

Gender (in)equality

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Contents

- A few definitions & key concepts & measurements
- Consequences of gender (in)equality
- Gender & climate change nexus
- Gender (in)equality in the scenario space

Key terms

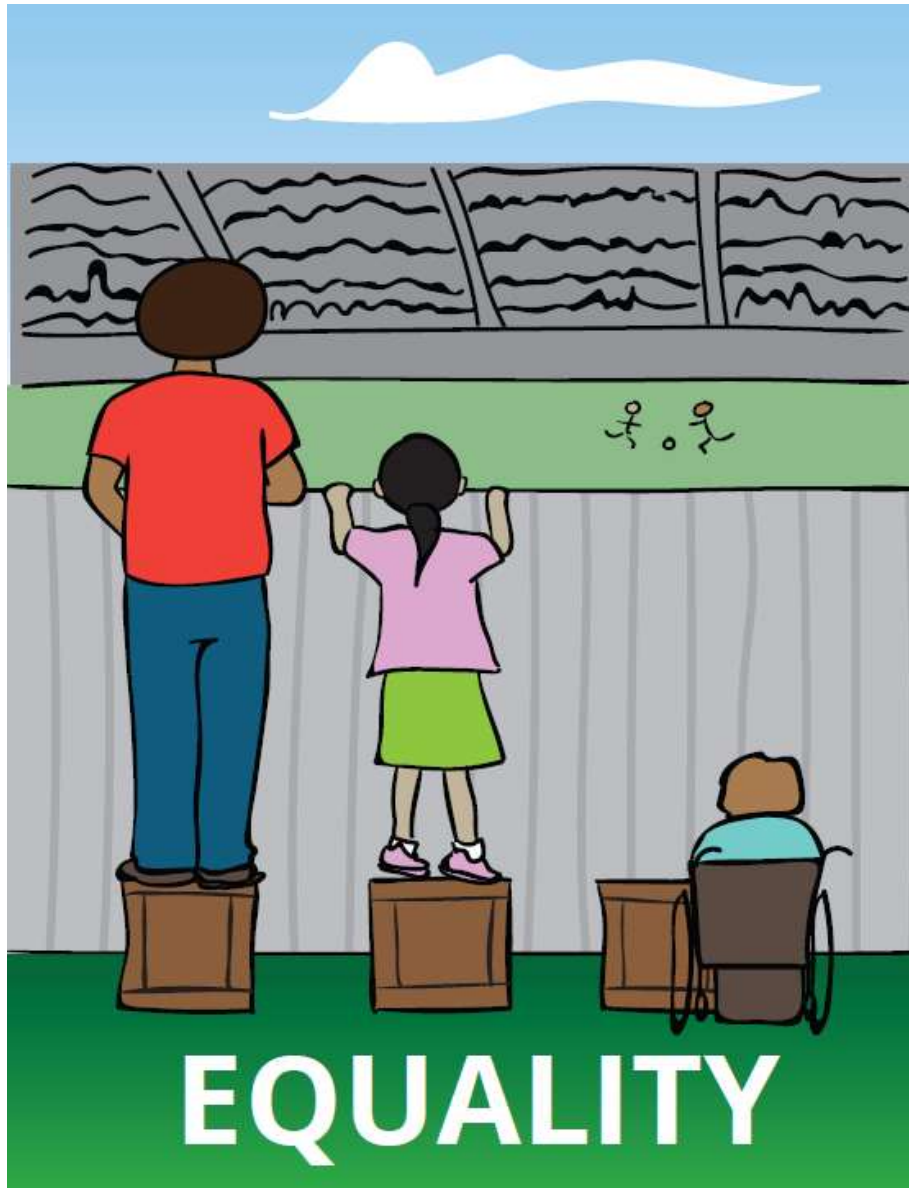
Sex: the biological characteristics associated with males/females

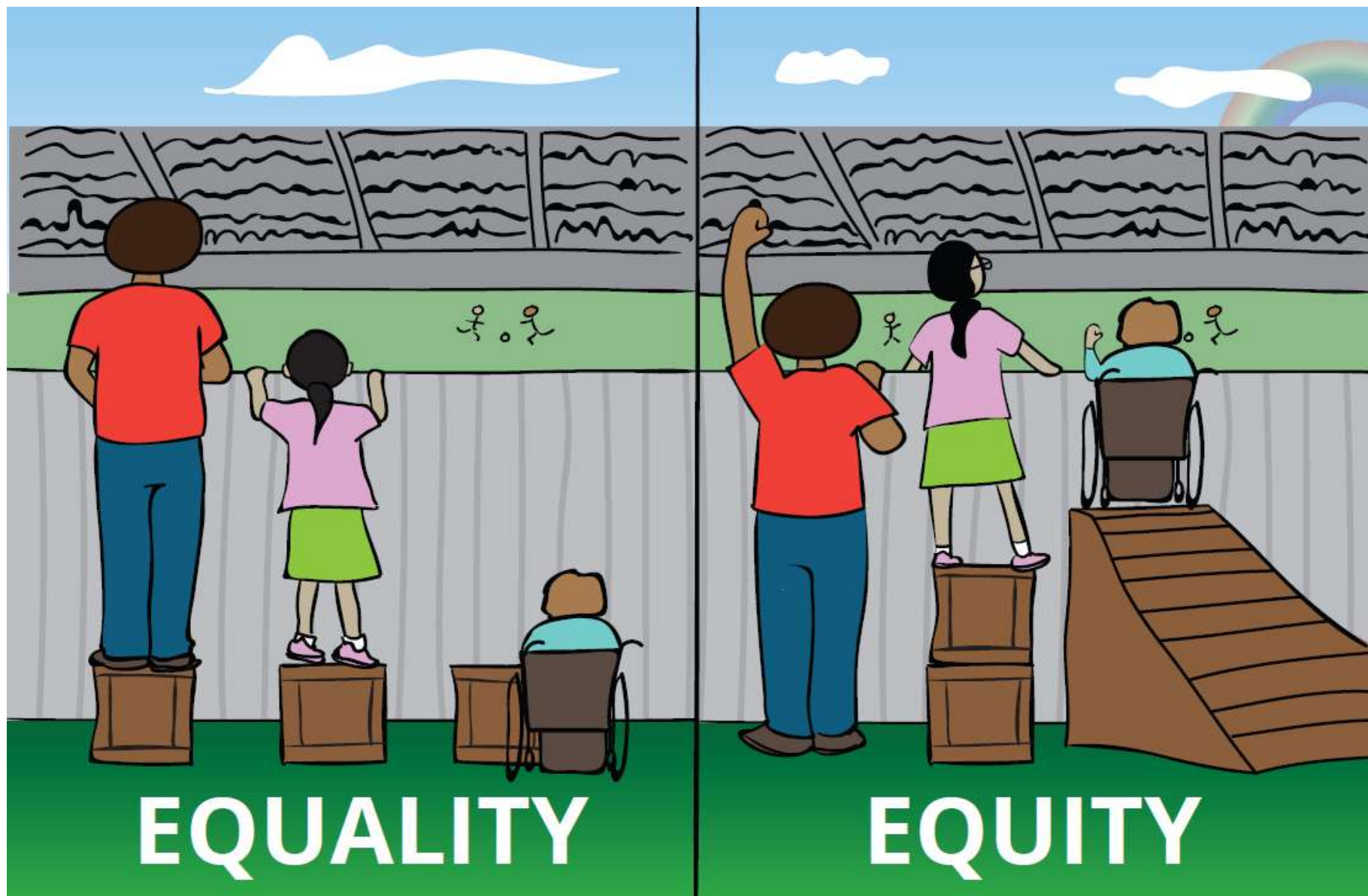
Gender: economic, social and cultural attributes and opportunities associated with being a certain gender

Equity: Recognizing that individuals have different needs and circumstances, and providing tailored support to ensure everyone has a fair chance

Equality: access to opportunities and life changes is neither dependent on, nor constrained, by sex

Empowerment: the process of promoting gender equality by identifying and redressing power imbalances





Definition of gender inequality?

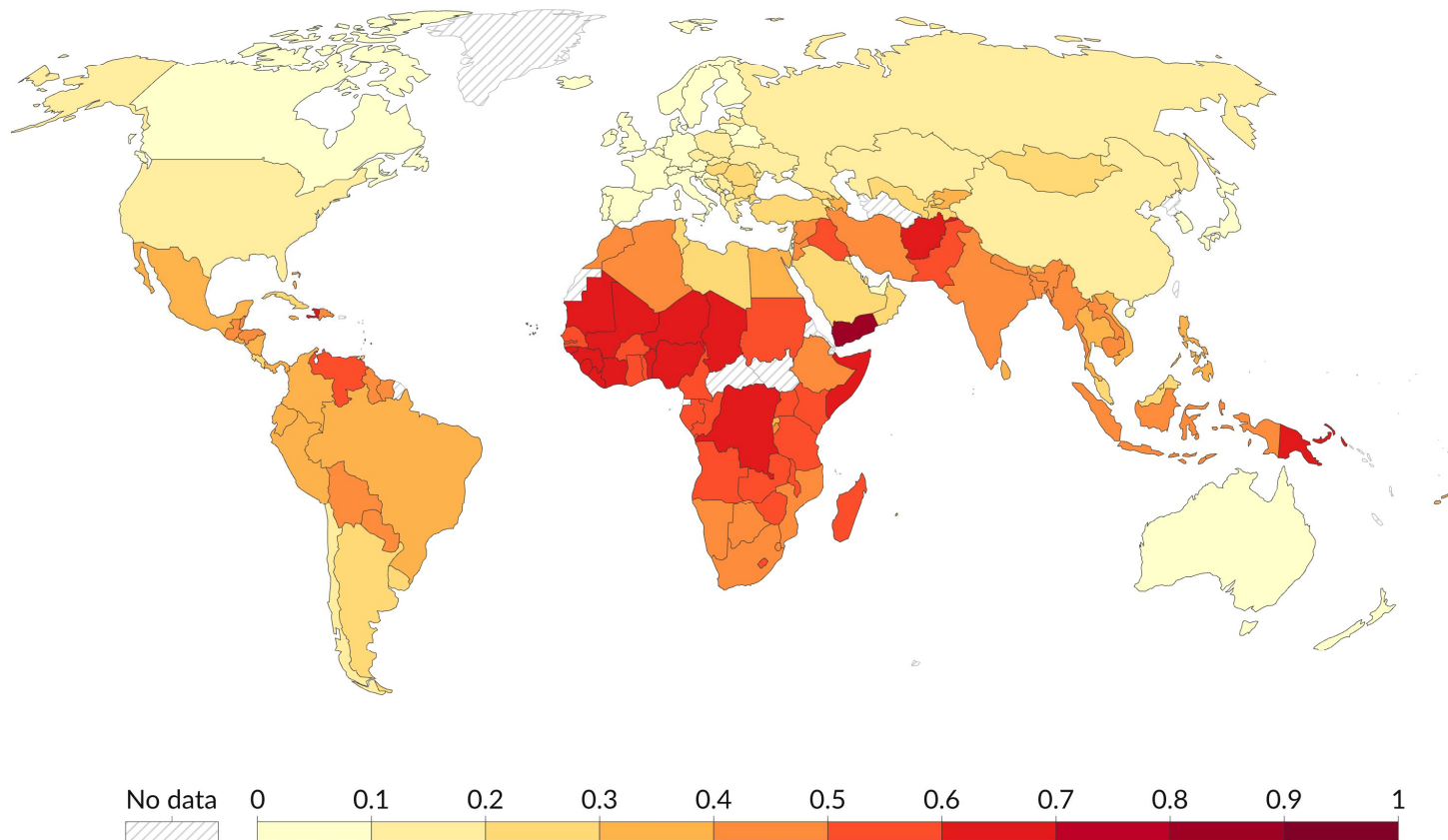
A product of dominant socio-cultural roles, values, and expectations for different genders that, among other repercussions, cause unequal access to power, opportunities, and resources.



Gender Inequality Index, 2022

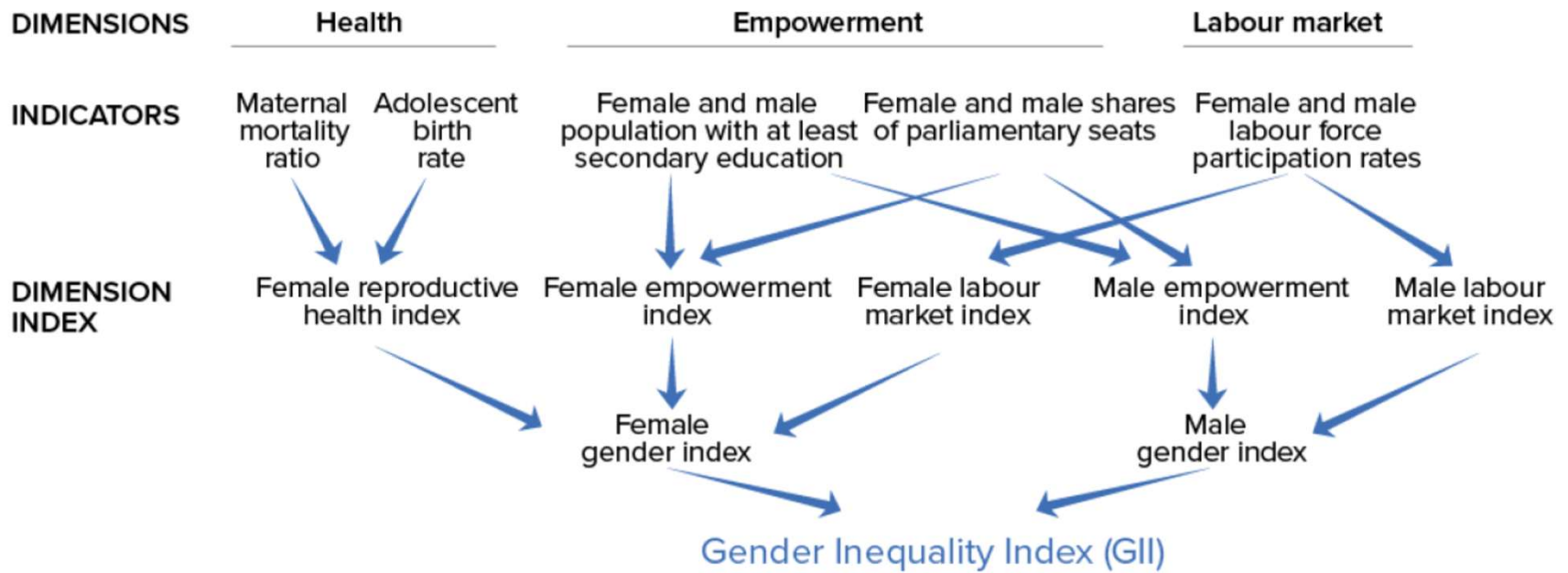
Our World
in Data

This index covers three dimensions: reproductive health, empowerment, and economic status. Scores are between 0-1 and higher values indicate higher inequalities.



