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Research gaps and needs to **optimize the use of assisted vaginal birth:** technical brief

Key messages

- Access to high-quality assisted vaginal birth is an integral part of the provision of emergency obstetric care to reduce maternal and perinatal mortality and morbidity, and it can promote the appropriate use of caesarean section.
- Research is needed to understand how assisted vaginal birth is perceived by women and communities, and how to provide appropriate, reliable and unbiased information through various communication channels to the general public about assisted vaginal birth and its alternatives.
- Research is needed on the most effective ways to train healthcare providers to acquire and maintain the knowledge and skills necessary to perform assisted vaginal birth. In addition to improving clinical skills, training should include effective communication, situation awareness, shared decision-making, informed consent, and how to build positive relationships with the woman, her family and community.
- There is a need for internationally-accepted evidence-based comprehensive assisted vaginal birth clinical guidelines that can be adapted and adopted at country level.
- Acknowledging the need for an enabling environment, it is important to investigate how to change the culture of health care to perceive labour and childbirth as physiological processes where interventions (including assisted vaginal birth) should be used if and when needed according to established indications and guidelines.
- Women and healthcare professionals must be involved and engaged in assisted vaginal birth research from the beginning and throughout all stages, so that their views and opinions are taken into account rather than simply studied.

Assisted vaginal birth as an integral part of emergency obstetric care

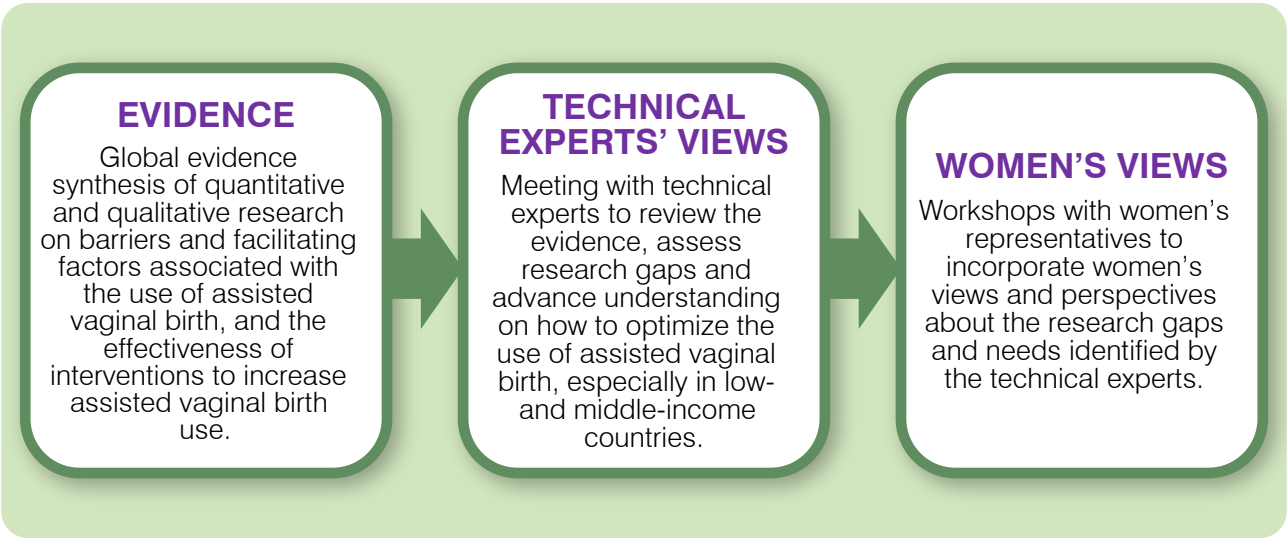
Assisted vaginal birth (AVB), also known as instrumental or operative vaginal birth, refers to a vaginal birth conducted with the help of an instrument such as a forceps or vacuum extractor *(1)*. The World Health Organization (WHO) includes AVB as one of the seven essential functions of basic emergency obstetric care *(2)*. Common indications for AVB include prolonged second stage of labour, maternal exhaustion and fetal distress when the head is deeply engaged in the birth canal. AVB can reduce maternal and perinatal morbidity and mortality without resorting to caesarean section in the second stage of labour which has additional associated risks compared to prelabour or first stage caesarean section *(3-6)* This may be particularly crucial in low-resource settings where women and babies have limited access to high-quality (i.e. safe, effective, timely, efficient, equitable, and people-centred) obstetric and perinatal care to manage complications *(7, 8)*.

