Advancing Cervical Cancer Screening:

Integrating Self-Sampling and Innovative Technologies for Equitable Access

Date of preparation: August 2024

Executive Summary:

Disparities in cervical cancer screening access and uptake persist among underserved communities, despite advances in cervical cancer prevention. These inequalities necessitate innovative approaches to improve screening rates and outcomes. These approaches should consider:

- **Implementation**: Utilise the public's acceptance of self-sampling from the COVID-19 pandemic and integrate self-sampling as a supplementary method into existing healthcare interactions.
- **Equity**: Design programmes in partnership with communities, prioritise high-risk and under-screened individuals, address socioeconomic barriers and tailor communication campaigns to diverse populations.
- **Operations**: Laboratory preparedness, kit distribution and management, and robust data collection and monitoring are crucial. The reliability and efficiency of the postal service for kit distribution and return should be evaluated, and alternative methods explored where necessary.
- **Broader Considerations**: Self-sampling and new technologies have the potential to expand preventative care beyond cervical cancer screening to other HPV-related cancers and even other diseases. While this offers benefits such as increased accessibility and convenience, it is important to carefully evaluate the risks and benefits of broader implementation, ensuring rigorous evaluation of self-sampling technologies and prioritising high-risk populations.

- **Key Message**: By prioritising high-risk populations, fostering collaboration and optimising communication and operational strategies, we can harness the power of self-sampling technologies to expand preventative care and move towards equitable cervical cancer elimination.

Recommendations

The roundtable discussion led to several recommendations for policymakers. We have prioritised these as short term (1-3 months), medium term (3-12 months) and long term (> 1 year) recommendations.

Short Term Policy Priorities

1. **Develop an Optimal Model for Distribution and Collection:** There is a need to evaluate the reliability and efficiency of the postal service for kit distribution and return, learning from other screening programmes, and explore alternative options such as partnerships with pharmacies or community diagnostics centres to ensure timely and convenient access for all individuals.
2. **Invest in Implementation Science:** Conduct research to understand the most effective ways to implement self-sampling programmes in diverse under-screened populations, considering behavioural, logistical, and cultural factors, and learning from existing screening programmes such as the implementation of the Bowel Screening Programme.
3. **Ensure Quality and Accuracy:** Establish robust criteria for evaluating the sensitivity and specificity of self-sampling technologies for inclusion in any screening pilots or programmes.

Medium Term Policy Priorities

1. **Advocate for Policy Change:** Advocate for policy changes that support the integration of self-sampling into national screening programmes, ensuring equitable access and coverage for all eligible individuals.
2. **Prioritise High-Risk Populations:** Focus initial self-sampling efforts in the UK on individuals at higher risk of developing cervical cancer, such as those who have not been screened regularly and underserved populations.
3. **Identify Partnership Opportunities:** Encourage partnerships between healthcare providers, policymakers, laboratories, community organisations, scientists and patient advocacy groups to co-produce effective and sustainable solutions to reach high-risk populations.
4. **Develop Tailored Communication:** Create targeted communication campaigns that address the diverse needs and barriers of different populations, emphasising the importance of HPV vaccination, cervical cancer screening and self-sampling.

Long Term Policy Priorities

1. **Strengthen Workforce Capacity:** Invest in training and professional development programmes to attract, train and retain cytology professionals, ensuring the availability of expertise in this critical field.
2. **Explore Innovative Technologies:** Investigate the potential of biomarkers as a triage tool for HPV-positive individuals to improve the accuracy and efficiency of cervical cancer screening. Investigate the use of AI to support workflows and improve efficiency.
3. **Evaluate Extended Genotype Reporting:** Assess the potential benefits of HPV assays that offer extended genotype reporting for triage and post-treatment management. While not currently recommended for primary screening, monitor emerging evidence on its utility in risk-based patient management, particularly in the context of self-sampling.
4. **Monitor and Evaluate:** Continuously monitor and evaluate the impact of self-sampling programmes on health outcomes, screening participation rates and health inequalities to identify areas for improvement and inform future policy decisions.

