International Power Relationships and Global Health

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Abstract:

Context: This paper critiques *methodological nationalism*—the tendency to treat countries as isolated, homogeneous units in comparative research—and argues that this approach obscures the global power relations shaping health outcomes. It reconceptualises international trade as a relational structure producing hierarchies and inequalities. Building on network theory and the Fundamental Cause Theory of health inequalities, the study asks whether countries' structural positions in global trade—measured through their economic relationships rather than their internal characteristics—influence their capacity to improve population health, here capture through progress in life expectancy.

Method: I apply a relational statistical approach to global trade data (2015–2019) and mortality indicators (2019) for 178 countries. It adapts Courgeau's *relative intensity index*, originally developed for migration, to quantify trade ties adjusted for economic size, producing matrices of *intensity* (strength of exchange) and *dissymmetry* (directional imbalance). These relational indicators are then summarised by country (median and interquartile range) and incorporated into structural equation models linking trade structure, GDP per capita, and change in life expectancy between 2015 and 2019, to identify direct and indirect effects of global trade asymmetries on health.

Provisional results: Countries with higher trade *intensity* and *dissymmetry* tend to display higher GDP per capita and are connected to partners with higher life expectancy—suggesting that integration and dominance in trade networks confer economic and relational advantages. Greater intensity and dissymmetry are associated with slower improvements in health, primarily through their impact on GDP growth. GDP itself shows a strong negative direct association with life expectancy gains, while the life expectancy of trade partners exerts only a modest positive effect. Thus, global trade imbalances reinforce existing hierarchies rather than promoting convergence in health outcomes.

Tentative conclusion: The findings demonstrate that relational measures of international trade—capturing both the strength and asymmetry of exchanges—help explain cross-national differences in economic and health trajectories. The analysis provides a proof of concept for integrating relational indicators into demographic and health research, though it remains constrained by the use of nation-states as indivisible units. Future work should extend this framework to better understand how global power structures condition countries' capacity to achieve health equity.

International trade, like society itself, should be seen not as a sum of separate units but as a web of relations shaping global hierarchies. Rather than a flat marketplace, it structures inequalities between dominant and peripheral states, reflecting deep structural dependencies. Yet, much comparative research still treats countries as autonomous entities, a bias known as *methodological nationalism*, reinforced by gravity models that overlook systemic interdependence. Relational and network approaches instead view countries as interconnected nodes, revealing asymmetries in access to resources and influence—echoing sociological theories such as the Fundamental Cause Theory. These perspectives suggest that structural positions in trade networks may affect states' capacity to invest in social sectors like health. To capture such dynamics, tools adjusting for population size, such as Courgeau's indicators from migration studies, could usefully be applied to international trade.

Methodological nationalism explained

The concept of nation-state is based on the combined ideologies of the nation as an essential building block of modern society (essentialism) and of the nation as the driving force of the evolution of societies (evolutionism). It leads to "methodological nationalism"[1] defined as "*the equation between the idea of society as social theory's key conceptual reference and the historical processes of modern nation-state formation*" (Chernilo 2011). Despite criticism against the concept of nation or state as reductionist at its best, neocolonialistic at its worst, social sciences still continue to use it as a basic unit in their analyses of contemporary societies.

Chernilo (2011) summarises five arguments against the concept of nation-state as explicating modernity (my own emphasis):

1. *"Explanatory argument: The rise and main features of the nation-state are used to explicate the rise and main features of modernity itself. Modernity is the sum of national trajectories.*
2. *Centrality argument: Nationalism is the modern culture and modernity is cast in nationalistic terms.*
3. *Container argument: The nation-state has succeeded in caging all aspects of modern social life.*
4. ***Internalist argument: The nation-state is an isolated, self-sufficient and endogenously developing unit.***
5. ***International system argument: The world is naturally divided into an indefinite number of formally analogous national units and the international system is composed now by nearly 200 of those units."***

Concentrating on the last two arguments, my contention is that the critique of methodological nationalism consists therefore not only in questioning the concept of nation-state and its boundaries and adopting a more universal view on modern societies (against arguments 1 to 3), but also in adopting methods that will depart from the use of nation or state as the basic analytical unit (against argument 4) and engage in a more holistic approach where societies at different geographical scales are linked by power relationships (against argument 5). This would help to counter the methodological nationalism embedded in the development of social sciences, in particular reification and eurocentrism (arguments 8 and 9 below), hoping that, by adopting new methodological tools, social sciences could experience a revival after their rise and fall (argument 10) (my own emphasis):

6. *"Prevalence argument: The nation-state is the most fundamental blind-spot of the social sciences' canon.*
7. *Ignorance argument: Grand social theory has thoroughly neglected the importance of the nation-state in the development of modernity.*
8. ***Reification argument: Any attempt at studying the nation-state with conventional social scientific tools is bound to naturalize its most important features.***
9. ***Eurocentrism argument: As the nation-state is mostly a European institution, methodological nationalism becomes another expression of the social sciences' inextricable Eurocentrism.***
10. ***Rise and fall argument: The co-evolution of the social sciences and the nation-state ties their destinies closely together; the social sciences' current crisis is explicated by the nation-state's own historical decline."***

[1] This is echoing the better known "methodological individualism" that consider social phenomena as resulting from the sum of individual behaviours, thus neglecting meso or macro effects.

