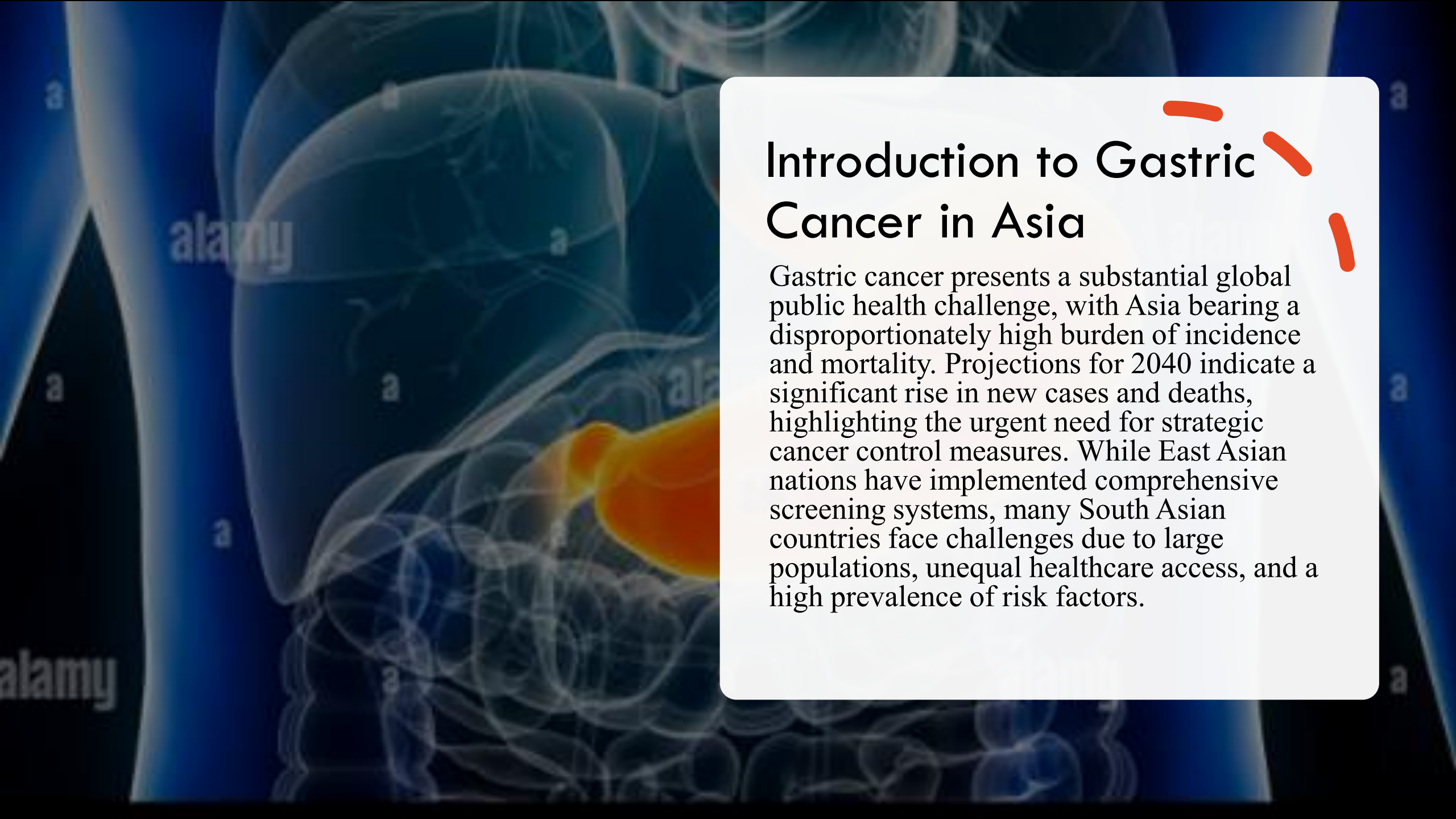


Cost-Effectiveness of Endoscopic Screening for Early Gastric Cancer Detection in High-Risk Asian Regions

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Introduction to Gastric Cancer in Asia

Gastric cancer presents a substantial global public health challenge, with Asia bearing a disproportionately high burden of incidence and mortality. Projections for 2040 indicate a significant rise in new cases and deaths, highlighting the urgent need for strategic cancer control measures. While East Asian nations have implemented comprehensive screening systems, many South Asian countries face challenges due to large populations, unequal healthcare access, and a high prevalence of risk factors.



