Ageing, health and investments in education over the lifecycle: an international perspective

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Ageing global and inevitable – no demographic solution

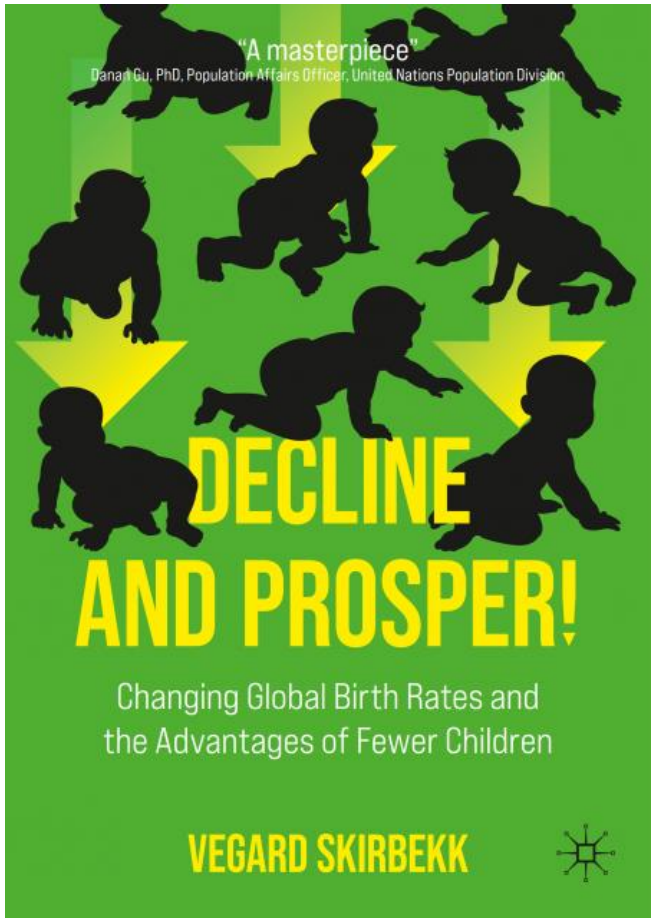
”A substantial degree of population ageing is expected over the next few decades in all regions of the world

[...] unlikely that policy interventions intended to encourage childbearing in low-fertility countries could substantially alter this expectation.

[...] no plausible assumption about international migration levels would have more than a moderate impact on the expected degree of population ageing that will be experienced in future decades by countries all over the world.”

(UN 2007)

Fertility is likely to stay low



- *Fertility decline is likely to spread to more nations – this will contribute to population ageing*

- *My recent book (Decline and Prosper) provides an overview of global fertility in the past, present and future from multiple perspectives including biological, economic, socio-cultural and evolutionary* https://link.springer.com/book/10.1007/978-3-030-91611-4

Ageing Metrics

- Most common ageing metric is the ‘Old Age Dependency Ratio’ (OADR) e.g., the number of individuals aged 65+ relative to those aged 20-64.
- It assumes onset of ‘old age’ is static and does not vary over time, or depend on function or health
- Alternative metrics have been proposed

