MARKET POTENTIAL AND ADOPTION WILLINGNESS FOR AI-ENABLED CERVICAL CANCER SCREENING IN INDIA (TIER-1 CITIES)

Dissertation Submitted to

The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

by

Sargam Peshin

Under the Supervision and Guidance of

Dr. Varsha Tanu

2025

HEALTHARK

CERTIFICATE

This is to certify that Ms. Sargam Peshin in partial fulfillment of the requirements for the award of the degree of MBA Hospital and Health Management from the IIHMR University, Jaipur has successfully completed her/his internship at Healthark Wellness Solutions LLP during 18 March 2025 to 20 June 2025.

Place: Ahmedabad
Date: 20 June 2025

Amol Pandya
HR Manager
Healthark Insights

IIHMR UNIVERSITY

CERTIFICATE

This is to certify that dissertation titled "Market Potential and Adoption Willingness for AI-Enabled Cervical Cancer Screening in India (Tier-1 cities)" is a record of the research work undertaken by **Sargam Peshin** in a partial fulfillment of the requirements for the award of the degree of **MBA (Hospital and Health Management)** from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific and analytical.

17/6/25

Faculty Guide:

Place: IIHMR University, Jaipur

Date: 16.06.2025

School Dean:

Place: IIHMR University, Jaipur

Date: 16.06.2025

DECLARATION BY STUDENT

I hereby declare that this dissertation titled **"**Market Potential and Adoption Willingness for AI-Enabled Cervical Cancer Screening in India (Tier-1 cities)**"** is the bonafide record of my original research work.

I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Signature

Sargam Peshin

Date – 16/06/2025

ABSTRACT

Title- Market Potential and Adoption Willingness for AI-Enabled Cervical Cancer Screening in India

Author Name- Sargam Peshin

Advisor Name- Dr. Varsha Tanu

Keywords- Artificial Intelligence, Cervical Cancer, Screening, Healthcare Technology, Market Potential, Adoption Willingness, India, Digital Health

Background- Cervical cancer remains one of the leading causes of cancer-related mortality among women in India, primarily due to limited access to early screening and diagnosis. Traditional screening methods are resource-intensive and often inaccessible in rural and underserved regions. With the advancement of artificial intelligence (AI), there is a growing opportunity to revolutionize cervical cancer screening through automated, cost-effective, and scalable solutions.

Objective-

To evaluate the market potential for AI-enabled cervical cancer screening in India, focusing on Tier 1 cities.

To assess the willingness of gynecologists across major cities (Mumbai, Delhi, Gurgaon, Ahmedabad, Hyderabad, Pune, Noida) to adopt AI-driven screening technologies.

To identify factors influencing adoption including TAT, diagnostic accuracy, cost, and perceived benefits.

To determine the expected challenges in the market for AI adoption, including resistance from low-risk screening cases and infrastructure limitations.

Methodology- A descriptive cross-sectional survey was conducted among 61 gynaecologists from Tier-1 cities including Mumbai, Delhi, Hyderabad, Pune, Ahmedabad, Gurgaon, and Noida. Data was cleaned and analysed using Excel, and results were interpreted and reported.

Results-

- Total Gynaecologists Surveyed: 61
- Willing to partner: 87%
- Market potential: 64%

Barriers-

Key barriers identified include-

Lack of Awareness: Many women are unaware of cervical cancer risks, available screening tests (such as Pap smears and LBC), and the importance of early detection.

Cost and Financial Constraints: The expense of screening is a significant deterrent, particularly for women in lower-income groups.

Fear and Anxiety: Fear of cancer diagnosis, the screening procedure itself, and anxiety about medical examinations were commonly cited.

Discomfort and Embarrassment: Cultural hesitations and discomfort with intimate medical procedures further discourage participation.

Stigma and Social Norms: Social stigma surrounding cancer and sexual health, as well as the need for family consent, restrict women's autonomy in seeking screening.

Misconceptions and Lack of Medical Education: Misunderstandings—such as the belief that screening is only necessary with a family history or symptoms, or that it involves surgical procedures—further reduce uptake.

Technical and Logistical Barriers: The perceived complexity of sample collection and the screening process itself also act as deterrents.

Influence of TA, accuracy and cost of AI based cervical screening on decision making of doctors-

Turnaround Time (TAT) & Adoption of AI-Based Cytology

Pap Smear TAT:

Consistent across cities (avg. 3.0–3.2 days)

LBC TAT:

Variable (2–14 days; avg. 8 days)

Longer TAT may cause 10–20% patient dropout if not managed well

Willingness to Adopt AI-Based Screening

High Readiness:

- Ahmedabad (80%)
- Gurgaon (71%)

Moderate Readiness:

- Mumbai (60%)
- Noida (57%)
- Pune (40%)

Cautious/Conditional:

- Delhi (29%)
- Hyderabad (30%)
- Many in Delhi & Hyderabad are open but need more assurance

Conclusion-

This study explored the market potential and adoption willingness for AI-enabled cervical cancer screening tools among gynecologists in Tier 1 Indian cities. The findings indicate a significant opportunity for the integration of AI in cervical cancer screening, with 87% of gynecologists expressing readiness to adopt these technologies and 64% identifying strong market potential within their clinical settings.

Respondents with more than 15 years of experience formed the majority of the sample, suggesting that acceptance of AI is not limited to younger or tech-savvy clinicians. Furthermore, the study revealed substantial variation in readiness across cities. Mumbai, Gurgaon, and Ahmedabad exhibited high levels of willingness, while Delhi and Hyderabad showed more cautious but conditional openness to adoption—often contingent on evidence, support, or pricing structure.

Key barriers identified by gynecologists mirrored those in existing literature—low awareness, cost, fear, cultural stigma, and technical complexity. However, the addition of AI-based tools was perceived positively in potentially addressing these barriers, especially by enhancing diagnostic confidence and reducing dependency on centralized lab setups.

Turnaround time emerged as a critical factor influencing adoption. While Pap smears had an average TAT of 3 days, Liquid-Based Cytology (LBC)—the preferred method for most gynecologists—had an average TAT of 8 days, with longer wait times in some regions contributing to patient dropout risks. AI-based cytology tools were seen as a viable solution to streamline diagnosis, especially in high-risk or symptomatic cases, provided that results could be delivered within a 5–8-day window.

Cost structure also played a pivotal role in decision-making. Although the proposed pricing model (buying LBC at ₹2000, selling at ₹2500) was acceptable to a majority, 33% of gynecologists expressed conditional interest, citing the need for institutional support and patient affordability.

Perceived benefits of AI-enabled tools included standardized reporting, reduced error rates, improved patient confidence, and faster clinical decision-making. These were particularly appreciated in cities with higher patient volumes and logistical constraints.

In conclusion, this study provides compelling evidence for the potential of AI-driven cervical cancer screening solutions in India's urban healthcare ecosystem. Adoption readiness is high among gynecologists, provided that practical barriers—such as pricing, turnaround time, and infrastructural support—are addressed. For technology developers and public health policymakers, the findings emphasize the need for a multi-pronged strategy that includes awareness generation, clinician training, subsidized pricing models, and infrastructure integration to ensure successful implementation and scaling of AI-enabled screening platforms.