Introduction

The future of the NHS relies on a significant shift towards prevention, with more care delivered in the community and at home. Home sampling and testing offers great potential in this shift, providing increased access and convenience.

The cervical screening programmes across the UK are a successful example of preventative care, and routinely screen participants aged 25-64 for human papillomavirus (HPV). These successful programmes save an estimated 4,500 lives yearly from cervical cancer (UK National Screening Committee, n.d.). The screening intervals vary by country: in England and Northern Ireland, women and people with a cervix aged 25-49 are invited every 3 years and those aged 50-64 every 5 years, while in Scotland and Wales, all eligible individuals are invited every 5 years. With current uptake rates around 70% (Cancer Research UK, n.d.), there is a pressing need to increase attendance across the UK. Achieving 100% attendance would prevent a significant proportion of cervical cancer deaths.

Cervical cancer disproportionately affects females and people with a cervix in deprived areas, with incidence rates 65% higher and mortality rates 148% higher compared (Cancer Research UK and NCIN, 2014) to more affluent areas in England. Despite the preventable nature of cervical cancer through HPV vaccination and screening, individuals in deprived areas are 40% less likely (Jo's Cervical Cancer Trust, n.d.) to attend screening and are also less likely to have received the HPV vaccine, particularly among the teenage participants and individuals living in high social deprivation.

This paper synthesises insights from a roundtable discussion of experts in the field, focusing on the potential of self-sampling and new technologies in cervical cancer prevention. The discussion highlighted the need for a multi-faceted approach that addresses technological, operational and socio-cultural factors to ensure equitable access and maximal impact on public health.

Short Explainer: HPV Self-Sampling, Cervical Cancer Screening and HPV Vaccination

HPV Self-Sampling

- **What it is:** A method of collecting a sample for HPV testing, typically done by the individual themselves at home.
- **How it works:** Involves collecting cells from the vagina using a swab or other sampling device.
- **Purpose:** To detect the presence of high-risk HPV types that can cause cervical cell changes and potentially lead to cancer.
- **Benefits:** More convenient and accessible, especially for those who face barriers to clinic-based screening. Using HPV assays that can determine the HPV genotype allows for risk-based patient management, which can help prioritise follow-up for those at higher risk.
- **Limitations:**
  HPV testing alone has a relatively low specificity, as it cannot distinguish transient infections from persistent infections that may lead to cervical cancer. This limitation applies to both clinician-taken and self-collected samples. A positive HPV test requires further investigation, which can result in unnecessary follow-up procedures for HPV-positive individuals. Additionally, there is evidence to suggest that HPV testing using self-samples may have a lower sensitivity compared to clinician-taken samples (Stanczuk et al., 2022).

Cervical Cancer Screening

- **What it is:** A screening programme to identify pre-cancerous changes on the cervix to allow early treatment to prevent the development of cervical cancer.
- **How it works:** Currently, screening involves a “smear test”, where a healthcare provider collects a sample of cells from the cervix to be tested for high-risk types of HPV; emerging alternatives now include self-collected vaginal or urine samples for HPV testing.
- **Purpose:** To detect precancerous changes or early-stage cervical cancer, allowing for prevention of cancer, or timely treatment and improved outcomes.
- **Benefits:** Proven to be effective in reducing cervical cancer incidence and mortality.
- **Limitations:** Clinician sampling may be less accessible for some individuals due to various barriers. Cervical cytology has not been as effective in lowering the incidence of adenocarcinoma, as it has for squamous cervical cancer.

HPV Vaccination

- **What it is:** A vaccination to protect against HPV infections that can lead to various types of cancer and genital warts. It is recommended for preteen boys and girls at ages 11-12 and some other high-risk subgroups. It is also recommended for everyone up to age 26 if they were not adequately vaccinated earlier.
- **How it works:** The vaccine stimulates the body to produce antibodies that prevent future HPV infections from the targeted types.
- **Purpose:** The current HPV vaccine (Gardasil 9) protects against 9 HPV types — 7 that cause most cervical, vaginal, vulvar, anal, penile, and oropharyngeal cancers, and 2 that cause 90% of genital warts.
- **Benefits:** Combined with cervical screening, it provides the best protection against cervical cancer, reduces HPV prevalence, and offers population immunity - where the collective protection of those immunised protects those not, or who are unable to be vaccinated.
- **Limitations:** The vaccine does not treat existing HPV infections or HPV-caused diseases and does not protect against other sexually transmitted infections, so safe sex practices are still important and screening is also still strongly advised.

