What Determines Prepaid Health Expenditure?

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The question

- We focus on the determinants of total prepaid health expenditure
  - Total prepaid health expenditure = total health expenditure – out of pocket health expenditure
  - It is not financed at point of use by private citizens, and so does not impose the risk of catastrophic health expenditure or pushing consumers of health care below the national poverty line
  - Instead finances are raised and pooled through government revenue, health insurance (public and private) and external organisations (development assistance for health)
- We produce results based on a global sample of 192 countries between 1995 and 2013, and compare these coefficients with those of the Caribbean region
- We attempt to determine:
  1) what drives prepaid health expenditure globally
  2) what drives prepaid heath expenditure regionally
  3) how do the results differ
  4) The answers to 2) and 3) form the basis for policy advice and recommendations for improved data collection and further studies

Motivation

- There is currently a large push (both internationally and at the individual country level) to expand health service provision to universal health coverage (UHC).
- Internationally, estimates of the minimum cost of UHC, when compared to current health expenditure, reveal a large resource gap – the gap is particularly large in low income countries.
- In the Caribbean, there is access to a minimum level of care. The focus is shifting towards expanding access to comprehensive quality services, providing financial protection and addressing health related inequalities.

Our Approach

- We analyse the determinants of total prepaid health expenditure
- Understanding what has driven changes in health expenditure in the past, can inform prediction for the future, which may help close the health financing gap in LIC and increase space for improvement in the Caribbean.
- Another reason for this approach is one of the short-comings in recording and reporting on other measures of inputs in the health sector. Expenditure data is most complete.
- We look at financing **sources** rather than the **agents** through which funds flow (public and private agents).
- Out of Pocket Expenditure is subtracted from total health expenditure to determine spending that does not impose a significant burden on the individual.

A first look at the data

Data and caveats

- Data covering the period 1995-2013 was taken from
  - WHO's Global Health Expenditure Database
  - World Bank DataBank
  - IMF's World Economic Outlook 2015
  - OECD Data
  - PAHO's Regional Health Observatory
- Current US$ used throughout
  - Policy makers think and talk in current figures
  - Without knowing in which currency externally sourced funds are spent, it is impossible to adjust for inflation

