Country Factsheet Series

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

Denmark

Key messages

In Denmark, mortality rates for total cancer in 2015–2019* were higher than the corresponding European average in women and lower in men. Mortality rates were higher for men than for women, and in both sexes varied according to a social gradient, i.e., with a progressive increase as educational levels decreased. A social gradient was found for all selected cancer types. However, among women, the socio-economic gradient was particularly high, and much larger than the corresponding average gradient observed in Europe.
Hence, despite the existence of a National Cancer Plan, which started in 2000, and of a universal health system, with national screening programmes for breast, cervical and colorectal cancer, inequalities in cancer in Denmark are quite high, especially among women.

Educational inequalities in total cancer mortality

In Denmark, mortality rates for total cancer** in 2015–2019 were 425 per 100,000 among men and 334 per 100,000 among women and varied greatly according to a social gradient, in both sexes. Men and women with primary education had cancer mortality rates approximately 70% higher than men and women with tertiary education (542 vs 313 per 100,000 for men and 444 vs 265 per 100,000 for women).
The difference in rates between primary and tertiary education (i.e., inequality gap) was smaller than the corresponding European average*** for men, but larger for women. Compared to countries in the same area, the inequality gap was similar to Norway, and larger compared to Sweden, Finland and Iceland in both sexes. Among women, the inequality gap was particularly high, much higher than the European average and than that observed in many countries in the continent.

* In Denmark, 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
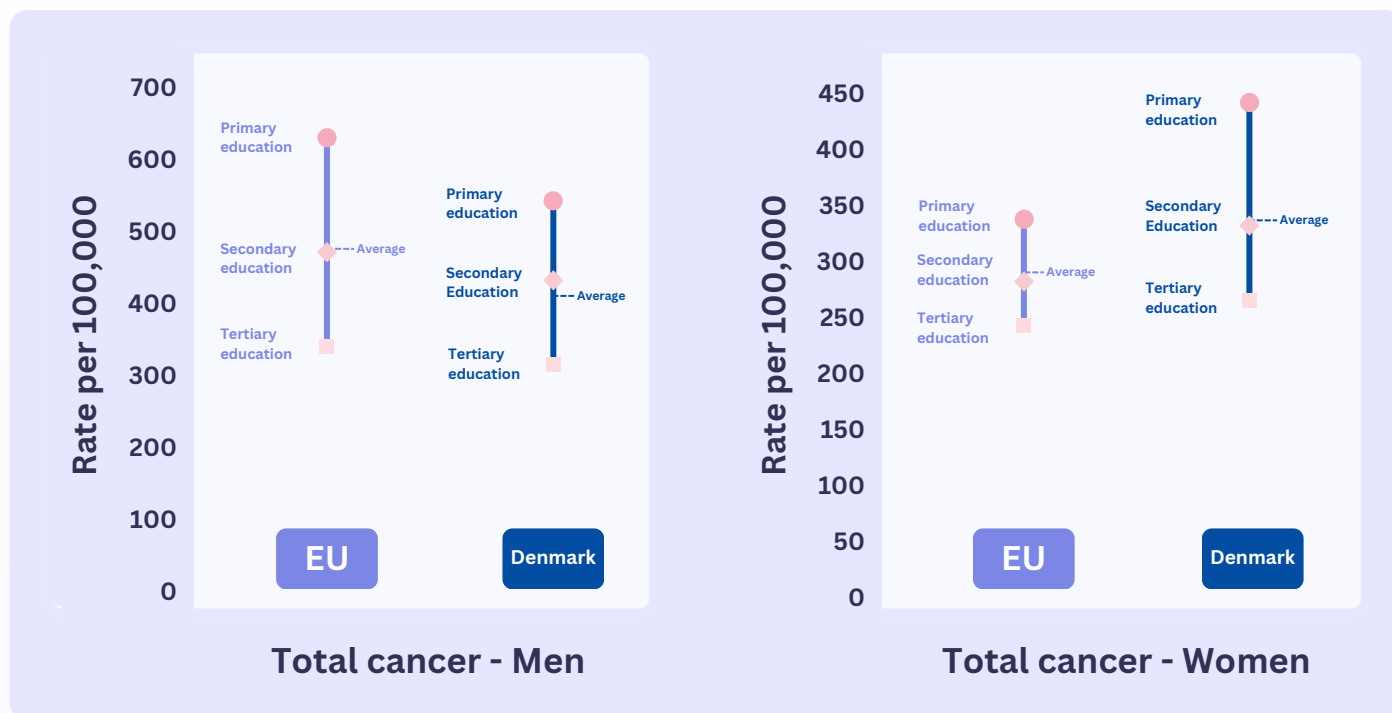*** European average is calculated considering 27 EU Member states + Norway and Iceland

