. This working group will be responsible for developing the global branding strategy and an 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 (e.g. 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 advocacy 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 future PPH advocacy efforts. This will include a recognizable logo and colour scheme. Materials to support awareness campaigns, whether they are conducted through workshops, webinars or training sessions, will be tailored to different audiences and will use the new PPH branding.

Advocacy framework for regional and national levels

The global branding strategy and advocacy 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 tailored to more local contexts and situations. The global

Fig. 3.4 Key activities and milestones for strategic area four: advocacy



IMNHC: International Maternal Newborn Health Conference; PPH: postpartum haemorrhage.

Milestones non contingent on new funding

Milestones contingent on new funding

advocacy framework will provide modular content that can be adapted as needed. Over the course of 2024 and 2025, the advocacy working group, along with other interested stakeholders, will work towards developing content and materials that can serve regional and national advocacy efforts. There will be an iterative process whereby regional and national actors will provide feedback that will help adjust and refine the global advocacy framework.

Global PPH Day

World Malaria Day and World Immunization Day have been crucial to raising 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, mobilize the community to address outstanding challenges and support resource mobilization efforts. A Global PPH Day can also raise the profile of PPH and elevate it on political agendas. In the third quarter of 2023, United Nations agencies and partnerships will work with supportive member states to find a suitable date for a Global PPH Day and submit the request to create the official commemoration. This is expected to happen over the course of 2024. WHO and partners will then organize the first Global PPH Day, with 2025 as a target launch year. The first Global PPH Day will also serve as a launch pad for the PPH branding strategy. That event and associated preparatory activities will subsequently be repeated on an annual basis.

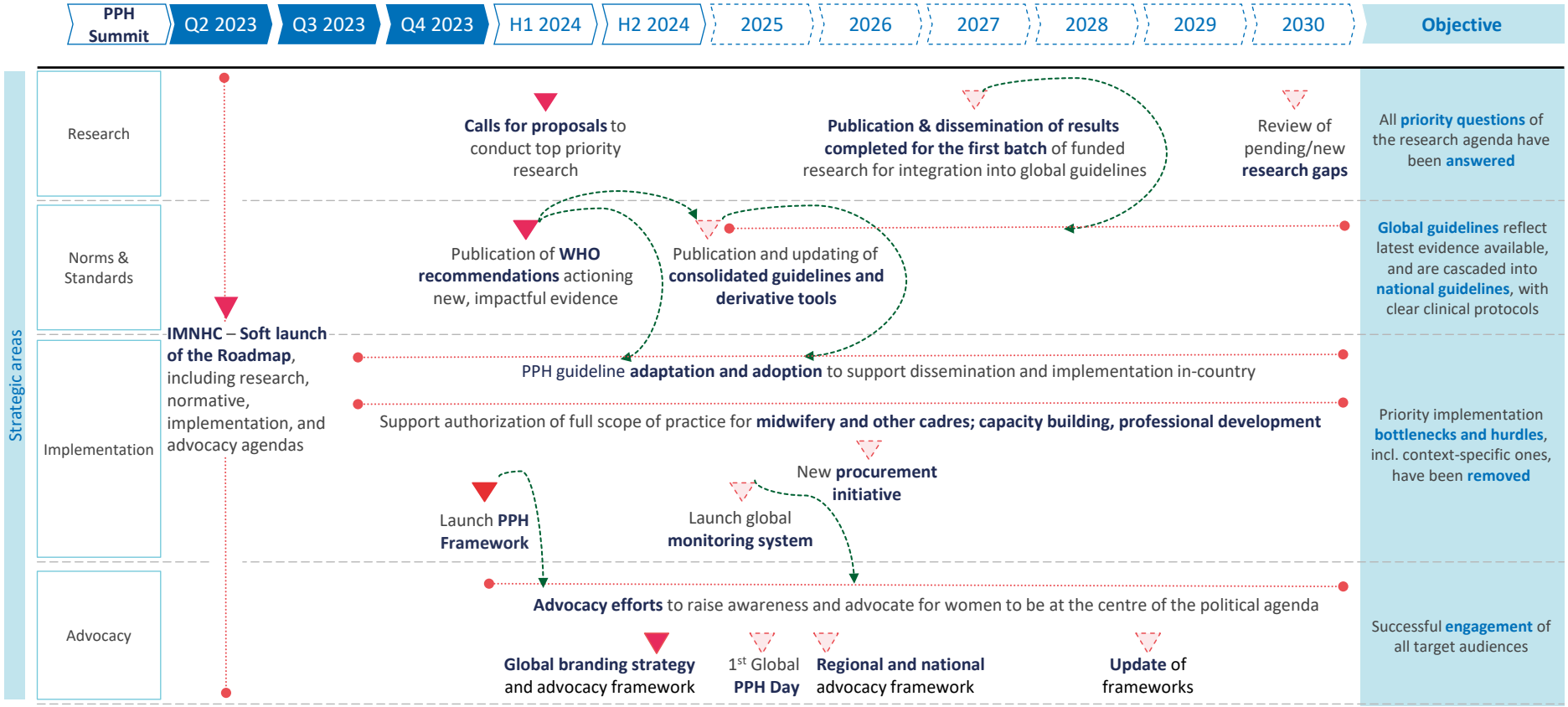
3.5 Interdependencies across the four strategic areas in the Roadmap