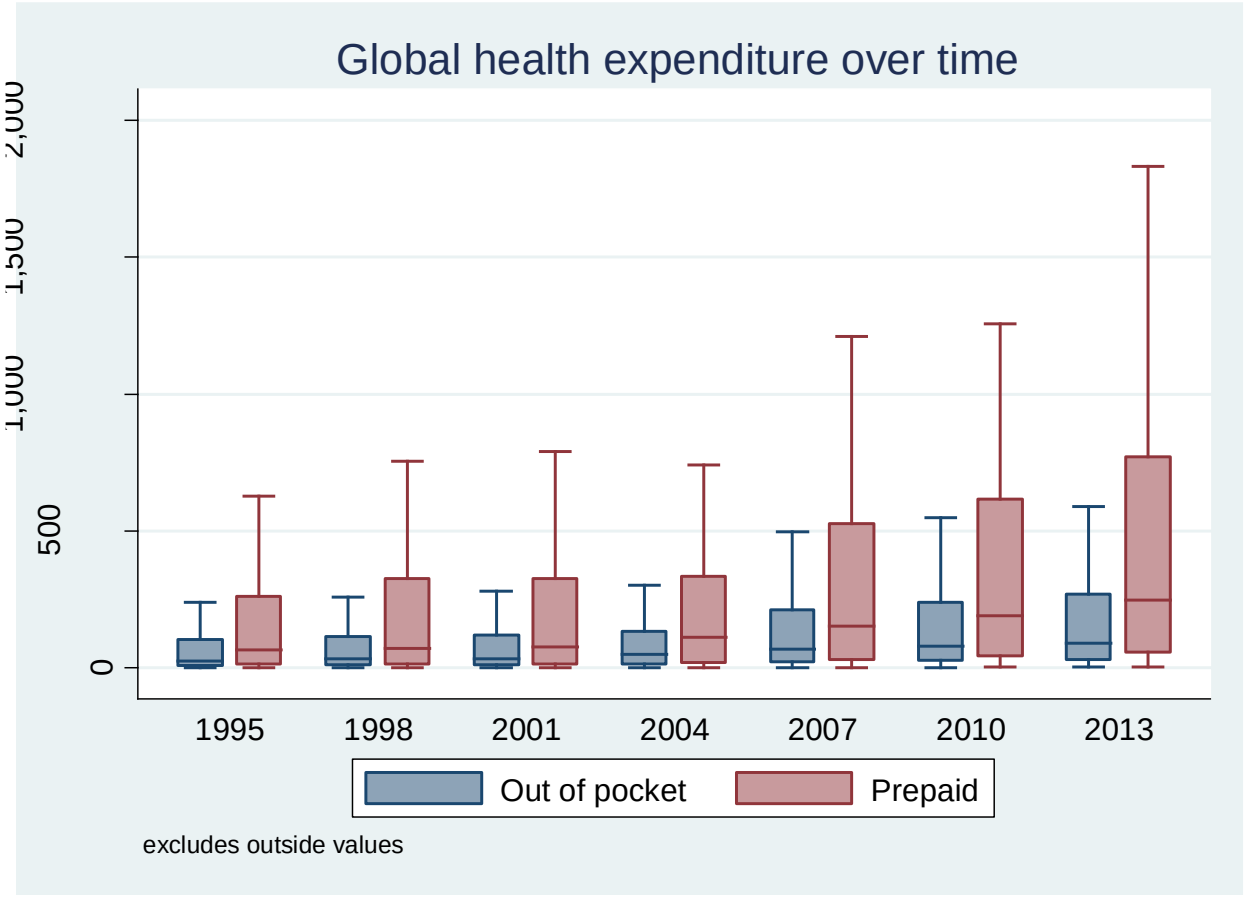
Variables of interest

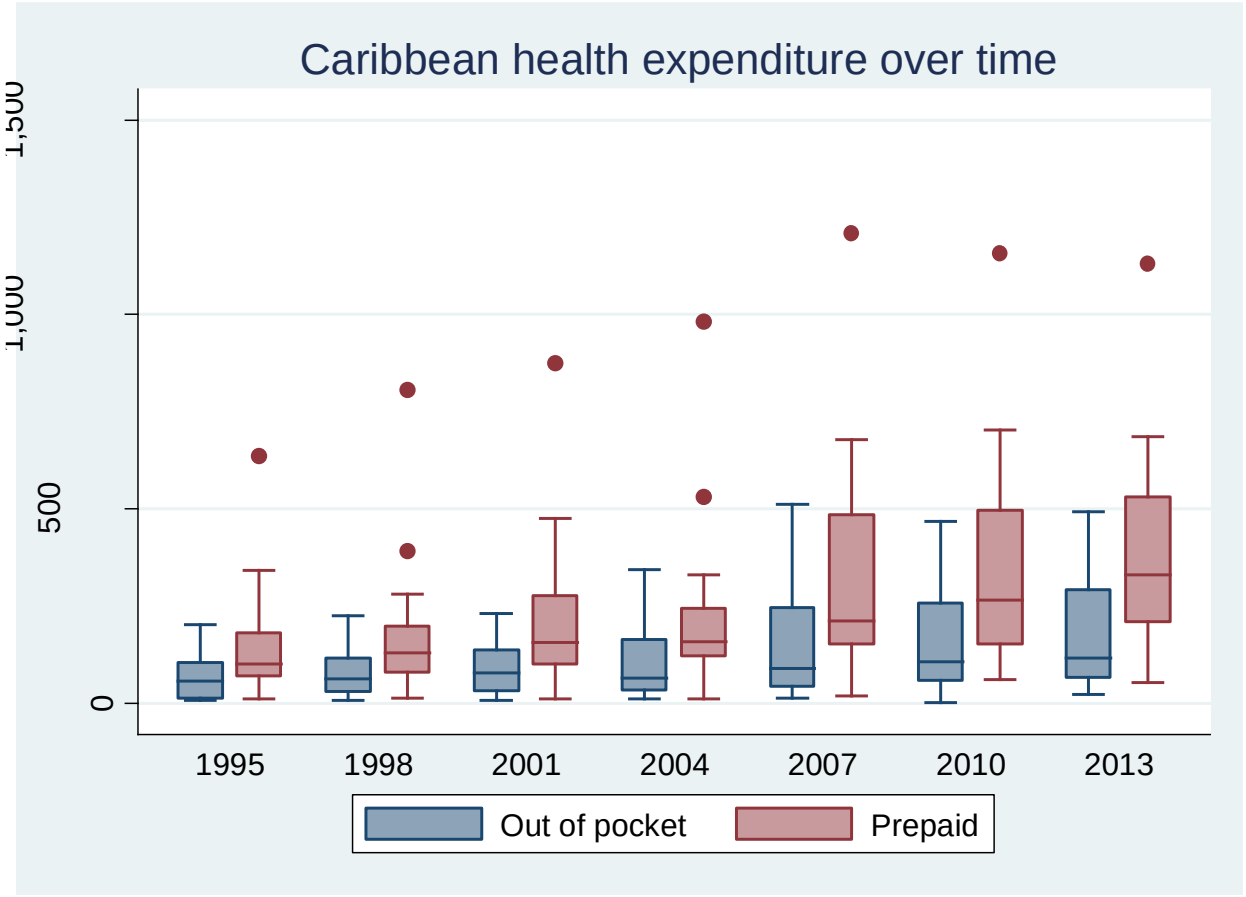
- Dependent Variables
  - Total prepaid health expenditure
  - Domestically sourced prepaid health expenditure
  - Externally sourced prepaid health expenditure

