Health expectancies in the European Union: same concept, different methods, different results

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Background (I)

Healthy life expenctacies (HLE) – "indicators of current health and mortality conditions"

- used for multiple purposes: health system performance assessment, retirement and budget planning

- Four dimensions
  1. Calculation method
  2. Definition and measurement of health states
  3. Valuation of health states
  4. Inclusion of other social values

Bogaert 2018; Murray 2000; Perić 2018; REVES 2008

Background (II)

- WHO's disability weight-based HLE (2010, 2015, 2016)
- IHME's disability weight-based HLE (yearly)
- EC's "healthy life years" or disability-free life expectancy (yearly)
- EC's self-perceived health HLE (yearly)

If the same concept is being measured, are there differences in the interpretation?

More importantly, do they (un)systematically differ across countries and over time?

Methods (I)

Data - EU28 countries, 2000-2017

EC's self-perceived health HLE (Eurostat)

- How is your health in general? Is it...[very good][good][fair][bad][very bad]
- dichotomized, using the prevalence of "less than good" perceived health

IHME's disability weight-based HLE (IHME/GBD)

- YLDs as product of prevalence of causes/sequelae with DW for 235 health states
- Disability Weight – magnitude of health loss (0 = full-health; 1 – death)
- simple paired comparison questions (who was the healthier overall between two particular health states)
- population health equivalence questions (compare health benefits of life-saving or health-improving programmes)

Methods (II)

Correlation - Spearman's rank order correlation coefficient (r)

Reliability - intraclass correlation coefficient (ICC)

(Dis)agreement - information-based measure of disagreement (IBMD)

