

STROKE IN HARINGEY

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Definition of Stroke

According to the World Health Organisation, stroke is a syndrome characterized by rapidly developing clinical signs of focal (at times global) disturbance of cerebral function, lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin. There are two types of stroke

Ischaemic stroke: The most common type of stroke, accounting for almost 80% of all strokes. It is caused by a clot or other blockage within an artery leading to the brain. Transient Ischaemic Attack (TIA) is a minor stroke which has usually rectifies itself within 24 hours. It is a strong risk factor of possible further stroke (Sauerbeck, 2006).

Haemorrhagic stroke: It is less common, accounting for 20% of all strokes. It caused by bleeding into brain tissue when a blood vessel bursts (Sauerbeck, 2006).

Burden of Stroke

National

Stroke is the third most common cause of death in the United Kingdom, and the largest single cause of severe disability (Saleem *et al.*, 2008). There are over 900,000 people who have had a stroke living in England (prevalence approximately 1.5%). In the United Kingdom, the prevalence of stroke in people aged over 75 years is about 8% for women and 9% for men (Kwain, 2001). Each year approximately 110,000 people in England suffer from a stroke. Thirty three percent will recover fully with no long-term ill effects, 33% may experience permanent disability and 33% will die. Stroke has a 2.2 higher incidence in people of African or Caribbean origin, and men of South Asian origin are also disproportionately susceptible to stroke. Bangladeshi and Pakistani women are reported to have relatively high levels of stroke. One in ten strokes occurs in people under the age of 55 years (Department of Health, 2007). Stroke is a life changing event that affects not only the person who may be disabled, but the entire family and other caregivers as well (Goldstein *et al.*, 2006). Its human and economic toll is staggering. Stroke costs the NHS and the economy about £7 billion a year: £2.8 billion in direct costs to the NHS, £2.4 billion of informal care costs (e.g. the costs of home nursing borne by patients' families) and £1.8 billion in income lost to productivity and disability (Department of Health, 2007). The NHS in London spent £136 million on stroke care in 2006/2007. By 2010 the Government aims to reduce the death rate from Stroke, CHD and related diseases in people under 75 by at least 40% (Saleem *et al.*, 2008).

Local

Stroke is one of the major causes of death from circulatory disease in Haringey. Deaths from stroke in Haringey are higher than for England as a whole. In 2004-2006, there were a total number of 196 deaths from stroke of these 45 people (23%) under the age of 75 died of potential preventable stroke. In Haringey, there has been a significant increase in Under 75 years stroke standardised mortality rate (SMR) from 2002 to 2006 (Figure 1). In 2006/2007, 270 people were admitted to hospital with stroke (Secondary Uses Service (SUS)). The rate of stroke admissions from 2001 to 2007 is shown in Figure 2 below. Haringey's GPs suggests that there are

2317 people living with stroke in Haringey in March 2008 – an overall prevalence of 0.84%. This is likely to be an under- estimate due to incompleteness of reporting known to be associated with the Quality Outcomes Framework (QOF) data in Haringey. Slight variations in stroke prevalence appear to occur across the geographical areas of the Borough; the highest prevalence being in the Central and North East Localities (0.9%) and lowest in the West (0.86%) and South East (0.69%). The London Observatory suggests that under diagnosis exists in Haringey, only 61% (the lowest in London) of the expected cases diagnosed and managed. High stroke death rates compared with London and England, particularly in Under 75s were recorded in 2004-06 (Office of National Statistics).

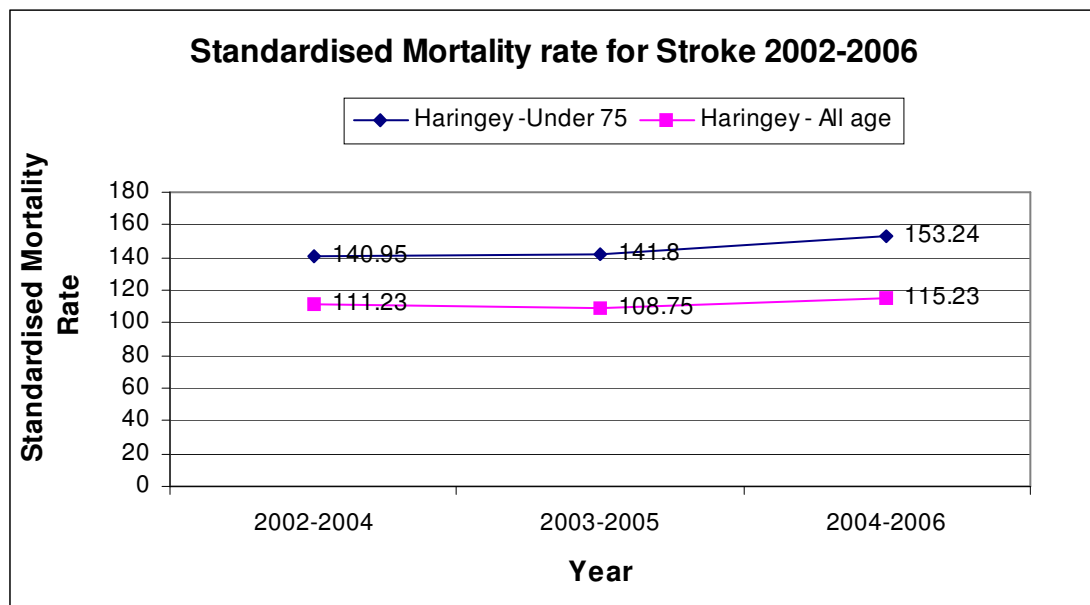


Figure 1: Stroke Standardised Mortality Rate (SMR) in Haringey, 2002-2006
Source: Office of National Statistics.

