Public Health Scotland

Scottish Stroke Statistics

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Objective

Identify what types of stroke are most prevalent in Scotland and which demographics are most affected by these.

Useful Jargon

Crude Rate

(Total number incidences / Total population) * 100 000

EASR

The European Age-Sex Standardised Rate per 100,000 population.

TIAs and related syndromes

aka "mini stroke", caused by a temporary disruption in the blood supply to part of the brain

Subarachnoid Haemorrhage

uncommon type of stroke caused by bleeding on the surface of the brain

The Data

Stroke Activity by Health Board

43200 rows

Stroke Activity by Council Area

95040 rows

Stroke Mortality by Health Board

8100 rows
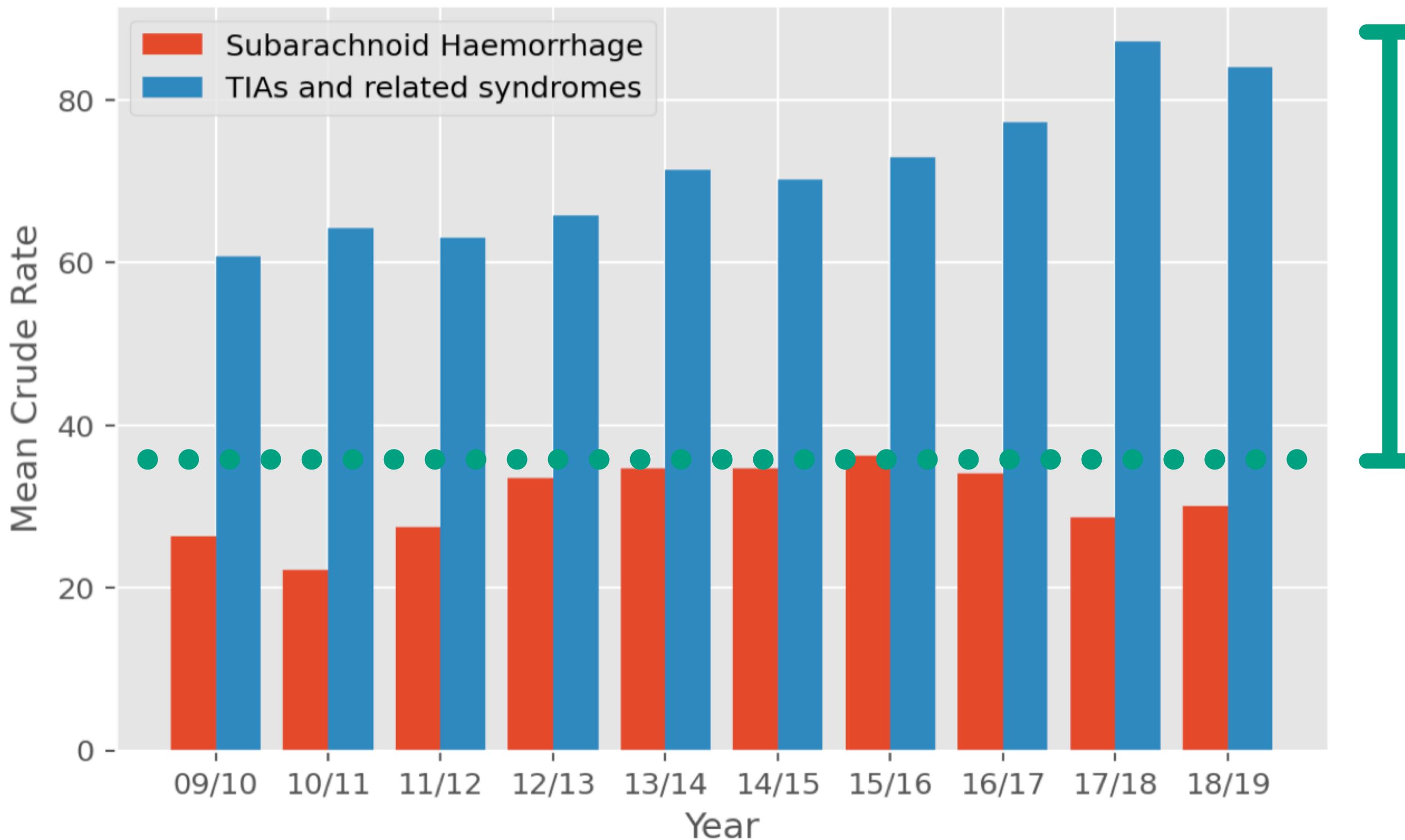
## Stroke Mortality by Council Area

