

Incidence, Morality, Risk Factors, and Temporal Trends of Cervical Cancer

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Background

- **Cervical cancer** is the **fourth** most common cancer and leading cause of cancer mortality among females globally.
- Determining the **epidemiology** of cervical cancer is particularly important as it is highly preventable through a combination of primary or secondary preventive strategies.
- This study aimed to evaluate the **worldwide distribution, risk factors, and temporal trends** of cervical cancer for different countries and age groups.



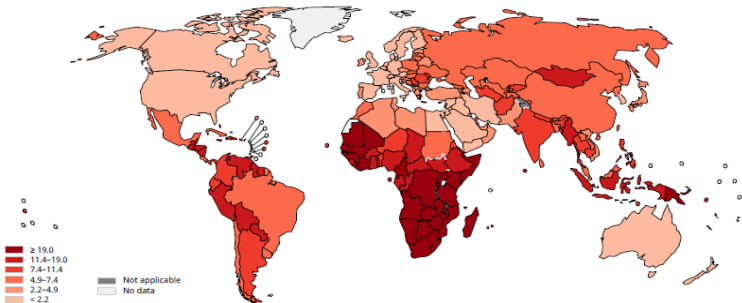
Methods

- The **Global Cancer Observatory** database was retrieved for the age-standardized rates (ASR, per 100,000 persons) for incidence and mortality in 2018.
- The prevalence of alcohol drinking, smoking, obesity, and hypertension in 2010 was retrieved from the **Global Health Observatory database**. The associations between prevalence of risk factors and incidence and mortality of cervical cancer were examined by multivariable linear regression analysis, adjusting for human development index (HDI) and gross domestic products (GDP) per capita.
- Joinpoint regression analysis was used to calculate the 10-year annual average percent change (AAPC) for incidence and mortality using data from **Cancer Incidence in Five Continents** and **WHO mortality database**.



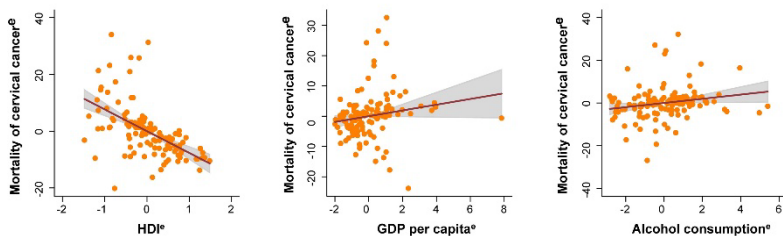
Results

Figure 1. Global mortality of cervical cancer in 2020



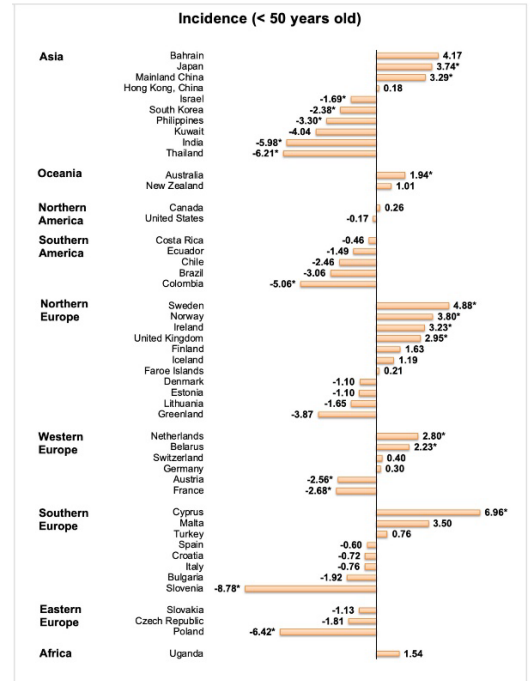
- A total of 604,127 new cases (ASR, 16.2) and 341,831 deaths (ASR, 7.3) of cervical cancer were reported globally in 2020. The highest incidence and mortality were observed in **Eastern Africa** (ASRs, 40.1 and 28.6), **Southern Africa** (ASRs, 36.4 and 20.6), **Middle Africa** (ASRs, 31.6 and 22.7), **Melanesia** (ASRs, 28.3 and 18.6) and **Western Africa** (ASRs, 22.9 and 16.6); and countries with **low HDI** (ASRs, 27.2 and 19.8) and **medium HDI** (ASRs, 16.5 and 10.4).

Figure 2. Factors associated with mortality of cervical cancer



- Population in countries with higher incidence and mortality of cervical cancer have **lower HDI** ($\beta=-8.19$, 95% CI -11.32 to -5.06, $p<0.001$; $\beta=-7.66$, CI -9.82 to -5.50; $p<0.001$) but **higher alcohol consumption** ($\beta=1.89$, 95% CI 0.59 to 3.19, $p=0.005$; $\beta=0.98$, CI 0.08 to 1.88; $p=0.033$), whilst adjusting for GDP, smoking, obesity, and hypertension ($p>0.05$).

Figure 3. AAPC for incidence of cervical cancer



- Generally, countries from Asia, Southern American, and Eastern Europe demonstrated a decrease in its incidence whilst countries from **Northern Europe** and **Oceania** showed an increase in its incidence. The increasing trend of incidence among **the younger population** was more **drastic** than that in the older, with Cyprus (AAPC, 6.96), Sweden (AAPC, 4.88), and Norway (AAPC, 3.80) showing the most prominent rise in individuals < 50 years. Although a decreasing trend of mortality was observed in most countries, the **Philippines** (AAPC, 5.44), **Italy** (AAPC, 1.47), and **Japan** (AAPC, 1.23) reported a significant increase.

Conclusions



- The burden of cervical cancer was the highest in regions with **low and medium HDI** and associated with the prevalence of **alcohol consumption**.
- There was an increasing trend in the incidence, particularly in **Northern Europe** and **people of younger age**.
- More intensive primary prevention (including lifestyle modifications and **human papillomavirus vaccination**) and secondary prevention (including **Pap smear screening** and precancerous lesions removal) strategies are recommended for these populations.
- The reasons behind the epidemiological transitions need to be further investigated.

Acknowledgments

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