European Commission

International Agency for Research on Cancer

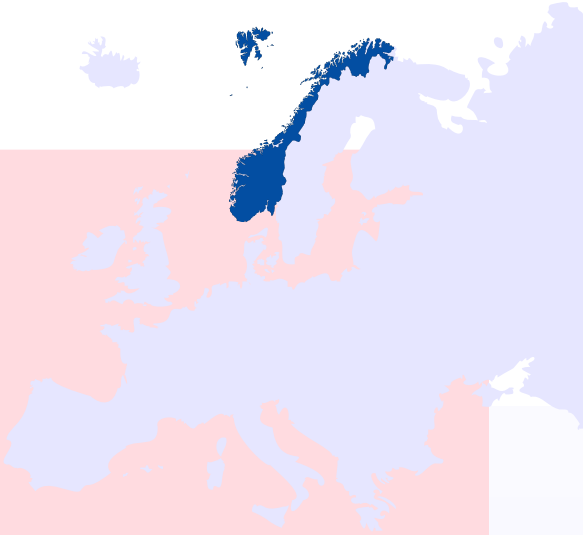
World Health Organization

Erasmus MC

Country Factsheet Series

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

Norway



Key messages

In Norway, total cancer mortality rates in 2015-2019* were higher in men than in women. However rates were lower than the European average, particularly for men. In both sexes, cancer mortality rates varied greatly across educational levels according to a social gradient, i.e., with a progressive increase as educational levels decreased. The social gradient in cancer among women was particularly large, especially in comparison with the European average, driven by the large socio-economic inequalities in lung, colorectal and cervical cancer mortality. As in other countries, mortality rates were highest for lung cancer, and a clear social gradient was found for all selected cancer types in men, and for lung, colorectum and cervical cancer in women. Despite the universal health care system, national screening program for breast and cervical cancer screening and the national cancer strategy since 2012, Norway is still affected by inequalities in cancer mortality, especially among women

Educational inequalities in total cancer mortality

In Norway, mortality rates for total cancer** in 2015-2019 were 365 per 100,000 among men and 284 per 100,000 among women. For both sexes, rates varied greatly according to a social gradient. Men and women with primary education had cancer mortality rates approximately 80% higher than their fellow citizens with tertiary education (in men 500 vs. 273 per 100,000; in women, 398 vs 219 per 100,000).

The difference in rates between primary and tertiary education (i.e., inequality gap) was lower than the European average*** for men, but larger for women. Compared to other countries in North Europe, the inequality gap was similar to Denmark but larger than that in Sweden, Finland and Iceland.

* In Norway, estimates were obtained using the method for group A countries. 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

