idw - Informationsdienst Wissenschaft
Nachrichten, Termine, Experten

Press release

Johannes Gutenberg-Universität Mainz
Petra Giegerich

04/07/2025
http://idw-online.de/en/news850291

Research results, Scientific Publications
Economics / business administration, Mathematics, Medicine
transregional, national

New insights into the risk of developing dementia: Economists contribute to medical research

Scientific paper in "Nature" reveals causal connection between the shingles vaccine and the risk of dementia / Statistical analysis of data based on a regression discontinuity design

Vaccination to prevent shingles also reduces the risk of developing dementia in later life, according to a research paper published recently in "Nature". This conclusion is based on the analysis of data collected in connection with the introduction of a shingles immunization program launched in Wales in 2013. Economists with their special expertise in statistical analyses have made a significant contribution to the corresponding study. "We were able to apply our capabilities in statistics to medical data, thus forging a bridge between these two fields," said Dr. Markus Eyting of Johannes Gutenberg University Mainz (JGU), lead author of the study. Together with co-lead author Dr. Min Xie, a postdoctoral researcher at the Heidelberg Institute of Global Health, he demonstrated that the shingles vaccination was associated with a 20 percent reduction in the probability of a new dementia diagnosis over a period of seven years. As noted in the article, "A natural experiment on the effect of herpes zoster vaccination on dementia," this could raise various new possibilities for dementia prevention.

Electronic health records for Wales supply basis for statistical analysis

Dr. Min Xie identified the groundwork of what would represent a "natural experiment" created by the introduction of a herpes zoster vaccination program in Wales about two years ago. In the program, the eligibility to receive the vaccine was determined by an individual's exact date of birth. Those born before 2 September 1933 were automatically ineligible for life, while those born on or after 2 September 1933 were entitled to receive the vaccine. "We can speak of a natural experiment in this context because this setting gives us the opportunity to compare individuals who had just turned 80 with those who had not quite reached 80 years of age," Eyting explained. Because the individuals in the study cohort were only a few weeks apart in age, the researchers could assume that vaccination was the only factor that set the groups apart. "We then looked at the risk of developing dementia over the next seven years," Eyting continued.

One of the main goals of the analysis was to identify a potential causal effect rather than just a correlation. In other words, the researchers were looking for a causal relationship between the shingles vaccine and the risk of developing dementia, not just a random connection between the two factors. In economics, threshold values and target dates – in this case, the individuals' birthdays – are often employed to test for causal effects using regression discontinuity designs. "This method is widely used in economics but has not yet been adequately recognized as a tool for clinical research," Eyting added. In his view, regression discontinuity analyses offer many opportunities for evaluating the effectiveness of public health measures.

Markus Eyting is a postdoctoral researcher at the Gutenberg School of Management and Economics (GSME) of Mainz University and at the Leibniz Institute for Financial Research SAFE in Frankfurt. His research focuses on experimental methods and survey and administrative data to study the interplay of beliefs and individual decision making with

applications relating to health, discrimination, and machine learning. Also involved in the study were Dr. Simon Heß of the Vienna University of Economics and Business, who supported the data analysis with his expertise in econometric methodologies, as well as researchers from Stanford University. Eyting received the 2023 Young Economist Award from the European Economic Association (EEA) for a paper on the cause of discrimination.

Image:
https://download.uni-mainz.de/presse/03_wirtschaft_digital_demenz_analyse.jpg
Dr. Markus Eyting
photo/©: Alina Frei

Related links:
- https://safe-frankfurt.de/research/researchers/researchers-details/showauthor/1102-eyting.html – Dr. Markus Eyting at the Leibniz Institute for Financial Research SAFE
- https://digital.economics.uni-mainz.de/ – Digital Economics group at the JGU Gutenberg School of Management & Economics
- https://wiwi.uni-mainz.de/ – Gutenberg School of Management & Economics (GSME) at Johannes Gutenberg University Mainz

contact for scientific information:

Dr. Markus Eyting
Digital Economics
Gutenberg School of Management and Economics
Johannes Gutenberg University Mainz
55099 Mainz, GERMANY
phone: +49 6131 39-22166
e-mail: meyting@uni-mainz.de
https://meyting.com/

Original publication:

M. Eyting et al., A natural experiment on the effect of herpes zoster vaccination on dementia, Nature, 2 April 2025,
DOI: 10.1038/s41586-025-08800-x
https://www.nature.com/articles/s41586-025-08800-x