

# Country Factsheet Series

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

## Germany

### Key messages

Mortality rates for total cancer in 2015–2019\* in Germany were slightly lower than the European average for both sexes. However, rates were higher in men, compared to women. These rates varied significantly across educational levels, following a social gradient, increasing as educational levels decreased. For both sexes, a social gradient was found for all six cancer types, except for breast cancer. Absolute inequalities in cancer mortality were the highest for lung cancer in men. Germany provides largely equitable access to cancer care regardless of insurance contributions. Cancer services are generally free of charge at the point of use, and unmet medical needs for reasons related to finances, geographical accessibility or ethnicity are relatively limited. Nevertheless, inequalities in cancer mortality persist.

### Educational inequalities in total cancer mortality

In Germany, total cancer\*\* mortality rates in 2015–2019 were 414 per 100,000 among men and 276 per 100,000 among women, and were characterized by a clear social gradient, which was more pronounced in men than in women. Cancer mortality rates among men with primary education were about 50% higher than those with tertiary education (504 vs 335 per 100,000). Women with primary education had

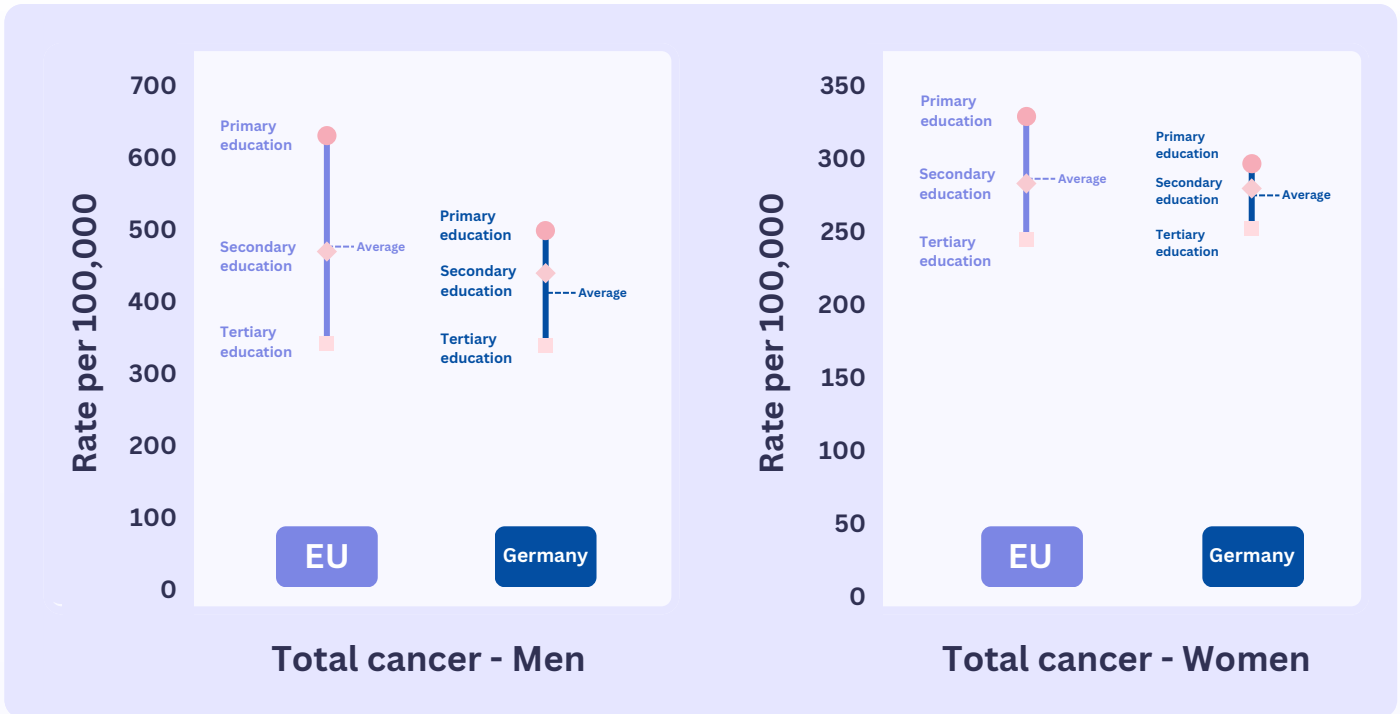
approximately 20% higher mortality rates compared to those with tertiary education (297 vs 253 per 100,000).

The difference in mortality rates between primary and tertiary education (i.e., the inequality gap) was lower than the European average\*\*\* for both sexes, and than in other Eastern European countries, like Czechia and Poland.

