Health for nothin' and the trade for free - That ain't workin' ?!

On the consequences of health on trade

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Outline

An interesting topic...

Figure 1: Exports and Health

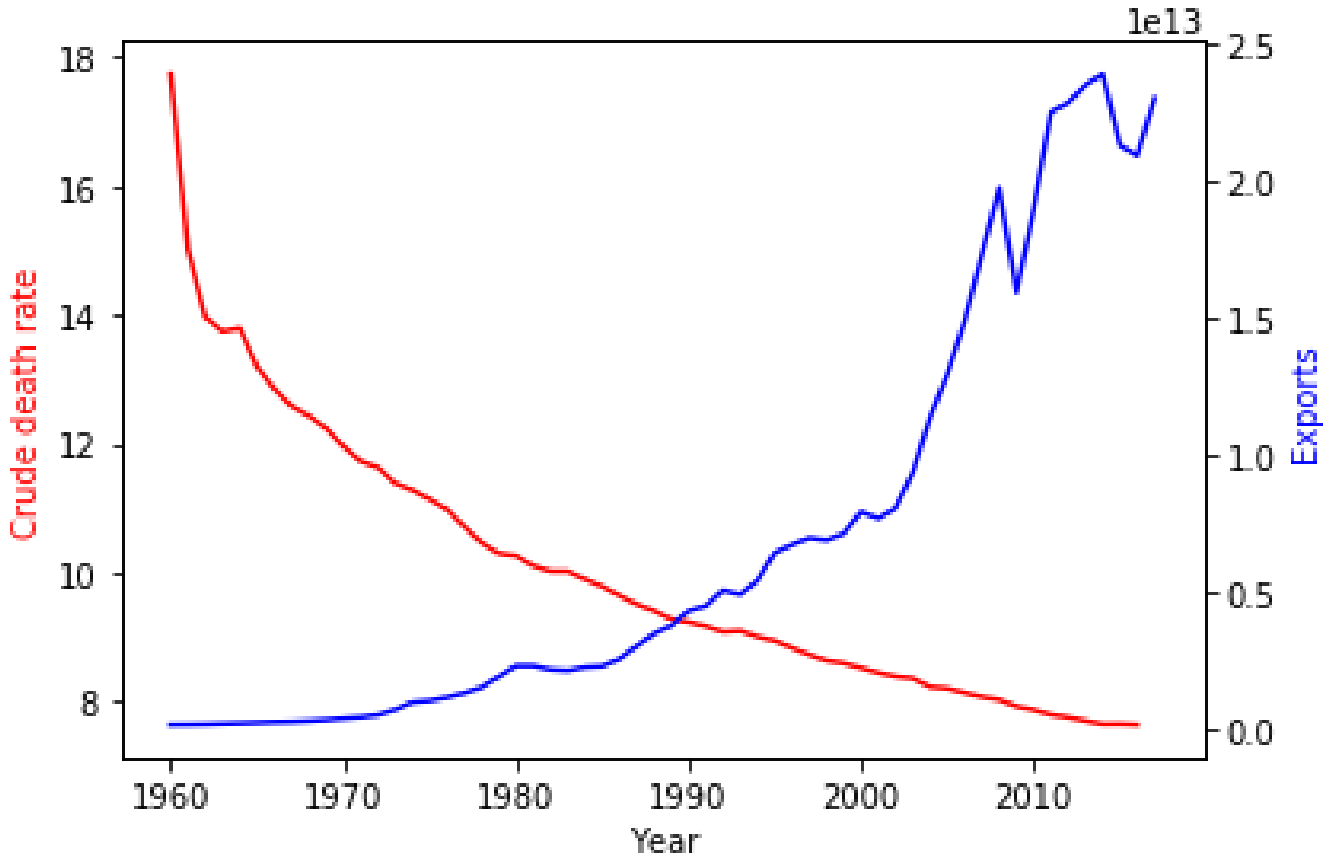


Figure 1 shows time trends of the crude death rate of the world (red) and the aggregated world exports (blue).