Indeed, social sciences – and demography is no exception – have been using the state as their preferred unit in international comparisons. Examples abound of comparative DHS or census analyses that are often considered as the most legitimate to offer a universal view of geographical differences or historical trends. The very idea of "comparison" implies the equivalence of the states as statistical unit, in the same way that individuals are considered literally equivalent ("of equal value"). To weight states by their population or geographical size does not call into question the boundaries of these states and their individual ("non-divisible") nature. Similarly, using sub-national divisions to mitigate the scale effect (for large states such as China, India, Brazil, USA, Russia, Nigeria, etc.) to make sub-divisions more comparable still leads to consider units as indivisible and equivalent in the final analysis.

Along these mitigations of size or scale effects, all very necessary but insufficient contributions to call into question the state as a basic statistical unit, my contention is that one should account for the relational dimension in analyses at the global scale. In other words, we should move away from the "comparative" approach and get closer to the "relational" approach to modern societies and their evolution. The main idea is that any demographic, social, or economic phenomenon does not depend only on endogenous factors (within borders that are anyway difficult to ascertain) but also on exogenous factors, that is on the relation between societies, in which economic and political power relationships are crucial.

Regarding World Health inequalities:

- Fundamental Causes Theory of diseases: Link & Phelan, Clouston…
- (Zadey and Sharma 2025)

Methods

How to implement that relational approach? The difficulty is that the methodological nationalism is embedded in the statistical analysis. Statistics[2] always assume the units of analysis are independent of one another. There are ways to mitigate this assumption, e.g. by clustering error terms or by computing error terms at different levels, but these clusters or levels will still be deemed independent of one another. An alternative is to build variables that will reflect some relational effects, such as through neighbours' effect or spatial correlation but the assumption is that the relation is defined by spatial proximity or limited to within clusters. This can indeed be useful to identify diffusion effects or similarities at different social or geographical scale. It will however fail to identify power relationships between units that are often spatially distant (discontiguous) and different in their fundamental socio-economically characteristics (dissimilarity). This paper tries and identifies interrelationships between countries through variables that will explicitly capture the power relationship between countries. These relational variables are constructed using matrices of exchanged quantities between units, such as, for example, goods or communication statistics.

Previous approaches

General references related to International Trade Network (ITN) (context and trends):

- Maluck, J., & Donner, R. V. (2015). A network of networks perspective on global trade. PloS one, 10(7), e0133310.
- Duenas, M., & Fagiolo, G. (2013). Modeling the international-trade network: a gravity approach. Journal of Economic Interaction and Coordination, 8, 155-178.
- Fan, Y., Ren, S., Cai, H., & Cui, X. (2014). The state's role and position in international trade: A complex network perspective. Economic Modelling, 39, 71-81.
- Yazawa, N. (2023). Dynamics of international Trade: A 30-year analysis of key exporting nations. *Plos one*, *18*(8), e0289040.
- Tajoli, L., Piccardi, C., & Hoang, V. P. (2022, March). *The structural change of world trade from 1996 to 2019. A network approach.*

[2] "Statistic" has the same etymology as "state". Statistics were originally reporting the state's matters, in particular with the aim to collect taxes or to recruit conscripts for the army.

Key concepts of (weighted-)directed network:

- Reciprocity
- Assortativity
- Core and bridge vertex
- Centrality (degree, betweenness, coreness, closeness, Eigenvector…)

(i) **Degree** indicates the extent of trade; **Strength** indicates trade competitiveness; **Closeness** indicates the central location of countries in international trade; **Eigenvector** indicates the importance of all its trade partners; **Betweenness** indicates the ability of a country as a bridge when trading occurs between any other countries; **Community Importance** contains two indicators: the I score reflects the leadership of countries in communities, and the ω score reflects a country's bridge position between communities. (Fan et al. 2014)

Continuous coreness to measure integration

Use symmetric matrix to extract a continuous measure of coreness (Prell et al. 2015), as produced by network analysis of core-periphery relationship.

Problem: does not account for dissymmetric relationships, as we do with trade.

Automorphic equivalence to assign roles

Block-modelling techniques applied to networks (Moore, Teixeira, and Shiell 2006), using 1999-2000 trade data on "four capital-intensive, production-based commodities […] having the highest loadings on the hi-tech and heavy-manufacturing factor […] (1) non-electrical machinery (SITC #71), (2) plastics and synthetics (SITC #58), (3) transportation equipment (SITC #71), and (4) metal manufactures (SITC #69)". "Each cell in the non-valued data matrix, X_{ij}, records simply the occurrence or non-occurrence of trade between countries *i* and *j*, and not the specific value of the trade. Since the data revealed differences among countries between import and export ties, the *X* matrix was asymmetrical, meaning that some countries might import but not export (or vice versa) to another country." The blockmodeling technique uses automorphic equivalence measures inspired by Doreian et al. (2005).

Problem: does not account for the scale of exchanges (weighted edges) and for total production (denominator) such as GDP, as can be done with trade.

Minimum residual singular value decomposition (MINRES/SVD)

"Each node in the network receives two indices, an "in-coreness" and an "out-coreness"", using the built-in Mathematica function, FindRoot, to minimize the sum of the non-diagonal squared residuals (Boyd et al. 2010). These indices account for dissymmetric relationships and for the intensity of trade.

Problem: does not account for total production (denominator) such as GDP; verify if it applies to weighted graph; the dissymmetry could be indirectly analysed by comparing the in- and out-coreness indices.

