

# Cancer Mortality: Scotland from 2000 to 2024

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# Introduction

Why do we care?

**Cancer is a global problem, with almost 20 million cases reported in 2022 . One in five men or women develop cancer in their lifetime, and one in nine men and one in twelve women die from it (Bray et al., 2024).**

Is there hope?

**Of course! There are countless individuals and organizations worldwide who are dedicating their careers to helping treat cancer patients and develop a cure for this disease. Luckily for us, these dedicated people keep *very* good records of cancer related data.**

What did we explore?

**Scotland specifically has an expansive dataset detailing cancer mortality over the last 24 years (Public Health Scotland, 2022). We wanted to use this data set, and compare the data points to current trends in cancer mortality.**

The big question:

**How does the NHS Scotland Open Data reflect current trends in cancer mortality rates?**



# THE DATA!

What's in there?

**Each row in the original data frame represents values for deaths and mortality rates associated with a single cancer site, per year, for a specific sex category. It contained 3075 observations and 60 variables**

What did we change?

**This dataset was pivoted three separate times and then filtered for different variables to make the analysis and graphing easier.**

What were we looking for?

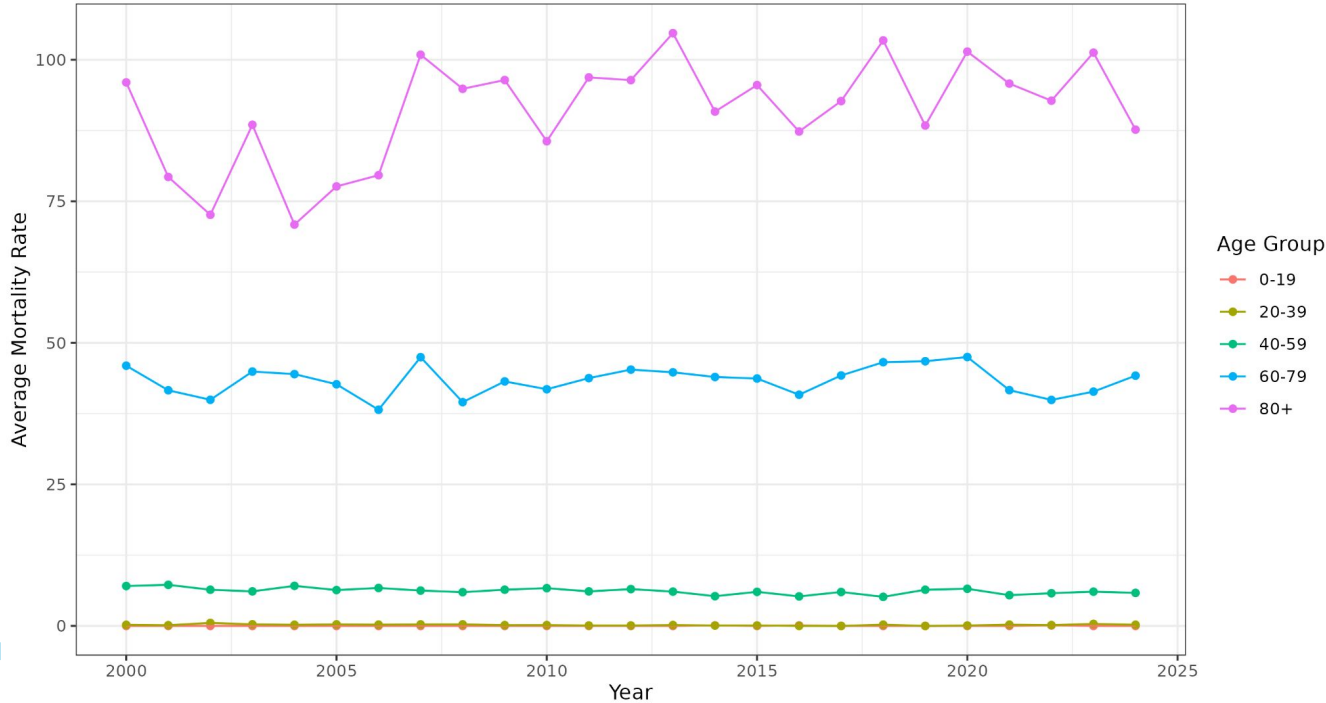
**From the data, we extracted mortality rates across all age groups and all years for some of the deadliest and most survivable forms of cancer. These trends were compared using time series**

**From the data, we also examined the number of deaths across all cancer types and all years for the 20 to 24 age group to examine the deaths across time.**