HPV self-sampling benefits in detail

Increased Accessibility and Participation

- Allows participants to collect their own sample privately at home, eliminating barriers like lack of access to clinics, embarrassment and cultural issues
- Meta-analyses (Arbyn et al., 2018) show HPV self-sampling can increase screening participation rates compared to clinician-sampling
- Particularly beneficial in low-resource settings, remote areas and for under screened populations such as large cities with highly mobile populations.

Potential for Cost Efficiency

Self-sampling kits can be cheaper than clinic visits and clinician time for sample collection on an individual basis.

- Some modelling studies (Malone et al., 2020) estimate cost savings for screening programmes by incorporating self-sampling, especially if uptake increases.
- However, a universal approach of sending kits to all eligible individuals may incur additional costs:

- Costs of producing and distributing kits to the entire screening population
- Potential wastage from unused kits
- Increased laboratory processing costs if participation rates rise significantly

The overall cost-effectiveness depends on factors such as increased participation rates, reduced clinic visits, and the specific implementation strategy chosen.

High Accuracy for Detecting Cervical Precancers

- Self-collected vaginal samples tested for HPV presence can be as accurate as clinician-collected samples for detecting high-risk HPV infections that can lead to cervical precancers.
- The accuracy of self-sampling may vary depending on several factors, including:
  - The specific HPV assay used to analyse the sample
  - The collection device and laboratory processing method used
  - The population being screened
  - The screening algorithm employed
- While there may be a slight reduction in sensitivity compared to clinician-collected samples in some cases, self-sampling can still facilitate HPV testing, which is generally more sensitive than cytology for detecting precancers.
- It's important to note that the choice of HPV assay is not the only factor that can affect sensitivity; other aspects of the sampling and testing process can also play a role.

Increased Privacy and Convenience

- Many individuals prefer the privacy and convenience of self-sampling at home over pelvic exams

In summary, HPV self-sampling can increase screening accessibility and participation while potentially reducing costs and clinical resources required. While studies show a slight drop in sensitivity compared to clinician sampling, the accuracy of self-sampling can be high, depending on factors such as the specific HPV assay used, the collection device and method, the population being screened, and the screening algorithm employed. The combination of good accuracy and improved screening participation makes self-sampling an effective strategy for cervical cancer prevention, especially in low-resource settings or among populations with low screening attendance.

Implementation of at home testing

The COVID-19 pandemic has accelerated the adoption and acceptance of self-sampling for various health conditions. The public's increased familiarity and trust in self-sampling methods, gained through widespread COVID-19 testing, presents a unique opportunity to promote self-sampling for cervical cancer screening. By leveraging this existing momentum, we can encourage wider adoption of self-sampling and reduce stigma associated with this approach while accepting that in many studies significant number of participants have indicated that they would prefer a clinician taken sample.

1.1 Collaboration

Close collaboration between the UK cervical screening programmes, virologists, molecular scientists, public health experts, epidemiologists, behavioural and communication scientists and other relevant disciplines is crucial to optimise sample collection and analysis protocols. This collaboration can ensure that self-sampling kits are designed for optimal user experience, sample quality is maintained, and results are accurate and reliable.

Additionally, engaging microbiologists in the development and implementation of self-sampling programs can facilitate knowledge sharing and capacity building across different sectors of the healthcare system. This multidisciplinary approach is essential for developing effective and sustainable self-sampling strategies within the context of the UK's existing cervical screening infrastructure.