The subsections above have described 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 – the 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 turn must be adapted for local contexts and then implemented. The global PPH framework and global monitoring system both contribute to data-driven advocacy efforts, which can then garner needed political support to drive further normative and implementation efforts.

Figure 3.5 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 for the period 2023 to 2030.

The key activities and milestones from the PPH Roadmap will be incorporated into ongoing support for scaling up evidence-based maternal and newborn health interventions and practices through the Every Newborn Action Plan and Ending Preventable Maternal Mortality (ENAP-EPMM) acceleration plans in 30 countries *(22)*.

Fig. 3.5 Interdependencies across the four strategic areas in the Roadmap



IMNHC: International Maternal Newborn Health Conference; PPH: postpartum haemorrhage.

▼ Milestones non contingent on new funding ▽ Milestones contingent on funding ⇢ Interdependencies

4. Global Call to Action

Ensuring the ambitious 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 – demonstrating that everyone has a role to play.

The following key learnings emerged from the PPH Summit.

- **Women's 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 determinants and risk factors are well known and can be prevented** through a diverse range of interventions spanning the preconception, antenatal, intrapartum and postpartum periods. While there are many known and effective interventions, there are also many barriers to implementation of existing tools that need to be addressed (e.g. ensuring a well trained and competent workforce and reducing out-of-pocket expenditures).
- 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 must commit to stronger coordination of their various PPH investments, which could be achieved through a donor 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 health care facilities, promote facility-based births and ensure women are managed at the right level of care. This will require effective collaboration among all PPH stakeholders as well as 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, 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 PPH Summit, including determining the effectiveness of a bundle approach (i.e. a bundle of recommended interventions) for early detection and treatment, identifying barriers and facilitators to the uptake of evidence (and assessing implementation strategies for addressing those barriers), evaluating the safety and effectiveness of alternative routes of administration for TXA and evaluating the safety and effectiveness of HSC for PPH treatment in women who have already received HSC for PPH prevention. The research agenda should focus on the most critical points along the continuum of care, where deaths and disabilities are most likely to occur. The research should ideally seek to generate quantitative and qualitative evidence in LMIC settings.

- **Global PPH guideline developers should align on a core set of recommendations**, consistent across guidelines, that can be contextualized 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 new and updated 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 (including blood loss measurement), and aspects of health systems, such as referral, transport and task sharing.
- An effective PPH response to change the trajectory of the projected adverse outcomes by 2030 requires an **efficient and sustainable global monitoring system** – including common indicators, systematic data collection and a common measurement platform – to track progress against targets. This monitoring system will be instrumental in providing the tools and data to enable progress to be tracked against the milestones included in the Roadmap.