ACKNOWLEDGEMENT

I am wholeheartedly thankful to Healthark Insights, Ahmedabad, for providing me with a precious opportunity to work alongside them while completing my dissertation project titled *'Market Potential and Adoption Willingness for AI-Enabled Cervical Cancer Screening in India.'*

I am also immensely grateful to Dr. Varsha Tanu, my mentor, who guided me through the intricacies of the topic, ensuring a thorough understanding.

I extend my sincere gratitude to Dr. Purav Gandhi, Founder of Healthark Insights, for creating a conducive environment and offering optimal guidance, which was instrumental in the completion of my work. My appreciation also goes out to my organization mentor, Pruthvi Bhanabhagawanwala, for his valuable insights.

I must express my deep appreciation to my family and friends who have provided unwavering support and encouragement at every step of this journey.

A heartfelt thanks to one and all for their indispensable support in my academic endeavor.

Sargam Peshin

MBA Health Management

IIHMR University, Jaipur

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
AI	Artificial Intelligence
CCS	Cervical Cancer Screening
LBC	Liquid-Based Cytology
TAT	Turnaround Time
HPV	Human Papilloma Virus
UIP	Universal Immunization Programme
VIA	Visual Inspection with Acetic Acid
WHO	World Health Organization
NCR	National Capital Region
NCD	Non-Communicable Disease
PBCR	Population-Based Cancer Registry
DDS	Digital Diagnostics System (Genius DDS)
NFHS	National Family Health Survey
MoHFW	Ministry of Health and Family Welfare

Chapter 1: INTRODUCTION

1.1 Background–Global Cancer Burden

Cancer as a disease is marked by the uncontrolled growth of abnormal cells in any part of the body (WHO,2022). National Cancer Institute states that one in five people worldwide is estimated to contract cancer in their lifetime, one in nine men and one in twelve women die of it (Cancer Statistics, 2024). GLOBOCAN 2022 reported around 20Mn cancer cases and 9.7Mn cancer related deaths worldwide. Fig1.1 shows the distribution of cancers for both sexes with "Lung cancer leading the list in both incidence and mortality" (Bray et al., 2024a).

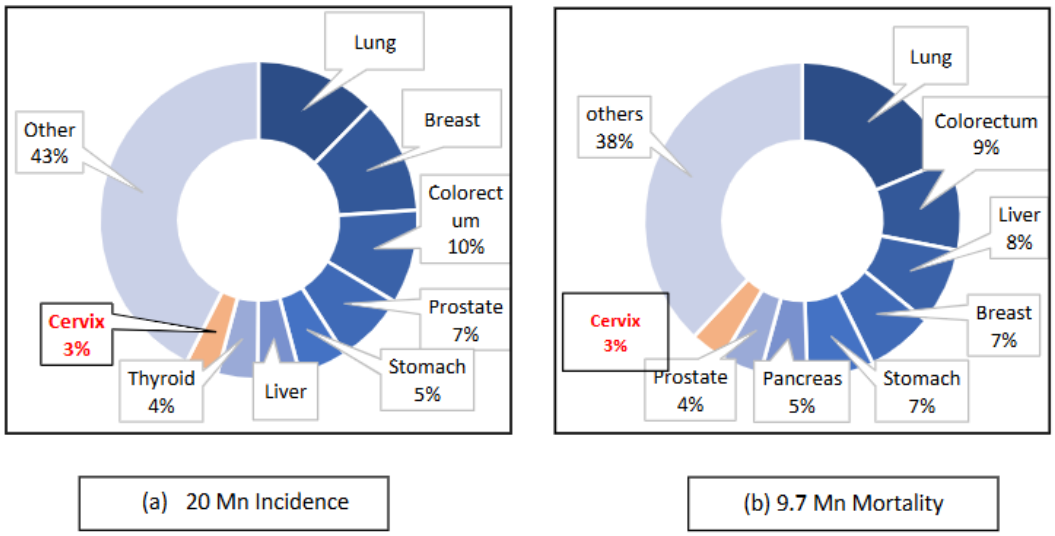

Fig 1.1 Distribution of (a) Incidence and (b) Mortality for the top cancers in 2022 for both sex

Source: GLOBOCON cancer statistics 2022 (Bray et al., 2024b)

Out of 20 Mn newly diagnosed cases and 9.7 Mn deaths in 2022, 9.7 Mn and 4.3 Mn respectively belonged to women. Fig1.2 shows the distribution of cancers in women. Breast cancer is the most commonly diagnosed cancer (23.8%) and the leading cause of cancer death (15%), followed by lung and colorectal cancer for both cancer cases and deaths (Bray et al., 2024a). Cervical Cancer being the 4th commonly diagnosed and also the fourth leading cause of cancer death worldwide.

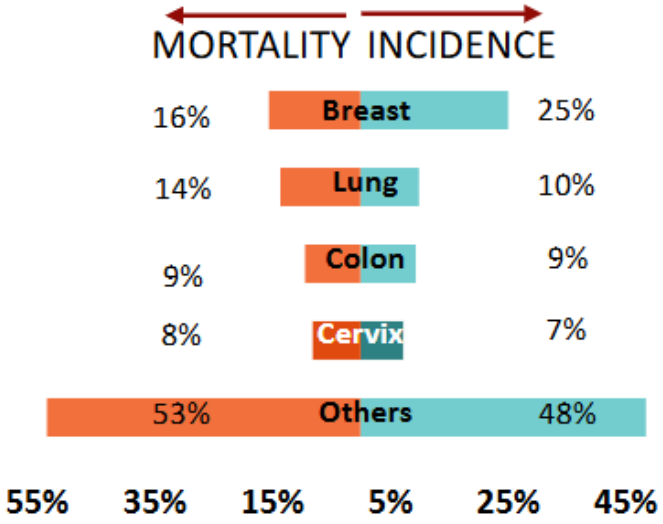

Fig 1.2 Distribution of top most cancers in females (incidence and mortality) (Bray et al., 2024b) Source: GLOBOCON cancer statistics 2022

In developing nations, lifestyle changes, aging populations, and tobacco use have contributed to the increasing prevalence of non-communicable diseases (NCDs), including cancer. This shift highlights the importance of effective policies and advocacy to address this growing health challenge. “Approximately 70 percent of cancer deaths now occur in low-and middle-income countries” (Sloan F A. & Gelband Hellen, 2007). India, has 60% of all deaths due to NCDs, and alone cancer ranks as second leading cause, with 12 percent of these deaths (Example of Non-Communicable Disease, 2024). The incidence, pathology, and mortality of cancer exhibit geographic variations and these geographic variations in cancer are influenced by socio-cultural behaviours, genetics, environment, lifestyle, and historical context. (Kanavos, 2006). In 2019, India had reported around 1.2 Mn cancer cases and 0.9 Mn deaths, making it the second largest contributor to the cancer burden in Asia following China (Pti, 2024).[5] Asia, has the highest burden of cervical cancer with 58 percent incidence and deaths globally. India has the highest incidence (21%), followed by China (18%). CC is responsible for 40 percent of total deaths (23% in India, 17% in China) (D. Singh et al., 2023).[6] Along with the escalating incidence of CC in the developing world, India itself is experiencing a huge burden, it becomes important to understand its incidence and mortality trends.