1.2 Potential for Opportunistic Screening

While integrating self-sampling opportunities into routine clinical encounters could potentially increase uptake, particularly among non-attenders, this is not currently part of the UK cervical screening programmes. The existing programmes are invitation-based, with eligible individuals receiving scheduled invitations for screening.

However, there is potential for exploring this approach in the future:

- It could leverage existing healthcare infrastructure and provider-patient relationships to promote self-sampling as a convenient and accessible option.
- Offering self-sampling kits during routine visits might help reach individuals who may not respond to screening invitations.
- This approach would not require significant changes to the current screening programme structure and guidelines.

Implementing such a system would face several challenges:

- Ensuring consistency and quality control across different healthcare settings
- Training healthcare providers to offer and explain self-sampling
- Integrating this approach with the existing invitation-based system
- Managing the logistics of sample collection, transport, and processing

While opportunistic screening through self-sampling is not currently part of the UK cervical screening programmes, it represents a potential area for future research and policy consideration to improve screening uptake.

1.3 Targeted Messaging

Tailored communication campaigns are essential to address the diverse barriers faced by different populations. These campaigns should be culturally sensitive, linguistically appropriate, and designed to resonate with the specific needs and concerns of each target group. For example, messages for younger participants may emphasise the convenience and empowerment of self-sampling, while messages for older participants may focus on the importance of regular screening and the peace of mind it can provide.

Developing a comprehensive communication and education strategy is crucial for the successful implementation of self-sampling programmes. This strategy should aim to:

- Raise public awareness about HPV, its link to cervical cancer, and the importance of regular screening.
- Clearly communicate the difference between HPV self-sampling and cervical cancer screening, emphasising the need for these preventative measures.
- Address misconceptions and concerns about self-sampling, ensuring that individuals understand the benefits and limitations of this approach.
- Tailor messages to diverse under-screened populations, considering cultural, linguistic and socioeconomic factors.
- Use various communication channels, including social media, community events, and partnerships with trusted organisations, to reach a wide audience.

Reducing Health Inequalities

A key advantage of self-sampling is its potential to increase accessibility to cervical cancer screening, particularly for individuals who face barriers to traditional clinic-based screening. These barriers may include geographical distance, lack of transportation, work or childcare commitments, cultural or linguistic barriers, fear or anxiety, victims of sexual abuse and negative past experiences with healthcare providers. Renting rather than owning a home, with subsequently a higher frequency of moving and missing health letters and invitations, is also a factor. Studies have shown (Landy et al., 2023) that offering self-sampling can increase participation rates among under-screened populations.

2.1 Co-production with Communities

Designing self-sampling programmes in partnership with underserved communities is essential to ensure that the solutions meet their specific needs and preferences. This co-production approach involves engaging community members in all stages of programme development, from identifying barriers to designing interventions and evaluating outcomes. By incorporating community perspectives and expertise, the UK can develop culturally relevant and sustainable self-sampling programmes that address the root causes of health disparities.

In addition to practical considerations, self-sampling can empower individuals by fostering a sense of autonomy and control over their health. Self-sampling can reduce anxiety and increase confidence in managing your own health, leading to greater engagement in preventative care. By actively involving individuals in their own health monitoring, self-sampling can contribute to a more patient-centred and empowering approach to healthcare.

2.2 Equity Focus

A secondary goal of self-sampling programmes should be to reduce, not exacerbate, health inequalities. This requires a proactive approach that prioritises high-risk under-screened individuals and addresses the unique barriers faced by different populations. For example, programmes may need to offer additional support to ensure that individuals from disadvantaged backgrounds can access self-sampling kits and follow-up care. It's crucial to consider how various barriers might intersect and compound for some individuals or communities.

2.3 Addressing Socioeconomic Barriers

Socioeconomic disadvantage is a significant barrier to healthcare access, including cervical cancer screening. Self-sampling programmes should be designed to be accessible to individuals from all socioeconomic backgrounds. This involves providing free kits, partnering

with community organisations to distribute kits and, where necessary, offering financial assistance to access follow-up care. It's important to address the digital divide, ensuring that access to self-sampling doesn't rely solely on digital technologies that may exclude some populations.