PPH Summit participants call on the international community to acknowledge the consensus that emerged from the Summit, which is reflective of broad and inclusive participation by all stakeholders. They specifically call for the actions detailed in Table 4.1.

Table 4.1 Key actions to ensure effective and coordinated efforts towards eliminating preventable deaths due to postpartum haemorrhage (PPH)

Stakeholder	Key actions
 International community	▸ **Identify a leading organization**, 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 and women's groups	▸ Share learnings from experience, take part in advocacy campaigns. ▸ **Participate in the design of solutions**, 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**, including detailed targets, a monitoring system, domestic financing and advocacy, and coordinate efforts with partners. ▸ **Ensure national guidelines are updated**, contextualized to local settings, and well disseminated. ▸ **Steer national procurement to quality-assured** medicines and devices, ensure appropriate staffing, training and equipment at health care facilities, and work to improve supply chain reliability and efficiency.

Stakeholder	Key actions
 Implementers (including NGOs and CSOs)	▸ Develop new approaches to address priority gaps. ▸ **Increase advocacy on PPH** through a unified voice or platform. ▸ Form coalitions with governments and professional associations to develop action plans to be implemented at the national and subnational levels.
 Professional associations	▸ **Promote adherence** to recommended interventions. ▸ Support collaboration, knowledge dissemination, and the activities of communities of practice (within countries and internationally), acting as convening bodies. ▸ Support coordinated, continuous, locally led capacity-building for health workers, with built-in accountability measures.
 Guideline developers	▸ **Ensure and maintain alignment between PPH recommendations** through enhanced collaboration among guideline developers (starting with sharing the evidence synthesis work and jointly building the evidence ecosystem for PPH). ▸ **Consolidate 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 the 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 contextualized** 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 and innovators	▸ **Focus PPH research and development 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- and middle-income settings, where their effectiveness should also be tested. ▸ **Commit to generating the evidence required** to inform health policy development processes at the global and country levels.
 Donor agencies	▸ **Increase financial commitments**, channelling investments to identified priority gaps (including 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. Consider 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 the agreed targets.

Signatories: Participants at the Global Summit on PPH, 7–10 March 2023, Dubai, United Arab Emirates

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 efforts 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 the availability of 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 points that may help stakeholders prepare for implementation.

5.1 Global leadership and governance

The Roadmap is multifaceted, 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 organizations will need to be identified to spearhead efforts, assure progress and rally support for the key priority actions.

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 national adoption of the Roadmap depends on well planned, participatory, consensus-driven processes of translation and 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 new and/or existing national and subnational strategies, and WHO will support these efforts. Any adaptations to country goals and milestones should be reflected in the monitoring and evaluation platform, to reduce the 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-affected 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 aids need to be adapted and tailored for the 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 implementers 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 organize local efforts, but other structures may be more appropriate given existing norms and institutions.

Partial contextualization 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 ensure the desired impact can be achieved.

5.3 Anticipated impact of the Roadmap

Annually, an estimated 70 000 women die due to PPH *(1)*. If nothing changes, an additional half a million women will die due to PPH by the close of the SDG era. These women will leave behind families and communities that are weaker for their absence. Millions of other women will suffer from the 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, one where women no longer die from a condition that is both preventable and treatable. In this future, countries have taken strong action to address upstream determinants and risk factors for PPH and to prepare health systems to respond quickly and effectively when PPH does occur. Frontline health workers are trained and competent to detect and treat PPH, and supported by robust referral and transport systems that get women to higher-level care promptly. Women no longer die because a needed medicine is out of stock or of poor quality. This future is possible. The Roadmap shows us how 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 burden of maternal mortality and morbidity and the impact of PPH on women's health and well-being. Women and families who are currently among the most marginalized 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 key goals and milestones of this Roadmap were presented at the International Maternal Newborn Health Conference, 8–11 March 2023, in Cape Town, South Africa, to obtain initial feedback. Following publication, the Roadmap (this document) will be disseminated through conferences and webinars organized by WHO and other stakeholders, including PPH Summit participants.