Weighted directed network

Using the weighted directed network framework, Carnazza and Vellucci (2022) computed the "**weighted degree centrality**, which is related to the number of links entering [weighted **in-degree** centrality] or exiting [weighted **out-degree** centrality] a certain node". Since the directed network use a non-symmetric adjacency matrix, the distance between nodes is not symmetric. "The shortest path between two nodes i and j of a graph is the path that connects these nodes and that minimizes the sum of the lengths of its constituent links" and is computed using Dijkstra's algorithm. "Based on shortest paths, there is the **betweenness centrality, a measure of centrality in a graph**" and "helps identify countries which play a **bridging role** in a network". "Still based on shortest paths, there is the **closeness centrality**" and "indicates how close a country is **to all other countries** in the Eurozone network."

Comparison of different measures of centrality:

- ***Strength centrality***, the weighted analogue of degree centrality, summing the total value of flows linked to a country
- ***Closeness centrality*** assesses centrality based on a node's proximity to all others, using the minimal sum of geodesic distances
- ***Harmonic centrality,*** same as closeness but replaces infinite distances with zero
- ***Betweenness centrality*** quantifies the proportion of shortest paths between other countries that pass through a given country, thereby reflecting its role as an intermediary or gatekeeper within the network
- ***Eigenvector centrality*** captures influence derived from being connected to other central economies

Problems:

- does not account for total production (denominator) such as GDP
- distribution of betweenness and eigenvector highly skewed (fail to capture but outliers)

Relative Intensity

Originally to analyse migration flows, Courgeau (1988) proposed a relative intensity index which accounts for populations at both origin and destination. First, the *gross intensity index* is computed by the dividing the flow from country *i* to country *j* by the product of the populations at origin and destination.

$$G_{ij} = \frac{M_{ij}}{P_i * P_j}$$

This can be interpreted as the probability of an individual originated in population P_i to be drawn in the population P_j, in a given time interval. The impact of the reference populations at origin and destination on the recorded flows is then controlled. However, when it comes to apply this index to international trade, the product of origin and destination economies gives disproportionately large values and exaggerates asymmetries. It is necessary to adapt it by taking the sum:

$$G_{ij} = \frac{M_{ij}}{P_i + P_j}$$

Or the product of the logarithm:

$$G_{ij} = \frac{M_{ij}}{\log{(P_i)} * \log{(P_j)}}$$

The *relative intensity index* R is the ratio of the gross intensity index to the average gross intensity index for all the countries included in the analysis. This average index is defined as the ratio between the total sum of flows and the total sum of the products of the populations in the countries.

$$R_{ij} = \frac{G_{ij}}{\overline{G_{ij}}} \text{ with: } \overline{G}_{ij} = \frac{\sum_i \sum_{j \neq i} M_{ij}}{\sum_i \sum_{j \neq i} P_i * P_j}$$

In the case of migration analysis, the central value of this index is 1 and is interpreted as the average probability of finding an individual in a country different from his country of origin. Then, the relative intensity index *R* denotes the attractiveness or repulsion of a country and is interpreted as a relative risk. For instance, an $R_{3,10}$ equals to 5 means that the probability to find a migrant from country *3* to country *10* is five times higher than to find a migrant from any country *i* to any country *j*. On the contrary, an index of 0.2 means the probability is five times lower. This measure of intensity can be applied to any flows, for example commercial trade, replacing migration by goods and population by GDP.

The intensity matrix *R* thus contains two essential indications: on the one hand, it describes through exchange flows the attractiveness or repulsiveness of countries; on the other hand, it gives a measure of the relative importance of flow with regard to the potentials of reception and emission in the countries involved.

Intensity and dissymmetry

It is sometimes difficult to analyse a matrix, especially if its dimension is important and even if the intensity index *R* is easily interpretable. If we consider two countries *a* and *b*, their relational tie is characterized with two *R*, R_{ab} and R_{ba} symmetrically located in the intensity matrix $\boldsymbol{R}$. In fact, put together, these two indices contain two information: the symmetry of the relationship defined by the difference between R_{ab} and R_{ba} – and the intensity of the relationship measured by the absolute sum of the indices. We can compute two new indicators based on the *R*s, a *dissymmetry index* and an *intensity index*.

The *dissymmetry index (D)* is defined as the difference of the logarithms of *R*s:

$$D_{ij} = \log R_{ij} - \log R_{ji}$$

The index *D* is centred on 0 (meaning equal relative intensity where country *i* is as attractive for country *j* as country *j* is for country *i*). When positive, country *j* is more attractive for country *i* than country *i* is for country *j*: this shows dissymmetry in favour of country *j*. When negative, the dissymmetry is in favour of country *i*. Note that if one or two of the R_{ij} and R_{ji} equal 0 – i.e. no exchanges – their logarithm cannot be computed. As it is often related to a lack of data or exchanges below a certain threshold, the easiest way to deal with this problem is to replace null *R*s with the minimum observed value or, as we did, to an arbitrary minimum value (e.g. $M_{ij} = 1$).

The *intensity index (I)* is defined as the logarithm of the sum of the *R*s:

$$I_{ij} = \log\left(R_{ij} + R_{ji}\right)$$

The sum of *R*s is contained between 0 and +∞, and remains centred on 1. To make the interpretation easier, we normalize the sum through logarithmic transform so that it is centred on 0 and varies between - ∞ and +∞.