Figure 1. Total cancer mortality by sex and education level

Educational inequalities in mortality by cancer site

🫁 Lung cancer

Lung cancer mortality rates in men were lower than the European average and approximately 10% higher for men compared to women. However, in women, the national rates and the inequality gap in lung cancer mortality, were very high, much larger than the corresponding European average. 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 the development of lung cancer, sex and socio–economic differences in lung cancer mortality in 2015–2019 may be partly explained by inequalities in past smoking patterns across these groups. Around 1990, smoking prevalence was higher for men than for women – except at younger ages (20–44 years), where rates were similar across sexes – and higher for lower, compared to higher, educated persons [1].
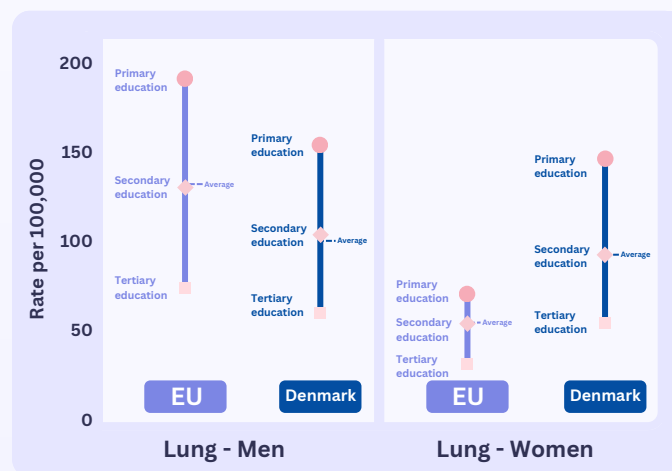

Figure 2.a. Cancer-specific mortality by sex and education level: lung

🫃 🔬 Colorectal and stomach cancers

National average rates for colorectal cancer mortality in Denmark were below the corresponding European

average for men and above for women. In men, colorectal cancer mortality rates were approximately 50% higher compared to women. For stomach cancer, national average mortality rates were below the European average, for both sexes, and were two times higher in men compared to women. For both colorectal and stomach cancer, a clear social gradient was observed in both men and women. Socio–economic and sex inequalities in the past exposure to risk factors, i.e., poor diet, physical inactivity, alcohol consumption obesity, smoking [2, 3] and Helicobacter pylori infection at young ages (for stomach cancer) [4], which are more prevalent among those with lower educational attainment [5], may partly explain the inequalities in colorectal and stomach cancer. Participation rates to colorectal cancer screening are among the highest in Europe, with only small differences between higher and lower education individuals [2,6].

Breast cancer

Breast cancer showed the second highest mortality rate among women, after lung cancer, with an average national mortality rate slightly higher compared to the corresponding European average. There was a clear social gradient suggesting possible inequalities across the different stages of the cancer continuum, from exposure to risk factors, to early diagnosis, screening and treatment [7]. Denmark has a relatively high participation rate in the national screening programme (in 2019, 82% for women 50–69 years old compared to the EU average (66%) [2], and the social gradient in screening was small [8].

Prostate cancer

Prostate cancer was a large contributor to total cancer mortality among men in Denmark, and rates were 12% higher than the European average. Mortality rates were similar for primary and secondary educated and higher than rates for tertiary educated. The recorded inequalities are possibly due to inequalities in stage at diagnosis, and disparities in timely access to treatment or treatment options [9].

