XLV Jornadas de Economía de la Salud

Datos, evidencia, decisiones: generando valor para la gestión y las políticas sanitarias

Sevilla, 17 al 19 de junio de 2026

Market and non-market productivity losses from the excess and COVID-19 mortality and morbidity in Poland

Błażej Łyszczarz, Paweł Niewiadomski
Nicolaus Copernicus University in Toruń, Poland
blazej@cm.umk.pl

Background

The literature shows that the COVID-19 pandemic resulted in notable population-level **productivity losses**[1]:

- **0% to 2.1% of GDP lost** in terms of production lost, depending on the health measure used, country and time settings;
- 0% in Germany for excess deaths and the initial pandemic phase (until May 2020)
- 2.1% in Spain for COVID-19 deaths (until 19/04/2020)

Limited evidence, including gaps in: (1) losses from other-than-mortality components, (2) long-term estimates, (3) work incapacity losses and (4) unpaid losses.

AIM: We estimated market (paid) and non-market (unpaid) productivity losses for excess and direct disease-related burden of the COVID-19 pandemic in Poland during 2020-2024

1. Niewiadomski et al. (2025), Productivity losses due to health problems arising from COVID-19 pandemic: A systematic review of population-level studies worldwide; *Appl Health Econ Health Policy* 23, 231–251.

Methods

This is a **population-level observational study using a societal perspective**.
Time scope: 2020-2024

Pandemic-related health burden

- COVID-19
- excess

Valuation of losses

- paid (market) losses:
  - human capital approach (HCA)
  - friction costs approach (FCA)
- unpaid (non-market) losses:
  - opportunity costs approach (OCA)

Productivty losses components

- short-term work absence
- medium-term work incapacity (rehab benefits)
- long-term work incapacity (disability pensions)
- premature mortality

Data sources

COVID-19-related health burden:

- work absence and work incapacity – Social Insurance Institution data
- premature mortality – demographic database of Statistics Poland

Excess health burden:

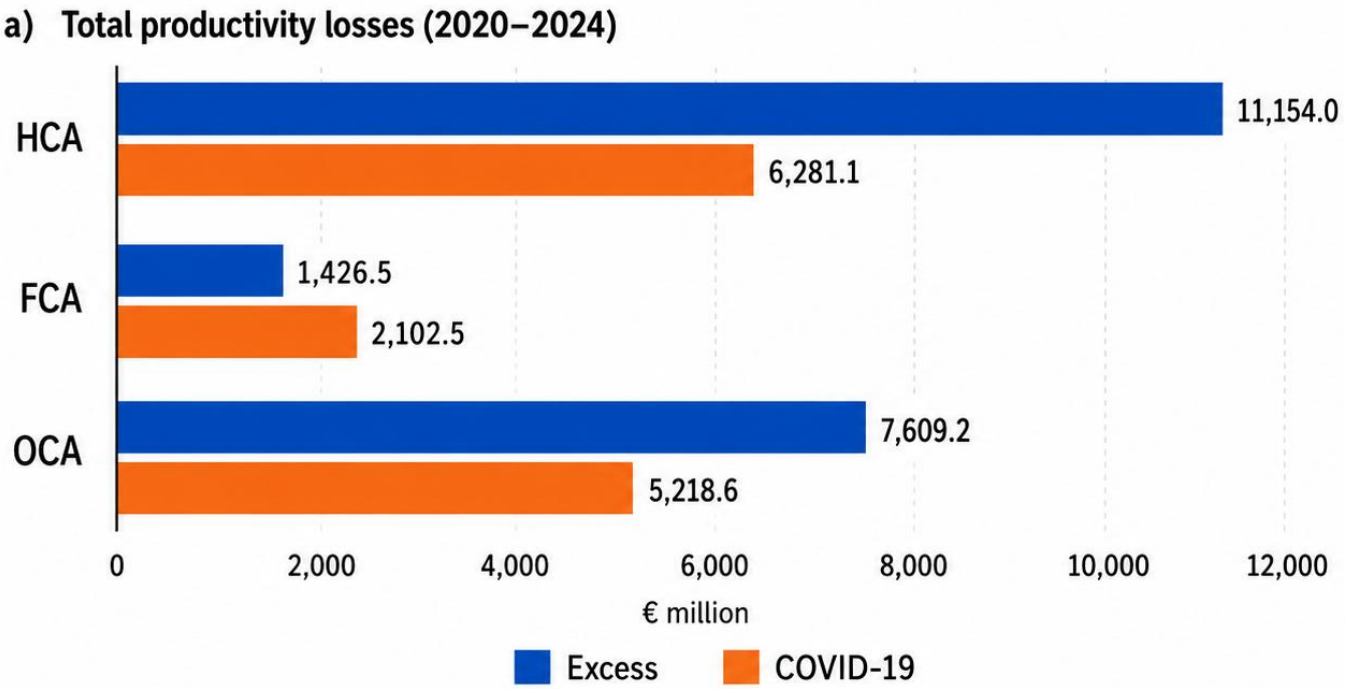
- previous studies on excess absence, excess work incapacity, and excess mortality in Poland[2,3,4].

