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An Aboriginal women-led approach to design a maternal and child health model when cardiometabolic complications are experienced in pregnancy in South Australia

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The known: Historically, maternal and child health services have lacked Aboriginal women's lived experiences and Aboriginal knowledges, leading to misaligned systems that fail to meet unique cultural, social and personal needs.

The new: This project highlights Aboriginal women as the protagonists of change — who identified systemic issues, proposed solutions and developed a health model of care shaped for their expressed needs. This project positions Aboriginal women as the designers, with researchers as facilitators providing resources and support.

The implications: Culturally responsive, person-centred care can bridge gaps between Aboriginal knowledge systems and biomedical paradigms, improving maternal, child and family health outcomes holistically.

Abstract

Objective: To develop a culturally responsive maternal and child health model, centred on Aboriginal and Torres Strait Islander women's knowledge of health, wellbeing and expressed health priorities, to address gaps in care for those who experience cardiometabolic complications in pregnancy.

Design: Health services and systems co-design.

Setting: Health services in South Australia providing maternal and child primary, acute and chronic disease management care.

Participants: Nineteen Aboriginal women from urban, regional and remote areas of South Australia participated in 2024, with most having personal experience of cardiometabolic complications in pregnancy and some contributing professional experience.

Main outcome measure: Development of a culturally responsive, evidence-based model of care to support Aboriginal women with cardiometabolic complications in pregnancy.

Results: Through a collaborative approach and an iterative co-design process, participants shared lived experiences, identified systemic issues and developed solutions to address gaps in maternal and child health care. Culturally safe spaces enabled deep reflection, open dialogue and collective decision making. With this, we developed a model of care that included a vision statement, guiding principles, a conceptual framework and 18 priority areas. In addition, eight health system enablers were identified to support implementation.

Conclusion: This project demonstrates the value of Aboriginal women's leadership in shaping health systems. This process highlights the value of culturally grounded, community-led co-design approaches to health service and system reform. For health systems and service providers and managers, this is an opportunity to foster meaningful change by listening to and acting on the voices of Aboriginal women. In doing so, they will meet their responsibility to address inequities. Researchers and health organisations must do more than amplify these voices; rather, they must listen, act and ensure that systems respond to what women say they need. This is a pivotal moment to drive systemic change for equitable and culturally safe maternal and child health care.

Aboriginal and Torres Strait Islander women have over 65 000 years of sacred maternal bloodline and ongoing innate cultural connection. Over the past 250 years, dominant Western social systems have disempowered Aboriginal and Torres Strait Islander women, disrupted intergenerational birthing systems, and placed the biomedical model at the centre of birthing.[1] Despite this, Aboriginal women continue to demonstrate resilience and cultural strength, preserving sacred maternal practices, fostering intergenerational knowledge and advocating for culturally safe birthing environments.

Over the past decade, a national agenda has sought to re-align maternal and child health care to be culturally safe, including integration of holistic and cultural models of care.[1-3] Successful introduction of culturally centred models of care has occurred, including the Aboriginal Family Birthing Program in South Australia.[4-6] Despite such programs, many women continue to face significant inequities, often compounded by systemic barriers and lack of culturally responsive care outside specific programs.[7]

Having a health condition during pregnancy, such as diabetes, hypertension, pre-eclampsia or underlying atherosclerotic cardiovascular disease (termed cardiometabolic complications), exacerbates these challenges. Aboriginal women with cardiometabolic complications navigate disjointed, complex, interventionalist journeys disconnected from social, emotional and cultural supports. These experiences detract from holistic wellbeing, leaving women without culturally safe and consistent support, with increased medical complexity and likelihood of birthing off Country (for regional and remote women), and increased risk of adverse outcomes.[8-10]

Co-design models are essential in health research and system design, particularly for Aboriginal communities. These approaches foster Aboriginal leadership, embed cultural safety, honour Aboriginal knowledges,[11,12] and promote equitable

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community-driven solutions, ensuring positive long term change.[13,14]

Ongoing, coordinated care and support when having experienced cardiometabolic complications of pregnancy has been identified as a gap through previous Aboriginal-led priority development in SA.[15-17] We sought to address gaps in care, coordination, support and knowledge of health journeys by having Aboriginal women as the designers of a maternal and child health model of care tailored to their needs. Grounded in Aboriginal ways of knowing, being and doing,[18] the initiative bridges the divide between biomedical paradigms and culturally responsive, holistic care for women who experience cardiometabolic complications.