\* In Germany, estimates of cancer mortality by education level were based on 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

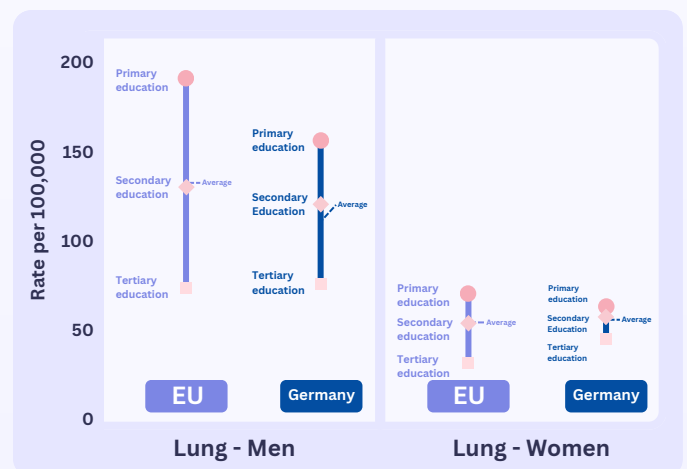
## Educational inequalities in mortality by cancer site

### Lung cancer

Lung cancer mortality rates in Germany were twice as high in men compared to women, although among women the national average rates were higher than the corresponding European average. In both sexes, lung cancer was a large contributor to inequalities in total cancer mortality, with a clear social gradient observed. These inequalities could be largely explained by inequalities in the past exposure to tobacco smoking across gender and educational levels. In 1998, the proportion of daily cigarette smokers in Germany was 45% among men and 30% among women, with higher prevalence in less educated individuals [1].

### Colorectal and stomach cancers

The national average rates for colorectal and stomach cancers mortality were below the European



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

average, for both men and women. For both cancer sites, mortality rates were higher in men compared to women, showing a social gradient, which however was more pronounced in men. Socio-economic and sex inequalities in past exposure to risk factors such as poor diet, physical inactivity, obesity, alcohol consumption, smoking [2, 3] and infection with *Helicobacter pylori* (for stomach cancer) earlier in life [4] may partly explain observed inequalities. In Germany, average alcohol consumption in 2020 was higher than in many other EU countries, with harmful use of alcohol being slightly more prevalent in men than in women (4.9% vs 4.3%) [3]. In 2019, 22% of people with higher educational levels reported to have never being screened for colorectal cancer, compared to 25% of those with lower educational attainment [5].

### Breast cancer

Breast cancer contributed to the second highest mortality rate among women, after lung cancer. Compared to the European average, the national mortality rate for breast cancer in Germany was slightly higher. This cancer showed a mild reverse gradient as mortality rates increased with increasing educational levels. This may be the result of the combined effect of several factors, possibly acting on different directions, including exposure to risk factors, particularly reproductive factors, early diagnosis, screening and treatment options. In 2019, screening participation rates were similar across educational groups [6].

### Prostate cancer

Prostate cancer was a large contributor to total cancer mortality among men in Germany, although rates were slightly lower than the European average. There was a social gradient, with increasing rates as education decreased. These observed inequalities could possibly be explained by inequalities in stage at diagnosis, and disparities in access to treatment or treatment options [7].

### Cervical cancer

Cervical cancer had the lowest mortality rates among all the cancer types analysed; nevertheless, a social gradient was evident, with primary education women experiencing higher mortality rates

