

Comparing Health Performance and the 2000 WHO health rankings experience

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WHO performance measures of national health systems

WHO league table for 191 countries

Composite index, amalgamating three ‘intrinsic goals’

- health improvement (DALEs - disability adjusted life years)
- responsiveness
- fairness of financial contributions

Single index, based on DALEs

Relative **Efficiency**:

level achieved / maximum achievable

FIFA performance measure

Quarterly league tables for 203 football playing nations, first published 1993

- Winning, drawing or losing
- Number of goals scored
- Home or away match
- Importance of match
- Strength of opponent
- Strength of local regional federations
- Number of matches played
- Previous results

Source: Dr Markus Lamprecht and Dr Hanspeter Stamm

<http://www.fifa2.com/scripts/runisa.dll?S7:gp:436054:67173+rank/index+E>

Does football improve
the nation's health?

Model specification

All nations

$$y_i = \alpha + \beta x_i + \sum_{k=1}^n \delta_k z_i + \varepsilon_i$$

WHO rank

FIFA rank

Federation dummies

European nations

$$y_i = \alpha + \beta_1 x_i + \beta_2 x_i^2 + \sum_{k=1}^n \delta_k z_i + \varepsilon_i$$

FIFA rank squared

Specification tests and results

Sensitivity analysis

- choice of dummy variables
- use of population weights

High explanatory power (R^2 0.49; 0.71)

Passed specification tests (RESET)

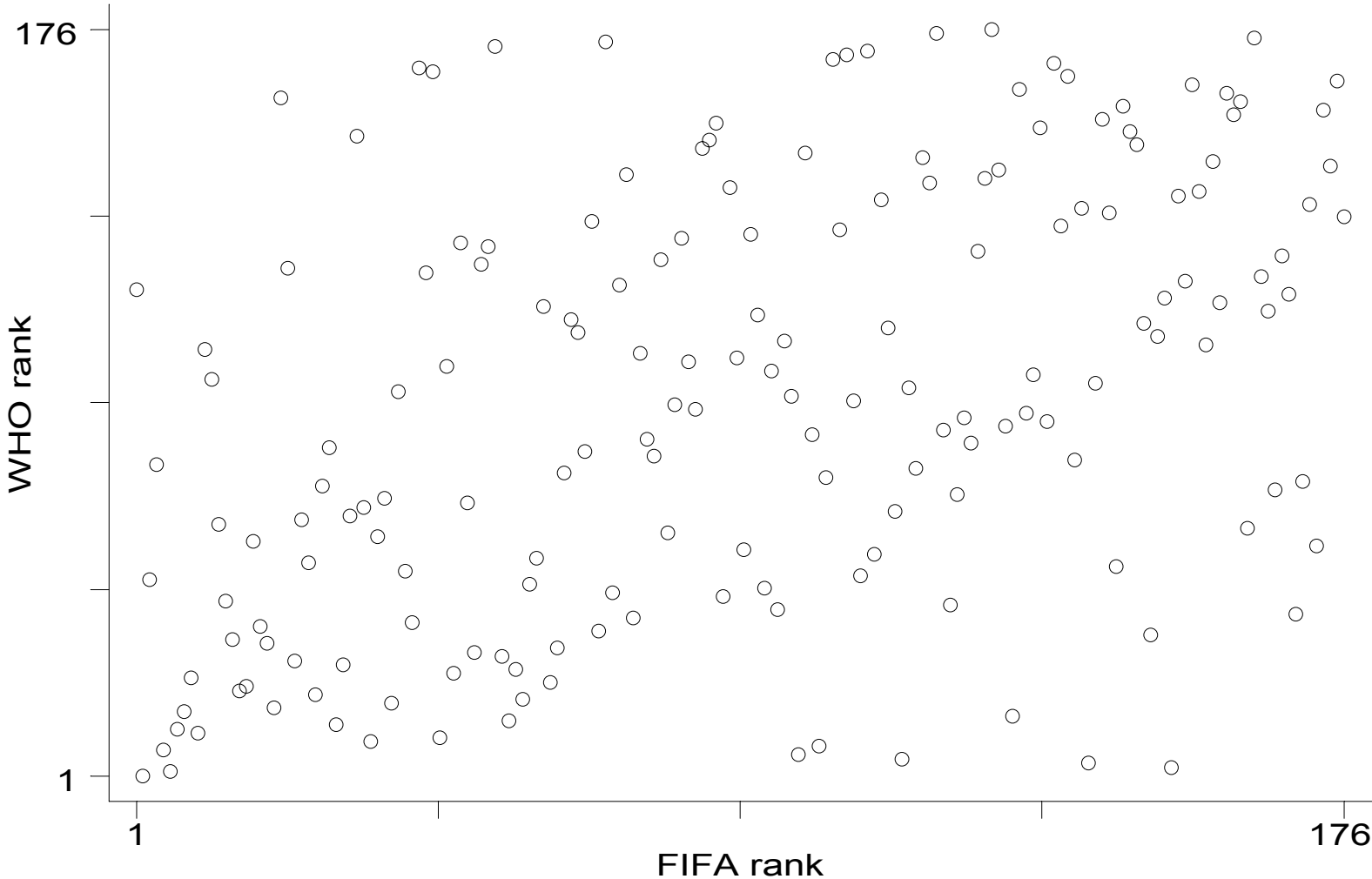
All countries FIFA rank significantly positive ($p < 0.001$) in explaining WHO rank

