UK Death Rate Trends for Malignant Neoplasms: Pancreas

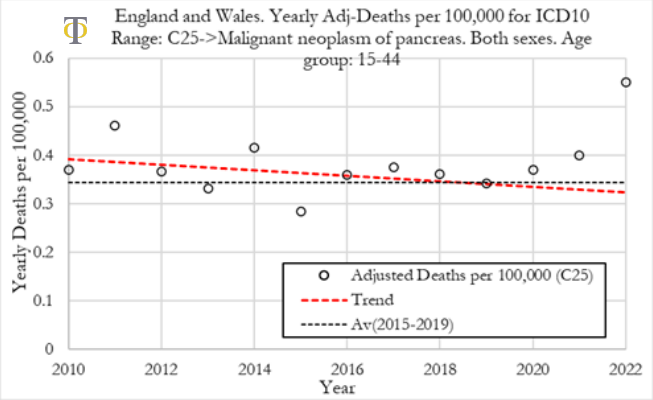
Data Sources: UK Office of National Statistics (ONS)
Time Period: Yearly Data, 2010 - 2022

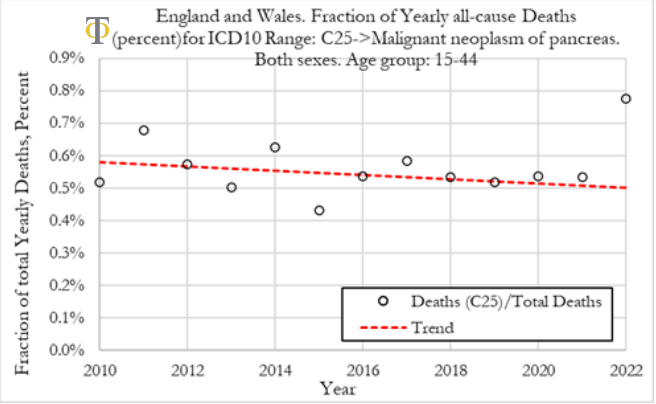
Project Website Full Report

In this Project Brief, we investigate the trends in death rates for ICD10 code C25 (Malignant neoplasm of pancreas), which represents only 3.1% 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 C25 versus deaths from all other causes.

Adjusted Death Rates & Deaths from Malignant Neoplasms of the Pancreas

The Figures below show yearly adjusted deaths for malignant neoplasms of pancreas 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:

- Our analysis shows that yearly death rates from malignant neoplasms of the pancreas have been trending slightly lower from 2010 to 2019. In 2010 the deaths rate was about 0.38 per 100,000, in 2019 it was around 0.35 per 100,000, a 7.9% reduction.
- The death rate dropped slightly in 2020 remained almost unchanged at 0.38 per 100,000.
- In 2021 the death rate from malignant neoplasms of the pancreas rose to 0.4 per 100,000.
- In 2022 the death rate jumped to about to 0.55 per 100,000, a level higher than that of 2010.

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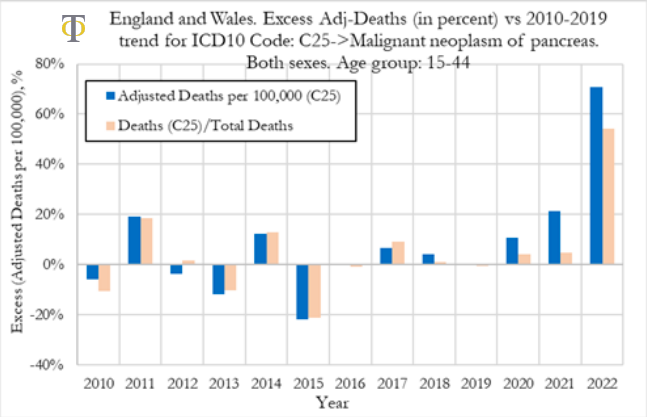
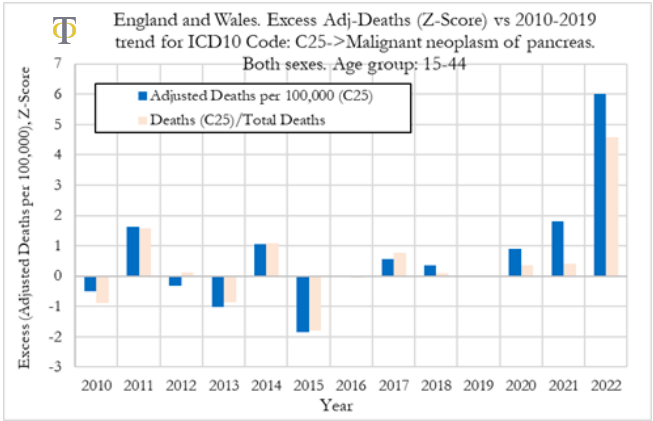
Analysis of Excess Adjusted Death Rates from Malignant Neoplasms of the Pancreas

