Cervical screening approach of self-collection, point-of-care HPV testing, and same-day colposcopy among Aboriginal and Torres Strait Islander women in remote Western Australia (the PREVENT Project): an implementation study

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Summary

Background Aboriginal and Torres Strait Islander women can face substantial cancer screening barriers in remote areas. To support WHO cervical cancer elimination targets, we evaluated a novel screening approach integrating self-collection, point-of-care human papillomavirus (HPV) testing, and same-day specialist assessment for Aboriginal and Torres Strait Islander women in remote Western Australia.

Methods We developed a screening approach using point-of-care HPV testing on self-collected samples with same-day results and immediate specialist assessment. This implementation study was delivered to six remote Kimberley Aboriginal communities and assessed clinical outcomes and participant satisfaction. The approach was implemented as part of routine outreach gynaecology care between Sept 1 and Dec 31, 2022, with follow-up for cervical test results continuing up to March 31, 2023. Women aged 25–74 years were eligible for this study if they identified as an Aboriginal and/or Torres Strait Islander, were asymptomatic, were due or overdue for cervical screening (or had not had a previous HPV screening test), and were residing in a remote community. The primary objective of this study was to assess whether a point-of-care testing and same-day follow-up approach increased participation in cervical screening among under-screened and never-screened Aboriginal and Torres Strait Islander women in remote Western Australia.

Findings Of the 844 women identified as eligible, 303 (36%) were directly invited to participate. Within 4 months, 108 women participated in the intervention, a 36% response rate. Among participants, 22 (21%) of 108 tested positive for oncogenic HPV, with 21 (95%) of these completing the same-day colposcopic assessment. No high-grade cervical abnormalities were detected. Participants reported high satisfaction with self-collection rapid results and same-day specialist access, with 107 (99%) indicating a willingness to recommend the approach to others.

Interpretation We showed the feasibility of integrating portable, same-day cervical screening and follow-up care into remote health-care settings, achieved through successful community engagement and advocacy. These findings offer valuable insights for policy makers and opportunities to increase women's participation in screening programmes, particularly in geographically remote areas.

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Introduction

Successful implementation of a comprehensive strategy that promotes high human papillomavirus (HPV) vaccination rates, attendance for cervical screening, and completion of treatment could lead to elimination of cervical cancer as a public health problem (with an incidence rate of less than four cases per 100 000 population as defined by WHO). Cervical cancer elimination is not on track for all women, particularly those in Indigenous populations, who face systemic health-care failures and substantial health disparities. There is an urgent need to develop new strategies that reach diverse populations. Countries must address these systemic barriers to ensure equitable health-care access for Indigenous women to achieve elimination goals.[1,2]

In Australia, Aboriginal and Torres Strait Islander women represent 4% of the total Australian population and have disproportionately high rates of cervical cancer.[3,4] For 2016–20, the incidence rate was 23 cases per 100 000 population—more than twice the rate in non-Indigenous women.[4] Mortality rates for 2018–22 were similarly concerning, at eight cases per 100 000 population—almost four times higher than the rate for non-Indigenous women.[4] Despite these

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Research in context

Evidence before this study

WHO has recommended that countries improve the provision of primary human papillomavirus (HPV) screening to support the elimination of cervical cancer, but current targets do not address the known inequities within countries for Indigenous peoples. Tailored solutions, informed by Aboriginal leadership and knowledge and developed through ongoing community engagement, are essential for achieving equitable health outcomes for Indigenous populations. We searched PubMed for original research articles published in English using the terms ("HPV screening" or "HPV testing") AND ("cervical test", "point-of-care", or Xpert®) AND ("Indigenous", "Aboriginal", or "Torres Strait Islander") to identify existing literature published between Jan 1, 2009, and Dec 31, 2024. Previous research has reported that the Xpert HPV test has good sensitivity and specificity, and self-collection is a well-accepted option for point-of-care cervical screening. However, no previous study investigated delivery and acceptability of offering a portable and same-day cervical screening approach for Aboriginal and Torres Strait Islander women who reside in some of the most remote communities. Insufficient real-world evidence on effectiveness and acceptability of new solutions for underserved populations hinders progress in global cervical cancer elimination efforts.