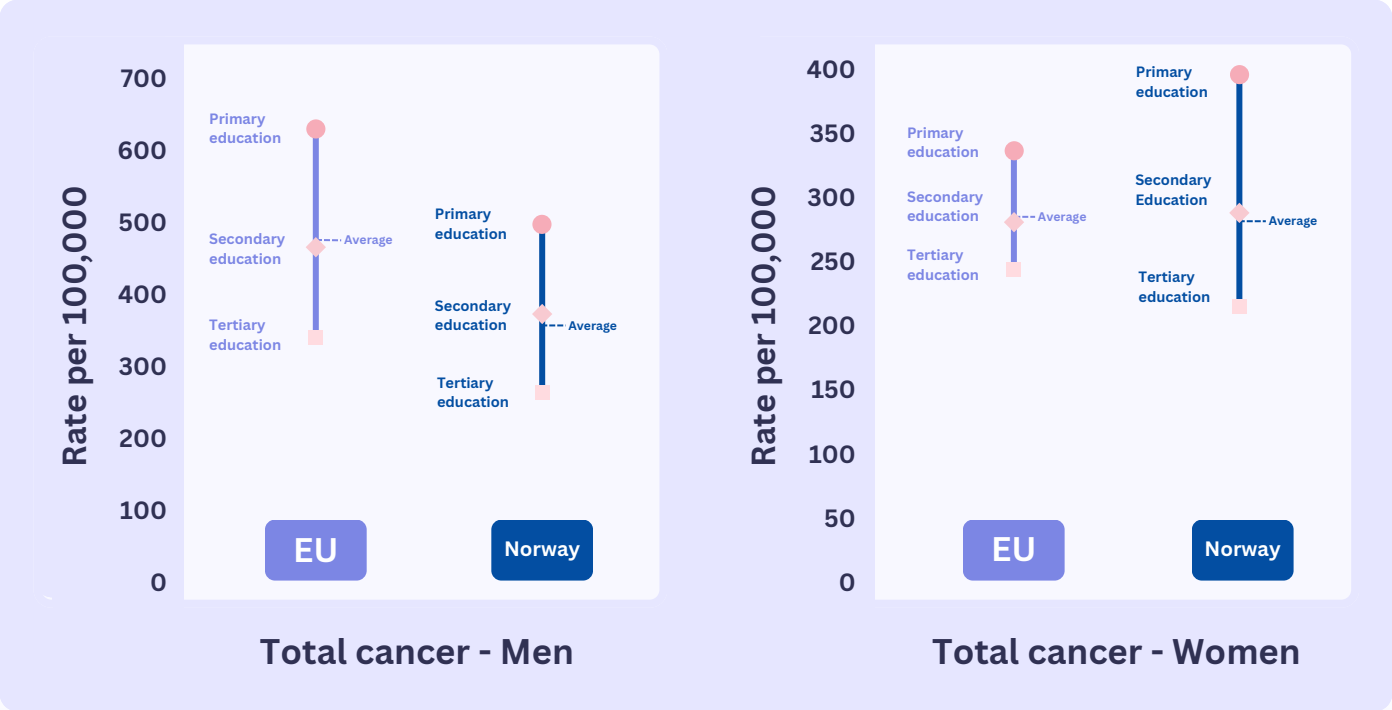


Figure 1. Total cancer mortality by sex and education level

Educational inequalities in mortality by cancer site

Lung cancer

Lung cancer mortality was lower than the European average in men and above the European average in women. Lung cancer mortality rates were approximately 30% higher in men compared to women. In both sexes, there was a clear social gradient for lung cancer and the disease was a large contributor to inequalities in total cancer mortality. Given the long delay between smoking and lung cancer development, sex and socio-economic differences in lung cancer mortality in 2015–2019 may be partly explained by past smoking patterns in those groups. Around 1990, the smoking prevalence was higher for men than for women, and for both sexes smoking prevalence was higher for lower educated than for higher educated persons [1].

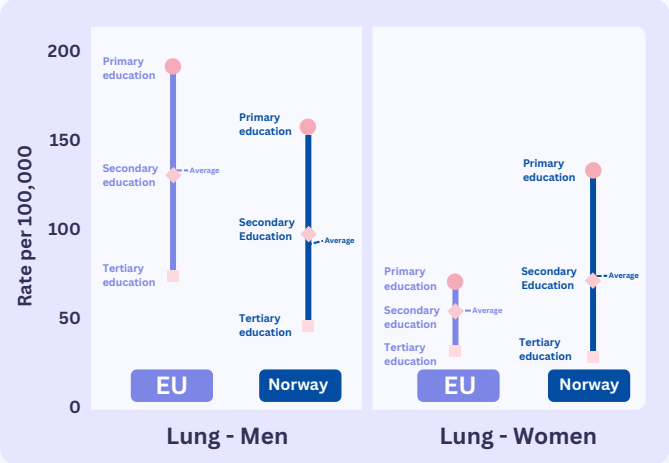


Figure 2.a. Cancer-specific mortality by sex and education level: lung

Colorectal and stomach cancers

National average rates for colorectal cancer mortality in Norway were below the corresponding European average for men and above for women. For stomach cancer, rates were below the European average in both sexes. In men, rates were approximately 30% higher than in women for colorectal cancer, whereas

