International Agency for Research on Cancer

World Health Organization

Erasmus MC

Country Factsheet Series

Socio-economic inequalities in cancer mortality across the EU27, Norway and Iceland

Cyprus

Key messages

National cancer mortality rates in Cyprus in 2015–2019* were lower that the European average in both sexes. Death rates were much higher in men than in women and varied greatly across educational levels, according to a social gradient, i.e., with a progressive increase as educational levels decreased. Mortality rates and socio-economic inequalities were highest for lung cancer in men. A social gradient was found for all selected cancer types, with the exception of breast cancer. Cyprus adopted only in 2019 an Updated National Cancer strategy in line with EU guidelines and the concurrent extensive presence of the private sector, which limits equal access to care for all citizens.

Educational inequalities in total cancer mortality

In Cyprus, mortality rates for total cancer** in 2015–2019 were lower that the corresponding European averages***, reaching 328 per 100,000 among men and 212 per 100,000 among women. Mortality rates varied according to a social gradient, which was more pronounced in men. Men with primary education had cancer mortality rates approximately 50% higher than men with tertiary education (386 vs 256 per 100,000). Women with primary education

had about 20% higher cancer mortality rates compared to those with tertiary education (226 vs 193 per 100,000).

The difference in rates between primary and tertiary education (i.e., inequality gap) was lower than the European average, similar to that of certain Western/Southern European countries, such as Malta, and generally much smaller compared to both Eastern European and Nordic countries.

* In Cyprus, estimates of cancer mortality by education level were obtained using the "back-calculation" method which consists in borrowing information from countries with observed data in the same geographical area, specifically Austria, Belgium, Spain and Italy. See methodological notes at the end and the Methodological report for more information.
** All cancers combined
*** European average is calculated considering 27 EU Member states + Norway and Iceland
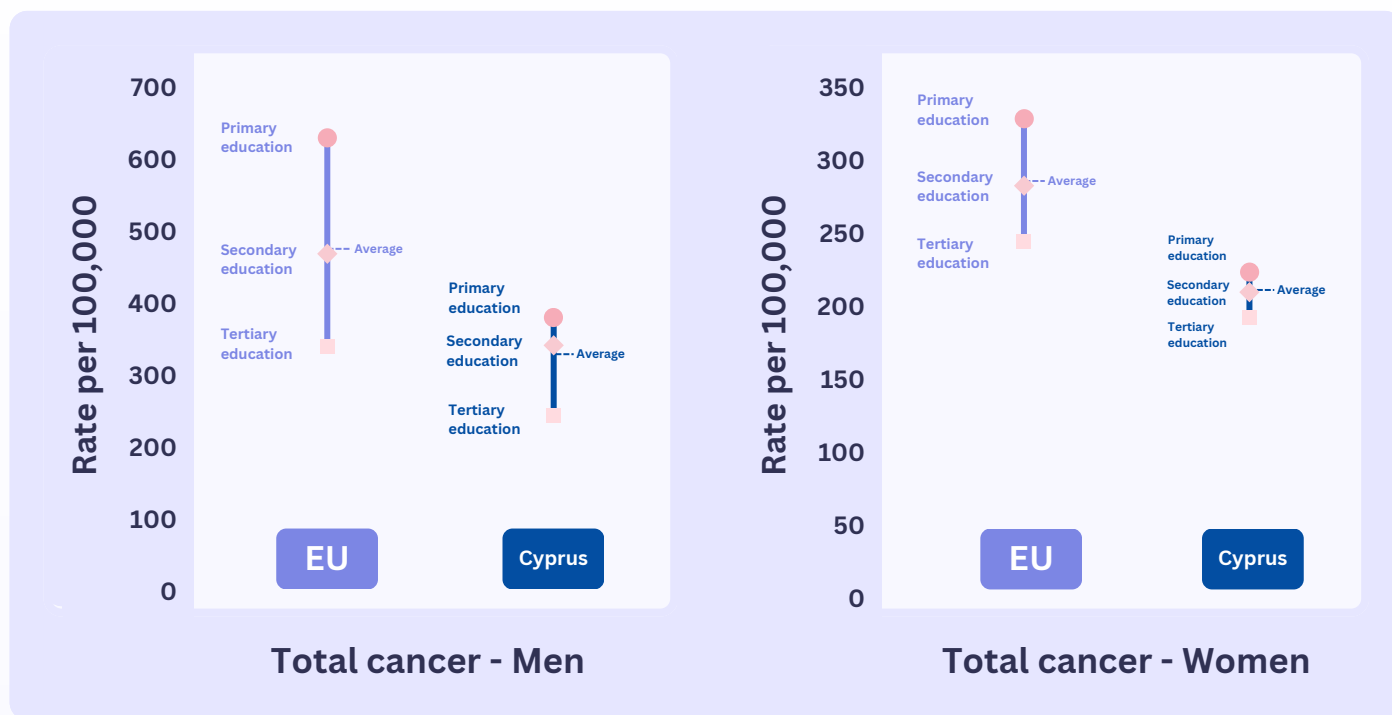
Figure 1. Total cancer mortality by sex and education level

