

Are diabetes and blood sugar control associated with eye disease development?

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Background

- Projected 300m new diabetes diagnoses in next 20 year globally
- In England, prevalence of diabetes increased from 2.8 to 6.8% among working age people during 2000s
- Worrying for ophthalmology because of the link to eye disease
 - Established pathways to diabetic retinopathy and diabetic macular edema
 - Epidemiological evidence mixed for glaucoma, macular degeneration and cataract
- Evidence the blood glycaemic control can slow progression to eye disease, but a lack of nationally representative samples

Research question

Is diabetes status (absence, controlled, uncontrolled or undiagnosed) associated with the development of eye diseases in older adults?



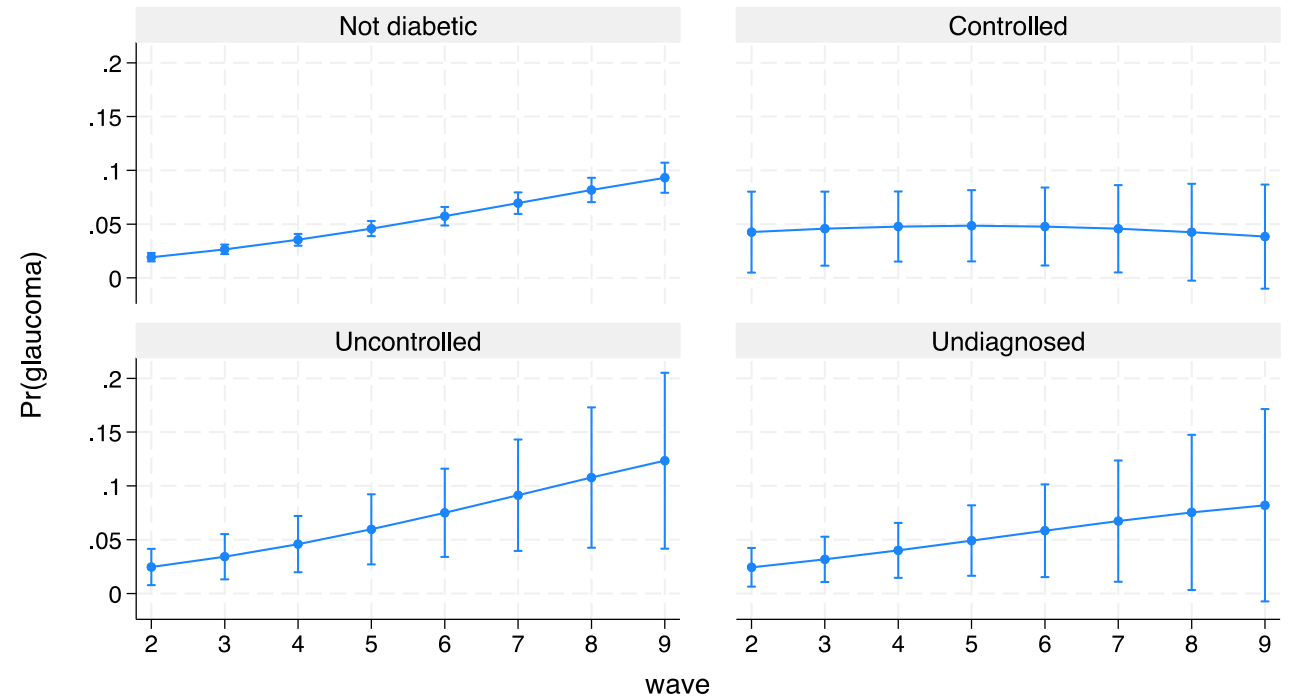
Data and measures

- English Longitudinal Study of Ageing (ELSA), wave 2 to 9 (2004/05-2018/19)
- 5,672 core members with blood sample at wave 2 and eye disease free
- Self-reported doctor or optician diagnosed glaucoma, diabetic eye disease, macular degeneration and cataracts
- Self-reported doctor diagnosed diabetes
- Glycated haemoglobin level above 6.5% from blood analytes
 - Categorised as non-diabetic, controlled, uncontrolled and undiagnosed

