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Longer survival likely to be reason for increased numbers with diabetes, rather than increased incidence

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Overall incidence of type 2 diabetes has stabilised over recent years, according to a new study published in *Diabetologia* (the journal of the European Association for the Study of Diabetes), whilst mortality has declined, suggesting that increasing prevalence of the disease within the population may be attributed not to increasing numbers but to longer survival of patients with diabetes. The findings were not equal across the population, however: significant differences are noted based on gender, age, and socioeconomic status.

Prevalence of type 2 diabetes is increasing in all high-income countries, with significant health and economic implications. The International Diabetes Federation estimates that USD 156 billion was spent on diabetes health care in 2015, and that this is likely to rise to USD 174 billion by 2040. In Scotland, the prevalence of all types of diabetes has increased from 3.2% in 2004 to 5.1% in 2013. The distribution of demographic characteristics across the country is stable, so trends in prevalence are influenced by the balance between changes in incidence and mortality. The authors suggest that an understanding of these trends is necessary as new approaches in prevention and treatment are planned, so that interventions can be targeted to those sections of the population that are most at risk.

The study focused on trends between 2004 and 2013 in Scotland, and was conducted by Dr Stephanie Read, University of Edinburgh, UK,

with colleagues from various Scottish universities and NHS (National Health Service) organisations, on behalf of the Scottish Diabetes Research Network. Data regarding diabetes diagnosis, population estimates, and numbers of deaths each year grouped by age, sex, and deciles of SIMD (Scottish Index of Multiple Deprivation) were obtained from the Scottish Care Information - Diabetes database and National Records Scotland. Incidence was considered as events per 1000 person years. Trends in incidence and mortality were analysed across the age, sex and SIMD groupings. The age range considered was 39-90.

The study found that incidence rates over the whole study period decreased for older men and women, increased slightly for younger women, and increased for younger men, although the incidence rate for younger men declined after 2009. Whilst incidence declined over all socioeconomic groups the decline was slower in the more deprived groups and from 2010 the incidence in the most deprived groups appeared to increase, which the authors suggest may lead to widening inequality in diabetes incidence. Incidence in men was higher than for women in all age groups.

The authors suggest that incidence rates may have stabilised partly because of a reducing pool of undiagnosed cases. This comes after marked increases in incidence during the 1990s and 2000s following changes in the diagnostic criteria made by the World Health Organisation in 1998, and an intensification of diagnostic activities in these decades. They also suggest that stabilisation of the incidence of adult obesity, an established risk factor for type 2 diabetes, will have helped stabilise diabetes incidence rates. Other European studies have also noted a stabilisation and/or decline in incidence of type 2 diabetes.

Overall, standardised mortality rates declined by 11.5% for men and 15.7% for women during the study period, with similar declines across all ages and deprivation groups. Mortality rates were higher in the most

deprived groups compared to the least deprived groups (We are only able to provide estimates for the most deprived and least deprived men and women aged 65 years, as shown in figure 2 in the full paper.

The finding that mortality rates for people with type 2 diabetes had declined has been mirrored in previous studies, including in Denmark, Australia and the USA. The authors note, however, that the decline in mortality might not be due to earlier diagnosis or improved diabetes care. Whilst in 2014 the Scottish Diabetes Survey showed that during the study period there had been an increase in the numbers of people showing good diabetes control (as indicated by glycated haemoglobin [HbA1c] below 7.5% (58 mmol/mol)), mortality rates for people with type 2 diabetes remained 40% and 80% higher, for men and women respectively, than for those without diabetes. The authors recommend further research to identify the relative contributions of better treatment and better survival rates for people with type 2 diabetes.

The authors conclude: "Despite improved mortality rates, type 2 diabetes confers an excess risk of death compared with the non-diabetic population...there is still scope to address the increased mortality associated with diabetes."

They add: "Major inequalities by age, sex and socioeconomic status in type 2 diabetes incidence and mortality indicate that effective approaches to treatment and control will need to address existing inequalities."

More information: Stephanie H. Read et al. Trends in type 2 diabetes incidence and mortality in Scotland between 2004 and 2013, *Diabetologia* (2016). DOI: 10.1007/s00125-016-4054-9