Mortality risks and prevalence at death of key medical factors

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Abstract

Background: The gradual and constant declines in mortality in recent decades have greatly contributed to the increasing shares of older individuals in societies – or, in other words, to population ageing. In this context, a growing number of individuals suffer from major degenerative diseases related to ageing (e.g. dementia), as well as several chronic conditions, for instance, diabetes or high blood pressure. Understanding the association between these conditions and the set of diseases causing death as well as the mortality risks between different subpopulations defined by these health conditions would contribute to a better design of preventive policies in public health. Aim: We aim to describe the mortality dynamics associated with four key medical factors or major diseases in ageing societies: high blood pressure, diabetes, dementia and cancer. Data: We use health and mortality data for adults living in Catalonia using primary care health records for the 2005 cohort, accessible through the "Public Data Analysis for Health Research and Innovation Program" (PADRIS), which accounts for databases for primary care, acute hospital and mortality registry by underlying cause of death. Methods: We will construct descriptive tables of correspondence, and assess mortality risks associated with each condition, if possible by socioeconomic position. Expected results: Our results are expected to provide novel insights on associated mortality risks as well as new novel information on the extent to which these key medical risk factors or major diseases are documented as underlying causes of death.

Extended abstract

Introduction

The gradual and constant declines in mortality in recent decades have greatly contributed to the increasing shares of older individuals in societies – or, in other words, to population ageing. In this context, a growing number of individuals suffer from major degenerative diseases related to ageing (e.g. dementia), as well as several chronic conditions, for instance, diabetes or high blood pressure. Understanding the association between these conditions and the set of diseases causing death as well as the mortality risks between different subpopulation defined by these health conditions would contribute to a better design of preventive policies in public health.

We have identified a set of major risk factors or diseases that are relevant in ageing societies, but that have substantially different characteristics: diabetes and blood pressure because they are highly correlated with (cardiovascular) morbidities, are considered to be chronic and are relatively prevalent among older populations (1). Yet these conditions –particularly high blood pressure- do not often appear as underlying causes of death; dementia as the major disease related with cognitive decline with raising mortality trends (2); and cancer as it is likely to be well reported in death certificates considering that it is prioritized when selecting the underlying cause of death (3). Thus, estimates of mortality associated with these conditions represent a challenge (3–6).

We aim to describe the mortality dynamics associated with four above described key medical factors or major diseases in ageing societies. We do so using primary care health records for the 2005 cohort of adults living in Catalonia.

Data

We use data from the Catalan health system, which has universal public health care coverage, and its register data have completed information for the population in Catalonia (a Spanish region with 7.5 million residents). The data are accessible since 2018 through the "Public Data Analysis for Health Research and Innovation Program" (PADRIS), which provides access to and allows linking anonymized individual data from different health databases, including the set of general health databases (Conjunt Mínim de Base de Dades) that accounts for databases for primary care, acute hospital or emergencies, as well as the mortality registry or the pharmacy prescription database. All these datasets are available for the period from 2005 onwards. The possibility of linking health and mortality data represents a unique opportunity for analysing as ever done before health conditions and related mortality for over 60,000 annual deaths, and therefore for accurately assessing the associations between cause-specific morbidities and cause-specific mortality. Data by socioeconomic status will be obtained using the co-pharmacy payment and educational attainment.

We will follow the 2005 cohort by accounting for a washout period in 2005-09 and study health and mortality within the period 2010-19. Our preliminary dataset consists of 1,553,485 individuals (23% of the total population living in Catalonia in 2005).

Methods

The analytical approach has several successive steps, each of them independently done for each of our dependent variables: high blood pressure, diabetes, dementia and cancer.

1) To estimate mortality risks for the general population, and for each population group suffering the health conditions of interest.
2) To construct morbidity-mortality correspondence tables for each specific condition and assess the extent to which a given condition was mentioned as underlying cause of death as well as the prevalence of each condition at death.
3) To estimate the differences in specificity described in 2) by sex and (if possible) across socioeconomic groups using logistic regression models.

Final results will be estimated for men and women separately and we will take into account additional morbidity given that mortality risks associated with each of the causes are likely to depend on the associated co-morbidity.

Expected outcomes

We study the health and mortality dynamics associated with four key medical conditions that are relevant in ageing societies: high blood pressure, diabetes, dementia and cancer. A main strength of our approach is the use of health-mortality linked data for a large representative sample in Catalonia. Our results are expected to provide novel insights on associated mortality risks of suffering each of the analyzed diseases and will be put into context as compared to estimates for the whole population. Additionally, our results on the associations between disease prevalence and underlying causes of death are expected to highlight that, even if important, most of these diseases may not be actually leading the causal process of death. Finally, the results by socioeconomic status will contribute to understanding the extent to which socioeconomic mortality differences depend on incidence, prevalence and actual mortality risks.

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