

Country Factsheet Series

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

Luxembourg

Key messages

In Luxembourg, mortality rates for total cancer in 2015–2019* were higher in men than in women and, for both sexes, lower than the corresponding European average. Rates varied according to a social gradient, with increasing mortality as educational level decreased. The social gradient was more pronounced in men and concerned all the selected cancer types, except breast cancer, for which a mild reverse gradient was found. The highest socio-economic inequalities in cancer mortality were observed for lung cancer in men. In Luxembourg, barriers to access cancer care are negligible. Cancer services are generally free of charge at the point of use. Nevertheless, inequalities in cancer mortality persist.

Educational inequalities in total cancer mortality

In Luxembourg, total cancer** mortality rates in 2015–2019 were 358 per 100,000 among men and 251 per 100,000 among women. A social gradient was observed for both sexes but was more pronounced in men. Mortality rates in men with primary education was about 50% higher than those with tertiary education (427 vs 284 per 100,000). Among women, this gradient was less steep with mortality rates about 20% higher for primary

education compared to tertiary education (268 vs 229 per 100,000).

The inequality gap (i.e., the difference in rates between primary and tertiary education) was lower than the European average*** and than that in other countries in the region like Belgium and Germany.

* In Luxembourg, 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.

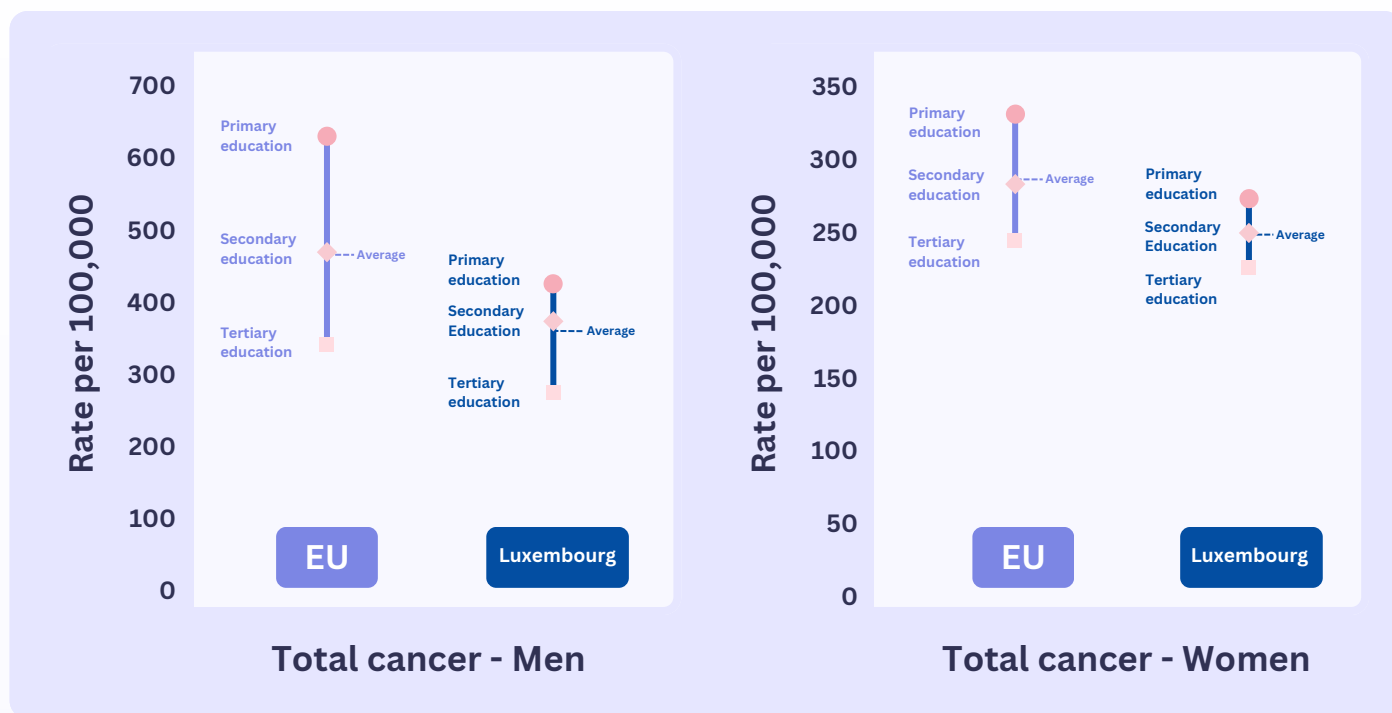


Figure 1. Total cancer mortality by sex and education level

Educational inequalities in mortality by cancer site



Lung cancer

Lung cancer mortality rates were approximately two times higher in men compared to women. Compared to the European average, national cancer mortality rates in Luxembourg were lower among men, but similar among women. For both sexes, there was a clear social gradient, which was more evident in men. Sex and socio-economic inequalities in lung cancer mortality could be explained by past differences in smoking patterns across these groups. In 2005, smoking prevalence in Luxembourg was higher among men than women, and among those with primary education (24%) compared to those with tertiary education (17%) [1].