This article presents an approach to model design led by Aboriginal women, integrating cultural responsiveness with biomedical paradigms through Aboriginal-driven solutions. By identifying systemic issues, proposing solutions and designing a culturally safe framework, this project sought to create a model of care that addresses maternal, child and family health needs through privileging Aboriginal voices.

Methods

Grounded in relational accountability, cultural safety and community governance, a maternal and child health model of care was developed by applying the six principles of best practice co-design with Aboriginal communities.[13] Governance frameworks ensured accountability and alignment with Aboriginal values. Aboriginal women led the design process through culturally safe workshops. Grounded in personal and professional experiences, participants (including KWH, RN, EB, LG) collaboratively identified priorities, shared reflections and refined solutions, which informed the development of the model tailored to women's needs. Aboriginal leadership (DS, KD, ARS, CR) guided all stages of the co-design, supported by non-Indigenous allies (PM, KB) committed to culturally safe, community-led research and relational accountability. The resulting model of care was collaboratively validated, aligning community-identified priorities with policy-relevant outputs.

Governance

Leadership and cultural integrity were ensured through three governance structures, each guided by terms of reference that upheld Aboriginal women's central role as the designers of the model.

The Aboriginal Women's Governance Group (KM, KG, CL) held cultural authority and guided the project to uphold Aboriginal ways of knowing, being and doing. As respected cultural and professional leaders within their respective communities, their authority stems from lived experience, cultural responsibilities and established leadership in maternal and chronic disease health. They ensured cultural integrity, safety and accountability through regular meetings, consensus-driven decision making and approvals of milestones. The group developed an intellectual property and publication protocol to safeguard Indigenous cultural and intellectual property, promote fair and transparent use, and ensure alignment with community priorities throughout and beyond the project.

With expertise in Aboriginal primary health, maternal care and cardiometabolic health, the SA Action Group guided model development, evaluation and implementation to align with service realities and system priorities. An (inter)National Advisory Group of clinical and research leaders provided oversight to ensure the work was evidence informed, system aligned and culturally respectful.

Ethics approval

This project, guided by the South Australian Aboriginal Health Research Accord,[19] prioritised Aboriginal leadership and cultural safety and aligns with the CONSIDER Statement (Supporting Information, section 1).

Ethics approval for this project was obtained from the Aboriginal Health Research Ethics Committee of the Aboriginal Health Council of South Australia (04-23-1105), the South Australian Department for Health and Wellbeing (2023/HRE00256) and the Australian National University Human Research Ethics Committee (H/2024/0503). Approvals covered data management. In addition to ethics approvals, site-specific assessments were conducted and approved to enable the project's implementation at six South Australian Local Health Networks.

Understanding local context and evidence of best practice

To ensure the model of care was grounded in best practice and contextually relevant, the project team conducted a review before the workshops. This included collating information on current service availability and examples of effective programs and models.

A desktop review identified existing guidelines for management of cardiometabolic complications, models of care, programs, services and resources across SA, mapping these to regions, stage of care and relevant condition, focus of service or resource, and whether they were specifically for Aboriginal women and children. Written resources and programs targeted at cardiometabolic care were mapped nationally. Where available, evaluation of effectiveness was included. Data informed subsequent discussions with service providers, including Local Health Networks and Aboriginal community-controlled health services, contributing to the development of a service and systems "map" spanning pre-pregnancy, pregnancy, labour and birth, postnatal and long term wellbeing.

A rapid systematic review examined published evidence on the availability and evaluation of relevant programs and systems for First Nations women from Australia, Canada, Aotearoa New Zealand and the United States (PROSPERO 2024 CRD42024519397). The findings of this systematic review are being prepared for publication separately.