Bland and Altman plots with 95% CI limits of agreement

EC's SPH-HLE vs. IHME's DW-HLE

EC's LE vs. IHME's LE

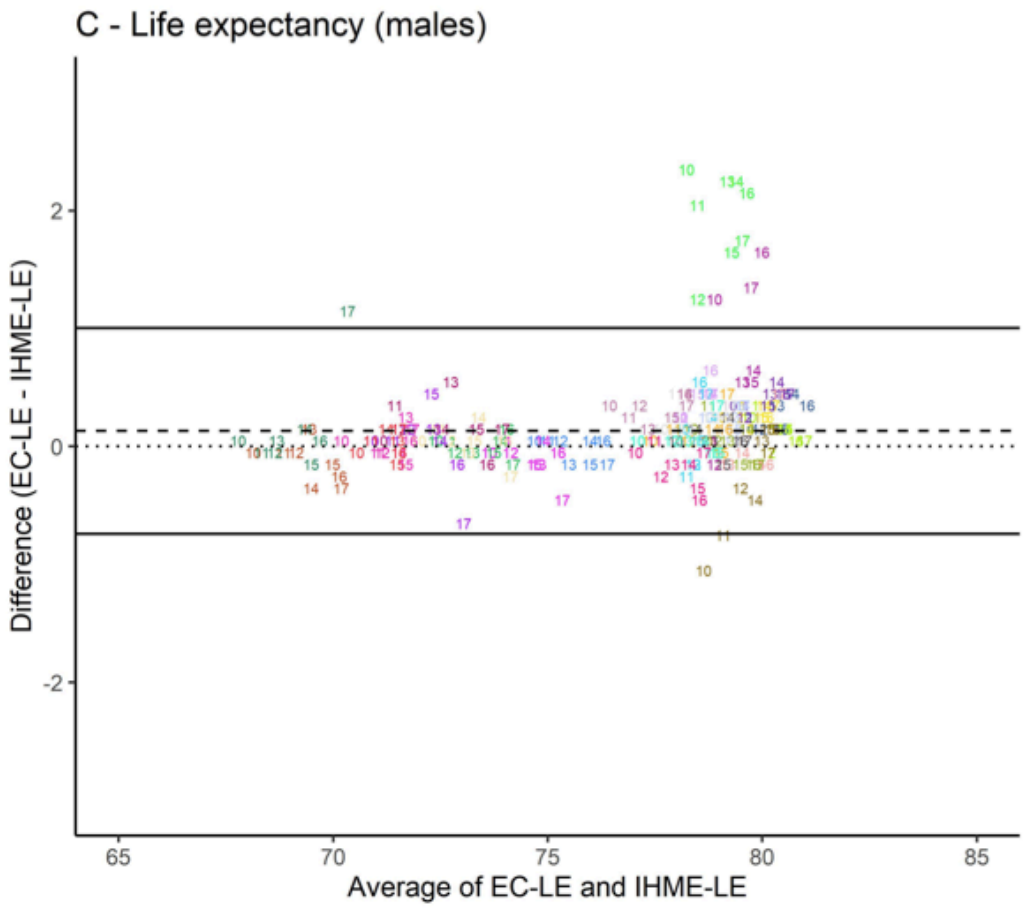
EC's %GH vs. IHME's %GH

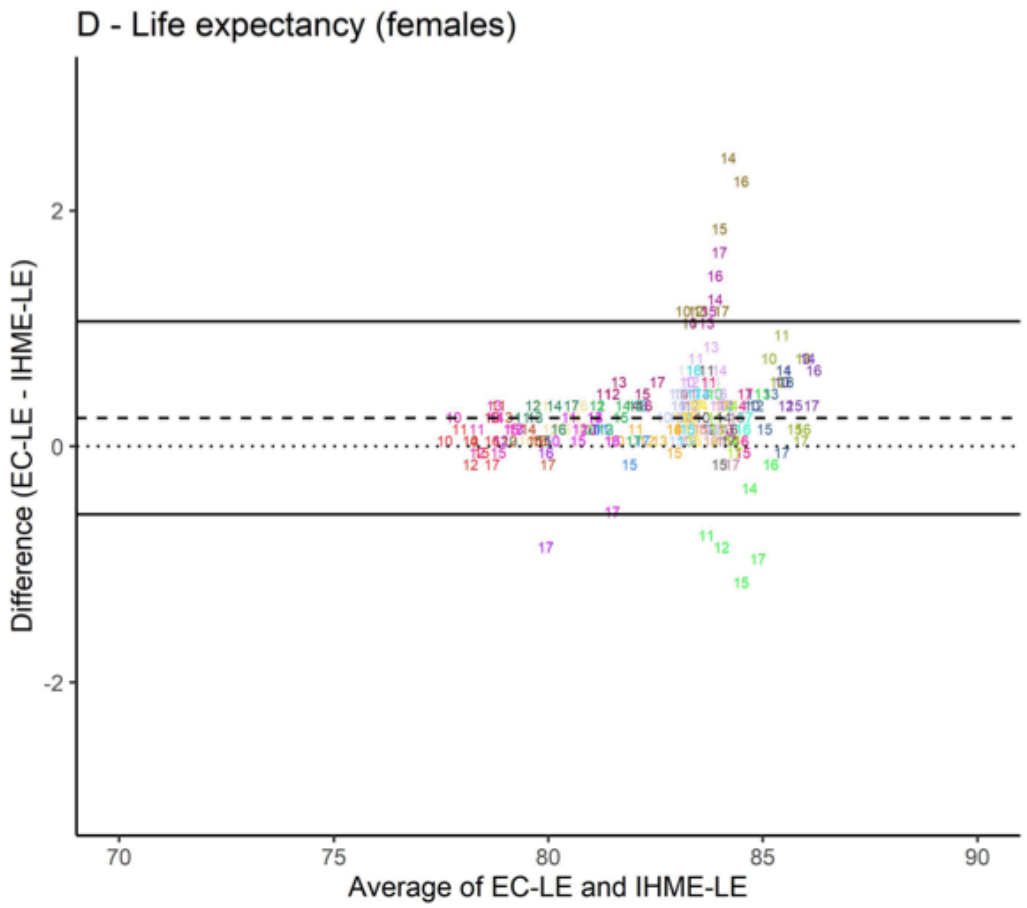
Kottner 2011

Results (I)