Added value of this study

To our knowledge, this is the first study to investigate the delivery of a culturally safe, portable, same-day cervical screening approach for under-screened and never-screened Aboriginal women in remote locations. Leveraging existing medical outreach services, the intervention integrated a validated cervical screening test with point-of-care testing, enabling rapid results and immediate access to collection of liquid-based cytology for triage or specialist colposcopic assessment (or both). In line with previous findings, self-collection is highly acceptable to Aboriginal and Torres Strait Islander women, and our new approach showed high effectiveness, acceptability, and safety in the early detection and follow-up of cervical abnormalities within the study population.

Implications of all the available evidence

The available evidence provides policy makers with indications regarding integrated HPV screening and same-day specialist assessment that could be implemented as a new strategy to increase participation among under-screened and never-screened women in remote areas. Such a strategy could help address disparities in cervical cancer prevention among under-served populations.

disparities, national data on screening participation from the Australian National Cervical Screening Program are not available for Aboriginal and Torres Strait Islander women.[4] However, estimates from the Australian Institute of Health and Welfare show that between December, 2020, and June, 2024, only 48% of Aboriginal and Torres Strait Islander women were documented as screened (ie, an HPV or liquid-based cytology [LBC] test).[5] Furthermore, among women aged 25–74 years identified as being at high risk of cervical abnormalities, timely follow-up via colposcopy (within 3 months) was achieved for just 51% of Aboriginal and Torres Strait Islander women in 2022, compared with 61% for non-Indigenous women.[4] These inequities in screening participation and follow-up contribute to poorer cervical cancer outcomes for Indigenous women compared with non-Indigenous women and underscore the limitations of the Australian screening programme in addressing the needs of all women.[4,6]

New cervical screening approaches are needed to overcome barriers and build trust with Aboriginal and Torres Strait Islander communities.[7,8] Research indicates that self-collection methods are increasingly accepted among Aboriginal and Torres Strait Islander women, potentially enhancing participation by providing greater control and privacy.[7,8] We aimed to evaluate cervical screening participation, follow-up completion, and acceptability of a novel approach involving point-of-care HPV testing of self-collected samples, followed by same-day specialist access, focusing on under-screened and never-screened Aboriginal and Torres Strait Islander women in a remote region of Western Australia: Kimberley. The Kimberley region presents unique challenges in cervical cancer prevention. Home to approximately 18 000 Aboriginal people (nearly half the local population), this area has the highest socioeconomic disadvantage levels in the state.[9] The vast area (423 000 km²) of the region and its remoteness mean residents often rely on infrequent visits from travelling specialists and must contend with long distances to access health-care services.

Methods

Development of a culturally safe and community-driven study design

A national research team comprising Aboriginal health-care leaders, local service providers, Elders, and non-Indigenous researchers collaborated closely. This collaborative design process prioritised cultural safety, trust-building, family-inclusive engagement, and integration with existing community health services.[10] Due to the setting and complexity, a randomised controlled trial was not feasible. Instead, this implementation study adopted WHO's implementation research guide[11] as the guiding framework, as well as the Standards for Reporting Implementation Studies guidelines[12] (appendix pp 2–3). This effort culminated

See Online for appendix

in the Point of Care HPV Testing Utilising Self-collection to Prevent Cervical Cancer (PREVENT) Project (figure 1).

Implementation approach

The study leveraged the region's existing, publicly funded gynaecology medical outreach service, which employs

