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On the Survival of Individuals with Type 2 Diabetes Mellitus in the United Kingdom: A Retrospective Case-Control Study

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Abstract : Life expectancy in the United Kingdom (UK) has been near constant since 2010, particularly for the individuals of 65 years and older. This trend has been also noted in several other countries. This slowdown in the increase of life expectancy was concurrent with the increase in the number of deaths caused by non-communicable diseases. Of particular concern is the world-wide exponential increase in the number of diabetes related deaths. Previous studies have reported increased mortality hazards among diabetics compared to non-diabetics, and on the differing effects of antidiabetic drugs on mortality hazards. This study aimed to estimate the all-cause mortality hazards and related life expectancies among type 2 diabetes (T2DM) patients in the UK using the time-variant Gompertz-Cox model with frailty. The study also aimed to understand the major causes of the change in life expectancy growth in the last decade. A total of 221 182 (30.8% T2DM, 57.6% Males) individuals aged 50 years and above, born between 1930 and 1960, inclusive, and diagnosed between 2000 and 2016, were selected from The Health Improvement Network (THIN) database of the UK primary care data and followed up to 31 December 2016. About 13.4% of participants died during the follow-up period. The overall all-cause mortality hazard ratio of T2DM compared to non-diabetic controls was 1.467 (1.381-1.558) and 1.38 (1.307-1.457) when diagnosed between 50 to 59 years and 60 to 74 years, respectively. The estimated life expectancies among T2DM individuals without further comorbidities diagnosed at the age of 60 years were 2.43 (1930-1939 birth cohort), 2.53 (1940-1949 birth cohort) and 3.28 (1950-1960 birth cohort) years less than those of non-diabetic controls. However, the 1950-1960 birth cohort had a steeper hazard function compared to the 1940-1949 birth cohort for both T2DM and non-diabetic individuals. In conclusion, mortality hazards for people with T2DM continue to be higher than for non-diabetics. The steeper mortality hazard slope for the 1950-1960 birth cohort might indicate the sub-population contributing to a slowdown in the growth of the life expectancy.

Keywords : T2DM, Gompetz-Cox model with frailty, all-cause mortality, life expectancy
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