2.4 Considering Life Stage Approaches

Integrating self-sampling opportunities into existing healthcare interactions, such as during GP appointments for other issues, pregnancy or family planning visits, can further improve uptake, particularly among individuals who may not otherwise seek out screening. Key stages in people's lives have particular relevance for their health. The life-course approach is about recognising the importance of these stages. By using a life stage approach, the NHS can leverage existing healthcare infrastructure and provider-patient relationships to promote self-sampling as a convenient and accessible option for cervical cancer screening without undue additional effort.

2.5 Addressing Potential Limitations

While self-sampling offers many benefits, it's important to address potential limitations. These include ensuring sample quality, providing clear instructions to address varying levels of health literacy, and establishing robust systems for follow-up care when results are positive. Programmes should also consider how to maintain the accuracy and reliability of self-collected samples compared to clinician-collected samples.

2.6 Cultural Sensitivity and Health Literacy

Self-sampling programmes must be designed with cultural sensitivity in mind, considering diverse cultural beliefs and practices related to health and screening. Materials and instructions should be available in multiple languages and formats to accommodate varying levels of health literacy. Community health workers or patient navigators can play a crucial role in supporting individuals through the self-sampling process.

2.7 Evaluation and Sustainability

To ensure the long-term success of self-sampling programmes in reducing health inequalities, it's crucial to establish clear evaluation metrics when integrating into the screening programme. These should measure not only increased participation rates but also the programme's impact on reducing disparities in screening and health outcomes across different populations. Long-term sustainability, including secure funding and integration into existing healthcare, is dependent on successful evaluation.

Operational Considerations for Self-Sampling

The successful implementation of self-sampling programmes requires careful consideration of operational factors to ensure efficiency, accuracy, patient satisfaction, and cost-effectiveness.

3.1 Laboratory Preparedness

Increasing sample volume from home testing requires robust laboratory infrastructure and streamlined processes. This includes investing in adequate staffing, equipment and information management systems to handle the increased workload. Laboratories need to establish standardised protocols for processing self-collected samples to ensure accuracy and reliability of results. Rigorous quality control measures should be implemented to maintain high standards of accuracy. This should include utilising HPV assays that have quality control mechanisms to ensure a patient sample is present (e.g., detection of human beta-globin) to avoid potential false negative reports when no sample is present. Additionally, regular proficiency testing and comparison with clinician-collected samples should be conducted.

It is crucial to address the workforce and expertise concerns in cytology. The aging workforce and the need to attract, train and retain professionals in this field poses a significant challenge to the successful implementation of self-sampling programmes. To mitigate this challenge, we recommend:

- Developing targeted recruitment and training programmes to attract new talent.
- Providing ongoing professional development.
- Implementing AI systems that support cytologists and improve efficiency.
- Offering incentives to encourage individuals to pursue careers in cytology.
- Exploring innovative workforce models to optimise the use of existing resources.

3.2 Kit Distribution Management, and Environmental Considerations

Optimising kit distribution and providing clear instructions are vital for the success of self-sampling programmes. This involves developing user-friendly instructions in multiple languages, ensuring kits are readily available in convenient locations, and implementing strategies to minimise environmental impact, such as using recyclable materials and efficient packaging.

Digital health technologies, such as mobile apps and online platforms, can play a crucial role in

supporting self-sampling programmes by providing instructions, reminders, and secure access to test results. However, these should complement, not replace, the essential role of healthcare providers in delivering personalised care.

To ensure equitable access, distribution methods should be tailored to community needs, potentially including:

- Partnerships with pharmacies or community diagnostics centres.
- Mobile clinics or pop-up testing sites for underserved populations (e.g. remote areas).
- Digital platforms for kit ordering and result delivery, with alternative options for those with limited digital access.

3.3 Data Collection and Monitoring

Robust data management systems are essential to track participation, outcomes, and monitor the impact of self-sampling programmes on health outcomes. These systems should be integrated with existing cervical screening programmes and electronic health records to ensure continuity of care. Stringent data privacy and security measures must be in place to protect patient information.