Participant recruitment

Governance groups and stakeholders guided recruitment of Aboriginal women across SA for design workshops. Aboriginal women with personal experience of cardiometabolic complications in pregnancy within the previous 5 years and/or health professional experience in maternal or cardiometabolic health within the previous year were invited to participate. Participants had to have given birth and/or worked in SA and, at the time of participation, had to be a resident of SA and be 18 years or older.

Recruitment involved paid social media advertisements, and flyers at community events and health services. Interested women completed a REDCap (Research Electronic Data Capture) electronic survey hosted at the Kids Research Institute Australia

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to register interest.[20] Eligible women were provided with detailed information and gave written consent to participate after reviewing the information sheet.

Space

Workshops were held at a local cultural centre on Kaurna country over 3 days in June and 2 days in July 2024. Travel, accommodation, childcare and carer support were arranged and paid for. Accommodation was within walking distance and family friendly. Catering was provided by an Aboriginal-owned business.

Participants received honoraria for their time, unless they participated as part of their work, in which case their employers were compensated. Women were encouraged to bring young children.

An Aboriginal consultant experienced in model development and design facilitated the workshops (DS) with the project team, with a Welcome to Country from a senior Kaurna woman. The design predominantly occurred through yarning — the telling and sharing of stories and information.[21] Facilitators ensured a culturally safe space, adapting the structure to meet participants' needs, supporting mothers as needed, and concluding the first workshop with a traditional Aboriginal smoking ceremony. All discussions were voice recorded, notes were written, and photos were taken with consent.

To address sensitive discussions, facilitators provided mental, social and emotional health service contacts and regularly checked in. Feedback from the first workshop informed changes for the second, including a larger room, more time, and a small group yarning approach that enabled women to remain seated with their babies while facilitators rotated.

Workshop One

The first workshop began with a Welcome to Country, introductions and grounding exercises occurring through yarning methods. Group norms were established, participants were introduced to the project background and design process, and women identified key principles of care (Supporting Information, section 2). During the afternoon, women engaged in yarning sessions to share maternal health journeys. Facilitators used semi-structured, open-ended questions guided by health journey mapping[22] and encouraged participants to document experiences through writing or illustrations (Supporting Information, section 3). To ensure a supportive environment, women with personal experiences of cardiometabolic complications in pregnancy were grouped separately from those with professional roles, avoiding potential discomfort, such as a woman being placed with a former care provider. Facilitators synthesised participant reflections, capturing what worked well, areas for improvement, and additional needs across each stage of the journey.

The second day began with facilitators checking in with participants. Each group's facilitator shared the synthesised reflections from the previous day, mapping these to the stages of the health journey using large sheets of paper. Women contributed additional comments and reflections, which were incorporated into the map. The project team presented the local context and evidence of best practice, prompting discussions. Through small group discussions, participants collaboratively identified solutions and grouped these into 23 priority areas. Using a structured prioritisation process, the women established a shared vision for the model of care.

On the third day, the women refined the vision statement in small groups before finalising it collectively. Small group discussions focused on the six highest-scoring priority areas, exploring what participants wanted services to provide in terms of care, support, and information for their cultural, physical, social and emotional wellbeing, as well as actions needed to achieve this. The workshop concluded with a smoking ceremony and an opportunity for participants to provide feedback via a survey (Supporting Information, section 2).

Post-workshop write-up for Workshop One

The outcomes of the first workshop were synthesised into a draft model that captured participants' reflections, priorities and voices. Discussions and health journey yarns were transcribed. The vision and principles were included as agreed. For each priority area, the issues, solutions, potential actions, system supports and region-specific considerations were identified from written notes and transcripts. Based on prior review, alignment to other programs or services and potential key partners was mapped.

Generated data were stored and housed at the Kids Research Institute Adelaide on a secure server with user-level access. Data will be stored for 15 years, in accordance with the SA Aboriginal Health Research Ethics Committee requirements. Hard copy documentation was secured in locked cabinets in secure areas. All data used for analysis were deidentified.