17820 rows
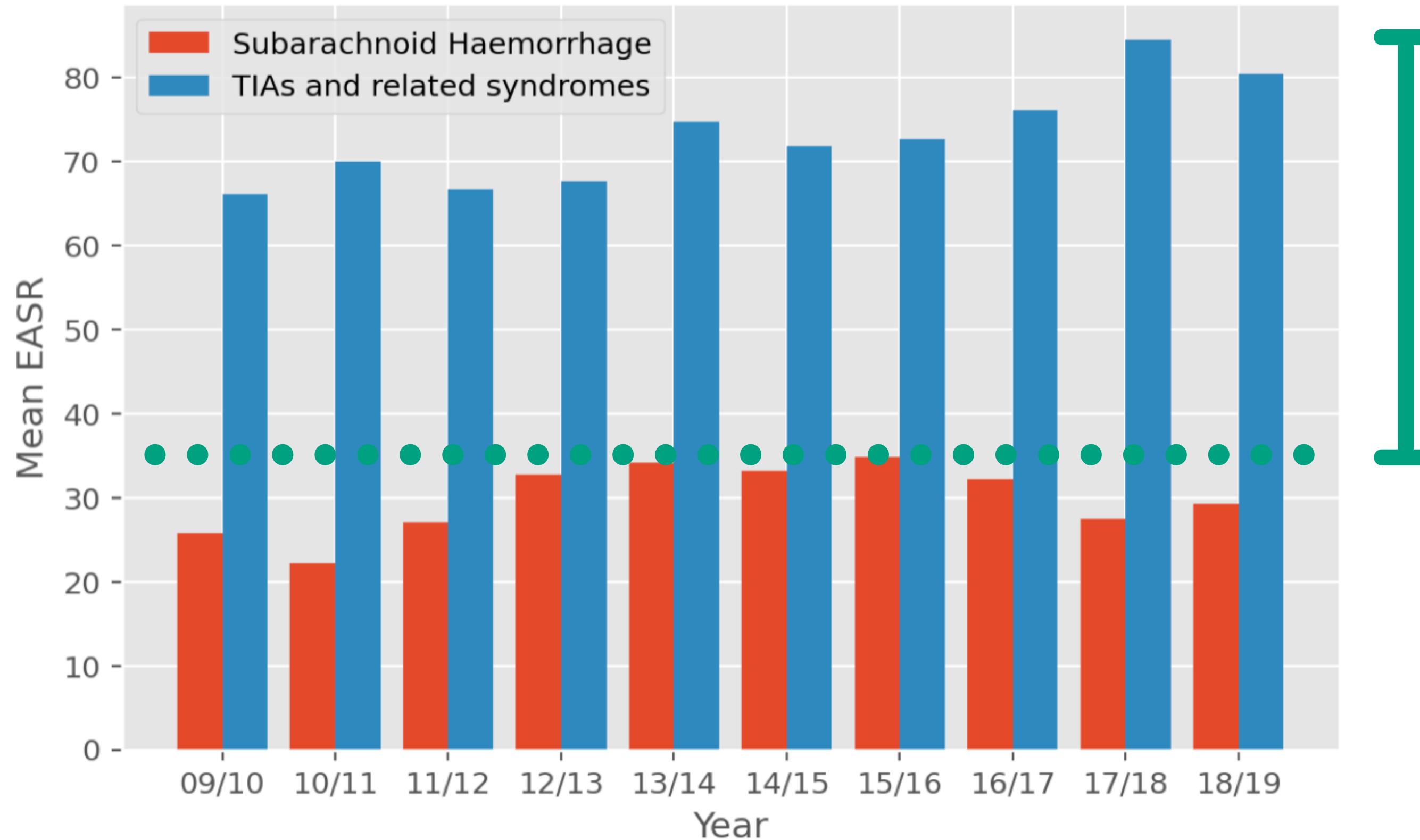
Most Common Stroke Diagnosis

This was between Subarachnoid Haemorrhage and TIAs and related syndromes
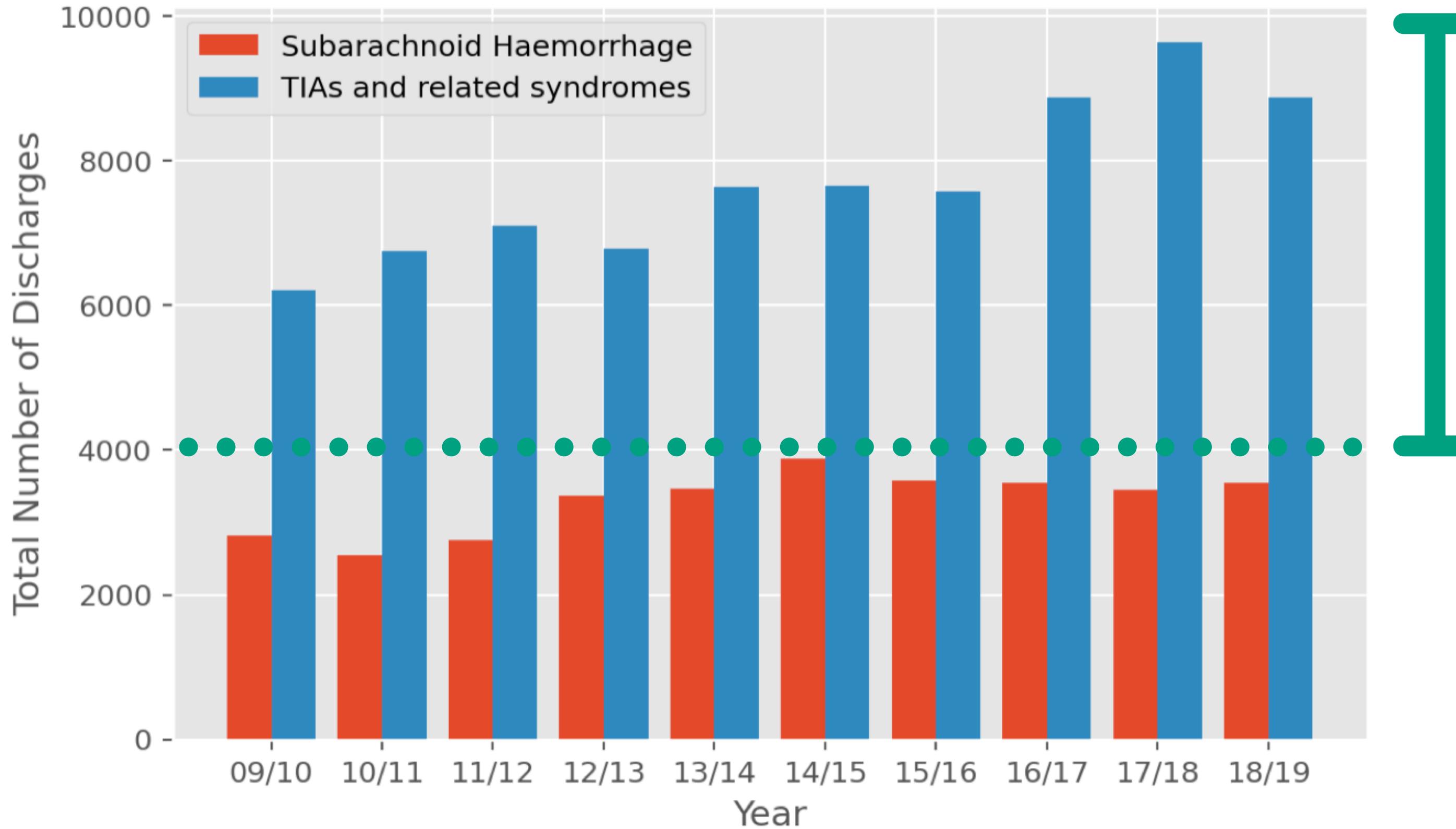
Mean Crude Rate by Stroke Type
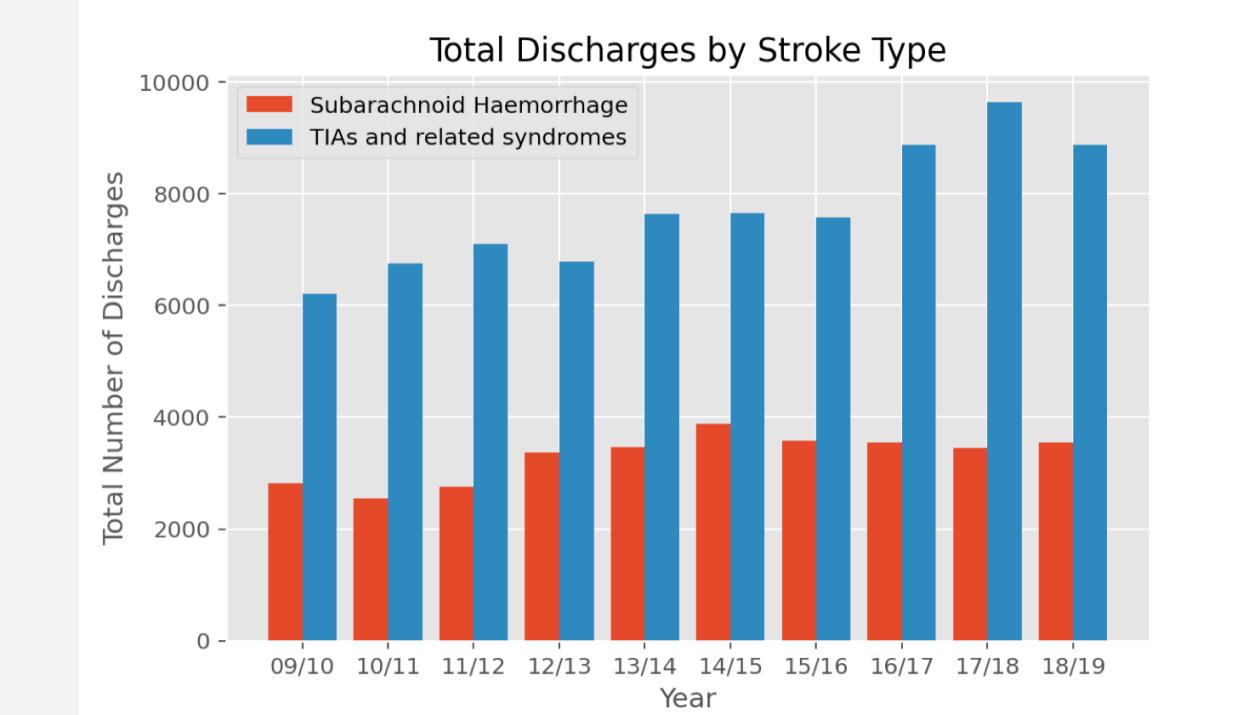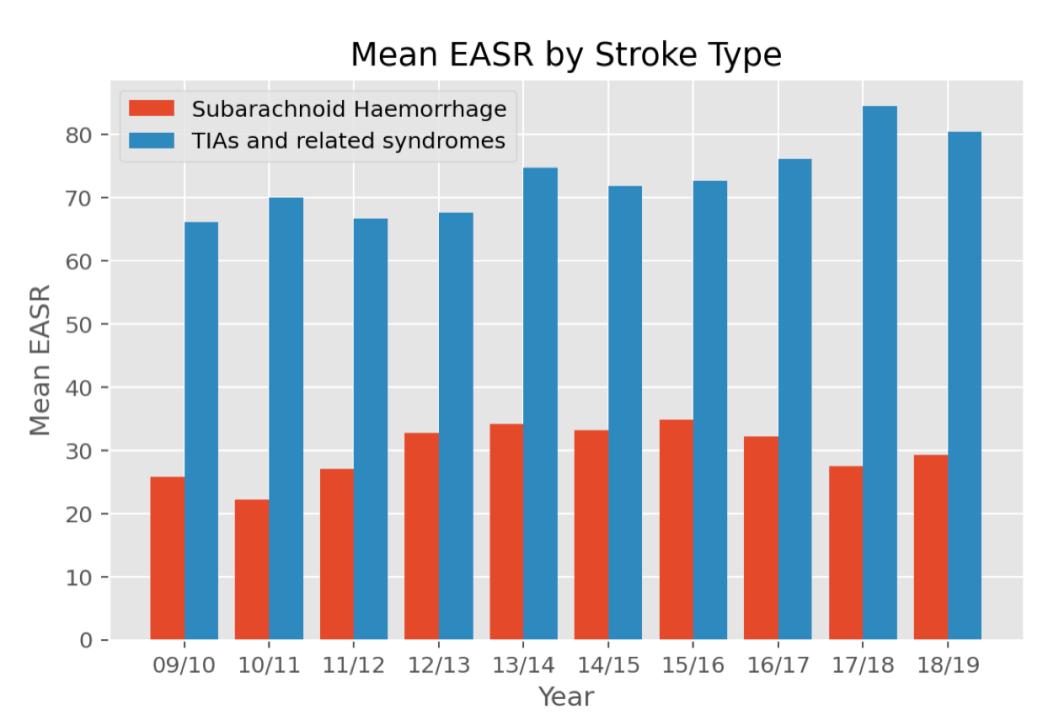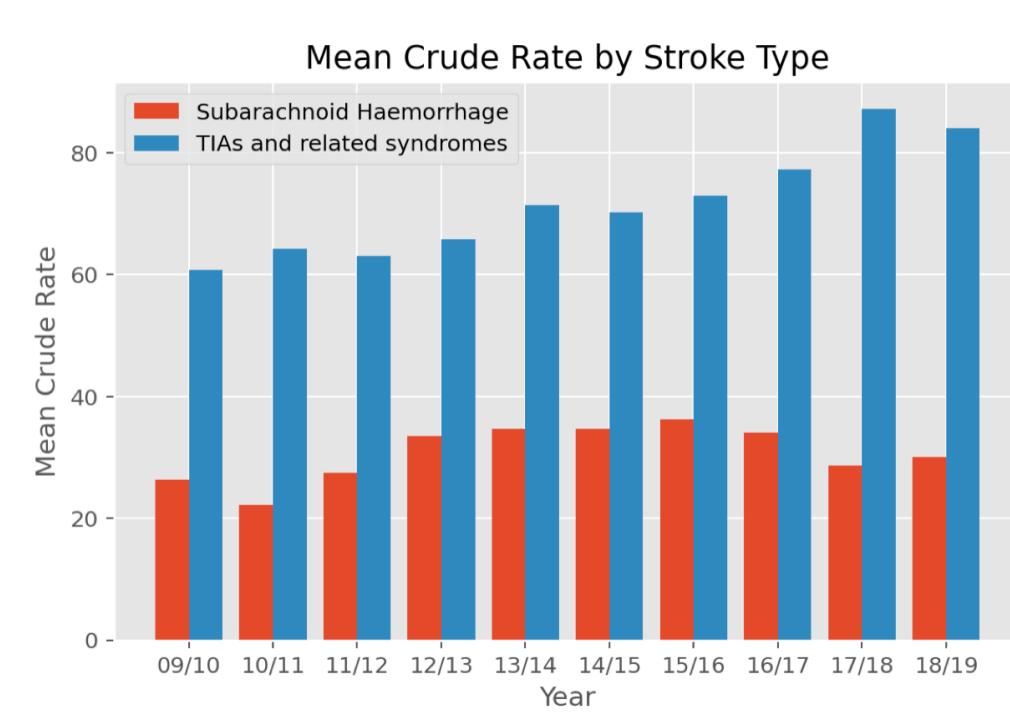
Mean EASR by Stroke Type