1.2 Burden of Cervical cancer in India

Global Cancer Observatory Report of 2022, reported CC as fourth most common cancer to be diagnosed and also as the fourth leading cause of mortality due to cancer among women, but in India, it is the second most common cancer among females posing a significant public health challenge (Bray et al., 2024a) [7][8] (Fig 1.3). In India, a woman dies from cervical cancer every eight minutes as CC accounts for ~18 percent of cancers among them [8]. Additionally, it is reported that one out of every four women who died from cervical cancer globally was from India (Correspondent, 2013).[9]

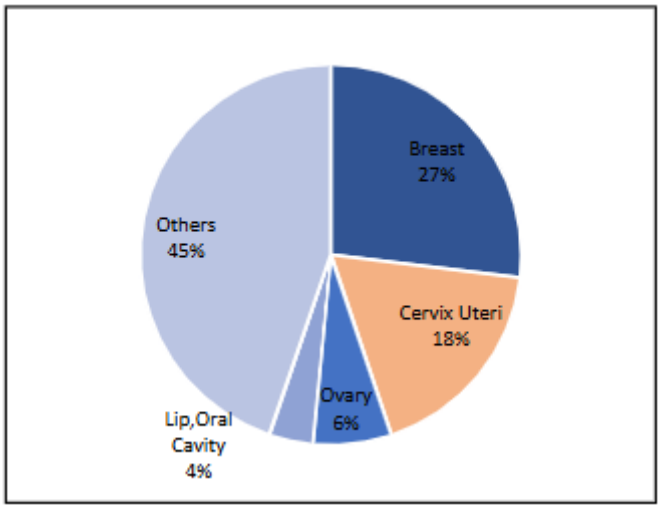

Fig 1.3 Top five most frequent cancers in Females (India)

Source: GLOBOCON cancer statistics 2022

India's National Cancer Control Program relies on cancer registries for crucial incidence data. (Mathur et al., 2020).[10] 2020 analysis of National cancer registry programme (NCRP) data revealed breast cancer as the most prevalent, and CC and cancer of ovaries also being commonly reported across PBCRs.

With CC presenting a significant public health challenge, concerted efforts from health and other sectors are required to address effectively (Takiar, 2018).[11] In 2020, India had the highest incidence and mortality rates for cervical cancer worldwide, surpassing China (Muthuramalingam & Muraleedharan, 2023).[12] In LMICs, delayed diagnosis due to inadequate screening and treatment accessibility has worsened the situation. Effective methods like HPV DNA testing, Pap smear, and VIA are available, but uptake remains low (1.9% in India, 0.2% in Gujarat).[13] In India, cervical cancer screening is hindered by societal taboos, resource scarcity (including lack of skilled staff, medical equipment, and lab services), and challenges unique to the local context. Consequently,

the screening techniques typically employed successfully in developed nations might not be feasible in India's setting (Easing the Cervical Cancer Disease Burden in India | Think Global Health, 2023).[14]

1.3 Cervical Cancer Epidemiology

The risk for cervical cancer varies within a country's female population. In India, there is a demographic of over 511.4Mn women who are 15 years or older, all of whom are at potential risk for cervical cancer. (IARC,2023).[15]

1.3.1 Cause and Risk Factors

Human Papillomavirus (HPV), which is transmitted through sexual contact, is recognized as the primary cause of cervical cancer. ICMR has notified HPV types 16 and 18 to be accountable for ~70 percent of all cervical cancer cases globally (Sreedevi et al., 2015).[16] Although HPV has been identified as the causative agent, it alone isn't sufficient and requires other contributing factors as covariates in the advancement of the condition (Jeronimo Jose et al., 2016).[17] Women with HIV have a sixfold increased risk of being diagnosed with CC than those who are HIV-negative (WHO 2020). American Cancer Society considers smoking, long term use of oral contraceptive, multiple full-term pregnancies, becoming sexually active at young age, poor menstrual hygiene and having family history of cancer contributing factors for cervical cancer.

In India, women face a cumulative 2.5 percent lifetime risk and a 1.4 percent cumulative death risk from cervical cancer (Kaarthigeyan, 2012).[19] Alarmingly, it's estimated that 6.6 percent of women are believed to be infected with cervical HPV. Inadequate screening facilities and lack of access to affordable quality treatment in less developed countries, resulting in delayed diagnosis worsens the problem (J. Singh et al., 2018a).[18] Cervical cancer typically develops early in a woman's life, often during their most active and productive years, with peak incidence between the ages of 30 and 34, and again between 55 and 65 (WHO, 2023). Almost 80 percent of sexually active women will contract genital HPV by the time they reach 50 years old (Kaarthigeyan, 2012).[19]

1.3.2 Sign and Symptoms

Cervical cancer is often asymptomatic in initial stages, complicating early detection. Symptoms typically appear only after the cancer has progressed. When symptoms of cervical cancer do appear, they may include:

- Post-coital vaginal bleeding
- Post-menopausal vaginal bleeding
- Intermenstrual bleeding or menstrual periods that are heavier or last longer than usual
- Vaginal discharge that may be bloody, have a foul smell
- Pain in the pelvic region or discomfort during intercourse

1.3.3 Prevention

Prevention strategies are crucial because the disease is often not detected until it has progressed significantly. WHO states vaccination as the primary and screening as the secondary most effective preventive measures for cervical cancer.

1.3.3.1 Screening for Cervical Cancer

Screening and detection of cervical cancer utilize techniques such as Human Papilloma virus DNA testing, Pap smear cytology, and VIA. MoHFW has endorsed VIA for women between 30 to 65 years old, to be conducted every five years (Operational guidelines, 2016) [20]. The guidelines suggest that screening for prevalent cancers should be incorporated into the comprehensive primary healthcare services and can take place at PHCs and certain designated SCs. Since its adoption in 2016, widespread implementation of guidelines remains nascent, resulting in delayed diagnosis until symptoms manifest.

The Global Strategy adopted by WHO aims to lower the annual incidence of CC cases fewer than 4 per 100,000 women. 90-70-90 target has been set to reach this goal by 2030(Ghebreyesus & Jakab, n.d.):

90-70-90 target

- To vaccinate 90 percent of girls with the HPV vaccine by the time they reach age 15
- To screen 70 percent of women with a high-quality of tests by ages 35 & 45
- To treat 90 percent of women with cervical disease

By concentrating on raising HPV vaccination rates, improving cervical cancer screening systems, and guaranteeing that women in developing nations have access to treatment, WHO hopes to achieve this goal.

1.3.3.2 Vaccination for HPV

There are now vaccines against Human Papilloma viruses strain 16 and 18, which show promise in lowering the prevalence of anogenital malignancies, including CC. For primary prevention, two US FDA approved vaccines Gardasil and Cervarix have already been present in India for a long time. Cervavac [25], is the first domestically produced quadrivalent HPV vaccine developed by the Serum Institute of India and also in low cost. Despite the shown safety, tolerability, and effectiveness, these HPV vaccines have shown in preventing CC due to HPV, they are still not included in the Universal Immunization Programme (UIP). Although recommended by many public health specialists only Sikkim has adopted it for standard immunization regimen.