2. Łyszczarz, Wojtasik (2025), Excess and reduced work absence during COVID-19 in Poland: insights from cause-specific time-series models; *Popul Health Metrics* 23, 35.
3. Łyszczarz et al (2026), Excess life-years and productive life-years lost in Poland through the COVID-19 pandemic and post-pandemic years; *Arch Public Health* 84, 11.
4. Łyszczarz, Wojtasik (2026), Excess work incapacity during and after the COVID-19 pandemic in Poland: evidence from population-level social insurance data; *Health Policy* 168, 105614.

Total productivity losses in Poland, 2020–2024

Excess vs COVID-19 burden across valuation approaches (€ million)

Results – 1



Key message

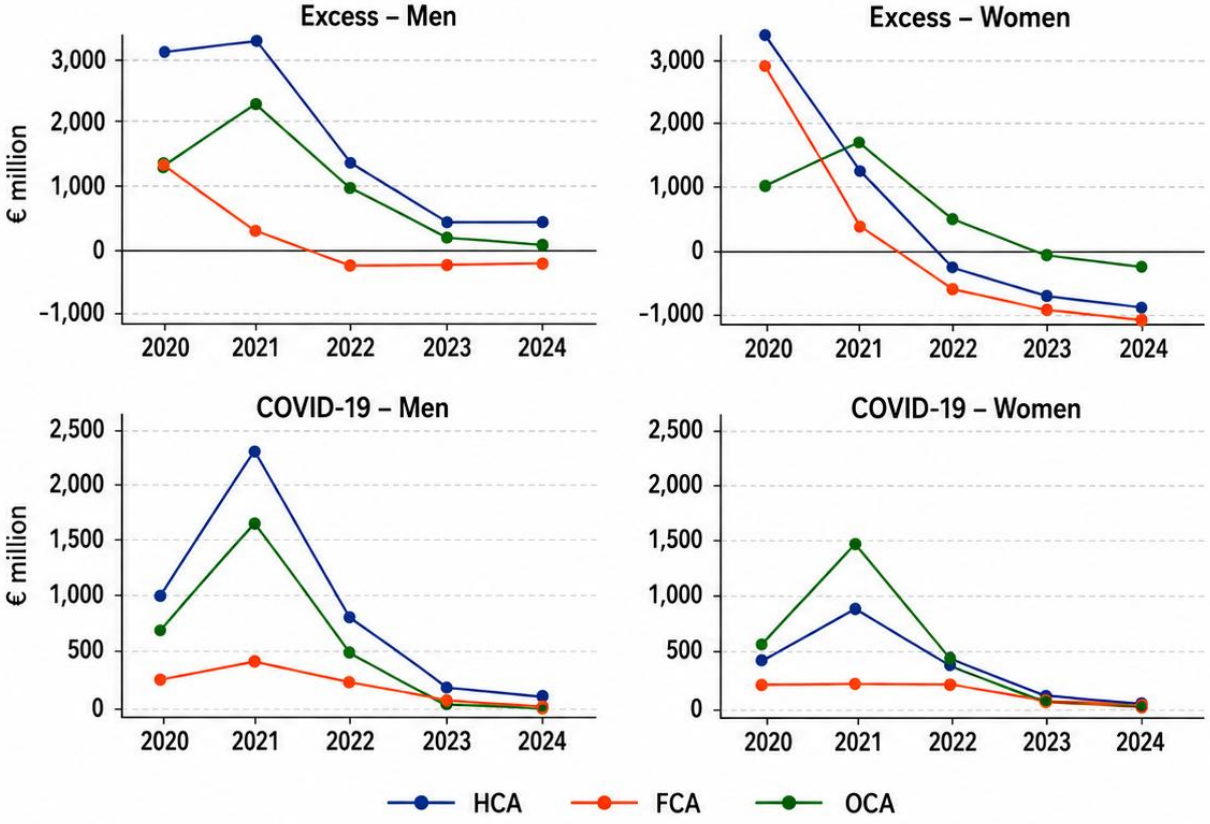
- HCA produced the highest total losses.
- FCA produced the lowest total losses.
- Excess losses exceeded COVID-19 losses under HCA and OCA.
- Under FCA, COVID-19 losses were higher than excess losses.