Total Discharges by Stroke Type

Conclusion

- In each measure, TIAs and related syndromes outnumber Subarachnoid Haemorrhage

Actionable Insight
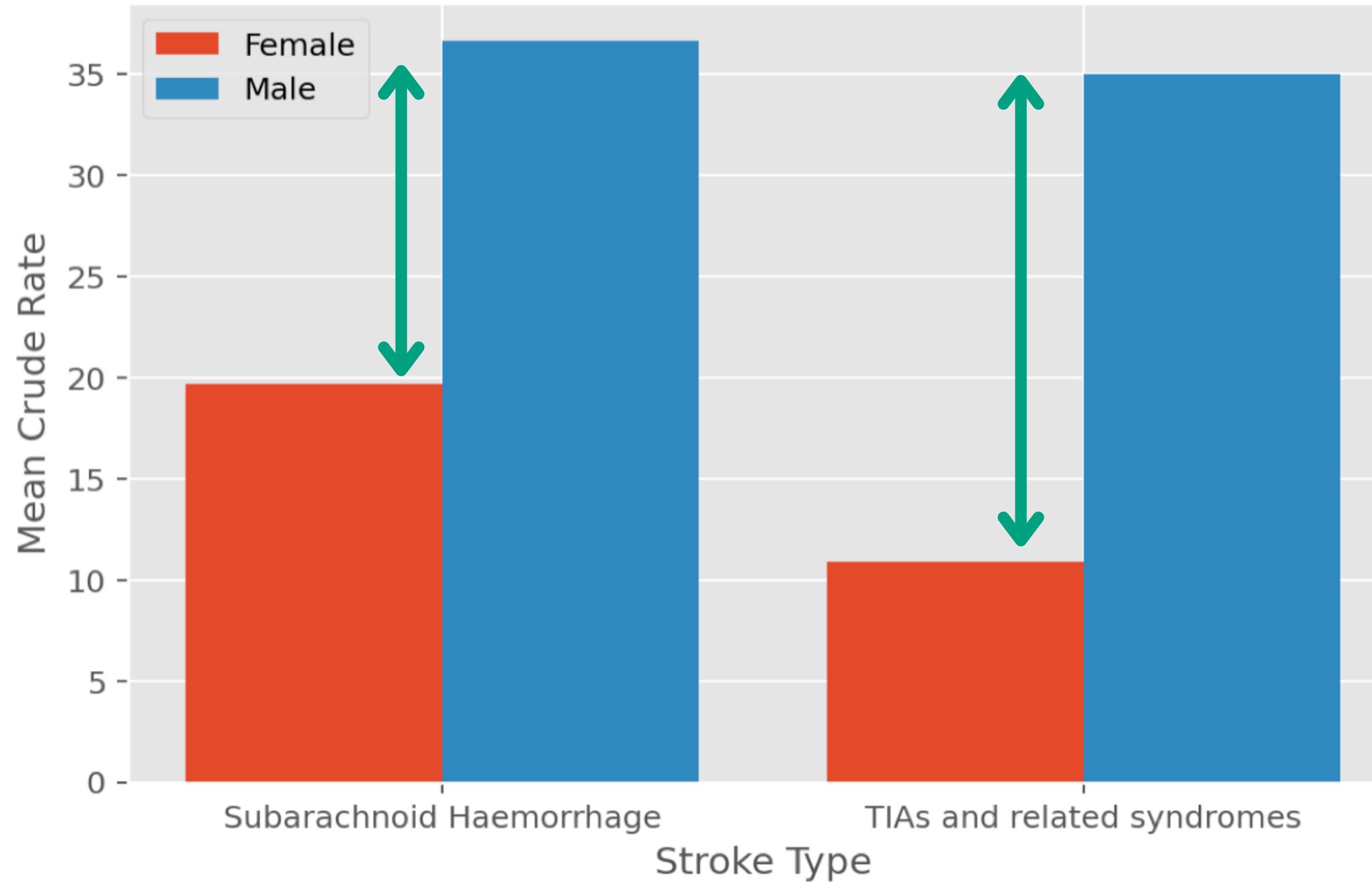
- Target TIAs in order to decrease numbers of full stroke victims in the future. Adverts/marketing/online prescience of symptoms of TIAs

Differences in Demographics
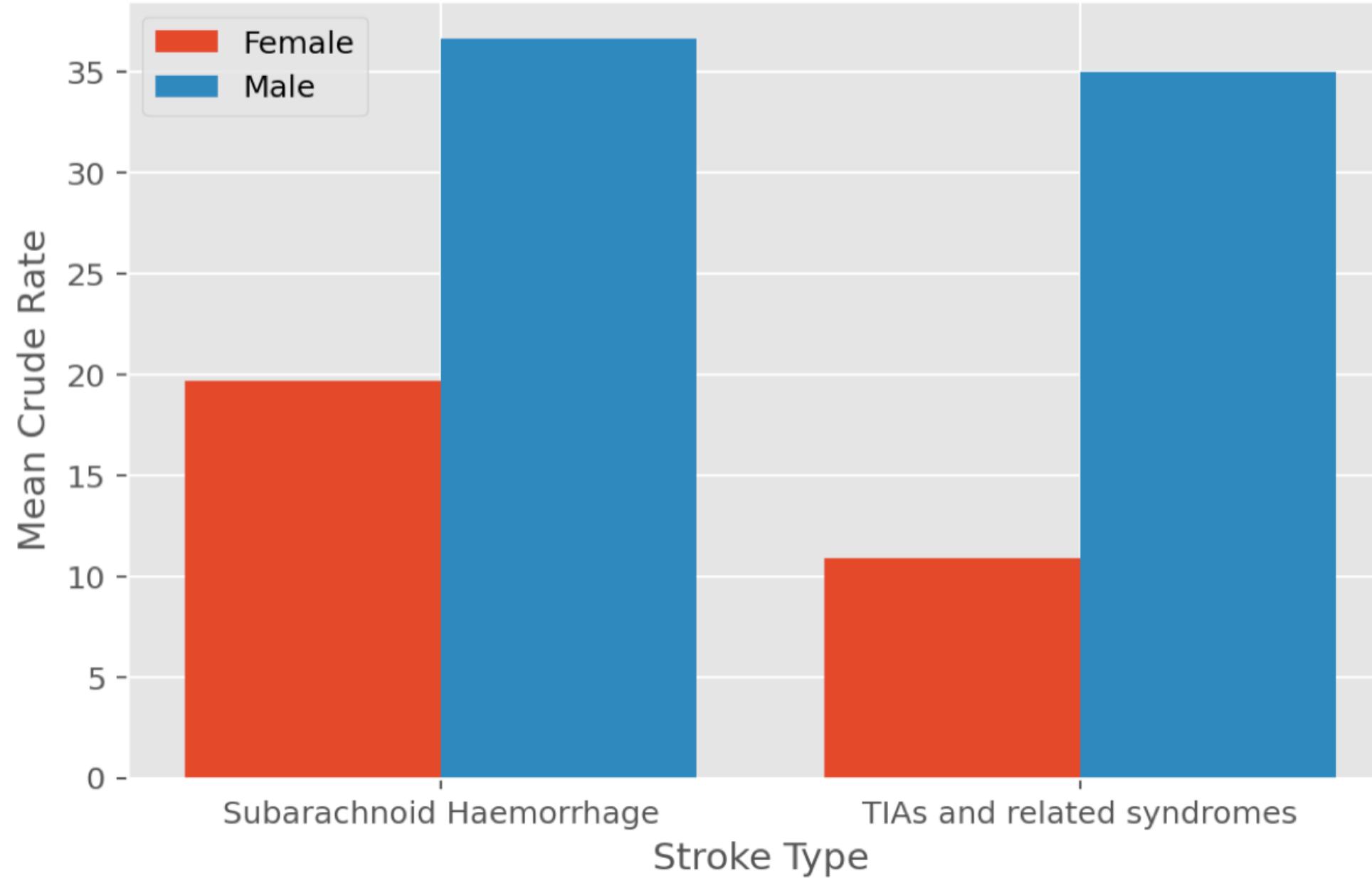
Specifically looking at gender and age groups.