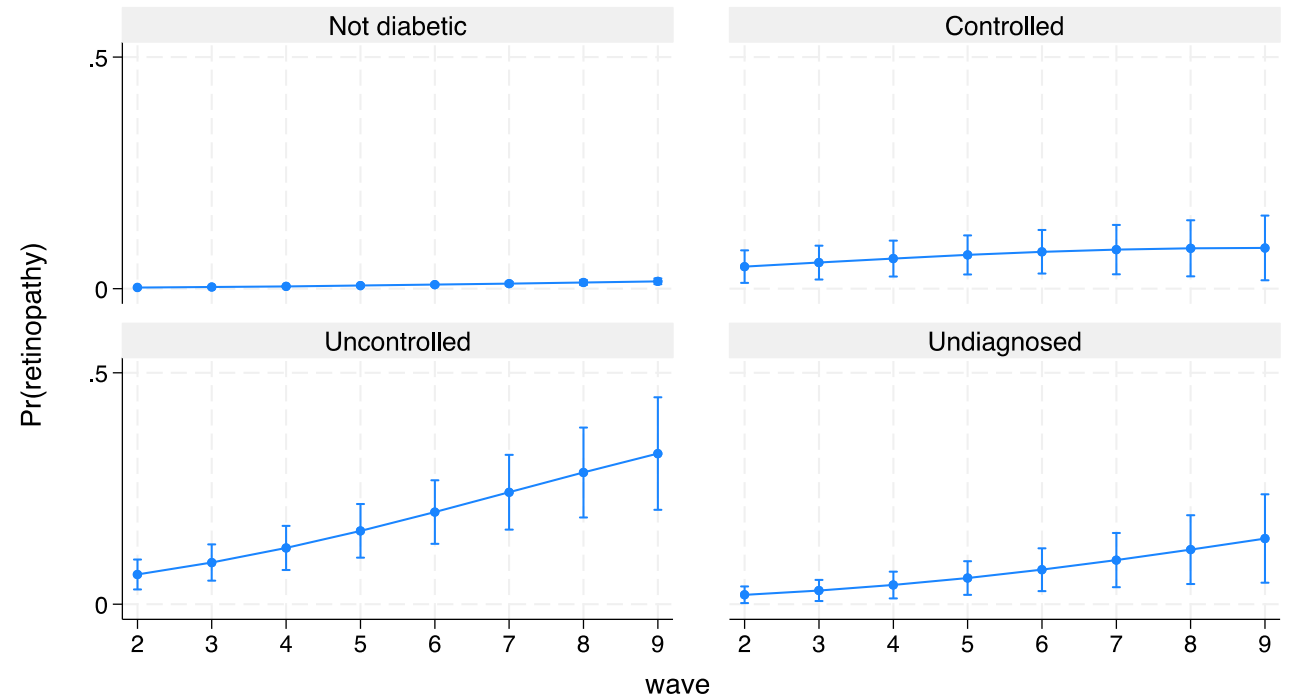
Modelling strategy

- Logistic regression with standard errors clustered within respondents for each eye disease between waves 2 to 9
- Covariates measured at wave 2: physical activity, BMI, age and sex
- Interaction terms between diabetes status and survey wave
- Adjusted for sample weights
- Multiple imputation applied for item non-response at wave 2
- Approx. 32,000 person-waves for 6,000 respondents per model

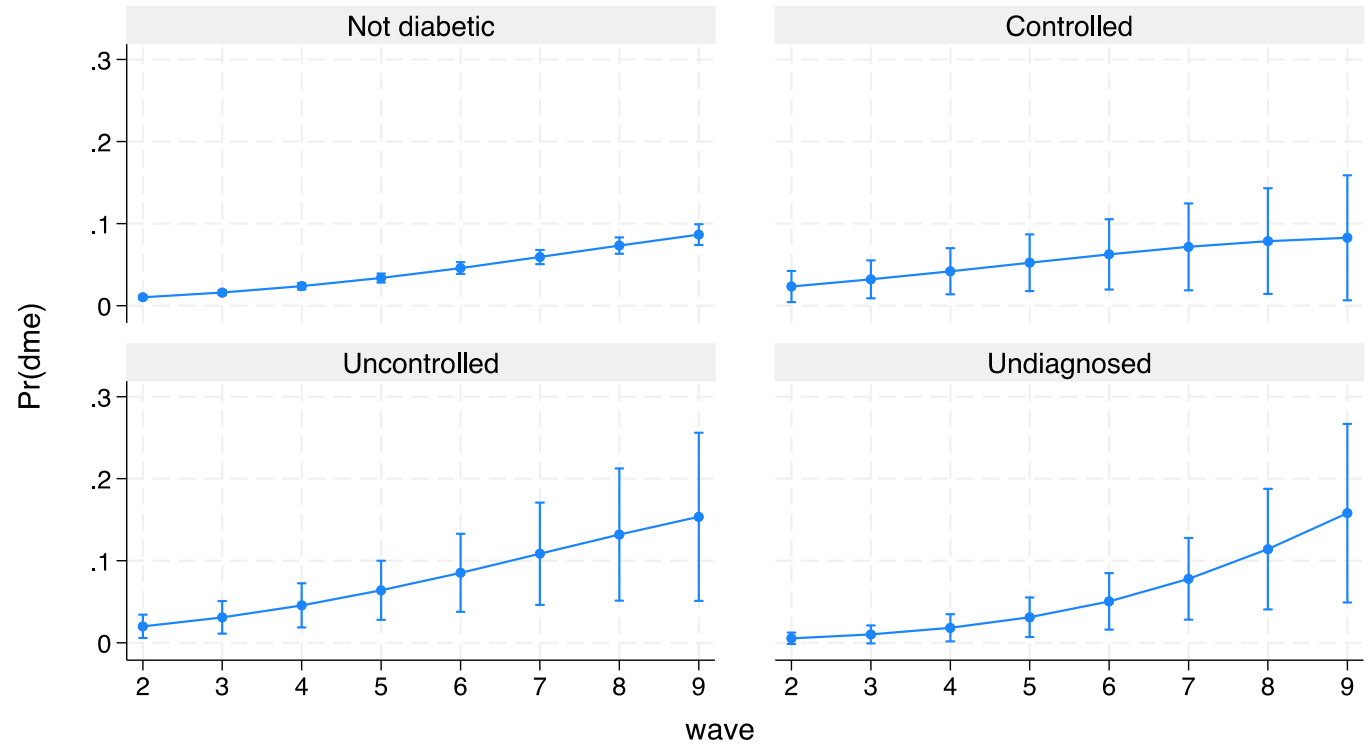
Predicted probability of glaucoma by diabetes status and wave of study



