



Insight

An implementation framework for introducing obstetric ultrasound in new contexts

To improve the quality of obstetric care, WHO recommends that all pregnant women receive at least one ultrasound before 24 weeks of gestation. Over the past decade, the global uptake of ultrasound technology has increased substantially, accelerated through the dissemination of (portable) devices, task sharing, telemedicine, and training of health-care providers. Concurrently, advances in artificial intelligence (AI) have enabled the integration of AI into affordable ultrasound devices, aiming to support (non-specialised) providers in identifying potential complications and facilitating timely referral.

Despite persistent global inequities in access to obstetric ultrasound, the convergence of technological innovation and health system interventions—aligned with universal health coverage goals—presents immense potential to improve maternal and newborn outcomes. However, it is imperative to critically examine the broader implications of ultrasound implementation, beyond mere technical and clinical effectiveness and with a deeper understanding of how contexts, systems, and people interact with technologies, so that the full potential of this technology can be realised. A more holistic implementation approach is advocated, one that integrates perspectives from the health system, providers, and users (panel; appendix p 2).

The problem: unequal access and benefits

Introducing new technologies without adequately addressing contextual, sociocultural, economic, and health system needs can lead to inappropriate or unethical practices, misuse, or overuse, paradoxical health outcomes, technology distrust, and, ultimately, implementation failure. In contexts where ultrasound services are introduced at unaffordable or uninsured costs, financial barriers can exacerbate inequities in access. Such disparities are intensified when providers are not appropriately trained or when health systems are insufficiently responsive to ultrasound findings. The absence of effective supervision or guidelines for ultrasound providers and subsequent care levels might create an environment for misuse, leading to potential harm (and induced costs) to the patient. Moreover, some health-care professionals have been reported to overly rely on ultrasound due to its convenience, often neglecting conventional methods such as patient history and physical examination. Barriers to referral can lead to additional ethical concerns, when ultrasound points towards a condition that a woman cannot get appropriately referred

or treated for. These inter-related issues can be termed the “rights paradox of medical technologies”—ie, a situation in which individuals and societies rightfully demand access to essential technologies, yet their rights are simultaneously compromised when access and benefits are constrained or distributed inequitably. Implementing ultrasound without due consideration of health-care infrastructure, system responsiveness, societal norms, or economic constraints can lead to disparities in utilisation, exacerbate inequities, and even cause harm.

The need for adaptive health systems

Effective implementation of obstetric ultrasound requires a functional and adaptive health system that is adequately prepared to integrate such technology. An enabling environment for the deployment of obstetric ultrasound should, at a minimum, address the availability of sufficient quality equipment and a reliable power supply, appropriately trained human resources, secure image storage, data privacy, and sustainable maintenance mechanisms. Equally important is the strengthening of referral systems to guarantee rights-based, high-quality care across the maternal health continuum. Implementation challenges emphasise that the development, utilisation, and impact of medical technologies are not merely technical processes but are fundamentally shaped by social, cultural, and institutional

Panel: Minimal requirements for obstetric ultrasound implementation

Health system needs

- Ensure an enabling environment
- Address referral system challenges
- Create adaptive systems and support implementation science
- Strengthen regulatory approaches
- Coordination and collaboration among stakeholders

Provider needs

- Design sustainable education programmes
- Provide comprehensive provider education beyond mere technical use

Women-centred care

- Address systemic issues that limit ultrasound accessibility
- Build trust through engagement and transparency

A more comprehensive panel, with examples for each bulletpoint, is available in the appendix (p 2).

Lancet Obstet Gynaecol Womens Health 2026

Published Online
January 27, 2026
[https://doi.org/10.1016/S3050-5038\(25\)00200-6](https://doi.org/10.1016/S3050-5038(25)00200-6)

For the WHO recommendation on ultrasound in pregnancy see <https://www.who.int/publications/i/item/9789240046009>

For an example of the use of portable devices, task-sharing, and telemedicine see *Front Glob Womens Health* 2025; 6: 1555547

For more on the integration of AI into ultrasound devices see *Ultrasound Obstet Gynecol* 2020; 56: 498–505

For more on global inequities in access to obstetric ultrasound see *Radiography* 2021; 27: 709–15

For more on the challenges of introducing ultrasound technology into health systems see *Semin Perinatol* 2019; 43: 267–72

See Online for appendix

For more on the unintended consequences of digital health technologies see *Soc Sci Med* 2021; 289: 114419

For more on the over-reliance on ultrasound and neglect of conventional methods see *Soc Sci Med* 2000; 50: 689–701