Thus, two matrices can be constructed on the basis of the relative intensity matrix: a matrix of dissymmetry $\boldsymbol{D}$ and a matrix of intensity $\boldsymbol{I}$. To synthesize the information further and provide a classification of countries in order to assign their role in the exchange, we compute the median values of $\boldsymbol{D}$ and $\boldsymbol{I}$, as well as their inter-quartile range, for each country on the basis of its relationships with all other countries. Median and inter-quartile range are preferred to mean and standard deviation as the distributions of $\boldsymbol{D}$ and $\boldsymbol{I}$ are not necessarily normal. Also, median and inter-quartile range are less sensitive to outliers and therefore more appropriate distribution indicators for the relatively small number (from a statistical viewpoint) of countries in the world.

Modelling

The analysis uses trade statistics (2015-2019) as a measure of power relationships and mortality (2019) as the outcome of interest. A first model is tested, regressing mortality indicator Y_i on intensity and dissymmetry in the relationship with other countries as recorded in previous years:

$$Y_i = c_i + \alpha_i I_i + \delta_i D_i + \varepsilon_i \qquad (1)$$

where c_i is a constant, α_i is the effect of the median intensity (I_i) and δ_i is the effect of the median dissymmetry (D_i) parameters, and ε_i is a country's error term. The combined effect is assumed to measure the effect of inequalities in economic power relationship (as proxied by trade) on mortality.

A second model tests the effect of the weighted mortality of other countries, with relative intensity $\boldsymbol{R}$ of country *i* with country *j* used as weights:

$$\bar{Y}_{i,J}^{R} = \sum_{j \neq i}^{J} Y_j R_{ij}$$

$$Y_i = c_i + \alpha_i I_i + \delta_i D_i + \beta_i X_i + \theta_i \bar{Y}_{i,J}^{R} + \varepsilon_i \qquad (2)$$

In this second model, the θ_i measures the effect of mortality in the *J* countries closed to *i*, the proximity of these countries measured according to their trade relationship with country *i*. The model also includes β_i, the effect of (a vector of) controlling variable(s) X_i.

The mortality can be measured through life expectancy in 2019 or by its evolution between 2015 and 2019. Different models can be implemented, with the dependent variable being life expectancy itself (*e0total_2019*, controlling for 2015 life expectancy), the absolute difference in life expectancy between 2015 and 2019 in years (*e0total_2015_2019*, controlling for 2015 life expectancy), or the relative difference in life expectancy in percentage as of 2015 life expectancy (*rel_diff_e0total_2015_2019*). The latter is, for its ease of interpretation, the preferred metric. The final model is (removing the index for each country *i* for simplicity):

$$\frac{e0_{2019}-e0_{2015}}{e0_{2015}} = c + \alpha I + \delta D + \beta \log \overline{GDP_{2015-19}} + \theta \overline{e0}_J^R + \varepsilon \quad (3)$$

The logarithm of the mean GDP per capita controls for the level of economic development over 2015-19.

Provisional results

Descriptive statistics

Table 1: Distribution of life expectancy in 178 countries as estimated in 2019 (source: UN Population Division)

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                  Life expectancy 2019 - Both sexes
-------------------------------------------------------------
      Percentiles      Smallest
 1%      54.1726        52.9104
 5%      60.2757        54.1726
10%      62.4484        55.0253       Obs                 178
25%      67.8933        59.3185       Sum of wgt.         178

