

Evaluating Optimal Age for National Gastric Cancer Screening in Korea: Focusing on Sex and Upper Age Limit

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Introduction

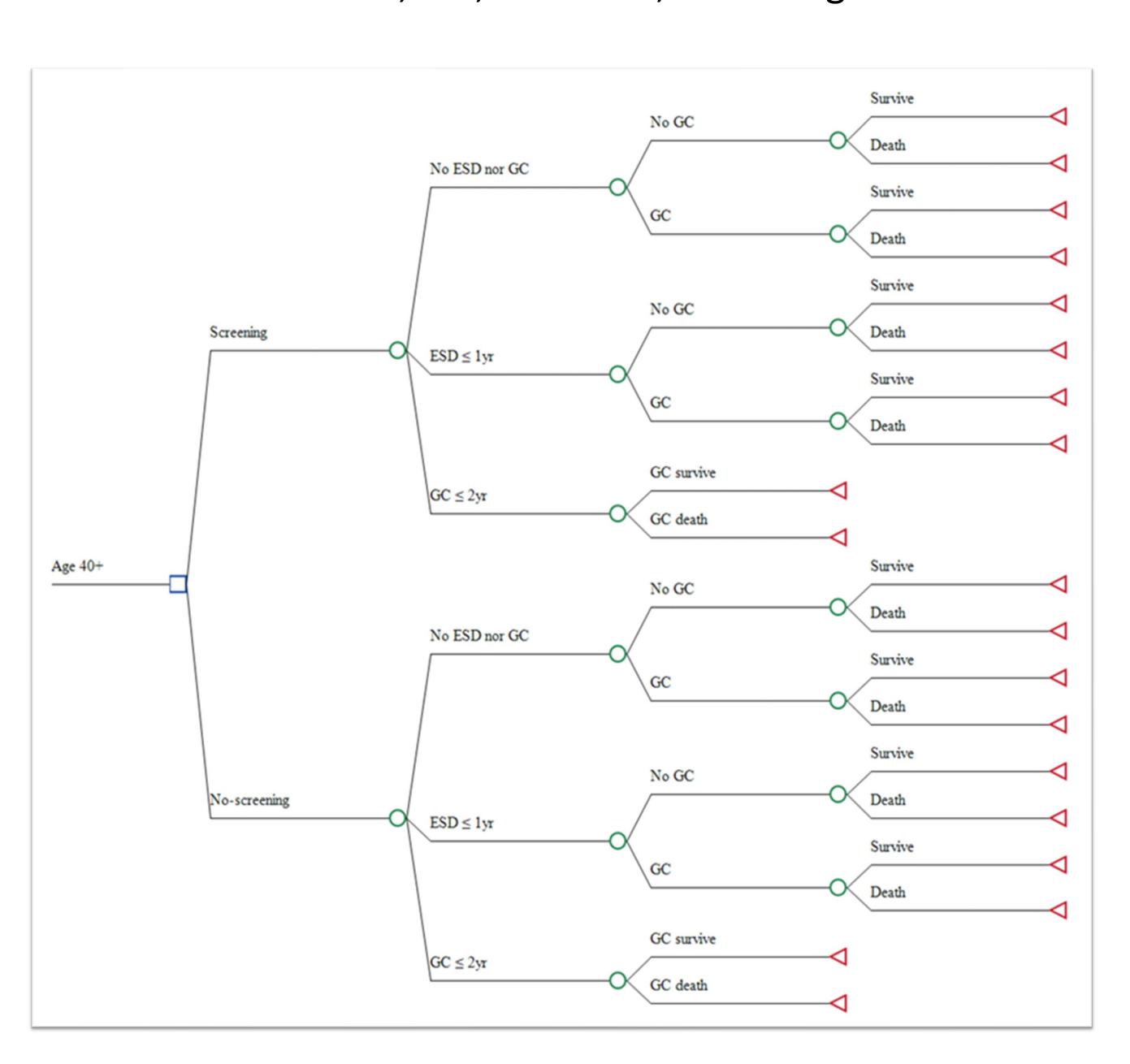
Gastric cancer remains highly prevalent in Korea and is a major cause of cancer-related mortality. With an aging population and increasing life expectancy, early detection is becoming increasingly important. The National Cancer Screening Program (NCSP) recommends biennial screening for individuals aged 40 and above using upper endoscopy or gastrointestinal series, but does not define an upper age limit. Although the 2015 guideline by the National Cancer Center suggests screening between ages 40 and 74, changing demographic and epidemiological trends call for a re-evaluation of age-specific screening criteria.

