UK Death Rate Trends for Malignant Neoplasms: Colon

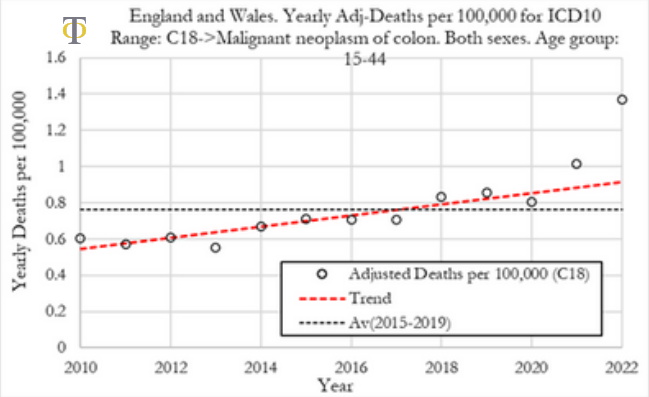
Data Sources: UK Office of National Statistics (ONS)
Time Period: Yearly Data, 2010 - 2022

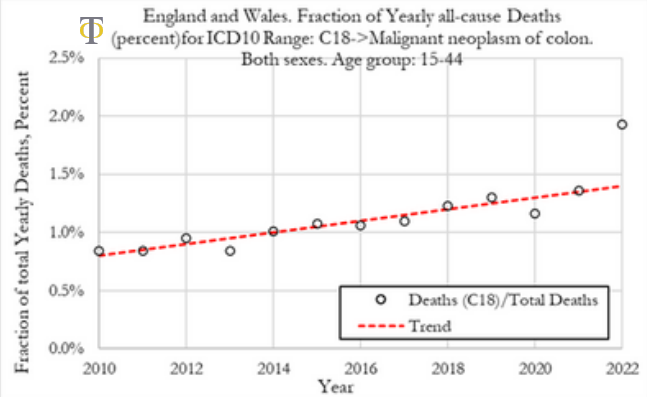
Project Website Full Report

In this Project Brief, we investigate the trends in death rates for ICD10 code C18 (Malignant neoplasm of colon), which represents 5.4% of all malignant neoplasm deaths in 2019 for 15 to 44 year-olds in the UK. This analysis investigates the absolute trends in adjusted deaths for a single ICD10 code. We also investigate the fraction of deaths attributable to ICD10 code C18 versus deaths from all other causes.

Adjusted Death Rates & Deaths from Malignant Neoplasms of the Colon

The Figures below show yearly adjusted deaths for malignant neoplasms of colon for females in England and Wales. The red dashed line shows the average from 2010 to 2019. The dotted line shows the 2015-2019 average death rate. Left: Adj-Deaths per 100,000. Right: Adj-Deaths (number).





Summary:

- We can observe that death rates per year from malignant neoplasms of colon have been trending higher from 2010 to 2019, with a significant upward slope. In 2010 the deaths rate was about 0.6 per 100,000, in 2019 it was around 0.85 per 100,000, a 41.7% rise.
- We believe that the pattern of rising death rates from colon cancers prior to 2020 is already worth investigating on its own merit.
- The death rate dropped slightly in 2020 to about 0.8 per 100,000.
- In 2021 the death rate from malignant neoplasms rose to 1 per 100,000 and in 2022 it increased again to 1.4 per 100,000.

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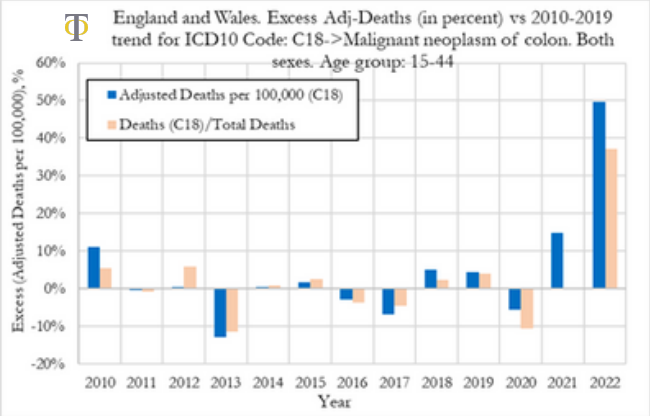
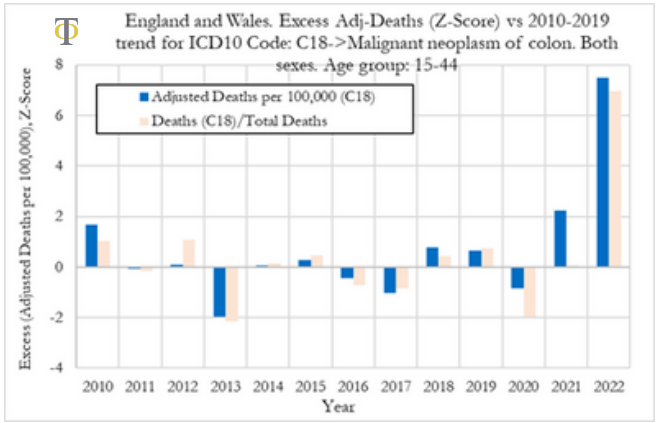
Analysis of Excess Adjusted Death Rates from Malignant Neoplasms of the Colon

