



Co-morbidity in stroke - a study of 8751 UK Biobank Participants

Dr Katie Gallacher, Dr Ross McQueenie,
Dr Barbara Nicholl, Dr Bhautesh Jani,
Prof Frances Mair.





Stroke

- Occurs when the blood supply to the brain is disrupted.
- 795,000 people in the US have a stroke every year.

Comorbidity

- The presence of at least one other condition in addition to an index condition.
- 94% of people with stroke have comorbidity ¹.
- 35% have 4-6 other long term conditions ¹.
- This can result in considerable burden of illness and complex treatment regimes.



1. Gallacher K, Jani B, Morrison D, Macdonald S, Blane D, Erwin P et al. Qualitative Systematic Reviews of Treatment Burden in Stroke, Heart Failure and Diabetes - Methodological Challenges and Solutions. BMC Med Res Methodol 2013; 13:10.

Why is this study important?

- Current stroke guidelines do not adequately take account of comorbidity.
- Healthcare services are not designed optimally for people with comorbidity.
- People with stroke describe their healthcare as fragmented and poorly coordinated.



We need to understand who is at risk of comorbidity in stroke and any effects on health related outcomes

To examine, in those with stroke / TIA:

- The relationship between sociodemographic and lifestyle characteristics, and multimorbidity / polypharmacy
- The relationship between multimorbidity / polypharmacy and all-cause mortality
- Which comorbid health conditions, if any, have a stronger association with all-cause mortality



- Cohort study using data from UK Biobank.
- 8751 adults aged 40-72 in the UK with self-reported stroke or TIA.
- Data collected between 2006-2010.
- Data : sex; age; ethnicity; socio-economic status (Townsend score); alcohol intake (never / special occasions only, one-three times a month, at least once a week); smoking status (never, current /previous); self-reported morbidities.
- This data was linked to national mortality registries; median follow up 7 years from baseline data.





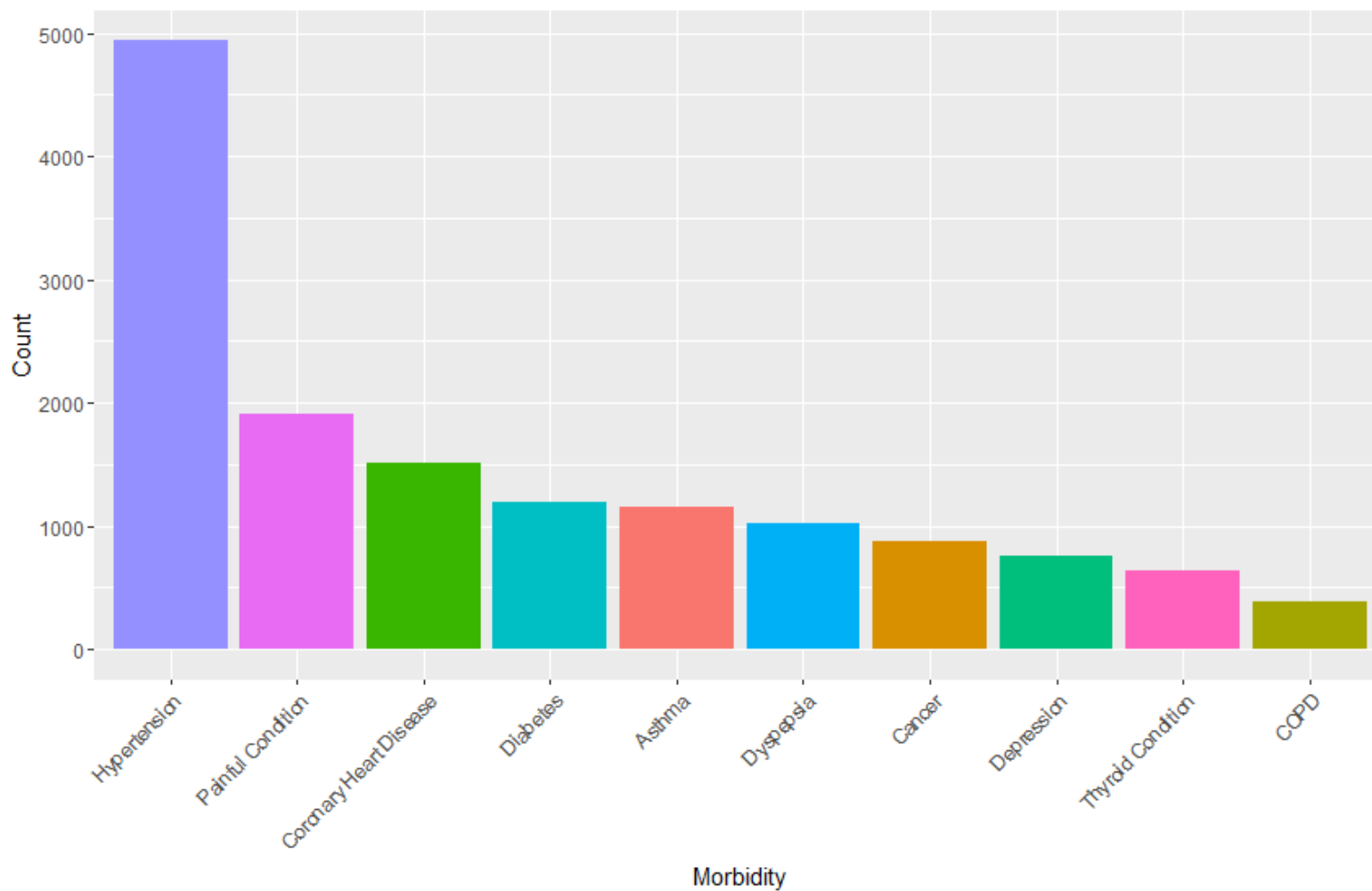
- A count of 42 morbidities was taken (established for a previous study ²).
- Multinomial regression examined associations between participant characteristics and number of comorbidities (1,2,3,4,>5).
- Cox proportional hazards regression was used to examine associations between number of comorbidities and all-cause mortality.
- Relative risk ratios and hazards ratios were fully adjusted for age, gender, deprivation, smoking status and alcohol intake.
- Referent category was always 0 comorbidities.