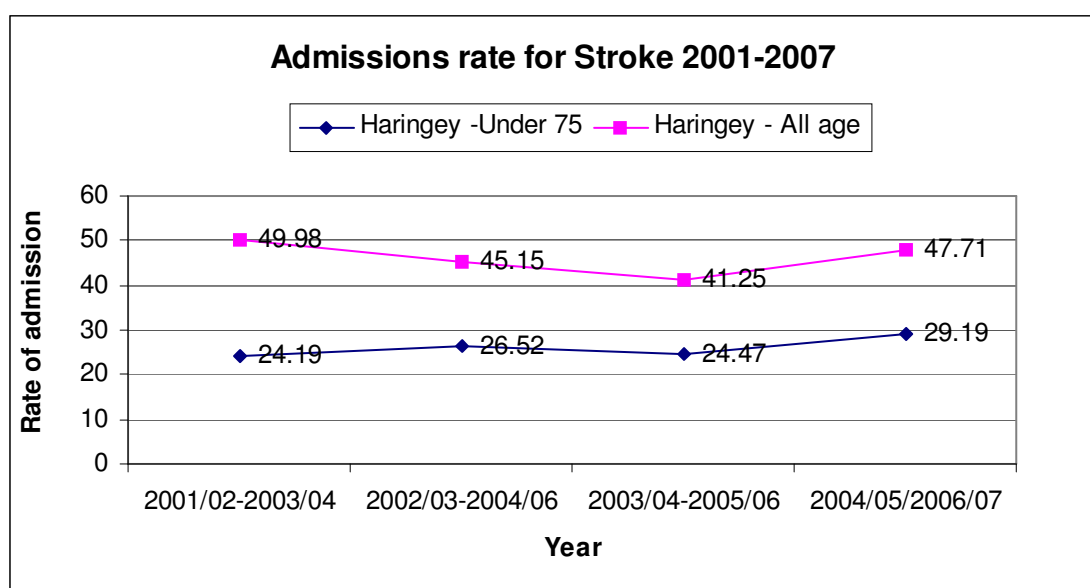


Figure 2: Stroke Admissions rate in Haringey, 2001-2007
Source: Secondary Uses Service (SUS)

Risk Factors for Stroke

The risk for stroke is based on heredity, natural processes, and lifestyle. Many risk factors for stroke can be changed or managed (i.e modifiable) such as lifestyle factors which include smoking, obesity, poor diet, physical activity and excessive alcohol consumption, and health conditions such as previous stroke or TIA, diabetes, hypertension (high blood pressure) and cardiac diseases (such as atrial fibrillation, infective endocarditis, mitral stenosis, recent large MI, left ventricular hypertrophy). Many of these conditions are associated with lifestyle factors. The relative risk of these conditions (Table 1) suggests that the identification and management of present health conditions should be vital to stroke prevention strategies.

Others that relate to hereditary or natural processes cannot be changed (i.e non-modifiable) which include age, ethnic group and gender. Both paternal and maternal history of stroke has been associated with an increased stroke risk. This increased risk could be mediated through a variety of mechanisms, including (1) genetic heritability of stroke risk factors, (2) the inheritance of susceptibility to the effects of such risk factors, (3) familial sharing of cultural/environmental and lifestyle factors, and (4) the interaction between genetic and environmental factors (Liao *et al.*, 1997).

Table 1: Stroke risk factors and their relative risk

Risk Factor	Relative Risk
Age (per decade)	2.2
Male gender	1.4
BP (per 10mmHg diastolic)	2.3
BP ($\geq$ 160mmHg systolic)	2.5 - 4
Atrial fibrillation	5
Diabetes Mellitus	2 -3
Ischaemic Heart Disease	2.5
Heart Failure	2.5 – 4.4
Peripheral vascular disease	2
Previous TIA	7
Previous stroke	9 - 15
Warfin treatment	7 - 10
Smoking	2
Alcohol (> 30 units/week)	2.5 - 4
Family History	1.4 - 2

Source: Kwain, 2001

The Stroke Pathway

- Population-level prevention
 - Health education, social marketing and life style modification
- Primary care prevention: management of risk factors in individuals – Hypertension, cholesterol, obesity, atrial fibrillation, alcohol, diabetes
- Rapid access to Health Care Transient Ischaemic Attack (TIA) management, Acute stroke management – including timely CT scans and thrombolysis
- Acute rehabilitation in a stroke centre
- Secondary prevention
- Specialist Rehabilitation in the community
- Care and support

Health inequalities in Stroke

Exworthy et al (2003) defined health inequalities as systematic, structural differences in health status between and within social groups within the population. These groups can be defined by socio-economic status, geographical area, age, disability, gender or ethnic group.

The differences in stroke risk and outcome in groups defined by socio-economic status, geographical area, age, disability, gender or ethnic group is demonstratable.

Age:

Stroke incidence is clearly associated with advancing age (Chong and Sacco, 2005). People who are over 65 years of age are most at risk from having strokes, but they can affect people of any age, including children. The risk of stroke doubles for each successive decade after the age of 55 years (Goldstein et al., 2006). Haringey has an aging population. The number of people aged 65 years plus in Haringey is projected to rise from 20,400 in 2008 to 23,300 in 2025 (Greater London Authority, 2006).