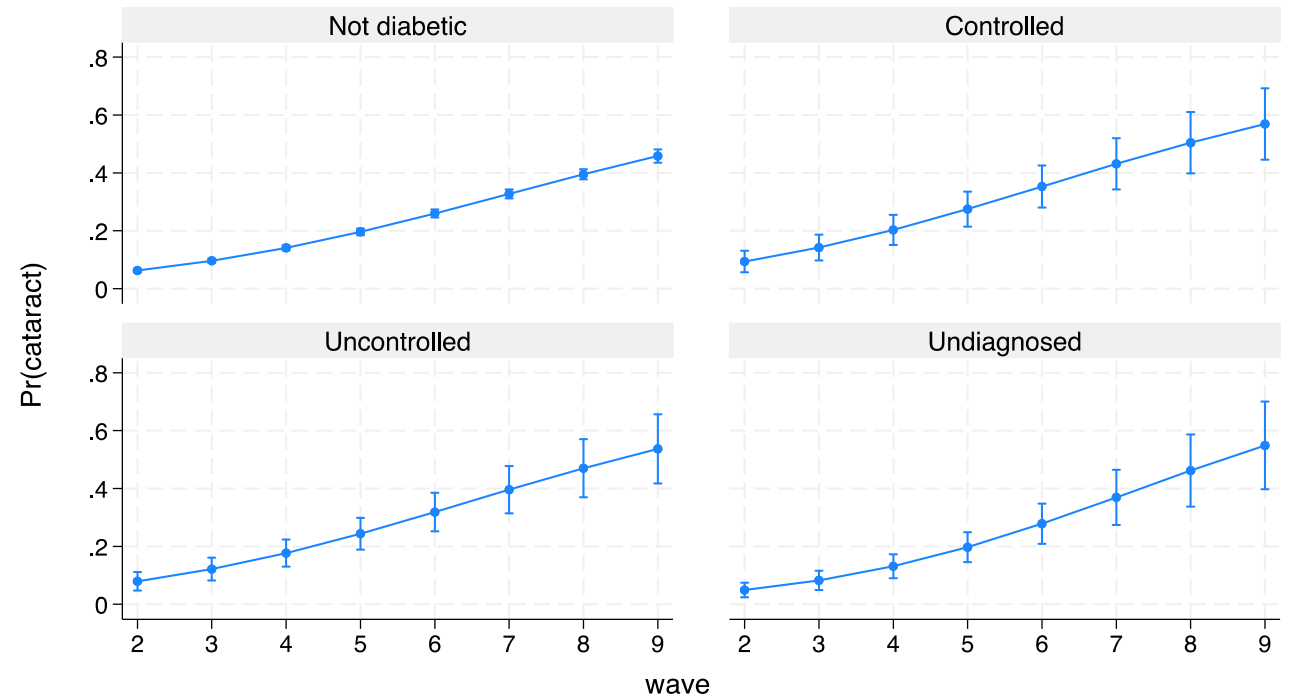
Predicted probability of **diabetic retinopathy** by diabetes status and wave of study



Predicted probability of age-related **macular degeneration** by diabetes status and wave of study



Predicted probability of cataracts by diabetes status and wave of study



Conclusion and recommendations

- Diabetes control is not associated with developing glaucoma, diabetic eye disease or macular degeneration
- Uncontrolled diabetes associated with development of glaucoma, diabetic eye disease and macular degeneration
- No history of diabetes associated with increased probability of eye disease over time
- No difference in diabetes status in development of cataracts

- Routine tests for diabetes
- Reduce age and increase frequency of free eye tests