Europe FIFA rank significant but non-linear (x $p < 0.001$; x^2 $p < 0.001$)

Conclusion

- If policy makers wish to improve the health of their nation, efforts should be made at strengthening the national football team
- In Europe, these efforts are rewarded only so long as the team is ranked in the top half of the “European league”

Scatterplot of WHO & FIFA ranks, all countries



WHO Fixed Effects Panel Model

health expenditure
per capita

educational attainment

DALE

$$y_{it} = \alpha + \beta_1 x_{1it} + \beta_2 x_{2it} + \beta_3 (x_{1it})^2 + \beta_4 (x_{2it})^2 + \beta_5 (x_{1it})(x_{2it}) + v_{it} - u_i$$

country specific inefficiency

The diagram illustrates the WHO Fixed Effects Panel Model equation. It features four blue arrows pointing from descriptive labels to specific terms in the equation. The label 'health expenditure per capita' points to the variable x_{1it} . The label 'educational attainment' points to the variable x_{2it} . The label 'DALE' points to the dependent variable y_{it} . The label 'country specific inefficiency' points to the error term u_i .

WHO sensitivity/uncertainty analysis

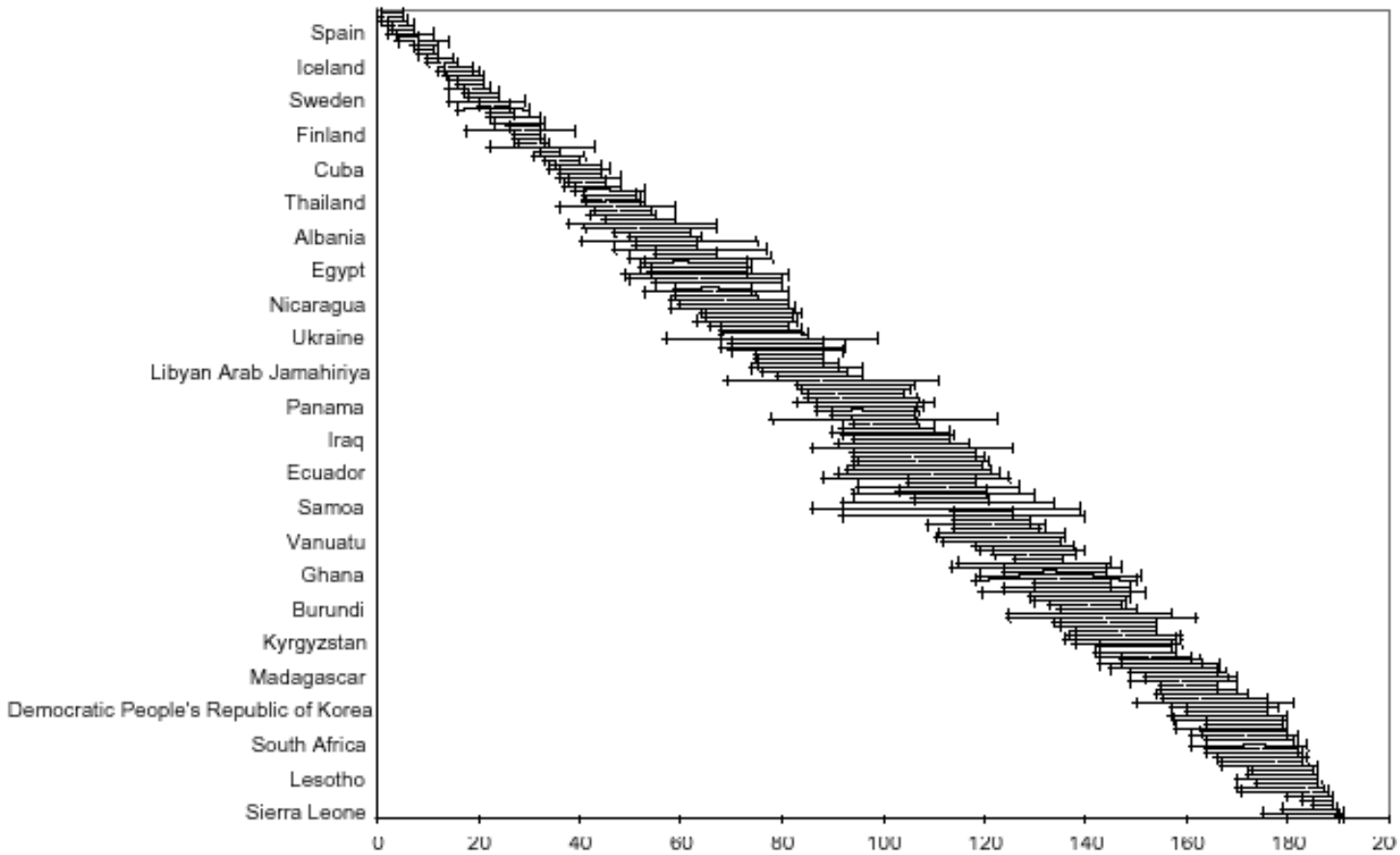


Figure 6: Uncertainty Intervals, Ranking of Overall Efficiency, 191 countries

WHO Fixed Effects Panel Model

WHO claim that rankings are stable under

‘numerous specifications’ (Evans et al, BMJ 2001)