Educational inequalities in mortality by cancer site

🫁 Lung cancer

Lung cancer mortality was lower than the European average for both sexes, particularly among women. Men had about five times higher mortality rates as compared to women. The social gradient for lung cancer was more pronounced in men, for whom the disease was the largest contributor to inequalities in total cancer mortality. Differences in tobacco-smoking and consumption across sex and socio-economic groups in the past decades are likely to explain a large part of the observed inequalities. Smoking habits are well rooted in Cyprus culture and until recently, the country reports rates of smokers higher than the EU [1, 2]. In more recent times (2006-2009), however, the proportion of daily smokers was higher among higher, compared to lower, educated men and women [1].
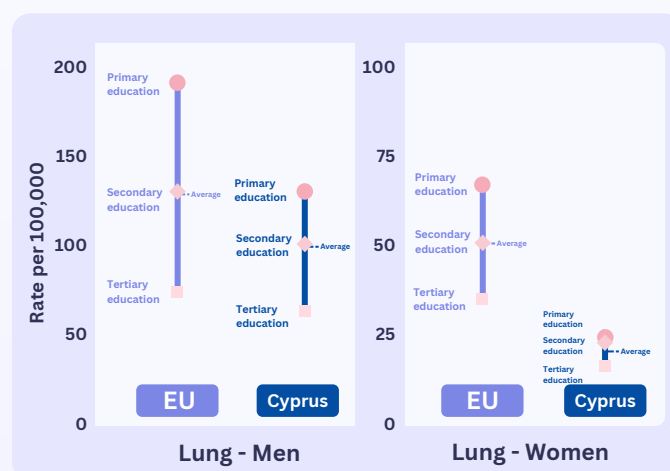
🩻 🩻 Colorectal and stomach cancers

National average rates for colorectal and stomach cancer mortality in Cyprus were below the

Figure 2.a. Cancer-specific mortality by sex and education level: lung

corresponding European average in both sexes, although rates in men were higher than in women. A clear social gradient was observed for colorectal and stomach cancer in both sexes although the inequality gap was larger in men than in women. The observed inequalities may be partly explained by past disparities in the prevalence of cancer risk factors (i.e., alcohol consumption, smoking, poor diet, overweight and obesity, Helicobacter pylori for stomach cancer [3]) across socio–economic groups. Indeed, while the prevalence of overweight and obesity is slightly lower than the EU average [1], obesity in children is high and differences among socio–economic groups exist (with a higher prevalence among primary education, as compared to tertiary education, 23% vs 11% in 2019) [2, 4]. There is no a population–based programme available in Cyprus and the uptake of available opportunistic screening is among the lowest in the EU, with only 3.5% of the population aged 50–74 years undergoing colorectal screening in 2019 [1].

Breast cancer

Breast cancer had the highest mortality rates among women, and with national rates similar to the corresponding European average. Slightly higher rates are observed in those with higher education levels compared to those with lower education. This pattern likely reflects the combined effect of several factors affecting breast cancer, such as exposure to risk factors (especially reproductive factors), early detection, and equitable access to diagnostic and treatment services. Breast cancer screening is the only population–based screening available in Cyprus, with an uptake rate for women 50–69 years similar to the EU average (66% for both in 2019) [2].

Prostate cancer

In Cyprus, prostate cancer mortality was a large contributor to total cancer mortality in men although rates were lower than the European average. There was a clear social gradient in mortality with rates decreasing as education level increased, possibly due to inequality in the availability of diagnostic and imaging services in public hospitals [5].

Cervical cancer

Cervical cancer mortality rates were generally low compared to the other cancer types and lower than the European average. There was a mild social
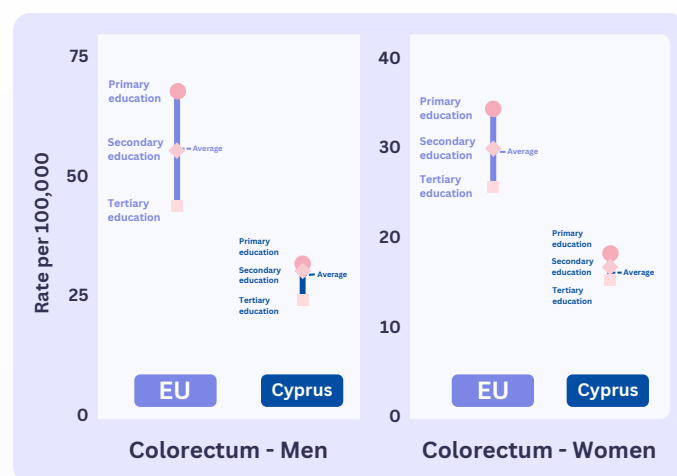