Specific evaluation metrics should include:

- Participation rates across different demographic groups
- Accuracy of self-sampling compared to clinician-collected samples
- Time from sample collection to result delivery
- Follow-up rates for positive results
- Long-term impact on cervical cancer incidence and mortality rates

3.4 Patient Education, Support, and Follow-up Care

Comprehensive patient education and support strategies are crucial, particularly for those with low health literacy or limited access to digital technologies. This could include:

- Clear, simple instructions in multiple formats (written, video, in-person demonstrations)
- Dedicated helplines for patient queries
- Community health worker support programmes
- Ensuring appropriate follow-up care for those with positive results is essential. This involves:
    - Clear communication of results and next steps
    - Streamlined referral processes for further testing or treatment
    - Support services to help patients make informed choices and navigate the healthcare system

3.5 Regulatory Considerations

Implementing self-sampling programmes may require navigating regulatory hurdles. This could involve:

- Obtaining approval for self-sampling devices and processes from relevant regulatory bodies
- Ensuring compliance with data protection regulations
- Developing guidelines for the integration of self-sampling into existing screening programmes

3.6 Evaluating the Role of the Postal Service

The postal service offers a convenient method for kit distribution and return. However, its reliability and efficiency can vary depending on location and logistical factors. To ensure timely and convenient access for all individuals, the need for confidence in the approach to distribution and collection should be considered:

- Postal Service: Collaborate with the Royal Mail and other postal services to develop efficient processes for kit distribution and return. This could include special handling procedures to ensure sample integrity and timely delivery to laboratories.

Alternative Distribution Methods:

- Partnering with pharmacies or community diagnostics centres to serve as distribution and collection points for self-sampling kits.
- Utilising mobile clinics or pop-up testing sites to reach underserved populations in remote or hard-to-reach areas.
- Leveraging digital health technologies, such as mobile apps or online platforms, to facilitate kit ordering and result delivery.

Hybrid Approaches:

- Implement a combination of postal and alternative methods to maximise reach and convenience. For example, kits could be ordered online and delivered by post, with the option to return samples via post or to local collection points.

Tracking and Monitoring:

- Implement robust tracking systems to monitor the journey of kits from distribution to return, ensuring timely processing and minimising loss or delay.

Accessibility Considerations:

- Ensure that distribution methods account for individuals with disabilities or those who may have difficulty accessing traditional postal services.

Environmental Considerations:

- Ensure that HPV assays used for self-collected samples have demonstrated clinical performance in time and temperature studies. This is crucial to maintain sample integrity and test accuracy across various environmental conditions during distribution and return.
- Consider the impact of seasonal temperature variations and transit times on sample stability when designing distribution and collection processes.
- Collaborate with HPV test manufacturers to establish and validate appropriate storage and transport conditions for self-sampling kits.

The choice of distribution and collection methods should be tailored to the specific needs and context of each community and/or geographical region, ensuring that self-sampling programmes are accessible and convenient for all. Regular evaluation of these methods should be conducted to identify areas for improvement and adapt to changing community needs.

Expanded Applications and Broader Considerations

While the primary focus of this paper is the prevention of cervical cancer, the potential applications of self-sampling and new technologies extend far beyond this specific context.

4.1 Beyond Cervical Cancer

The success of HPV self-sampling in cervical cancer screening could pave the way for its potential application in other areas of healthcare. Self-sampling can be leveraged for the prevention and early detection of other HPV-related cancers, such as anal, penile, vulvar, vaginal, and oropharyngeal cancers. Additionally, self-sampling can be adapted for other infectious diseases, such as sexually transmitted infections (STIs), and chronic conditions, such as diabetes or cardiovascular disease. More research is needed in this area.

The benefits of self-sampling, such as increased accessibility, convenience, and patient empowerment, can be extended to these other health conditions, potentially leading to earlier detection, improved health outcomes, and reduced healthcare costs. Studies have shown that self-sampling can significantly increase participation rates in screening programmes, with some trials reporting over 80% participation when self-sampling kits were mailed directly to participants' homes (Arbyn et al., 2018).