In parallel with the growing use of caesarean section in the last decades, there has been a worldwide decrease in the use of AVB, particularly in low- and middle-income countries (LMICs) *(9-12)*. Currently, the practice of AVB is more common in high-income countries than in LMICs where, with some exceptions, it is almost non-existent *(10)*. Researchers have identified several potential factors associated with underuse of AVB, such as lack of functioning equipment, lack of staff adequately trained to indicate and perform ABV, sub-optimal supervision and support for healthcare providers trained to perform AVB, maternal and fetal safety concerns, and fear of complications or of litigation in case of adverse outcomes *(13)*. These factors may have contributed to disincentivizing the use of AVB in favour of second stage caesarean section, which is often perceived by providers and women as safer and easier to perform *(12)* –too much, too soon– , or in favour of complicated and late referrals jeopardizing the lives of women and babies –too little, too late–, in setting where caesarean section is not available.

Development process of the technical brief

WHO led a three-step process to foster thinking and catalyze research on AVB (Fig 1). First, WHO conducted global evidence syntheses of quantitative and qualitative research on barriers and facilitating factors associated with the use of AVB, and on the effectiveness of interventions to increase AVB use *(13-15)*. Subsequently, a technical consultation with 37 technical experts (healthcare providers, researchers, policy-makers and public health experts) was convened to identify the research gaps and needs to reintroduce or increase access to

Fig 1: Outline of process for developing the technical brief.



and use of AVB, especially in LMICs. Participants for the consultation were selected taking into consideration their capacity to represent different perspectives and experiences in AVB, gender and geographical balance, and no important conflicts of interest. Then, four workshops were conducted with representatives of women and advocacy groups from 27 different countries to gather women's views on the importance and relevance of the research gaps and needs identified by the technical experts *(16)*.

Given that the majority of those that give birth identify as women, this term is used throughout. However, this technical brief also aims to be inclusive of all gender diverse individuals who give birth, regardless of their self-determined gender identity.

Challenges for the use of assisted vaginal birth

Lack of trained providers capable of identifying which labouring women could benefit from AVB, and of safely performing the procedure is a major barrier for its use. Education and training are, therefore, considered crucial for building skills and confidence in conducting AVB and there is evidence that it would be welcomed by healthcare providers *(14)*. However, acquiring and maintaining AVB skills is a complex task that requires a supportive environment, mentorship, supervision and accountability. As with other practices to manage infrequent procedures and complications, continuous education and on-site supervision are essential to ensure the safe and sustainable use of AVB.

WHO recommendations for intrapartum care recognize a "positive childbirth experience" as a significant end point for all women and babies *(17)*. Not only what is done, but why, when and how it is done matters. Thus, it is important that the healthcare providers also develop non-clinical skills, such as effective communication, professional behaviour within the multidisciplinary team, support for shared decision-making and informed consent, and how to build positive relationships with the woman, her family and community.

Lack of functional equipment and its maintenance also represent a crucial barrier and may contribute to failure rates of instrumental assisted birth which can act as a deterrent to attempt AVB in appropriate cases, when a caesarean section is also available. Lack of guidelines on indications and contraindications for AVB, and steps to follow after a failed operative birth attempt, including local contextualization and adaptation, are also limiting the use of AVB. The absence of analgesia for AVB is a barrier to acceptability and practice of AVB.

Cultural challenges to overcome include misconceptions about the safety of AVB compared to a second stage caesarean section which need to be better understood across stakeholders (e.g. women, communities, obstetricians, midwives, anesthetists, neonatologists, health systems managers). Facilitating a 'learn not blame' culture and addressing the fear of adverse outcomes and malpractice litigation is necessary. In many LMICs, professional regulation may not support the practice of AVB by midwives, which potentially could expose midwives to litigation and limit access where trained doctors are not available.

Research gaps and needs on assisted vaginal birth identified by the technical experts

Research gaps and needs are grouped in three categories: a) women and communities' views; b) education, training and clinical aspects; and c) implementation and sustainability. A detailed list is presented in Table 1 under each category.

Women's views on the proposed research gaps and needs

In general, women agreed with the research gaps identified by the technical experts. Importantly, they emphasized the need to involve women from the start of the research and throughout all stages, so that their opinions are considered rather than simply studied.

Table 1: Detailed list of research gaps and needs identified by technical experts and women's views on the importance and relevance of these research gaps and needs.