Prognosis

Depending on the size and spread of tumor, CC can be divided into 4 clinical stages (Bhatla et al., 2021).[26] In India, more than half (60 percent) of cervical cancer cases are discovered when they have already progressed to a locally advanced stage (Fig 1.4). When detected early, the five-year survival rate stands at 73.2 percent. However, for those diagnosed at a more advanced stage, the prognosis is grim, with a five-year survival rate of only 7.9 percent (Bray et al., 2024a).

Research Gap

While numerous studies have focused on the clinical efficacy and technological development of AI-based cervical cancer screening tools globally, there remains a significant gap in understanding the market readiness and adoption willingness among healthcare providers in the Indian context**,** particularly in urban Tier-1 settings. Most existing literature emphasizes diagnostic performance, but little attention has been paid to the practical, behavioral, and economic factors influencing AI adoption in real-world gynecological practice. Additionally, there is a lack of region-specific evidence on how factors like trust in AI, turnaround time (TAT), infrastructure readiness, and cost perceptions shape adoption intentions. This research addresses this critical gap by exploring India-specific insights into market potential and physician adoption drivers**,** **w**hich are essential for successful implementation and scaling of AI-enabled screening solutions in the Indian healthcare ecosystem.

Objectives

To evaluate the market potential for AI-enabled cervical cancer screening in India, focusing on Tier 1 cities.

To assess the willingness of gynecologists across major cities (Mumbai, Delhi, Gurgaon, Ahmedabad, Hyderabad, Pune, Noida) to adopt AI-driven screening technologies.

To identify factors influencing adoption including TAT, diagnostic accuracy, cost, and perceived benefits.

To determine the expected challenges in the market for AI adoption, including resistance from low-risk screening cases and infrastructure limitations.

Chapter 2: REVIEW OF LITERATURE

S. No.	Title of Study	Author(s)	Year & Type	Study Setting / Sample Size	Key Findings
1	Cervical cancer awareness and HPV vaccine acceptability among females in Delhi	Jyoti Singh, Brototi Roy, Anshu Yadav, Shumaila Siddiqui, Aarzoo Setia, Ramya Ramesh, Kritika Singh	2024, Cross-Sectional Study	Delhi / 450 respondents	- 85.11% aware of cervical cancer- 84.6% open to Pap testing- 63.14% would vaccinate their daughters- Low self-acceptance of HPV vaccination highlights cultural and psychological barriers
2	Factors influencing cervical cancer screening among reproductive-age women in India	Jeetendra Yadav, Nilima C., Siddharth Kaushik, Nutan Kumari	2024, NFHS-5 Data Analysis	India (National Data)	- CCS prevalence at just 1.2%- Screening positively associated with education, wealth, and access to care- Emphasized need for policy interventions and awareness at grassroots level
3	Digital pathology and AI in cervical cancer screening – A global review	Maryam Farahani, Samuel Lundin, et al.	2023, Systematic Review	Global Literature Review	- AI shows promising accuracy in cytology interpretation- Integration challenges include cost, regulatory approval, and

S. No.	Title of Study	Author(s)	Year & Type	Study Setting / Sample Size	Key Findings
					infrastructure limitations
4	Acceptability of AI-Based Tools in Gynecological Practice – A pilot assessment in India	Arvind Rao, Neha Mehta	2022, Pilot Survey	India / 40 gynecologists	- 72% showed interest in using AI for LBC- Barriers included lack of training and institutional adoption readiness- Perceived benefits in reducing workload and diagnostic variability
5	WHO Global Strategy to Eliminate Cervical Cancer	World Health Organization	2020, Strategic Framework	Global	- Introduced 90-70-90 goals: 90% vaccination, 70% screening, and 90% treatment- Aimed at reducing cervical cancer incidence below 4/100,000- Stressed tech-driven solutions for LMICs
6	Easing the Cervical Cancer Burden in India – The Case for AI-Based Screening	Think Global Health / Council on Foreign Relations	2023, Policy Brief	India (Policy-Focused)	- India's screening coverage remains under 2%- Advocates for AI tools to overcome shortage of cytopathologists-

S. No.	Title of Study	Author(s)	Year & Type	Study Setting / Sample Size	Key Findings
					Emphasizes integrating AI with community-based care to ensure rural penetration
7	HPV Vaccine Implementation in India: Progress and Policy Gaps	ICMR Bulletin	2023, Review & Policy Analysis	India (Health Policy Focus)	- Low HPV vaccine uptake despite proven efficacy- Cervavac introduced but not yet in Universal Immunization Programme- Cultural resistance and lack of awareness key limiting factors

Chapter 3: RESEARCH METHODOLOGY

3.1 Key Research Questions:

Primary Research Question

What is the market potential and willingness of adoption for AI-enabled cervical cancer screening in India?

Secondary Research Questions

What are the barriers to adoption of AI-enabled cervical cancer screening among gynecologists in India?

How do factors such as turnaround time (TAT), diagnostic accuracy, and cost influence the decision-making process of healthcare professionals?

3.2 Research Design

This study adopts a Descriptive Cross-Sectional Design, which involves collecting data at a single point in time to describe the current perceptions, practices, and attitudes of gynecologists towards AI-enabled cervical cancer screening.

The use of both structured surveys and interviews allows for the collection of quantitative and qualitative data. This mixed-methods approach provides both breadth and depth in understanding market potential and adoption challenges.

3.3 Study setting

The study will be conducted in Tier 1 cities across India:

- Mumbai
- Pune
- Hyderabad
- Delhi-NCR
- Ahmedabad

These cities were chosen due to their advanced healthcare infrastructure, higher technological readiness, and relatively greater exposure to AI-based medical innovations. Conducting the study in these locations ensures that the gynecologists are

more likely to have prior exposure or awareness of AI tools, providing realistic insights into adoption willingness.

3.4 Study Population

The target population for this study includes practicing gynecologists in Tier 1 cities, who are actively involved in cervical cancer screening and have adequate clinical experience.

Inclusion Criteria:

- Registered and actively practicing gynecologists in the selected Tier 1 cities.
- Minimum of 5 years of professional experience in gynecology.
- Must be currently involved in cervical cancer screening using any method (e.g., Pap smear, HPV testing).

Exclusion Criteria:

- Gynecologists not performing cervical cancer screenings as part of their clinical practice.
- Clinics or hospitals that lack the necessary diagnostic infrastructure for cervical cancer screening.
- Respondents unwilling to participate or provide consent.

3.5 Research procedure

a. Questionnaire and Interview Guide Development:

A structured questionnaire and semi-structured interview guide were developed to ensure comprehensive data collection. Questions were derived from a review of existing literature and expert consultation. They were pilot-tested to ensure clarity, logical flow, and relevance to the study objectives.