For more on barriers to referral for ultrasound-diagnosed complications see *Reprod Health* 2018; 15: 204

For more on the requirements for implementation of ultrasound see *Reprod Health* 2018; 15: 129

For more on **training programmes for the use of ultrasound** see *Ann Emerg Med* 2014; **64**: 277–85

For more on the **introduction of ultrasound in a low-resource setting** see *BJOG* 2022; **129**: 1712–20

For more on **patient-provider communication** see *Reprod Health* 2021; **18**: 199

For more on the **perceptions of women on ultrasound** see *PLoS One* 2012; **7**: e34018

contexts. As ultrasound technology becomes increasingly embedded within health systems, often regardless of contextual readiness, a proactive equity-focused approach is essential for implementation. Health systems should evolve through their dynamic interaction with the technology, supported by implementation research and context-appropriate evidence, to ensure that innovation reinforces rather than undermines equitable and effective care delivery (appendix p 3).

Strengthen systemic and regulatory approaches

Ensuring quality obstetric ultrasound services requires robust governance mechanisms to guarantee consistency, safety and effectiveness of care. National guidelines or frameworks should address the challenges associated with ultrasound implementation by defining provider qualifications, establishing standardised training and certification requirements, and promoting appropriate use. Quality assurance can be strengthened through regulatory or accreditation systems that monitor service delivery, stimulate supportive supervision or second opinion mechanisms, and mandate continuous professional development for all ultrasound providers. Implementation plans in any setting should also clarify financial strategies to ensure accessibility and affordability, such as inclusion within health benefit packages or health insurance schemes, thereby promoting equitable access while safeguarding the financial sustainability of services. Developing and operationalising such regulatory and implementation frameworks will require coordinated cross-sectoral collaboration among ministries of health, financial institutions, and higher education to align policy, resource allocation, and workforce development toward equitable and high-quality ultrasound provision.

Ensure comprehensive provider education

Provider education is essential for effective implementation of obstetric ultrasound into health systems. Donor-initiated training programmes—often combined with task-shifting and tele-ultrasound—have shown short-term benefits, but evidence for the impact of training programmes on patient outcomes and long-term sustainability remains sparse. Sustainable capacity development requires collaboration with national institutions to co-create and maintain locally embedded training programmes beyond external support. Importantly, technical proficiency in ultrasound scanning alone is insufficient. Competencies in communication, counselling, and integration of ultrasound within comprehensive clinical assessment and cascades of care are equally essential for ensuring quality care and patient acceptability.

Ultrasound should complement, rather than replace established diagnostic approaches, and the findings must be interpreted in relation to the clinical context

and capabilities of the health system. In settings where ultrasound has been newly introduced, clinical observations point to the risks of decision making based on incomplete information and inappropriate interventions, including the rise of caesarean sections, compromising patient safety and quality of care. These risks also necessitate particular attention within task-shifting approaches. As ultrasound devices become increasingly simplified and enhanced with AI, including potential use by lower-cadre health workers, or even pregnant women themselves, it is imperative to ensure that information, interpretation and subsequent clinical decision-making are guided by appropriate safeguards and professional oversight.

Prioritise women-centred care

Effective implementation requires careful attention to patient-provider communication. Women and their companions should receive balanced comprehensible information on the purpose, capabilities, and limitations of ultrasound, including potential findings, referral pathways, and associated costs. Women and people supporting them also need to understand the meaning of positive (and possible false-positive) results, as well as the limitations of what a normal examination means. While myths and mistrust in technological advancement might induce unjustified fear, overestimation of technological power also exists among patients and providers and can induce a false sense of safety. On the contrary, technology is sometimes blamed as having had a negative influence, resulting in poor health outcomes, leaving a devastating reputation on new technologies.

Towards a holistic approach for ultrasound implementation

The rapid adoption and expansion of ultrasound technology for obstetric care offers significant potential to improve maternal and newborn health outcomes, especially in currently underserved low-resource settings. A coordinated holistic approach—engaging developers, implementers, funders, policymakers, health-care workers, and women—is needed to ensure that ultrasound technologies are introduced and integrated in ways that reflect and respond to local contexts and social dynamics. Understanding how technologies interact within health systems and societal structures is fundamental to ensuring equitable access, effective implementation, and sustained impact. Such an approach is vital for improving the quality of antenatal care while promoting equity and protecting the reproductive rights of women.

**Irene de Vries, Trust Saidi, Sam Ali, Aris T Papageorgiou, Marleen Temmerman, Marcus J Rijken
i.d.vries@kit.nl*

Author affiliations are in the appendix (p 1).