Mean Crude Rate by Stroke Type & Gender

Mean Crude Rate by Stroke Type & Gender
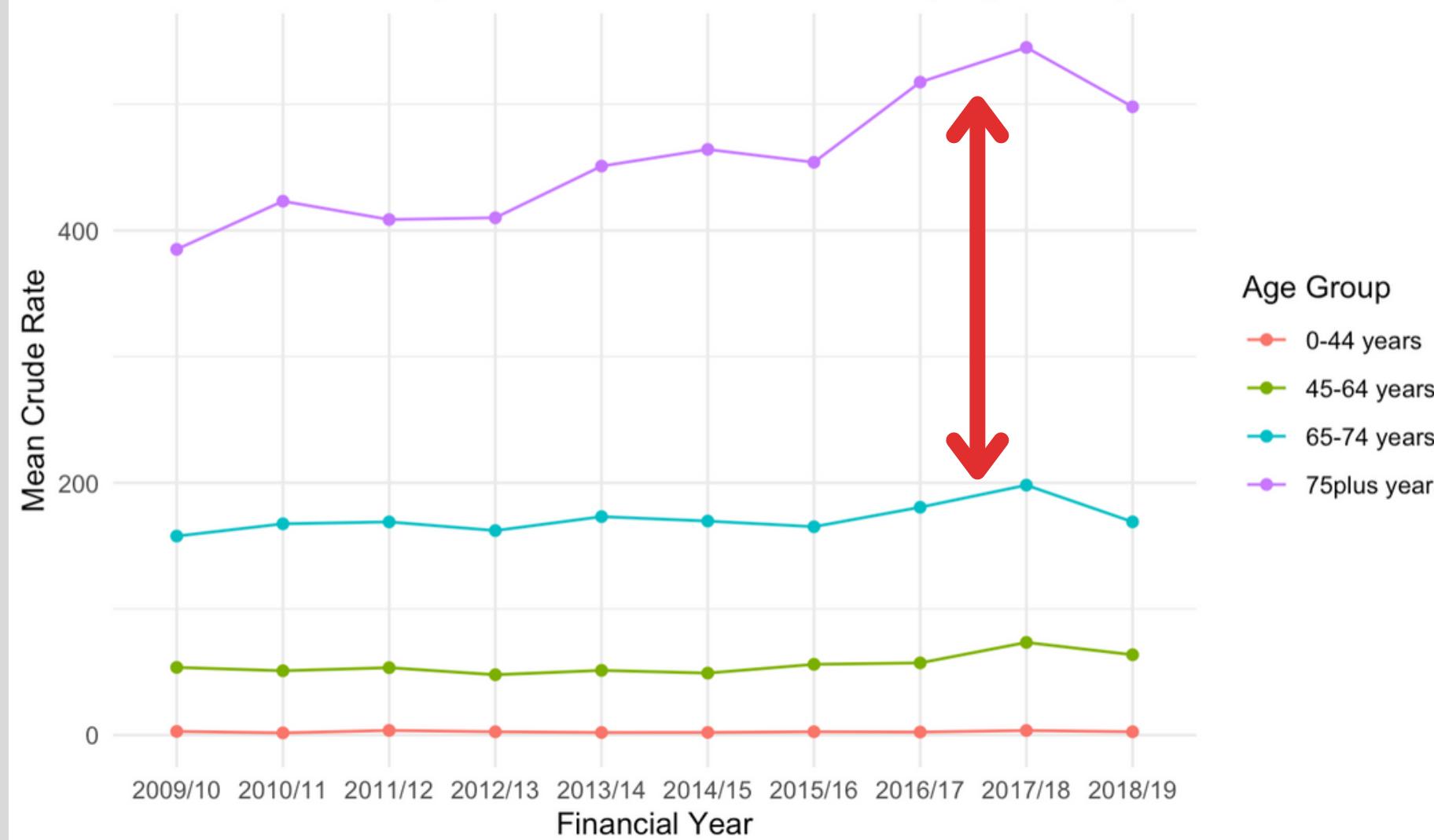
Conclusion