Workshop Two

In the second workshop, women who attended Workshop One reviewed and refined the draft model of care. Working in small groups, facilitators rotated between discussions to review content, explore additional challenges, and further define issues and solutions for each priority area. Through these discussions, priority areas were consolidated and validated. Small groups

1 Characteristics of participating women

Characteristic	Number of women
Experience of cardiometabolic complications in pregnancy	
Professional experience	4
Personal experience	11
Both professional and personal experience	4
Condition(s)*	
Diabetes (gestational or type 2)	8
Cardiac complications (gestational or pre-existing hypertension, pre-eclampsia and/or atherosclerotic disease)	5
Both diabetes and cardiac complications	2
No recorded condition (health professionals)	4
Location	
Major city	10
Regional (inner and outer)	3
Remote and very remote	6
Total	19

*Participants with personal experience of cardiometabolic complications in pregnancy had one or more conditions. ◆

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also yarned on participants' understanding of cultural safety and broader social issues affecting maternal journeys.

Participants collaborated to create a visual representation of the conceptual framework and brainstorm on the model's name, using sticky notes and digital tools to share and refine ideas through group discussions. The workshop concluded with a discussion on recognising participants' contributions, with women deciding to choose their acknowledgement preferences through a follow-up survey (Supporting Information, section 4).

Post-workshop write-up for Workshop Two

The draft model was updated to reflect the outcomes of the second workshop. With participants' consent, four de-identified vignettes illustrating health journeys were developed, incorporating non-identifying quotes. Three potential titles for the model were created based on participants' input. Feedback from the Aboriginal Women's Governance Group and SA Action Group informed the inclusion of system enablers for each priority area aligned with workshop discussions.

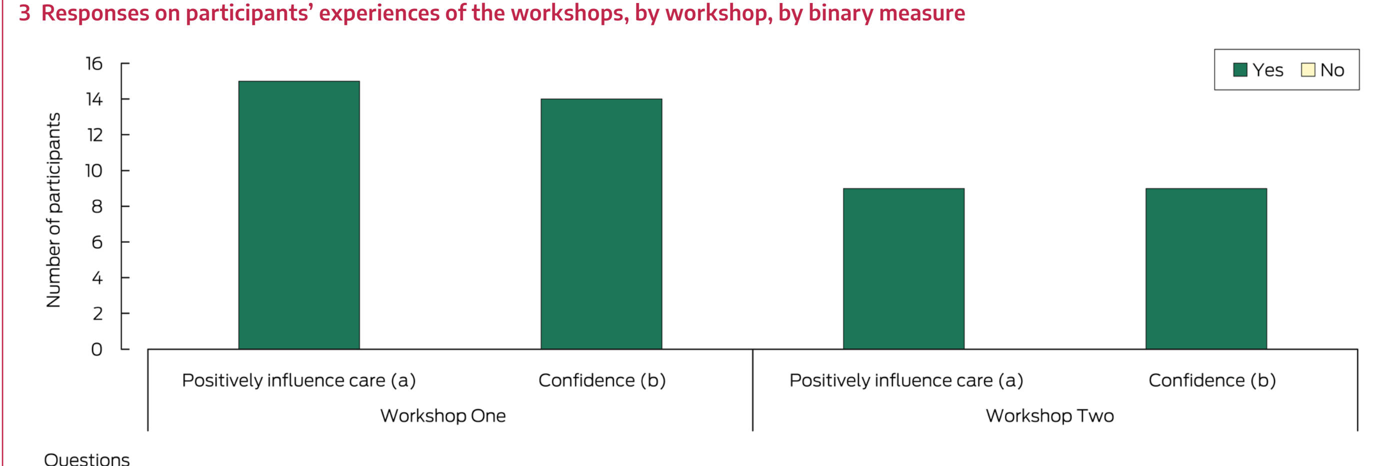
Review and endorsement

Participating women reviewed the draft model of care document, which included the vision statement, guiding principles, conceptual framework, priority areas and system enablers. Women chose if and how they wanted to be acknowledged in the document. Each vignette was sent to the woman whose story it was drawn from for review and authorisation. Feedback

2 Responses on participants' experiences of the workshops, by workshop, measured on a 5-point Likert scale

Questions
a. I feel supported in participating in this program
b. My knowledge and experiences have been heard through the workshop process
c. My knowledge and experiences have been respected and valued through the workshop process
d. My involvement has had an impact on what the model of care will be

3 Responses on participants' experiences of the workshops, by workshop, by binary measure



Questions
a. Do you think that your participation will positively influence care for Aboriginal women who have cardiometabolic complications
b. If the opportunity arose, would you have confidence to be involved in a process to design the way care is provided (such as a model of care) again?