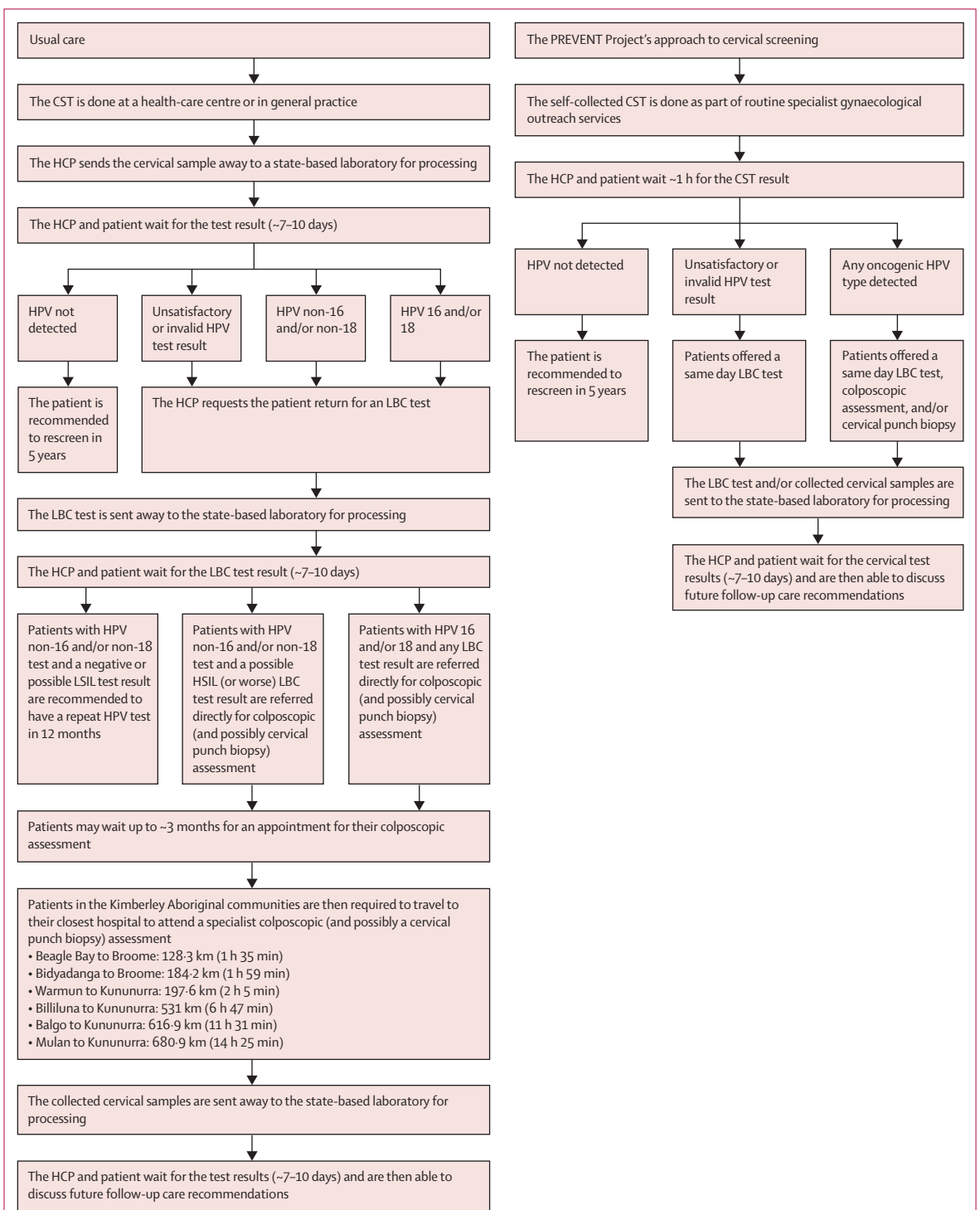

Figure 1: **Overview of the differences between usual care and the new approach to cervical screening delivered as part of the PREVENT Project**
CST=cervical screening test. HCP=health-care provider. HPV=human papillomavirus. HSIL=high-grade squamous intraepithelial lesion. LBC=liquid-based cytology. LSIL=low-grade squamous intraepithelial lesion.

consultant gynaecologists who reside and work in partnership with Aboriginal Community Controlled Health Organisations in the Kimberley region. With the availability of new technologies, these specialists were able to conduct screening and follow-up assessments on-site at remote Aboriginal health-care community clinics. Key features of this approach included self-collected vaginal samples for HPV testing, point-of-care testing with results available within 1 h, collection of LBC for triage testing, use of a portable colposcope (MobileODT; Tel Aviv, Israel) for real-time image capture and sharing, on-site colposcopy, and hospital referrals as needed.

