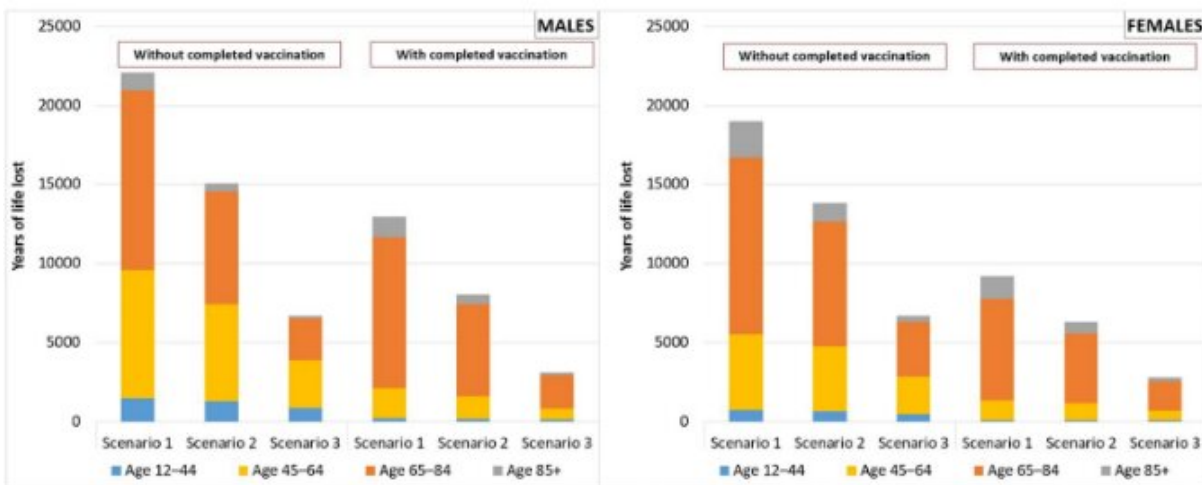


Study shows that COVID-19 vaccination helped to reduce the years of life lost among the fully vaccinated by nearly 88%

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Years of life lost (YLL) by males, females, population with or without completed vaccination, and Scenarios 1–3 during the period of October 1 to December 31, 2021, Czechia. The scenarios reflect different assumptions about the risk of death and potential remaining life expectancy at each age. Scenario 1 assumes a potential remaining life expectancy at each age at the pre-pandemic life expectancy level, while scenarios 2 and 3 also work with pre-pandemic mortality tables but consider a potential remaining life expectancy at each age of 30% and 10%, respectively, of those at highest risk of death. Credit: *Scientific Reports* (2022). DOI: 10.1038/s41598-022-23023-0

When evaluating vaccine efficacy, the conventional measures include a

reduction of risk of hospitalization and death. The number of patients dying with or without vaccination is often in the public spotlight. However, when evaluating public health interventions or the burden of disease, it is more illustrative to use mortality metrics that also take into account the prematurity of the deaths, such as years of life lost (YLL) or years of life saved (YLS) due to the vaccination.

Researchers from the Faculty of Science at Charles University used this approach to evaluate the difference in YLL and YLS between COVID-19 victims with or without completed vaccination in the autumn pandemic wave during 2021 (October-December) in Czechia.

For the analysis, individual data about all COVID-19 deaths in the country was used. While 40.6% of the deaths were in cohorts with completed vaccination, this corresponds to 35.1% of years of life lost. The role of vaccination is expressed using YLS and hypothetical numbers of deaths. The registered number of deaths is approximately 3.5 times lower than would be expected without vaccination. The results illustrate that vaccination is more effective in saving lives than suggested by simplistic comparisons.

The COVID-19 pandemic emphasized the need for an [interdisciplinary approach](#). The role of demography is irreplaceable in the case of evaluation of its consequences for the population and the effectiveness of applied measures above all. The study has proposed a method usable in this evaluation and contributes to the topic of [vaccine effectiveness](#) using demographic and [mathematical methods](#).

Metrics such as YLL should be considered when evaluating the impacts of various population-wide interventions. Assessing years of life lost is a good indicator of the effects of a pandemic, as it provides a much more relevant view than the crude mortality rate (numbers of deaths per [population size](#)) often used in practice. In this study, the measure of

YLL was used not only for illustration of the outcome of the pandemics but above all for the evaluation of the effect of completed vaccination. It provides clear evidence of the benefits of COVID-19 vaccination, and using the YLS illustrates the advantage of a population with complete vaccination as compared to a population without it.

The result illustrates that vaccination is even more effective in saving lives than suggested by straightforward and often simplified comparisons.

"Moreover, in the case of Czechia, among the population with completed vaccination, almost 15,000 COVID-19-related deaths were potentially avoided. Vaccination helped to reduce the YLL among the fully vaccinated by around 88% during the studied period, and the registered number of deaths is approximately 3.5 times lower than would be expected without vaccination," concluded researchers Dr. Hulíková Tesárková and Dr. Džúrová.

The full study is available in *Scientific Reports*, and it demonstrates that COVID-19 vaccination saves lives and saves years of potential future lives.

More information: Klára Hulíková Tesárková et al, COVID-19: years of life lost (YLL) and saved (YLS) as an expression of the role of vaccination, *Scientific Reports* (2022). [DOI: 10.1038/s41598-022-23023-0](https://doi.org/10.1038/s41598-022-23023-0)

Provided by Charles University

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