Where: prepaid = total – out of pocket
domestic prepaid = total – out of pocket – external

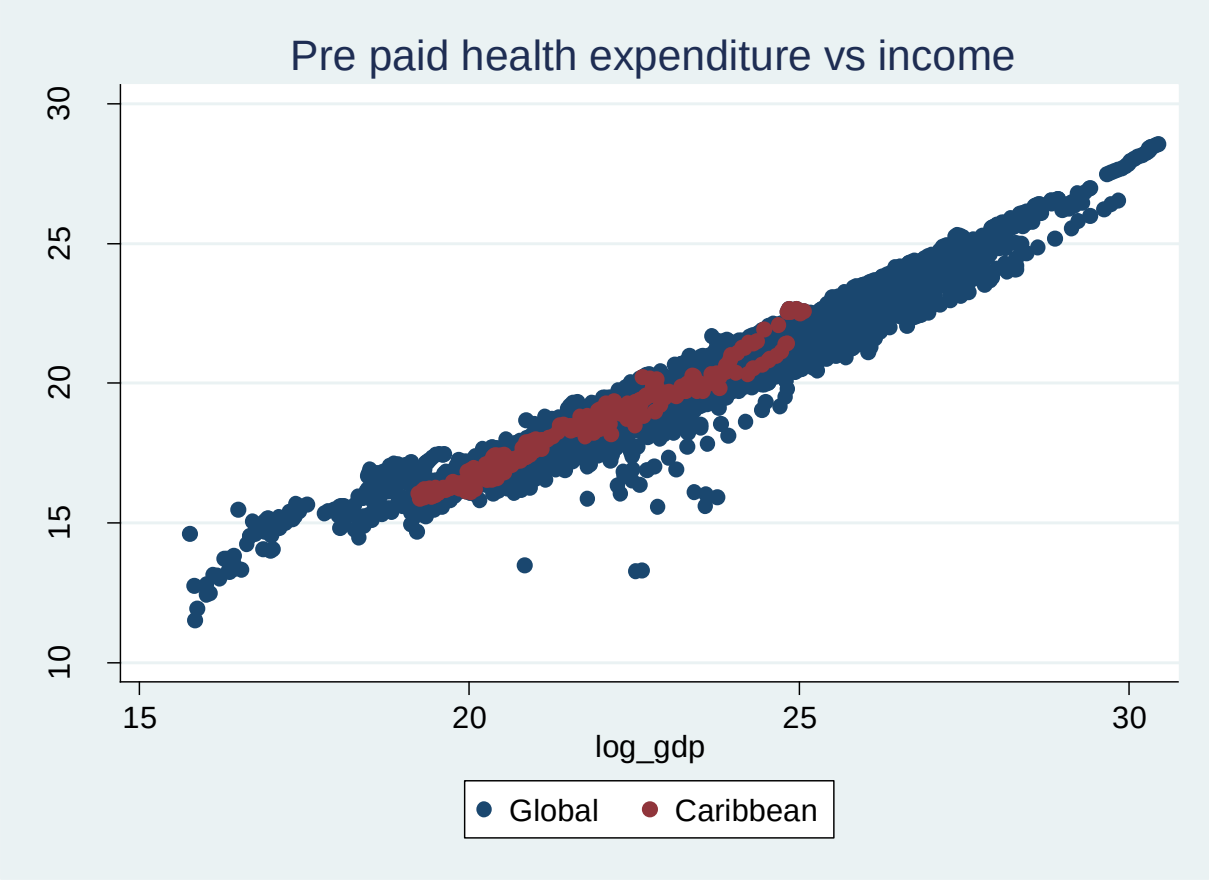
- Independent Variables
  - GDP
  - Government revenue as % of GDP – capacity of government to raise funds
  - OECD growth rate – in particular to investigate its relationship with externally sourced health expenditure
  - Infant mortality rate per 1,000 live births – as a proxy for health sector sophistication
  - Tuberculosis incidence rate per 100,000 population – as a proxy for disease burden
  - Proportion of the population under five years of age – demographic population structure
  - Population (in thousands)

