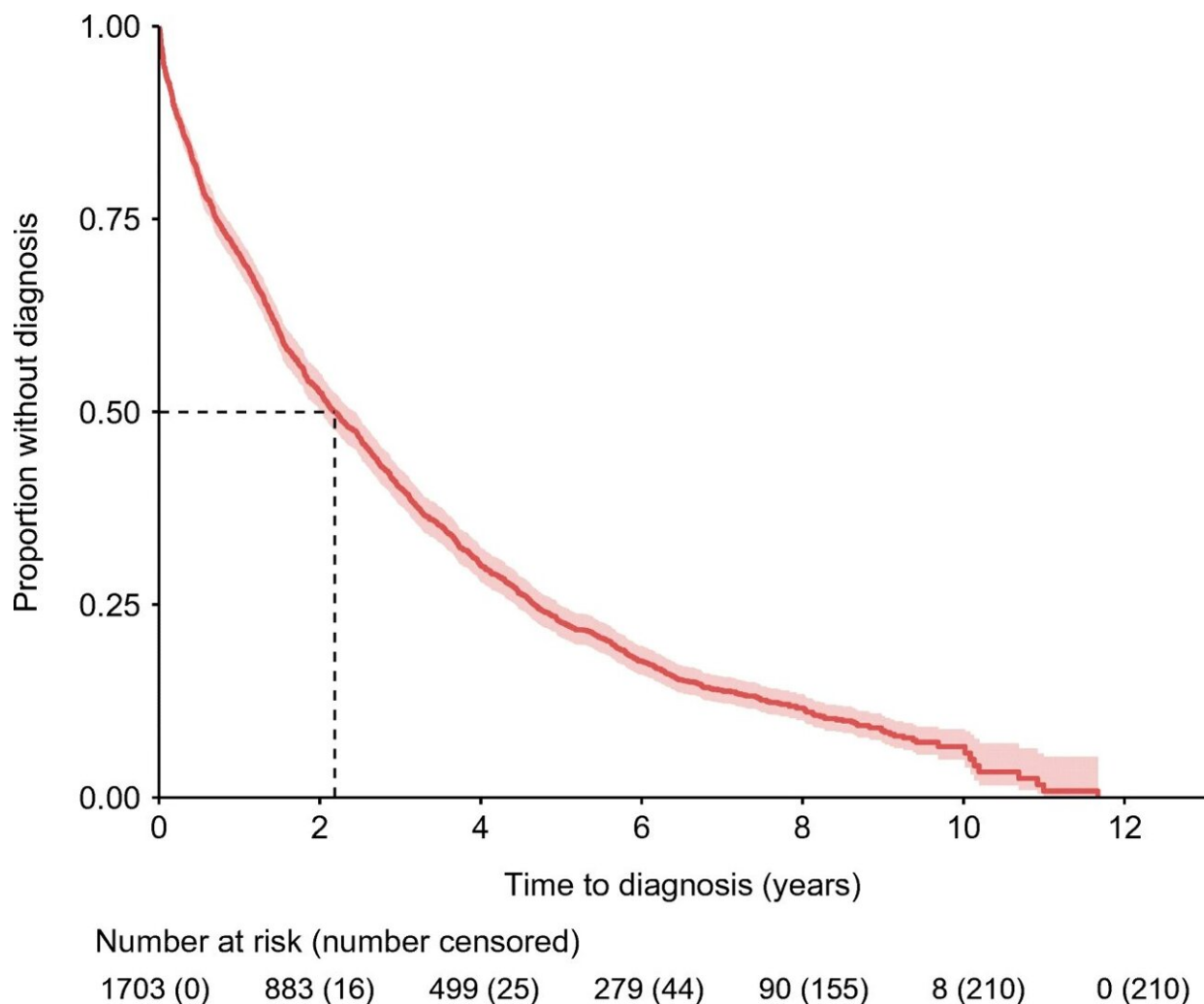


Screening all older adults aged 40-70 years would find undiagnosed type 2 diabetes cases at least two years earlier

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Kaplan–Meier plot of time to diagnosis for those with undiagnosed diabetes at enrolment (n=1703). Lighter red shading: 95% CI; dashed black line: median

time to diagnosis (2.2 years). Credit: *Diabetologia* (2022). DOI: 10.1007/s00125-022-05824-0

Using a standard diabetes test to screen all UK adults aged 40-70 years would find undiagnosed cases of type 2 diabetes more than two years earlier, and help those people begin treatment at a much earlier stage in their condition. The study is published in *Diabetologia* and is by Dr. Katie Young, Dr. John Dennis and Dr. Nicholas Thomas, University of Exeter, UK, and colleagues.

This is the first study to use real-world [clinical data](#) (from the UK Biobank) to determine by how much diabetes diagnoses would be brought forward in a large population cohort by the implementation of a diabetes screening program.