Data source: UNDP, Human Development Report (2024)

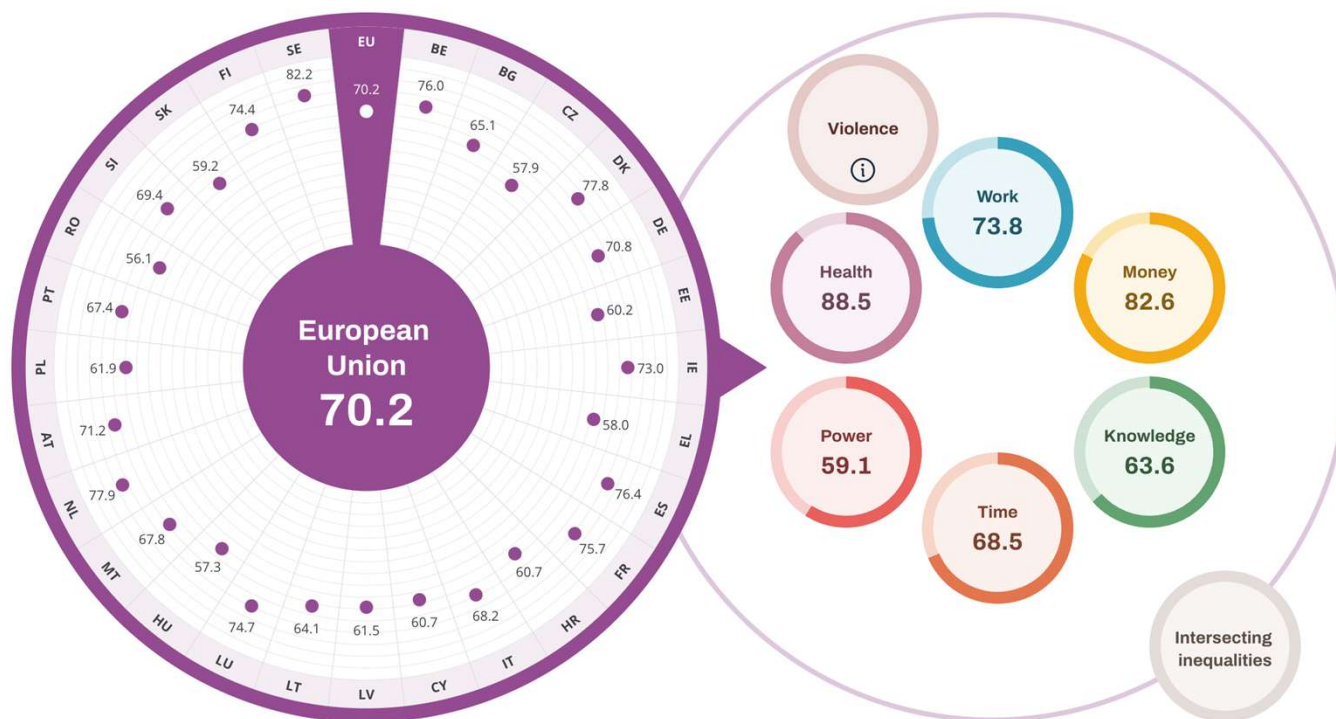
OurWorldInData.org/economic-inequality-by-gender | CC BY



Source: UNDP

EU Institute for Gender Equality Index

 European Union  in **2023**  edition



The data for **2023 Index** is mostly from **2021** and **2022**.

The Gender Equality Index gives the EU and the Member States **a score from 1 to 100**. A score of 100 would mean that a country had reached full equality between women and men.

Paid employment



Participation

Full-time equivalent employment rate (% , 15-89 population) ⓘ



Source: Eurostat, EU LFS, 2022. EIGE's calculations.

Duration of working life (years, 15+ population) ⓘ



Source: Eurostat, EU LFS, 2022. lfsi_dwl_a.

Education



Attainment and participation

Graduates of tertiary education (% , 15-89 population) ⓘ

EU-W	28
EU-M	26

Source: Eurostat, EU LFS, 2021. EIGE's calculations.

People participating in formal or non-formal education and training (15-74 population)



EU-W	19
EU-M	18

Source: Eurostat, EU LFS, 2021. EIGE's calculations.

Time



People caring for and educating their children or grandchildren, elderly or people with disabilities, every day (% , 18-74 population) ⓘ



Source: EIGE' survey on unpaid care, 2022. EIGE's calculations.

People doing cooking and/or housework, every day (% , 18-74 population) ⓘ



Source: EIGE' survey on unpaid care, 2022. EIGE's calculations.

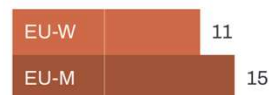


Workers doing sporting, cultural or leisure activities outside of their home, at least daily or several times a week (% , 16-74 workers) ⓘ



Source: EIGE' survey on unpaid care, 2022. EIGE's calculations.

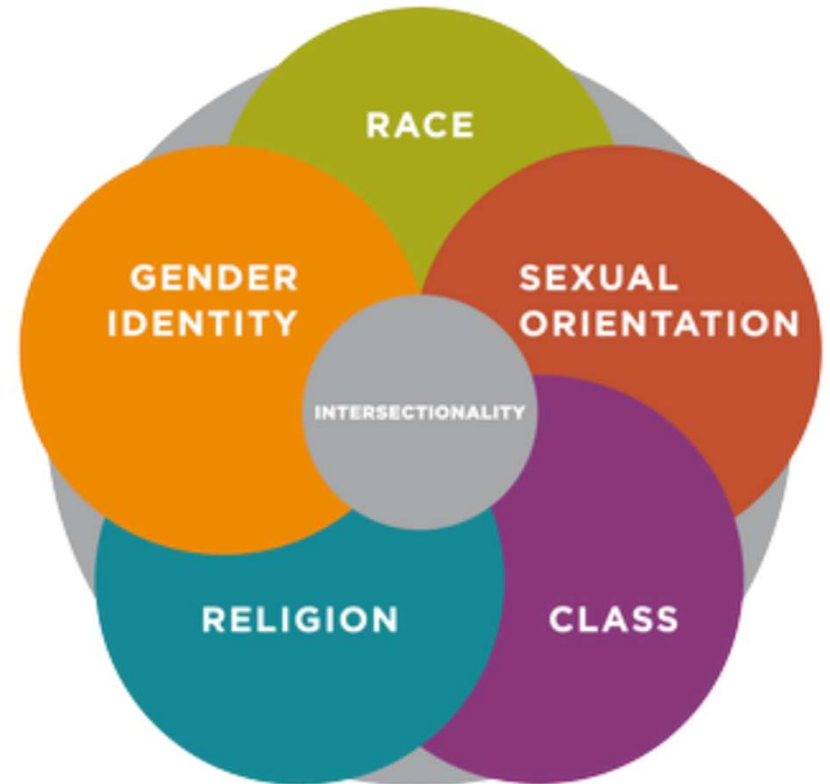
Workers involved in voluntary or charitable activities, at least once a month (% , 16-74 workers) ⓘ



Source: EIGE' survey on unpaid care, 2022. EIGE's calculations.

Intersectionality

- Coined by Kimberle Crenshaw
- The interaction of multiple forms of discrimination affecting the daily lives of individuals





Attainment and participation

Graduates of tertiary education (% , 15-89 population) ⓘ

With disabilities

EU-W	17
EU-M	18

Without disabilities

EU-W	32
EU-M	29

Source: EIGE's calculation with microdata, EU SILC, 2021 (SK, 2020), LU break in times series. n/a: data not available or not published due to reliability problems



Attainment and participation

Graduates of tertiary education (% , 15-89 population) ⓘ

Native born

EU-W	28
EU-M	26

Foreign born

EU-W	29
EU-M	27

EU-born

EU-W	30
EU-M	29

Non-EU born

EU-W	28
EU-M	26



Participation

Full-time equivalent employment rate (% , 15-89 population) ⓘ

Single



Lone parent



Couple without children



Couple with children

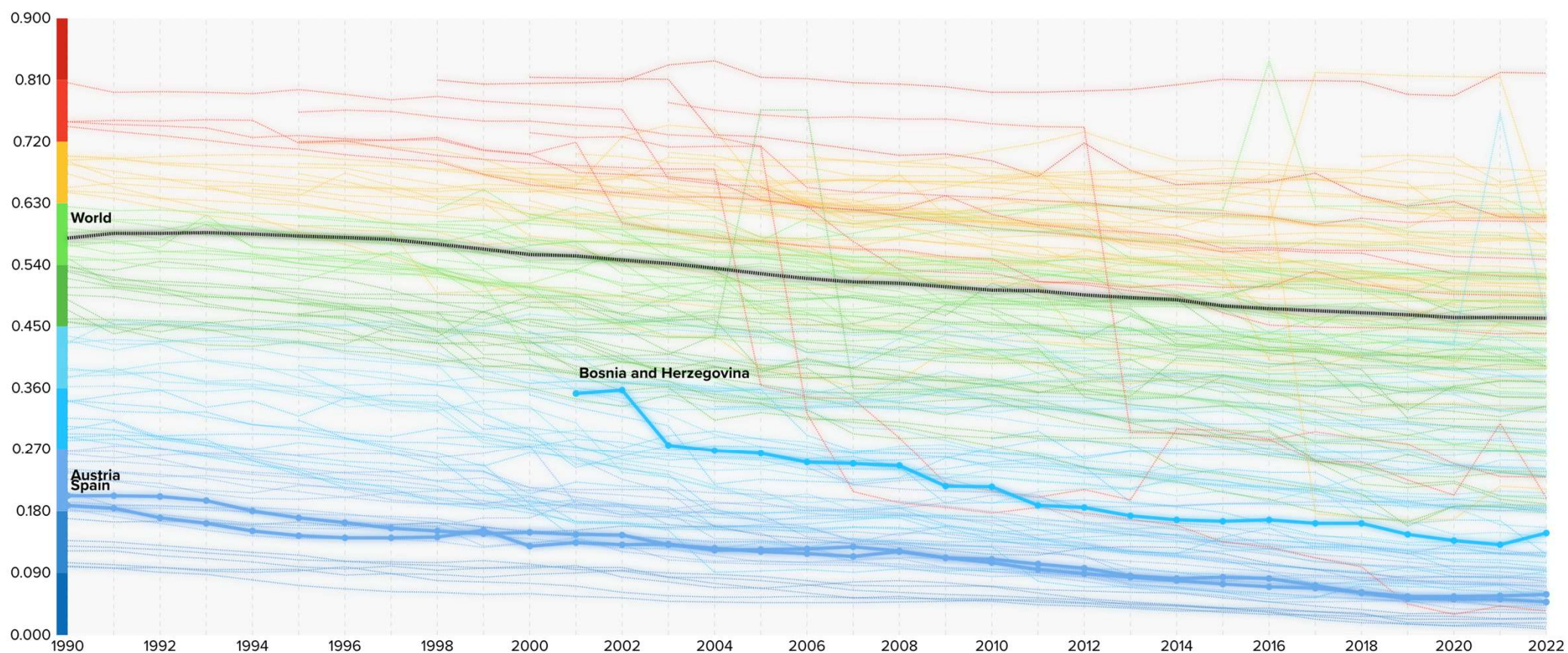




**How many countries have
achieved gender equality?**

0

Gender Inequality Index (GII)



THE WORLD IS 
NOT ON TRACK TO ACHIEVE
GENDER EQUALITY BY 2030

OUT OF GOAL 5 INDICATORS:

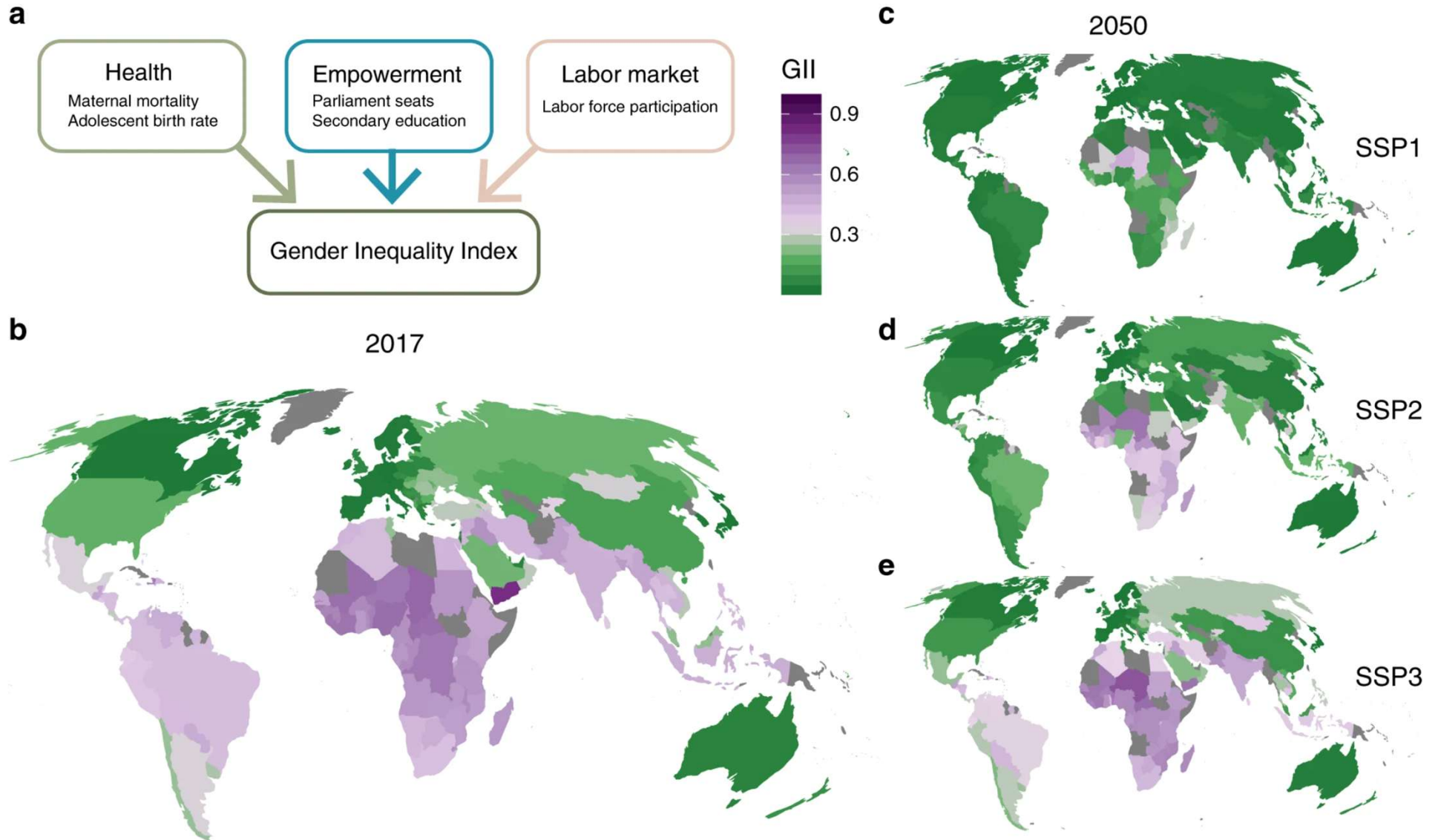


- "ON TRACK"
- AT A MODERATE DISTANCE
- FAR OR VERY FAR OFF TRACK



When will we reach gender
equality?

Not until 2154, says the World
Economic Forum



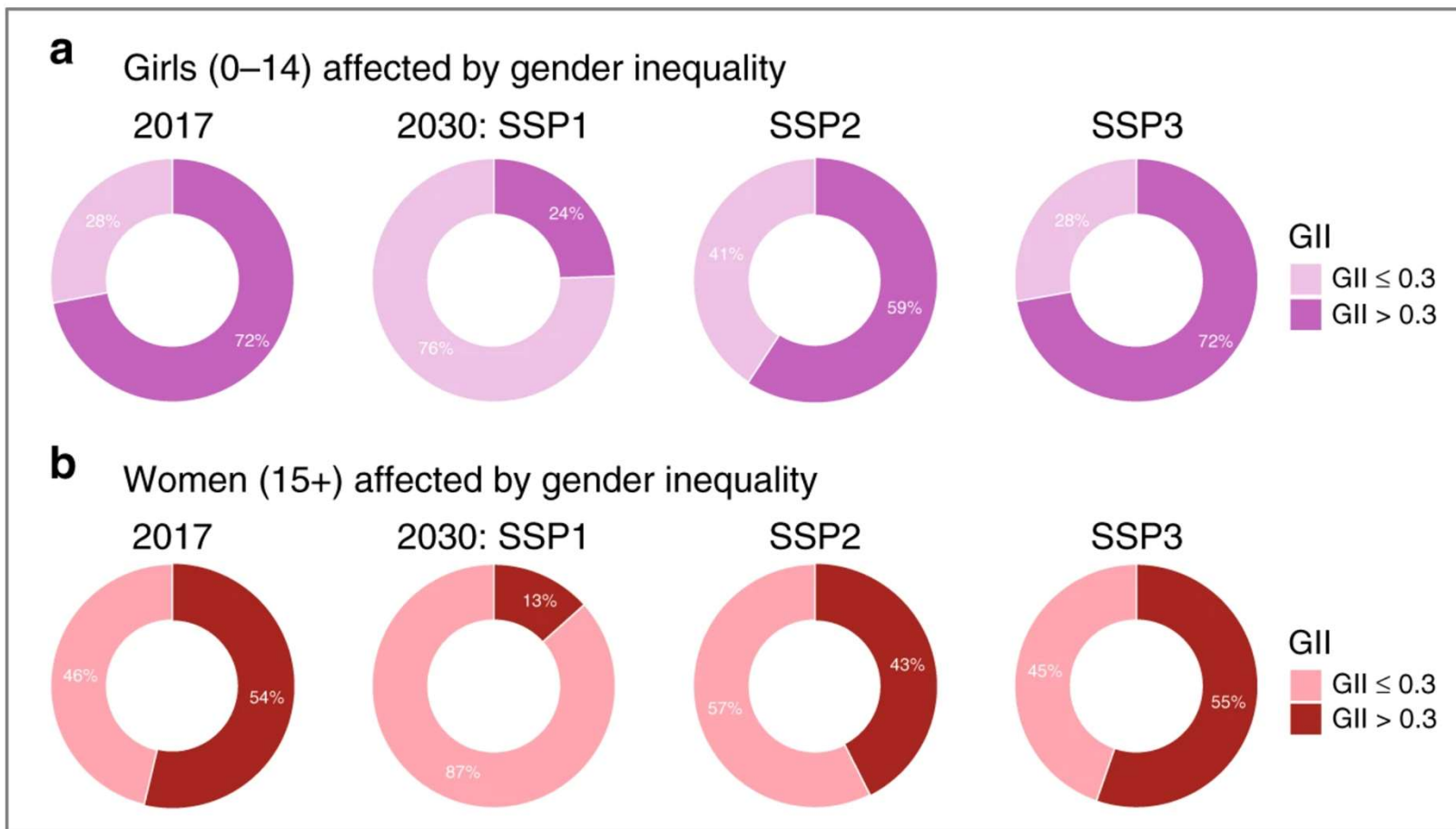
Andrijevic et al. "Overcoming gender inequality for climate resilient development." Nature Communications (2020)

Possible trajectories of gender (in)equality



Andrijevic et al. "Overcoming gender inequality for climate resilient development." Nature Communications (2020)

Possible trajectories of gender (in)equality



Andrijevic et al. "Overcoming gender inequality for climate resilient development." Nature Communications (2020)

Implications for the society & the
economy & climate

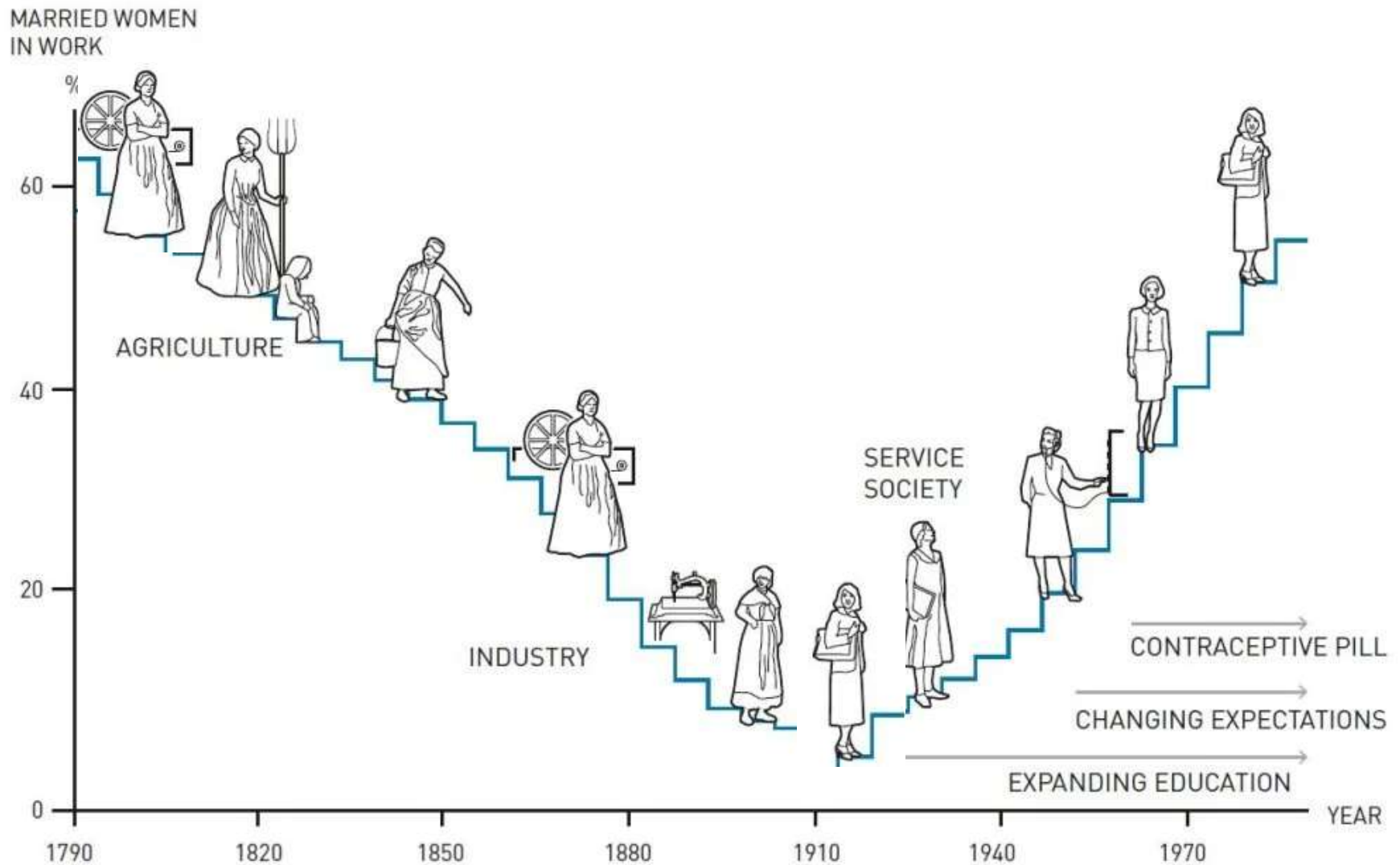


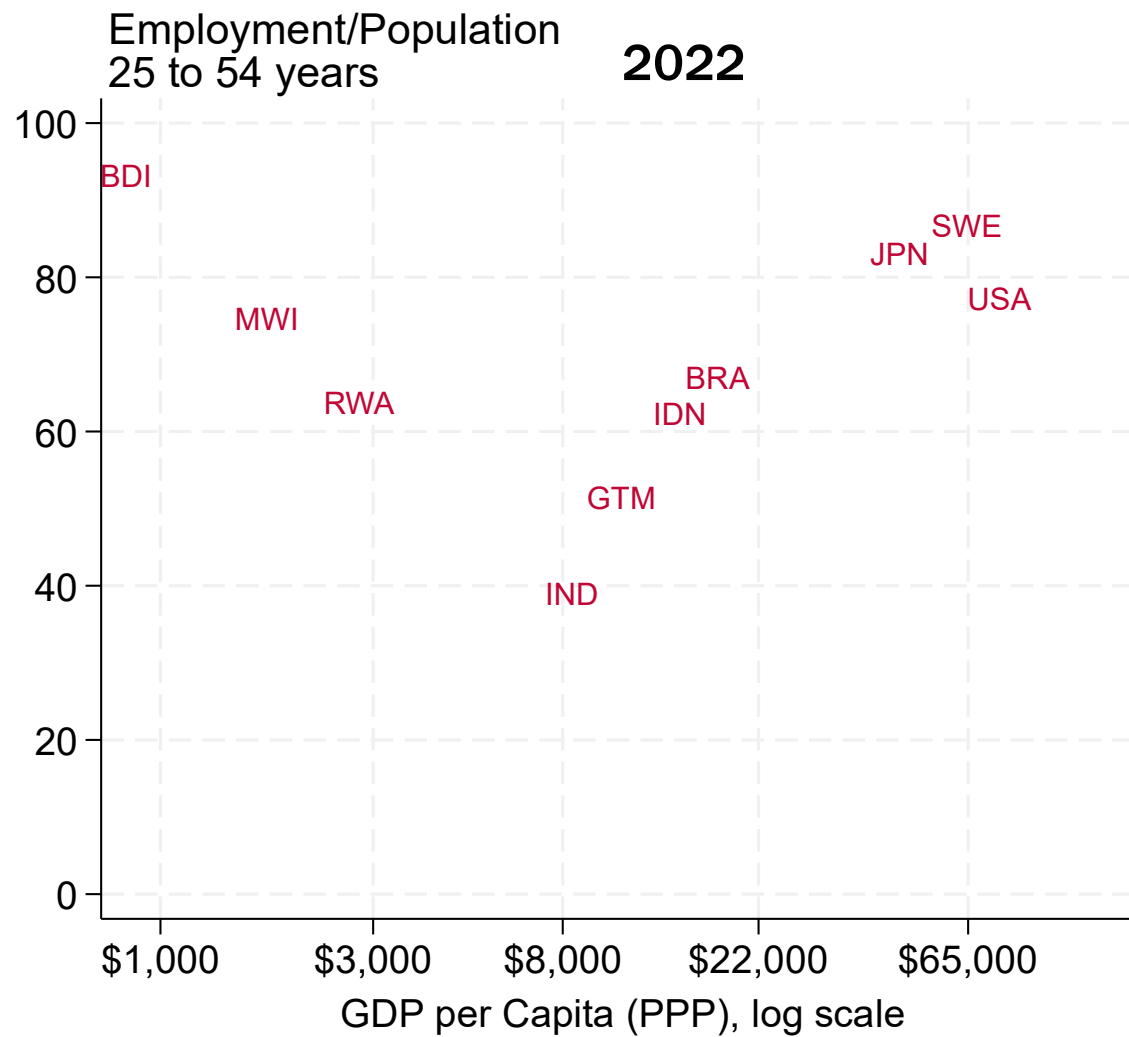
Claudia Goldin

- 2023 Nobel laureate for economics
- Professor at Harvard University
- Economic historian and labor economist
- Nobel lecture "An evolving economic force":