2. Barnett K, Mercer SW, Norbury M, Watt G, Wyke S, Guthrie B. *Epidemiology of Multimorbidity and Implications for Health Care, Research, and Medical Education: a Cross-Sectional Study. Lancet* 2012; 380(9836):37-43.

Stroke/ TIA participants

- 57.5% male
- 95.6% white British
- Mean age was 60.9 years (SD 6.7)
- Mean number of comorbidities 2.0 (SD 1.6)





WHO WAS AT INCREASED RISK OF COMORBIDITY?

Women:

- Women were at increased risk of having 4 comorbidities (fully adjusted RRR; 95% CI: 1.32; 1.09-1.60) and >5 comorbidities (1.41; 1.15-1.72).

Older participants:

- Compared to the youngest age group (40-49 years), participants in the oldest age group (60-72 years) had a 3.5-fold increased risk of having 3 comorbidities or more (3.51; 2.44 -5.05)



People who were more deprived:

- 10.9% in the most deprived category had >5 comorbidities compared to only 3.9% in the least deprived (3.85; 2.70-5.48).

Smokers:

- Current or previous smokers were twice as likely as non-smokers to have >5 comorbidities (1.9; 1.54-2.33).

Less frequent consumers of alcohol (!):

- Those who reported alcohol consumption at least once a week had a quarter of the risk of having >5 comorbidities when compared to those who reported no intake or special occasion drinking only (0.25; 0.20-0.32).