50%     74.22195                      Mean           73.32587
                        Largest       Std. dev.      7.348179
75%       79.138        83.7802
90%      82.4042        84.4258       Variance       53.99574
95%      83.2065        84.9779       Skewness      -.5134104
99%      84.9779        85.2735       Kurtosis        2.46485
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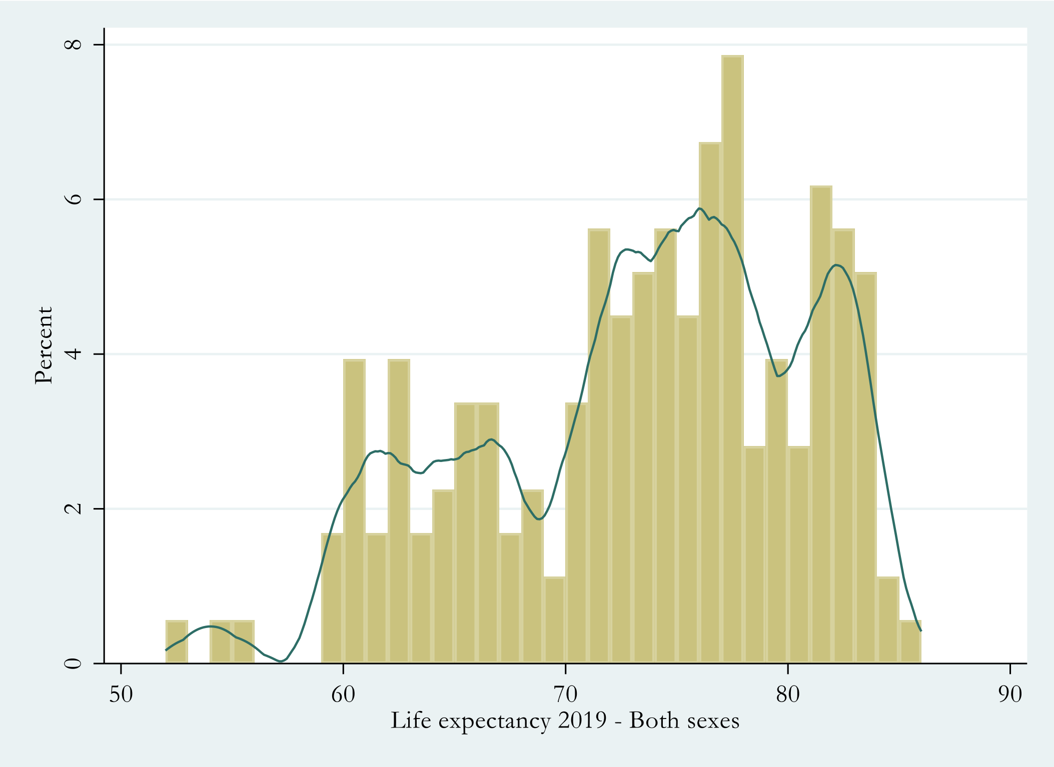
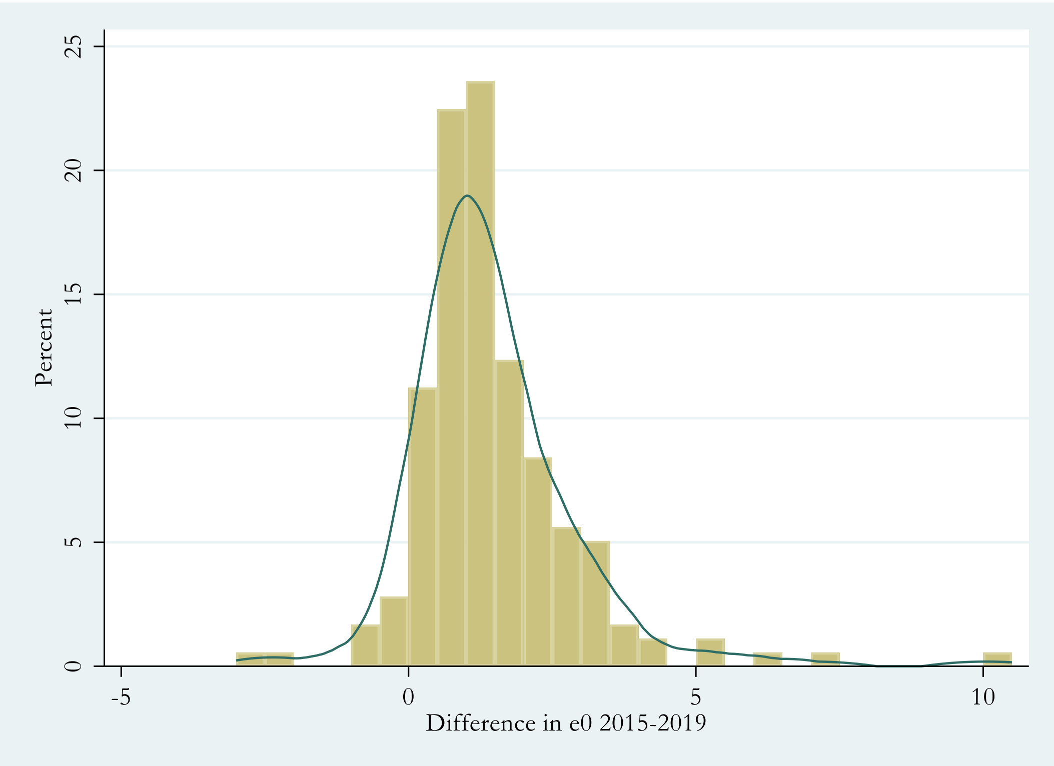


Figure 1: Distribution of life expectancy in 178 countries as estimated in 2019 (source: UN Population Division)

Table 2: Distribution of relative difference (%) in life expectancy in 178 countries as estimated between 2015 and 2019 (source: our computation based on UN Population Division data)

rel_diff_e0total_2015_2019

	Percentiles	Smallest		
1%	-2.113233	-2.597661		
5%	-.199033	-2.113233		
10%	.1900546	-.8660924	Obs	178
25%	.6612865	-.7689011	Sum of wgt.	178
50%	1.174529		Mean	1.453803
		Largest	Std. dev.	1.420325
75%	1.894452	5.361001		
90%	3.076169	6.010014	Variance	2.017324
95%	3.616046	7.031046	Skewness	1.892849
99%	7.031046	10.05103	Kurtosis	11.51589



