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From Problem to Question

The Problem	The Limitation	The Innovation	Our Question
High cervical-cancer mortality in LMICs driven by gaps in accurate, accessible colposcopy	Traditional colposcopy shows moderate sensitivity and large inter-observer variability	AI-enabled digital colposcopes analyze high-resolution images in real time	Does AI digital colposcopy deliver superior diagnostic accuracy?

Evidence Gap

- Every two minutes, a woman dies of cervical cancer.
- 660,000 new cases and 350,000 deaths in 2022. Cervical cancer remains a major global health inequity.
- Diagnostic accuracy of colposcopy is still constrained by human variability.
- We synthesized 18 studies to test whether AI-powered digital colposcopy can close this gap.

How we studied it

- Design:** Systematic review & meta-analysis of diagnostic accuracy
- Sources:** PubMed, Cochrane, JBI, Google Scholar
- Selection:** 1,835 records screened → 18 studies included
- Analysis:** Data pooled with Cochrane RevMan
- Quality:** Dual independent extraction using JBI tool



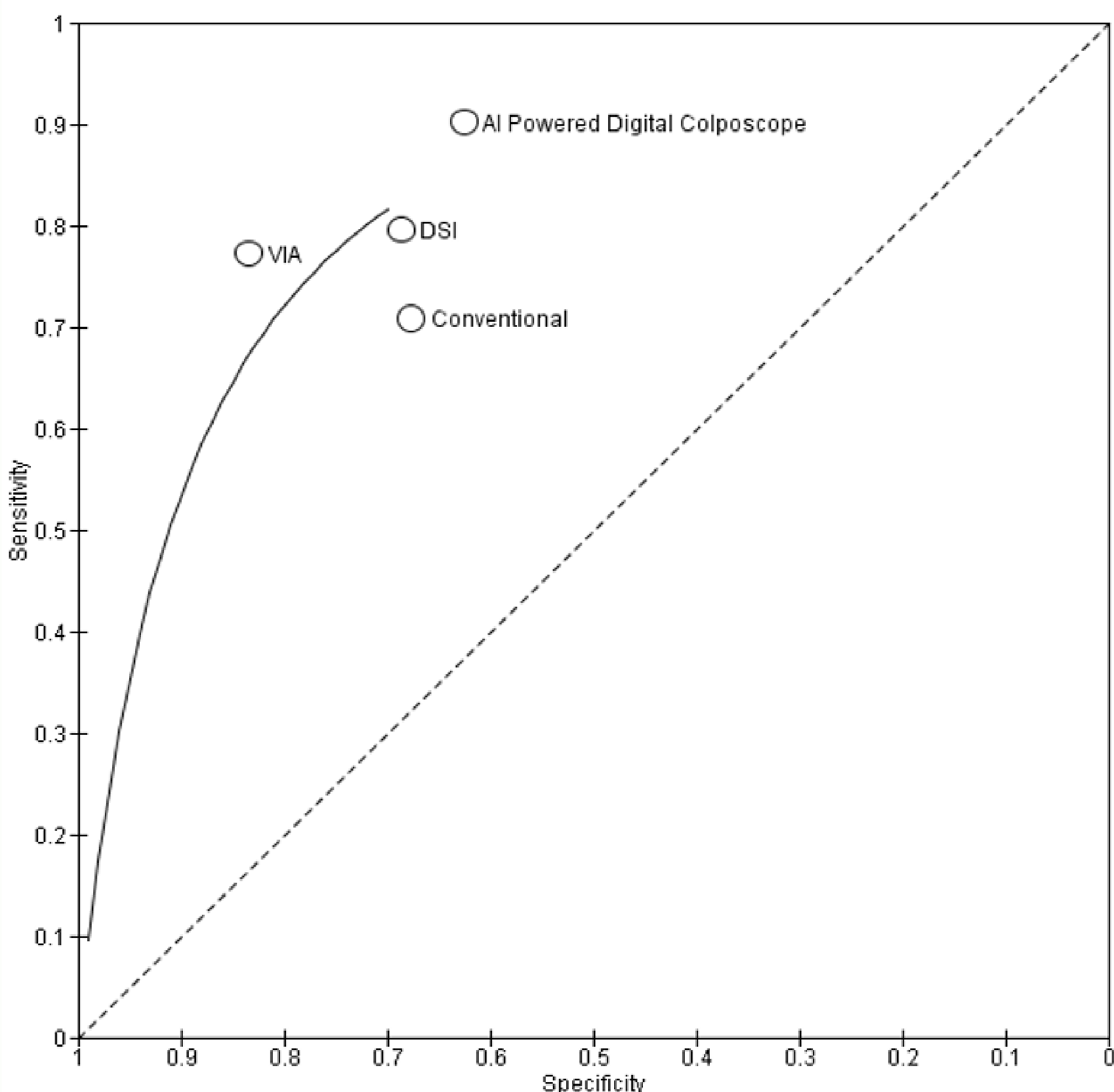
Figure 1. AI-Powered Digital Colposcope

What we Found

AI SENSITIVITY: 0.90

Method	Sensitivity (95% CI)	Specificity (95% CI)
AI Digital Colposcopy	0.90 (0.90–0.90)	0.63 (0.62–0.63)
Digital Spectral Imaging	0.80 (0.79–0.80)	0.69 (0.68–0.69)
Conventional Colposcopy	0.71 (0.70–0.72)	0.68 (0.67–0.68)
VIA	0.77 (0.73–0.81)	0.83 (0.82–0.85)

ROC Curve



What it Means

For clinicians' Higher sensitivity means fewer missed precancerous lesions.

For health systems AI can reduce observer variability and support triage in low-resource settings through portable devices and telemedicine.

For policy With adequate training, infrastructure and governance, AI colposcopy can strengthen screening programmes and support cervical cancer elimination goals.

Conclusion

AI-powered digital colposcopy shows the highest sensitivity for detecting cervical precancer and cancer which offers a promising scalable tool for screening and triage — especially in low-resource settings.

Next Steps & Contact

- Conduct large multicenter studies to confirm real-world accuracy and long-term outcomes.
- Assess cost-effectiveness, acceptability, and implementation feasibility.
- Develop standardized guidelines, training, and governance frameworks for scale-up.

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