- Males far outnumber Females in each stroke diagnosis, as measured by *Crude Rate*
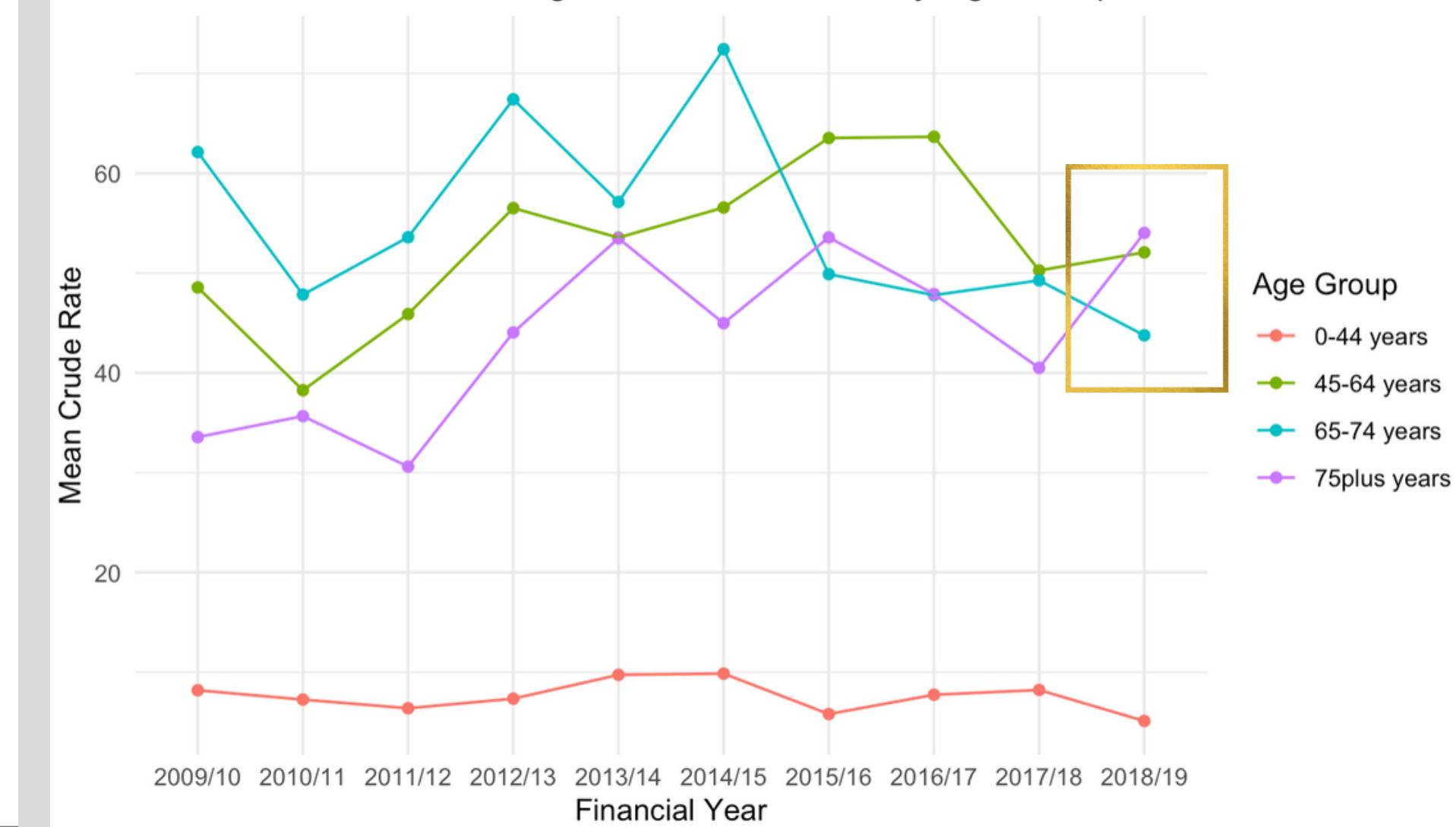
Actionable Insight
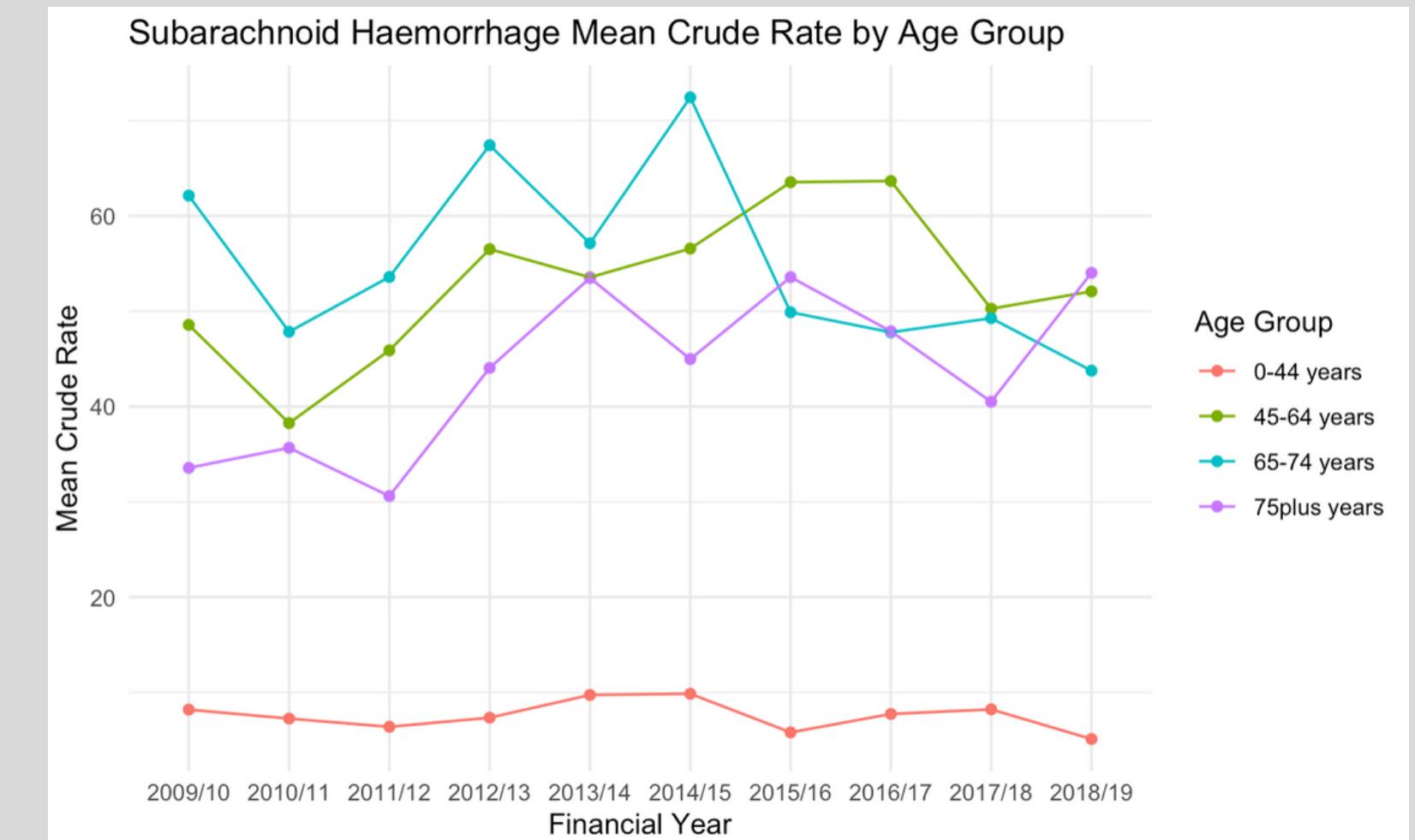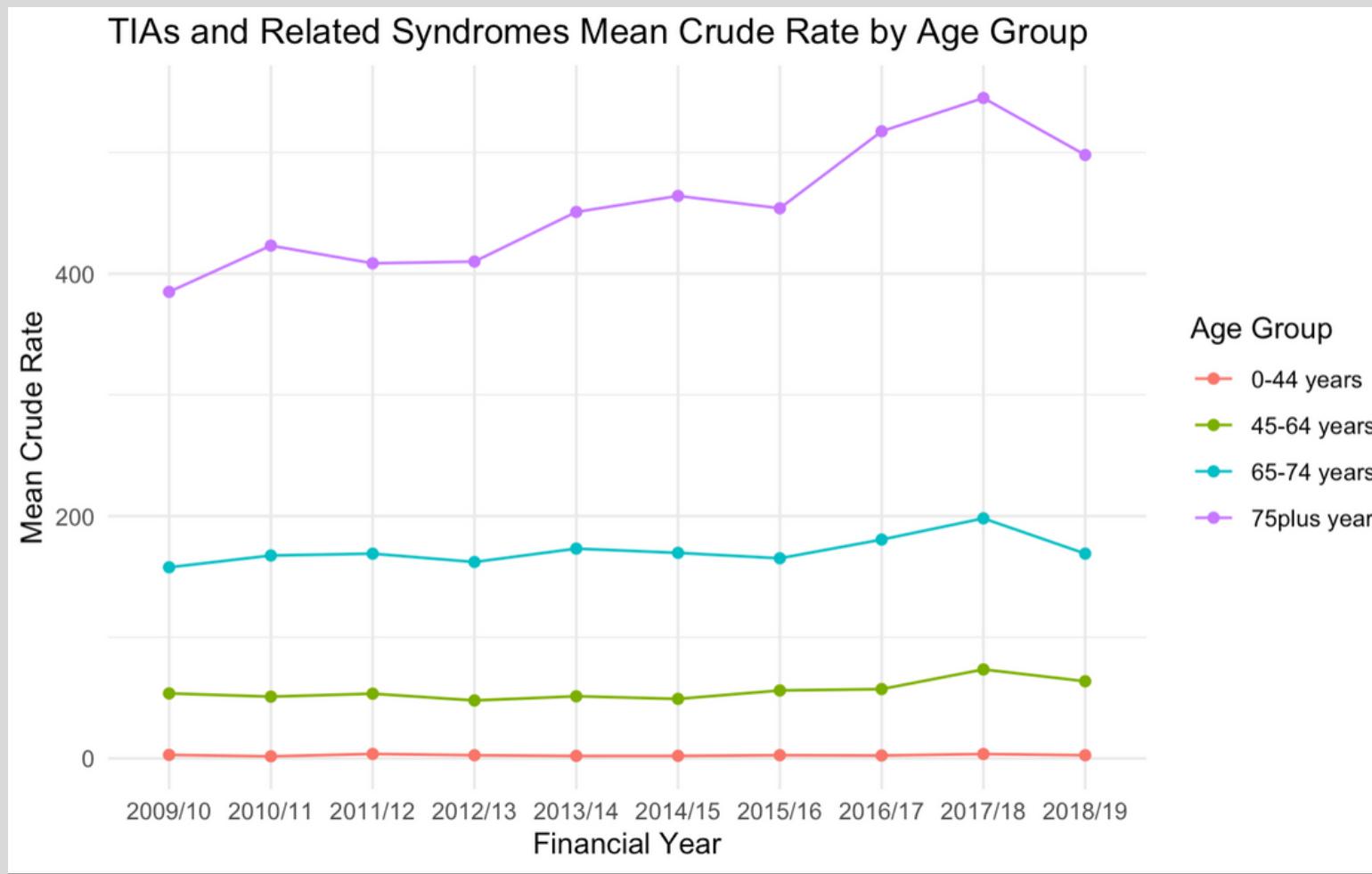
- PHS target Males who suffer from a TIA in order to limit the number of those that progress to a full stroke later in life. Adverts aimed at males, potentially during sports events to get yourself checked out.