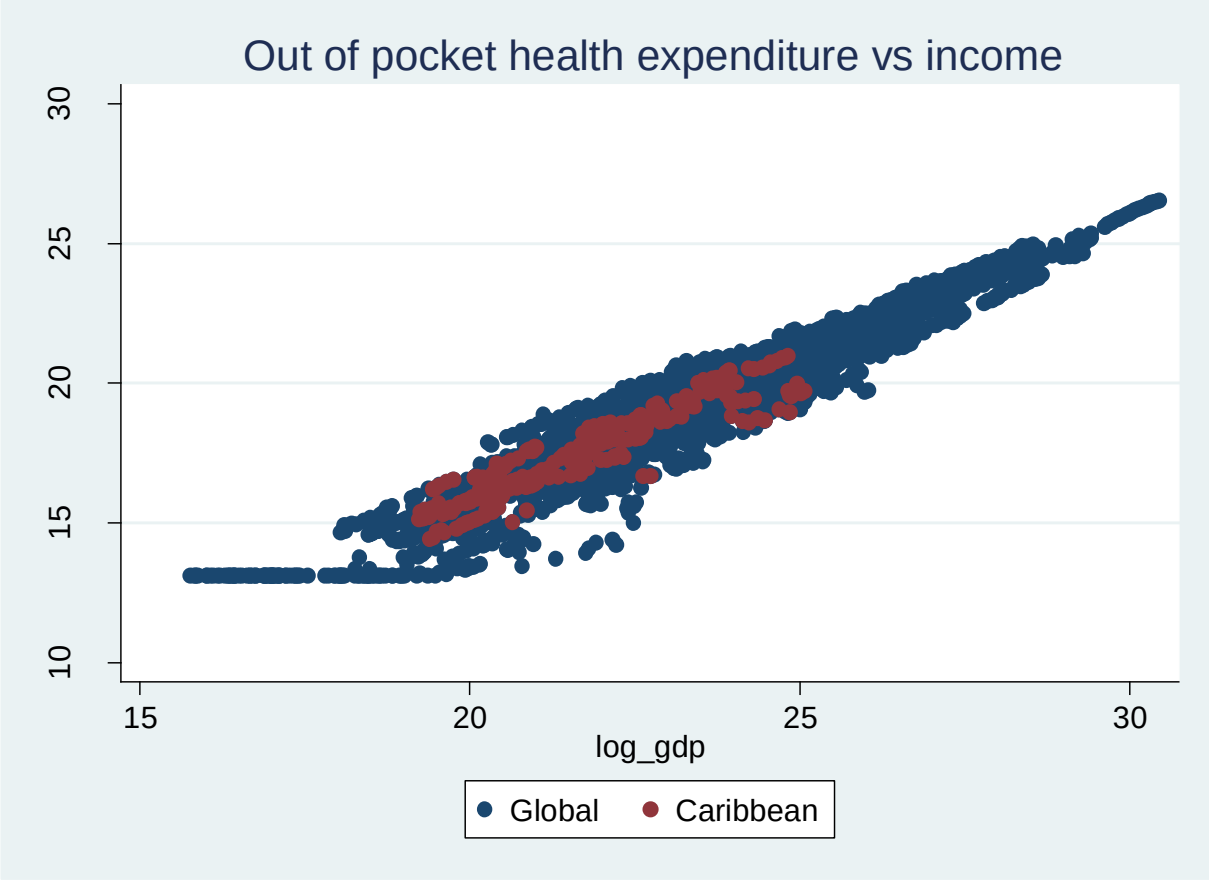
Health expenditure over time



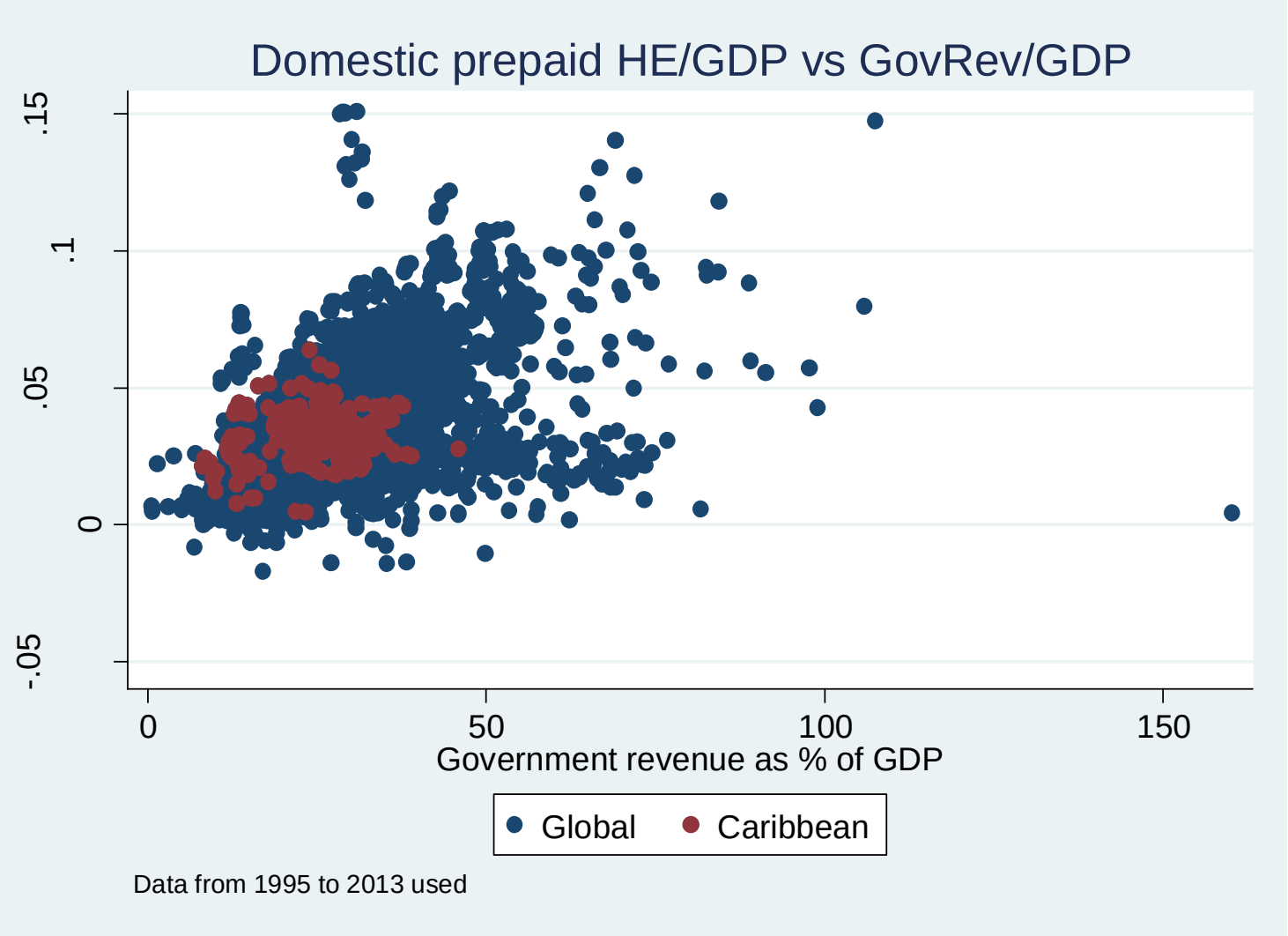