Baseline measures and estimation of the target population

Australia implemented HPV testing into the cervical cancer screening programme on Dec 1, 2017, inviting women aged 25–74 years for screening every 5 years. The 2017 change also introduced self-collection, initially available to women aged 30 years and older who were at least 2 years overdue or had never been screened and refused clinician-collected testing. Nationally, self-collected tests accounted for only 1% of all cervical screening tests (CSTs) done between Dec 1, 2017, and June 30, 2022.[13] Between 2019 and 2023, the cervical screening participation rate in Western Australia was 64% but was only 59% in the Kimberley region.[14]

To determine the target population (ie, women who had been under-screened or never-screened) we used data from the Western Australian Cervical Screening Registry and Australian Bureau of Statistics (female resident population, by postcode). Adjustments were made to account for hysterectomy prevalence, and women who had a cervical test in the past 5 years (from June 1, 2017, to May 31, 2022) were excluded. An annual mean count was then calculated to determine the number of women this screening approach should target during the implementation period, reflecting service requirements if all eligible women were to screen once over a 5-year period.

Outcomes

The primary objective of this study was to assess whether a point-of-care testing and same-day follow-up approach increased participation in cervical screening among under-screened and never-screened Aboriginal and Torres Strait Islander women in remote Western Australia. Secondary objectives were reporting clinical findings, evaluating follow-up participation rates, and assessing the preferences and acceptability of this novel screening approach among both women and their health-care providers.

Participants

Recruitment followed standard cervical screening practices as part of routine gynaecological outreach care, with self-collection offered as an additional option to eligible women. Health clinic staff used established protocols and local health information systems (MMEx and CHIS)[15,16] to identify women overdue for cervical screening. Eligible women were invited through standard recruitment methods, including direct telephone contact, face-to-face outreach, and community engagement. Women were informed that self-collection, point-of-care results, and same-day specialist assessment were available as enhanced service options. Peer referrals and community networks were also used for recruitment. Women could choose a practitioner-performed test, the enhanced screening options, or decline participation.

Sex and gender were determined through self-report during initial clinical consultation. All participants self-identified as women.

Aboriginal and Torres Strait Islander identity was determined through self-identification. WA Health collects Aboriginal and Torres Strait Islander status by asking all individuals attending a health service if they identify as Aboriginal and/or Torres Strait Islander, without collecting further specific identification information.

Inclusion and exclusion criteria

Women were considered eligible for this study if they self-identified as an Aboriginal and/or Torres Strait Islander and self-reported being asymptomatic and ever having had sexual contact; were aged 25–74 years; had an intact cervix (regardless of previous gynaecological surgical history); were due or overdue for cervical screening (or had not had a previous HPV screening test); were residing in a remote or very remote community; and were physically able and mentally competent to provide consent to choose to do a self-collected HPV test. Women were excluded from the study if they self-reported current gynaecological symptoms, had a history of cervical cancer, or had undergone a hysterectomy. If a woman presented with symptoms suggestive of cervical pathology, the attending gynaecologist recommended co-testing with both HPV and LBC, along with colposcopic assessment.[17]

Delivery of cervical screening

The cervical screening approach was integrated into routine gynaecological care provided at health-care centres in participating communities. This approach was led by consultant gynaecologists and supported by nurses, midwives, and Aboriginal Health Workers, all of whom were trained and accredited in the use and transportation of the GeneXpert IV point-of-care HPV testing platform (Cepheid; Sunnyvale, CA, USA).

Cultural and language support were available throughout the entire screening process. The approach was implemented as part of routine outreach gynaecology care between Sept 1 and Dec 31, 2022, with follow-up for cervical test results continuing up to March 31, 2023. In each clinic, health-care providers conducted small-group

education sessions (three to five women) using culturally appropriate materials, including visual aids (eg, vaginal swabs) and a pictorial information sheet (appendix p 4). These sessions covered the nature and prevalence of HPV, the importance of cervical screening, and available treatment options. Upon request, health-care providers could also perform clinician-collected CSTs as part of routine care.

Once a self-collected sample was obtained, the HPV test was processed on-site within 1 h. Results were then discussed privately with a health-care provider. Women with negative HPV results received personalised follow-up recommendations. Invalid or unsatisfactory samples prompted the offer of same-day repeat testing, and positive results led to offers of LBC testing or colposcopic assessment (or both). Colposcopic assessment included cervical punch biopsy (where a small sample is taken from the surface of the cervix). All self-collected specimens were sent to VCS Pathology (Carlton, VA, Australia) for temporary storage (for up to 1 month after collection). Clinician-collected CSTs, LBC tests, and cervical biopsies were sent to the designated state-based laboratory.[17]

Data collection

This study used a mixed-methods data collection approach to comprehensively assess the implementation and acceptability of the new cervical screening approach.