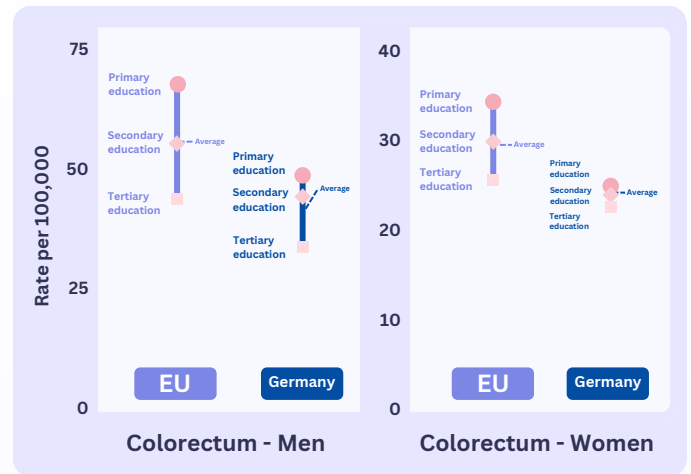


Figure 2.b. Cancer-specific mortality by sex and education level: colorectum

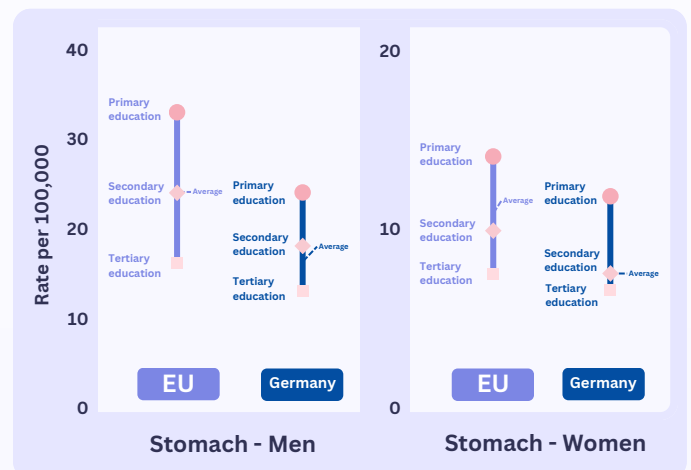


Figure 2.c. Cancer-specific mortality by sex and education level: stomach

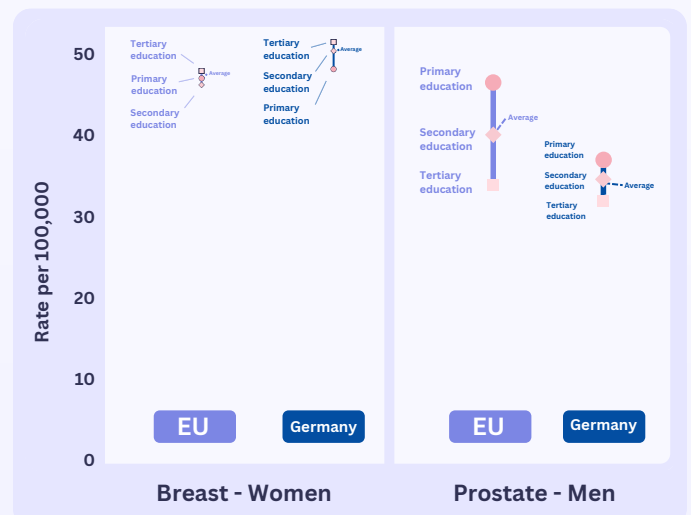
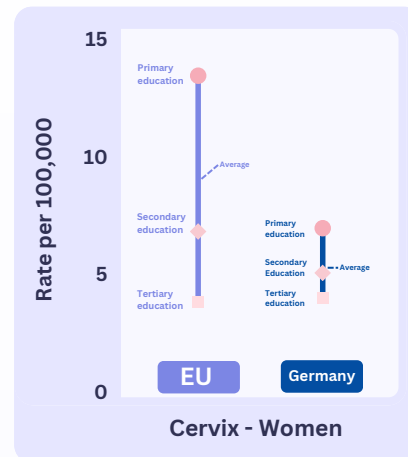


Figure 2.d. Cancer-specific mortality by sex and education level: breast (left), prostate (right)

compared to those with tertiary educational attainment. These inequalities may be partially explained by differential uptake of screening services across educational groups. In 2019, less women with tertiary education (6%) reported to have never taken a smear test compared to women with secondary and primary education (9%) [8]. Scale-up of HPV vaccination and HPV-based screening, if equitably implemented, has the potential to decrease the burden and reduce inequalities.



**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 Germany, 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

**IARC:** Cancer Inequalities Team, Cancer Surveillance Branch, International Agency for Research on Cancer.  
eu-canineq.iarc.who.int

**European Cancer Inequalities Registry (ECIR):** cancer-inequalities.jrc.ec.europa.eu ec-ecir@ec.europa.eu sante-rt-d-cancer@ec.europa.eu

**Disclaimer:** This document has been prepared for the European Commission however it reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

## References:

1. Huisman, M., A.E. Kunst, and J.P. Mackenbach, Educational inequalities in smoking among men and women aged 16 years and older in 11 European countries. *Tob Control*, 2005. 14(2): p. 106–113.
2. Huijts, T., et al., Educational inequalities in risky health behaviours in 21 European countries: Findings from the European social survey (2014) special module on the social determinants of health. *The European Journal of Public Health*, 2017. 27: p. 63–72.
3. OECD, EU Country Cancer Profile: Germany. OECD Publishing, Paris, <https://doi.org/10.1787/fcc8586e-en>, 2023.
4. Vaccarella S, Lortet-Tieulent J, Saracci R, Conway DI, Straif K, Wild CP, editors (2019). Reducing social inequalities in cancer: evidence and priorities for research (IARC Scientific Publication No. 168). Lyon, France: International Agency for Research on Cancer. Available from: <https://publications.iarc.who.int/580>
5. ECIR, Uncovering Inequalities Colorectal Cancer Screening in Europe. 2024.
6. ECIR, Uncovering Inequalities Breast Cancer Screening in Europe. 2023.
7. Chen SL, Wang SC, Ho CJ, Kao YL, Hsieh TY, Chen WJ, Chen CJ, Wu PR, Ko JL, Lee H, Sung WW. Prostate Cancer Mortality-To Incidence Ratios Are Associated with Cancer Care Disparities in 35 Countries. *Sci Rep*. 2017 Jan 4;7:40003. doi: 10.1038/srep40003. PMID: 28051150; PMCID: PMC5209738.
8. ECIR. ECIR data tool. 2019 [cited 2024 05 December].