WHO will also develop tools to aid adaptation of the Roadmap for use in 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, CSOs and NGOs, among others. The Roadmap will be published on the WHO/HRP website, and its launch will be announced in WHO/HRP News, which is issued monthly. This newsletter currently reaches over 8000 subscribers including clinicians, programme managers, policy-makers 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 will be translated into the six United Nations languages for dissemination through the WHO regional and country offices and during meetings organized by, or attended by, WHO 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 area (including development and identification of priorities) and key implementation considerations will be prepared for publication in peer-reviewed journals, in compliance with WHO's open access and copyright policies. Relevant WHO clusters and departments, and partnerships, such as the Partnership for Maternal, Newborn and Child Health (PMNCH), will also be part of this dissemination process.

To ensure the Roadmap has an impact on maternal health at the 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, ICM and national professional associations) can support national stakeholders in developing or revising existing national guidelines or protocols, and optimizing their implementation in response to the Roadmap. Context-specific tools and toolkits may be required in addition to standard tools to support stakeholders to implement the Roadmap recommendations in the context of humanitarian crises.

7. Monitoring and evaluating impact

In 2015, Ending Preventable Maternal Mortality (EPMM), a global multi-partner initiative to improve maternal health and well-being and achieve SDG target 3.1 for global MMR below 70, outlined broad strategies for maternal health programmes *(22)*. 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), which was launched in September 2020. The PPH Roadmap complements these initiatives by focusing on efforts related to PPH, given that PPH is the most significant 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 develop a comprehensive global monitoring system 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 progress and general enough to draw from existing data collection efforts to avoid increasing the monitoring and reporting burden. Moreover, indicators should be common across countries and time, to allow for consistent monitoring and benchmarking.

Establishing the global monitoring system is challenging, in no small part because there are few universal indicators for PPH. Newly emergent evidence on the validity and feasibility of indicators included within the EPMM monitoring framework may prove useful *(23, 24)*. Given the challenge and opportunity presented here, establishing the core set of indicators and common measurement platform is a key milestone early in the PPH Roadmap. As an immediate next step, WHO, FIGO, ICM, ministries of health and national professional societies will need to convene to review and assess potential indicators for a common measurement platform for monitoring changes in practice performance, health outcomes and inequities. These initial efforts should include clear sustainability plans from the outset.

8. Planning future updates

A mid-term review will be conducted in 2026 or 2027 of the Roadmap and its implementation. At that time, the Roadmap may be updated to reflect stakeholder commitments and more clearly define key activities and milestones leading up to 2030.

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Annex 1.
List of contributors

Participants at the Global PPH Summit

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Sabaratnam Arulkumaran St. George's, University of London United Kingdom of Great Britain and Northern Ireland	Gave lectures in India on "Advances in prevention of PPH" symposia sponsored by Abbott India. Received travel support and honoraria from Ferring Pharmaceuticals (GBP 4,000).
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Pete Lambert Monash University Australia	Received research support for inhaled oxytocin programme from Johnson & Johnson.
Cammie Lee Results for Development (R4D) USA	Received grants from Bill & Melinda Gates Foundation and USAID.
Elliott Main Stanford University School of Medicine USA	Served as consultant to revise and lead national implementation of safety bundles including obstetric haemorrhage.
Suellen Miller (*co-chair*) University of California, San Francisco USA	Institution holds the trademark for the "Lifewrap" brand of non-pneumatic antishock garment. It is possible that the deliberations and recommendations from PPH Summit could affect the royalties the institution receives for the use of the trademark.

