

Review outlines methods to estimate life expectancy

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Five key methods have been explored by Leicester researchers to

calculate life expectancy and the life years lost due to disease and illness.

Life expectancy measures, particularly years of life lost or gained, have captured a great interest in the last years by public health institutions and [healthcare professionals](#) given their immediate and actionable interpretation.

Academics from the University of Leicester investigated the common methods used to predict the "years of life lost" by reviewing a range of methods: from basic methods—such as life tables—to most recent and advanced methods using statistical modeling.

They highlighted the important differences between the methods, current software used, and how they can be implemented in healthcare research and real-world settings using an example from a clinically-relevant topic of multimorbidity in the UK Biobank.

According to the findings, the review found that using the same data and research question, the estimated years of life lost value differed among methods, as each method focused on estimating different quantities.

Lead researcher Dr. Yogini Chudasama, an Epidemiologist at the Leicester Real World Evidence Unit, says that "this project was initially from my Ph.D., where at the time there was no simple and comprehensive paper explaining or comparing the methods for the years of life lost calculation, or showing which method I should use for my data. This was a challenging task and required a lot of patience and learning to overcome the difficulties encountered. Collaborating with co-authors and supervisor Dr. Francesco Zaccardi, I was able to explore the methods in detail and understand how they are applied to real-world data."

"I am very proud to have this published in the *Journal of Clinical*

Epidemiology, as a tutorial guide for researchers and healthcare professionals, as it will help promote a better and easier understanding of life expectancy metrics in healthcare research."

As a result, the researchers also developed a general life expectancy analytical program, which has been applied to three NIHR ARC-funded published studies, published in *PLOS Medicine*, the *Journal of Internal Medicine*, and *BMC Medicine*.

Dr. Francesco Zaccardi, Clinical Epidemiologist at the University of Leicester, main supervisor for the study, says that "findings from epidemiological studies are commonly reported in terms of relative risk—for example, type 2 diabetes increases the risk of death by two-fold. This statement is difficult to interpret because it does not convey information on the absolute risk of death."

"Years of life lost, conversely, are easily interpretable: in a middle-aged person, type 2 diabetes reduces the life expectancy by five years. As different methods exist to estimate [life expectancy](#), in our study we highlighted that decisions should be based on the purpose of the research, the type of available data, and the required flexibility when using complex statistical modeling."

Professor Kamlesh Khunti CBE, Director of NIHR ARC East Midlands and the Real World Evidence Unit and Professor of Primary Care Diabetes and Vascular Medicine at the University of Leicester, added that "this review is important as years of lost life metrics are simple summary measures that can enhance the interpretation of the findings from [epidemiological studies](#) for healthcare professionals and the public."

More information: Yogini V. Chudasama et al, Estimates of years of life lost depended on the method used: tutorial and comparative

investigation, *Journal of Clinical Epidemiology* (2022). [DOI: 10.1016/j.jclinepi.2022.06.012](https://doi.org/10.1016/j.jclinepi.2022.06.012)

Yogini V. Chudasama et al, Healthy lifestyle and life expectancy in people with multimorbidity in the UK Biobank: A longitudinal cohort study, *PLOS Medicine* (2020). [DOI: 10.1371/journal.pmed.1003332](https://doi.org/10.1371/journal.pmed.1003332)

Y. V. Chudasama et al, Leisure-time physical activity and life expectancy in people with cardiometabolic multimorbidity and depression, *Journal of Internal Medicine* (2019). [DOI: 10.1111/joim.12987](https://doi.org/10.1111/joim.12987)

Yogini V. Chudasama et al, Physical activity, multimorbidity, and life expectancy: a UK Biobank longitudinal study, *BMC Medicine* (2019). [DOI: 10.1186/s12916-019-1339-0](https://doi.org/10.1186/s12916-019-1339-0)

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