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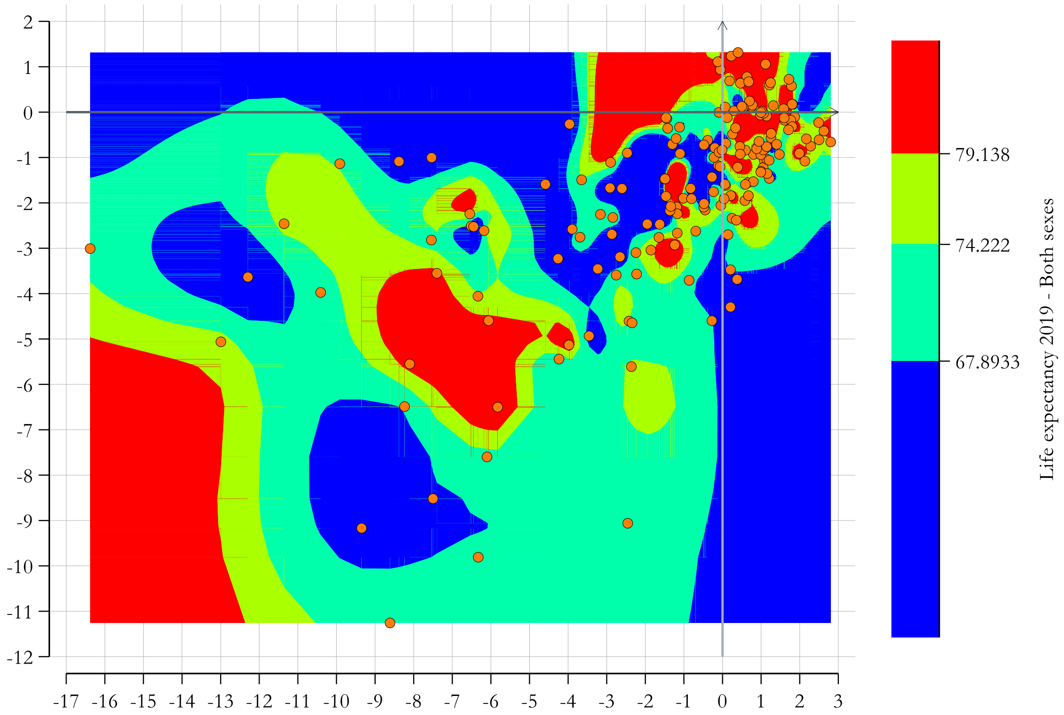


Figure 3: Distribution of life expectancy in 178 countries as estimated in 2019 (source: UN Population Division), expressed in quartiles (Q1: 67.8933; Q2:74.222; Q3:79.138), in relation to intensity and dissymmetry of trade exchanges (source: our own computation using UN Statistical Division data)

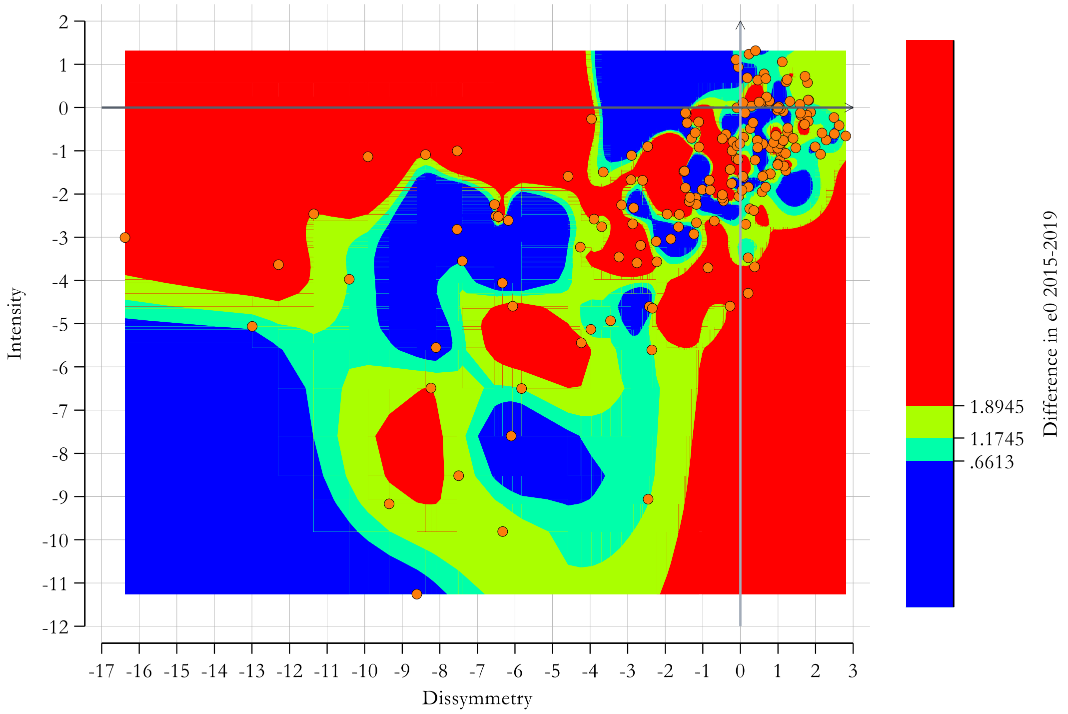


Figure 4: Distribution of relative difference (%) in life expectancy in 178 countries between 2015 and 2019 (our own computation using UN Population Division data), expressed in quartiles (Q1: 0.6613; Q2:1.1745; Q3:1.8945), in relation to intensity and dissymmetry of trade exchanges (source: our own computation using UN Statistical Division data)

Figure 5: Distribution of life expectancy in 178 countries in 2019 (UN Population Division data), in relation to mean life expectancy of proxy countries (our own computation based on relative intensity of trade exchanges using UN Statistical Division data)