<https://www.nobelprize.org/prizes/economic-sciences/2023/goldin/lecture/>

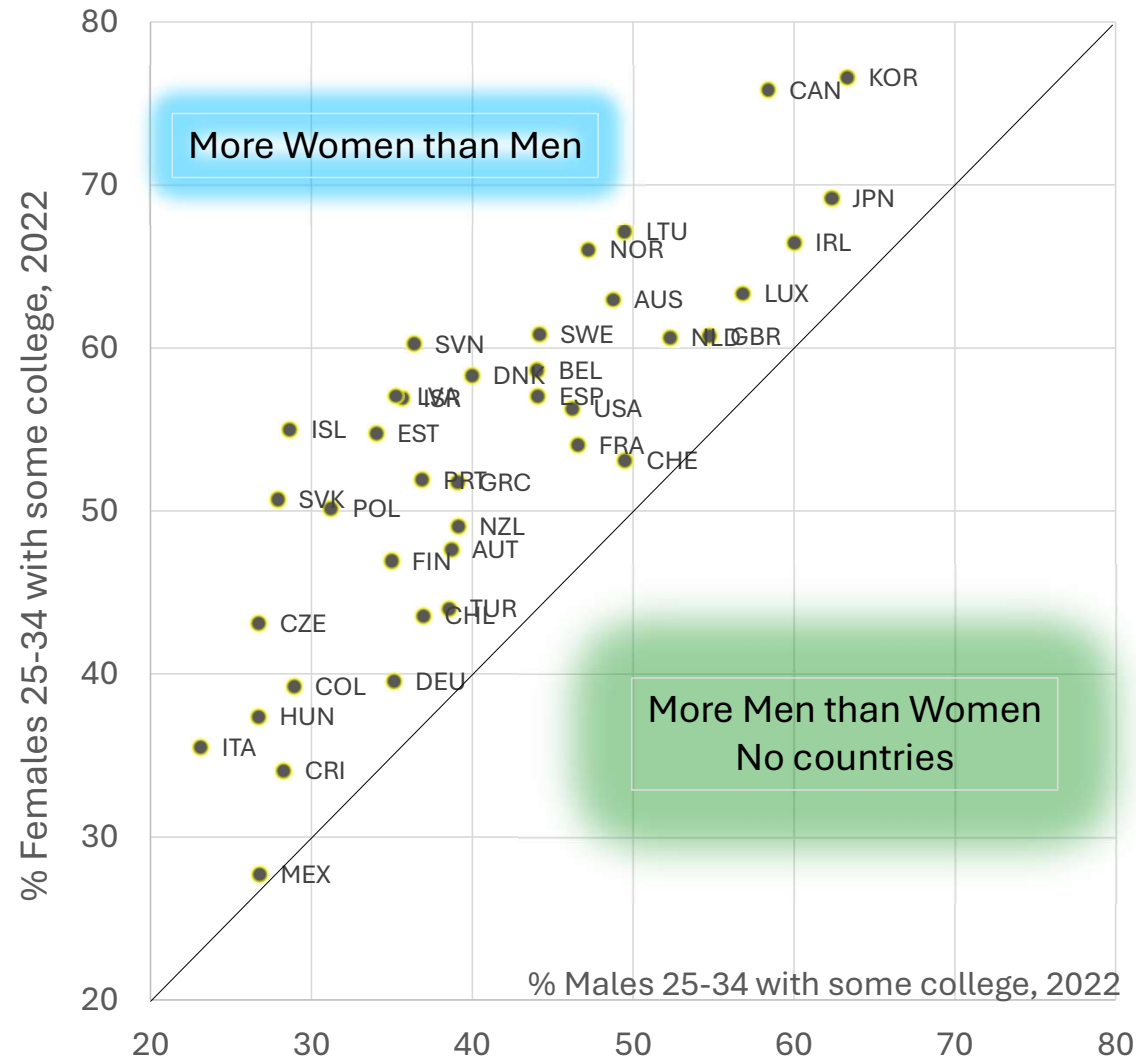
Claudia Goldin, Nobel Lecture, "An Evolving Economic Force," Dec. 8, 2023





Claudia Goldin, Nobel Lecture, "An Evolving Economic Force," Dec. 8, 2023

More women than men, 25-34 years, had attended college in *all* OECD nations in 2022



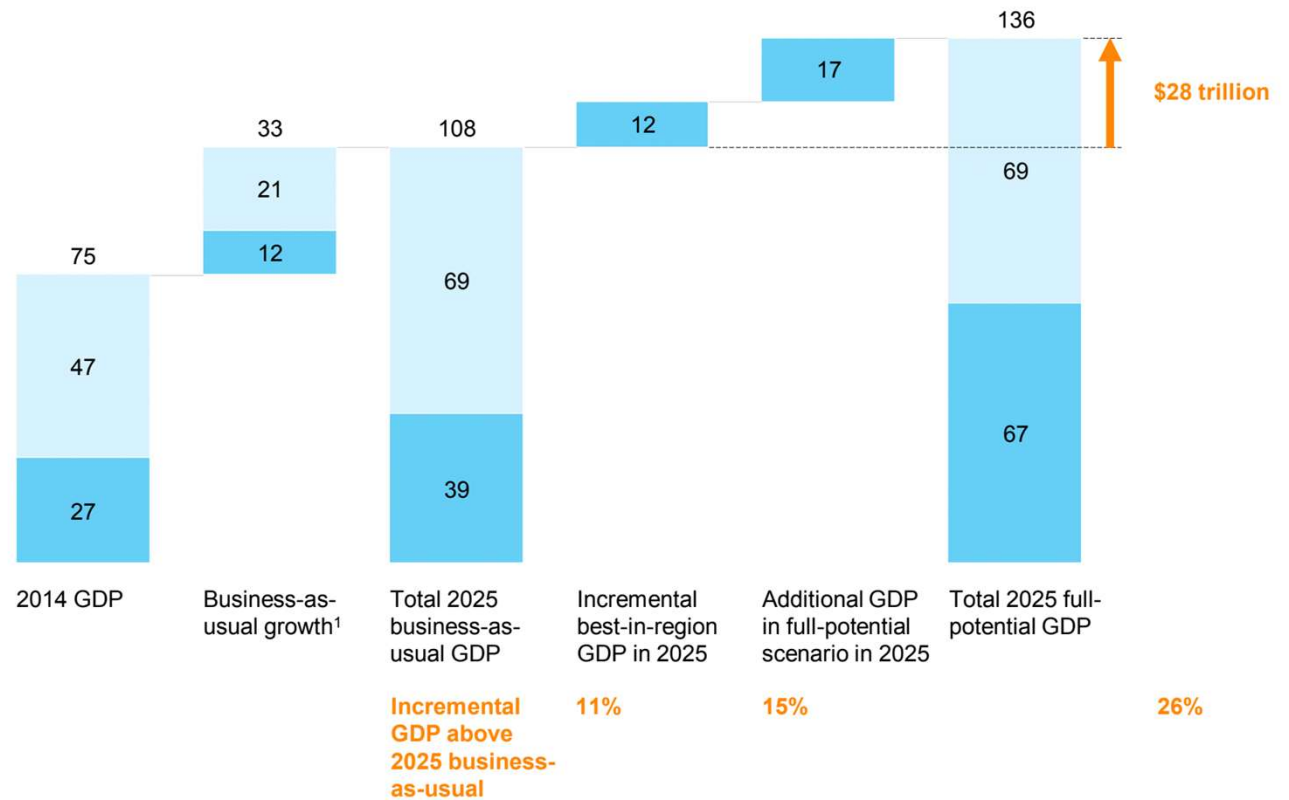
Claudia Goldin, Nobel Lecture, "An Evolving Economic Force," Dec. 8, 2023

“Gender inequality makes no economic sense”
(McKinsey Global Institute)

Closing the global gender gap could deliver \$12 trillion to \$28 trillion of additional GDP in 2025

Global GDP opportunity
2014 \$ trillion

Male Female



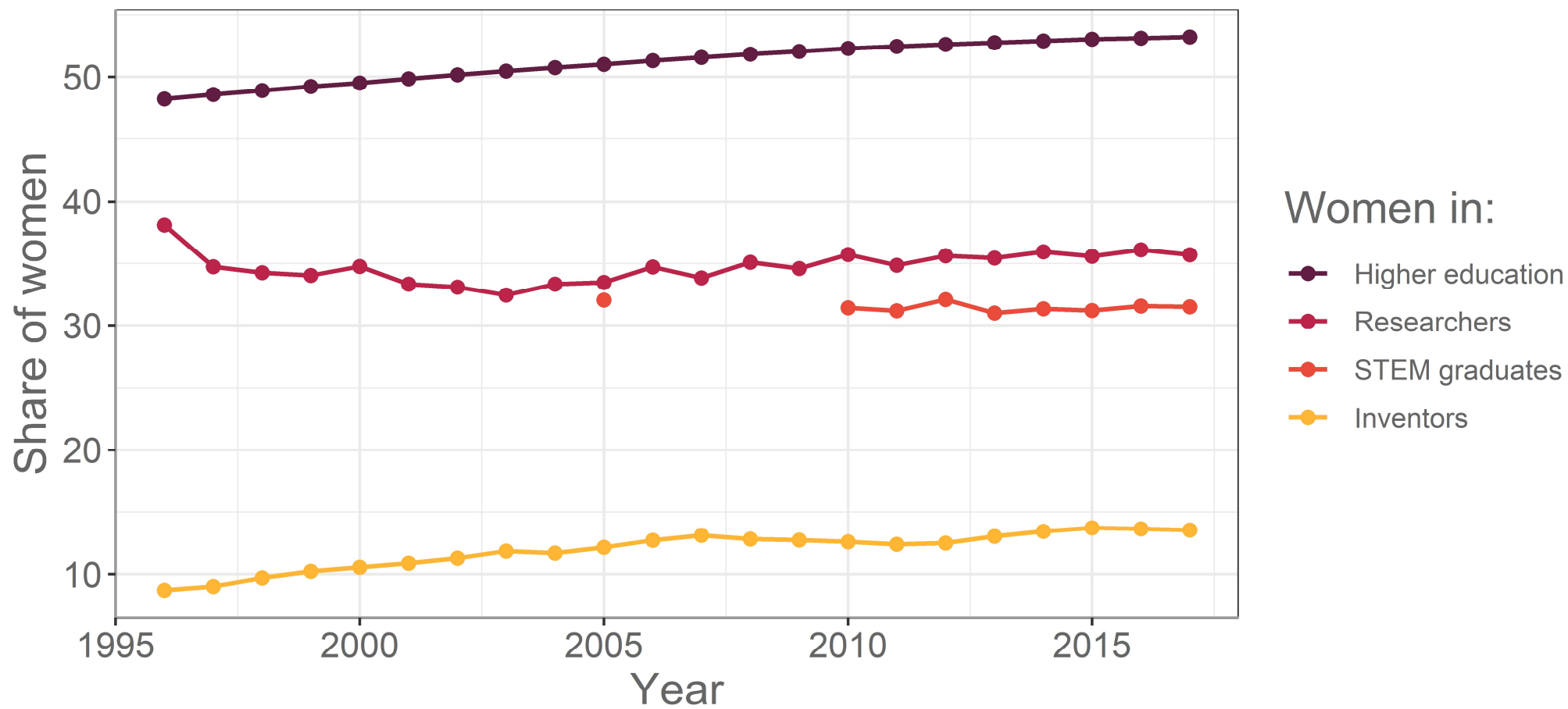
¹ Represents difference between annual GDP in 2014 and in 2025 for the business-as-usual scenario.
NOTE: Numbers may not sum due to rounding.