Ethnic Group:

Stroke is an important cause of mortality and morbidity in Blacks worldwide. People of Black ethnic origin are at increased risk of having a stroke, and the number of people affected by the condition is higher among this ethnic group than the white ethnic group (Bravata et al., 2005). This is because of higher prevalence or severity of stroke risk factors (smoking and obesity) in blacks, biological differences between blacks and whites, and lower socioeconomic status in blacks compared with whites. People of Black ethnic origin have a genetic predisposition (a natural tendency) to developing diabetes and heart disease, which are two conditions that can cause strokes (Gillum, 1999). Stroke also occurs at a higher rate than the general population in some other ethnic groups such as Bangladeshi and Pakistani ethnic origin and

whit Irish men (Health Survey for England, 2004). Given the ethnic diversity of Haringey's population this is very important for local preventive strategies.

Gender:

Stroke is more prevalent in men than in women (Goldstein *et al.*, 2006). Men also generally have higher age-specific stroke incidence rates than do women; exceptions are in 35- to 44-year old and in those of 85 years of age groups in which women have slightly greater age-specific stroke incidence than do men (Sacco *et al.*, 1998). Factors such as oral contraceptive (OC) use and pregnancy contribute to the increased risk of stroke in young women (Kittner *et al.*, 1997) and the earlier cardiac-related deaths of men with cardiovascular disease may contribute to the relatively greater risk of stroke in older women (Goldstein *et al.*, 2006).

Geographical area:

Area deprivation is associated with a higher incidence of stroke, increased rate of recurrence and early first stroke (Aslanyan *et al.*, 2003).

Disability:

Having a disability irrespective of independent living by an individual results in a delay in presenting for treatment in the event of stroke (Smith *et al.*, 1998).

Socio-economic Status and Stroke:

The phenomenon that health is not evenly distributed over the different socioeconomic classes has been well established in many studies (Cox *et al.*, 2006). In several studies a gradient appears across the social spectrum, rather than a threshold effect, suggesting that it is the position within the social hierarchy that is important for health (Macintyre, 1997). General factors that affect health have been categorised at the individual level to include material (e.g income and possessions), behavioural (e.g. diet, smoking and exercise) and psychosocial factors (percieved inequality, stress). Socioeconomic status (SES) (as defined by occupational position, income or education) is an important and powerful determinant of stroke incidence and outcomes (Cox *et al.*, 2006). Decreasing socioeconomic status is associated with increasing stroke incidence and stroke mortality. People from lower socioeconomic groups have a substantially higher risk of stroke. Higher stroke mortality rates of lower socioeconomic groups are probably related to several factors (Kapral *et al.*, 2002). As a general rule, disadvantaged communities are more frequently exposed to lifestyle factors for the risk of stroke, such as excessive alcohol consumption, smoking and obesity (Anton *et al.*, 1998), which result in conditions such as hypertension and diabetes.

Haringey Population Profile

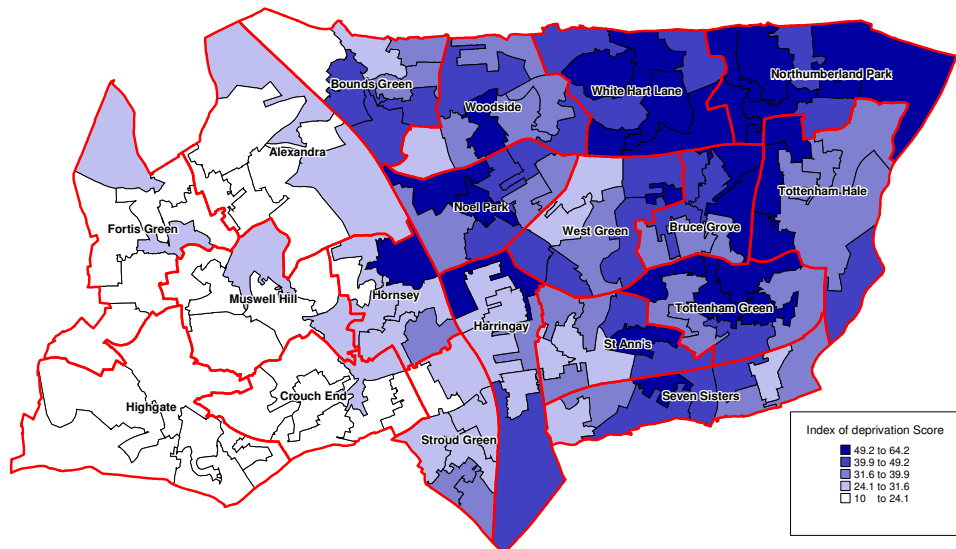


Figure 3: Index of deprivation score by lower super output area.

Source: Department and Local Government, Indices of Deprivation, 2007 of Communities

Socioeconomic deprivation has a significant impact on health. Inequalities in experience of health occur in Haringey and this can be explained by difference in socioeconomic status (using index of deprivation) in different parts of Haringey (Figure 3).