GDP and prepaid health expenditure

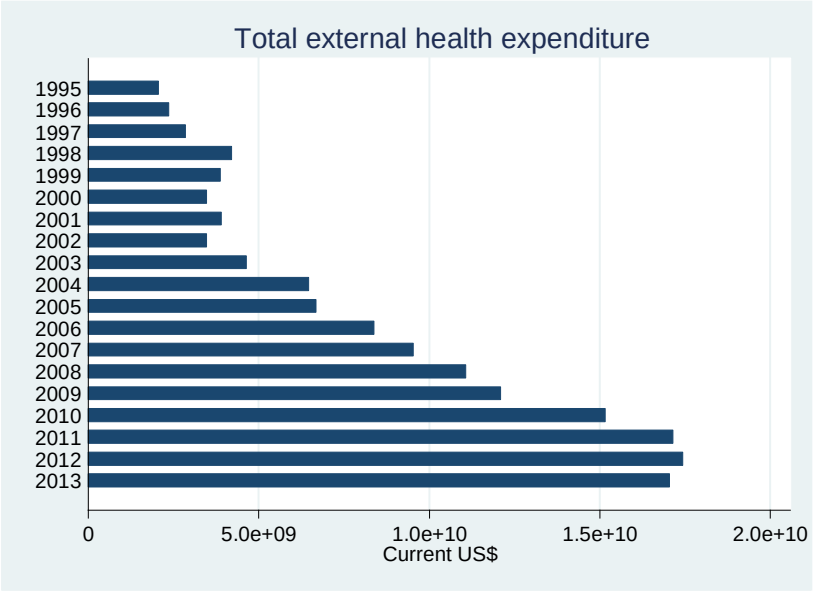