SOURCE: ILO; World Input-Output Database; Oxford Economics; IHS; national statistical agencies; McKinsey Global Growth Model; McKinsey Global Institute analysis

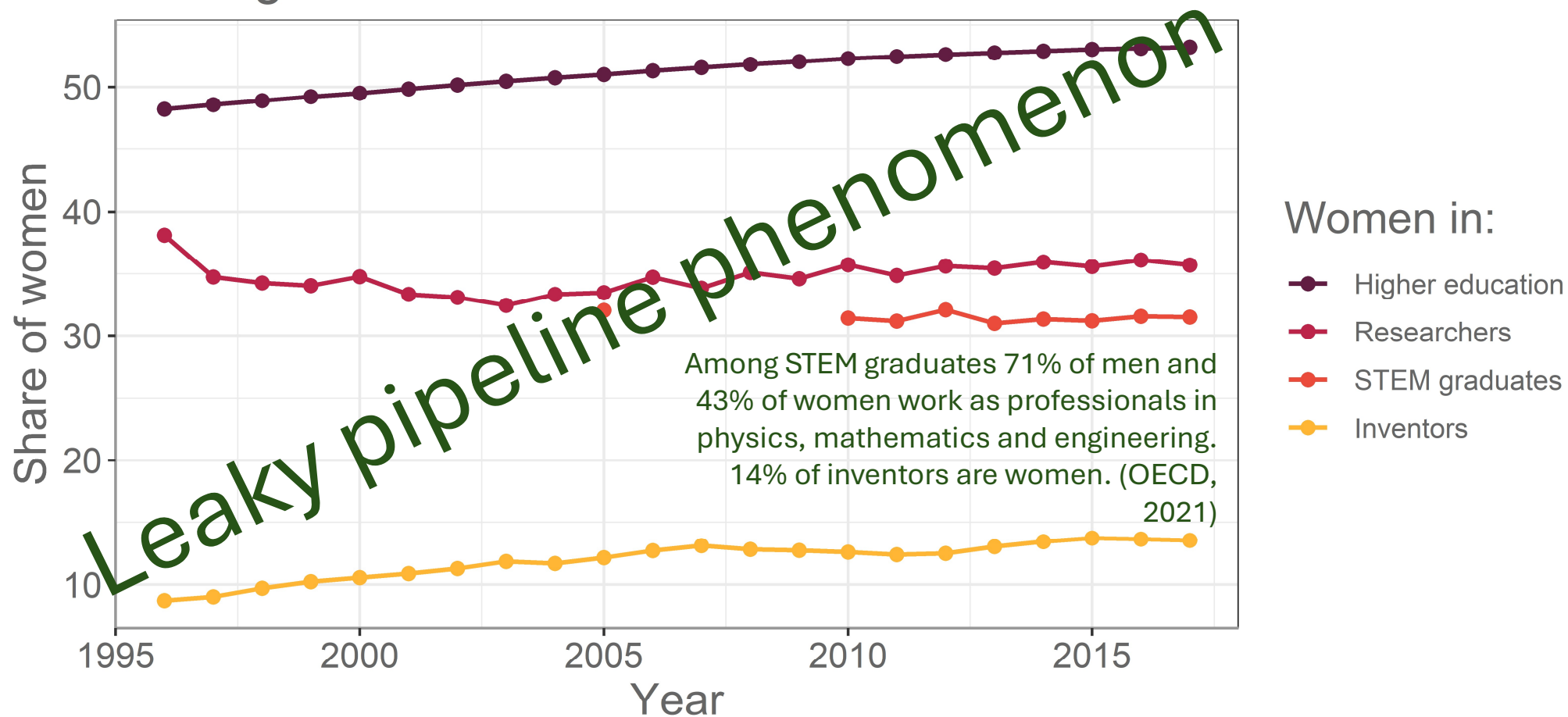
Relationship between innovation and gender equality in science in OECD countries



Average in OECD countries

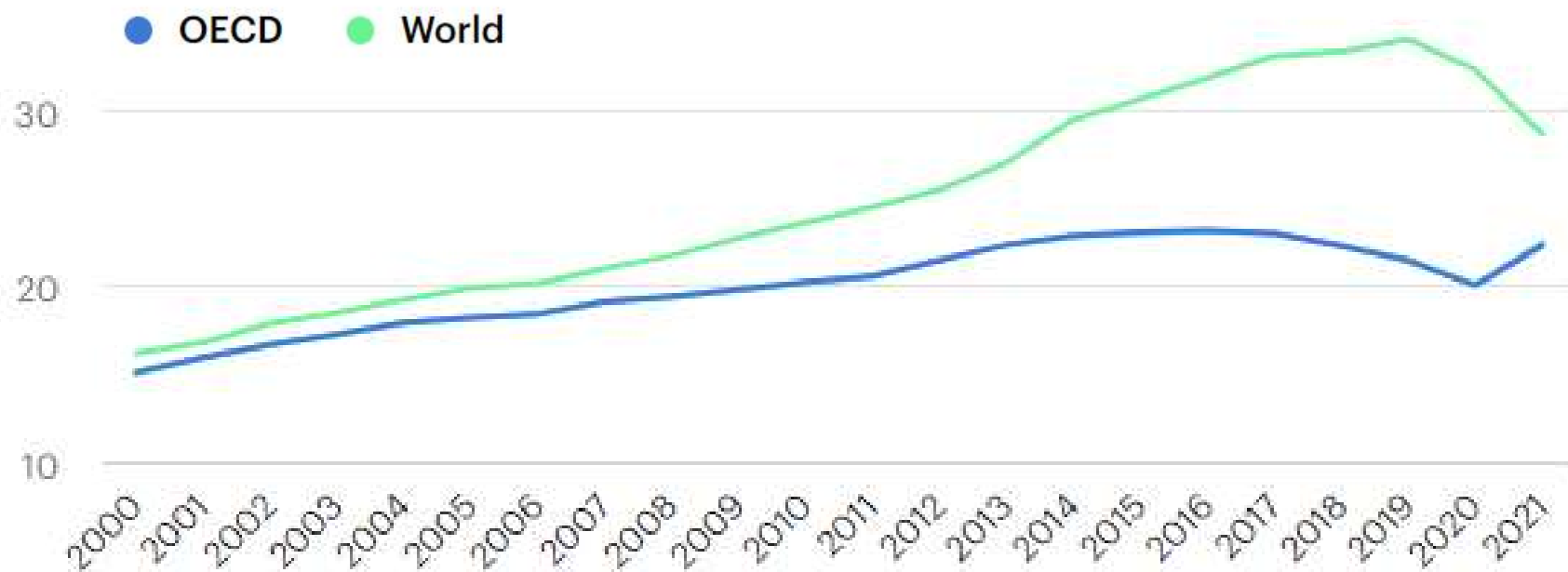


Average in OECD countries



Share of patents with at least one female inventor

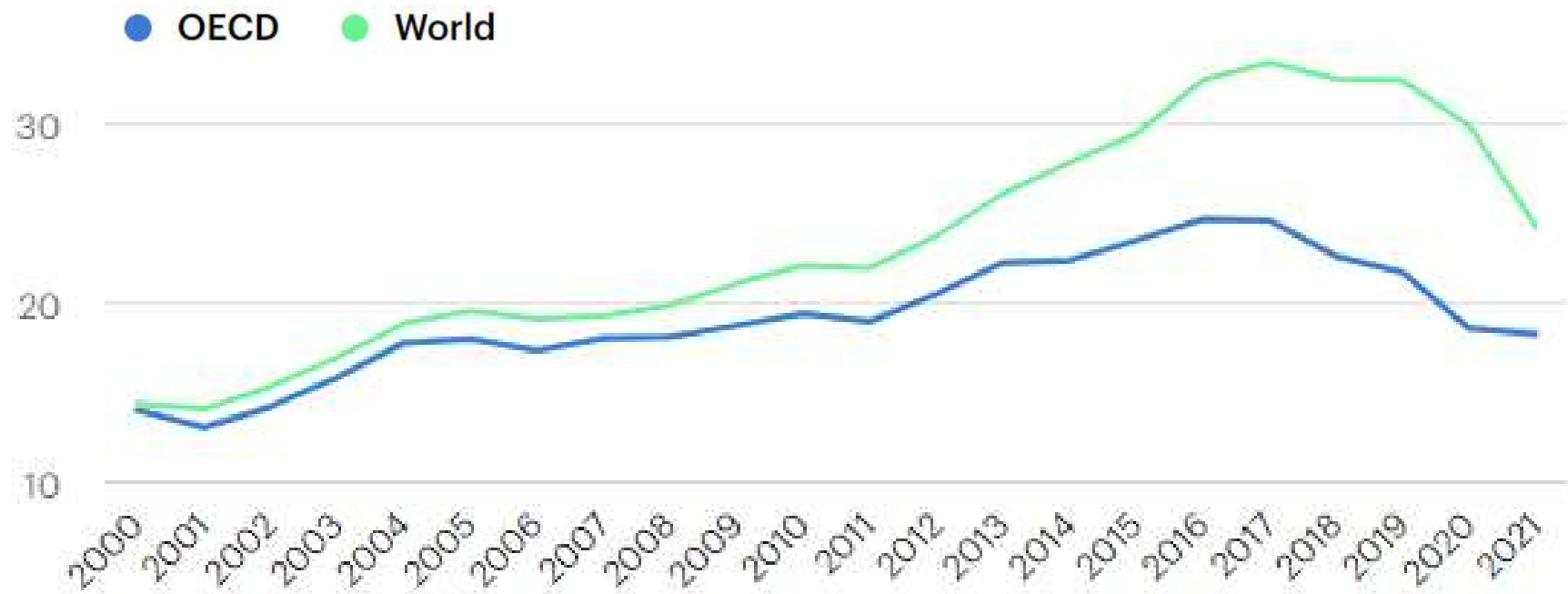
Total - all technologies



Source: International Energy Agency (2022)

Share of patents with at least one female inventor

Total - clean energy transition technologies



Source: International Energy Agency (2022)

Innovation increases with more gender equal research

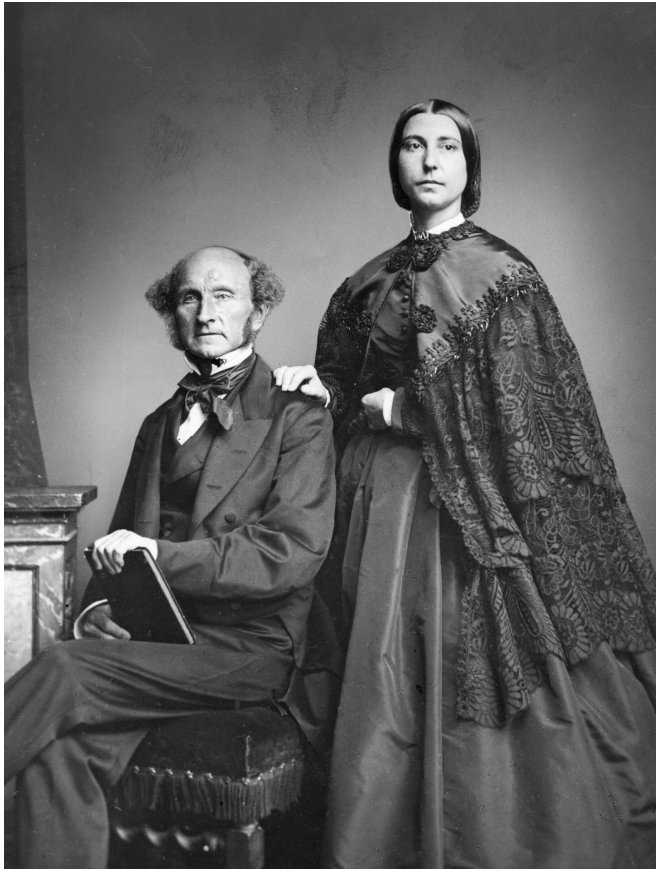
- Share of women in research is positively associated with patents:
 - 5 percentage points increase in the share of female researchers leads to 6 more patents per capita
 - 5 percentage points increase in the share of female researchers leads to 4 more **environmental patents** per capita
- The relationship is robust after controlling for indicators such as GDP, % of GDP invested in research and development, researchers per 100t people and regulatory environment
- The effect of female researchers appears to be stronger than the effect of GDP