for stomach cancer rates in men were over 2 fold higher than those in women. For both colorectal and stomach cancer, a clear social gradient was observed in men, while among women a clear gradient was observed only for colorectal cancer. Socio-economic and sex inequalities in past exposure to risk factors, i.e., poor diet, physical inactivity, obesity, smoking [2, 4] and Helicobacter pylori infection at young ages (for stomach cancer), usually more prevalent among those with lower educational attainment [5], may partly explain the observed inequalities in colorectal and stomach cancer. The national screening program on colorectal cancer was launched in 2022, hence after the reporting period. Prior opportunistic participation rates to colorectal cancer screening were relatively low and educational inequalities small (in 2019, more than 80% of people aged 50–70 years reported that they never had colorectal cancer screening) [2, 6].

Breast cancer

Like in many other countries, breast cancer mortality rates are relatively high but lower than the corresponding European average. There was no clear social gradient, suggesting a balancing between risk factors, early diagnosis, screening and treatment practices [7]. In Norway, there was a relatively high participation rate in the national screening programme (in 2019, 76% for women 50–69 years old compared to the EU average (66%) [2] and educational inequalities were small [8].

Prostate cancer

Prostate cancer was a large contributor to total cancer mortality among men in Norway, with rates slightly higher than the European average. There was a clear social gradient in mortality with rates decreasing as education level increased, possibly due to inequalities in stage at diagnosis, and disparities in timely access and use of treatment options [9].

Cervical cancer

In Norway, like in other Nordic countries, cervical cancer rates are relatively low, in comparison to the European average and to other cancer types. Cervical cancer mortality showed a social gradient, with rates increasing with decreasing educational attainment. The differences across educational groups are likely to be largely related to