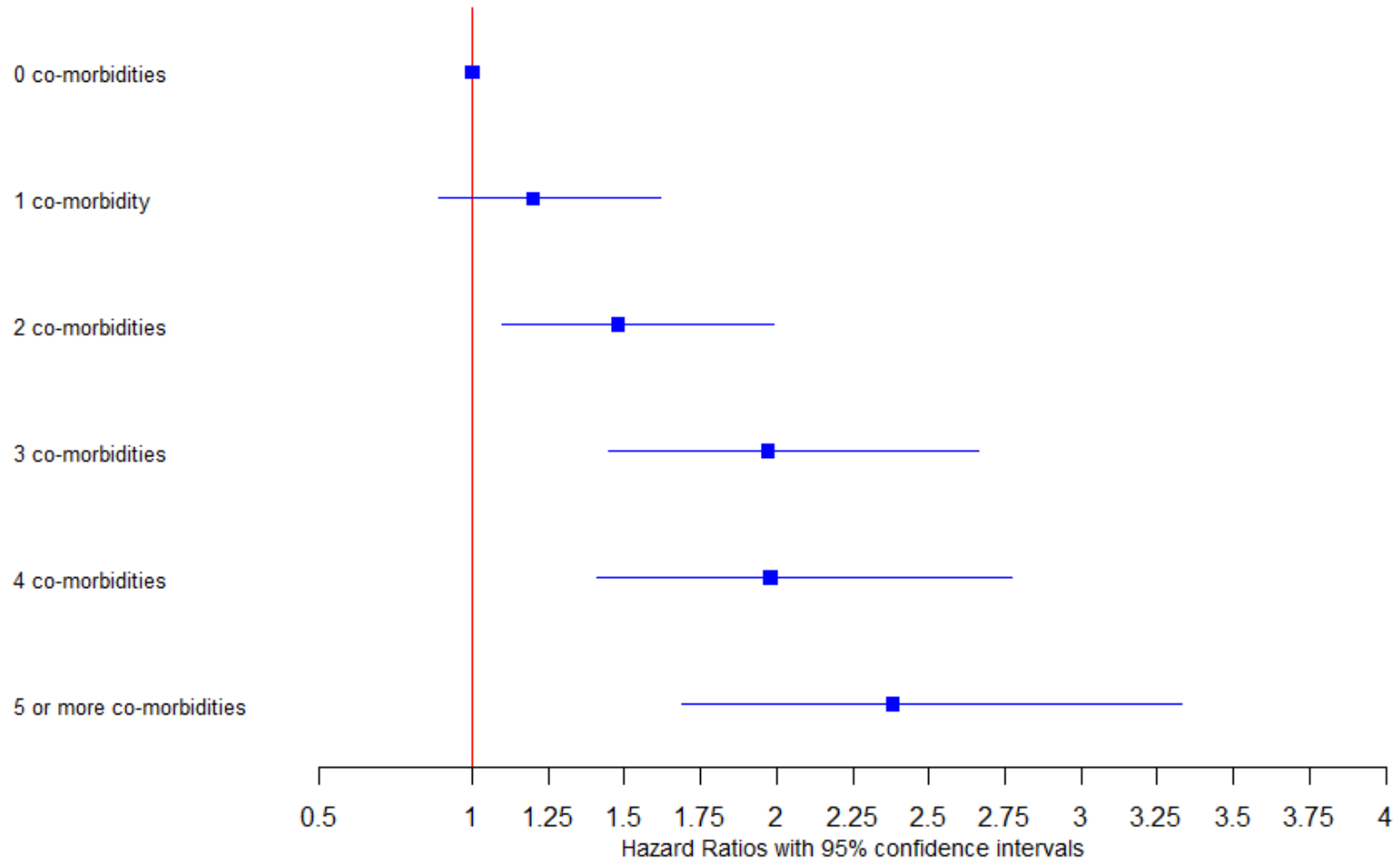


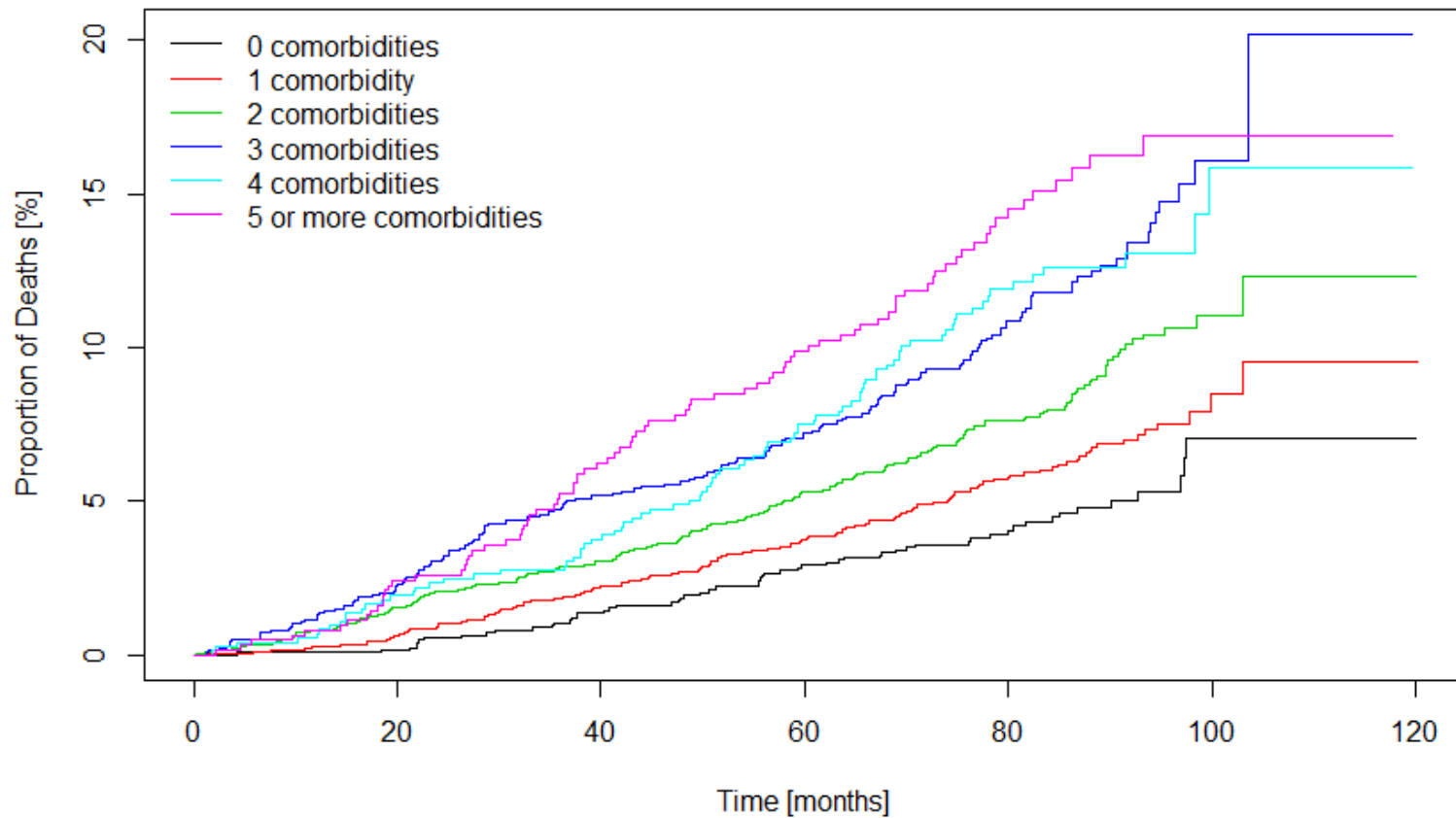
Polypharmacy showed a similar pattern except there were no differences between men and women.