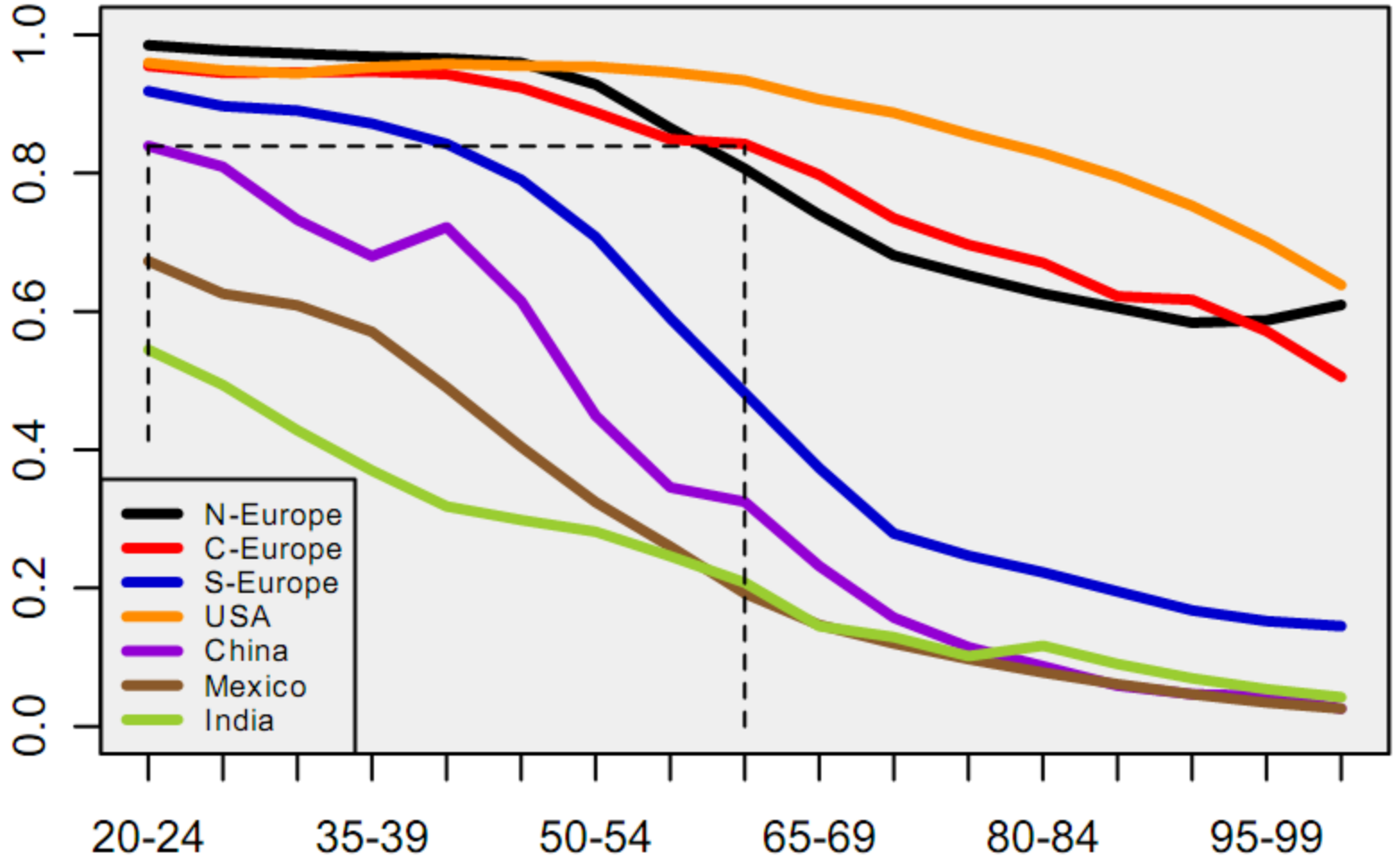
"Older" countries effectively younger when functional measures are accounted for

Country	**OADR** (65+/15-64)
India	**1** *(0.07)*
Mexico	**2** *(0.09)*
China	**3** *(0.12)*
United States of America	**4** *(0.19)*
Northern Europe (Denmark, England, Ireland, Sweden)	**5** *(0.24)*
Continental Europe (Austria, Belgium, Czech Republic, France, Germany, Netherlands, Poland, Switzerland)	**6** *(0.25)*
Southern Europe (Greece, Italy, Spain)	**7** *(0.27)*

OADR = Old Age Dependency Ratio (2005), *CADR* = Cognitively Adjusted Dependency Ratio