TIAs and Related Syndromes Mean Crude Rate by Age Group

Subarachnoid Haemorrhage Mean Crude Rate by Age Group

Conclusion

- TIAs: More prevalent as you move up the age groups, especially 75+ years
- SH: More balanced by 18/19 in terms of Crude Rate
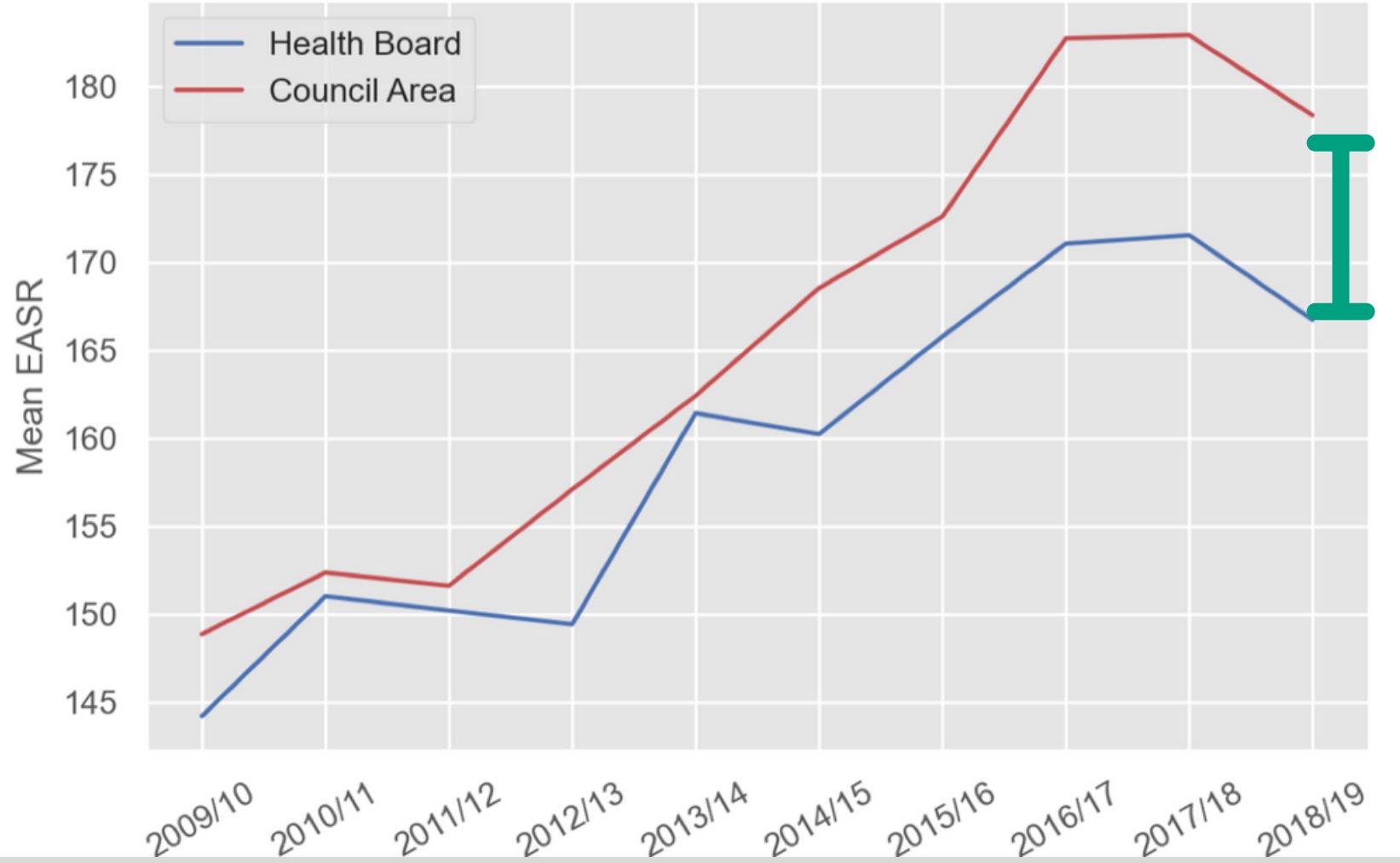
Actionable Insight

- Likelihood of suffering a stroke appears to increase with age, can screening be set up for these age groups to prevent future attacks?
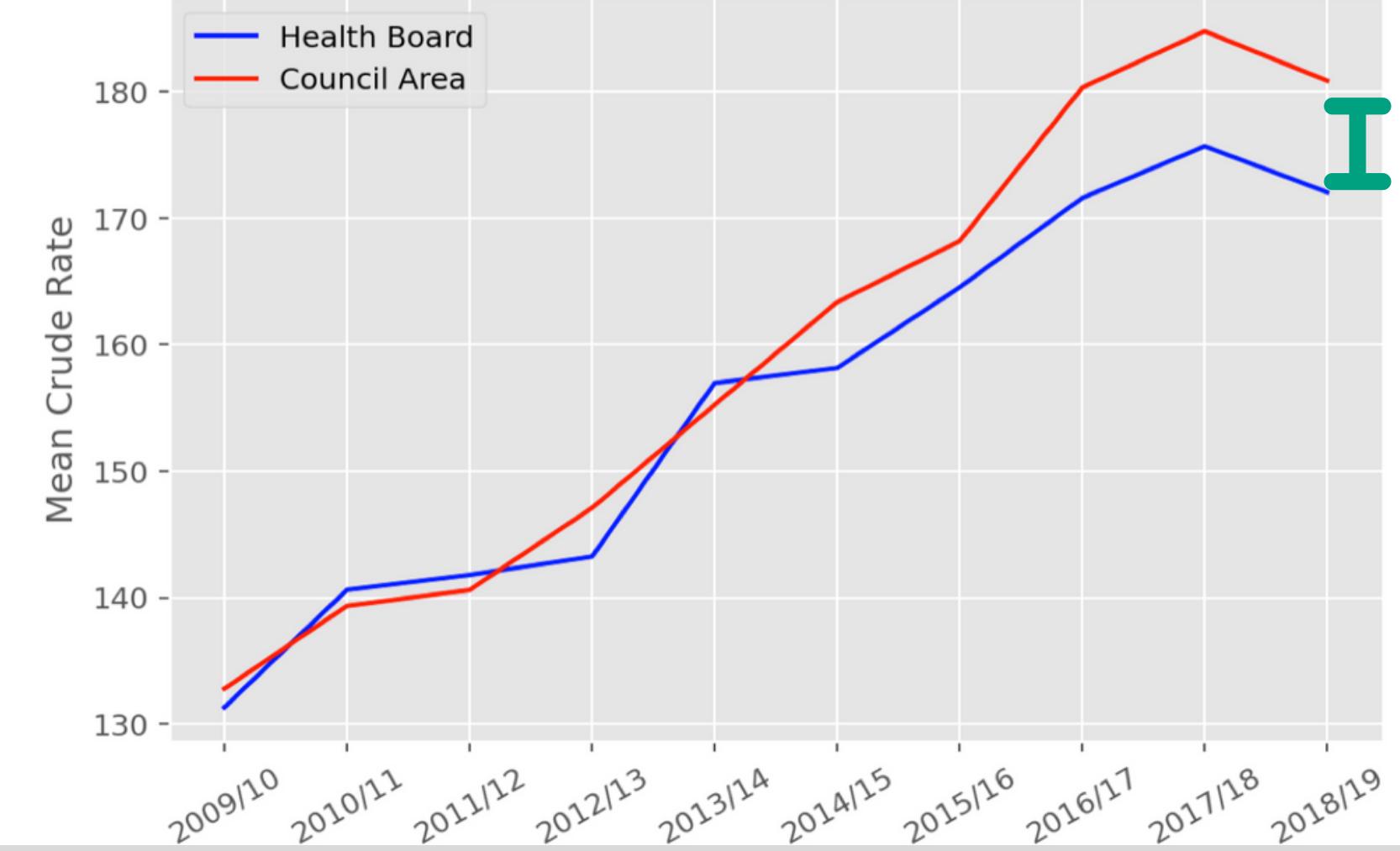
Health Board vs Local Authority