In the Figure below (left) we can observe that the excess deaths rates from malignant neoplasms of pancreas were close to zero in 2020, then rose to about +20% in 2021 and about +70% in 2022. In terms of statistical significance of the excess deaths, we observe from the Figure (right) that for cancers of pancreas, in 2020 the Z-score for adjusted death rates was low, which point to low statistical significance. In 2021 the Z-score was close to 2, which is a weak signal in statistical terms. In 2022 the Z-score was 6, which is a very strong signal and indicates that the excess deaths from cancers of the pancreas are statistically significant deviations from the 2010-2019 trend.

When looking at changes in the fraction of all deaths attributed to cancers of pancreas, we observe that the fraction of deaths for these cancers were close to trend in 2020 and 2021 (slightly above trend but with low statistical significance). In 2022 however, the fraction of deaths for these cancers jumped about 55%, with a Z-score of above 4, indicating very high statistical significance. It appears that pancreas 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 pancreas were close to zero in 2020, then rose to about +20% in 2021 and about +70% in 2022.
- The excess mortality from malignant neoplasms of the pancreas 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 6, indicating very high statistical significance.

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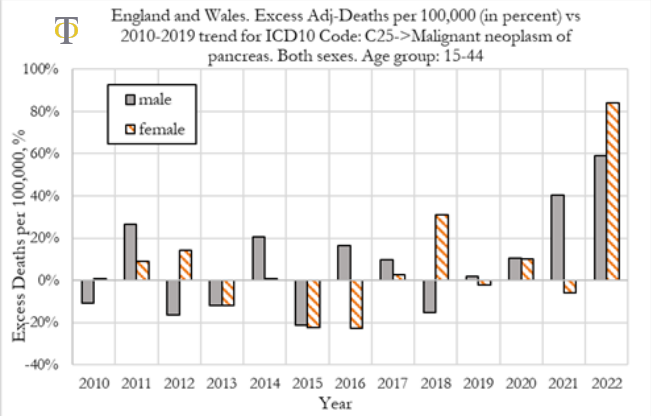
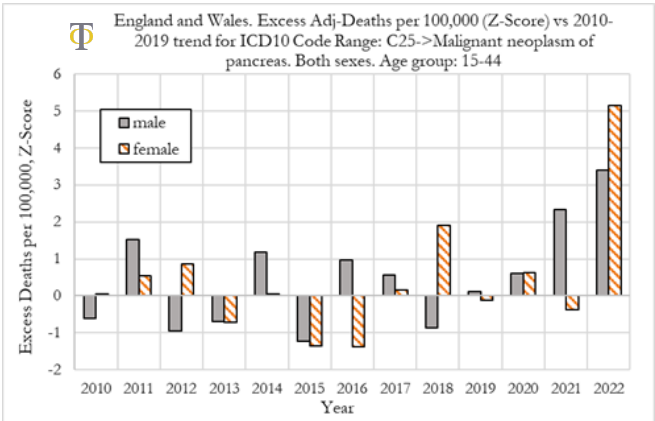
Analysis of Excess Adjusted Death Rates from Malignant Neoplasms of the Pancreas for Males and Females

We now compare excess deaths rates from malignant neoplasms of pancreas for males and females aged 15-44, as shown in the Figure below.
When comparing excess death rates attributed to malignant neoplasms of pancreas 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 to zero (low statistical significance).
In 2021 men suffered much worse outcomes than women, with men experiencing about 40% deviation from trend, compared to about -5% for women. In 2021 the signal strength for men was strong enough to warrant further investigation (with a Z-score close to 2.5) but for women the deviation from trend was statistically insignificant (with a Z-score close to zero), as shown in the Figure (right). In 2022 the signal strengths for both men and women were strong (with a Z-score of above 3), with the deviation from trend of being 60% for men and 85% for women. Malignant neoplasms of the pancreas appear to have accelerated in 2022 for both males and females. However, an interesting observation is that these cancers also started rising in 2021 for men, which we believe should also be subject to further research by medical doctors.





Summary:

- When comparing outcomes for men and women, we observe that both had neglegible excess death rates from malignant neoplasms of the pancreas in 2020.
- In 2021, men suffered worse outcomes than women, with men experiencing a 40% deviation from trend, compared to about -5% for women.
- In 2022, both men and women suffered bad outcomes, with men experiencing a 60% deviation from trend, compared to about 80% for women.
- Further investigation is needed to understand the factors contributing to this difference in malignant cancers of the pancreas for males and females.