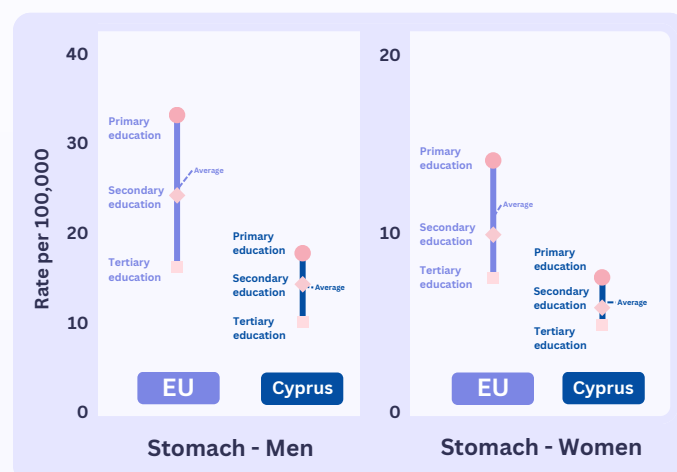**Figure 2.b.** Cancer-specific mortality by sex and education level: colorectum

Figure 2.c. Cancer-specific mortality by sex and education level: stomach
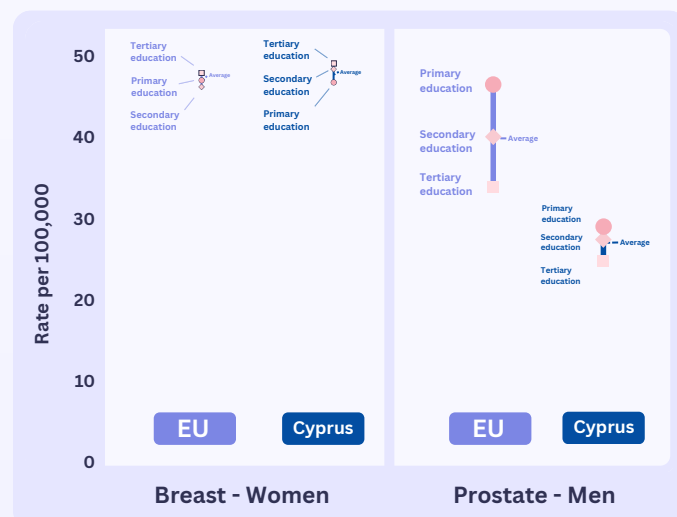

Figure 2.d. Cancer-specific mortality by sex and education level: breast (left), prostate (right)

gradient, with higher rates among primary, compared to tertiary educated women. This could be, at least partly, explained by the opportunistic nature of cervical cancer screening in Cyprus and by substantial differences in uptake rate of screening across socio-economic groups (41% of women with low income and 78% of women with high income were screened in 2019), although the overall uptake rate is in line with European average [1, 2]. If implemented equitably, human papillomavirus (HPV) vaccination and HPV-based screening could further alleviate the disease burden and contribute to reducing associated socio-economic disparities.
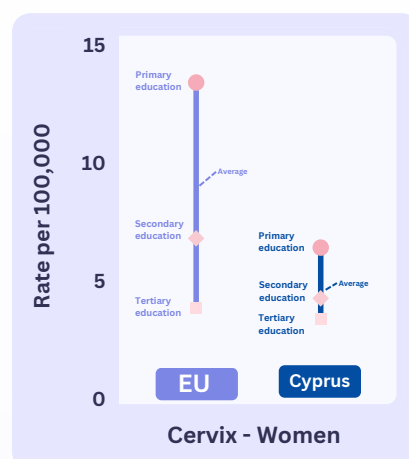

Figure 2.e.
Cancer-specific mortality by education level: cervix

Methodological notes:

Findings are based on the ERAINHE dataset, which includes mortality data by educational attainment, age group, sex, period, country and cause of death. For most countries, the data are derived from individually-linked records, collected and harmonized in different periods in different projects (for the full description see the Methodological report). Geographical and temporal gaps in the ERAINHE dataset were addressed using complementary data sources and appropriate estimation methodologies tailored to the availability of the data. Age-standardised (European Standard Population) mortality rates by educational level for individuals aged 40–79 years were thus estimated for 2015–2019, using four different methods:

- **Method for group A countries,** for countries with at least 3 recorded observations over different periods of time: actual observed data for 2015–2019 (when available) or projections based on linear regression models;

- **Method for group B countries,** for countries with 1 or 2 recorded observations only: incomplete data combined with trends from other databases;
- **Method for group C countries,** for countries with no observations for certain cancer sites: integration of data from different databases with information from countries in the same geographical area;
- **"Back-calculation" method,** for countries without available data in the ERAINHE dataset: combination of population a mortality data from different databases with information on educational inequalities in cancer from countries in the same geographical area.

For Cyprus, the "back-calculation' method was used.
Disclaimer: As this method also integrates information from countries within the same geographical area, the degree of uncertainty associated with the estimates is higher compared to estimates based solely on national data.

✉ Contact information

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