In the Figure below (left), we can observe that the excess deaths rates from malignant neoplasms of the colon were -5% in 2020, then rose to about +15% in 2021 and about +50% in 2022. In terms of statistical significance of the excess deaths, we observe from the Figure (right) that for colon cancers, in 2020 the Z-score for adjusted death rates was low, which point to low statistical significance. In 2021 the Z-score was about 2, which is a weak signal in statistical terms. In 2022 the Z-score was above 7, which is a very strong signal and indicates that the excess deaths from colon cancers are statistically significant deviations from the 2010-2019 trend.

When looking at changes in the fraction of all deaths attributed to colon cancers, we observe that the fraction of deaths for these cancers were about 10% below trend in 2020 and at trend for 2021. In 2022 however, the fraction of deaths for these cancers jumped about 37%, with a Z-score of above 7, indicating very high statistical significance. It appears that colon cancers as a fraction of all deaths deviated significantly from prior trends in 2022.





Summary:

- Our analysis shows that the excess deaths rates from malignant neoplasms of the colon were -5% in 2020, then rose to about +15% in 2021 and about +50% in 2022.
- The excess mortality from malignant neoplasms of the colon in 2021 was already a statistically significant signal with Z-scores of about 2.
- In 2022 the signal was very strong with a Z-score above 7, indicating very high statistical significance.

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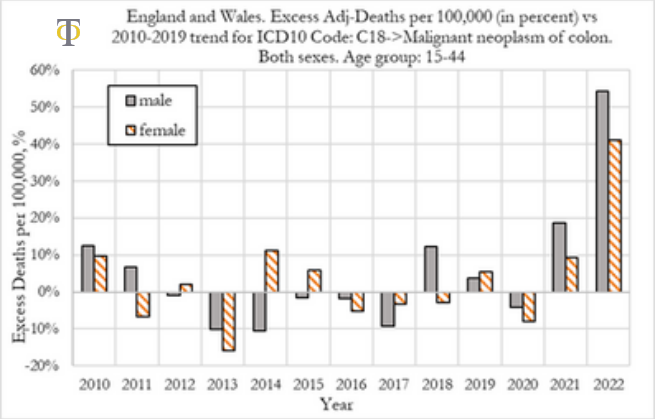
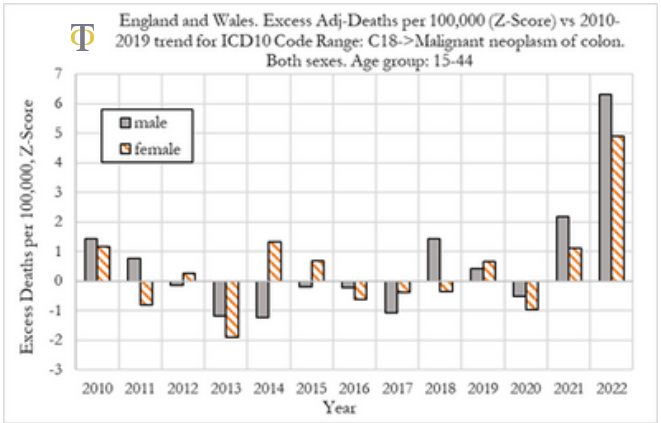
Analysis of Excess Adjusted Death Rates from Malignant Neoplasms of the Colon for Males and Females

When comparing excess death rates attributed to malignant neoplasms of the colon for males and females, shown in the Figure below, we observe that in 2020 both males and females showed no noticeable excess mortality, with respective Z-scores close or above -1 (low statistical significance).

In both 2021 and 2022 men suffered much worse outcomes than women, with men experiencing about 19.5% and 55% deviations from trend in 2021 and 2022 respectively, compared to about 10% and 41% for women.

In 2021 the signal strength for men was weak (with a Z-score of 2.1) and for women the deviation from trend had low statistical significance (with a Z-score of 1.1), as shown in the Figure (right). In 2022 the signal strength for men was very strong (with a Z-score of 6.4) but for women the deviation from trend shows low statistical significance (with a Z-score of 5), as shown in the Figure (right).





Summary:

- When comparing outcomes for men and women, we observe that both had a small drop in excess deaths from malignant neoplasms of the colon in 2020, albeit with no statistical significance.
- In 2021, men suffered worse outcomes than women, with men experiencing a 19.5% deviation from trend, compared to about 10% for women.
- In 2022, men suffered worse outcomes than women, with men experiencing a 55% deviation from trend, compared to about 41% for women.