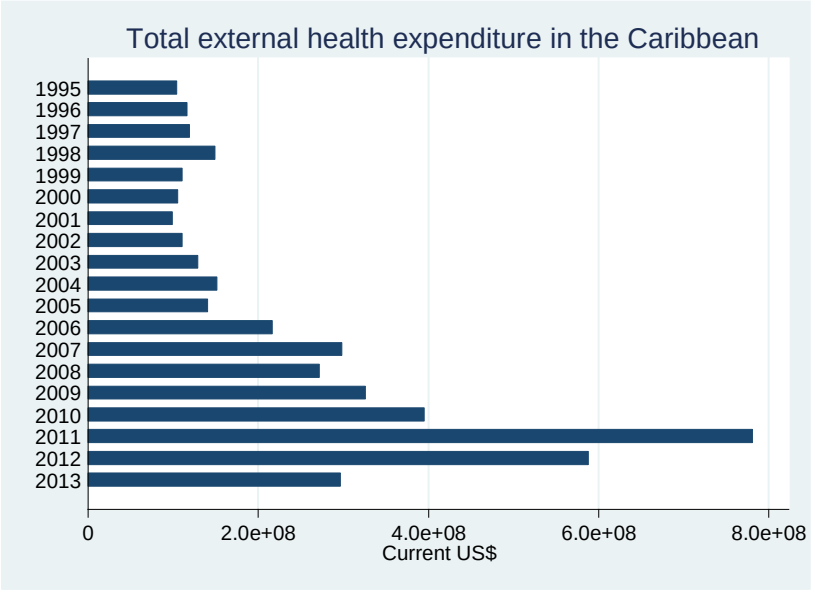


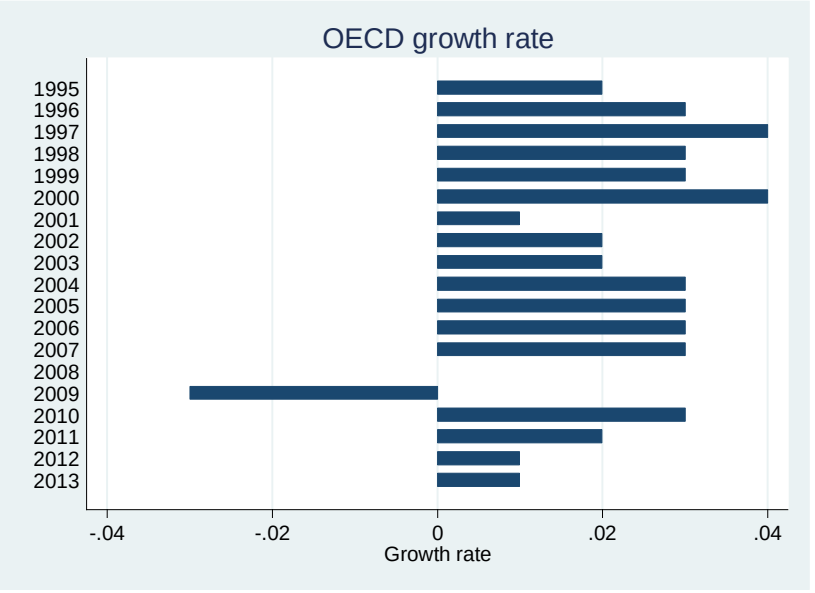
Government revenue and prepaid