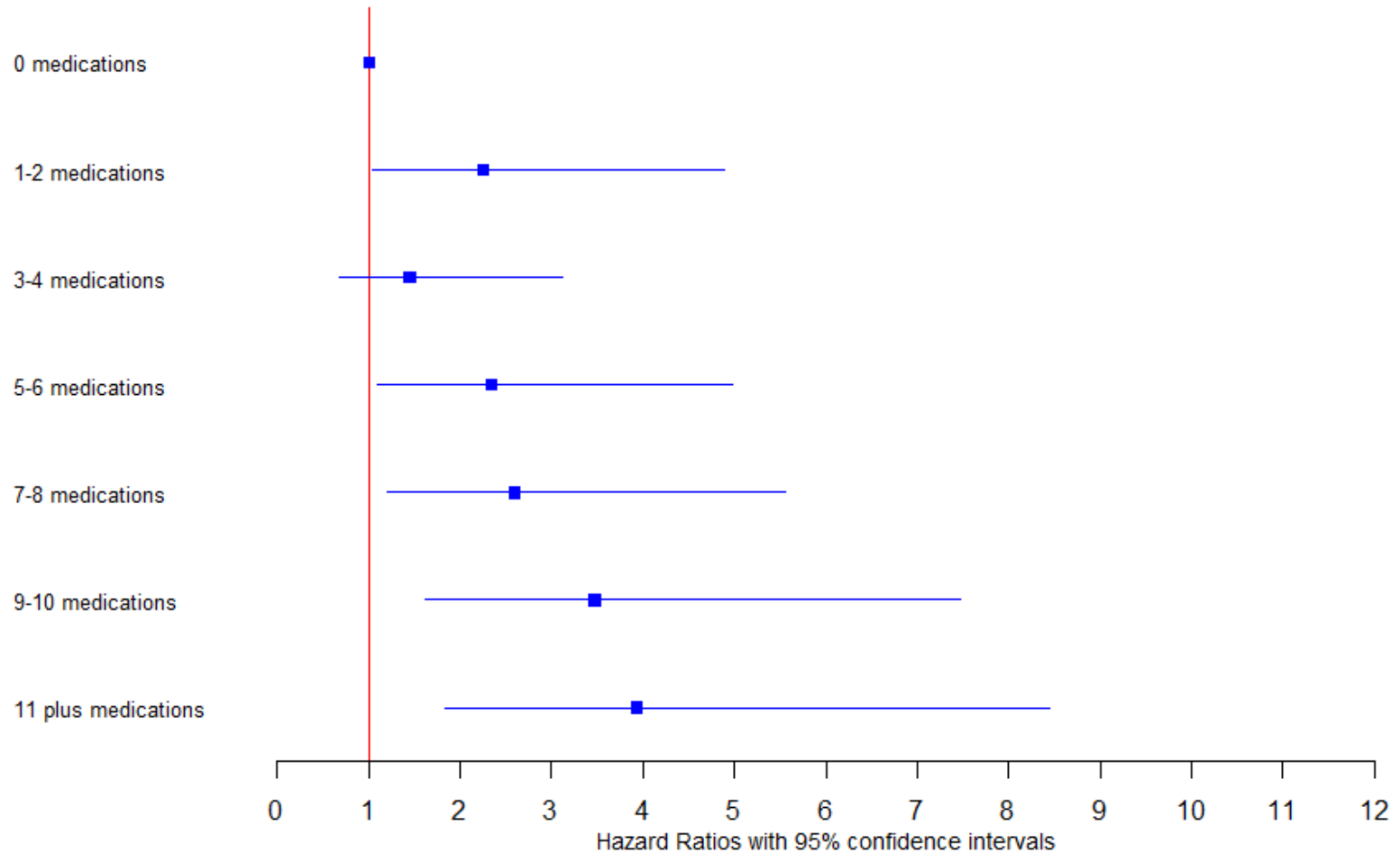


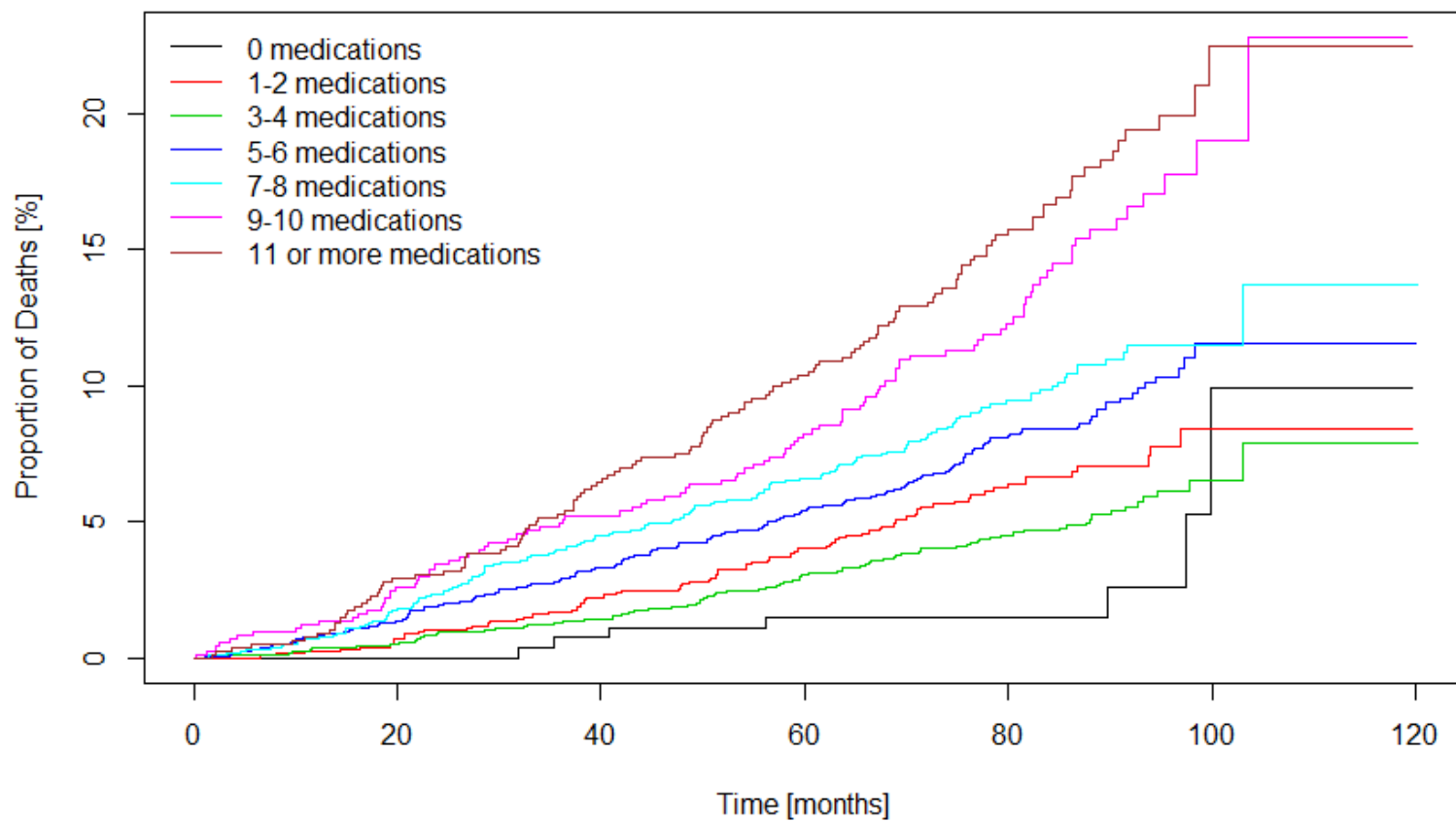


Multimorbidity and mortality









When compared to no comorbidities, presence of the following individual conditions alongside stroke / TIA significantly increased the risk of all-cause mortality:

- cancer (fully adjusted HR; 95% CI: 2.16; 1.80-2.60)
- coronary heart disease (CHD)(1.60; 1.36 -1.88)
- diabetes (1.72; 1.45-2.04)
- chronic obstructive pulmonary disease (COPD) (1.48; 1.13-1.92)



- Multimorbidity and polypharmacy are associated with age, socioeconomic deprivation, smoking and less frequent alcohol consumption.
- Multimorbidity is more common in women.
- The risk of all-cause mortality increases with number of morbidities and medications.
- A diagnosis of cancer, CHD, diabetes or COPD alongside stroke significantly increases risk of all-cause mortality.

Further work :

- Exploration of causes of mortality
- Other health-related outcomes e.g. hospital admission
- Prescribing/polypharmacy in stroke



- Use of self reported data (advantages and disadvantages).
- Age of sample (younger than average stroke patient).
- Sample was mostly white British and relatively affluent.
- No consensus on methods of measuring comorbidity.
- Data on alcohol – red herring?



Thank you.

Questions?

katie.gallacher@glasgow.ac.uk