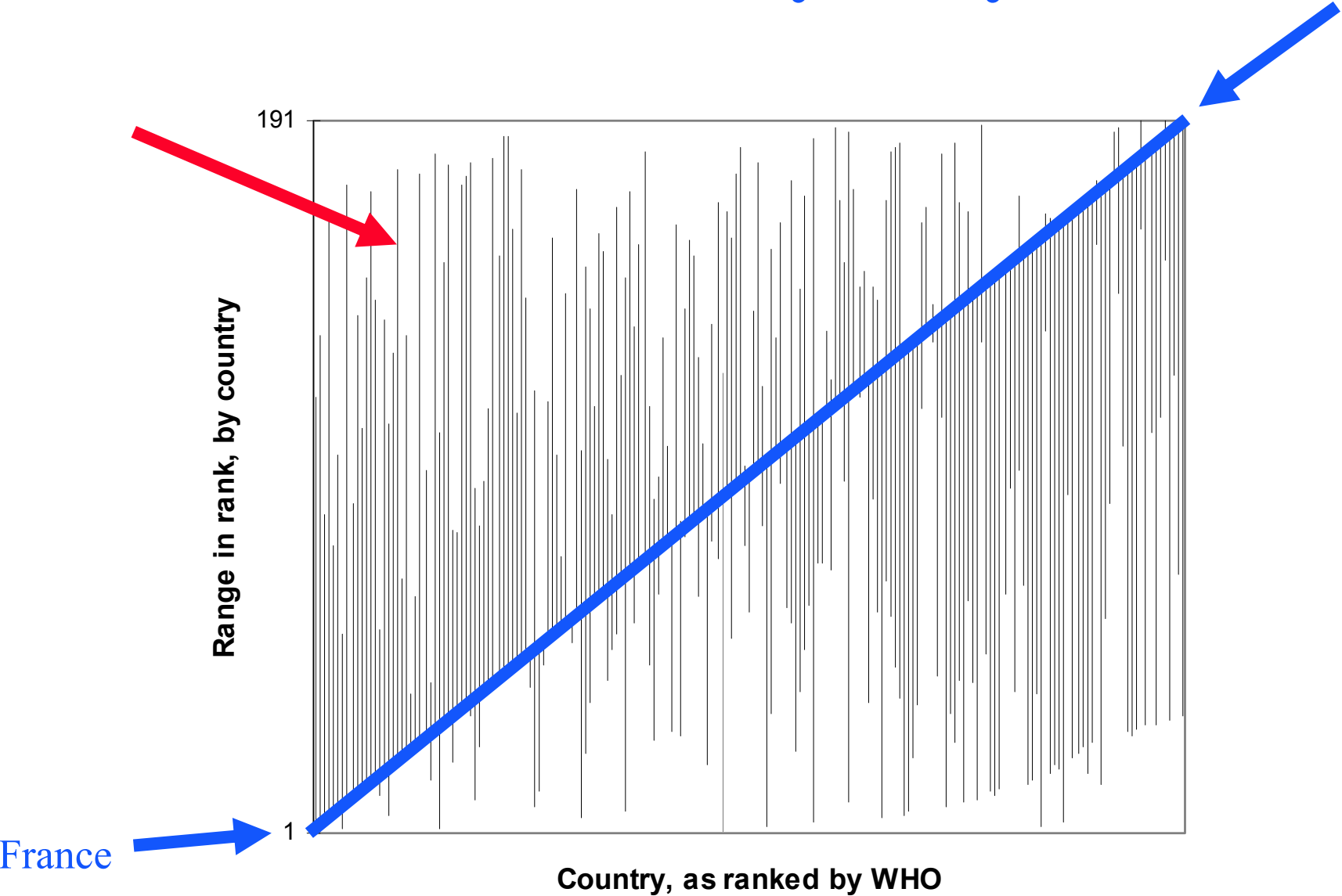
$$y_{it} = \alpha + \beta_1 x_{1it} + \beta_2 x_{2it}$$

$$+ \beta_3 (x_{1it})^2 + \beta_4 (x_{2it})^2 + \beta_5 (x_{1it})(x_{2it})$$
$$+ v_{it} - u_i$$

York sensitivity analysis

- Remove concept of minimum health
- Estimate model using a between effects panel data estimator
- Estimate DALEs in natural units
- Include time trends
- Include non-health expenditure

York sensitivity analysis



Conclusion

WHO results are **not robust** to reasonable alternative specifications

Measuring performance is **inherently complex**, especially when there are multiple objectives

WHO exercise was **innovative** - measuring health, responsiveness and fairness

WHO stimulated **debate** - among politicians, public and academics

References

- Appleby J, Street A. Health system goals: life, health ... and football. *Journal of Health Services Research and Policy*, 2001; 6(4), 220-225.
- Gravelle H, Jacobs R, Jones AM, Street A. Comparing the efficiency of national health systems: a sensitivity analysis of the WHO approach. *Applied Health Economics and Health Policy*, 2003; 2(3): 141-147.