health expenditure



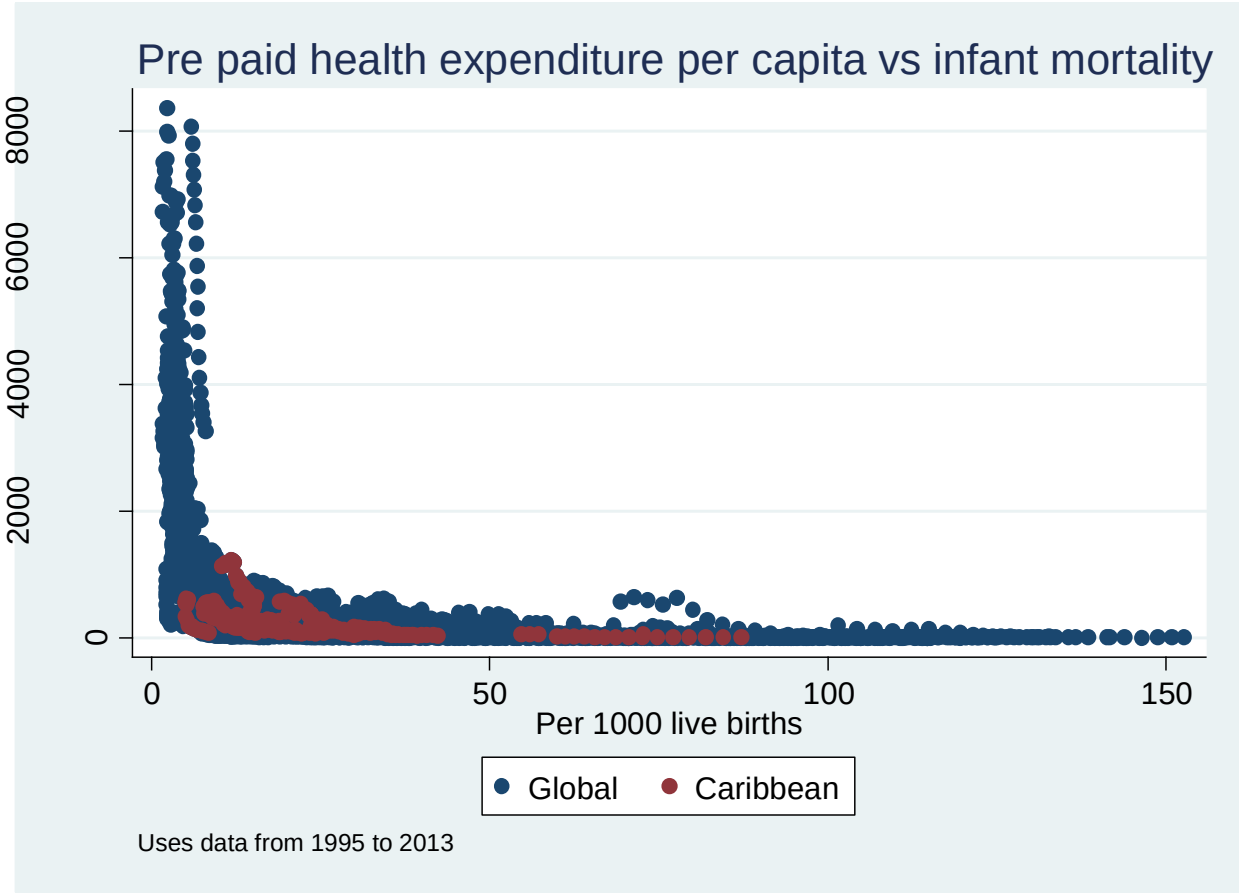
OECD growth and prepaid health expenditure