	Spearman's R		ICC		IBMD	
	Male	Female	Male	Female	Male	Female
HLE	0.876	0.706	0.919	0.657	0.082	0.086
LE	0.956	0.955	0.966	0.990	0.005	0.005
%GH	0.323	0.141	0.249	0.056	0.084	0.079

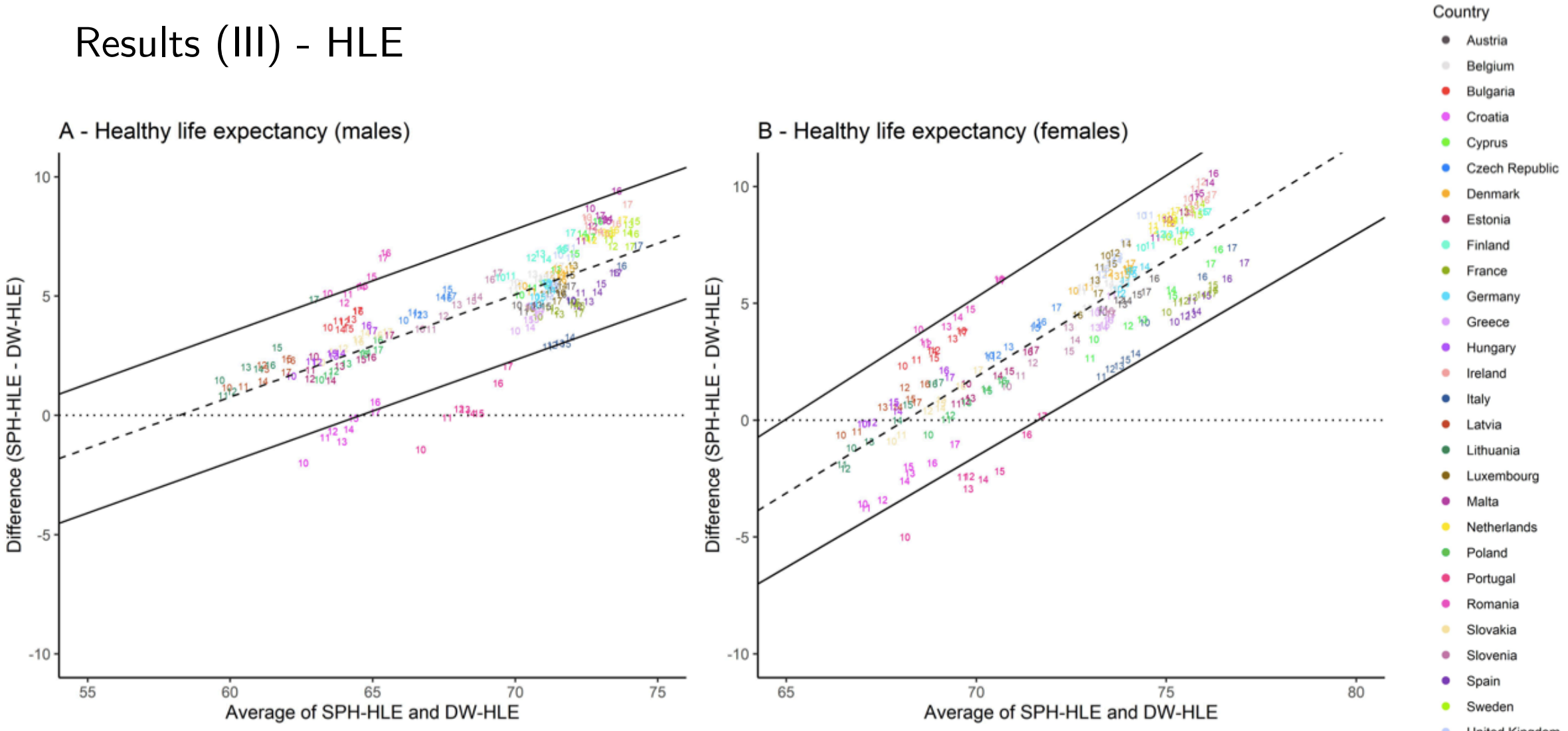
Results (II) - LE



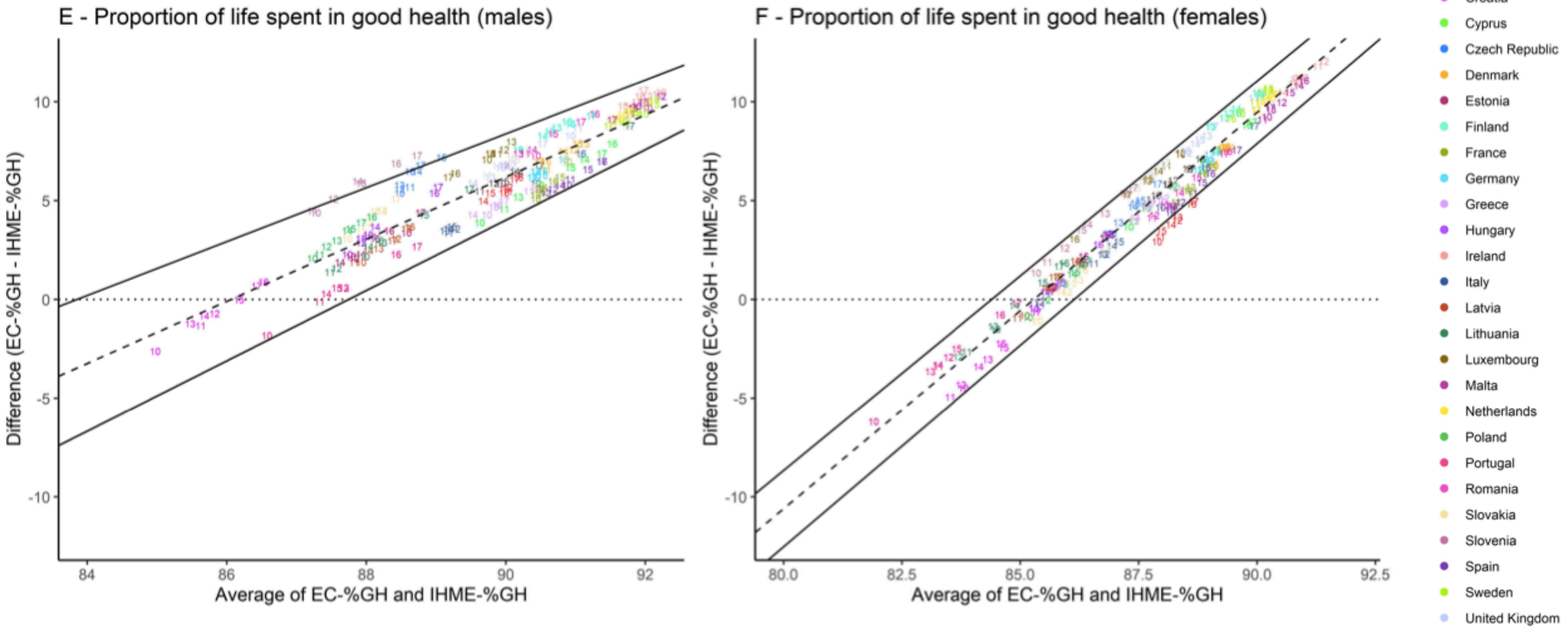


Country
- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Ireland
- Italy
- Latvia
- Lithuania
- Luxembourg
- Malta
- Netherlands
- Poland
- Portugal
- Romania
- Slovakia
- Slovenia
- Spain
- Sweden
- United Kingdom

Results (III) - HLE



Results (IV) - %GH



Conclusion

- "Good performance" for correlation, reliability and disagreement between both HLE methods
- Bland and Altman plots suggest a high variability HLE range: 6 years ($\pm$3 years)
- There is a systematic error with a positive linear model
  - Countries (or country-years) with higher HLE also have higher differences between SPH-HLE and DW-HLE

- HLE results from both methods differ considerably for both sexes and across countries
- It could be easier to analyse and compare estimates considering the systematic (positive linear) relation
- Caution must be taken when reusing these measures!

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