Methods

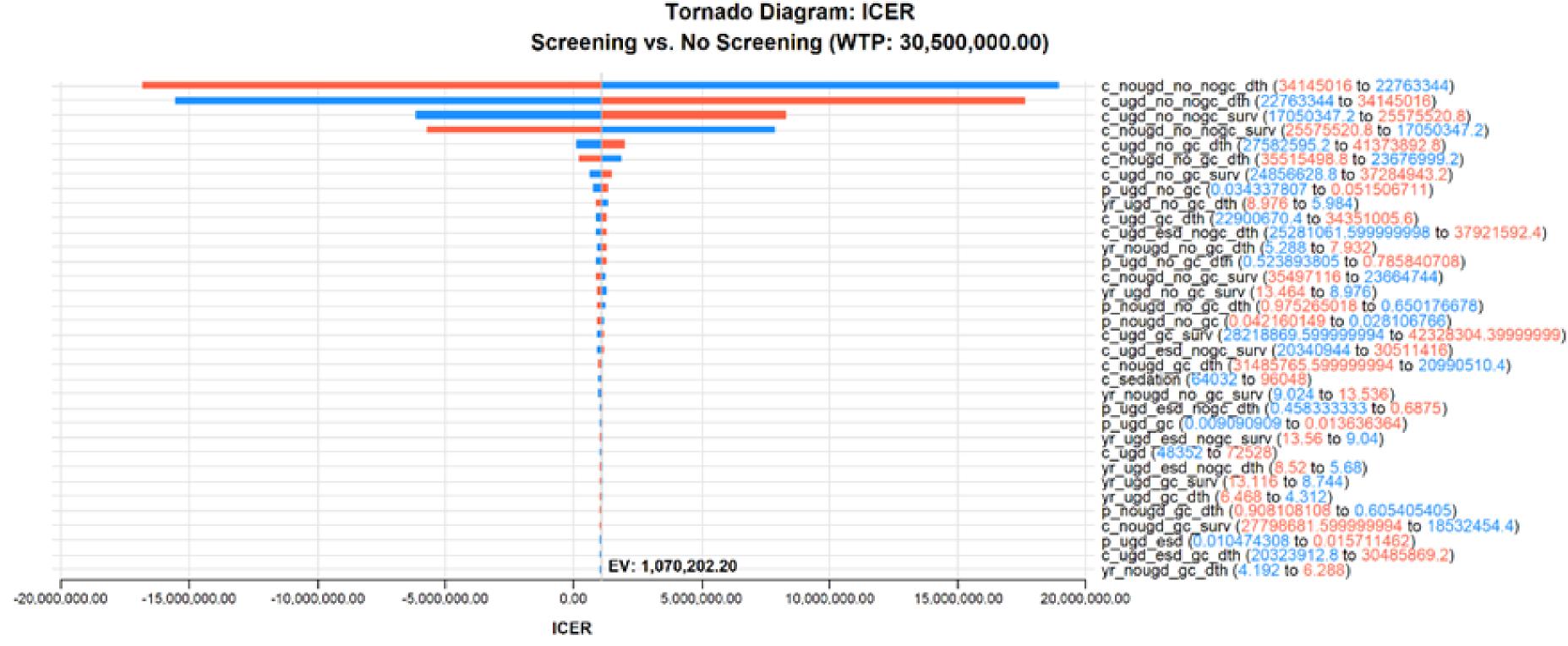
- Study design & data: Population-based retrospective cohort study using customized claims data from the Korean National Health Insurance Service.
- Study population: Adults aged ≥40 who received gastric cancer screening in 2009–2010 were matched with non-screened individuals by age and sex, and followed up until 2020.
- Statistical analysis: SAS Enterprise Guide 7.14 was used. McNemar's test compared post-diagnosis mortality between screened and non-screened groups by sex and age group (40–74, ≥75, 40–79, ≥80 years).
- Cost-effectiveness analysis: A decision-tree model (TreeAge Pro 2023) was used to estimate cost per life-year gained. Direct medical costs were calculated quarterly based on screening, ESD, diagnosis, and survival, adjusted for CPI with a 3% discount rate. ICER was calculated.

Results

- In women aged ≥80, post-diagnosis mortality was significantly higher in the screened group than in the non-screened group (χ^2 =5.07, df=1, p=0.024). This pattern was not observed in any other age or sex subgroup. Due to the lack of clinical benefit, cost-effectiveness analysis was not performed for this group.
- In all subgroups men and women aged 40–74, ≥75, and 40–79 the screened group dominated the non-screened group, indicating that gastric cancer screening was more effective and less costly.
- In men aged ≥80, the ICER for gastric cancer screening was KRW 1,070,202 per life-year gained, which is well below the Korean willingness-to-pay threshold of KRW 30,500,000. Thus, screening was considered cost- effective in this group.



Men (≥80 years)	Screened group	Non-screened group
Cost (KRW)	26,388,842	26,172,140
Life-years gained	8.17	7.96
Cost difference	-216,701	
Life-year difference	-0.20	
ICER (KRW per LYG)	1,070,202	



Discussion

This study used NHIS data to evaluate the long-term cost-effectiveness of gastric cancer screening, providing evidence for policy. However, limitations include potential selection bias, lack of clinical data(e.g., cancer stage, family history), and analysis based on a single screening event.

Conclusion

- For men, gastric cancer screening remained cost-effective even at age ≥80, suggesting that continued screening beyond the current upper age limit of 75 may be considered under certain conditions, given the elevated cancer risk and potential survival benefit.
- In contrast, among women aged ≥80, the net benefit of screening may be limited, indicating that individualized, health status—based screening may be a more appropriate strategy.
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