Clinical data were initially collected using identifiable patient information for health-care delivery. Each participant was assigned a unique alphanumeric study identifier to link clinical screening data with survey responses. Following data collection, all identifiable information was removed and replaced with study identifiers before statistical analysis. The de-identified linked dataset was stored securely, with access restricted to analysis investigators (AP and JW), and identifier linking keys were stored separately for ongoing clinical follow-up. Authorised clinical staff verified each participant's HPV vaccination status and cervical screening history using the Australian Immunisation Register, National Cancer Screening Register, and local health records. Clinical data were categorised as follows: HPV vaccination status (vaccinated, not vaccinated, or ineligible); cervical screening history (up to date, lapsed or overdue, or never screened); and self-collected HPV test results (invalid or unsatisfactory, HPV-negative, HPV 16/18-positive, or other oncogenic HPV-positive). HPV positivity was defined as detection of any oncogenic HPV type (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, or 68). Biopsy results were reported using the Australian Modified Bethesda System.[17]

Participants completed satisfaction questionnaires via Qualtrics XM using a 5-point Likert scale (1="unsatisfied" to 5="very satisfied"), reporting their experiences with self-collection, point-of-care test results, colposcopic assessments, and the likelihood of recommending the approach (appendix p 6). Health-care providers also completed brief satisfaction surveys regarding service delivery (appendix p 6). Survey data were used to complement clinical outcomes and provide descriptive insights into acceptability rather than for formal statistical hypothesis testing.

	Number of women who screened (n=108)
Indigenous status	
Aboriginal and/or Torres Strait Islander	108 (100%)
Age group at time of HPV test, years	
<30	15 (14%)
30–34	22 (20%)
35–39	14 (13%)
40–44	10 (9%)
≥45	47 (44%)
Eligible for the HPV school-based (ie, offered to year 7 students in the school setting) and catch-up programme (ie, woman was born after April 1, 1981)	
Yes	50 (46%)
No	58 (54%)
HPV vaccination status	
Complete (ie, at least one dose was administered)*	34/50 (68%)
Not HPV vaccinated (no dose)	16/50 (32%)
Cervical screening history	
Adequately screened	49 (45%)
Lapsed or overdue	41 (38%)
Never screened	18 (17%)
Index of Relative Socio-economic Disadvantage	
Most disadvantaged or very disadvantaged	61 (56%)
Least disadvantaged	47 (44%)

Data are n (%). HPV=human papillomavirus. *A single dose is now (since 2023) considered a complete schedule (for those vaccinated aged <26 years at the time of HPV vaccination).

Table: **Participants' demographic and clinical history**

Statistical analysis

Demographic and clinical (ie, the last CST date) variables were described. The postcode of residence was used to assign socioeconomic level using the Index of Relative Socio-economic Advantage and Disadvantage[18] and the Accessibility/Remoteness Index of Australia.[19] Statistical analyses were done using Stata version 18.0.

Ethics and consent

Following completion of the CST, health-care providers invited women to participate in the project evaluation. Written consent was obtained via a hardcopy form for access to screening history and test results. Consent to participate in the acceptability survey was incorporated into the survey itself.

This study received Human Research Ethics Committee (HREC) and other required approvals from the Kimberley Aboriginal Health Planning Forum's Research Subcommittee (2021-028), Clinical Trials Notification—acknowledgement (CT-2021-CTN-0443801), University of Queensland (2021/HE002650), University of Notre Dame

Australia (2021-149F), WA Aboriginal Health Ethics Committee (HREC1104), WA Country Health Service (RGS-4936), and Women and Newborn Health Service (RGS-4936).