The Environment

Overall,

- International RBC Model
- 2 countries, 2 goods

Shocks occur to health

$$H_t = \rho^H H_{t-1} + \epsilon_{t-1} \tag{1}$$

which enters via

$$\ln A_t = \rho^A \ln A_{t-1} + H_t \tag{2}$$

$$\ln N_t = \rho^N \ln N_{t-1} + H_t \tag{3}$$

Simulation

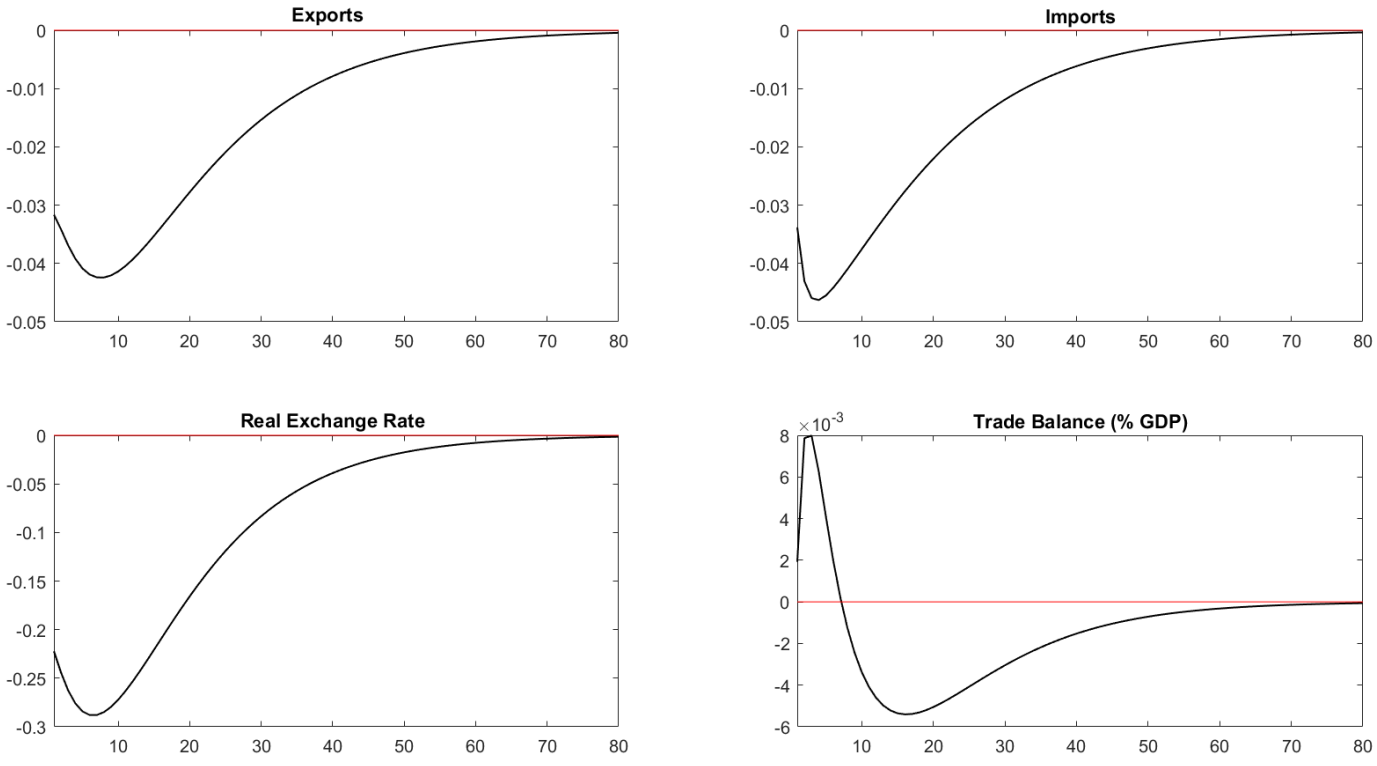


Figure 2: Simulation.

Estimation Strategy

When simply regressing health on trade outcomes, estimates are likely to be biased.

Therefore, I instrument health with a difference-in-differences study of the 2014 Ebola outbreak.

$$Y_{ijt} = \beta \mathbf{H_{it}} + X'_{ijt}\eta + \alpha_{ij} + \zeta_t + \epsilon_{ijt} \tag{4}$$

with

$$\mathbf{H_{it}} = \beta Z_{it} + Q'_{it}\nu + X'_{it}\eta + \pi_{it} + \alpha_i + \zeta_t + \epsilon_{it} \tag{5}$$

Measuring Ebola

The 2014 Ebola Outbreak

- Guinea, Liberia and Sierra-Leone
- In the years 2014 and 2015

The sample

- 37 control countries + 3 treatment countries
- For the years 2000 until 2016

Two main measures

- Case Prevalence Rate
- Ebola Articles in NYT

Other Data

- Ebola Data from the *WHO Situation reports*.
- Health is measured in adult, age-adjusted mortality rates from the *World Bank Development Indicators*.
- Measures of trade include the logarithms of exports and imports as well as the trade balance (in % of GDP). Measured in country-pairs. Data is taken from *IMF Directions of Trade* dataset

Was the 2014 outbreak truly random?