HCA – human capital approach; FCA – friction cost approach; OCA – opportunity cost approach.
Values are totals for 2020–2024 and are expressed in € million.

Results – 2

Sex-specific trends in productivity losses, 2020–2024

Productivity losses by burden framework and valuation approach (€ million)



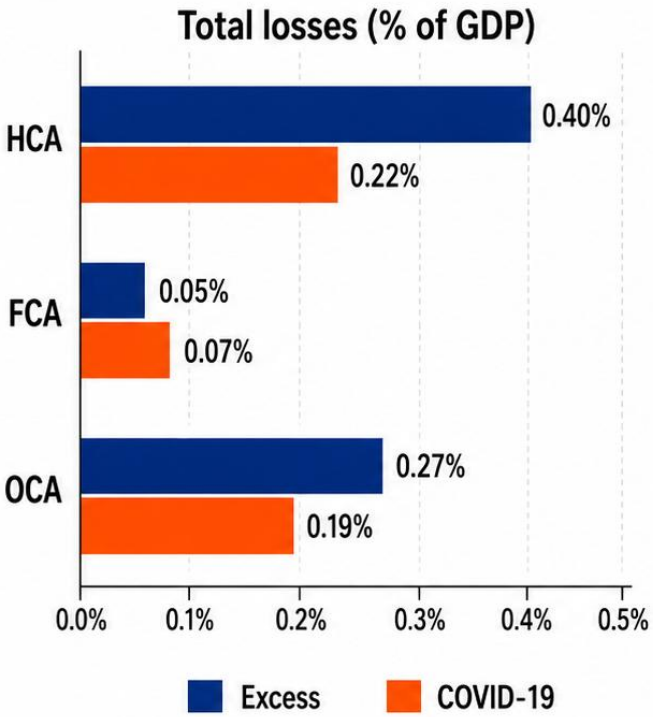
Key message

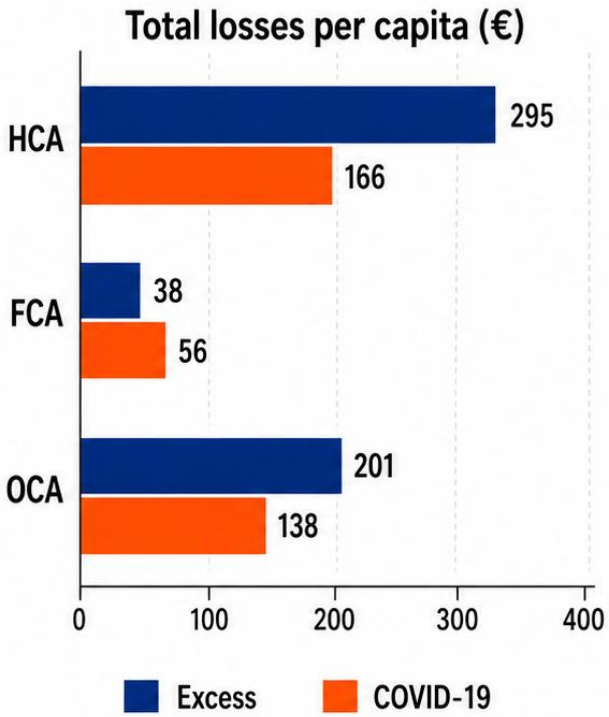
- Losses were concentrated in 2020–2021.
- COVID-19-related losses peaked in 2021 and declined sharply thereafter.
- Excess losses turned negative after 2021, most clearly among women and under FCA.
- FCA estimates were generally lower than HCA and OCA.