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Justus Hofmeyr University of the Witswatersrand South Africa	Served as a technical advisor to *Equalize Health* (No approximately USD 750–1000 pwe month x 2 years; ceased end of 2022 when *Equalize Health* closed). Prior intellectual property related to Maternawell tray IP transferred to *Equalize Health* (No Nil; Ceased 2021). IP may be transferred to another company following closure of *Equalize Health*. Collaborating with colleagues at Umoya Health to develop the Maternawell tray. Has not received any income to date but may receive income from the project in the future.
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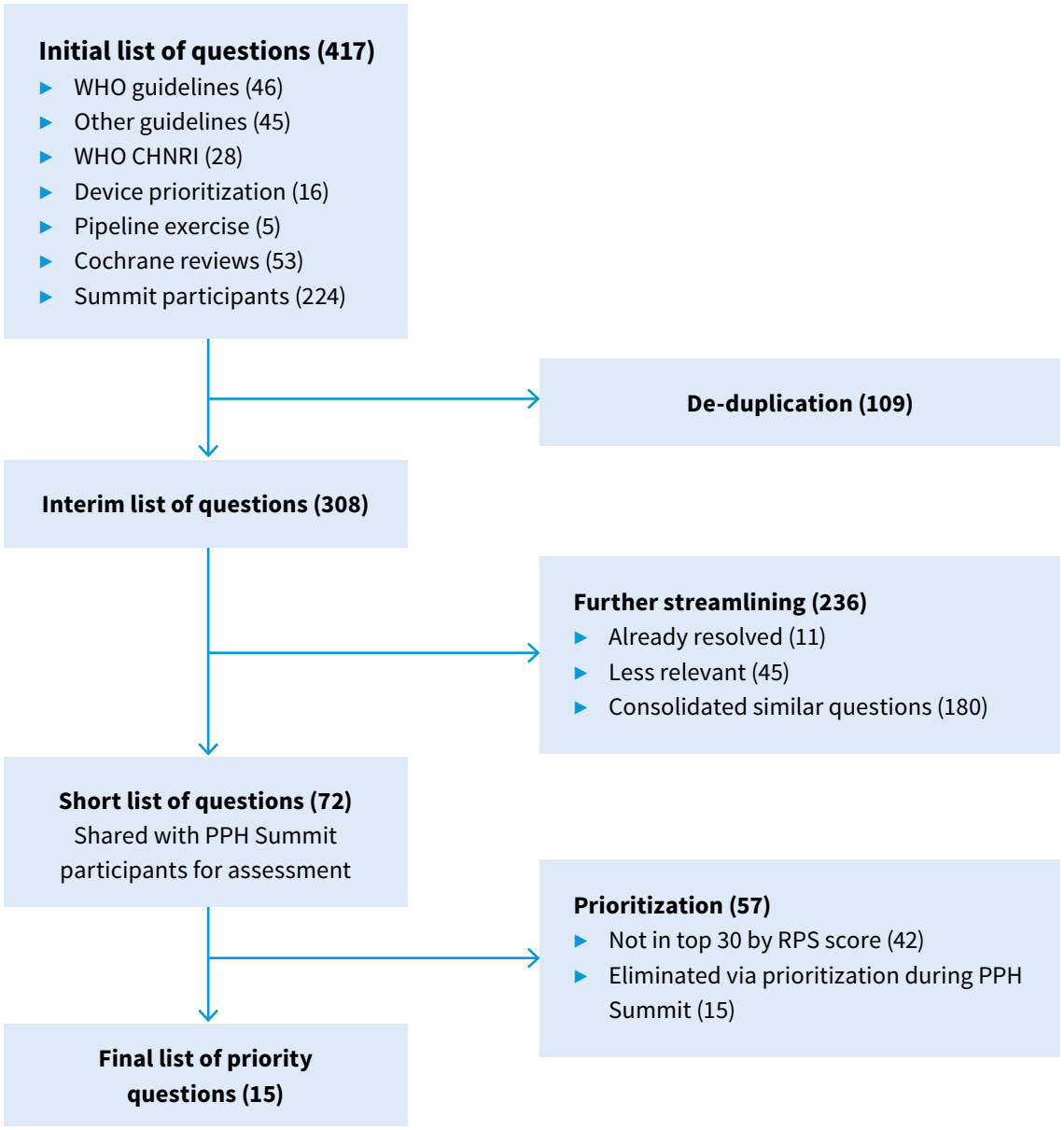
Annex 2.