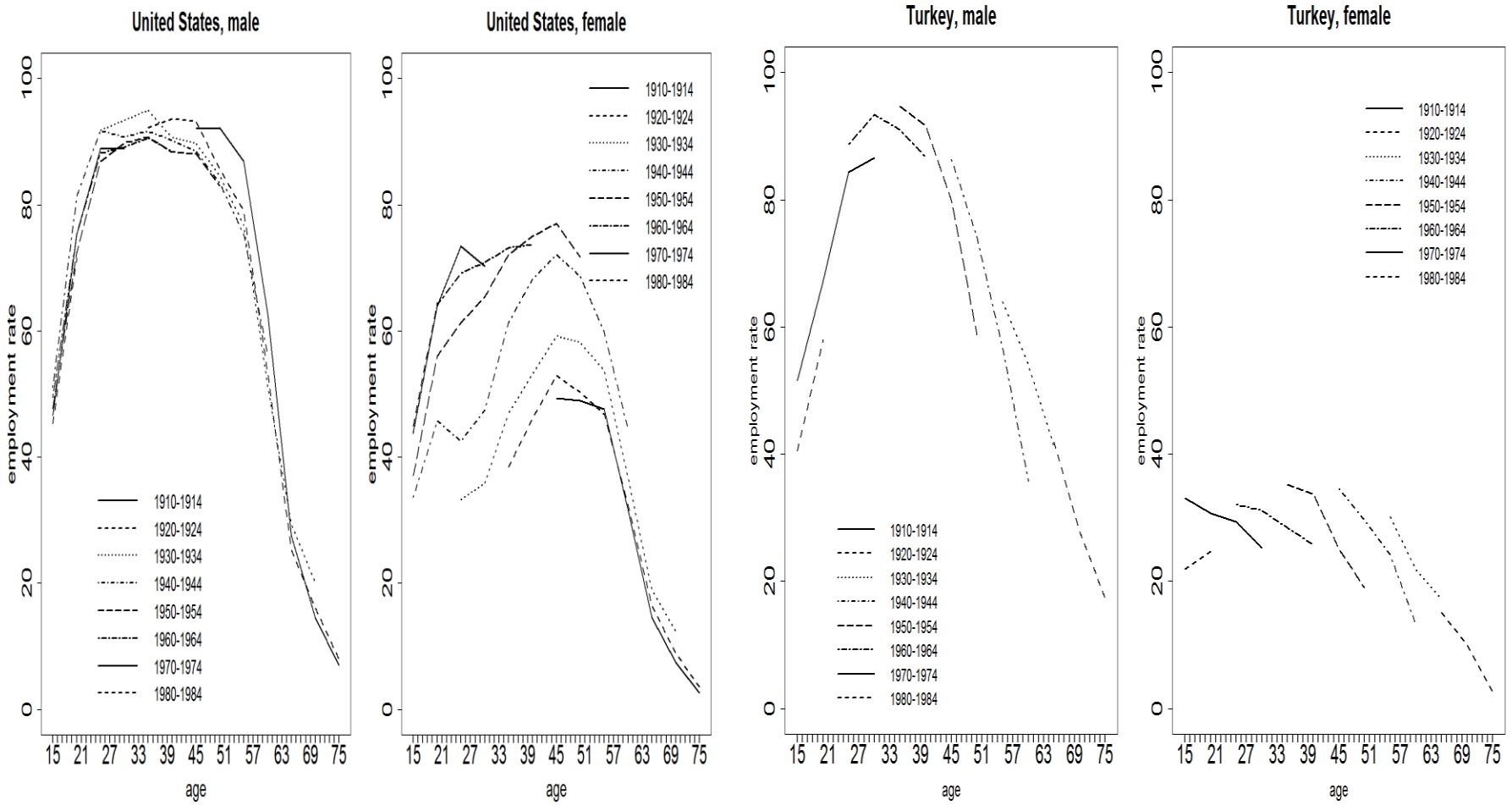
(Skirbekk, Loichinger & Weber, PNAS, 2012)

Education central - proportion with at least secondary school



Education causally improves old age health and cognition (e.g., Schneeweiss et al. 2014, Davies 2018)

Cultural factors important – female labour force participation varies



(Elke Loichinger and Vegard Skirbekk, 2017, CPS)

Health adjusted dependency ratios – a new understanding of aging

- The OADR (65+/20-64) rigidly assumes “being old” occurs at age 65 and everyone older than this age being “dependent”
- Yet, **health may better predict “dependence” than chronological age**
- A new metric, the **Health Adjusted Dependency Ratio (HADR)**, assumes **“dependence” depends on health not age**
- We find that the HADR **burden of ageing is relatively similar across most world regions** – contrasting the OADR