Results – 3

Productivity losses in Poland, 2020–2024

Total losses by burden framework and valuation approach: % of GDP and per capita (€)





Key message

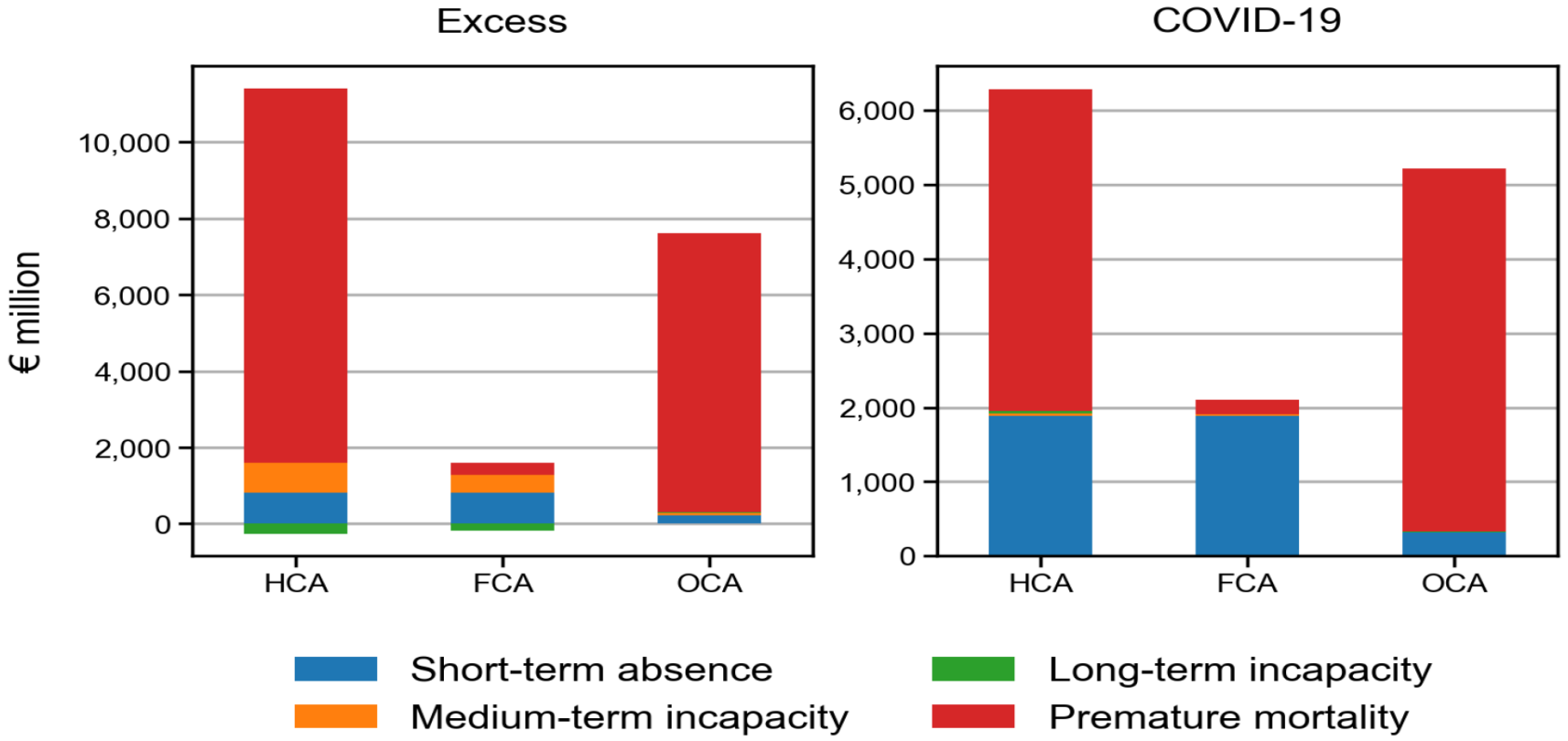
- HCA produced the highest losses, while FCA produced the lowest.
- Excess losses exceeded COVID-19 losses under HCA and OCA.
- Under FCA, COVID-19 losses were slightly higher than excess losses.
- The same pattern was observed for both % of GDP and per capita estimates.

HCA – human capital approach; FCA – friction cost approach; OCA – opportunity cost approach.