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on the conceptual framework and votes on the model's name were collected using Mentimeter. The Aboriginal Women's Governance Group then reviewed the draft model of care, providing final endorsement without amendment, and ensuring it aligned with the cultural values and broader community priorities.

Dissemination

Ongoing dissemination ensured iterative engagement with participants and governance groups. A third version of the model, incorporating context for future implementation, was shared with participants and tabled at a forum of health service and system leaders and teams to guide the development of the implementation plan — a companion document for applying the model. Future dissemination will include tailored workshops with partner organisations, health service providers and accessible materials designed to ensure findings are widely shared. These efforts uphold the priorities of the Aboriginal Women's Governance Group, ensuring Aboriginal women remain central to implementation.

4 Participant feedback at end of Workshop Two

Quote 1: I hope my participation allows/encourages services to better support Aboriginal women

Quote 2: I have hopes that [my participation] will [positively influence care for Aboriginal women who have cardiometabolic complications] as the solutions that we have come up with are easily obtainable/achievable

Quote 3: Safe space provided to be able to speak. Have a better understanding about the project and my involvement

Quote 4: Thank you for taking the time and recognising the gaps in the system to improve the way we receive future treatment and respect

5 Title, vision and guiding principles for the model of acre

Title: Powerful Nunga mums, strong healthy Bibi and families: improving care, support and knowledge of women who experience cardiometabolic complications in pregnancy

Vision for the model: To continue the longevity of birthing, practising Grandmothers Lore by providing a culturally safe space for Aboriginal women where their choices are respected and heard

Our vision is underpinned by recognising that:

- as Aboriginal women, we have over 65 000 years of sacred maternal bloodline and ongoing cultural connection
- we expect allies to stand and advocate with us to recognise the ongoing impact of colonisation
- we carry our strength, our ancestors and our cultural strength and pass it on to our children
- we deserve access to services that are culturally safe and informed by us and our families; services and support must adhere to best practice by meeting the holistic needs of Aboriginal women socially, emotionally, physically and spiritually

Core principles:

- women's experiences and voices are core
- respect
- education and information the right way
- holistic and culturally safe
- social and emotional wellbeing is embedded across a woman's journey
- partners and family are cared for and valued
- Aboriginal leadership and ongoing community consultation
- outcome focused and accountable with sustainable funding to put actions into practice
- prioritises and recognises Aboriginal workforce