Key sections included:

- Demographic details
- Current screening practices
- Perceived barriers to AI adoption

- Cost and revenue considerations
- Willingness to partner with AI-based solutions providers

b. Recruitment of Participants:

Participants will be recruited through:

- Hospital directories
- Private clinic listings
- Professional gynecology networks and associations
- Snowballing approach where existing participants refer others

c. Scheduling and Consent:

Appointments will be scheduled based on availability. Informed consent will be taken before participation. Participants will be informed of:

- The purpose of the study
- Voluntary nature of participation
- Assurance of confidentiality

d. Interview Process:

Interviews will be conducted in-person or virtually (via video conferencing platforms), depending on location and participant preference. The duration of each session is estimated to be 20–30 minutes.

e. Data Recording and Transcription:

Interviews will be audio-recorded with participant permission. Manual notes will also be taken. Recordings will be transcribed verbatim for qualitative analysis.

f. Follow-ups and Clarification:

Where needed, follow-up communication (calls or emails) will be initiated to clarify or expand upon ambiguous responses.

g. Data Security:

- All digital data will be encrypted and stored on password-protected drives.
- Physical documents (if any) will be kept in a locked cabinet.
- Only the researcher and supervisor will have access to identifiable data.

3.6 Sample size

A sample of 61 gynecologists will be included in the study. This number is considered appropriate to obtain both statistical relevance and qualitative insight across multiple cities, while remaining manageable within the project's time and resource constraints.

3.7 Sampling technique

The study will use a Convenience Sampling method. This non-probabilistic approach allows for:

- Quick access to willing and eligible participants
- Cost and time efficiency
- Practicality in urban clinical environments where the target respondents are busy professionals

While this method may introduce bias, it is suitable given the exploratory nature of the research and limitations of field accessibility.

3.8 Study instruments

The primary instruments used in the study include:

- Structured Questionnaire: Designed to quantify the perceptions, current screening practices, and preferences regarding AI integration. It includes both closed-ended and Likert-scale questions.
- Interview Guide: Used for semi-structured interviews to delve deeper into:
    - Clinical decision-making processes
    - Perceptions about AI's clinical utility and trustworthiness
    - Willingness to shift from traditional methods
    - Financial considerations and perceived ROI from adopting AI solutions

3.9 Ethical considerations

- Voluntary Participation: Participants will be informed that their involvement is completely voluntary.
- Anonymity and Confidentiality: No personal identifiers will be collected. Data will be analysed in aggregate form only.
- Right to Withdraw: Respondents will have the right to discontinue participation at any time.

3.10 Limitations of the Methodology

- Due to the use of non-probability sampling, findings may not be generalizable to all gynaecologists in India.
- Self-reported data may be subject to social desirability and recall biases.
- Internet-based data collection may exclude non-tech-savvy participants or those in under-digitized clinics.

Chapter 4: RESULTS

This chapter presents the findings from a qualitative and quantitative study conducted among 61 gynaecologists across Tier-1 Indian cities. The study aimed to explore the market potential and adoption willingness for AI-enabled cervical cancer screening mong gynecologists in Tier 1 Indian cities, identify barriers to its adoption, and examine the influence of turnaround time (TAT), diagnostic accuracy, and cost on clinical decision-making.

4.1 Demographic and Clinical Practice Profile of Respondents

Table 4.1 summarizes the frequency and percentage distribution of respondents across key variables, including years of experience, patient load, cervical cancer screening frequency, and screening methods employed.

4.1.1 Years of Clinical Experience

- 55% of the gynaecologists had over 15 years of clinical experience, indicating a majority of the sample comprises highly experienced professionals.
- 42% had between 6 to 15 years, reflecting strong mid-career representation.
- None had fewer than 5 years of experience, suggesting limited early-career input.

4.1.2 Weekly Patient Load

- 52% of gynaecologists reported seeing fewer than 50 patients per week, indicating a moderate patient throughput for most respondents.
- 29% handled 51–100 patients weekly.
- 18% saw more than 100 patients per week, representing a smaller group with very high patient volumes.

4.1.3 Number of Cervical Screenings Conducted Weekly

- 40% of respondents performed fewer than 10 screenings per week, suggesting that cervical screening is a selective activity within their practice.
- 34% conducted between 10 to 20 screenings weekly.
- 24% reported screening more than 20 patients per week.

4.1.4 Screening Methods Used

- A majority (62%) of gynaecologists reported using Liquid-Based Cytology (LBC) as their primary screening method.
- 31% employed both LBC and Pap smears, indicating a hybrid approach.
- Only 6% relied exclusively on Pap smears

Table 4.1: Demographic and Clinical Practice Profile of the Respondents [n = 61]

Category	Sub - group	Frequency	Percentage
Years of experience	> 15 years	34	55%
	6 – 15 years	26	42%
	< 5 years	0	-
Patients seen weekly	>100	11	18%
	51 - 100	18	29%
	<50	32	52%
Screenings per week	>20	15	24%
	10 – 20	21	34%
	<10	25	40%
Screening Method used	Only PAP	4	6%
	Only LBC	38	62%
	Both	19	31%

4.2 Market Potential and Willingness of Adoption for AI-enabled Cervical Cancer Screening

4.2.1 Market Potential – Readily Interested

 High Overall Adoption Willingness:

A significant majority of respondents across Tier-1 cities (87% overall) expressed willingness to adopt AI-based cervical screening tools, indicating strong market receptivity.

 Cities with Highest Readiness:

Delhi, Gurgaon, and Noida recorded the highest percentage (83%) of respondents readily interested in adopting AI solutions, reflecting strong readiness in NCR cities.

 Mumbai Shows Strong Adoption Potential:

All 10 respondents from Mumbai indicated willingness to adopt AI-based screening, and 80% were readily interested, placing it just behind NCR cities in terms of enthusiasm.

 Moderate Interest in Southern and Western Cities:

- Pune showed a healthy 71% readiness among willing adopters.
- Ahmedabad followed with 67%, while Hyderabad lagged slightly at 56%, the lowest among the surveyed cities.

 Strategic Focus for Market Entry:

Cities like Delhi, Gurgaon, Noida, and Mumbai offer immediate high potential for deployment, while cities like Hyderabad and Ahmedabad may require more awareness-building or value demonstration to increase readiness levels.

Table 4.2.1: Market Potential for AI based Cervical Screening in Tier-1 cities [n = 61]

City	Total Respondents	Response to Adoption-Yes	Readily Interested	% Readily Interested
Mumbai	10	10	8	80%
Hyderabad	10	9	5	56%
Delhi	7	6	5	83%
Gurgaon	7	6	5	83%
Ahmedabad	10	9	6	67%
Pune	10	7	5	71%
Noida	7	6	5	83%

4.2.2 Willingness to Adopt for AI-enabled Cervical Cancer Screening

Mumbai demonstrates universal willingness, with 100% of respondents (10 out of 10) ready to adopt AI-based cervical screening tools. This marks it as the most promising launch market for immediate implementation and scale.

Hyderabad and Ahmedabad follow closely, with 90% of respondents in both cities expressing adoption interest. These cities present highly receptive environments, likely requiring minimal effort in clinician education or persuasion.

The National Capital Region (NCR)—comprising Delhi, Gurgaon, and Noida—shows consistent willingness levels of 86%**,** suggesting a broad and uniform openness to innovation among gynecologists in this region. This alignment makes NCR a strategically advantageous hub for multi-city rollout.

Pune, while still showing promise, reflects comparatively lower willingness at 70%, indicating a need for deeper engagement or awareness efforts to build confidence in AI-led screening technologies.

