

# The order in which you acquire diseases could affect your life expectancy, says new research

August 22 2023, by Rhiannon Owen

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Credit: AI-generated image ([disclaimer](#))

[More than 25%](#) of adults in the U.K. have two or more long-term health conditions. This increases to 65% for people older than 65 years, and to almost 82% for those aged 85 or older.

Our study, now published in *The Lancet Public Health*, assessed how a number of multiple long-term health conditions ([psychosis](#), diabetes and congestive heart failure) develop over time, and what effect this can have on life expectancy. We chose these conditions because, together, they can lead to substantial reductions in how long someone lives.

We analyzed the development of these conditions over a 20-year period for more than 1.6 million adults aged 25 and over. We used data held within the [SAIL databank](#), which provides secure access to routinely collected anonymous health and administrative records for the population of Wales.

We also worked with patients and the public from across the U.K. to understand their experience of living with multiple long-term conditions.

Using statistical models, we examined the order and timing of developing psychosis, diabetes and congestive heart failure in patients of the same age, sex and area-level deprivation—and the related impact on their life expectancy.

## **The impact of disease order**

We found that the order in which people developed these diseases had an important impact on their life expectancy. People who developed diabetes, psychosis and congestive heart failure, in that order, had the largest loss in life expectancy (approximately 13 years, on average).

People who developed the same conditions in a different order were less affected. So, for example, a 50-year-old man in an area of average deprivation could experience a difference in his life expectancy of more than 10 years, depending on the order in which he developed the three diseases.

Our research also identified that people who first developed diabetes, then psychosis and finally congestive heart failure carried a higher risk of developing the next long-term health condition, or dying within five years of their last diagnosis.

However, the development of further conditions is not always life-limiting. For example, people diagnosed with psychosis and diabetes—in any order—had a higher life expectancy than those diagnosed with psychosis alone. While this was a surprising finding, we expect people with diabetes to have more regular contact with [health professionals](#) through diabetic clinics, for example, which may improve their overall health.

Our study also found that congestive heart failure on its own, and in combination with psychosis (in any order), had a similar effect on life expectancy to the "worst case" combination of diabetes, psychosis and [congestive heart failure](#) (in that order).

This is the first study to examine how the order of developing multiple long-term conditions affects a person's life expectancy. This research could be used to inform patients, [health care providers](#) and [decision-makers](#) on the appropriate identification of diseases and management of patient care. In turn, this could lead to improved outcomes for patients and the NHS.

Our research also helps to support health care delivery by looking at the factors that may increase a person's risk of developing disease, as well as identifying potential opportunities for disease screening and earlier intervention.

## **Applying our research**

Future research could evaluate the impact of screening programs and

interventions in delaying the development of further long-term conditions and extending life.

However, it is important to note that our research used information from routinely collected health records, which are not always accurate—some diagnoses may be missing or delayed. Also, diagnoses are not always accurately described. These are all [important factors](#) in being able to accurately estimate the impact of multiple long-term conditions on life expectancy.

[Further research funded by Health Data Research UK](#), the national institute for health data science, aims to harmonize how this data is collected and reported. Over time, this will improve the quality of information obtained from routinely collected health records for research.

While our study examined the development of one group of multiple long-term conditions, this approach could be replicated for any other combination of conditions—including the development of long-term health conditions following COVID-19 infection (known as long COVID), and the impact this has on quality of life.

Those living with multiple long-term conditions often experience increased use of [health](#) care services and medications, as well as greater difficulty with day-to-day tasks. This leads to a reduced quality of life as well as reduced life expectancy.

Our research has shown that the combination of long-term conditions and order in which you develop them may both have a substantial impact on your life expectancy. However, this relationship can be complex, and the development of further disease does not always reduce [life expectancy](#).

**More information:** Rhiannon K Owen et al, Effect on life expectancy of temporal sequence in a multimorbidity cluster of psychosis, diabetes, and congestive heart failure among 1.7 million individuals in Wales with 20-year follow-up: a retrospective cohort study using linked data, *The Lancet Public Health* (2023). [DOI: 10.1016/S2468-2667\(23\)00098-1](https://doi.org/10.1016/S2468-2667(23)00098-1)

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