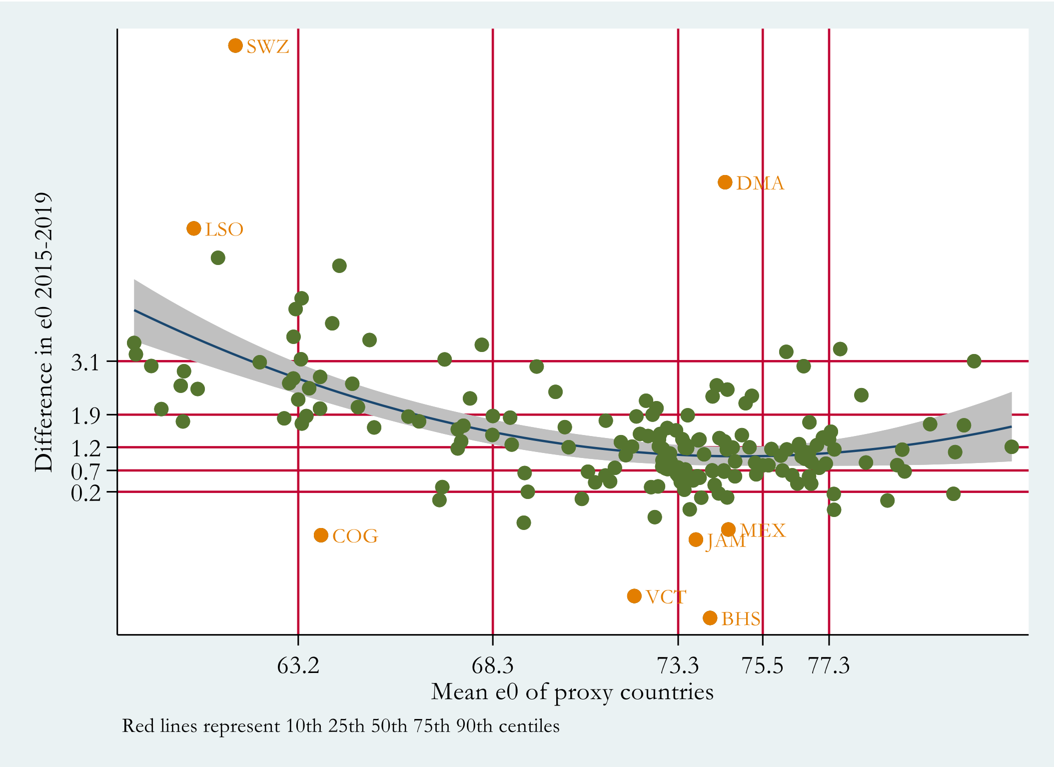


Figure 6: Distribution of relative difference (%) in life expectancy in 178 countries between 2015 and 2019 (our own computation using UN Population Division data), in relation to mean life expectancy of proxy countries (our own computation based on relative intensity of trade exchanges using UN Statistical Division data)

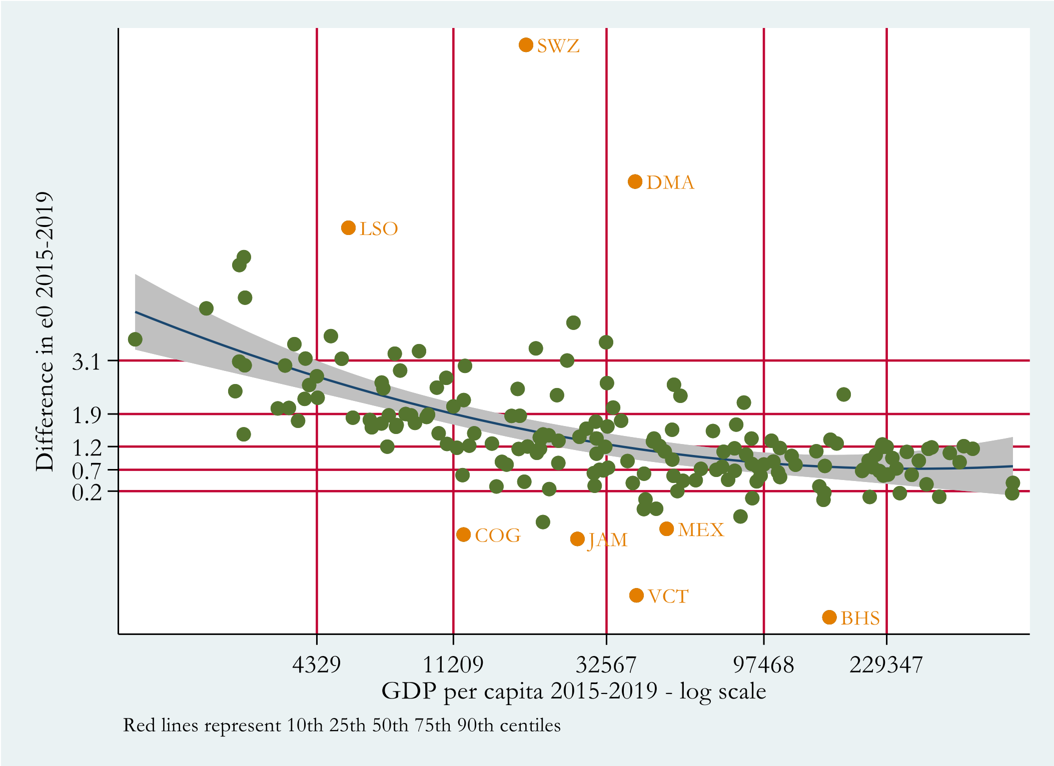


Figure 7: Distribution of relative difference (%) in life expectancy in 178 countries between 2015 and 2019 (our own computation using UN Population Division data), in relation to GDP per capita, log scale (UN Statistical Division data)

Outliers: SWZ – Swaziland, LSO – Lesotho, COG – Congo, DMA – Dominican Republic, MEX – Mexico JAM – Jamaica,BHS – Bahamas, VCT – St-Vincent & Grenadines