Mean EASR in Health Board vs Council Area

- Health Board
- Council Area

Mean EASR

2009/10 2010/11 2011/12 2012/13 2013/14 2014/15 2015/16 2016/17 2017/18 2018/19

Mean Crude Rate in Health Board vs Council Area

- Health Board
- Council Area

Mean Crude Rate

2009/10 2010/11 2011/12 2012/13 2013/14 2014/15 2015/16 2016/17 2017/18 2018/19
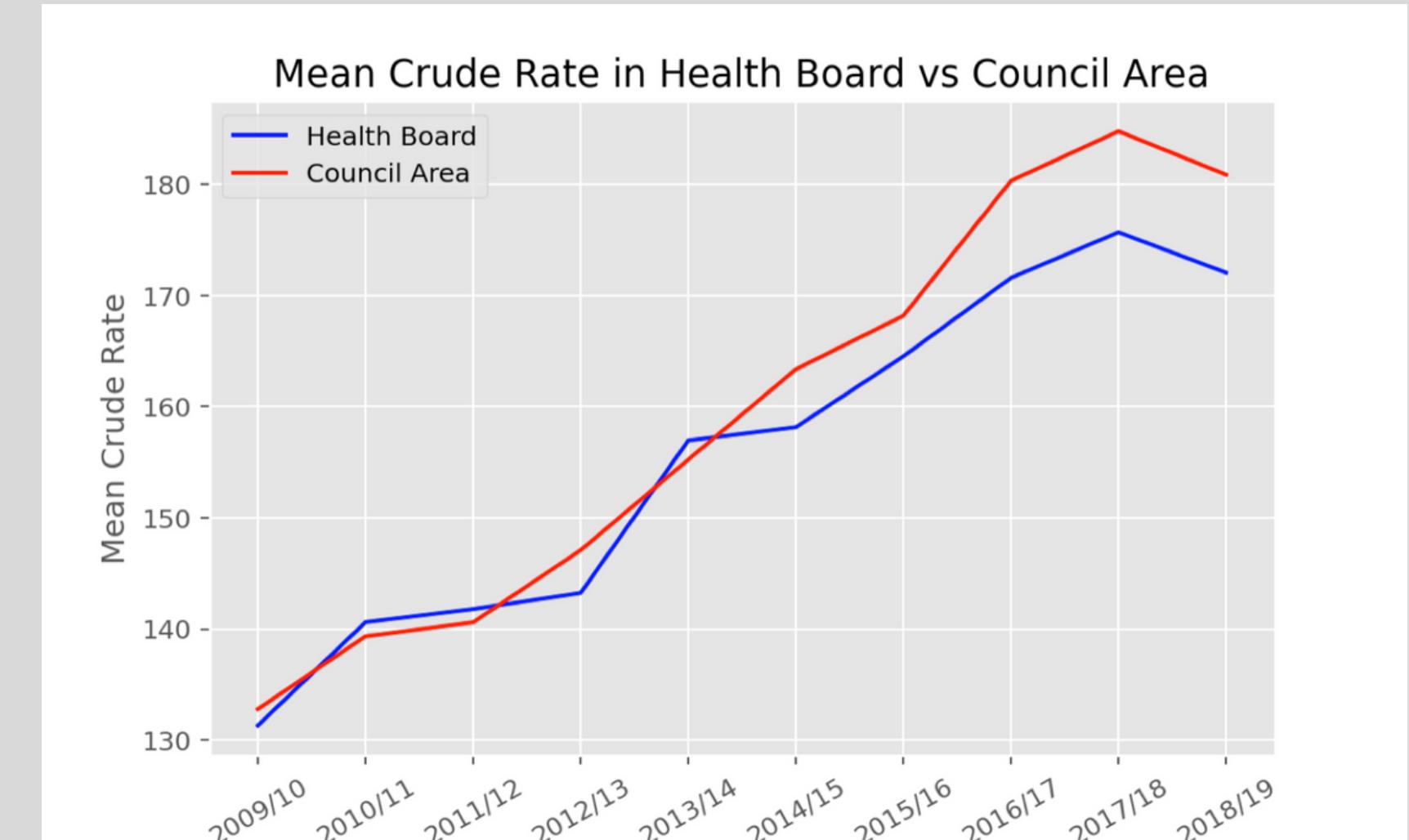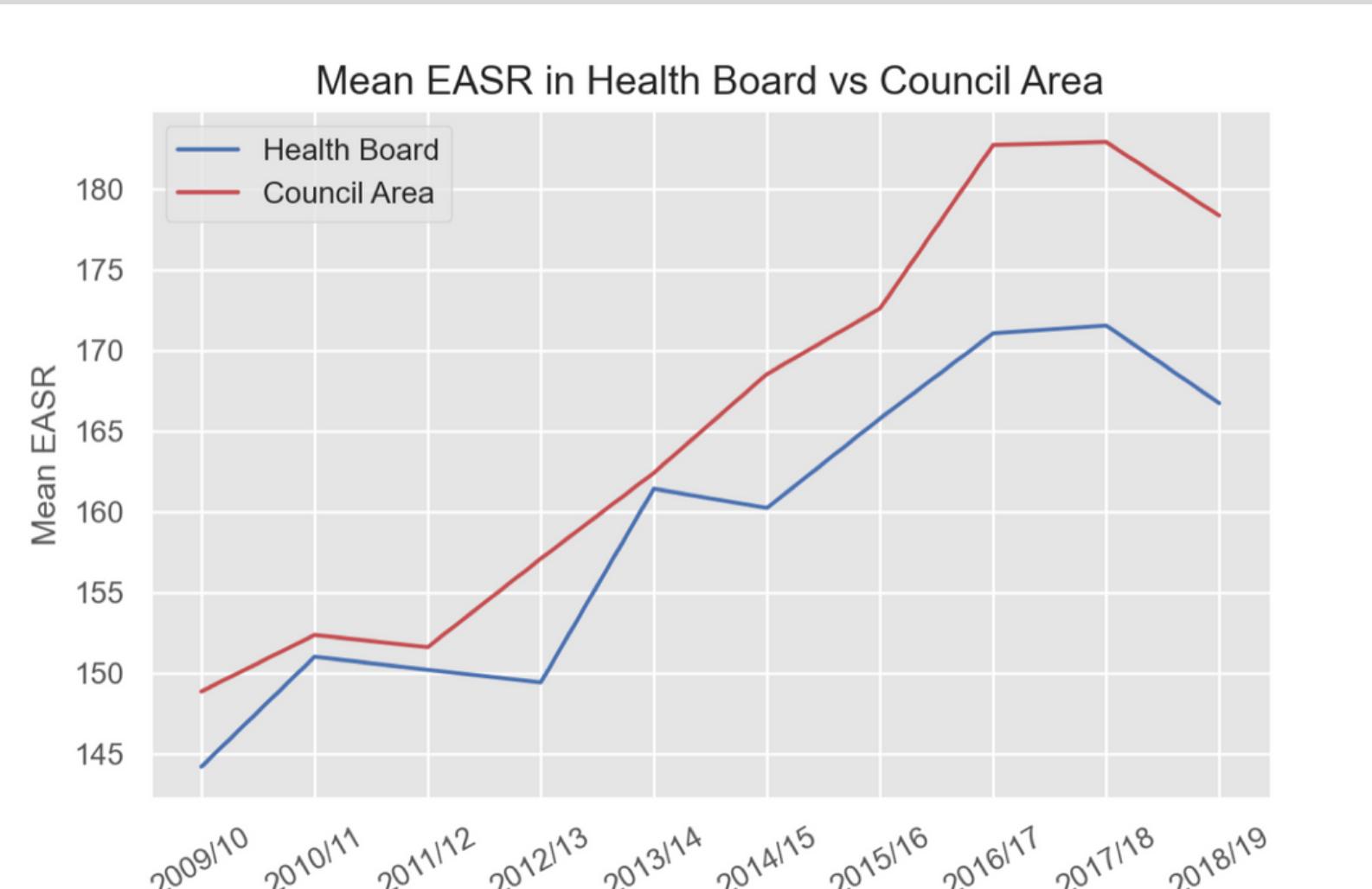
Mean EASR in Health Board vs Council Area

Mean Crude Rate in Health Board vs Council Area

Conclusion

- Measured by Crude Rate & EASR, Council Areas have higher rates of stroke
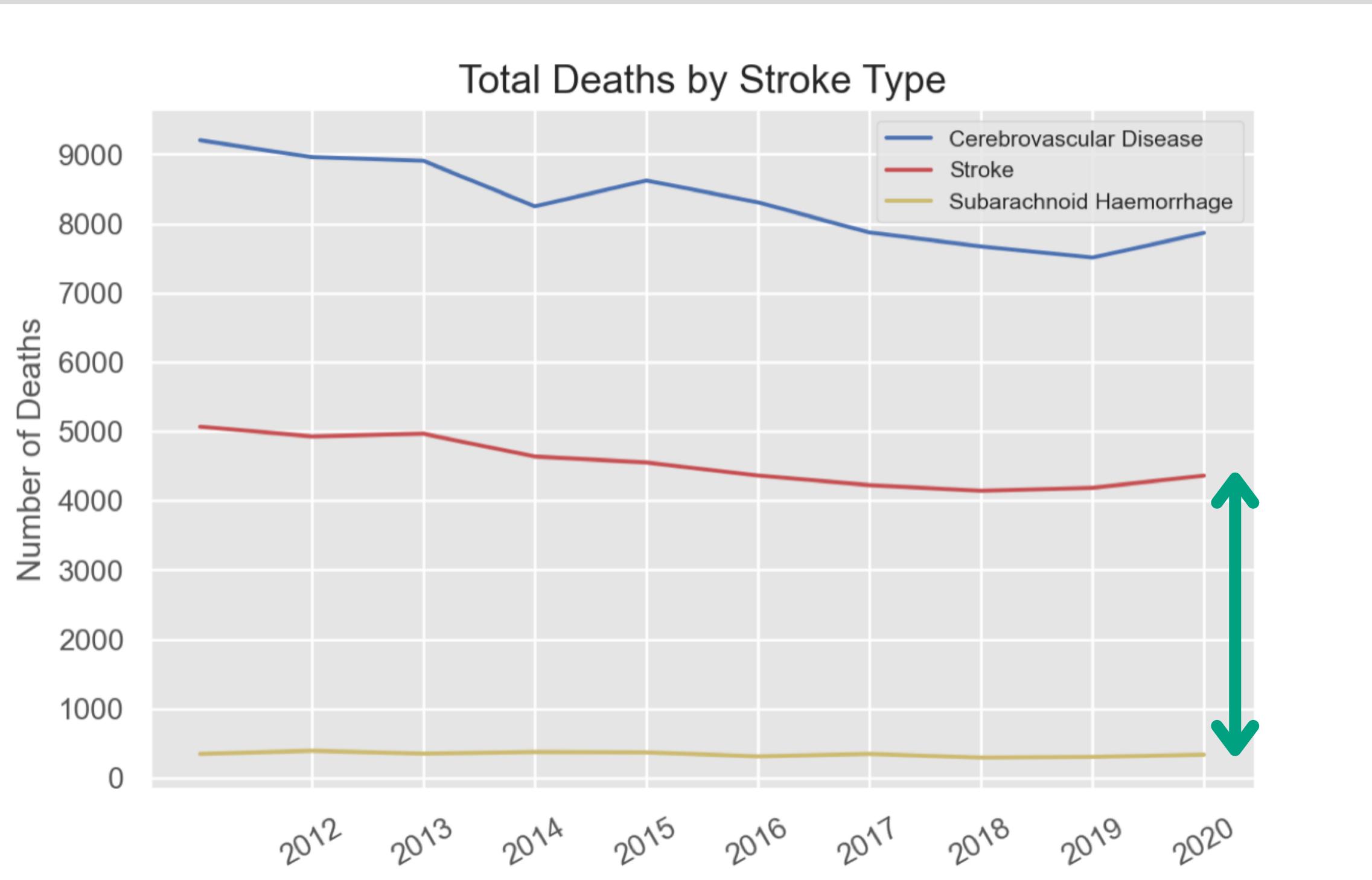
Actionable Insight

- May be worthwhile allowing councils the autonomy to use resources how they see fit for their area. Future analysis deeper into council areas would be beneficial

Mortality rates and different types of stroke

Does this vary with demographics?