Skirbekk et al., May 2022, Lancet Healthy Longevity

Health is more important than age for determining dependency ratios

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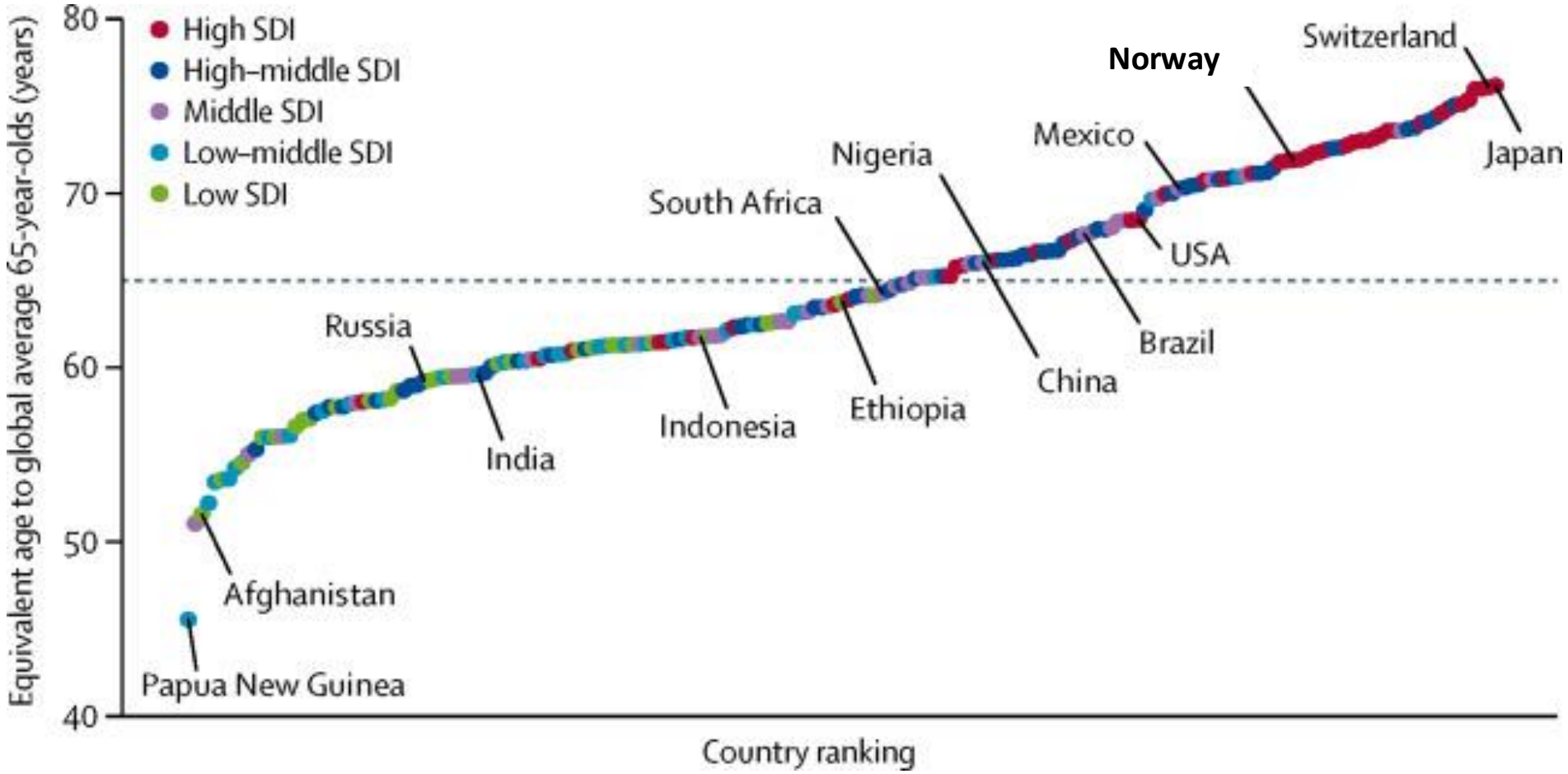
- Rather than using some arbitrary age limit such we look at the age one reaches a certain disease level (which can occur at different ages)
- The Health-Adjusted Dependency Ratio (HADR) the numerator consists of those in relatively ill-health (with worse health than the average global 65 year old), while the denominator population includes those in better health.