Cervical cancer

Despite the relatively low rates in comparison to the European average and to other cancer types, cervical cancer mortality showed a social gradient,
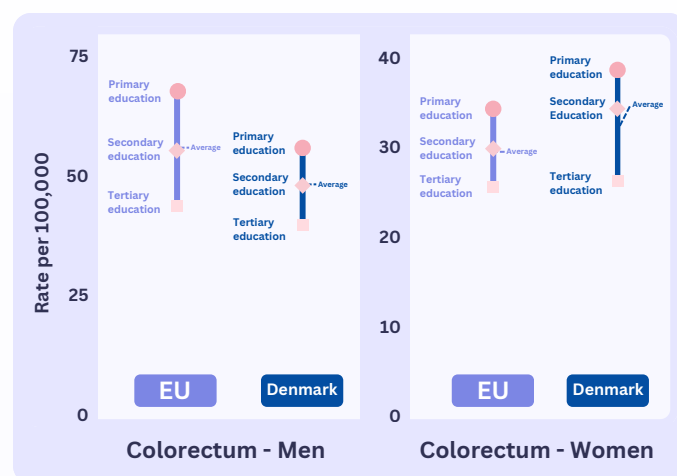

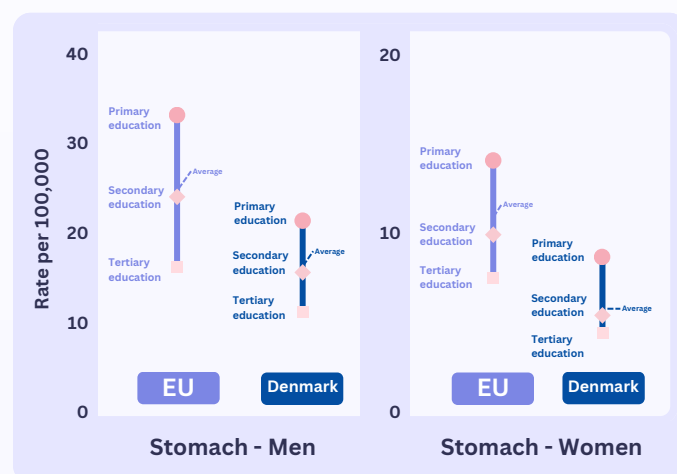**Figure 2.b.** Cancer-specific mortality by sex and education level: colorectum

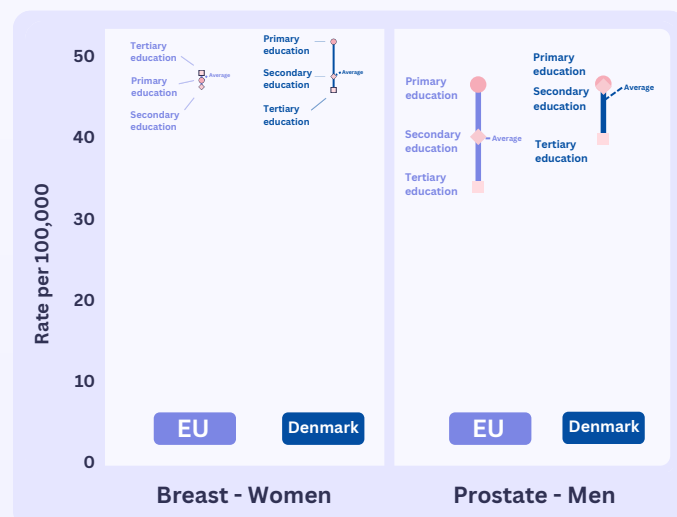**Figure 2.c.** Cancer-specific mortality by sex and education level: stomach

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

with rates increasing with decreasing educational attainment. The differences across educational groups may be largely related to variations in the uptake of cervical cancer screening. Cervical cancer screening rates were lower than the European average [2], especially for women with lower educational attainment. In 2020, according to registry data, 55% of women with low education levels have been screened for cervical cancer compared to 75% of women with high education levels [2]. Human papillomavirus (HPV) vaccination and HPV-based screening might further decrease the disease burden and related inequalities if implemented equitably.
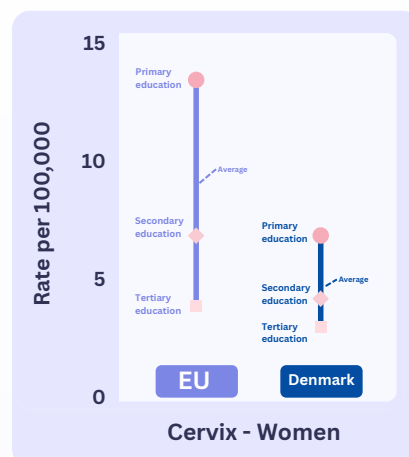

Figure 2.e.
Cancer-specific mortality by education level: cervix

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.

In Denmark, the method for group A countries was used.

✉ Contact information

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