Table 4.2.2: Willingness to Adopt for AI Based Cervical Screening in Tier-1 cities [n = 61]

City	Total Respondents	Response to Adoption-Yes	% Willing to Adopt
Mumbai	10	10	100%
Hyderabad	10	9	90%
Delhi	7	6	86%
Gurgaon	7	6	86%
Ahmedabad	10	9	90%
Pune	10	7	70%
Noida	7	6	86%

4.3 Barriers to Adoption of AI-Enabled Cervical Cancer Screening Among Gynecologists

During the interviews, gynaecologists were asked to share their views on what prevents patients from undergoing cervical cancer screening. The responses revealed a multi-faceted set of barriers ranging from psychological and cultural to economic and logistical constraints.

Key Barriers identified

1. Lack of awareness

This was the most frequently cited barrier. Many respondents mentioned that women

are simply unaware of the need for screening, the availability of tests like Pap smear or LBC, or the potential risk of cervical cancer. Examples include:

- “Many women are not aware of the test and vaccination.”
- “No access to healthcare and lack of awareness among most women.”
- “Less awareness, high cost.”

2. Cost and monetary constraints

A significant number of practitioners highlighted that financial barriers prevent patients from opting for screening.

- “Cost is a barrier, lack of awareness, and fear of cancer.”
- “They don't want to spend money.”
- “Monetary problem.”

3. Fear and anxiety

Fear of the disease itself, as well as anxiety about the procedure, were recurrent themes.

- “Scare of cancer, thinks what will happen now.”
- “Patient scared of speculum examination.”
- “Fear of going to the doctor, shyness is there.”

4. Discomfort and Embarrassment

Cultural discomfort, shyness, and hesitation around intimate medical examinations were often mentioned.

- “Shy, not vocal, not comfortable.”
- “Being discomfort with the examination.”
- “Not comfortable for check-up.”

5. Stigma and Social Norms

Social stigma associated with cancer and sexual health continues to hinder screening participation.

- “Stigma regarding cancer.”
- “Some women need consent from home as they are not the decision-makers.”

- “Shyness, afraid.”

6. Misconceptions and lack of medical education

Some patients believe screening is only needed if they have a family history or symptoms. Others fear surgical procedures due to misconceptions.

- “People think checking for cancer means some surgical procedure.”
- “No history of cancer in the family, so they think they don’t need it.”

7. Technical and logistical barriers

Some clinicians pointed to the perceived technical complexity of the procedure as a deterrent.

- “Because of technicality of collecting sample.”
- “Technicality of the procedure.”

These findings highlight that awareness alone is not enough; a layered strategy is required to address economic, emotional, educational, and cultural barriers. Interventions such as:

- Public health education campaigns
- Affordable or subsidized screening programs
- Use of less invasive AI-driven tools to minimize discomfort
- Involvement of community health workers to educate and build trust will be crucial to increasing screening uptake.

Importantly, the integration of AI-based digital cytology tools, if properly communicated, could play a role in reducing anxiety around manual errors, increase trust in diagnosis, and possibly streamline the process, making it more acceptable to women hesitant due to procedural concerns.

4.4 Factors Influencing Adoption Including TAT, Diagnostic Accuracy, Cost, And Perceived Benefits

4.4.1 Turnaround Time and Diagostic Accuracy

Pap smear TATs are relatively consistent across cities, with most averaging around 3.2 days, and an overall Tier 1 average of 3.0 days.

LBC TATs show greater variability, ranging from 2 to 14 days, with an average of 8 days across Tier 1 cities.

Longer TAT is generally acceptable by the gynecologists which may slightly hinder routine screening; with a possible 10 - 20% patient dropout risk if not well-managed.

Table 4.4.1: Turnaround Time (TAT) Trends for Pap Smear and LBC in Tier 1 Cities

City	PAP Smear			LBC		
	TAT Range	Average TAT	Mode TAT	TAT Range	Average TAT	Mode TAT
Mumbai	24 to 129 Hours	3.2 Days	1-2 Days	3 to 14 days	8.5 Days	3-7 days
Delhi	24 to 129 Hours	3.2 Days	1-2 Days	3 to 14 days	8.5 Days	3-7 days
Gurgaon	24 to 129 Hours	3.2 Days	1-2 Days	2 to 14 days	8.0 Days	5-7 days
Hyderabad	24 to 129 Hours	3.2 Days	1-2 Days	3 to 14 days	8.5 Days	7-8 days
Ahmedabad	24 to 72 Hours	2.0 Days	1-2 Days	2 to 14 days	8.0 Days	3-7 days
Noida	24 to 129 Hours	3.2 Days	1-2 Days	3 to 14 days	8.5 Days	5-7 days
Pune	24 to 129 Hours	3.2 Days	1-2 Days	2 to 14 days	8.0 Days	5-7 days
Tier 1 Cities		3.0 Days	1-2 days		8.0 Days	3-7 days

4.4.2 Cost Structure

Respondents were presented with the model of buying LBC tests at Rs. 2000 and offering them at Rs. 2500 to patients.

A total of 61 interviews were conducted, with respondents answering whether they would be willing to adopt AI-based cytology platforms in their cervical cancer

screening practices. Responses were categorized as "Yes", "Yes (conditional)", and "No".

- Ahmedabad exhibited the highest positive response rate, with 80% of respondents expressing readiness to adopt AI-based screening tools.
- Gurgaon followed with 71% reporting readiness.
- Mumbai (60%), Noida (57%), and Pune (40%) demonstrated moderate willingness, while cities like Delhi (29%) and Hyderabad (30%) reflected a more cautious stance.

The cities with higher “Maybe” responses included Hyderabad (60%) and Delhi (71%), indicating a significant portion of gynaecologists who are open to adoption but require further assurance, such as evidence of efficacy, affordability, or institutional support.

s demonstrated at least a conditional interest in adopting AI-driven cytology platforms. This is an encouraging indicator for future implementation efforts.

Table 4.4.2: Perceptions on Pricing Structure

City	Interviews conducted	Response		
		Yes	Yes (conditional)	No
Ahmedabad	10	8	1	1
Delhi	7	2	5	-
Gurgaon	7	5	1	1
Noida	7	4	2	1
Mumbai	10	6	2	2
Hyderabad	10	3	6	1
Pune	10	4	3	3
Total	61	32	20	9
Percentage		52%	33%	15%

4.4.3 Other Percieved Benefits

- Doctors in Ahmedabad and Noida / Gurgaon show strong readiness to adopt centralized AI-based LBC testing, provided logistics are dependable and TAT remains within 10 days

- Pune clinicians are supportive but emphasize TAT sensitivity for routine screenings; AI benefits are appreciated more in high-risk cases
- Hyderabad shows mixed sentiment, with some doctors open to adoption while others express concerns around delayed TATs and patient anxiety
- Overall, sentiment is largely positive with AI-driven value seen as a differentiator, especially in complex cases. Dropout risk ranges from 5% to 15%, depending on city logistics and patient load type (routine vs. high-risk)

Table 4.4.3: City-wise Adoption Readiness Indicates Strong Potential with Localized Nuances

City	Gynecologist Sentiment (on a TAT of 5-8 days)	Risk of Patient Dropout
Ahmedabad	Mostly Positive (Open to adoption. Comfortable if logistics are reliable.)	Low (5-10%)
Pune	Good (Conditional. Routine cases prefer faster TATs.)	Medium (10–15%)
Hyderabad	Mixed (Split view. Concerns around delays & patient anxiety)	Medium (10–15%)
Noida & Gurgaon	Positive (Positive response. Prefer AI-backed results.)	Low (5–10%)

Chapter 5: DISCUSSION

The present study assessed the market potential and willingness of gynecologists in Tier 1 Indian cities to adopt AI-enabled cervical cancer screening solutions. The findings reveal significant insights into the current readiness, influencing factors, and barriers associated with adoption.