Structural Models

Table 3: Structural modelling direct and total effects

	Log GDP per capita 2015-19	Mean e0 of proxies 2015	Diff (%) of e0 2015-2019 **Indirect effects**	Diff (%) of e0 2015-2019 **Direct effects**	Diff (%) of e0 2015-2019 **Total effects**
Median Intensity	0.40***	0.56	-0.18***	0.05	-0.13
	[0.27,0.53]	[-0.04,1.17]	[-0.27,-0.09]	[-0.11,0.20]	[-0.29,0.02]
Median Dissymmetry	0.25***	0.74**	-0.14***	-0.03	-0.17*
	[0.15,0.35]	[0.28,1.20]	[-0.19,-0.08]	[-0.20,0.15]	[-0.31,-0.02]
Interaction D*I	0.084***	0.25***	-0.05**	0.00	-0.05**
	[0.06,0.11]	[0.14,0.37]	[-0.06,-0.03]	[-0.03,0.03]	[-0.08,-0.01]
Log GDP pc 2015-19				-0.36***	-0.36***
				[-0.54,-0.17]	[-0.54,-0.17]
Mean e0 proxies				-0.07*	-0.07*
				[-0.13,-0.00]	[-0.13,-0.00]
Constant	10.89***	72.09***	9.91***	9.91***	9.91***
	[10.66,11.11]	[71.22,72.96]	[6.31,13.50]	[6.31,13.50]	[6.31,13.50]
N	178	178	178	178	178

95% confidence intervals in brackets; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; bootstrap s.e. (5000 replications).

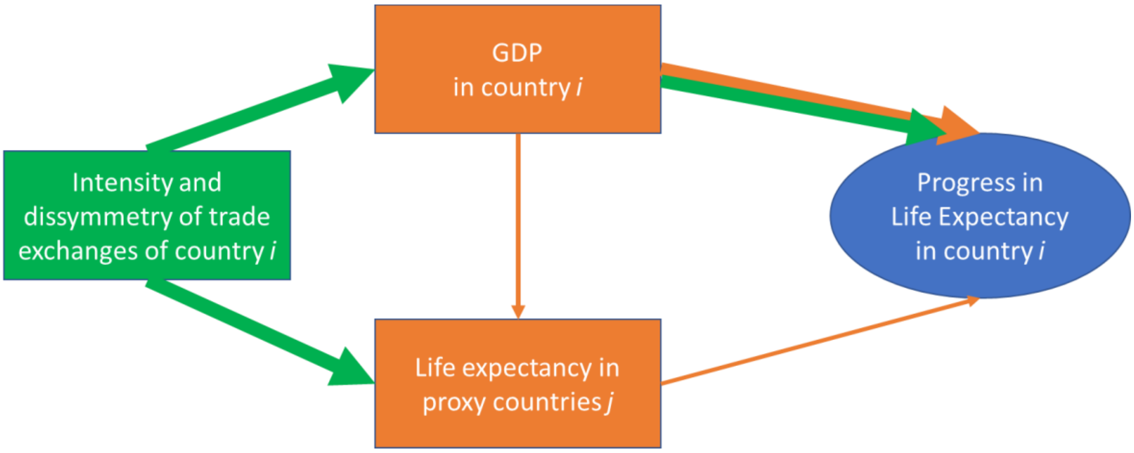
- The higher the intensity and dissymmetry, the higher the…

- Economic power (GDP per capita) of the country
- Life expectancy at birth (LE) of "connected" neighbours (influence on proxies' LE)

⇒ **Power relationship helps building country's economic power and positively influence health in proxy countries**

- **GDP strong negative direct predictor** of progress in life expectancy, more than proxies' LE, which however capture some GDP effect
- Intensity and dissymmetry are…
  - strong **negative <u>indirect</u> predictor** of progress in life expectancy: the higher the intensity and dissymmetry, the lower the country's progress in life expectancy
  - Not a **direct predictor** of progress in life expectancy
  - **Indirect** effect of Intensity & dissymmetry **essentially through GDP**
  - Relatively strong **negative total predictor** of progress in life expectancy, essentially **through dissymmetry**

⇒ **Progress in life expectancy at low** (high) **level of economic power does** (not) **depend on power relationship through building economic power** and not through proxies' life expectancy



GDP: strong negative direct predictor of progress in life expectancy & of proxy countries' life expectancies

Proxy countries' life expectancy: weak direct predictor of life expectancy

Intensity & Dissymmetry:

- **Strong direct effects on GDP and proxy countries' life expectancy**
- **Strong indirect effect, essentially through GDP**
- Not a direct predictor of progress in life expectancy

TO BE TESTED:

Analysis of different periods (evolution)

Use variants of trade and economic independent variables, add new ones (e.g. international migrants' stocks as a proxy for information exchange, World Bank's openness).

Use other dependent variables (e.g. health expenditure, fertility)

Conclusions

Merits

Proof of concept: relational intensity and dissymmetry do matter

Easily accessible data at international level

Use of structural modelling (direct and indirect effects)

Limits

Depends on country-level data (same “non-divisible”, “equal-value” country statistical unit): did not depart from the use of nation or state as the basic analytical unit

Depends on availability and choice of relational data (migration, trade, information…)

Some avenues for research

Structural models for sub-national analysis (districts, provinces…)

Other indicator as dependent variable: causes of death (e.g. highly dependent on treatment), health expenditure, fertility behaviour, international migration, urbanisation…

Other relational measure than trade (or in combination with trade) as independent variable: international migration, information…

Measure the respective impacts of geographical neighbours and relational neighbours

Method: relational statistical unit, fuzzy statistical units…

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