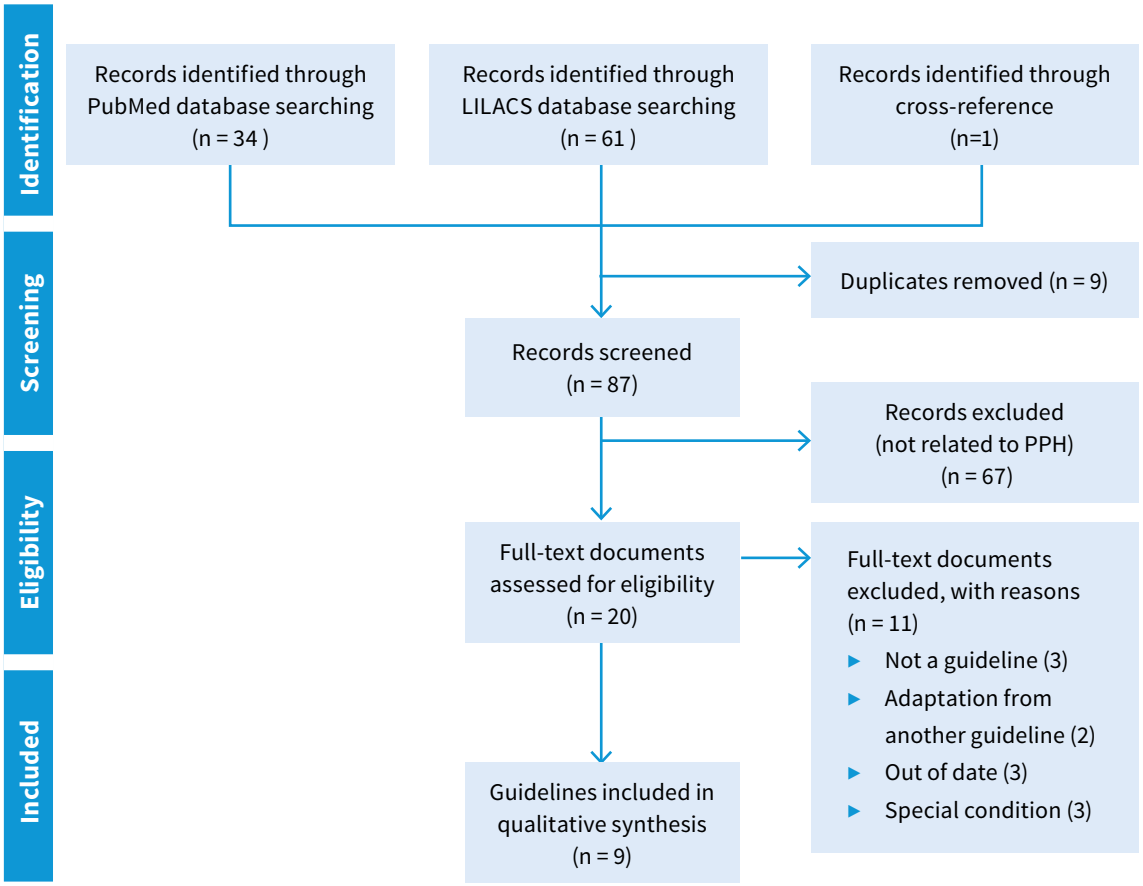
Postpartum haemorrhage research prioritization flowchart



CHNRI: Child Health and Nutrition Research Initiative; PPH: postpartum haemorrhage; RPS: research priority score.

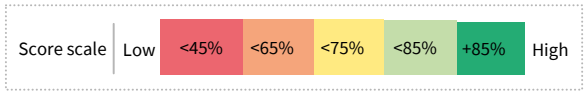
Annex 3.

Identification of published guidelines to inform mapping of postpartum haemorrhage recommendations



LILACS: Literatura Latino-Americana e do Caribe em Ciências da Saúde (Latin American and Caribbean Health Sciences Literature).

Annex 4. Heatmap of results from barriers to implementation survey



		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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