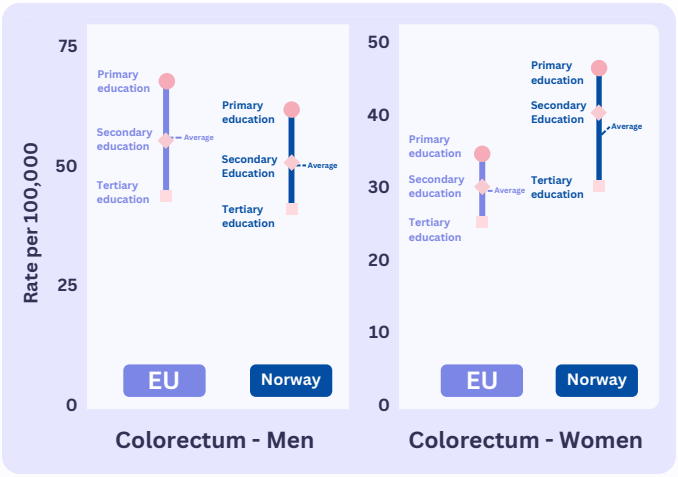


Figure 2.b. Cancer-specific mortality by sex and education level: colorectum

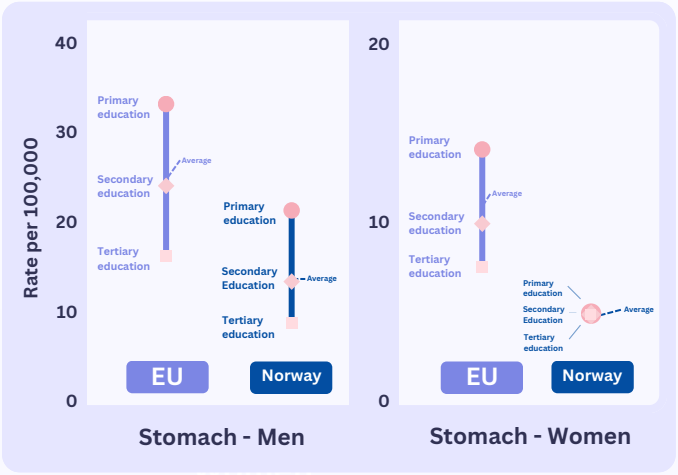


Figure 2.c. Cancer-specific mortality by sex and education level: stomach

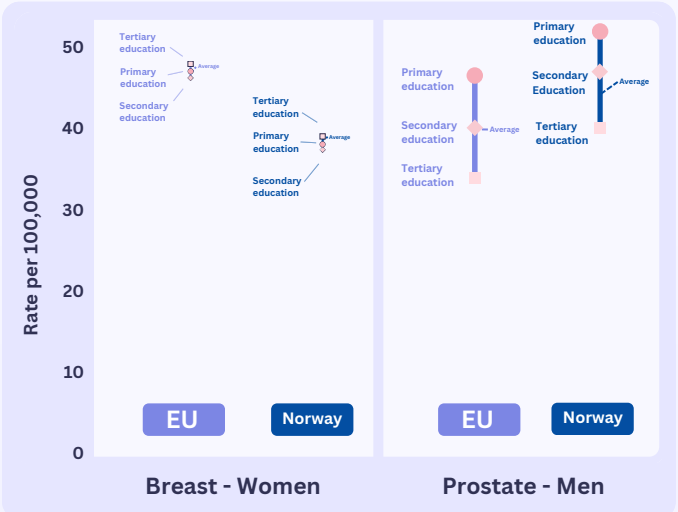


Figure 2.d. Cancer-specific mortality by sex and education level: breast (left), prostate (right)

variations in the uptake of cervical cancer screening. Despite an overall screening participation close to the EU average, screening uptake was lower among those with lower educational attainment. In 2019, 41% of women with low education levels had taken a smear test in the last three years compared to 77% of women with high education levels [2]. The equitable implementation of human papillomavirus (HPV) vaccination and of HPV-based screening has the potential to further decrease inequalities in cervical cancer and the disease burden as a whole.

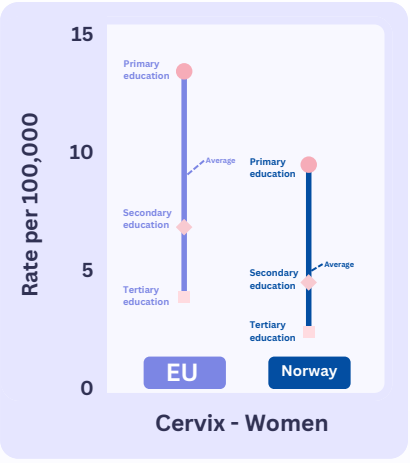


Figure 2.e. Cancer-specific mortality by education level: cervix

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 Norway, the method for group A was used. Caution is nevertheless required when interpreting the results.

Contact information

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References:

1. Cavelaars AE, Kunst AE, Geurts JJ, et al. Educational differences in smoking: international comparison. BMJ 2000; 320(7242): 1102-7.
2. OECD (2023), EU Country Cancer Profile: Norway 2023. (2023). In Country cancer profiles. https://doi.org/10.1787/0fcf5d28-en
3. 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. Eur J Public Health, 2017. 27(suppl_1): p. 63-72.
4. Health for everyone? (2019, September 27). OECD. https://www.oecd.org/en/publications/health-for-everyone_3c8385d0-en.html
5. 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
6. European Commission., Uncovering Inequalities Colorectal Cancer Screening in Europe. 2024.
7. Gadeyne S, Menvielle G, Kulhanova I, et al. The turn of the gradient? Educational differences in breast cancer mortality in 18 European populations during the 2000s. Int J Cancer 2017; 141(1): 33-44.
8. European Commission. Uncovering Inequalities Breast Cancer Screening in Europe. 2023.
9. 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