Total Deaths by Stroke Type

Conclusion
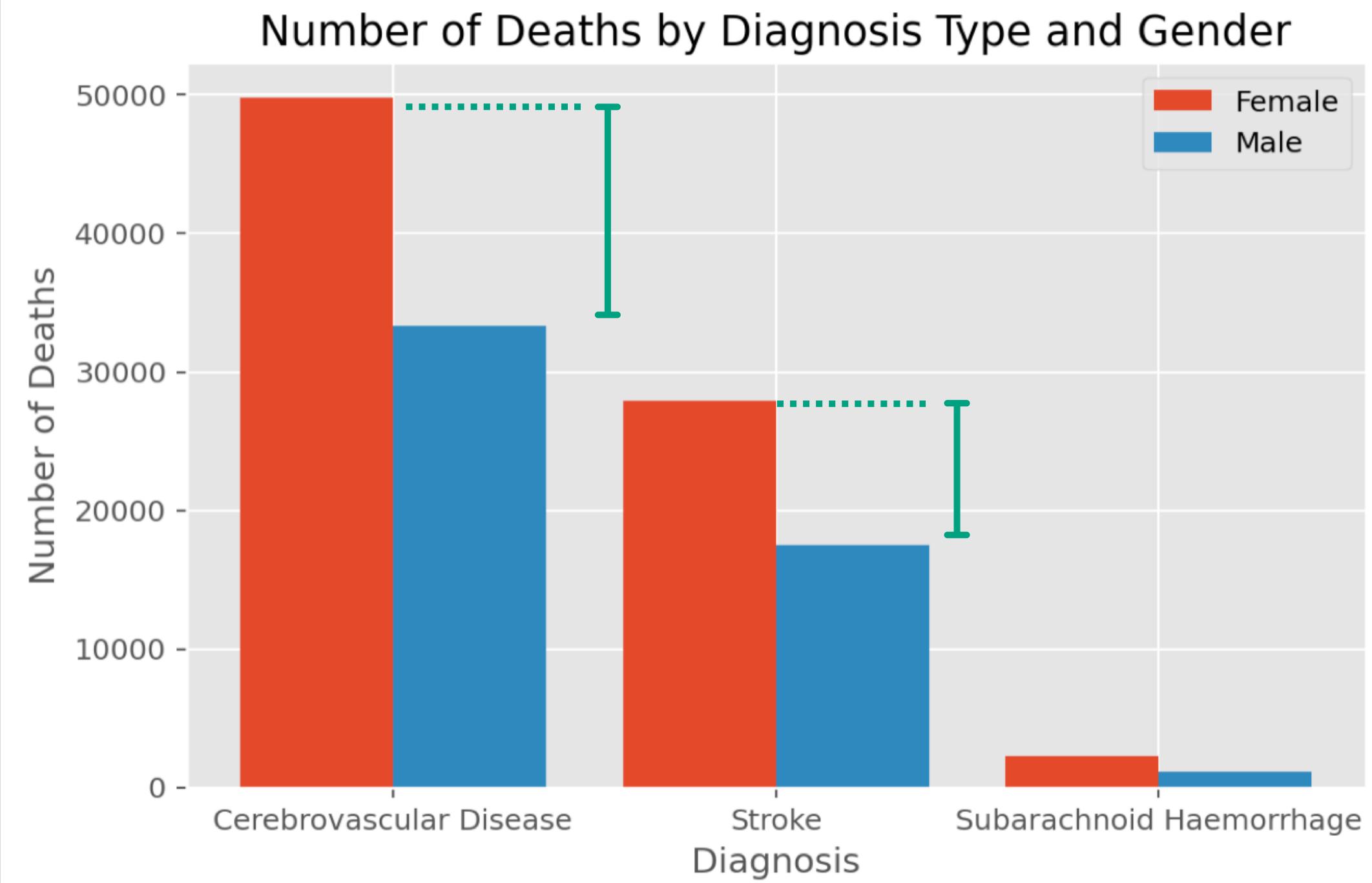
- Cerebrovascular ranks the highest among all years in number of deaths, unsurprising given its broad definition.
- Follows logic that stroke is second greatest. SH is a rare type of stroke and it would be expected to be less frequent than a stroke

Actionable Insight

- Would be worthwhile to gather further data about what other cerebrovascular diseases are driving this number.

Number of Deaths by Diagnosis Type and Gender

Conclusion

- Tells a different story from diagnosis incidence rates where males outnumbered females.

Actionable Insight

- Why are female mortality rates so much greater than those of males? Further research needed into this

Predicting Mortality Rates

The Model

Number of deaths ~ crude rate + easr + health board + age group + diagnosis

Statistically significant predictors:

Crude Rate   **Health Board**   **Stroke Diagnosis**

EASR   **Age Group**

R-Squared: **0.79***

*statistical measure of fit that indicates how much variation of a response variable is explained by the predictors variable(s) in a regression model.

What does this significance mean?

NHS Greater Glasgow and Clyde has a coefficient of 34.5137
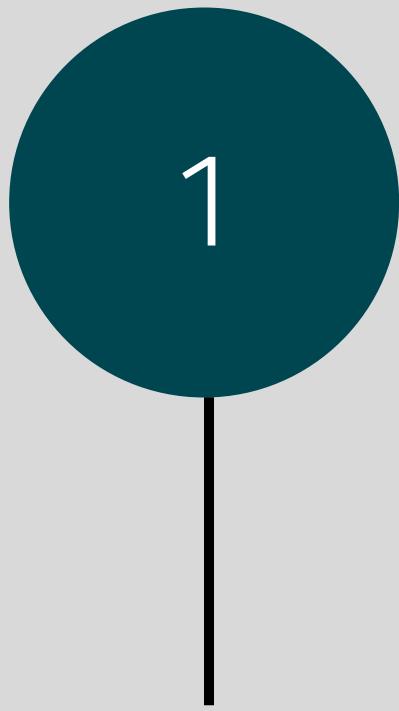
*NHS Ayrhisre and Arran is our baseline (reference)

With all other predictors held <u>constant</u>, if you live in the NHS Greater Glasgow and Clyde health board, the number of **deaths increases by ≈ 34 people** (compared to the reference level of NHS Ayrshire and Arran)
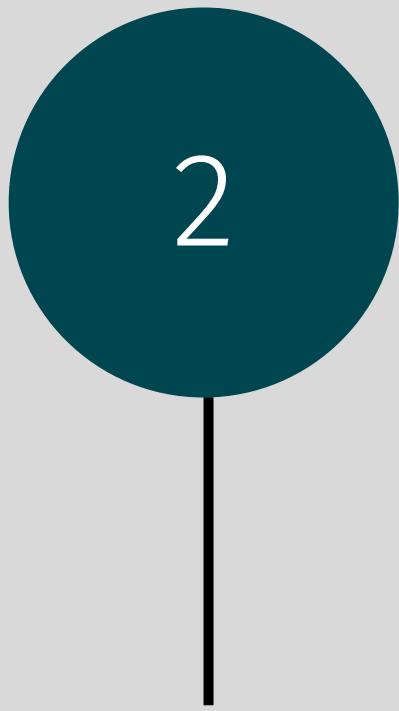
	coef	std err	t	P>|t|	[0.025	0.975]
hbr_S08000031	34.5137	1.708	20.209	0.000	31.165	37.862
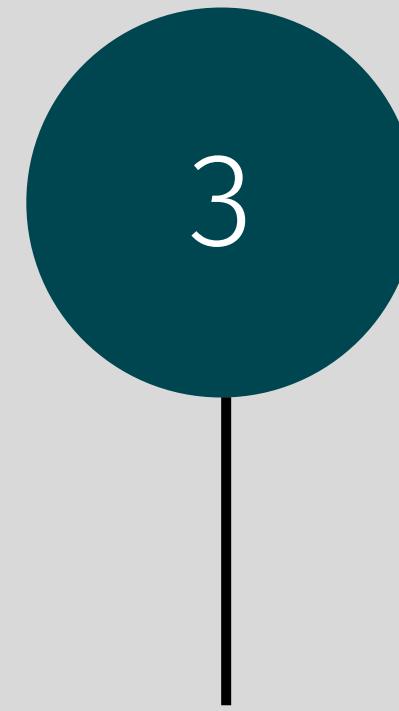
Key Takeaways
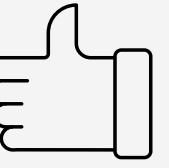
1 Males outnumber females for incidence rates of all strokes

2 Females then outnumber males in terms of stroke mortality

3 Health Boards can have a significant effect on the mortality rate

Thank you!