Anecdotal evidence suggests so, but a more thorough statistical investigation is needed.

Figure 3: Pre-trends

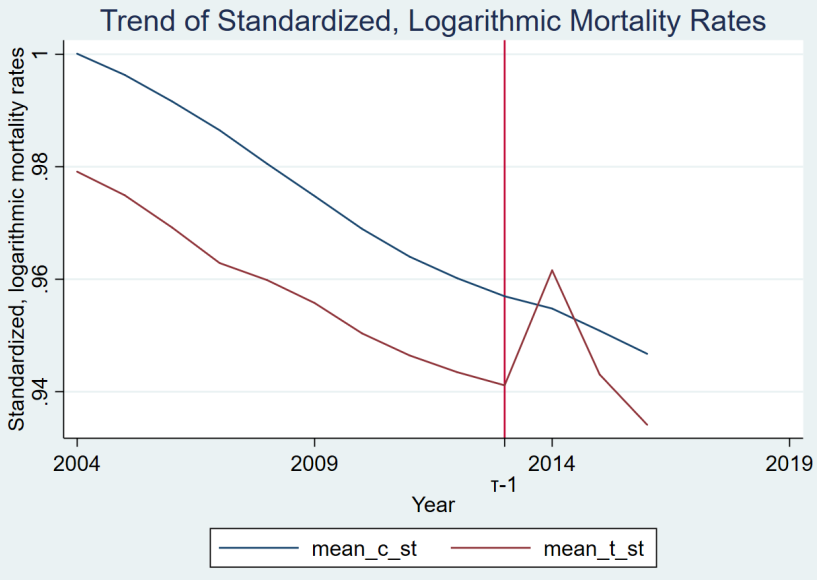
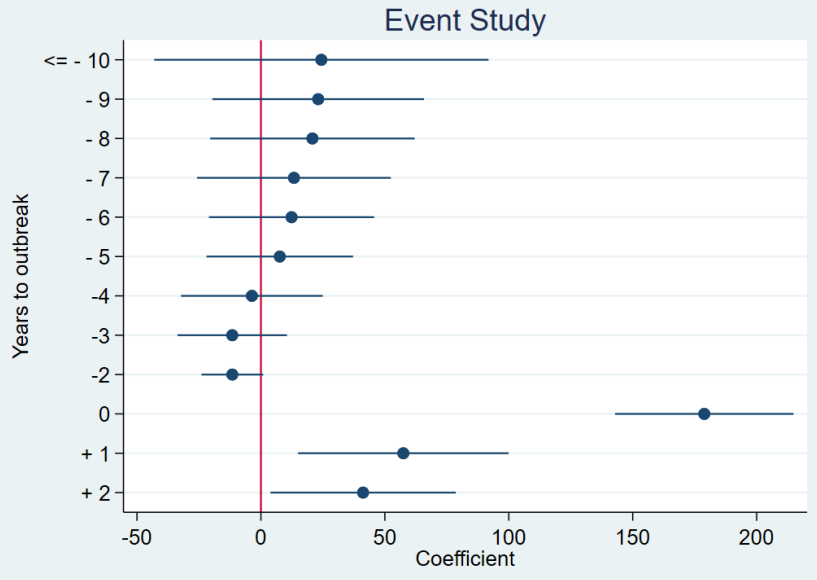


Figure 4: Event Study



First Stage Results

Table 1: First stage results

Dependent Variable	Log Adult Mortality Rate	
Log Prevalence Rate	0.9716***	
	(0.3169)	
Log Ebola Articles		0.0203***
		(0.00389)
Linear Trend	-0.0236***	-0.0238***
	(0.00267)	(0.00270)
Observations	124,117	124,117
Number of country-pairs	7,301	7,301
Two-way FE	Yes	Yes
Cluster level	Country pair	Country pair
F-statistic	39.60	69.58

Log Prevalence Rate is the log of the number of infected divided by the total population
Log Ebola Articles is the log of the number NYT articles about Ebola and a country
Clustered standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Baseline Results