East Asia's High Burden

Countries like China, Japan, and South Korea report the highest incidence and mortality rates. This is attributed to factors such as high *Helicobacter pylori* infection rates, genetic predispositions, and dietary patterns rich in smoked and salted foods. However, proactive screening efforts have significantly improved early detection and survival.

South Asia's Emerging Challenge

Nations like India, Pakistan, and Bangladesh, despite comparatively lower incidence rates, face a significant burden due to their vast populations and prevalent risk factors. Delayed diagnosis, often stemming from lack of awareness and inadequate screening infrastructure, leads to poor prognoses and high mortality-to-incidence ratios.



Modifiable Risk Factors for Gastric Cancer



Helicobacter pylori Infection

Designated a Group 1 carcinogen by the WHO, H. pylori infection is highly prevalent in many Asian nations (70-80%). Eradication campaigns, as seen in Taiwan, can reduce incidence by up to 53%.



Dietary Habits

High consumption of salty, pickled, and smoked foods, particularly in East Asia, markedly increases risk. This underscores the importance of public health initiatives promoting healthier dietary choices.



Smoking and Alcohol Use

Heavy drinking and smoking are well-established risk factors that substantially escalate the risk of disease progression. Public health campaigns targeting these habits are vital for reducing gastric cancer burden.

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RESEARCH AIM

To assess the cost-effectiveness of screening endoscopy for early gastric cancer detection in high-risk Asian regions and explore implications for health policy in South Asia.





RESEARCH OBJECTIVE

Review and Synthesise Studies

On the cost-effectiveness of endoscopic screening for gastric cancer in high-incidence Asian countries, providing a robust evidence base.

Identify Key Success Factors

To identify overarching patterns, existing gaps, and crucial success factors from the reviewed literature that can inform and shape future screening strategy development in varied healthcare settings.

Analyse Methodologies and Outcomes

To critically analyse the diverse methodologies, key outcomes, and policy recommendations from selected studies conducted in nations like Japan, South Korea, and China, drawing out actionable insights.

Evaluate Relevance to South Asia

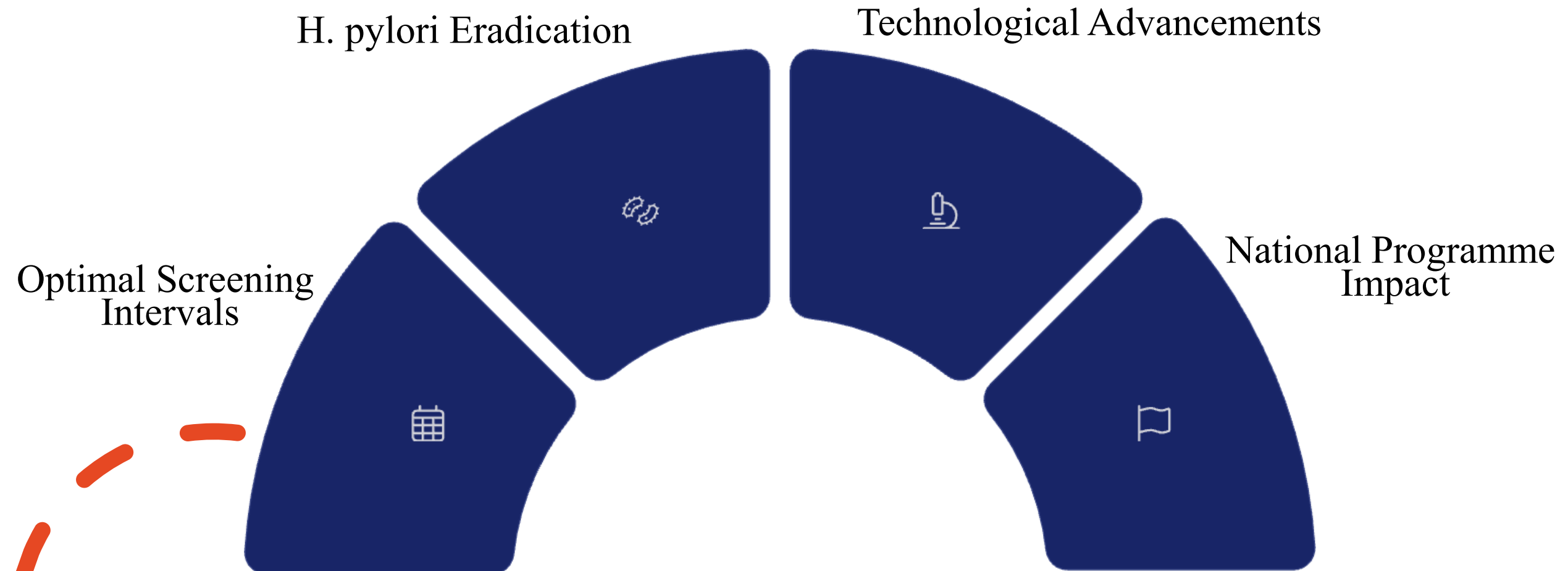
To evaluate the direct relevance and potential applicability of these findings to South Asian countries, particularly India, where the current evidence base and existing screening programmes remain notably limited.