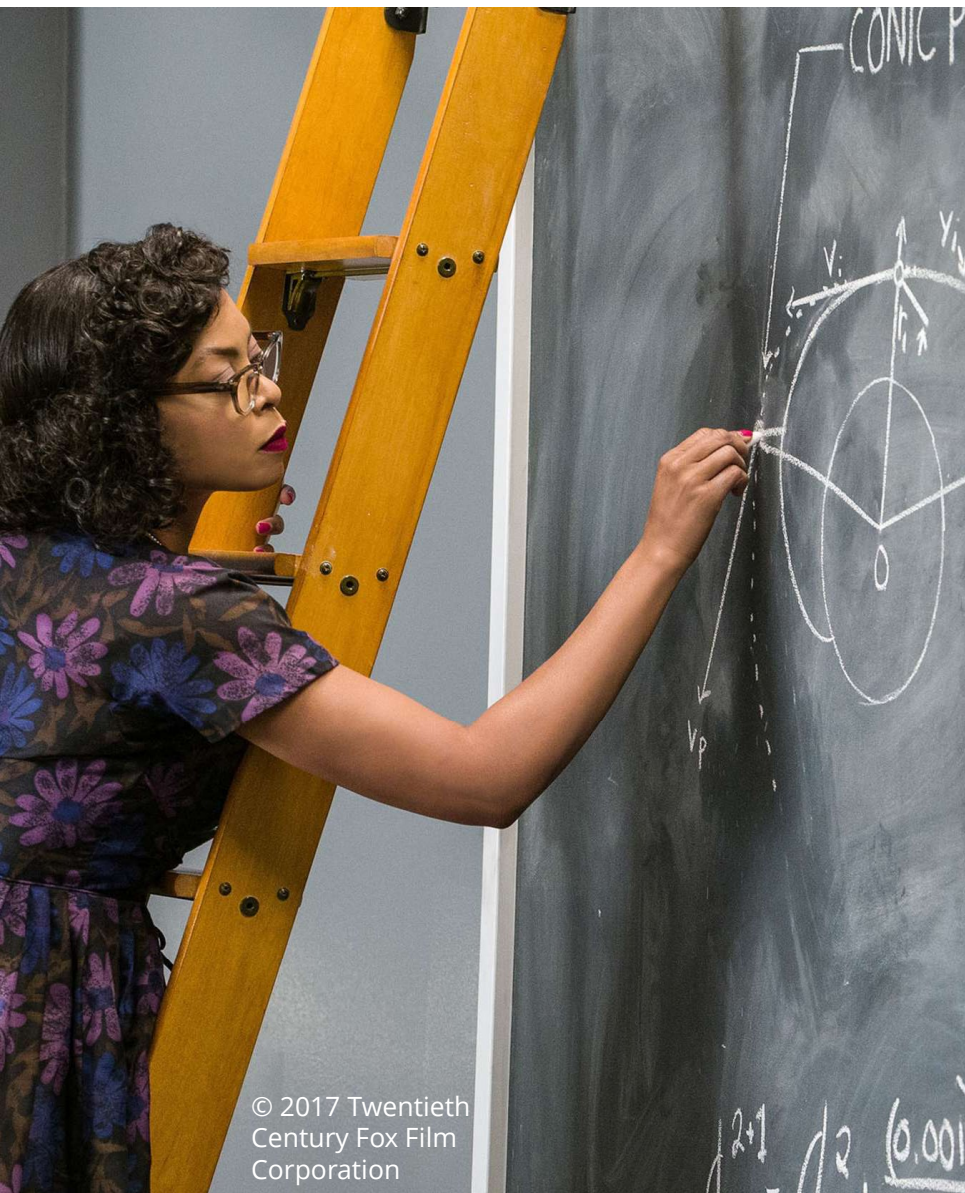
Credit: L'Oreal

Source: Own work in progress

Not a new idea

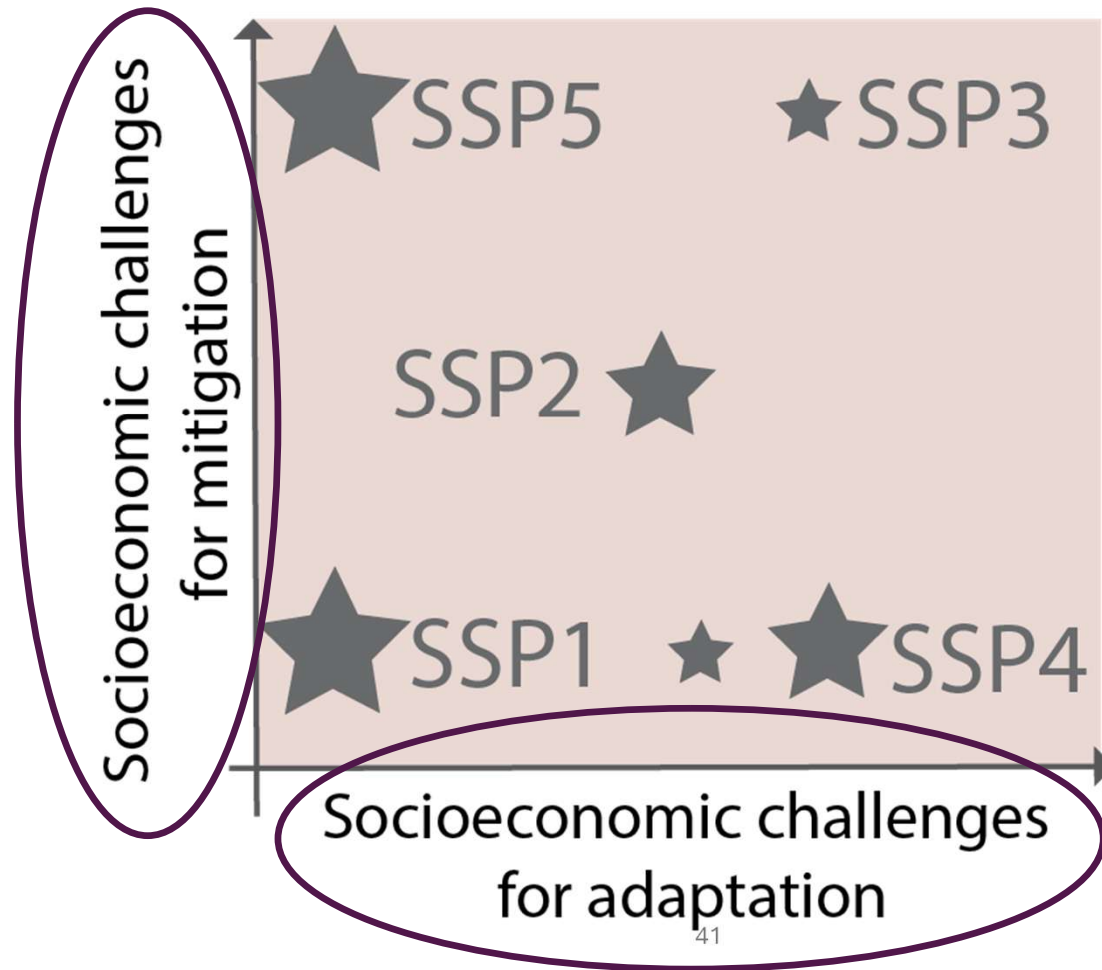


- John Stuart Mill and Harriet Taylor Mill - "The Subjection of Women" (1869): Moral and intellectual advancement of humankind would result in greater happiness for everybody
- They argued that inequality of women was a **relic from the past** (in the 19th century!)
- *"If we tried equality, we would see that there were benefits for individual women. They would be free of the unhappiness of being told what to do by men. And there would be benefits for society at large – it would double the mass of mental faculties available for the higher service of humanity. **The ideas and potential of half the population would be liberated, producing a great effect on human development.**"*



Implications for climate change

Shared Socioeconomic Pathways (SSPs)



Gender (in)equality & adaptation challenges

Women are disproportionately affected by climate extremes:

- Lower adaptive capacity due to the lack of access to resources
- Responsible for securing fuel or water
- More susceptible to water-related infections
- Unable to swim/prevented by traditional clothing

...and in the aftermath of climate extremes:

- Exposed to domestic violence
- Increased likelihood of early marriage
- Increased likelihood to interrupt or end schooling

...while men are unfavorably affected in the following:

- More exposed in the building sector
- More likely to die in floods and storms
- More likely to be victims of suicide & depression during droughts



Source: Shutterstock/Grist

Gender (in)equality & mitigation challenges

Strengthening institutions and decision-making:

- Higher share of women in parliament connected to more stringent climate policy
- Female bureaucrats more likely to promote green procurement

Strengthening human capital:

- Female researchers % positively associated with innovative capacity
- More labor force available to support clean energy transition
- What if higher participation of women in education and labor force leads to higher emissions?

Behavioral change towards low-emissions demand side:

- The higher gender equality, the weaker the association between GDP per capita and CO2 emissions
- Women's consumer choices tend to be more "climate friendly"
- Are women inherently more climate friendly than men?



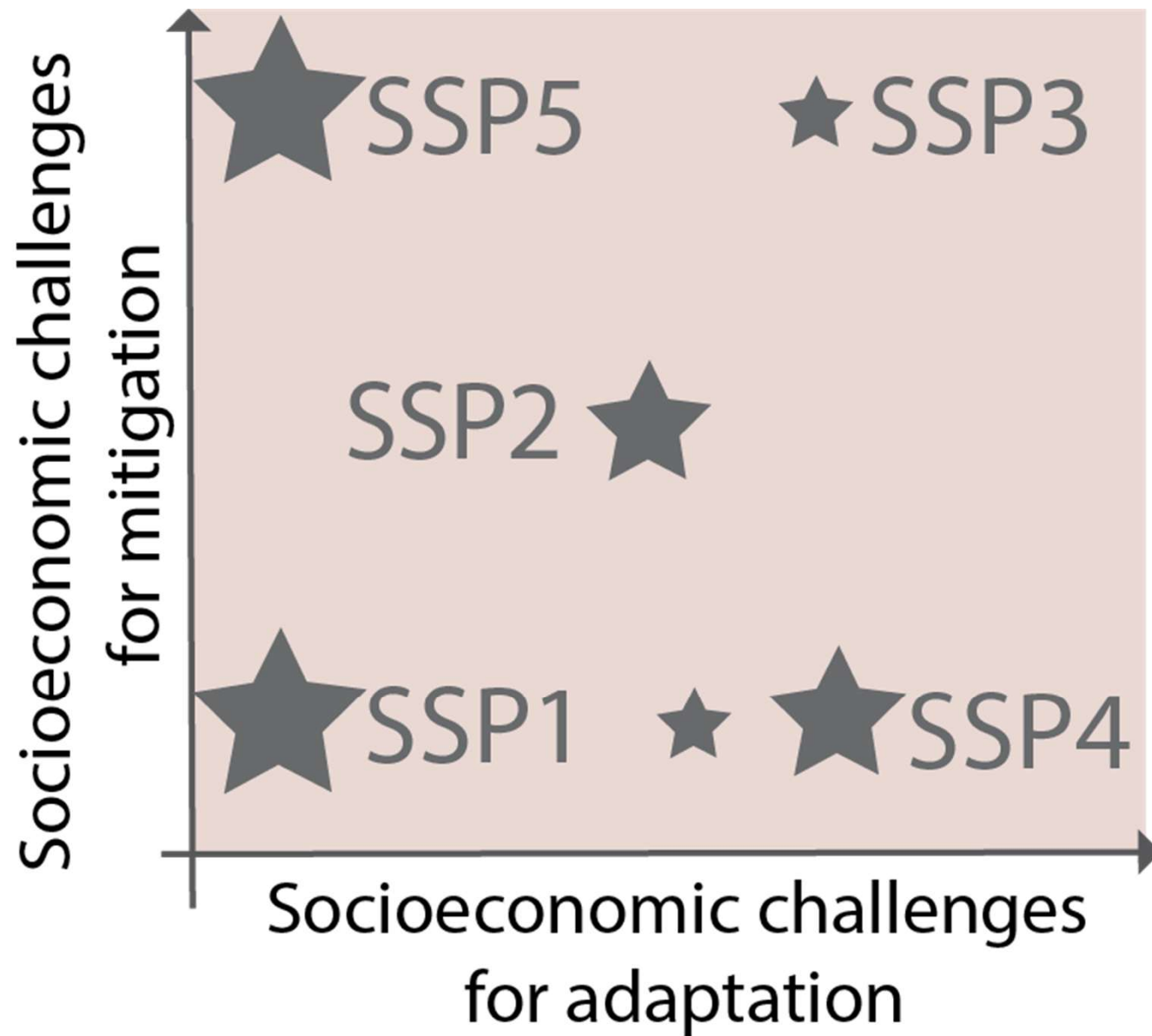
Source: Trevor Adeline/Plainpicture

In other words



Gender equality affects
both challenges for adaptation and for mitigation

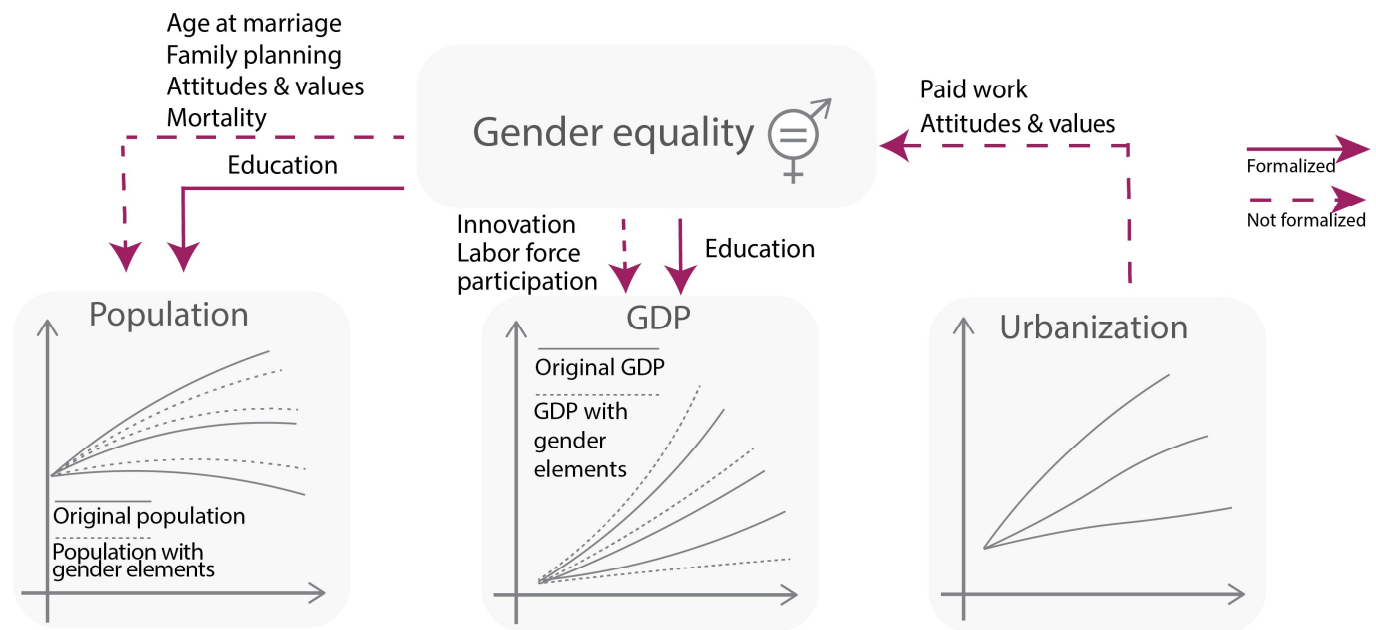
A gender equal world is still hypothetical...
...but scenarios can help us imagine it