The authors believe the potential for finding undiagnosed cases earlier could be even higher than their study suggests, since the UK Biobank population is healthier than the general population, and ethnic minorities such as Black and South Asian people are underrepresented in the UK Biobank cohort and have higher rates of diabetes.

The authors studied UK Biobank participants aged 40–70 years who had their HbA1c (glycated hemoglobin) measured at enrolment. HbA1c reflects a person's blood sugar control over the past 2-3 months, and is more widely used and convenient than the oral glucose tolerance test (another commonly used method). HbA1c is expressed as an absolute value (mmol/mol) or as a percentage, with a cut-off of 48 mmol/mol or higher (6.5% or higher) usually used to diagnose diabetes.

The participants' HbA1c results were not fed back to either participants or their doctors. The researchers then analyzed the 179,923 participants

with linked health care data, and identified those with a pre-existing diabetes diagnosis (n=13,077, 7.3%). Among the remaining participants (n=166,846) without a diabetes diagnosis, 1.0% (1,703) had undiagnosed diabetes based on their HbA1c at enrolment. These participants added an extra 13% of cases to the 13,077 participants with a diabetes diagnosis.

There are approximately 25 million adults aged 40-70 years living in the UK today without a diagnosis of diabetes, so the authors' estimate of 1.0% with undiagnosed diabetes suggests that up to 250,000 adults in this age group have undiagnosed diabetes which could be detected by HbA1c-based screening. However, this is likely to be an underestimate for the reasons described above and below. Diabetes UK estimates that there are 850,000 people living with undiagnosed diabetes in the UK.

In this study, the median time to clinical diagnosis for those with undiagnosed diabetes was 2.2 years, with a median HbA1c at clinical diagnosis of 58.2 mmol/mol (7.5%). By 10 years of follow-up, 88% of those 1,703 undiagnosed cases had received a clinical diagnosis.

Female participants with lower HbA1c and BMI measurements at enrolment experienced the longest delay to clinical diagnosis—this suggests that clinicians are currently more likely to screen men or individuals with obesity and less likely to screen women or individuals with a BMI below the obese range (less than 30 kg/m²).

Given the known associations between both non-white ethnicity and higher social deprivation and increased risk of diabetes, the authors say the prevalence of undiagnosed diabetes in this age group in the wider population is likely to be higher than that observed in UK Biobank (1.0%); studies in other UK cohorts give estimates of 2.8–4.5%.

In addition, as UK Biobank participants are likely to be more health-conscious than average, similar to volunteers in other research studies,

they may have more frequent health care appointments and so may be diagnosed with diabetes earlier. This suggests that screening initiatives in the 'normal' [general population](#) of adults aged 40-70 years could identify even more cases of undiagnosed diabetes and reduce the time to diagnosis even more than the 2.2 years seen in this study.

However, they also add that increases in opportunistic diabetes testing during and after the study period may mean that any screening initiative implemented today would provide less substantial benefits than the 2.2 year improvement observed in this study, as supported by the reduction in time to diagnosis seen in the study between recruitment in 2008 and recruitment in 2010.

However, other issues have hindered diabetes testing recently, including the COVID-19 pandemic which resulted in both fewer HbA1c tests and delays in diagnosis of type 2 diabetes. Health care spending in the UK is under intense pressure as economic circumstances worsen. The authors say that all this means "diabetes screening initiatives might be more important than ever to prevent long delays in diagnosis".

The authors also highlight that unless ways to identify people at risk of diabetes (diabetes risk scores) are improved, population-based screening with HbA1c is the only way to reliably identify undiagnosed diabetes. Currently in England, the NHS Health Check for adults aged 40-74 years old includes screening for diabetes for those at 'high risk' of diabetes based on the Leicester Risk Score.

However, as highlighted in this study, these risk scores do not identify all patients with undiagnosed diabetes, and do not perform as well in those people without obesity, and so there is a need for increased awareness among health care professionals of the importance of type 2 diabetes checks in people without obesity. On this, they say: "However, the cost-effectiveness of this population-wide screening of older adults merits

further assessment and will vary based on the current levels of HbA1c testing in the underlying population."

The authors conclude, "Our study provides the first population-based estimate of the impact of HbA1c-based screening on reducing the time to diabetes diagnosis. In UK Biobank, 1.0% of those aged 40–70 years had undiagnosed diabetes, and population-level HbA1c screening could have reduced the time to diabetes diagnosis in this group by a median of 2.2 years. Earlier [diagnosis](#) would allow earlier intervention with the potential to reduce the risk of [diabetes](#) complications, but this requires further evaluation."

More information: Katherine G. Young et al, The impact of population-level HbA1c screening on reducing diabetes diagnostic delay in middle-aged adults: a UK Biobank analysis, *Diabetologia* (2022). [DOI: 10.1007/s00125-022-05824-0](#)

Provided by Diabetologia

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