Role of the funding sources

The funders of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Results

After community consultations, local consultant gynaecologists were invited to deliver the screening approach in six Kimberley Aboriginal communities, with each community visited only once (appendix p 5). Based on data estimates from the Western Australian Cervical Screening Registry, an estimated 844 women were identified across the participating communities as under-screened or never screened over the preceding 5-year period. When considering the 5-yearly cervical screening schedule in Australia, this finding translates to an annual target of 169 women for the entire area (844/5 years=169 women per year). For the 4-month implementation period, we therefore aimed to screen approximately 56 women (169/12 months×4 months). Of the 844 women identified as eligible, 303 (36%) were directly invited to participate through targeted outreach by clinic staff. Community engagement involved a respected Elder who participated in screening before promoting the initiative to her community, and a local Aboriginal doctor who was involved from the study design stage through to clinic implementation, particularly for the Warmun community, where she has extended family.[10,20] We believe this was an important factor to no one declining the invitation to screen on the day of service delivery. 130 women attended the participating health clinics for screening, including women who responded to direct invitations and those who self-referred through word of mouth and peer networks within the community. Of the 130 attendees, 22 (17%) women were found to be ineligible due to age and were excluded from data collection. The final 108 (36% of those invited) women who completed screening represented 64% (108 of 169 women) of the yearly average number of women screened at these clinics, surpassing expectations for the 4-month study period. Among the 108 participants, 18 (17%) women had never undergone a cervical screening test before, indicating that the approach effectively reached a key target group that is traditionally missed by conventional approaches (table).

Of the 108 self-collected HPV tests, three (3%) samples were invalid. These women underwent same-day clinician-collected CSTs, which returned HPV-negative results. Of

	Negative (n=83)	HPV 16/18-positive (n=6)	HPV (not 16/18)-positive (n=16)	Invalid (n=3)	Total (n=108)
Median age at time of HPV test result, years	44 (25–72)	54 (41–61)	37 (26–59)	34 (28–40)	NA
Cervical screening history					
Adequately screened	38 (46%)	6 (100%)	7 (44%)	3 (100%)	49 (45%)
Lapsed or overdue	32 (39%)		9 (56%)		41 (38%)
Never screened	13 (16%)			NA	18 (17%)
Total	83	6	16	3	108
Follow-up outcomes for HPV-positive (any type) women (N=22)					
Colposcopic assessment and liquid-based cytology test					
Yes	NA	6	15	NA	21
No		0	1		1
Total		6	16		22
Liquid-based cytology test result					
Negative	NA	6	10	NA	15
Possible LSIL			6		6
LSIL		0			
HSIL		0			
Total		6	16		22
Was a cervical punch biopsy done?					
Yes	NA	6		NA	6
No		16			16
Total		6	16		22
Cervical punch biopsy test results (N=6)					
Negative	NA	6		NA	6
CIN1					
Total		6			6

Figure 2: **Colposcopic, liquid-based cytology, and punch biopsy test outcomes by HPV test result (n=108)**
Data are median (IQR), n (%), or n. CIN=cervical intraepithelial neoplasia. HPV=human papillomavirus. HSIL=high-grade squamous intraepithelial lesion. LSIL=low-grade squamous intraepithelial lesion. NA=not applicable.

the remaining 105 valid tests, 83 (79%) women were negative and 22 (21%) women tested positive for oncogenic HPV types, of which seven (7%) were HPV 16-positive and/or HPV 18-positive, and 15 (14%) were positive for other oncogenic types (figure 2).

Among participants who tested positive for HPV, 21 (95%) of 22 women consented to same-day colposcopy, and six (27%) women underwent cervical punch biopsy. Among these punch biopsies, the most severe histological finding was a low-grade squamous intraepithelial lesion. The participant who was unable to participate in a same-day assessment (reason given that she had previous family commitments) subsequently attended hospital for a colposcopic evaluation and LBC test, both of which were negative. Therefore, no treatment was required per Australian national guidelines (figure 2).[17] All women who tested positive for HPV were counselled on follow-up recommendations and remain under the care of their local health-care providers for ongoing surveillance.

All 108 women completed the acceptability and evaluation survey. Key findings included high satisfaction with self-collection and point-of-care test results, with most participants stating that having same-day results, being able to collect their own specimens, and receiving a fast test result (available within 1 h) on the same day greatly encouraged their participation in cervical screening. 107 (99%) of 108 women reported that they were "very likely" to recommend this screening approach to others. Common reasons for preferring self-collection included: "It was easy to do" (90 [83%] women); "It felt more private" (89 [82%] women); "It was quick" (89 [82%] women); "There was no shame" (75 [69%] women); and "The test result came back fast" (71 [66%] women).