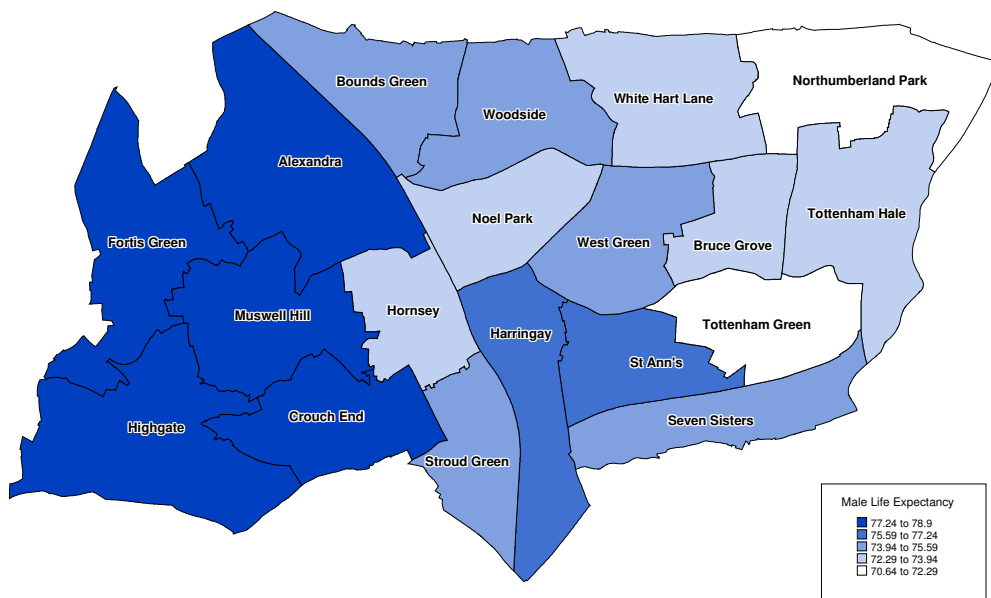


Figure 4: Male Life Expectancy 2002-2006
Source: London Health Observatory, 2002-2006 data

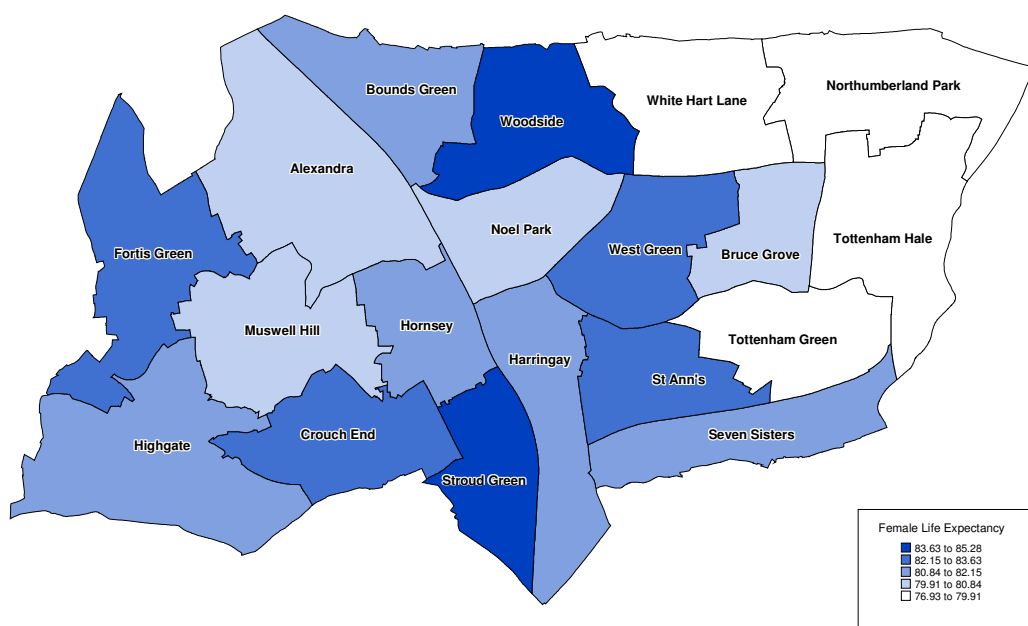


Figure 5: Female Life Expectancy 2002-2006
Source: London Health Observatory, 2002-2006 data

Generally, the more deprived wards (as measured by the Index of Multiple Deprivation) have a lower male life expectancy than the more affluent wards. At the two extremes, male life expectancy in Tottenham Green (70.6 years) is over 8 years lower than male life expectancy in Alexandra (78.9 years) (Figure 4). The gap in

female life expectancy between the boroughs with the highest and lowest life expectancy is 6.8 years in 2002-2006 (Figure 5).

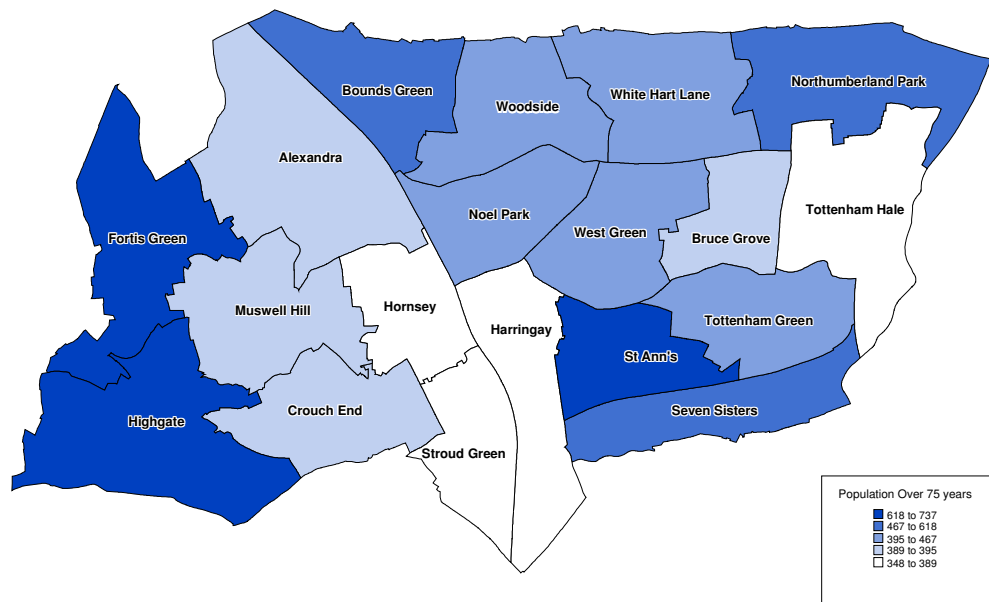


Figure 6: Population Over 75 years
Source: Greater London Authority, 2007

Residents in Highgate, Fortis Green and St Ann's have the highest number of people under the 75 years. Residents in Tottenham Hale, Hornsey, Stroud Green and Harringay have the lowest number of people under the 75 years.