# Pancreatic Cancer: One of the most deadly

Average Mortality Rate of Pancreatic Cancer  
Scotland 2000 to 2024



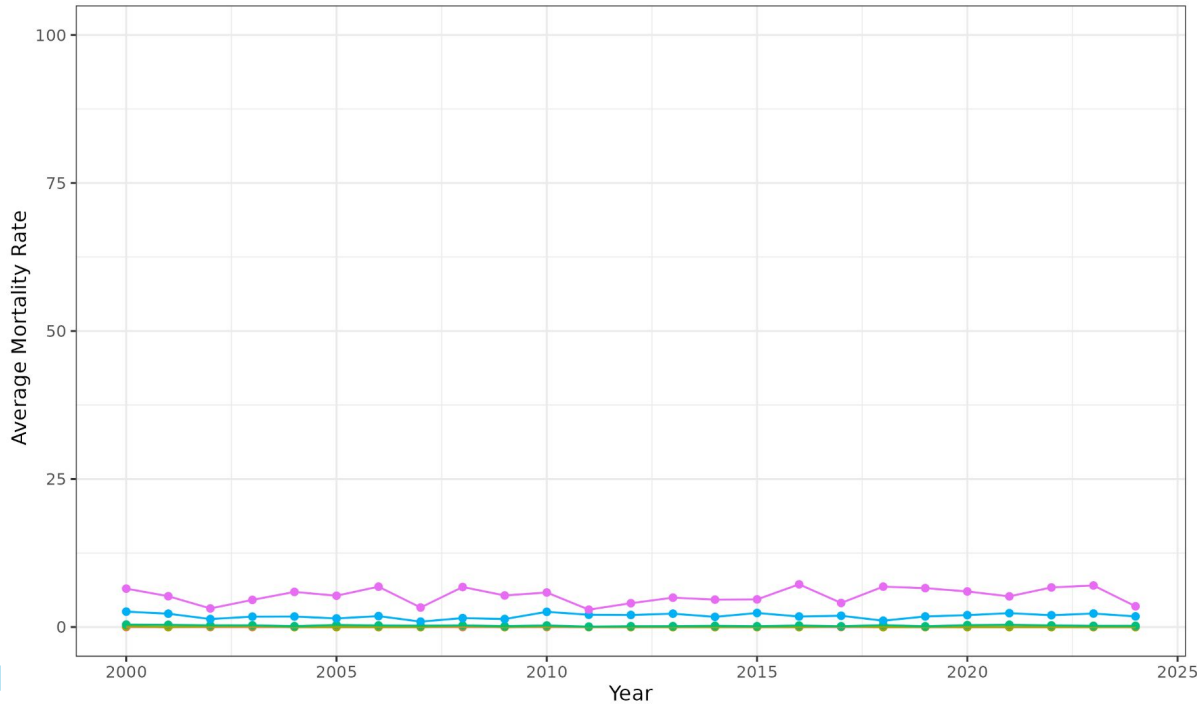
Data sourced from Scotland NHS OpenData

## Takeaways:

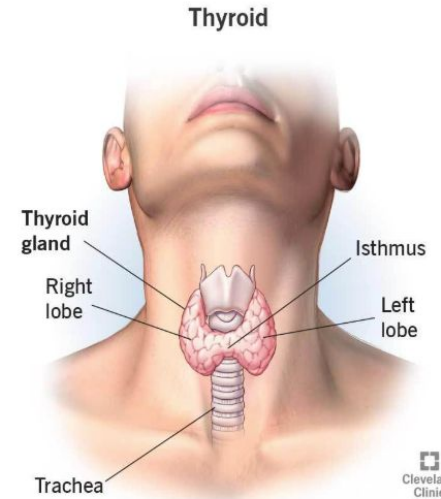
- Known to be deadly
- Data aligns
- Close to no deaths under 39
- Average mortality rates from the graph
  - 0-15: 0.01
  - 20-39: 0.17
  - 40-59: 6.18
  - 60-79: 43.37
  - 80+: 91.10
- The pink line, which represents the 80+ age group, is consistently the highest across every year, showing that pancreatic cancer mortality is by far greatest among the oldest population