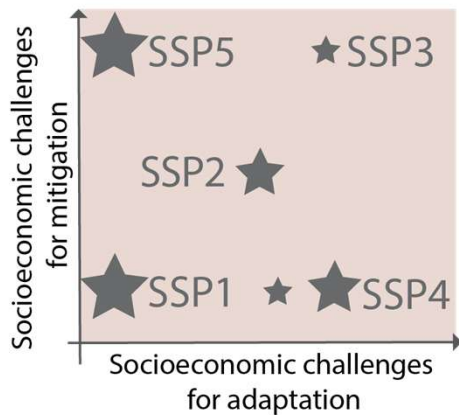


Steps for the scenario building community

- Develop more detailed narratives
- Integrate quantified indicators of gender equality in models of the key drivers
- Endogenize the relationships



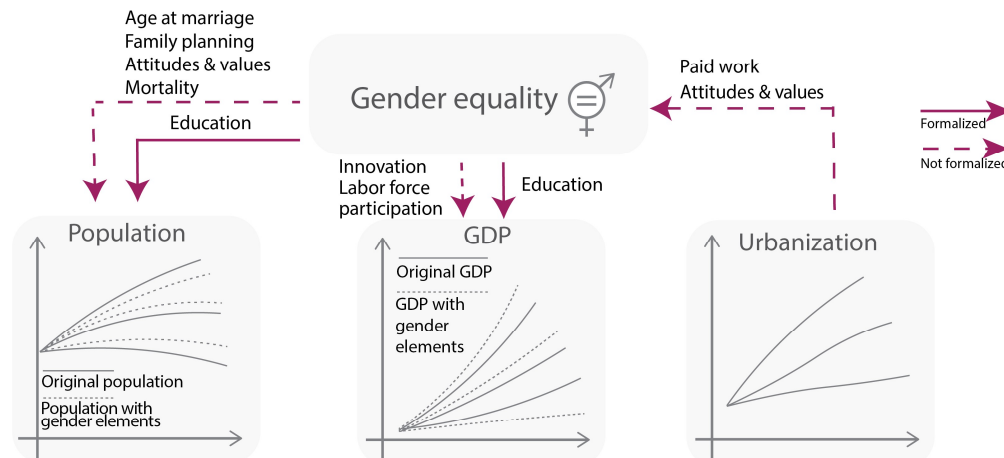
Rethinking the SSP challenge space



+

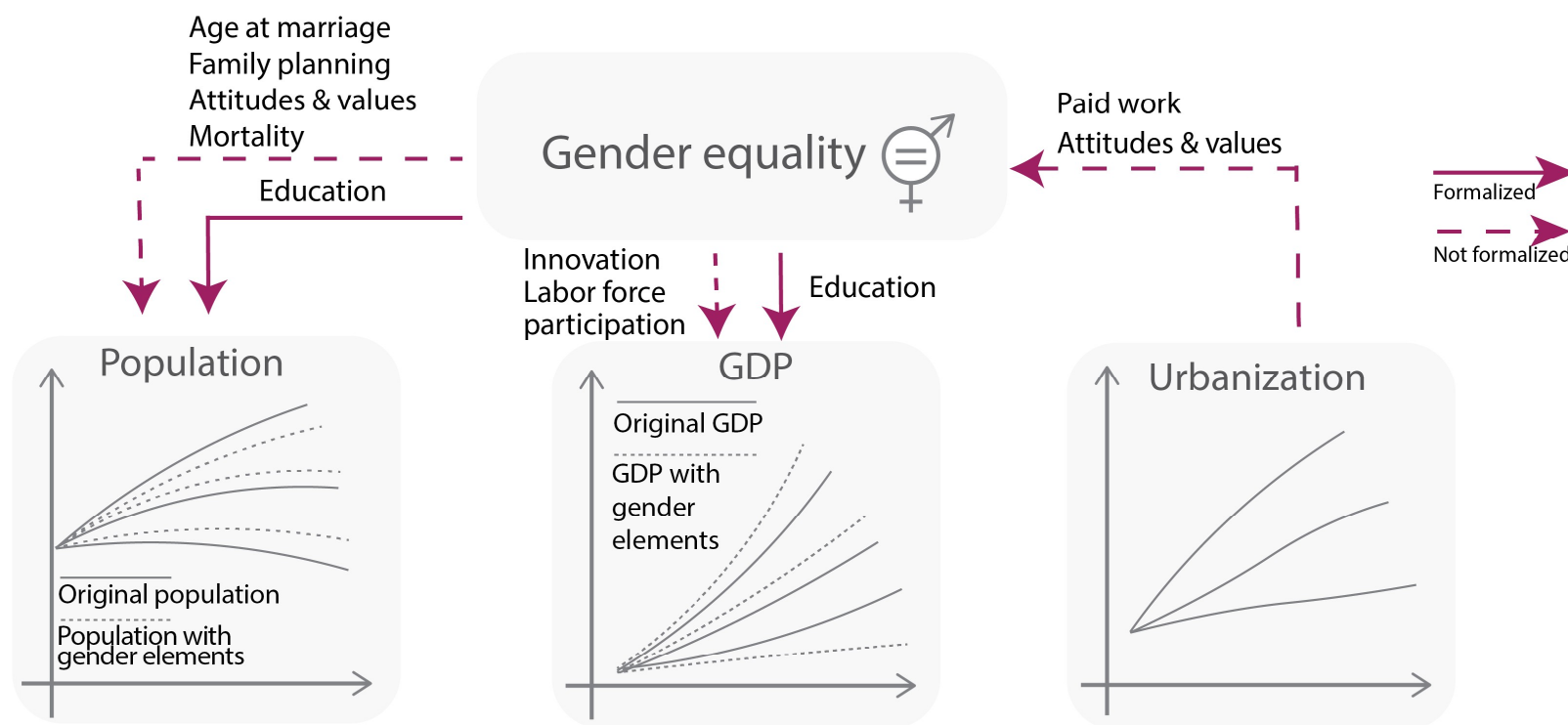
Develop more detailed narratives

Integrate quantified indicators of gender equality & endogenize relationships



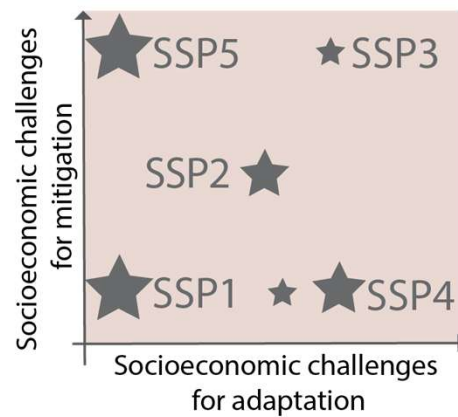
Andrijevic, M., Zimm, C., Moyer, J. D., Muttarak, R., & Pachauri, S. (2025). Representing gender inequality in scenarios improves understanding of climate challenges. *Nature Climate Change*, 1-9.

Links with key drivers



Andrijevic, M., Zimm, C., Moyer, J. D., Muttarak, R., & Pachauri, S. (2025). Representing gender inequality in scenarios improves understanding of climate challenges. *Nature Climate Change*, 1-9.

Rethinking the SSP challenge space

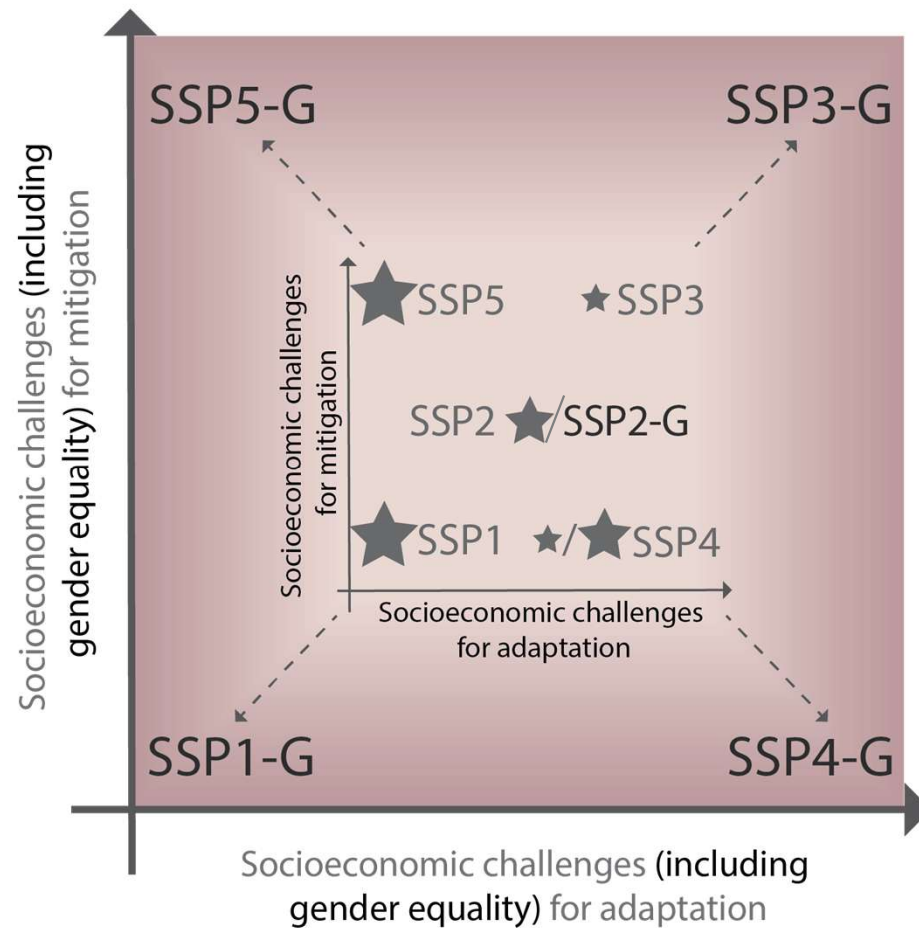


Implicit gender equality
(O'Neill et al., 2017):



Rethinking the SSP challenge space

Broader? Smaller? Different!

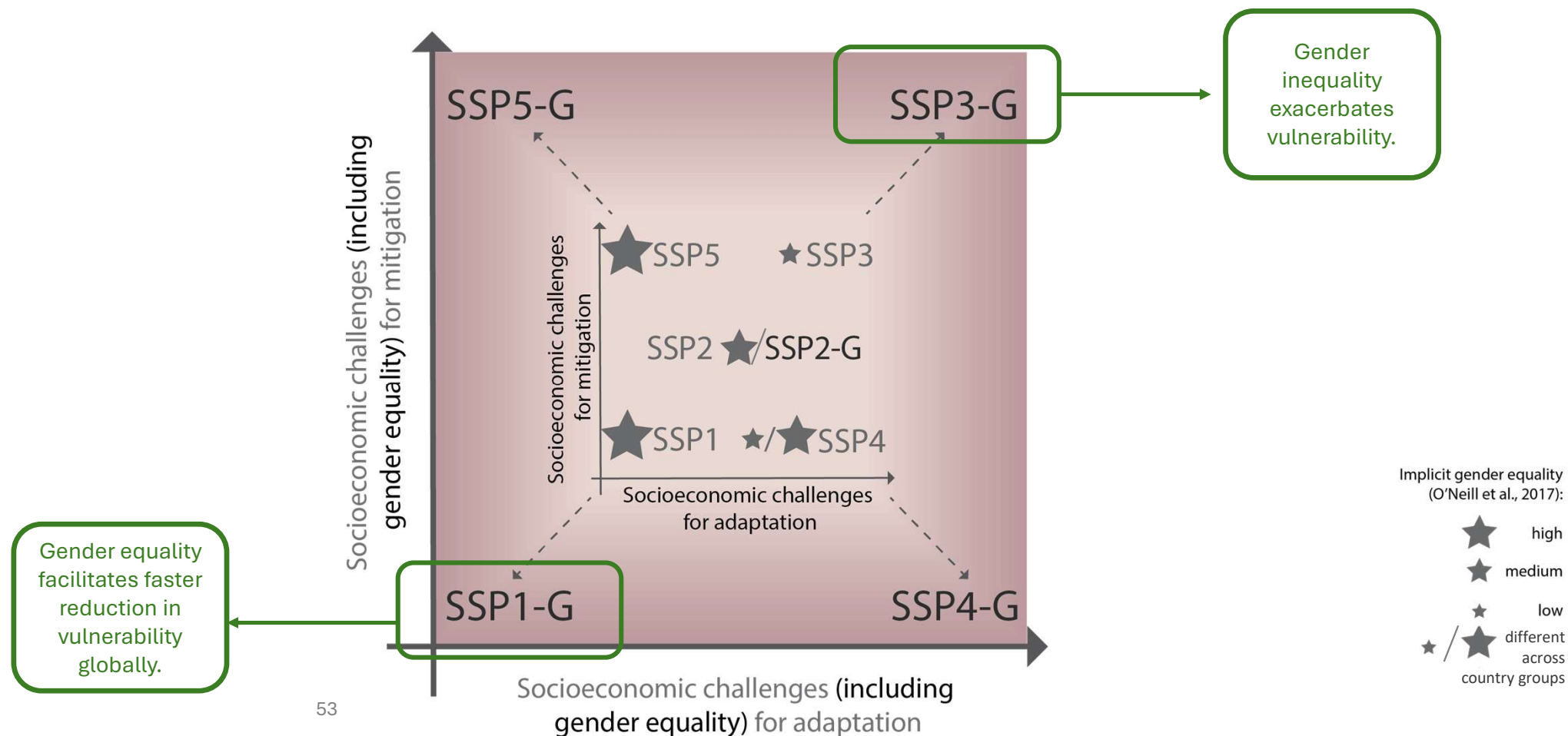


Implicit gender equality
(O'Neill et al., 2017):

