

# Cervical Cancer Screening via HPV Self-Testing

## Is this a Screening Method that can be used to Increase Participation Rates for Rural US Women?



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### Background:

Cervical cancer morbidity and mortality rates remain higher in rural women living in the United States (US) compared to urban residents, despite cervical cancer being highly treatable and preventable with screening tests.<sup>1,2</sup> Current screening recommendations include provider performed human papillomavirus (HPV) testing with cytology, also known as a Papanicolaou (PAP) test every 5 years for women aged 30–65.<sup>3</sup> However, **over 20% of women have not been tested as recommended,**<sup>4</sup> and many rural women experience additional barriers to traditional screening methods including lack of time, increased travel distance, and lack of rural providers.<sup>5</sup> Recent studies, mostly outside of the US, have demonstrated that self-screening with high-risk HPV (hrHPV) self-swabs is a way to increase screening rates in under-screened women.

Traditional cytology-based screening has numerous limitations including low sensitivity, high demand on the healthcare system, and high costs.<sup>6</sup> Self-screening specifically examines for hrHPV infection as this is known to be more accurate in cervical cancer detection than cytology alone.<sup>5,7</sup>

### Methods:

A search was performed via PubMed on the topic of cervical cancer self-screening in adult women. The search was conducted June 22, 2020 to December 15, 2020. Terms such as "self-cervical cancer screening", "self-cervical human papillomavirus (HPV) test", and "mailed in cervical cancer screening tests" were used. The search was set for studies published from 2015–2020, and no country restrictions were set; however, there was higher preference towards literature published in the United States.

### Accuracy of HPV Self-Sampling

> A study by Wright et al.<sup>8</sup> found that testing of self-collected vaginal samples detected just as many cases of cervical intraepithelial neoplasia (CIN) and invasive cervical cancer as traditional cytology. Similarly, a recent study in Sweden showed that there was increased detection of CIN when compared to cytology screening alone.<sup>9</sup>

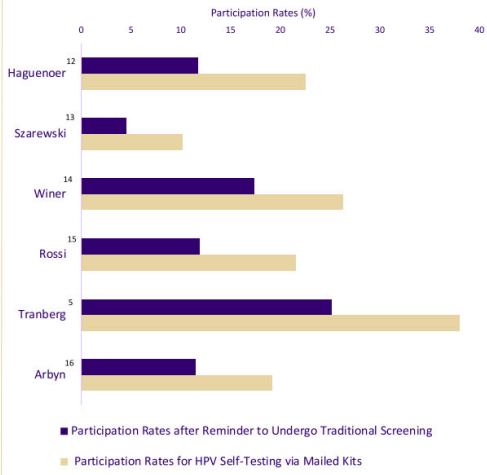
> Petignat et al.<sup>10</sup> demonstrated that vaginal self-sampling was just as sensitive as provider performed HPV sampling for detection of HPV infection.

> Balasubramanian et al.<sup>11</sup> found that the sensitivity of self HPV testing was 16.7% greater than cytology-based screening, though the specificity of cytology is lower which is likely due to transient infections.

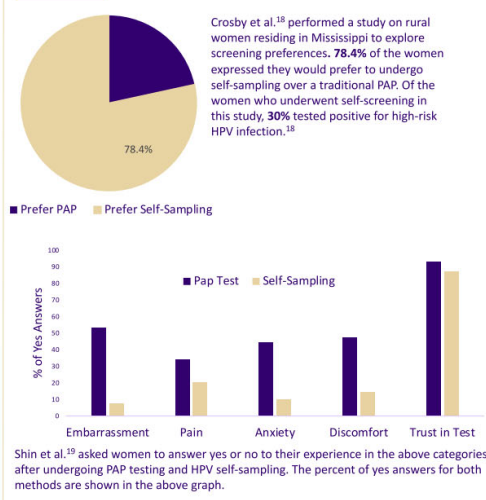
In all, studies conclude that the sensitivity and specificity of HPV self-sampling is sufficient to be used in low-resource settings to increase access to screening.

### Screening Rates

**Self-screening via HPV DNA increases participation rates for women in hard-to-reach areas who would otherwise remain under-screened, or not screened at all.** Recent studies demonstrate significantly increased screening rates when HPV self-sampling kits are mailed directly to under-screened women's homes compared to reminders to undergo traditional screening as shown in the different studies represented in the graph below.



### Acceptability of Self-Sampling



Some commonly reported difficulties of the self-testing process were uncertainty if the collection was performed properly, less trust in the accuracy of the test, and difficulty inserting the self-collection brush.<sup>19,20</sup> Women also cited missing the opportunity to talk to a gynecologist,<sup>21</sup> which may not be a concern in rural, US communities where women may not have easy access to a gynecologist.

### Cost Effectiveness

> Cervical cancer self-screening has the potential to reduce overall screening costs for women as an initial clinical encounter is not needed, and multiple factors impact the cost-effectiveness of self-screening including lower costs of materials and lower cost of testing.<sup>11,22,23</sup>

> Mezei et al.<sup>24</sup> analyzed 13 studies that compared cytology versus HPV self-testing and concluded that self-collected HPV testing was cost effective when it yielded higher population coverage.

> Additionally, HPV self-screening appears to be most cost-effective when there has been a longer time since the women's last PAP smear.<sup>23</sup>

### Follow Up After a Positive Result

For a screening program to be successful, a patient should undergo appropriate follow-up with colposcopy or cervical biopsy after a positive screening result.<sup>3</sup>

However, There is conflicting information regarding follow up after self-screening. Some studies suggest that women who screen positive will follow up due to a positive result acting as a re-entry point to the healthcare system.<sup>6</sup> **Nonetheless, many women remain uninsured or have other barriers to healthcare access that would make them less likely to follow up.** Studies that incorporated direct referral after a positive screening result had higher follow-up rates than studies that used a triage policy after a positive screening result, as well as studies that sent reminder letters after a positive test, and have a provider explain the consequences of not following up.<sup>16, 25</sup>

### Conclusion

HPV self-screening is an adequately accurate way to increase screening rates for women residing in low resource settings, such as rural America, and lack access to traditional screening. Future efforts should be directed towards research within the US healthcare system, with focus on best ways for community education, how to identify which women need screening, as well as ways to increase follow-up after a positive result despite certain barriers such as lack of health insurance. As it stands, cervical cancer screening guidelines in the US are robust and dynamic; however, with more research, HPV self-sampling could be a viable option to increase screening rates in rural, under-screened US women.

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