Review of Literature

<u>Author and Year</u>	<u>Country</u>	<u>Key Findings</u>	<u>Conclusion</u>
Xia R et al., 2021	China	Screening every 2 years from age 50 most cost-effective.	Endoscopic screening is cost-effective in high-risk populations.
Kowada A, 2021	Japan	Triennial screening from age 50 most cost-effective post-H. pylori eradication.	Triennial endoscopy post-H. pylori eradication is cost-effective.
Choi IJ et al., 2019	South Korea	Biennial endoscopy had higher QALY gains and was cost-effective.	Endoscopy should remain a key strategy in high-risk countries.
Jun JK et al., 2017	South Korea	Screening associated with 21% mortality reduction.	National endoscopic screening improves survival and is justifiable.
Shichijo S et al., 2017	Japan	AI had higher sensitivity and consistency in early detection.	AI-based tools can enhance screening efficiency and accuracy.

Narrative synthesis of Literature



Methodology: A Secondary Research Approach



Data Sources

Biomedical and Public health databases, including PubMed, Google Scholar, and SpringerLink, alongside reports from WHO and IARC.



Search Strategy

Keyword combinations such as "gastric cancer," "endoscopic screening," "cost-effectiveness," and "Helicobacter pylori eradication" were used



Inclusion & Exclusion Criteria

Studies on Asian populations assessing cost-effectiveness or health economics, based on trials or models, were included. Excluded were non-English articles, those focused solely on treatment, editorials, and Western population



Data Analysis

Extracted data were tabulated, followed by a narrative synthesis. This process identified thematic patterns across studies, categorised by screening strategy, economic outcomes, and risk-based approaches.

Key Findings

Cost-Effectiveness

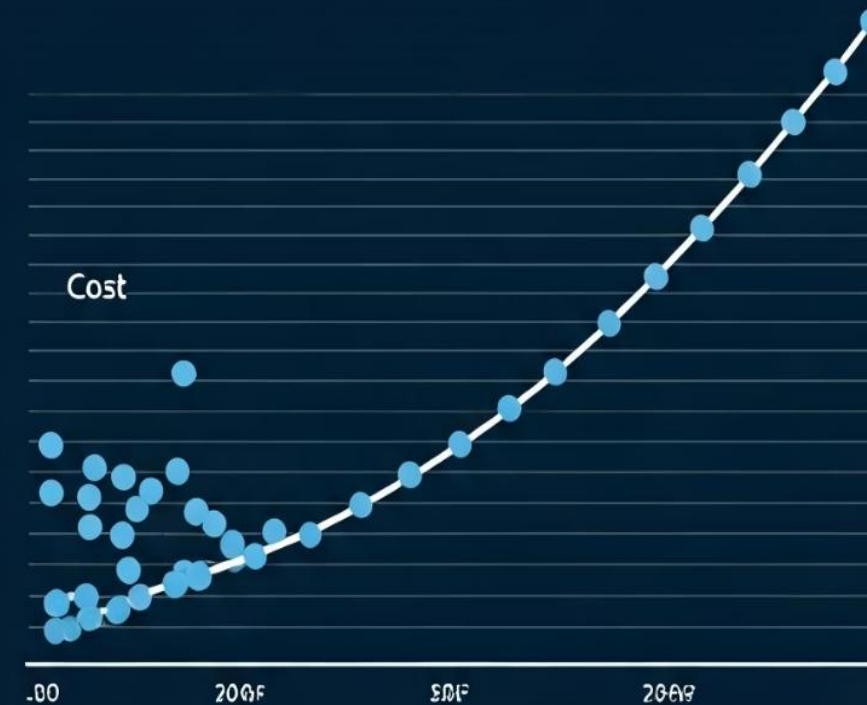
Biennial or triennial endoscopic screening for individuals aged 40+ is consistently found to be cost-effective. ICERs range from \$6,000 to \$25,000 per QALY, well within willingness-to-pay thresholds.