Participants also shared positive comments, such as:

> *"Really comfortable, quick, and felt in control. There was no shame."*

> *"I wish all women could have it done this way."*

> *"Glad to have the check-up. The oldest daughter had it done, and she came and told me about it—it's good that I did."*

A small number of women expressed concerns, with seven (6%) worried while waiting for results, three (3%) questioning the accuracy of self-collected tests, and two (2%) reporting minor discomfort during sample collection. Only one participant reported being "not likely" to recommend the approach due to discomfort discussing cervical screening with others.

All participants reported that having access to a specialist on the same day substantially increased their willingness to participate in cervical screening. The majority were "very likely" to recommend same-day specialist assessments to others. Key reasons included: "I did not have to travel anywhere" (82 [76%] women); "I was able to stay in my community" (79 [73%] women), and "I felt safe and supported" (51 [47%] women). All 108 women supported the continuation of this screening approach, which includes self-collection, point-of-care testing, same-day test results, and specialist access, within existing outreach services. One participant summarised the community sentiment:

> *"I was very happy to have all tests and procedures done in one day. I would have been anxious if I had to wait. It's about time remote communities had proper access to healthcare."*

Health-care providers surveyed (n=5) also reported high satisfaction (five [100%]) with the screening approach, particularly noting improved patient engagement and the elimination of referral delays. Providers described the approach as reducing shame, increasing participation, and giving women control:

> *"The patients that undertook their testing, and then rounded up their sisters and mother to come in as well. What better recommendation could that be!"*

Discussion

To our knowledge, this is the first Australian study to show the feasibility of integrating portable, same-day cervical screening and specialist assessment into remote health-care settings for Aboriginal and Torres Strait Islander women. Through community co-design, the approach improved cervical cancer screening—achieving 64% of estimated annual screening needs within 4 months. The clinical outcomes aligned with national data, with most participants testing negative for oncogenic HPV and no high-grade cervical abnormalities detected.[21] Integration of portable colposcopy enabled immediate specialist assessment, eliminating geographical barriers that would otherwise require long-distance travel for follow-up care. Among women who tested positive for HPV, the integrated approach achieved 95% same-day colposcopy completion—a substantial improvement over standard referral pathways, where up to 38% of recommended and booked colposcopies are missed in this region. Although some participants received the same-day colposcopy beyond current guideline requirements (eg, HPV not 16/18 with negative cytology), this approach reflected community preferences for definitive assessment established during co-design, consistent with findings from Māori communities in New Zealand.[22,23] Overall, the approach showed high acceptability, with endorsement from 99% of participants, and all health-care providers reported improved patient engagement and workflow efficiency. This combination of participation rates, follow-up completion, and stakeholder satisfaction indicates meaningful progress in addressing health-care disparities for remote Indigenous communities.

The 36% invitation response rate in the PREVENT Project reflects known challenges in engaging under-screened Indigenous populations, but the study methodology provided valuable insights into practical implementation strategies for this population.

Participation rates in similar studies focused on recruiting under-screened or never-screened Indigenous women have varied considerably (22–81%), reflecting differences in recruitment methods, engagement periods, and service integration.[24–28]

The He Tapu Te Whare Tangata cluster randomised trial achieved a 59% participation rate of Māori women accepting HPV self-sampling compared with 22% in the usual care group.[24] This success was attributed to intensive recruitment by use of multiple contact methods and sustained community engagement over extended periods, with routine outreach services embedded into existing primary care relationships. Similarly, Dutton and colleagues[25] achieved a 52% participation rate among Aboriginal women through nurse-led community engagement over sustained periods, showing the effectiveness of locally driven relationships. These rates align with broader international evidence from Arbyn and colleagues' meta-analysis,[28] which reported pooled participation rates of 25% for self-sampling mailout approaches compared with 12% for routine invitations. The most successful interventions consistently had sustained engagement over 6–8 weeks per community rather than single-visit approaches.[24–28] Although our single-visit approach achieved 64% of annual screening targets within 4 months, this strategy might have reduced participation among women who were unavailable on the specific service day. However, the unique strength of our study lies in addressing follow-up barriers rather than solely focusing on initial participation. The integrated same-day specialist assessment achieved 95% follow-up completion among women who tested positive for HPV, showing that comprehensive care approaches addressing multiple barriers can be as important as initial participation rates for overall screening effectiveness in remote populations.

