



THE EFFECT OF COCHLEAR IMPLANT ON EMPLOYMENT PARTICIPATION

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What

We evaluate the effect that receiving a cochlear implant (CI) has had on the employment rate of Deaf and Hard of Hearing (DHH) individuals in the Netherlands. With this comparison, we aim to understand whether cochlear implantation improves labor participation in the population over time.

Why

Thanks to recent improvements in data availability, it is now possible to identify individuals with cochlear implants in national administrative registers. This is a new opportunity to evaluate the long-term impact of cochlear implantation on important life outcomes such as employment.

How

Difference-in-differences method
This method compares the change in employment rates over time in the group that received CI with the change in the group that did not. By doing so, it helps isolate the impact of cochlear implantation on work participation.

Data Sources and Population

Data sources: two administrative files containing reimbursement for hearing-related care:

Sensory disability care
DHH people with **No-CI**
N = 1177

Medical specialist care
DHH people with **CI**
N = 1097

- We selected a fixed sample of individuals who were between 15 and 46 years old in 1999.
- This allows us to follow people who were part of the economically active population throughout the **observation period (1999–2023)**.
- Individuals **don't overlap** between the samples.

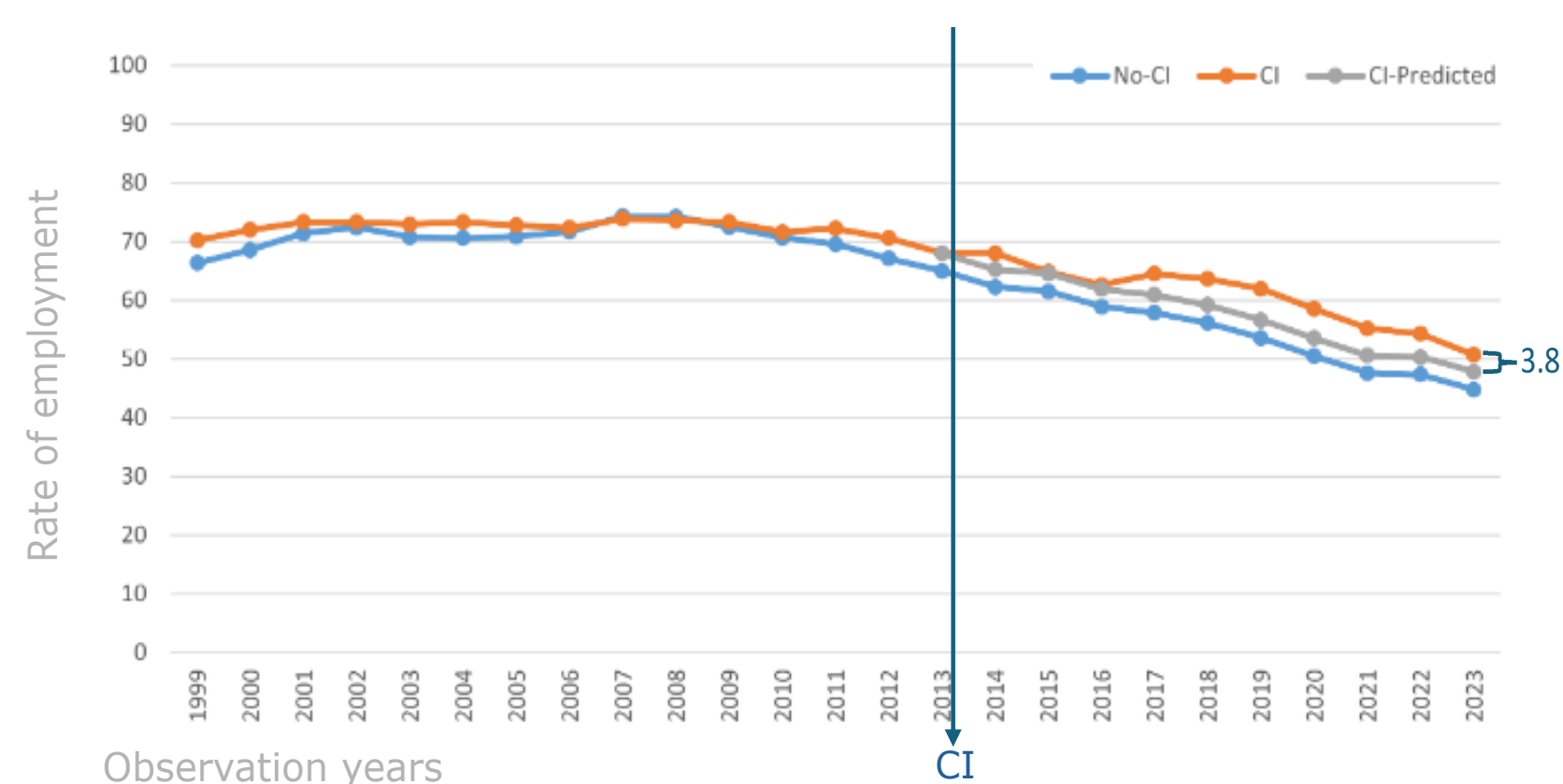
Working population

A person is considered **part of the working population** if their main income source is one of the following categories:

- Employee
- Head leader/CEO
- Self-employed
- Working family member

People can also receive income from other sources such as social assistance, pensions, or other benefits.

Results



Age	CI	No-CI
Mean Age (1999)	34.5	32.1
Sex	CI	No-CI
Male	42.4%	41.3%
Female	57.6%	58.7%
Migration background	CI	No-CI
Native	82.6%	66.7%
First generation migrant	10.7%	24.0%
Second generation migrant	6.7%	9.3%

Main findings

- Employment increased by **3,8%** in the group that received CI in one of the years between 2013 and 2023
- This increase suggests that cochlear implantation has a positive effect on labour market participation.

• There were significant demographic differences between the two groups in terms of age and migration background. While **Difference-in-Differences (DiD) allows for differences in group characteristics**, it assumes that the difference in outcomes between groups remains stable prior to the implementation of CI, which is called the **parallel trends assumption**.

• Before 2013, when CI began to be received, the difference in employment rate trends between the CI and non-CI groups was not statistically significant, indicating **parallel trends**.

• **After 2013, the difference between the groups changes:** The blue and orange lines show the observed employment rate. The grey line shows the predicted employment rate in the CI group if no implants had been received (the counterfactual). The gap between the orange and grey lines represents the estimated effect of cochlear implantation on employment.

Conclusion

With this study we aim to contribute to the understanding of how cochlear implants can serve as a source of improvement for some individuals. We emphasize the importance of maintaining access to this option, as well as using appropriate methods to evaluate the impact of cochlear implants on the DHH population.