H. pylori Eradication

Combining H. pylori eradication with screening significantly enhances long-term efficacy, preventing cancer and controlling costs. This "screen-and-treat" strategy is highly relevant for South Asia.

Policy Implications

Despite a high burden (64,611 new cases, 57,727 deaths in India in 2022), South Asian nations lack organized screening. East Asian models offer a reproducible paradigm for structured pilot programs, especially risk-based initiatives.



Screening Intervals and Cost-Effectiveness

Biennial Endoscopy

Proven to offer the most economical balance, with QALY increases ranging from 0.05 to 0.2 per person screened. ICERs were well below national willingness-to-pay thresholds, highlighting its value.

Annual Screening

Generally found to be less cost-effective due to its marginal QALY benefit relative to the significantly higher cost. This highlights the importance of optimising frequency for resource efficiency.

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Triennial Post *H. pylori* Eradication

Also yielded cost-effective outcomes, particularly in populations with high prior infection rates, by effectively preventing cancer and controlling long-term treatment costs.

Public Health and Policy Implications for South Asia



Adopt Structured Pilot Programmes



Implement Risk-Based Screening

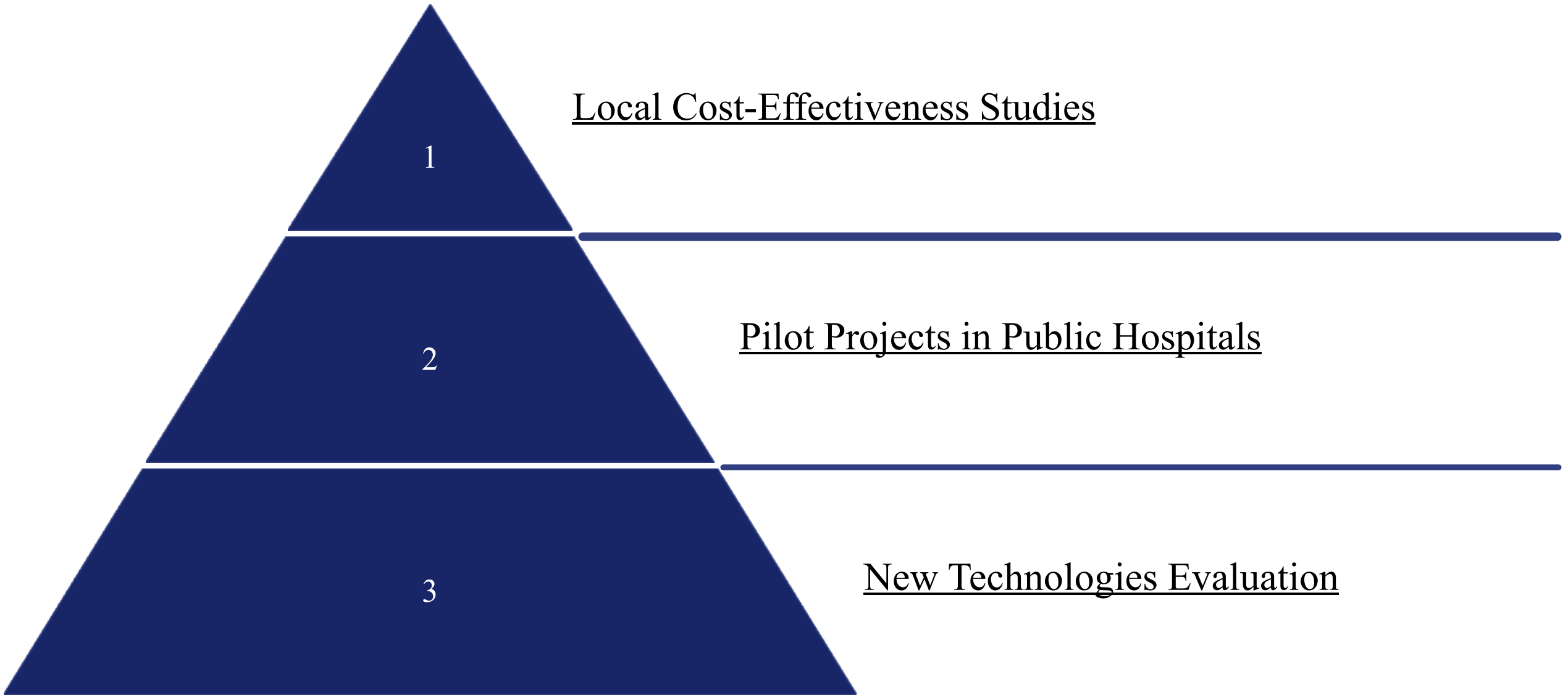


Integrate 'Screen-and-Treat' Strategy



Address Implementation Obstacles

Gaps in Existing Literature



Recommendations for Gastric Cancer Control



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Pilot Screening Programs

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Integrate H. pylori Screening