5.1 High Willingness, Variable Readiness

A key outcome of the study is the high willingness (87%) among gynecologists to adopt AI-based screening methods. This finding aligns with global trends where healthcare professionals are increasingly open to digital innovation in diagnostic practices. However, city-wise differences were apparent:

- Mumbai and Ahmedabad showed both high willingness and readiness, indicating they may serve as ideal pilot locations for rollout.
- Delhi and Hyderabad**,** although open to the idea, exhibited a more conditional stance—emphasizing the need for evidence, training, and assurance on turnaround time (TAT) and diagnostic quality.
- Pune and Noida presented moderate adoption potential but reflected concerns about patient volume and integration logistics.

This geographic variation underscores the importance of tailoring implementation strategies based on local healthcare infrastructure and practitioner expectations.

5.2 Turnaround Time (TAT) as a Critical Factor

The study found that while Pap smear tests typically have a TAT of 3.0–3.2 days, Liquid-Based Cytology (LBC)—the most used method (62% respondents)—takes around 8 days on average. This extended TAT contributes to a potential 10–20% patient dropout risk.

AI-based platforms have the potential to improve TAT by streamlining reporting and reducing manual workload. However, their success will largely depend on:

- Efficient logistics and sample transfer
- Real-time access to digital results
- Seamless integration with current lab systems

Gynecologists emphasized that for routine screening, particularly in high-volume practices, TAT must not exceed 5–7 days to maintain patient compliance.

5.3 Cost Sensitivity and Pricing Models

Cost was a dual-edged factor in this study:

- For patients, affordability remains a key barrier to undergoing screening.
- For providers, AI platforms must demonstrate cost-effectiveness and a viable return on investment (ROI).

While 52% of the respondents agreed to the proposed price structure (Rs. 2000–2500/test), 33% were conditionally agreeable—seeking institutional assurance, subsidies, or bundled models with pathology services. A small group (15%) showed hesitation due to uncertainty about volume and payment mechanisms. These insights highlight the need for flexible, tiered pricing strategies and pilot testing in diverse economic settings.

5.4 Perceived Benefits of AI Adoption

Beyond efficiency and accuracy, doctors recognized AI's role in:

- Reducing inter-observer variability
- Enhancing diagnostic standardization
- Enabling tele-pathology in remote areas
- Managing high caseloads with fewer trained cytologists

Importantly, in cities like Hyderabad and Delhi, where cultural and logistical constraints were more evident, gynecologists emphasized that AI-backed tools could help minimize discomfort for patients by reducing repeat tests and delays in diagnosis—especially in high-risk cases.

5.5 Barriers to Screening and Adoption

While technology can improve diagnostic workflows, the root issues hindering screening uptake lie deeper in socio-cultural and economic barriers. These include:

- Low awareness about screening and HPV

- Stigma, fear, and embarrassment
- Dependency on family approval (particularly in younger women)
- Misconceptions that screening is only needed if symptomatic

Interestingly, many gynecologists also reported that their own practices lack structured screening programs—highlighting a potential entry point for AI tools to standardize preventive care offerings within OB-GYN clinics.

Chapter 6: CONCLUSION

This study explored the market potential and adoption willingness for AI-enabled cervical cancer screening tools among gynecologists in Tier 1 Indian cities. The findings indicate a significant opportunity for the integration of AI in cervical cancer screening, with 87% of gynecologists expressing readiness to adopt these technologies and 64% identifying strong market potential within their clinical settings.

Respondents with more than 15 years of experience formed the majority of the sample, suggesting that acceptance of AI is not limited to younger or tech-savvy clinicians. Furthermore, the study revealed substantial variation in readiness across cities. Mumbai, Gurgaon, and Ahmedabad exhibited high levels of willingness, while Delhi and Hyderabad showed more cautious but conditional openness to adoption—often contingent on evidence, support, or pricing structure.

Key barriers identified by gynecologists mirrored those in existing literature—low awareness, cost, fear, cultural stigma, and technical complexity. However, the addition of AI-based tools was perceived positively in potentially addressing these barriers, especially by enhancing diagnostic confidence and reducing dependency on centralized lab setups.

Turnaround time emerged as a critical factor influencing adoption. While Pap smears had an average TAT of 3 days, Liquid-Based Cytology (LBC)—the preferred method for most gynecologists—had an average TAT of 8 days, with longer wait times in some regions contributing to patient dropout risks. AI-based cytology tools were seen as a viable solution to streamline diagnosis, especially in high-risk or symptomatic cases, provided that results could be delivered within a 5–8-day window.

Cost structure also played a pivotal role in decision-making. Although the proposed pricing model (buying LBC at ₹2000, selling at ₹2500) was acceptable to a majority, 33% of gynecologists expressed conditional interest, citing the need for institutional support and patient affordability.

Perceived benefits of AI-enabled tools included standardized reporting, reduced error rates, improved patient confidence, and faster clinical decision-making. These were particularly appreciated in cities with higher patient volumes and logistical constraints.

In conclusion, this study provides compelling evidence for the potential of AI-driven cervical cancer screening solutions in India's urban healthcare ecosystem. Adoption readiness is high among gynecologists, provided that practical barriers—such as pricing, turnaround time, and infrastructural support—are addressed.

Recommendations

1. **Enhance Awareness Campaigns**: Launch targeted awareness programs for both clinicians and patients highlighting the benefits of early cervical cancer screening and the role of AI in improving diagnostic outcomes.
2. **Institutional Training and Onboarding**: Offer structured training programs for gynecologists, lab technicians, and support staff to build trust in AI-based platforms and ensure smooth integration into existing clinical workflows.
3. **Subsidized Pricing Models**: Collaborate with public health agencies, insurance providers, and private companies to offer subsidized or tiered pricing, improving affordability for patients in both private and public sectors.
4. **Streamline Turnaround Time**: Ensure AI systems are optimized to deliver results within the critical 5–8-day window to reduce dropout rates and maintain patient follow-up adherence.
5. **Pilot Programs in High-Readiness Cities**: Launch demonstration projects in cities like Mumbai, Ahmedabad, and Gurgaon to establish proof-of-concept, build confidence, and generate local success stories for broader rollout.
6. **Integrate with National Programs**: Align AI-enabled screening initiatives with existing government frameworks such as the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) to ensure scalability and sustainability.
7. **Invest in Infrastructure and IT Support**: Strengthen digital infrastructure in clinics and diagnostic centers to facilitate seamless data transfer, secure storage, and AI platform accessibility.