Results – 4

Distribution of productivity losses in Poland, 2020–2024

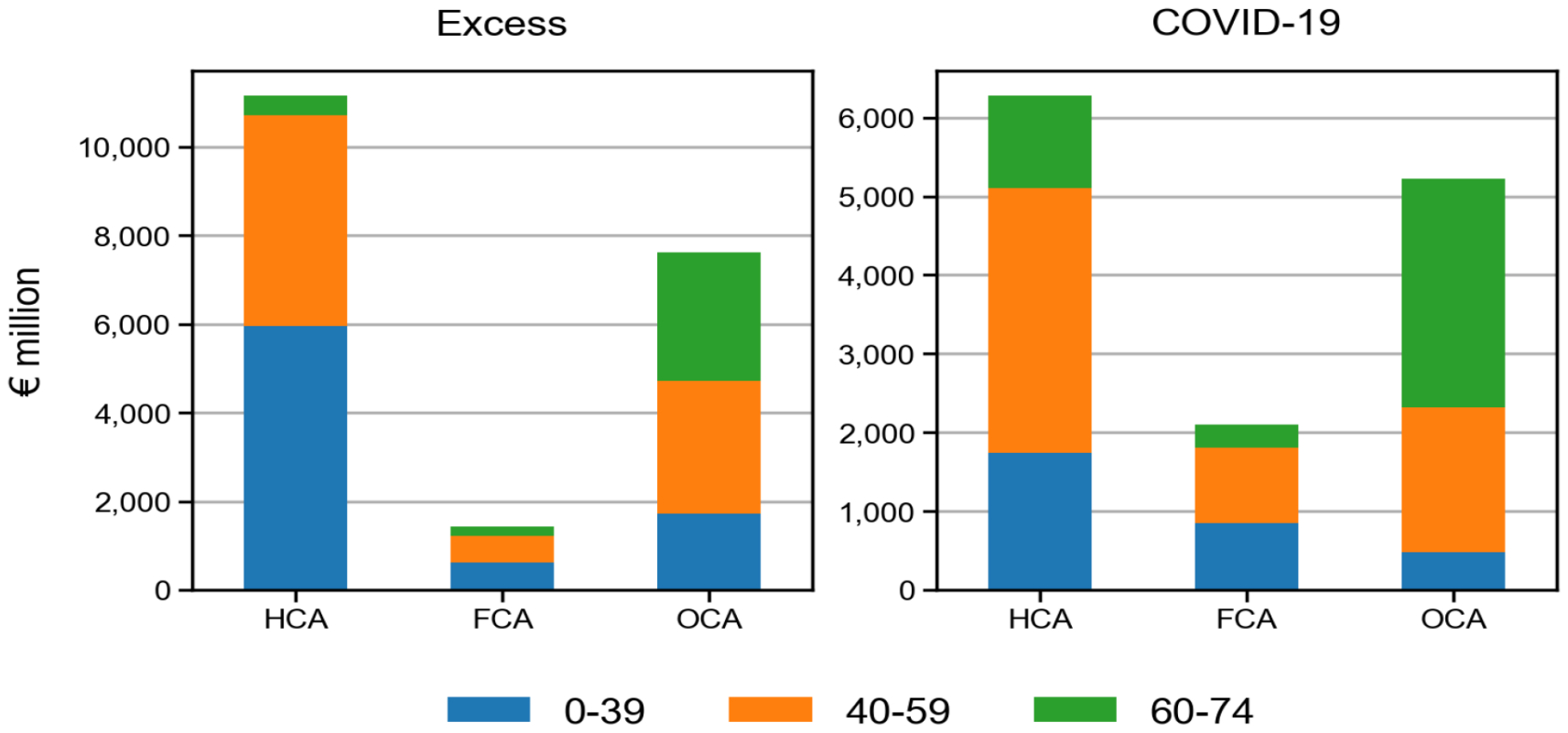
Breakdown by loss category, age, sex, and year across burden frameworks and valuation approaches (€ million)