A. Women and communities' views on AVB

Summary of research gaps and needs identified during the technical consultation	Summary of women's views on the research gaps identified during the technical consultation
• What knowledge and attitudes exist among women and communities in LMICs about mode of birth in general and AVB in particular? • What are the barriers and facilitating factors for AVB (e.g. social, cultural) emerging from women and communities from LMICs? • What are the most effective ways to communicate and disseminate information about AVB to women and communities (e.g. healthcare providers, mass media, social media, dance, songs, videos) across different setting and populations (e.g. low access to internet, low literacy levels? • What is the quality of the information about AVB available through mass and social media channels in LMICs? • How does the information available in mass and social media channels impact women's and communities' knowledge and attitudes towards AVB in LMICs?	• It is key to understand how AVB is framed by women, the source of their information and how these influence women's views. • Education is key to avoid misconceptions. Access to correct and unbiased information is conducive to empowerment; thus, how to effectively inform women is crucial. • How to inform women in countries, settings and contexts where their reproductive health and decision-making rights are suboptimal, and how to inform women from marginalized or minority groups. • The role of decision-aids and of mass and social media in informing women and societies needs to be explored. • Safety concerns need to be addressed for successful reintroduction and optimization of AVB. How to assess and address these concerns is crucial. • How to change the perspectives of societies where labour and birth are considered an illness, and the vision of the birth as a pathology prevails is considered important.

B. Education, training and clinical aspects

Summary of research gaps and needs identified during the technical consultation

- What are the effective components and modalities of AVB education (e.g. lectures, e-learning, international exchange programmes) and training (e.g. simulation, hands-on clinical training with experienced and skilled professionals) across different settings and healthcare cadres? Education and training need to include the management of maternal and perinatal complications following AVB, because fear of complications can be an important deterrent for healthcare providers.
- What is the impact of including information and training on maternal and fetal physiology and mechanisms of labour/birth in training courses about AVB?
- What is the optimal analgesia method for AVB across different settings and healthcare providers cadres?
- What is the safety, feasibility, and effectiveness of new technologies to perform AVB? Development of technologies that are simple, user-friendly and reusable may have the most impact.
- What is the effect of AVB compared with second stage caesarean section on maternal and neonatal outcomes (short- and long-term)?
- Development and dissemination of evidence-based, comprehensive AVB guidelines, and training packages are crucial including the management of possible complications following AVB.
- At national level, professional associations need to play an active role; AVB guidelines need to be endorsed, and AVB regulation and training should be ensured.
- Development of a core outcome set for AVB studies is key. The set should include short- and long-term (5 years or later) maternal and neonatal outcomes that matter to relevant stakeholders (including women) and how to measure these outcomes.

Summary of women's views on the research gaps identified during the technical consultation

- It is imperative to have highly qualified and trained professionals. How to educate, train and sustain knowledge and skills at the point of care is fundamental as well as how to integrate the role of midwives in AVB.
- Strong and consistent agreement on the need to teach and train providers about the physiology of labour and childbirth, and to view labour and childbirth as healthy physiological processes that should be respected. Similarly, how to best support women physically and emotionally during these processes (humanized care) is crucial.
- Training on AVB needs to include non-technical skills such as communication skills and how to treat women with empathy and respect.
- How to change the culture of health services and institutions towards humanized birth in settings where this is perceived exclusively as a mechanical process.
- Particularly in Africa, it is important to explore the techniques for virtual, on-line, long-distance training, including how to overcome the lack of technological skills of some providers.
- Good-quality studies are needed on the effect of AVB on the pelvic floor and long-term sequelae since this is a concern for women.

C. Implementation and sustainability

Summary of research gaps and needs identified during the technical consultation

- What are the barriers and facilitating factors across health systems in LMICs for the introduction and use of AVB (e.g. organization and culture, supply and human resources)?
- What are maternity services organization models for effective access of high quality AVB?
- What is the cost-effectiveness of increasing AVB use for policy-makers and organizations?
- How to facilitate use of AVB in primary health care settings.
- What is the safety, feasibility, and effectiveness of midwife-led models in the use of AVB across different settings?
- How to ensure funding and appropriate mechanisms to acquire, replace, and maintain essential equipment including instruments needed for AVB.
- What type of behavioural interventions other than education (e.g. audit and feedback, the use of local champions) are effective, feasible and safe to sustain the use of AVB?
- How to ensure appropriate ongoing support for healthcare providers, especially when re-introducing AVB.
- How to use advocacy strategies and engage policy makers and professional associations more effectively to encourage evidence-based practices related to AVB?