However, it is important to carefully evaluate the feasibility, accuracy, and cost-effectiveness of self-sampling for each specific condition before widespread implementation. Potential risks, such as false negatives, overtreatment, and negative impacts on existing screening programmes, must be mitigated. Additionally, challenges such as ensuring adequate follow-up care and addressing privacy concerns must be considered.

4.2 Methylation Markers as a Triage Tool

In the ongoing battle against cancer, genomics offers powerful tools for early detection and risk assessment. A promising avenue involves analysing epigenetic modifications, such as DNA methylation, which can signal the potential for malignant transformation.

Methylation markers refer to specific patterns of DNA methylation, which is an epigenetic modification that can regulate gene expression and cellular processes. DNA hyper-methylation and hypo-methylation patterns have been associated with various cancers, including cervical cancer.

By analysing the methylation status of specific genes or genomic regions, researchers aim to identify methylation marker panels that can differentiate between transient HPV infections and those with a higher risk of progressing to cervical precancerous lesions or cancer. This allows for more targeted follow-up and intervention.

The interest in methylation triage of HPV-positive screening results is heightened with uptake of self-collected vaginal samples, since these sample types cannot be analysed for cytology and therefore a molecular triage could be advantageous. Further research and development in this area could lead to more accurate and efficient cervical cancer screening programmes.

Should HPV Self-Sampling Be Available to All?

While universal access to HPV self-sampling may seem ideal, the roundtable participants emphasised the importance of carefully considering how to implement this approach to maximise impact on reducing cancer rates and ensure efficient use of resources.

Self-sampling is emerging as a viable alternative to clinician-collected samples for many individuals. As technology improves, it may become an option for all participants in the UK screening program. However, it's important to note that preferences vary, and surveys indicate that a significant number of participants still prefer clinician-taken samples.

Currently, a targeted approach, focusing on individuals at higher risk of developing cervical cancer or those less likely to attend regular screening, is recommended to build the clinical and economic evidence for the UK. This approach allows for more efficient allocation of resources while ensuring that those who might benefit most from cervical cancer screening are reached.

High-risk groups include:

- Those who have not been screened regularly
- Certain underserved populations, such as those in remote and rural areas or from lower socioeconomic backgrounds

- Individuals with known risk factors for HPV infection or cervical cancer such as HIV and AIDS

It's important to emphasise that offering self-sampling to these groups is not about providing an inferior screening option, but rather about increasing access and participation in screening. The goal is to provide a screening method that is both effective and acceptable to individuals who might otherwise not participate in screening.

Implementing a targeted approach does present challenges around equity and access, such as accurately identifying and reaching high-risk individuals. Care must be taken to ensure that this strategy does not inadvertently widen health disparities.

As self-sampling technology continues to improve and costs decrease, the approach may evolve towards more universal access. Future research should continue to evaluate the balance between targeted and universal access, considering clinical outcomes, cost-effectiveness, and patient preferences. Ultimately, the aim should be to offer informed choice in screening methods, allowing participants to select the option that best suits their needs and preferences.

Conclusion

Self-sampling and new technologies offer a pathway to achieving equity and eliminating cervical cancer. The insights and recommendations from this roundtable discussion highlight the potential of these tools to improve preventative care by increasing accessibility, empowering individuals and reducing health disparities. However, successful implementation requires a multifaceted approach that addresses technological, operational and socio-cultural factors.

An initial targeted approach, focusing on high-risk and hard-to-reach populations, may be most effective in maximising impact and resource efficiency. As these technologies are implemented, ongoing research and evaluation will be crucial to refine strategies and ensure their effectiveness across diverse settings.

By addressing these key issues and continually adapting our approaches, we can harness the power of self-sampling and new technologies to achieve equitable cervical cancer elimination and improve public health outcomes for all. This effort aligns with global initiatives to increase cervical cancer screening coverage and brings us closer to the goal of eliminating this preventable disease.

Recommendations

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