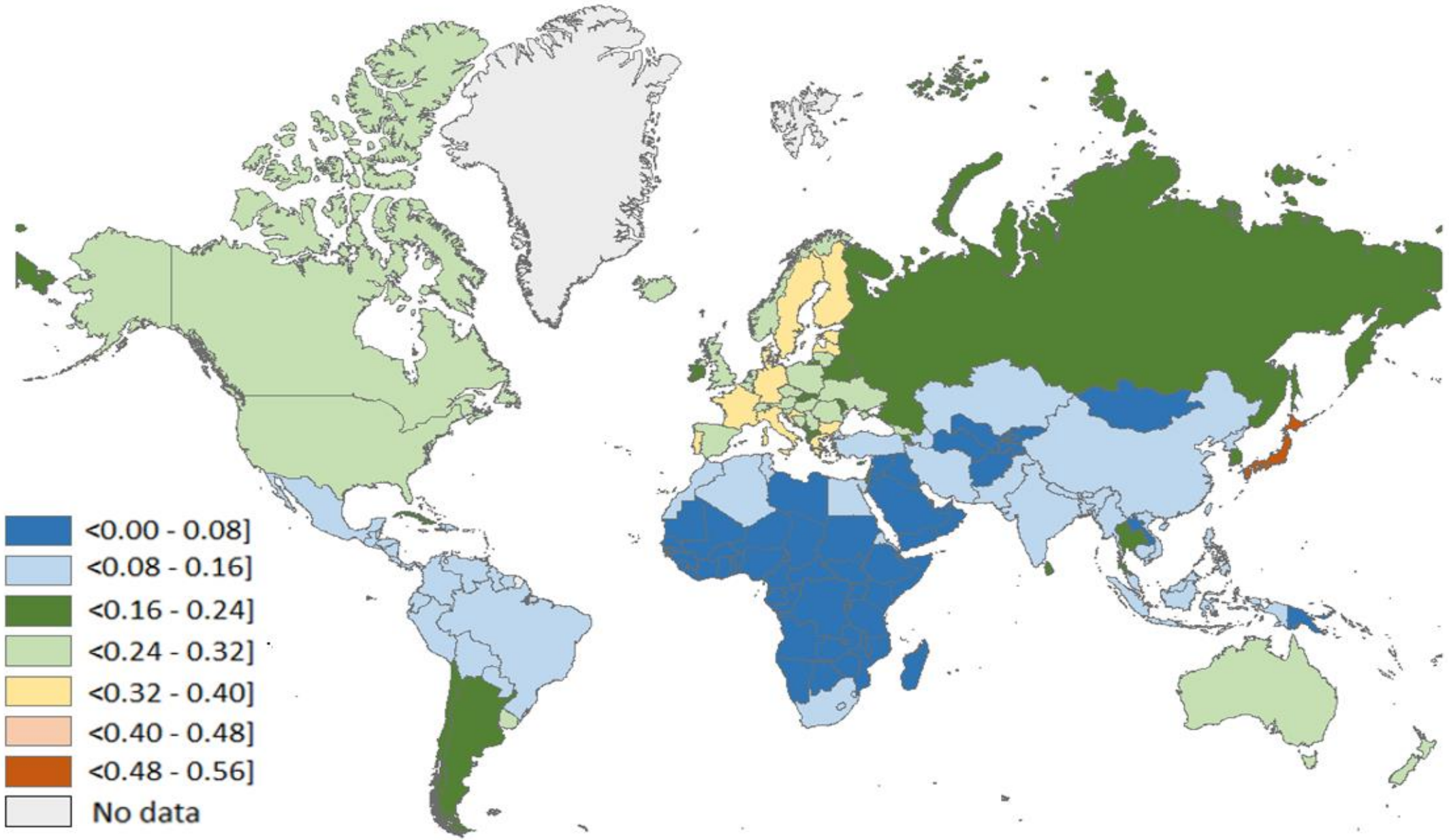
$$HADR(t) = \frac{DP(t)}{SP(t)} = \frac{\int_{E(t)}^{\omega} P(x,t)dx}{\int_{S}^{E(t)} P(x,t)dx}$$