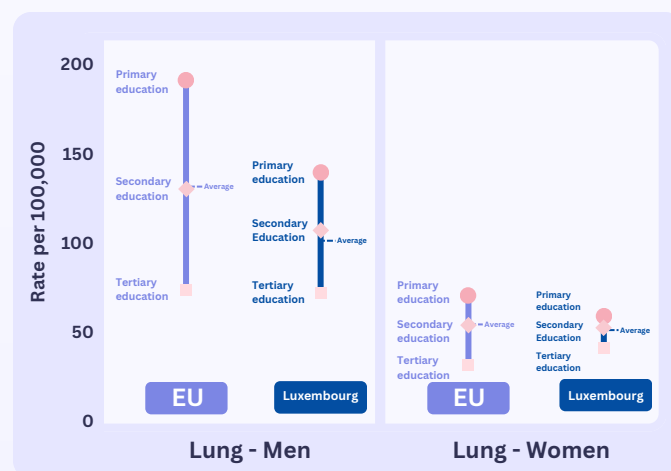


Figure 2.a. Cancer-specific mortality by sex and education level: lung



Colorectal and stomach cancers

Colorectal and stomach cancer national mortality rates in Luxembourg were both below the European

average. Stomach cancer mortality rates were lower than colorectal cancer rates, but a clear social gradient was observed for both cancer sites and in both sexes. Inequalities in the past exposure to risk factors across social groups and sexes such as, alcohol consumption, smoking, poor diet, obesity, physical inactivity [2, 3], and infection with *Helicobacter pylori* at young ages (for stomach cancer) [4] could partly explain the observed inequalities. In Luxembourg, average alcohol consumption is higher than in many other EU countries, particularly for men with low education levels [3]. Interestingly, differences in the uptake and use of colorectal cancer screening services are higher among those with lower (44%), compared to higher (38%), educational levels [3, 5].

Breast cancer

Breast cancer mortality rates were higher than the corresponding European average. There was evidence of a mild reverse social gradient as mortality rates increased with increasing educational levels. Participation to breast cancer screening is relatively high in Luxembourg, and rates are slightly higher among less educated women (83%) compared to their higher educated counterparts (80%) [3, 6]. A combination of several factors, including differences in the exposure to breast cancer risk factors, early diagnosis, screening and treatment across educational groups may explain the above-described patterns for the disease.

Prostate cancer

The national average mortality rate for prostate cancer was lower than the corresponding European average. A social gradient was also observed, with rates decreasing as educational levels increased. Inequalities in the stage at diagnosis and access to treatment services [7] could possibly explain the observed disparities.

Cervical cancer

Cervical cancer mortality rates in Luxembourg were the lowest among all cancers assessed and lower than the corresponding European average. However, inequalities across educational levels were found, with increasing mortality as educational levels