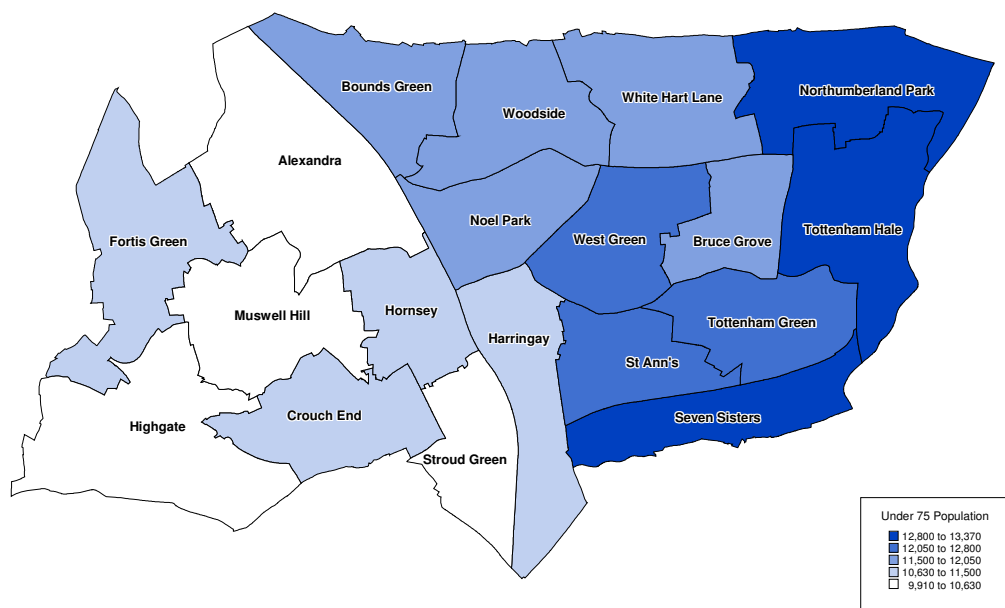


Figure 7: Population Under 75

Source: Greater London Authority, 2007

Residents in Tottenham Hale, Northumberland Park and Seven Sisters have the highest number of people under the 75 years. Alexandra, Highgate, Muswell Hill and Stroud Green have the lowest number of people under the 75 years. Tottenham Hale and Northumberland are in top fifth of wards for under 75 years population and in the fifth of the wards with the highest under 75 mortality from stroke.