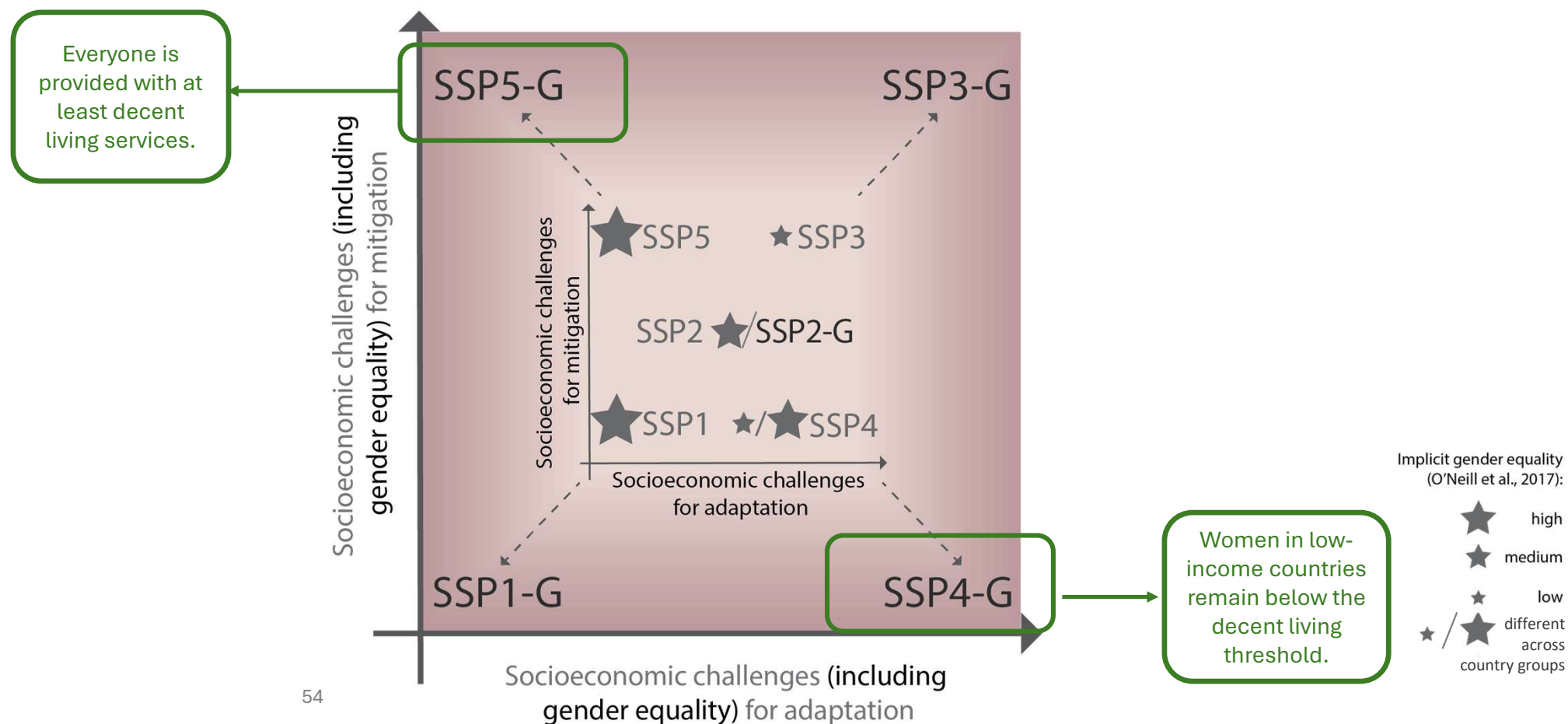
- ★ high
- ★ medium
- ★ low
- ★ / ★ different across country groups

Andrijevic, M., Zimm, C., Moyer, J. D., Mutarak, R., & Pachauri, S. (2025). Representing gender inequality in scenarios improves understanding of climate challenges. *Nature Climate Change*, 1-9.

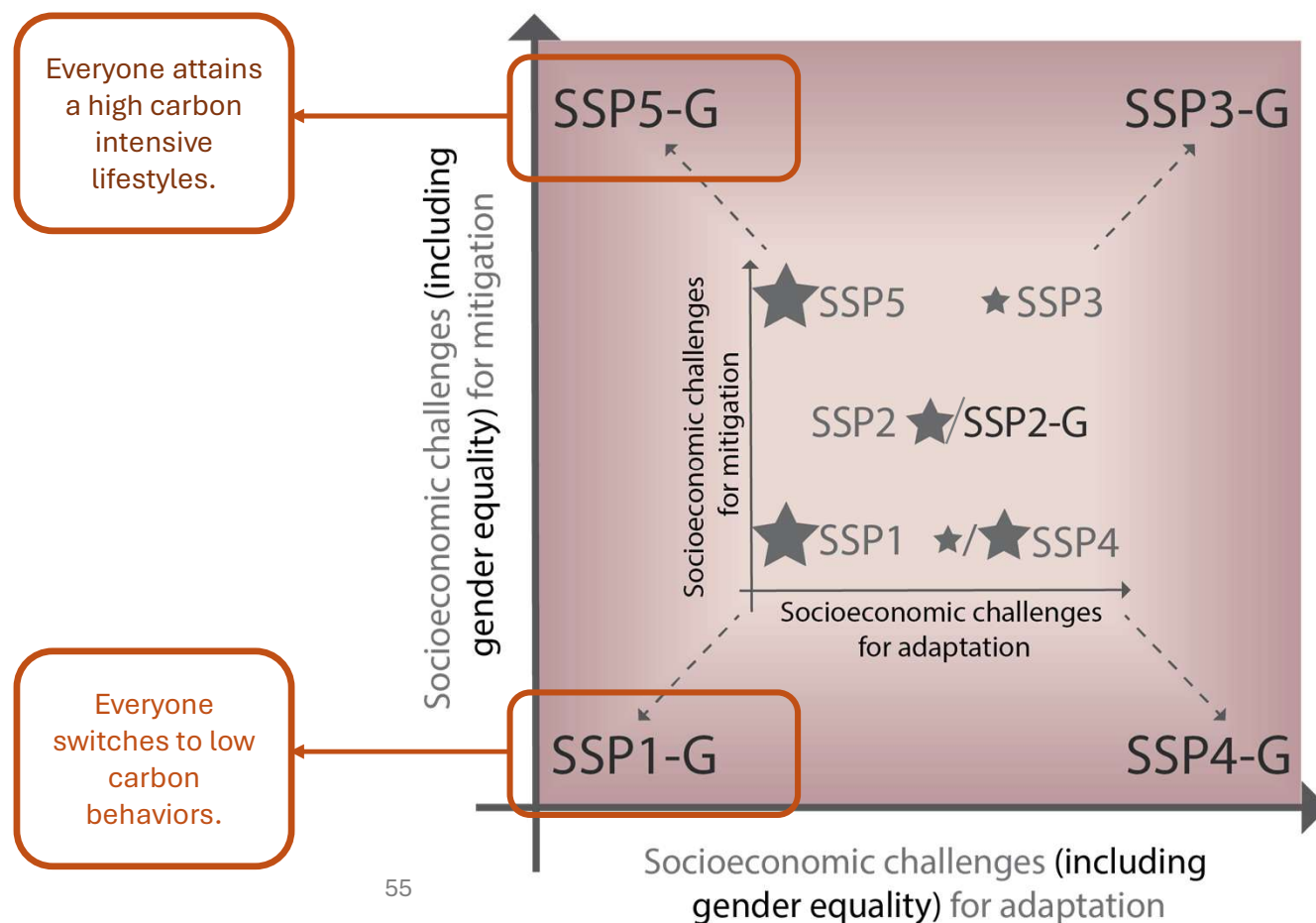
Effects of gender (in)equality on **vulnerability**



Effects of gender (in)equality on **decent living services**



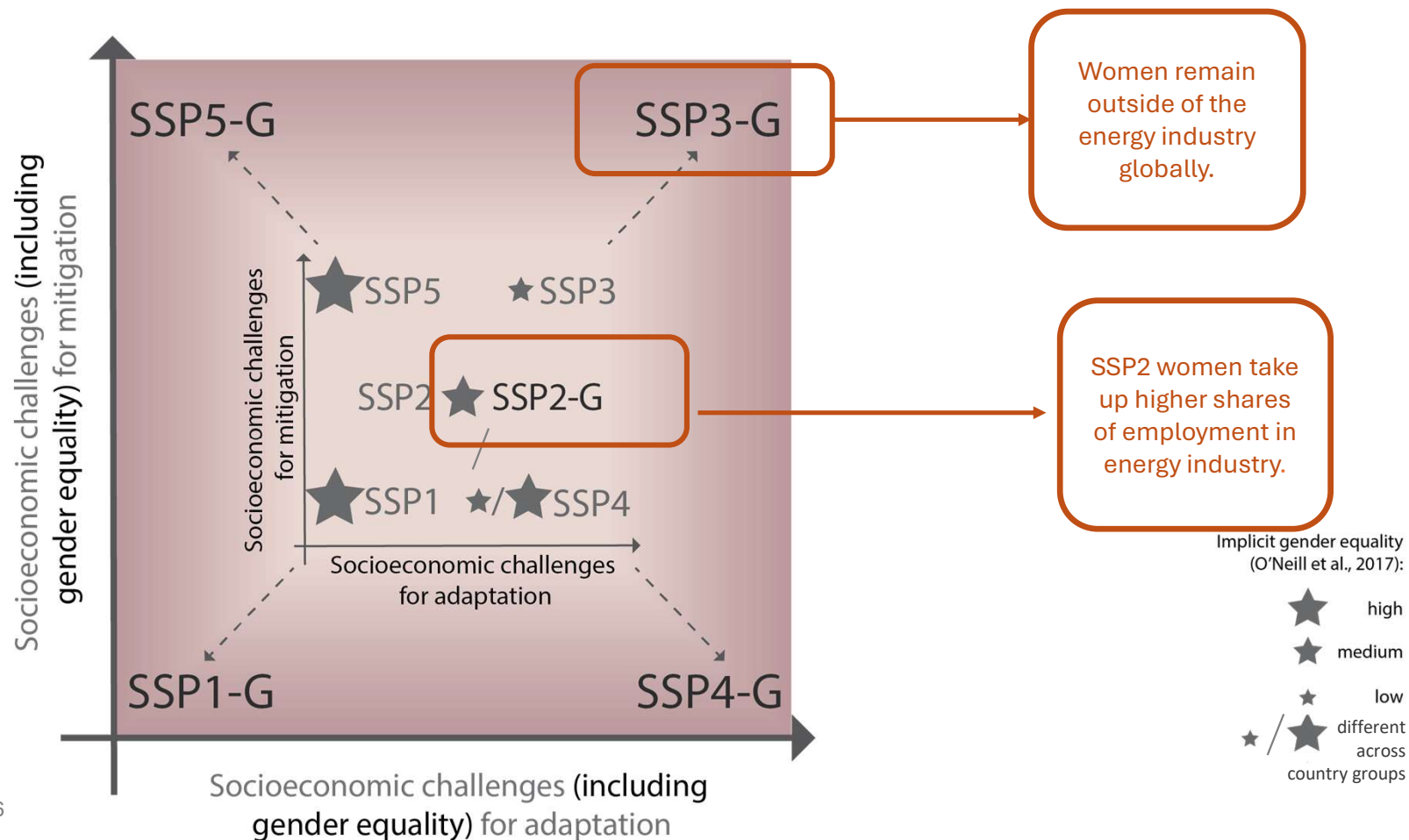
Effects of gender (in)equality on **demand side changes**



Implicit gender equality
(O'Neill et al., 2017):



Effects of gender (in)equality on **just transition**



Why do we need more gender-aware scenario research?

Climate change impacts, mitigation and adaptation have gendered-effects

- Difference in levels of gender (in)equality **impact SSP challenge space**
- Different assumptions about gender (in)equality **impact key SSP quantifications**
- **Multiple interactions** between gender (in)equality, climate and development goals (SDGs)

Diverse applications of SSPs – also beyond climate research community

- Supporting just transition strategies
- Identifying feasible transformation pathways
- Understanding sustainable development scenarios and their assumptions about certain levels of gender equality. How do we get there? What does it entail?

Useful reading

- Anything by Claudia Goldin
- Denton, F. Climate change vulnerability, impacts, and adaptation: why does gender matter? *Gend. Dev.* **10**, 10–20 (2002).
- Lau, J. D., Kleiber, D., Lawless, S. & Cohen, P. J. Gender equality in climate policy and practice hindered by assumptions. *Nat. Clim. Change* **11**, 186–192 (2021).
- Walk, P. et al. Strengthening gender justice in a just transition: a research agenda based on a systematic map of gender in coal transitions. *Energies* **14**, 5985 (2021).
- Andrijevic, M., Crespo Cuaresma, J., Lissner, T., Thomas, A. & Schleussner, C. F. Overcoming gender inequality for climate resilient development. *Nat. Commun.* **11**, 6261 (2020).
- Andrijevic, M., Zimm, C., Moyer, J. D., Muttarak, R., & Pachauri, S. (2025). Representing gender inequality in scenarios improves understanding of climate challenges. *Nature Climate Change*, 1-9.