Our approach prioritised community control over the screening process, with local Aboriginal health-care providers and Elder endorsement ensuring that community voices guided both participation and promotion strategies. Our 36% response rate among directly invited women indicates opportunities for improvement. Future studies or delivery of this screening approach could enhance participation by strengthening community leadership through extended engagement periods with multiple community visits, positioning local Aboriginal Health Workers as primary recruiters, enabling flexible scheduling, and integrating services with existing health programmes. The achievement of 64% of the annual need in 4 months suggests that sustained, regular service delivery led by community voices could substantially exceed yearly targets. Our findings show that optimal population coverage might require two to three community-controlled service delivery rounds annually, thereby transforming cervical screening from an episodic intervention into an ongoing, integrated community health-care approach that upholds Aboriginal self-determination.

Implementation and evaluation were constrained by external factors beyond the research team's control. COVID-19 pandemic restrictions and widespread flooding in the Kimberley region in 2022 substantially restricted extended implementation periods or return visits for post-intervention interviews. Other limitations included the inability to differentiate between invited and self-referred participants, meaning we do not know exactly how successful the recruitment method was, as well as constraints imposed by single-visit service delivery. Based on implementation experience, restricted service availability was likely the main barrier—each community was visited only once, so women who were unavailable on that day could not participate. Satisfaction questionnaires underwent informal pilot testing with women and health-care providers but were not formally validated. A systematic collection of specific non-participation reasons among invited women was not undertaken, primarily due to the logistical constraints of the single-visit approach and the challenges of follow-up in remote communities covering 423 000 km². This paper focused on clinical feasibility and acceptability rather than economic evaluation, which will be reported separately, to guide policy decisions about scaling up.

In conclusion, this study shows that HPV screening with same-day specialist assessment is feasible when implemented through Aboriginal-led co-design approaches. The findings support Australia's National Strategy for the Elimination of Cervical Cancer[6] and underscore the crucial role of Aboriginal Community Controlled Health Organisations in health service delivery. Further research should prioritise community leadership and investigate opportunities for economic sustainability and programme expansion, including enhanced Aboriginal Health Worker roles, telehealth assessments, and direct national register reporting.

Contributors

Study conceptualisation and design: all authors. Project administration and coordination: AP, JPC, and JW. Methodology development, resources, and equipment training: AP, CE, DH, JMLB, JW, KS, KW, LA, LJW, MAS, MS, NS, PAC, and YL. Data collection and clinical implementation: AP, CE, JW, LA, NS, PAC, and YL. Data analysis and statistical verification: AP, JMLB, JW, KS, LJW, and MAS. Writing—original draft: AP, JPC, JMLB, JW, and LJW. Writing—review and editing: all authors. Critical revision for important intellectual content: all authors. All authors have read and agreed to the published version of the manuscript. Author order reflects the first and last authors' primary contributions, with all other authors listed alphabetically. AP and JW directly accessed and verified all underlying data reported in the study. Access to the complete dataset was restricted to these investigators to maintain participant confidentiality and comply with ethical requirements, as other authors were not directly involved in statistical analyses or data management. All other authors had access to summary data and findings relevant to their specific contributions. All authors accept full responsibility for the decision to submit this manuscript for publication and approve the final version to be published.

Declaration of interests

JMLB is a former employee (within the past 3 years) of the Australian Centre for the Prevention of Cervical Cancer (ACPCC), which has

received donated laboratory tests, equipment, and funding for HPV validation studies and self-collection-related research from multiple manufacturers. DH and MS are current employees of ACPCC, which has received donated laboratory tests, equipment, and funding for HPV validation studies and self-collection-related research from multiple manufacturers. All other authors declare no competing interests.

Data sharing

The raw datasets are not available for sharing because of privacy policies and regulations in Western Australia.

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