Table 2: Second Stage Baseline

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Exports		Imports		Trade Balance (% GDP)	
Log Mortality Rate	-3.1353***	-3.179***	0.0591	0.0649	0.0172	0.0173
	(0.673)	(0.675)	(0.0499)	(0.0494)	(0.0134)	(0.0141)
Log GDP p.c.					0.0067	0.0067
					(0.0091)	(0.0092)
Instrument	Prevalence	Articles	Prevalence	Articles	Prevalence	Articles
Observations	57,794	57,794	64,203	64,203	81,872	81,872
Two-way FE	Yes	Yes	Yes	Yes	Yes	Yes
F-statistic first stage	34.53	47.49	41.77	58.36	27.95	35.64
No. of clusters	40	40	40	40	38	38
Cluster	Country pair					

Clustered standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Impulse Response Functions

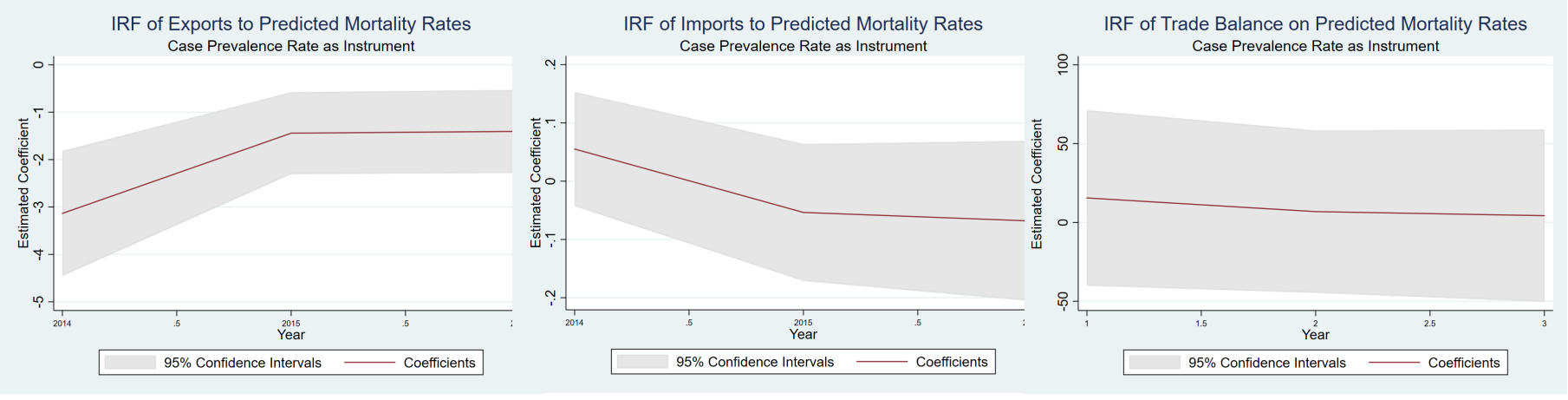


Figure 5: Second Stage IRF

Clustered Standard Errors

Table 3: Wild cluster bootstrap

	(I)		(II)	
Treatment group	Three countries		Three countries	
Treatment variable	Case prevalence		Ebola articles	
Estimate	0.9716		0.02	
Cluster robust s.e.	0.3169		0.004	
t-statistic	3.07		5.21	
P-values & CI	P value	CI	P value	CI
Initial results	0.004	[0.331, 1.613]	0.000	[0.012, 0.028]
Bootstrap by country, restricted	0.105	[-631.6, 24.2]	0.1054	[-.1698, .2974]
Bootstrap by country, unrestricted	0.28	[-.461, 2.404]	0.0000	[.01224, .02828]
Bootstrap by country-pair, restricted	0.0856	[-1.649, 5.502]	0.009	[.009949, .03193]
Bootstrap by country-pair, unrestricted	0.1381	[-.5862, 2.529]	0.000	[0.012, 0.028]

Let's wrap it up

- An increase in the Ebola prevalence rate by 1 % cause mortality rates to climb by 1% to 1.5%.
- Increase in mortality rates by 1% can be associated with a reduction of exports by between 2% and 3 %.
- Likely no impact on imports or trade balance.
- Micro-approach to investigate the exact mechanism
- Longer time horizon.
- To policy-makers: Effective spending on health to increase exports, potentially, threefold.