Health and ageing – the average health differs by nation

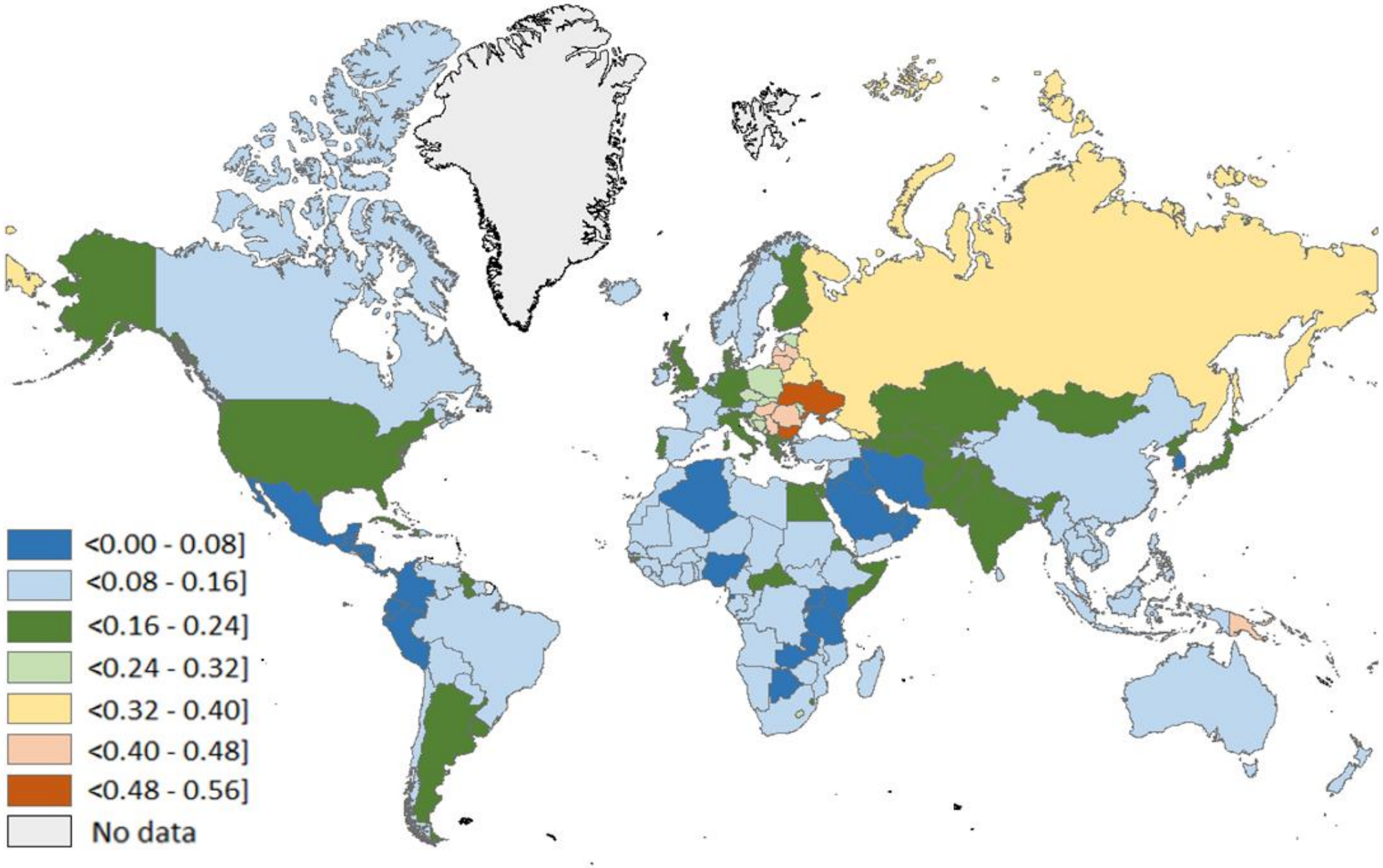


Chang, Skirbekk et al, Lancet Public Health 2019

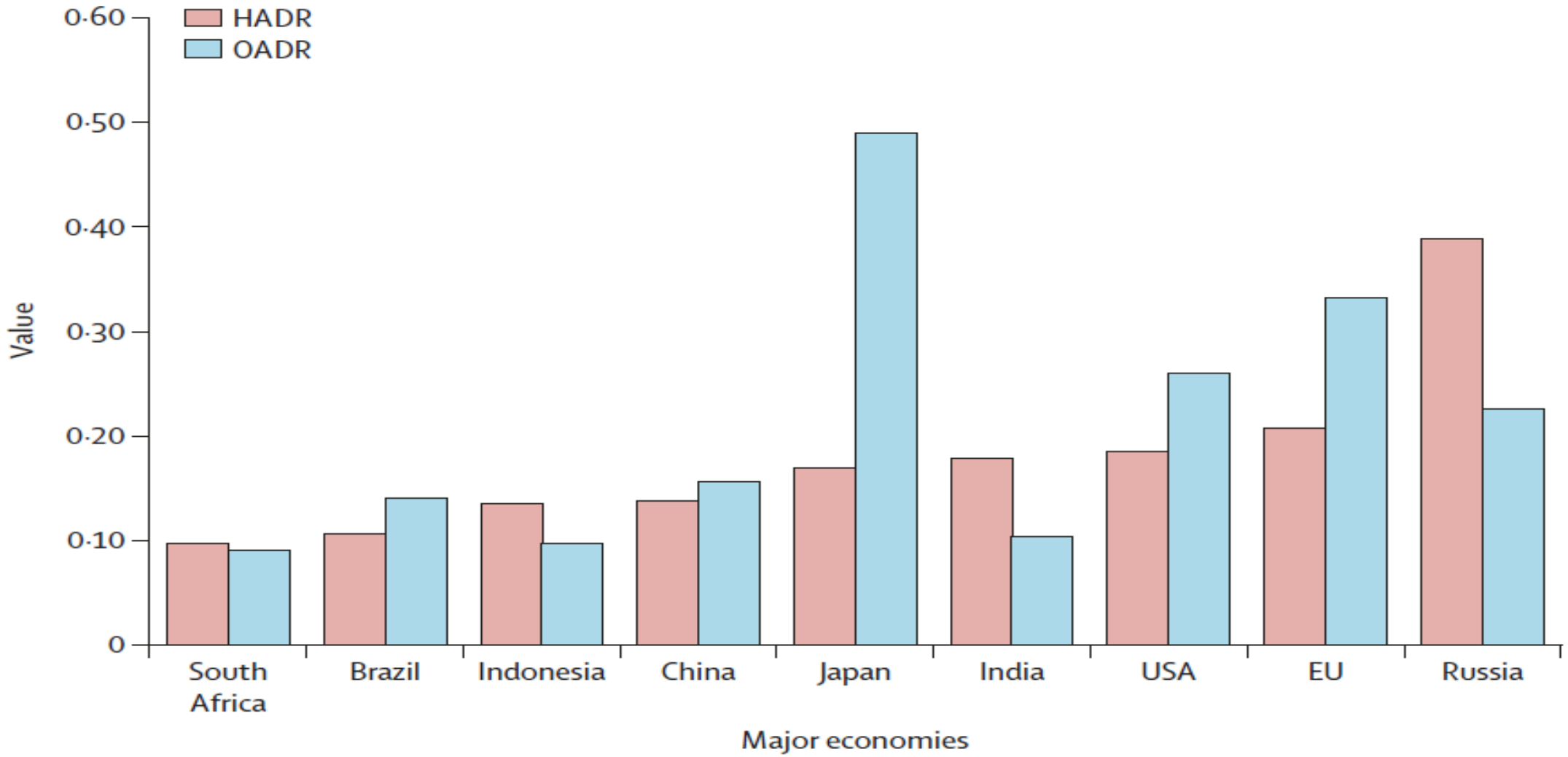
The Old Age Dependency Ratio



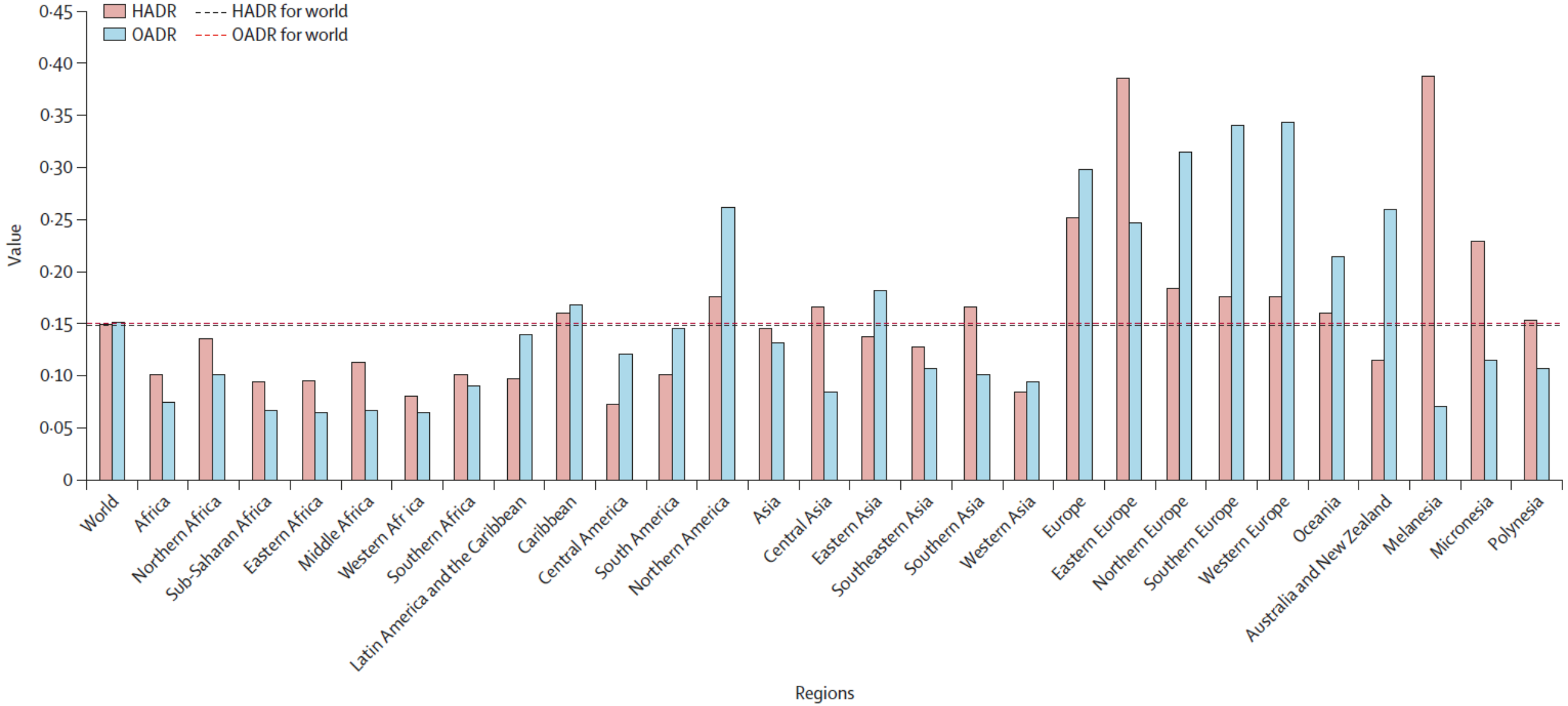
The Health Adjusted Dependency Ratio

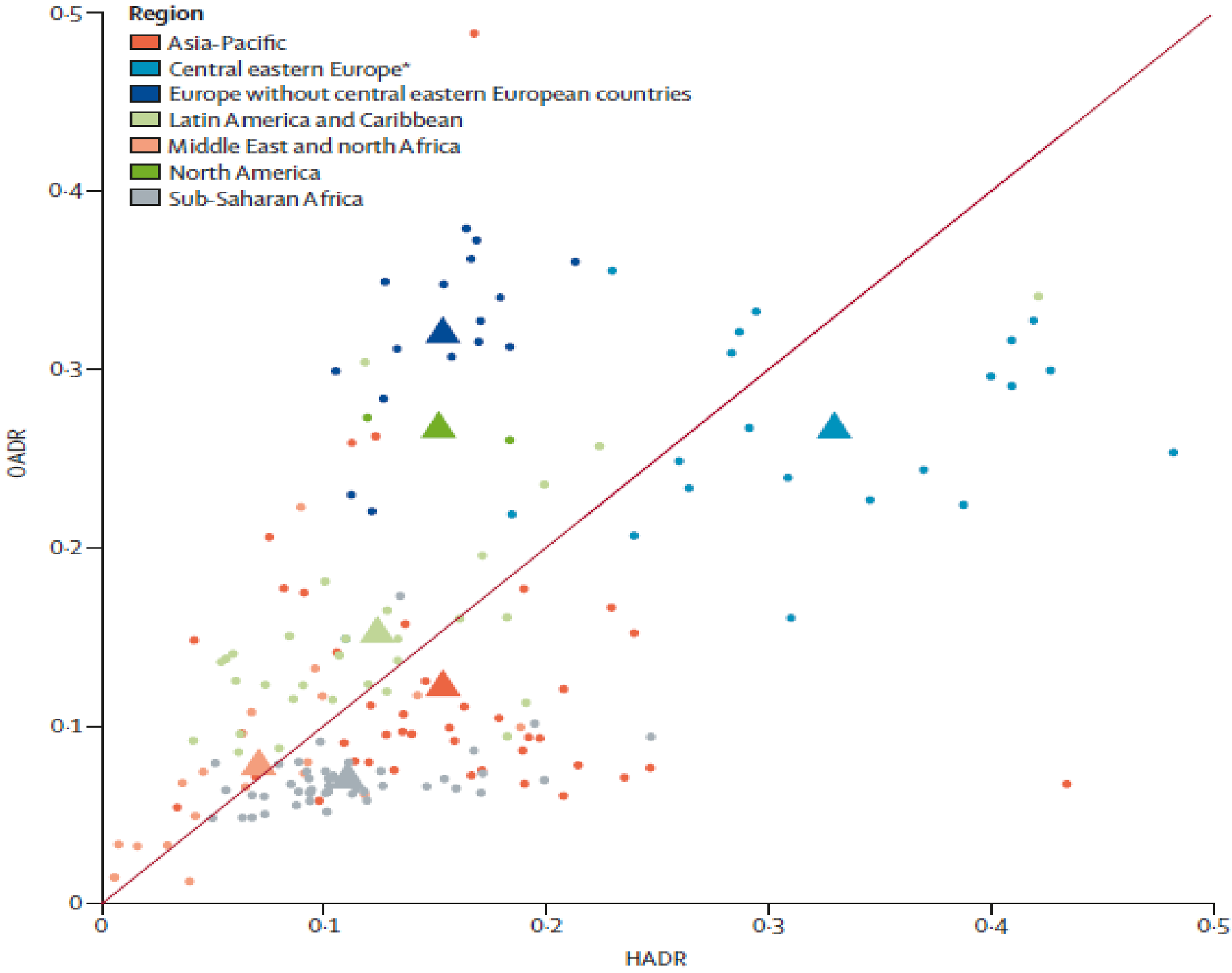


Health-adjusted dependency ratio (HADR) and old-age dependency ratio (OADR) for selected major economies. Higher values indicate higher ageing burden.



Health-adjusted dependency ratio (HADR) and old-age dependency ratio (OADR) by world region. Higher values indicate higher ageing burden.




Region
Asia-Pacific
Central eastern Europe*
Europe without central eastern European countries
Latin America and Caribbean
Middle East and north Africa
North America
Sub-Saharan Africa
0·5
0·4
0·3
0·2
0·1
0
OADR
0
0·1
0·2
0·3
0·4
0·5
HADR

OADR VS HADR

Key points

- The HADR shows that the “young” or “old” world regions does not correspond to OADR – the ageing burden are similar in most regions.
- However, the Middle East and North Africa somewhat lower burden based on HADR assessment, Eastern Europe greater HADR.
- Americas, Asia, Africa and Western Europe all have very similar HADR.
- Some demographically old nations age well due to low disease burden: Japan has a slightly lower burden than India, Spain a lower burden than Somalia
- Many demographically young (and several old) countries need to invest more in healthy ageing and healthier lifestyles – education central