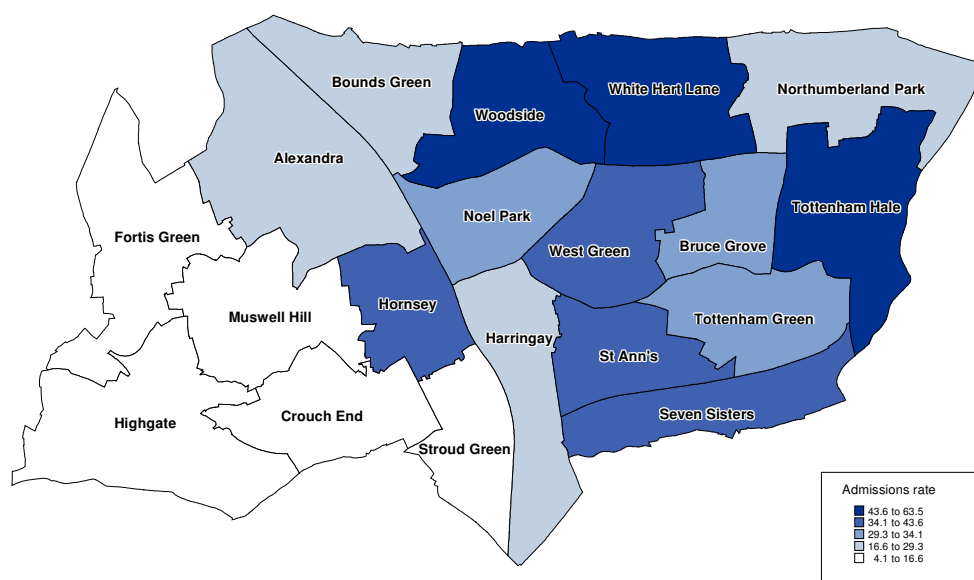


Figure 8: Under 75 years stroke admissions rate. Source: SUS

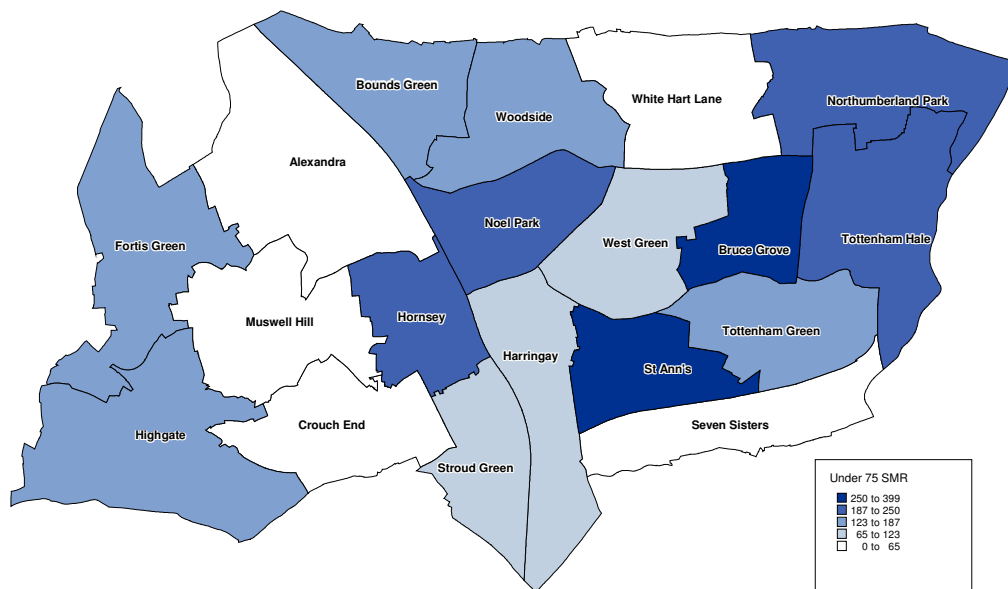


Figure 9: Under 75 years stroke standard mortality ratio (SMR)

Source: Office of National Statistics

Figure 8 and 9 show rate of hospital admissions and deaths from stroke in those under 75 years of age in Haringey. There are geographic differences in the mortality and incidence of stroke in Haringey. In 2004/05 to 2006/07, hospital admissions for stroke those under 75 years of age in Haringey occurred at a rate of 29.19 per 100,000. Higher rates of stroke admissions were observed in the wards of Tottenham Hale, Woodside and White Hart Lane. Lower rates were observed in Muswell Hill and Stroud Green. Stroke deaths rates (SMR) for residents less than 75 years of age in 2004-06 was 153, 50% higher than expected. Higher than expected mortality rates from stroke (in residents aged less than 75 years) were observed in almost all areas in the borough, particularly St Ann's and Bruce Green wards.

The Stroke death rate and hospital admission give an important pointer of the size of the problem, but underestimates the true incidence in the community. Some people are surviving with mild or slowly developing stroke, for which they do not go to the hospital for treatment. For example, White Hart Lane has relatively high under 75 years stroke admissions rate, but a fairly low stroke mortality compared to other wards, whereas Northumberland is in middle fifth of wards for under 75 years stroke admissions rate but in the fifth of the wards with the highest mortality. Hornsey has high rates of under 75 years stroke admissions and mortality from stroke. These differences could reveal not just differences in wards in the treatment of acute stroke by health services but also differences in ward populations' ability to identify and take effective timely action.

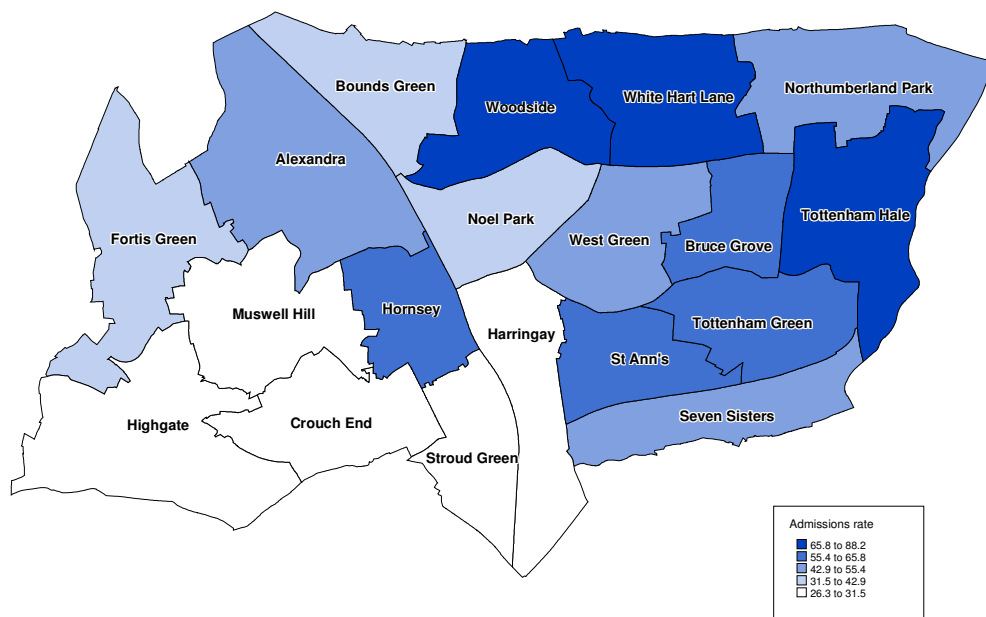


Figure 10: All age stroke admissions rate
Source: Secondary Use Service (SUS)