Results

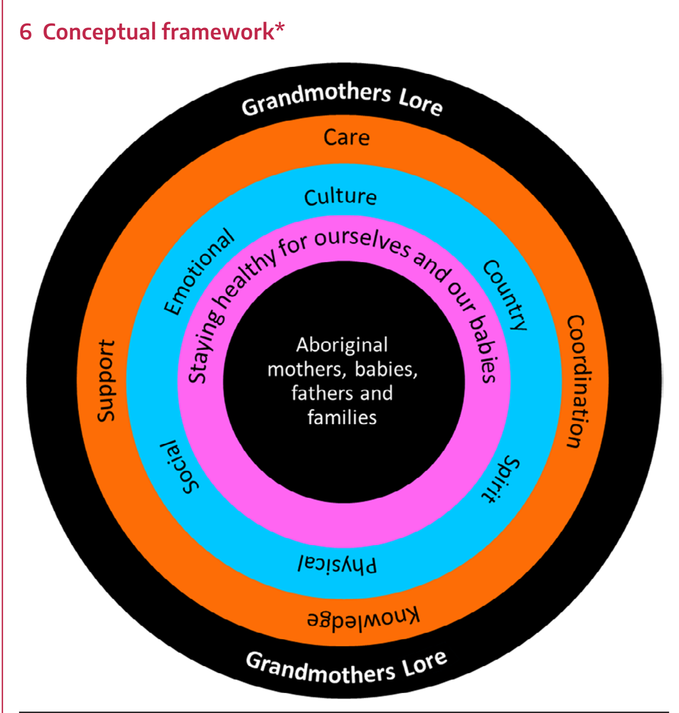
Participants

Nineteen Aboriginal women attended the first workshop (Box 1). Fifteen had personal experience of one or more cardiometabolic complications during pregnancy; ten had experienced gestational or type 2 diabetes, and seven had experienced heart-related complications, including gestational or pre-existing hypertension, pre-eclampsia and/or atherosclerotic disease. Four of the 15 also held health professional roles in maternal and/or cardiometabolic health care. An additional four participants solely brought health professional experiences. Eleven women attended the second workshop. The eight women who did not attend the second workshop, due to personal (ie, giving birth) or professional (ie, training, workforce shortages) commitments, remained engaged and provided further feedback and review.

Participant evaluation

Fifteen women completed the evaluation at the end of Workshop One, and ten did so after Workshop Two. Most participants who completed the survey felt their knowledge and experience was heard and felt their involvement influenced the model of care design in Workshop Two (Box 2). All reported that their participation would positively impact care for Aboriginal

6 Conceptual framework*



* The conceptual framework places Aboriginal mothers, babies, fathers and families at its core, symbolising their central role in the maternal health journey. Surrounding the core are essential layers that reflect the values and priorities shared by Aboriginal women, with the outer-most layer, Grandmothers Lore, which wraps around all others, representing the wisdom, cultural guidance and ancestral strength that sustain Aboriginal families and communities.[23] ◆

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7 Priority areas and system enablers

PRIORITY AREAS			
SYSTEMS			
1. Culturally safe systems and workforce 2. Strong supported Aboriginal workforce			
ACROSS JOURNEY			
3. Social and emotional wellbeing wrap-around 4. Accommodation and travel supports 5. Nutrition 6. Information, resources and education 7. Peer supports and support people 8. Choice and control and consent 9. Supporting women whose children are considered "high risk"			
PRE-PREGNANCY	DURING PREGNANCY	LABOUR AND BIRTH	POST-BIRTH
10. Care, management and support	11. Screening, support, care and management 12. Ongoing support for monitoring and self-management of cardiometabolic conditions	13. Support and care during birth 14. Birthing close to home 15. Aboriginal birthing space	16. What should happen in neonatal intensive care unit (NICU) 17. Knowledge on "what's next" 18. Support, care and management after baby is born

SYSTEM ENABLERS
1. Governance: Aboriginal leadership and partnerships 2. Resourcing and sustainable funding 3. Workforce: a strong cardiometabolic and maternal workforce 4. Transport and accommodation support 5. Systems: information and communications technology solutions 6. Community engagement 7. Integrated and coordinated services 8. Monitoring and evaluation

women with cardiometabolic complications (Box 3). Qualitative feedback indicated the practical and achievable nature of solutions developed, optimism about the model's potential to drive meaningful change, and a feeling of safety in the space (Box 4).

Elements of the maternal and child health model of care

The model of care incorporates the title, the vision for the model of care and the guiding principles (Box 5), a conceptual framework (Box 6) and refined priority areas with system enablers (Box 7). Central to these findings was cultural safety (Box 8), which amplifies Aboriginal women's voices and honours strengths, while addressing expressed needs. Together, these elements provide a cohesive, culturally responsive approach to improving health care for Aboriginal women, children and families — spanning pre-pregnancy, pregnancy and post-partum care, and long term wellbeing.

The name of the model, "Powerful Nunga mums, strong healthy Bibi and families: improving care, support and knowledge of women who experience cardiometabolic complications in pregnancy", developed collaboratively through the workshops and a follow-up survey, reflects cultural strength and holistic wellbeing, and incorporates self-identification language for Aboriginal people in SA and Pitjantjatjara language groups. The vision for the model of care is grounded in women's lived experiences and cultural values, articulating collective aspirations for a health system that provides holistic, culturally safe and responsive care.