3

Develop Infrastructure

4

Perform Regional Studies

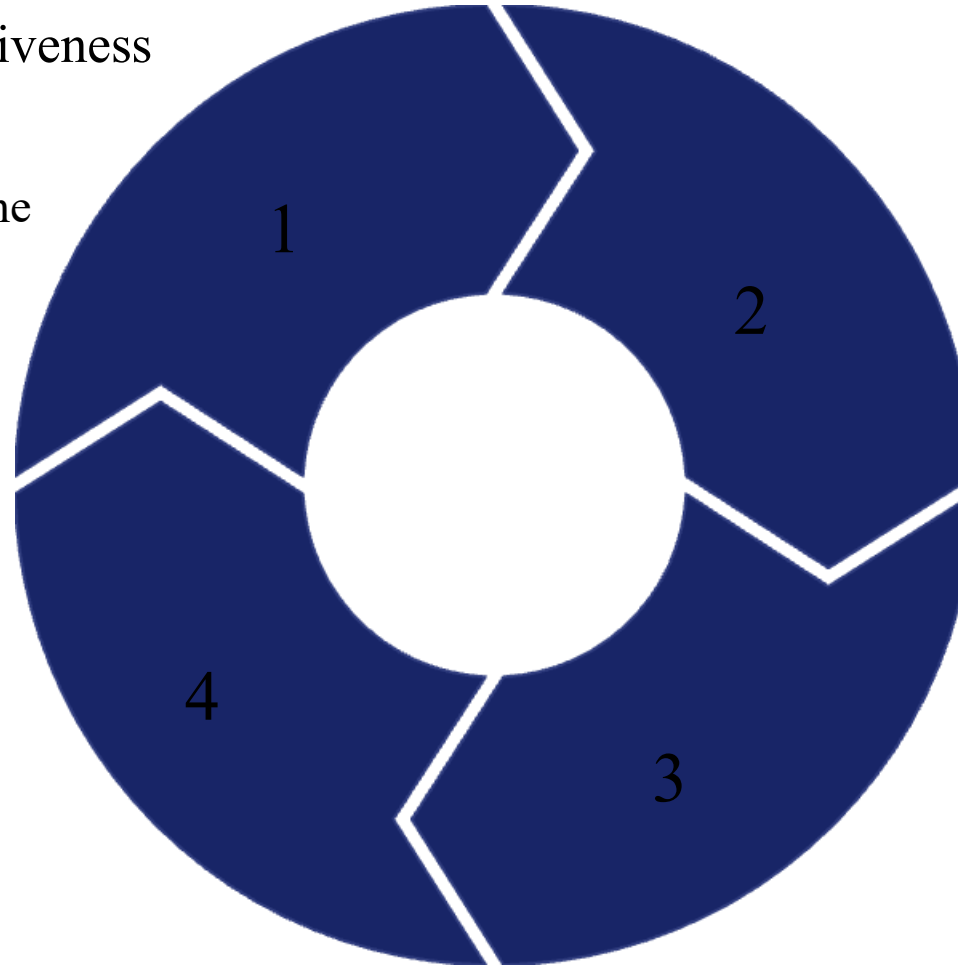
Future Scope and Reflection

Real-World Cost-Effectiveness

Further research is needed on the actual cost-effectiveness of gastric cancer screening in Indian states.

Comparative Modeling

Conduct comparative modeling of "screen-and-treat" versus universal endoscopy approaches.



Acceptability in Rural Areas

Investigate the acceptability of screening endoscopy among rural populations.

Implementation Challenges

Study the specific implementation challenges in public-sector hospitals.

Conclusion

Gastric cancer remains a significant public health challenge in Asia. This dissertation highlights that endoscopic screening is a clinically and financially sound method for early diagnosis and mortality reduction, especially when combined with *H. pylori* eradication. East Asian nations provide successful models for organised, risk-based, and economically justifiable screening. While South Asia can greatly benefit from these models, implementation requires adaptation to local realities, resource availability, and healthcare systems.



THANKYOU