Summary of women's views on the research gaps identified during the technical consultation

- How to ensure the necessary managerial skills, structure and funding is essential including hygiene and infection prevention aspects.
- How to manage political and financial barriers including insurance structures, are important research questions. As long as a caesarean section is more profitable for the system, change will be difficult.
- It is crucial to explore how to train and empower midwives to provide AVB since they are the main healthcare providers in rural and remote areas of many LMICs.
- It is important to have clear guidelines and indications for both processes (caesarean and AVB) and when each is the best option.
- How to ensure the financial and managerial strategies to guarantee the continued availability of instruments and other necessary equipment.
- How to engage policy-makers and governments to optimize the use of AVB.

Because information is perceived as a source of empowerment, understanding how to effectively inform women about AVB is considered key (ranging from societies where women are more influenced by the media to those in which women are influence by their mothers and grandmothers). Information needs to be tailored to the local context.

Women perceive that skills not only on how to perform AVB but also on how to support labour and vaginal births in general, have been lost in some settings due to the rise in caesarean section use, thus training in providing high-quality intrapartum care including AVB is essential. Training needs to encompass understanding of the physiological processes of labour including the emotional and neurohormonal changes. The role and inclusion of midwives are emphasized. Because safety and long-term physical and psychological sequelae for women are a source of concern, high-quality studies on the effects of AVB are strongly supported by women.

Financial incentives fostering caesarean section are perceived to be widespread and need to be understood to be best addressed. A more detailed summary of women's views on the research proposed is provided in the Table 1. The views of women on assisted vaginal birth collected during the workshops are summarized in the Box 1.

The way forward

Currently, overuse of medical interventions coexists with a large proportion of women lacking access to life-saving procedures. When correctly indicated, access to high-quality AVB has the potential to reduce maternal and perinatal mortality and morbidity. The safe reintroduction of AVB, and sustaining its use where it is appropriate, is a complex challenge that requires multifaceted interventions that involve all stakeholders. Dynamic, multidisciplinary and comprehensive research approaches are needed to address the interconnected behaviours and relationships between stakeholders. Women's and providers' experiences, views, values and beliefs about AVB and its alternatives are crucial and need to be considered to optimize the design and

Box 1:

Women's views on assisted vaginal birth: what matters to women

In the workshops, women said that they were most concerned about safety-related issues. The baby's health and safety are paramount, as are the physical, mental, and emotional risks, complications, sequelae, and trauma for women who undergo AVB. If complications happen, the lack of follow-up and support for women who sustain them is a source of distress.

A recurrent topic in the workshops was the urgent need to recognize labour, childbirth, and the postnatal period as physiological and dignified human processes where interventions should only be used if and when needed. The prevention of disrespect, abuse or overmedicalization was emphasized as something that needed to be addressed. Shared and informed decision-making and constructive communication with providers were considered crucial to building trust between women and providers and to reduce fear. Participants emphasized the uniqueness of each woman and childbirth and the need for a holistic approach where women and babies are at center stage.

Lack of information, misuse of informed consent and its consequences, including fear, disempowerment and abuse, are sources of distress for women. Women expressed concern about health systems with overburdened providers, lack of infrastructure and equipment, and pervasive incentives that foster caesarean sections as well as inequalities in access to AVB.

implementation of effective strategies.

Research should not consider AVB as a stand-alone intervention but should ensure in-depth knowledge of physiological labour, and the management of non-physiological (particularly prolonged) labour. The reintroduction or increase of AVB must be embedded within interventions to improve healthcare providers' capacity to safely and respectfully support women in labour, identify possible complications and ways to correct them, recognize when a second stage caesarean is better than to attempt AVB, and manage possible complications following AVB.

Research needs to recognize AVB as a practice embedded within local health systems, with their own challenges, limitations and priorities. Operational implementation research using a systems thinking approach and adaptive research approaches that encourage learning and its systematic integration in the implementation process should be used and reconciled with the rigour of more traditional evaluation study designs *(18)*. The use of behavioural science *(19)* can improve the impact of interventions through the analysis of individual and community behaviours that may block or facilitate change, but also to mediate negotiation and overcome resistance to change. Complex interventions are subject to more variation than conventional interventions like the use of medications. Although the success of a complex intervention in one setting provides a benchmark, it does not ensure reproducibility in a different setting. Therefore, research will need to be preceded by an initial formative phase to assess local health system preparedness, acceptability, and availability of resources, among other factors, which in turn will help to tailor the design and implementation of AVB interventions to local situations and contexts.

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