Results – 5

Distribution of productivity losses in Poland, 2020–2024

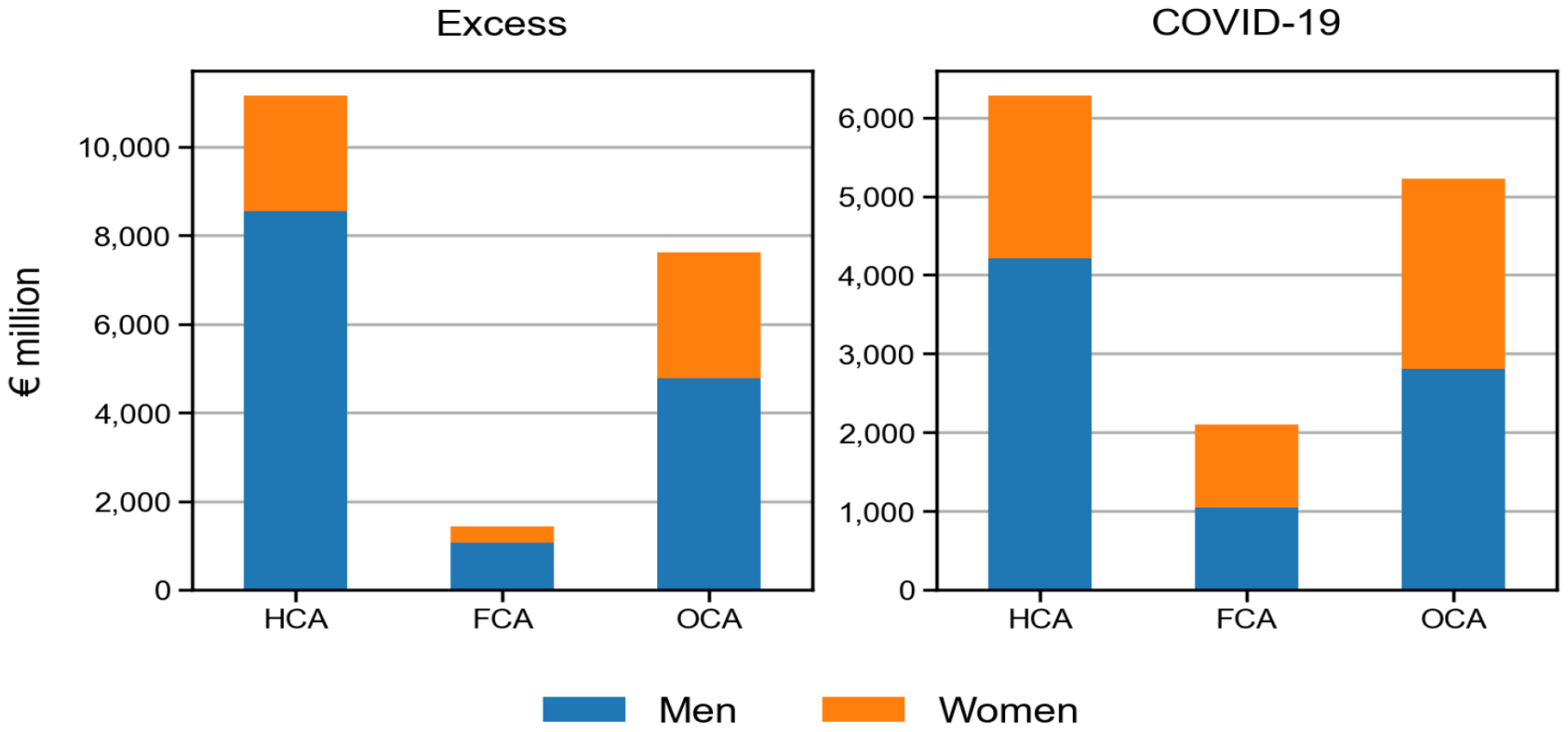
Breakdown by loss category, age, sex, and year across burden frameworks and valuation approaches (€ million)