# Thyroid: One of the most survivable

Average Mortality Rate of Thyroid Cancer  
Scotland 2000 to 2024

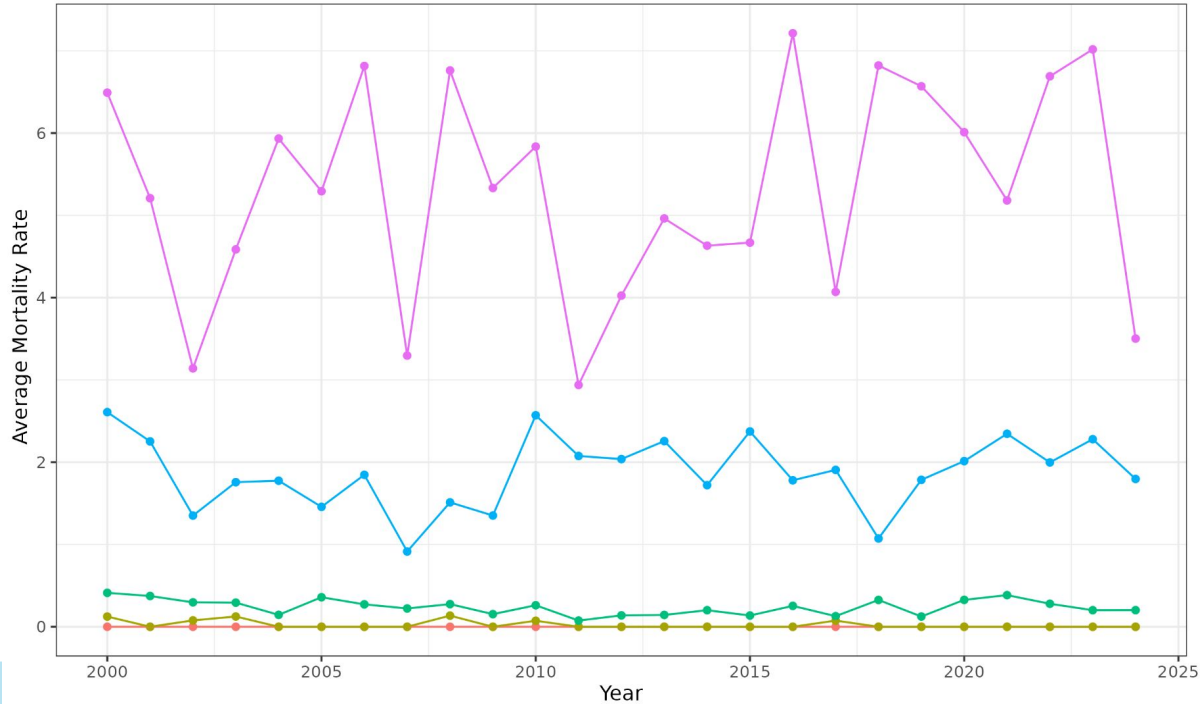


Data sourced from Scotland NHS OpenData



# Thyroid: One of the most survivable

Average Mortality Rate of Thyroid Cancer  
Scotland 2000 to 2024



Data sourced from Scotland NHS OpenData

## Takeaways:

- Average rate does not exceed 10
- 80+ category has greatest rate
- Rates have remained steadily low for 0-39 age group
- Average mortality rates from the graph
  - 0-15: 0.00
  - 20-39: 0.02
  - 40-59: 0.24
  - 60-79: 1.87
  - 80+: 5.32

# Ages 20 to 24... that's us!

Deaths from cancer in people ages 20 to 24  
Scotland 2000 to 2024



## Takeaways:

- These numbers may *appear* high but check the y-axis!
- Cancer is not a common cause of death for young people
- This plot still demonstrates important trends for the number of deaths

Data sourced from Scotland NHS OpenData

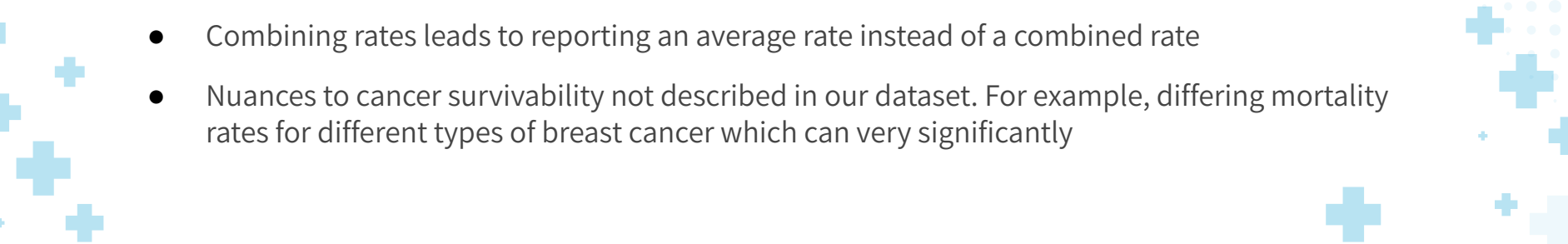


# Wrapping Up

## Conclusions:

- Time series reveal that average mortality rate of pancreatic and thyroid cancers have not changed much for any age group, but the average mortality rates do follow to expected trend based on scientific literature.
- Older age groups have a much higher mortality rate, particularly for more deadly cancers.
- The cohort of 20 to 24 year olds has relatively low numbers of deaths from cancer. Female deaths shows a clearer decreasing trend in deaths since 2000, whereas male deaths have not declined steadily. However, male deaths do demonstrate an overall decline since 2000.

## Critiques

- Combining rates leads to reporting an average rate instead of a combined rate
  - Nuances to cancer survivability not described in our dataset. For example, differing mortality rates for different types of breast cancer which can vary significantly
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# Sources

Bray, F., Laversanne, M., Sung, H., Ferlay, J., Siegel, R. L., Soerjomataram, I., & Jemal, A. (2024). Global Cancer Statistics 2022: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA: A Cancer Journal for Clinicians*, 74(3), 229–263.  
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Clinic, C. (2024, July 24). *Cancer Survival Rate: Understanding Your Prognosis*. Cleveland Clinic.  
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<https://www.opendata.nhs.scot/dataset/cancer-mortality>