

## Quantifying the fatal and non-fatal burden of Stroke and its modifiable determinants using routine Scottish healthcare datasets

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### Objectives

The gap between a population's actual and ideal health can be quantified by Disability-Adjusted Life Years (DALY). This metric combines the Years Lived with Disability (YLD) and Years of Life Lost (YLL). When supplemented by a Comparative Risk Assessment (CRA) it can depict the magnitude of disease burden and the effect that modifiable exposures contribute. We aim to utilise routine healthcare records to quantify the burden and potential reduction in DALY caused by stroke.

### Approach

Hospital stays involving a stroke diagnosis (ICD-9: 430-431, 433-34, 436; ICD-10: I60-61, I63-64) were identified through secondary care primary diagnoses from 1981-2013 and used to derive the incidence of acute stroke and the point-prevalence of chronic stroke. Disability weights for each health state of stroke sequelae were sourced from the Global Burden of Disease 2013 study and used to derive YLD. YLL for each death was calculated using Scotland-specific life tables for deaths where stroke was the underlying cause.

Eight waves of the Scottish Health Survey (SHES) from 1995-2012 were linked to secondary care and mortality records. Risk factors were identified from SHES then mapped to levels in the Dahlgren and Whitehead model and Population Attributable Fractions (PAFs) were calculated for each risk factor that was a significant casual risk of stroke from a Cox-proportional hazard regression model.

### Results

Stroke was responsible for 47,836 DALY in Scotland during 2013 which was a reduction of 33.3% from 2000. The proportion of

YLD contributing to DALY was 7.6% in 2000 rising to 14.4% in 2013. The main reasons for the changing profile of DALY are due to the large reduction in mortality and influence of the rising prevalence of chronic stroke. Stroke mortality reduced 34.3% during the period 2000-2013 from 7,013 deaths in 2000 to 4,610 in 2013, whilst chronic prevalence increased from 46,184 in 2000 to 59,367 in 2013.

Between 23.5 to 38.8% of excess first stroke incidence can be explained by education, social class and area deprivation, which were all significant predictors of stroke after adjusting for confounding. Altering the exposure distribution for each independent risk factor to its theoretical minimum risk exposure level could potentially reduce the DALY by between 9,615 to 15,882 in 2013.

### Conclusion

This study highlights the benefit of using linked administrative health records to quantify the burden of stroke on the population and how public health interventions to tackle inequalities would be a method of reducing strokes in Scotland.

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