Results – 6

Distribution of productivity losses in Poland, 2020–2024

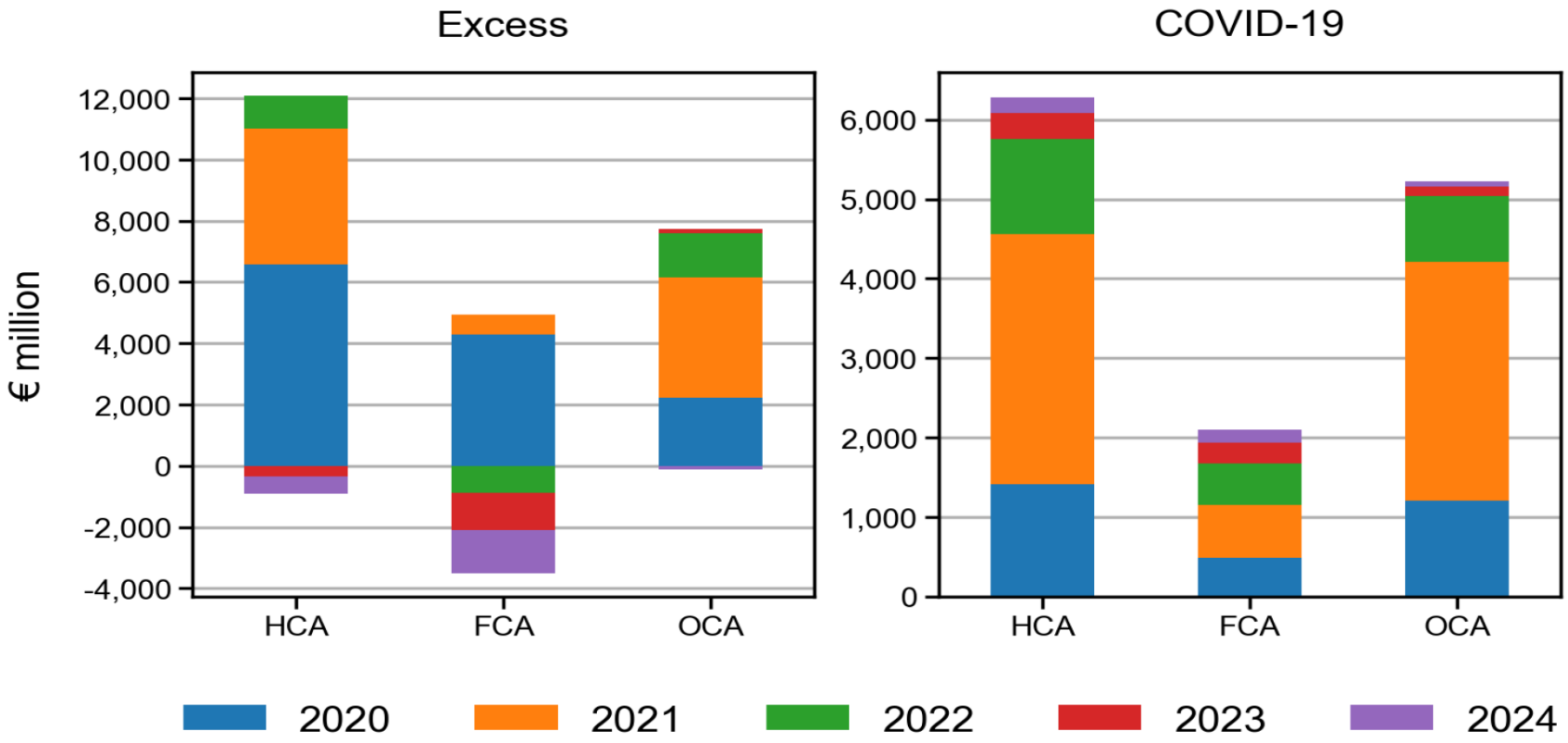
Breakdown by loss category, age, sex, and year across burden frameworks and valuation approaches (€ million)