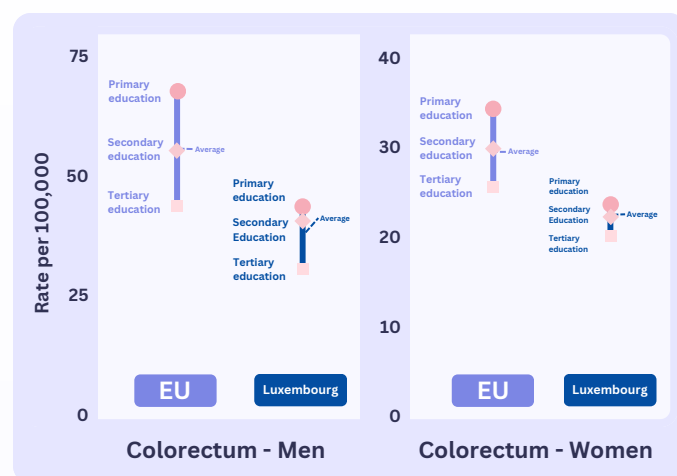


Figure 2.b. Cancer-specific mortality by sex and education level: colorectum

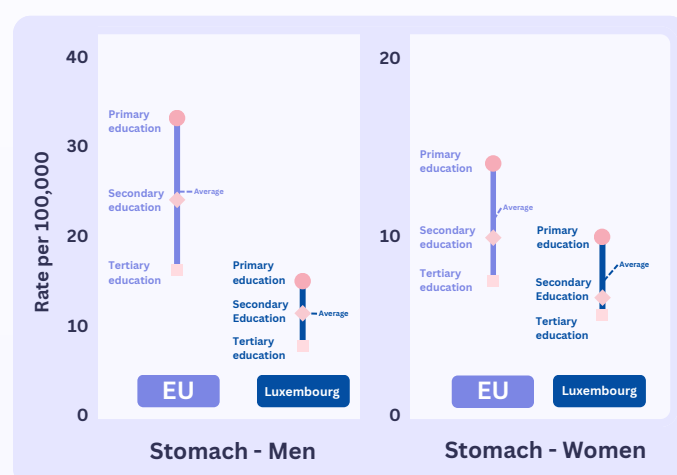


Figure 2.c. Cancer-specific mortality by sex and education level: stomach

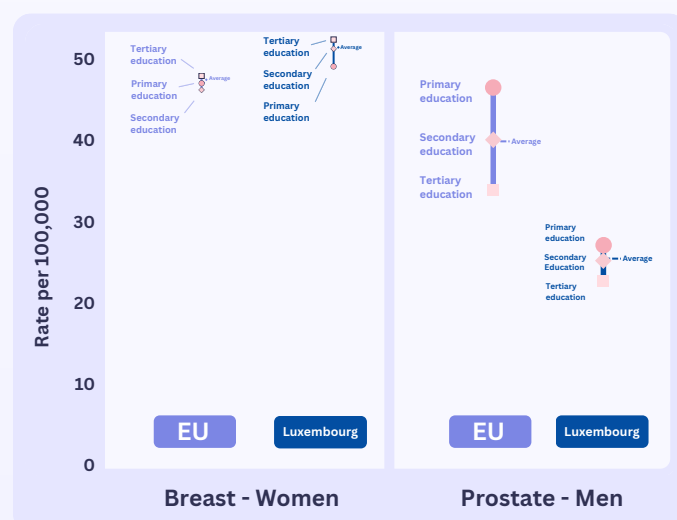


Figure 2.d. Cancer-specific mortality by sex and education level: breast (left), prostate (right)

decreased. Despite high uptake of cervical cancer screening in Luxembourg, educational inequalities persist, with lower participation rates among women with lower levels of education (53%) compared to those with higher educational levels (86%) [3, 8]. This may explain the differences in cervical cancer mortality across educational groups. Human papillomavirus (HPV) vaccination and HPV-based screening, if equitably implemented, may further decrease the disease burden and reduce socio-economic disparities.

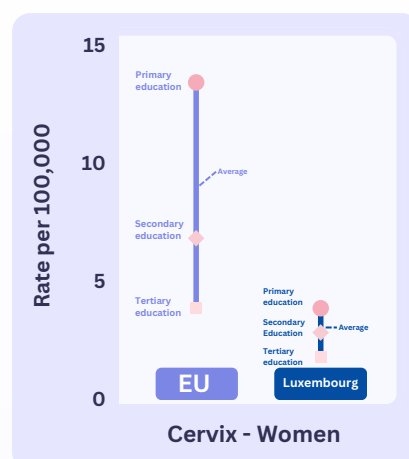


Figure 2.e.
Cancer-specific
mortality by
education level:
cervix

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 Luxembourg, 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-rtd-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. Anastase Tchicaya, N.L., Stefaan Demarest, Socioeconomic Inequalities in Smoking and Smoking Cessation Due to a Smoking Ban: General Population-Based Cross-Sectional Study in Luxembourg. PLOS ONE, 2016.
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 (2023), EU Country Cancer Profile: Luxembourg. OECD Publishing, Paris, <https://doi.org/10.1787/6c6cdb7d-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].