8 Cultural safety: what it means to Aboriginal women

Aboriginal women participants describe cultural safety as being present when:

- there is an understanding of the whole person and that sometimes decisions aren't our own to make; sometimes we need to consider our elders, mothers, aunties in our decisions — something mainstream don't understand
- feeling supported, treated respectfully, feeling like I belong, seeing Aboriginal workers and staff supporting me, allies being respectful of my cultural beliefs
- the space makes Aboriginal and Torres Strait Islander people feel comfortable
- there is a person you can yarn to that understands and respects your culture, obligation etc; non-judgemental and supportive like having aunties supporting your journey
- there is an understanding that birthing should be about respect, love, sacredness, happiness
- feeling supported, valued, cared for, and there is knowledge of community values and beliefs
- being comfortable and confident to be able to be yourself and have a voice without fear, and being surrounded by strong Aboriginal people and leaders
- creating a space that is safe for Aboriginal and Torres Strait Islander people — a place that makes you feel comfortable

The core principles form the foundation of the model, reflecting the values and priorities of Aboriginal women in SA regarding wellbeing. They guide health service providers in delivering accountable and sustainable care that fosters trust, inclusivity and improved health outcomes.

The conceptual framework (Box 6) embodies a holistic approach to addressing the health and cardiometabolic care needs of Aboriginal women. Fostering culturally safe, respectful environments where Aboriginal women feel empowered, supported and valued is critical to improving health outcomes.

The final model presents 18 priority areas, with eight system enablers necessary for implementing priorities and achieving meaningful health outcomes (Box 7). Each priority area highlights specific issues and solutions, with recommendations to guide health service providers in the first steps towards delivering culturally safe, responsive and effective maternal and child health care. The system enablers are adapted from the previous work that informed this project[24] and provide the structural foundation to ensure the model is effective, resilient and culturally responsive.

For Aboriginal women in SA, cultural safety means feeling supported, valued and respected within a holistic framework that honours identity, family and community. At its core, and in their words (Box 8), cultural safety enables women to speak freely, feel confident in their identity and see cultural ways of knowing, being and doing valued throughout the journey.

Discussion

A persistent challenge in Aboriginal health is that repeated reforms have failed to improve outcomes, largely due to excluding culturally grounded approaches and genuine partnerships with Aboriginal communities.[17,25] This project centred Aboriginal women as leaders in designing a maternal and child health model, identifying needs and priorities across the pregnancy journey. By using previously identified priorities[15-17] and guidance by Aboriginal leadership, the co-design process upheld principles of respect, mutual benefit and two-way learning.[13] Participants described feeling safe, supported, and confident that their contributions would drive real change. While aligned in principle with initiatives such as Birthing on Country,[26] this model is distinct in its statewide, systems-focused approach and specific emphasis on cardiometabolic health. It offers a holistic, interconnected framework to address systemic failures of current care models, particularly in ensuring cultural safety and eliminating discrimination.[16,27]

Limitations

Engaging women across kinship networks and from urban, regional and remote SA communities enriched the depth and cultural relevance of discussions. However, recruitment primarily via social media might have introduced self-selection bias, potentially limiting participation from women with less digital access or differing views. Including a broader range of experiences could further deepen findings. Preliminary work to understand the SA context and international best practice sought to provide balance, and highlighted that place-based solutions are required and can be built on existing models and programs in other jurisdictions. We recognise that there were many aspects of a women's maternal journey that did not emerge as priorities through this specific project. For example, trauma and grief, and loss of a pregnancy or infant, compounded by the challenges of cardiometabolic conditions, demand holistic and sensitive approaches to address both emotional and physical wellbeing.

Conclusion

Through a process of identifying gaps and collaboratively shaping solutions, Aboriginal women have charted a path for culturally safe care, aiming to improve outcomes for mothers, children and families across the life course. The model highlights the need for systemic changes, including improved workforce capacity and enhanced post-pregnancy care. Health service systems, funders and decision makers must embrace opportunities for transformative change by actively implementing solutions led by Aboriginal women in the maternal and child health space. The findings illuminate a way forward, but sustained action, investment and courage are needed to ensure that health systems deliver equitable, culturally responsive care that supports Aboriginal women's needs as required under priority reforms such as Closing the Gap.[28]

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[Correction added on 22 August 2025, after first online publication: CAUL funding statement has been added.]

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Supporting Information

Additional Supporting Information is included with the online version of this article.

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