Risk of dying from cancer in some poorer districts of England over 70% higher than wealthy districts, study suggests

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The risk of dying from the 10 forms of cancer with the largest death toll for men and women varies massively depending on the district in

England where people live, according to a study published in *The Lancet Oncology*.

Cancer is now the leading cause of death in England, having overtaken cardiovascular diseases, however there is a lack of data on the risk of dying from different types of cancer, and how much this risk has changed over the last 20 years, on a district level.

This study is the first to estimate how much the risk of dying from cancer in England has changed from 2002 to the onset of the COVID-19 pandemic for areas as small as local authority districts.

"Although our study brings the good news that the overall risk of dying from cancer has decreased across all English districts in the last 20 years, it also highlights the astounding inequality in cancer deaths in different districts around England," says Prof Majid Ezzati, senior author of the study and Professor of Global Environmental Health, Imperial College London.

The researchers used death records in England from 2002 to 2019 to measure the number of deaths caused by the 10 cancers with the largest death toll for each of men and women in the 314 regions in England. Using a statistical model that could handle small numbers, they estimated the risk of dying before 80 years of age from each of the 10 cancer types for men and women in each district for each year between 2002 to 2019.

The authors also used the proportion of the district population claiming income-related benefits due to being out-of-work or having low earnings to work out the relationship between risk of dying from cancer and poverty in the district.

Changes in risk of dying from cancer from 2002–2019

Nationally, the risk of dying from cancer before 80 years of age declined for both sexes from 2002-2019, from one in six to one in eight for women and from one in five to one in six for men.

However, some regions had a larger decline than others. For women, the greatest district-level reduction in the risk of dying from a cancer was nearly five times that of the smallest (30.1% decline in Camden, compared to a 6.6% decline in Tendring). For men, the largest decrease was triple that of the smallest (36.7% in Tower Hamlets compared to 12.8% in Blackpool). Overall, districts in London achieved the largest declines.

The risk of dying did not decrease for all types of cancer as the risk of dying from pancreatic cancer increased for men and women in all districts apart from one, and the risk of dying from liver cancer among men and from endometrial cancer among women increased in all districts.

Although deaths from lung cancer reduced from 2002 to 2019 in every district for men, the result was more mixed for women with the risk of dying decreasing in many districts, particularly in London, but mostly staying the same elsewhere and increasing in some areas in the East of England. The authors speculate that this is due to the rise and fall in female smoking lagging behind men by about 20-30 years.

Inequalities in cancer mortality in 2019

In 2019, the risk of dying from cancer before 80 years of age ranged from one in 10 in Westminster to one in six in Manchester for women, and from one in eight in Harrow to one in five in Manchester for men. The highest risks of dying were in northern cities such as Liverpool, Manchester, Hull and Newcastle, and in coastal areas to the east of London.

The risk of dying from cancer was higher for both men and women in districts with more poverty. In part, this was due to the risk of dying from lung cancer—the leading cancer cause of death for both sexes—being strongly linked with poverty. Lung cancer was also one of the cancers with the most inequality in risk of dying across different districts, with women in Knowlsey in 2019 having triple the risk of dying from lung cancer than those in Waverley, and men in Manchester having triple the risk of dying from lung cancer than men in Guildford.

Both men and women in poor districts of London had lower probabilities of dying from lung, colorectal and oesophageal cancer and men had a lower risk of dying from bladder cancer than in comparably poor districts in the rest of the country. Authors suggest this may be due to a combination of differences in cancer risk factors, such as smoking rates, between London's ethnically diverse population and the rest of England, and differences in the quality of health care, with Londoners more likely to have access to specialized hospitals and advanced treatments such as immunotherapies.

"The greatest inequality across districts was for the risk of dying from cancers where factors such as smoking, alcohol and obesity have a large influence on the risk of getting cancer. Due to funding cuts, many local authorities have reduced their budgets for smoking cessation since 2010. Our data shows we cannot afford to lose these public health programs and are in urgent need of the reintroduction and strengthening of national and local policies which combat smoking and alcohol," says Theo Rashid, first author and Ph.D. student at Imperial College London.

"Access to cancer screening and diagnostic services which can prevent cancer or catch it early are key in reducing some of the inequalities our study highlights. Those who are more deprived are less likely to be able to access and engage with cancer screening. To change this, there needs to be investment into new ways to reach underserved groups, such as

screening 'pop-ups' in local areas like supermarkets and working with community organizations and faith groups," adds Prof Amanda Cross, study author and Professor of Cancer Epidemiology, Imperial College London.

The authors acknowledge some limitations of the study, including that they only analyzed deaths from the 10 cancers with the highest death toll and did not separate the remaining group of cancer deaths into more specific cancer groups. Additionally, the correlations with poverty were reported at the district level, but there are variations in both risk of dying from cancer and levels of poverty within each district. Finally, the authors caution that this data only goes up to 2019 and say there is a need for further research to find out what happened to the risk of dying from cancer during the COVID-19 pandemic and corresponding pressures on the NHS.

Writing in a linked Comment, Dr. Karri Seppä and Prof Janne Pitkäniemi, Finnish Cancer Registry, Finland, who were not involved in the study, say, "High-resolution population-based cancer statistics are important to gain a more comprehensive picture of geographical variation in cancer burden. These statistics might identify differences that are important for the prevention of new cancers and the improvements in early detection and cancer survival."

More information: Mortality from leading cancers in districts of England from 2002 to 2019: a population-based, spatiotemporal study, *The Lancet Oncology* (2023). DOI: 10.1016/S1470-2045(23)00530-2

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