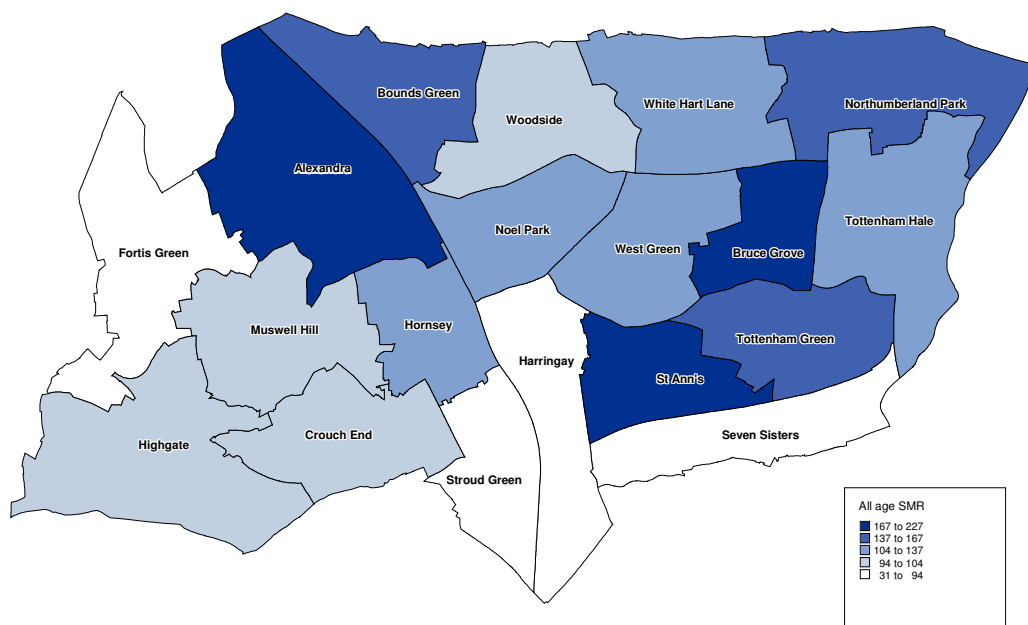


Figure 11: All age stroke standard mortality ratio (SMR)
Source: Office of National Statistics

Figure 10 and 11 show rate of hospital admissions and deaths rates from stroke for all ages in Haringey. There are geographic differences in the mortality and incidence of stroke in Haringey. In 2004/05 to 2006/07, hospital admissions for all age stroke in Haringey occurred at a rate of 47.7 per 100,000. Higher rates of stroke admissions were observed in the wards of Tottenham Hale, Woodside and White Hart Lane. Lower rates were observed in Muswell Hill and Stroud Green. Stroke death rates for residents of all age in 2004-06 was 115, 15% higher than expected. Higher than expected mortality rates from stroke for all ages were observed in almost all areas in the borough, particularly in St Ann's, Bruce Green and Alexandra wards.

GPs recorded prevalence (0.84%) of stroke in Haringey (Figure 12). According to Eastern Region Public Health Observatory (ERPHO) the expected prevalence of stroke in Haringey is 2.3%. GPs are treating only about 37% of those estimated to have stroke. There is therefore serious under recording of stroke in GP registers. The difference could be explained by the fact that the estimated prevalence is the number of people who have had stroke at any time while GPs rely only on presented stroke in primary care. The fraction of people with stroke, in particular people with no apparent, lasting disability could be overlooked. There is evidence of differences between ethnic groups and socioeconomic status in timely recognition of stroke, seeking help early and early arrival at the hospital (Ratner *et al.*, 2006). Stroke awareness campaigns should focus on ethnic minorities and disadvantaged population to promote early recognition of stroke signs and prompt access to healthcare services.

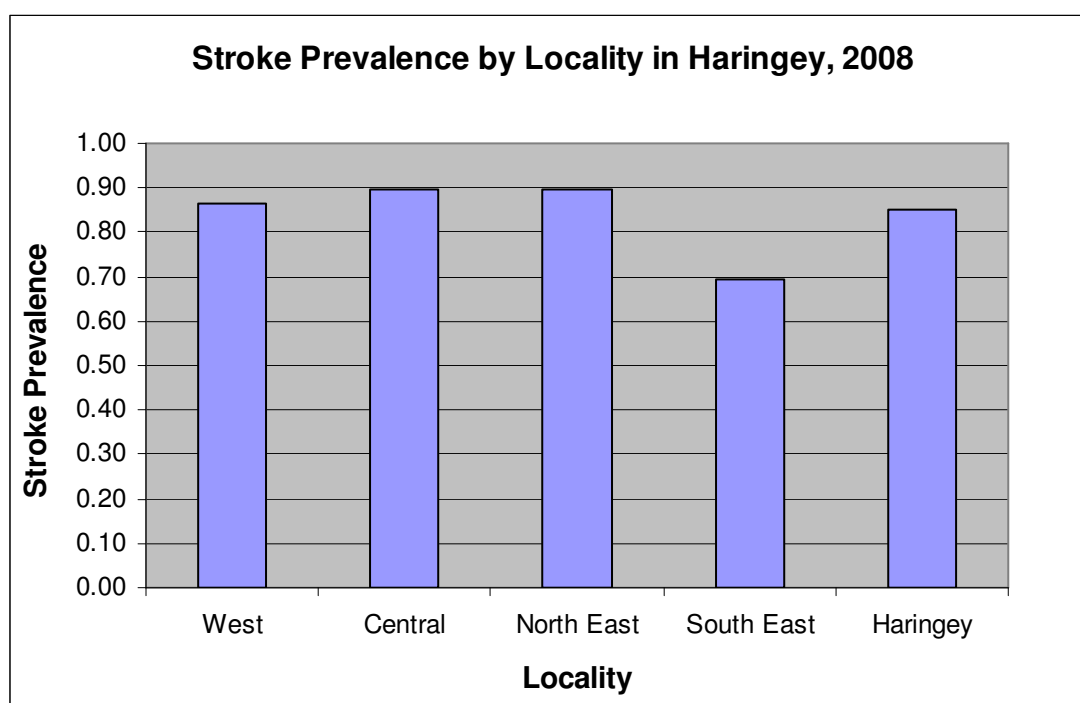


Figure 12: Stroke Prevalence by Locality in Haringey (2008)