Results – 7

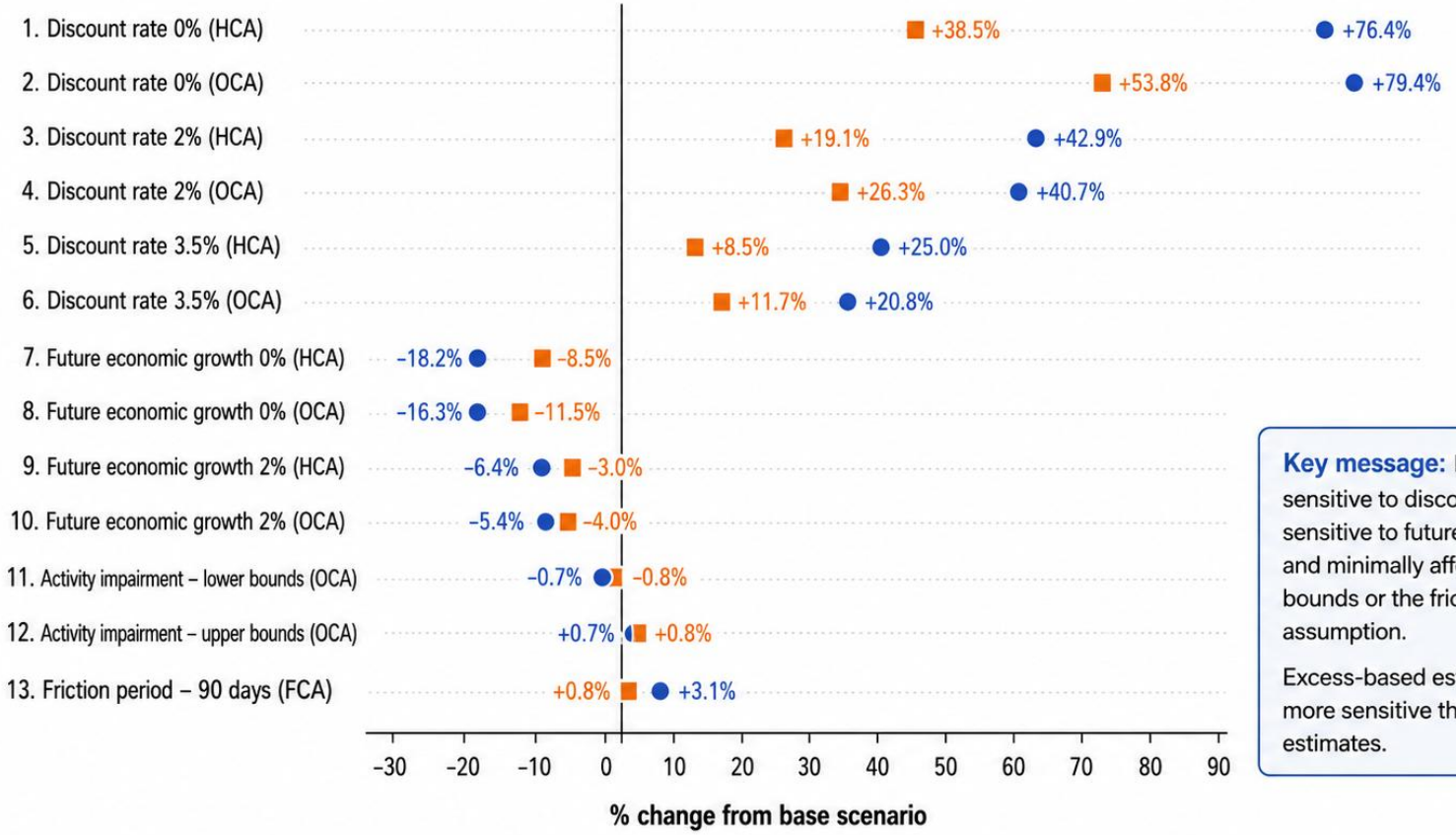
Distribution of productivity losses in Poland, 2020–2024

Breakdown by loss category, age, sex, and year across burden frameworks and valuation approaches (€ million)



Stability of productivity loss estimates: one-way sensitivity analysis

Percent change from base scenario (2020–2024 total losses)



Key message: Results were most sensitive to discounting, moderately sensitive to future growth assumptions, and minimally affected by impairment bounds or the friction-period assumption.

Excess-based estimates were generally more sensitive than COVID-19-based estimates.

Discussion

1. Productivity burden was substantial (up to 1.25% GDP in 2020 HCA excess framework), but **strongly method-dependent**.
2. **Excess burden** usually exceeded direct COVID-19 burden – unsurprising given limited testing capabilities.
3. **Mortality** dominated HCA and unpaid losses, while **short-term absence** dominated FCA.
4. Losses concentrated **mainly in 2020–2021 – pandemic impact declined, and the** harvesting effect of the early pandemic and reduced mortality later.
5. **Post-2021** excess losses **turned negative** for some categories.

Limitations:

- HCA and FCA reflect different perspectives, not one ***true*** cost.
- Excess estimates depend on baseline and modelling choices.
- Presenteeism and some subgroup details could not be captured.

Thank you…

This research is supported by

NATIONAL SCIENCE CENTRE
POLAND

under grant no. 2022/47/B/HS4/00081

The economic and epidemiological burden associated with mortality and morbidity related to the COVID-19 pandemic