REFERENCES

1. **Cancer Statistics.** (2024, May 9). *Cancer.gov*. https://www.cancer.gov/about-cancer/understanding/statistics
2. **Sloan, F. A., & Gelband, Hellen.** (2007). *Cancer Control Opportunities in Low- and Middle-Income Countries* (1st ed., Vol. 1). National Academies Press (US).
3. **Care Health Insurance.** (2024, June 5). Example of non-communicable disease. *Care Insurance Blog*. https://www.careinsurance.com/blog/health-insurance-articles/list-of-major-non-communicable-diseases-in-india
4. **Kanavos, P.** (2006). The rising burden of cancer in the developing world. *Annals of Oncology: Official Journal of the European Society for Medical Oncology*, 17(Suppl. 8). https://doi.org/10.1093/annonc/mdl983
5. **Pti.** (2024, January 7). India registered 9.3 lakh cancer deaths, second highest in Asia: LANCET study. *The Hindu*. https://www.thehindu.com/news/national/india-registered-93-lakh-cancer-deaths-second-highest-in-asia-lancet-study/article67701510.ece
6. **Singh, D., Vignat, J., Lorenzoni, V., Eslahi, M., Ginsburg, O., Lauby-Secretan, B., Arbyn, M., Basu, P., Bray, F., & Vaccarella, S.** (2023). Global estimates of incidence and mortality of cervical cancer in 2020: A baseline analysis of the WHO Global Cervical Cancer Elimination Initiative. *The Lancet Global Health*, 11(2), e197–e206. https://doi.org/10.1016/S2214-109X(22)00501-0
7. **Bray, F., Laversanne, M., Sung, H., Ferlay, J., Siegel, R. L., Soerjomataram, I., & Jemal, A.** (2024). Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, 74(3), 229–263. https://doi.org/10.3322/caac.21834
8. **GLOBOCON 2022.** India Fact Sheet.
9. **Correspondent, H.** (2013, April 6). One woman dies of cervical cancer every 8 minutes in India. *Hindustan Times*. https://www.hindustantimes.com/punjab/one-woman-dies-of-cervical-cancer-every-8-minutes-in-india/story-cvLhbAFnWFPym1dN8uqfTK.html
10. **Mathur, P., Krishan Sathishraj, V., Chaturvedi, M., Das, D., Leburu, R., Kondalli, S., Sudarshan, L., Santhappan, S., Nallasamy, V., John, A.,**

Narasimham, S., & Roselind, F. S. (2020). Cancer statistics, 2020: Report from National Cancer Registry Programme, India. *Indian Council of Medical Research (ICMR)*. https://ncdirindia.org/All_Reports/Report_2020/default.aspx

11. **Takiar, R.** (2018). Status of Breast and Cervix Cancer in Selected Registries of India. *Annals of Women's Health*, 2(1), Article 1012. https://www.researchgate.net/publication/329885411
12. **Muthuramalingam, M. R., & Muraleedharan, V. R.** (2023). Patterns in the prevalence and wealth-based inequality of cervical cancer screening in India. *BMC Women's Health*, 23(1). https://doi.org/10.1186/s12905-023-02504-y
13. **NFHS-5.** (2019–2021). *National Family Health Survey-5*. Government of India.
14. **Council on Foreign Relations.** (2023, September 26). *Easing the Cervical Cancer Disease Burden in India*. Think Global Health. https://www.thinkglobalhealth.org/article/easing-cervical-cancer-disease-burden-india
15. **IARC.** (2023). *HPV Related Cancers Factsheet*. International Agency for Research on Cancer.
16. **Sreedevi, A., Javed, R., & Dinesh, A.** (2015). Epidemiology of cervical cancer with special focus on India. *International Journal of Women's Health*, 7, 405–414. https://doi.org/10.2147/IJWH.S50001
17. **Jeronimo, J., Castle, P. E., & Denny, L. T.** (2016). Secondary prevention of cervical cancer: ASCO resource-stratified clinical practice guideline. https://doi.org/10.1016/j.jgo.2016.006577
18. **Singh, J., Roy, B., Yadav, A., Siddiqui, S., Setia, A., Ramesh, R., & Singh, K.** (2018). Cervical cancer awareness and HPV vaccine acceptability among females in Delhi: A cross-sectional study. *Indian Journal of Cancer*, 55(3), 233–237. https://doi.org/10.4103/ijc.IJC_28_18
19. **Kaarthigeyan, K.** (2012). Cervical cancer in India and HPV vaccination. *Indian Journal of Medical and Paediatric Oncology*, 33(1), 7–12. Georg Thieme Verlag. https://doi.org/10.4103/0971-5851.96961
20. **MoHFW.** (n.d.). *Screening Guidelines*. Ministry of Health and Family Welfare, Government of India.

ANNEXURES

Questionnaire:

Ask at Reception:

1. What are the consulting fees for patients?
2. How many years of experience does the doctor have?
3. How long has the doctor been running this centre?

As from Doctor:

Cervical Cancer Screening numbers

4. Total # of patients seems per day / week / month
5. What is the volume of cervical cancer screenings performed per week?
6. What methods are used for cervical cancer screening?
7. Reason for using this particular method for screening.
8. What are the costs of these cervical cancer screening methods?

Cervical cancer and PAP Smear

8. How does doctor collect the sample for CC screening?
9. How many PAP smears are performed per week?
10. Does the doctor perform HPV co-testing as well along with PAP or only PAP?
11. Primary reason for screening (from patient's perspective)?
12. Major volume of patients for CC screening is from which age group?
13. What is the doctor’s opinion on cervical cancer screening (adequate/not)?
14. Are there any barriers or patient hindrances for cervical cancer screening?
15. In general, how frequently does the doctor recommend CC screening (Once in ____ Years)
16. What role do you think gynecologists can play a role in increasing cervical cancer screening rates?

17. According to them, what steps can be taken to increase enrolments for CC Screening.
18. Would the doctor be interested in championing / advocating for CC Screening.
19. Does the doctor think that being an active promoter of CC screening would benefit his profile and overall reputation

Advanced LBC Technique:

20. Is the doctor aware of advanced LBC techniques?
21. Has the doctor used advanced LBC techniques?
22. According to the doctor, what are the advantages and disadvantages of LBC compared to traditional PAP smear methods?
23. If the doctor starts full steam cervical screening regularly, how many PAP smears will he be able to do daily
24. Would you prefer to partner with a company that is a market leader in cervical cancer screening, which does US FDA-approved cervical screening using AI-based reporting for thin prep smears and US FDA approved mRNA-based HPV testing
25. How likely are you to move away from your preferred lab to a highly specialized cervical cancer screening center
26. Would you be okay partnering under the company's terms and conditions and receiving electronic payments
27. How comfortable would you be adopting a pricing structure where you purchase cervical screening tests at Rs 2000 and offer them to your patients at Rs 2500
28. Does the doctor think that this can be an additional lucrative revenue generating workstream for him
29. Do you think your patients will perceive the value of advanced cervical screening technology at this price point?
30. What types of support (e.g., patient education materials, diagnostic tools, operational assistance) would you expect from the company to make this partnership successful
31. Key Reason - if the doctor refuses for the partnership