Source: Quality Outcomes and Framework data (March, 2008)

Prevention of Stroke in Haringey

Stroke is a preventable condition. Kwain (2001) highlighted that 50% of stroke deaths in patients aged less than 70 years might be preventable by use of existing knowledge through primary care and population level preventive strategies. There are two types of stroke prevention: Primary prevention – prevention before first event and Secondary stroke prevention – prevention for recurrent strokes.

Primary prevention

According to Lynch *et al* (2005), the management of risk factors leads to significant reductions in the occurrence of both first and recurrent strokes. The Stroke Association highlighted that 40% of strokes could be prevented with the monitoring and treatment of Hypertension (high blood pressure). Kwain (2001) highlighted that modifiable risk factors for stroke in the general population such as hypertension, smoking, arterial fibrillation and obesity should be the target for primary prevention strategies. Evidence shows that the identification and management of underlying stroke risk factors in primary care varies across general practices in Haringey (Table 2).

Table 2: Management of stroke risk factors in primary care in Haringey in 2006/2007

Performance of GP practices in Haringey in identification and management of stroke related risk factors			
	Haringey	General Practice Variance	London
Patients on Hypertensive register	9.5%	2.5% - 17.0%	10.3%
Hypertensive patients blood pressure checked < 9 months	91.5%	76.4% - 100%	90.3%
Patients that are obese (BMI 30+)	7%	2.2% - 18.0%	6.5%
Patients that smoke	25.1%	8.6% - 27.5%	23.4%
Patients on Arterial Fibrillation Register	0.5%	0% - 2.0%	0.8%
Arterial Fibrillation treated with anticoagulant/platelets	88.0%	0% - 100%	87.8%

Source: London Health Observatory data (2006/2007)

Secondary prevention

Due to the considerable risk of a reoccurrence of a stroke in persons with major stroke or Transient Ischaemic Attack (TIA), monitoring and treatment after first event of stroke are important in preventing further stroke (i.e. secondary prevention). Following discharge from hospital, the management and care of stroke patients is primarily undertaken through the General Practices. The performance of GPs in managing stroke patients (secondary prevention) is measured through the Quality and Outcomes Framework. The Quality and Outcomes Framework (QOF) is an innovative way to reward GPs for providing good quality care for their patients and a way of funding the work needed to improve the health care delivered to people

across the United Kingdom. Stroke patients in Haringey seem to be well managed by their GP through regular blood pressure and cholesterol monitoring, provision of anti blood thinning/ thickening treatments. However, evidence shows that the performance of general practices varies across Haringey (Table 3).

Table 3: Management of stroke in Haringey in 2006/2007

Management of stroke and TIA in Haringey 2006/7			
	Haringey	General Practice variance across Haringey	London
Patients on stroke register	0.84%	0.1%-2.0%	1.0%
Stroke Patients BP Check in past 15 months	93.8%	82.4% - 100%	94.4%
Stroke Patients BP 150/190 or less	81.2%	35.7-100%	81.8%
Stroke Patients cholesterol checked in past 15 months	82.8%	64.3-100%	84.9%
Stroke Patients with cholesterol <5.0	61.9%	25-100%	63.6%
Stroke Patient with anti platelet /anti coagulant	93.2%	50-100%	93.7%
Stroke Patients given flu immunisation	72.2%	35.7-100%	74.6%

Source: London Health Observatory data (2006/2007)

Given the relative cost of stroke prevention interventions (Table 4), population level prevention and primary care prevention seem to be the effective methods of reducing risk of stroke.

Table 4: Cost of interventions to prevent one stroke per year

Interventions	Cost to Health Services (£)
Quit smoking by yourself	Nil
Quit smoking with NRT	12,000
Aspirin for those at increased risk of stroke	600
Treatment of High Blood Pressure	1000-7000
Low dose anticoagulation for atrial fibrillation	9000
Statins (for treating high blood cholesterol)	20,000-25,000
Carotid surgery (for those at high risk of stroke)	162,000-232,000

Source: London Health Observatory

Conclusion

Stroke is a serious but potentially preventable public health problem in Haringey. Understanding of the risk factors, local burden of stroke and relative cost of stroke prevention health services is essential in order to provide preventive primary care services. The variation in identification and management of underlying stroke risk factors in primary care across general practices in Haringey proves to be significant.

The North Central London Cardiac Network (NCLCN) will take the strategic lead in scoping local stroke services to assess the level of service provision and to identify any service gaps across the sector, across Barnet, Camden, Enfield, Haringey and Islington. The initial focus of the work from the NCLCN will be on acute stroke care provision; however, work will also be carried out in terms of stroke prevention.

Local initiatives are focusing on:

- Commissioning awareness campaigns aiming to promote early recognition of stroke signs and prompt presentation to healthcare services;
- Developing strategies to improve stroke registers in primary care;
- Vascular risk checks to identify people who are at risk for stroke and apply evidence-based intervention measures to reduce morbidity and mortality related to stroke
- Strengthening stroke specialist rehabilitation services in the community

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