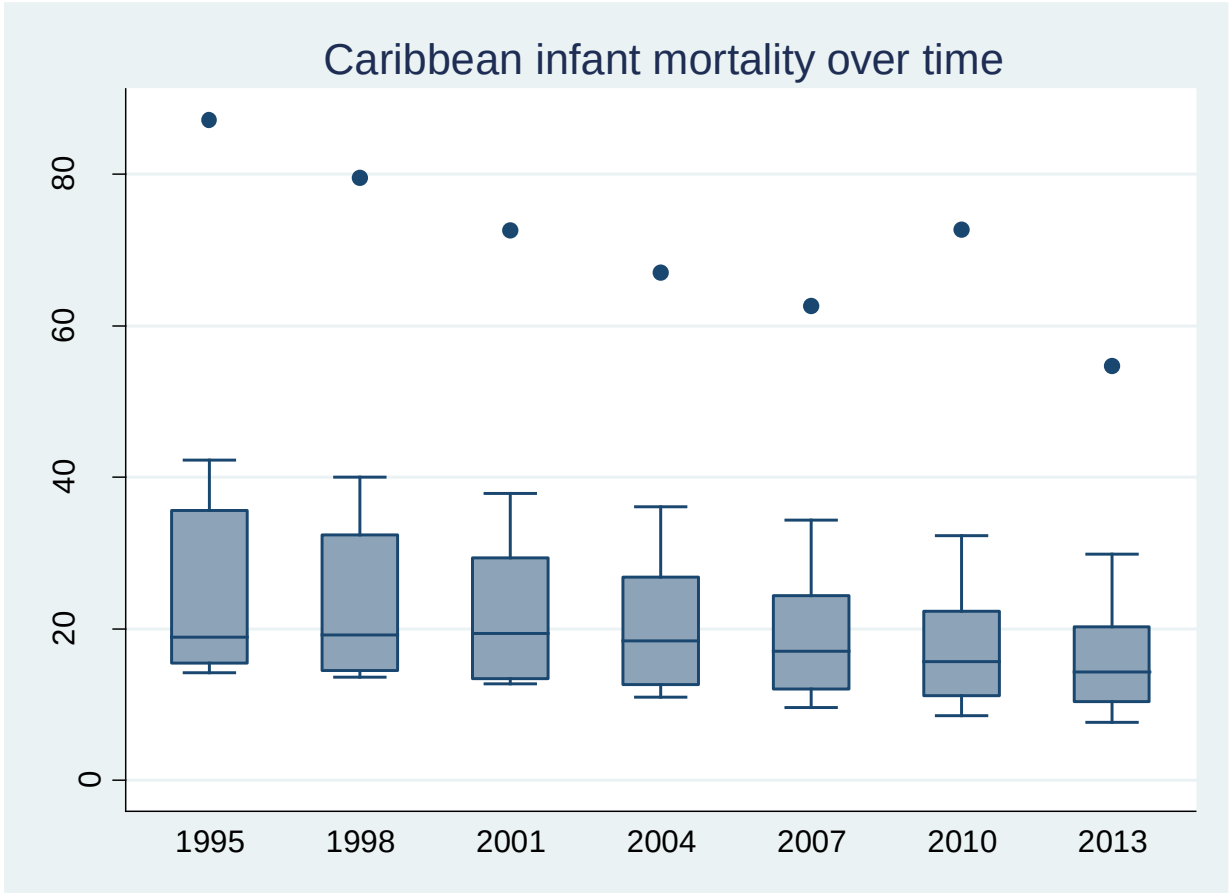




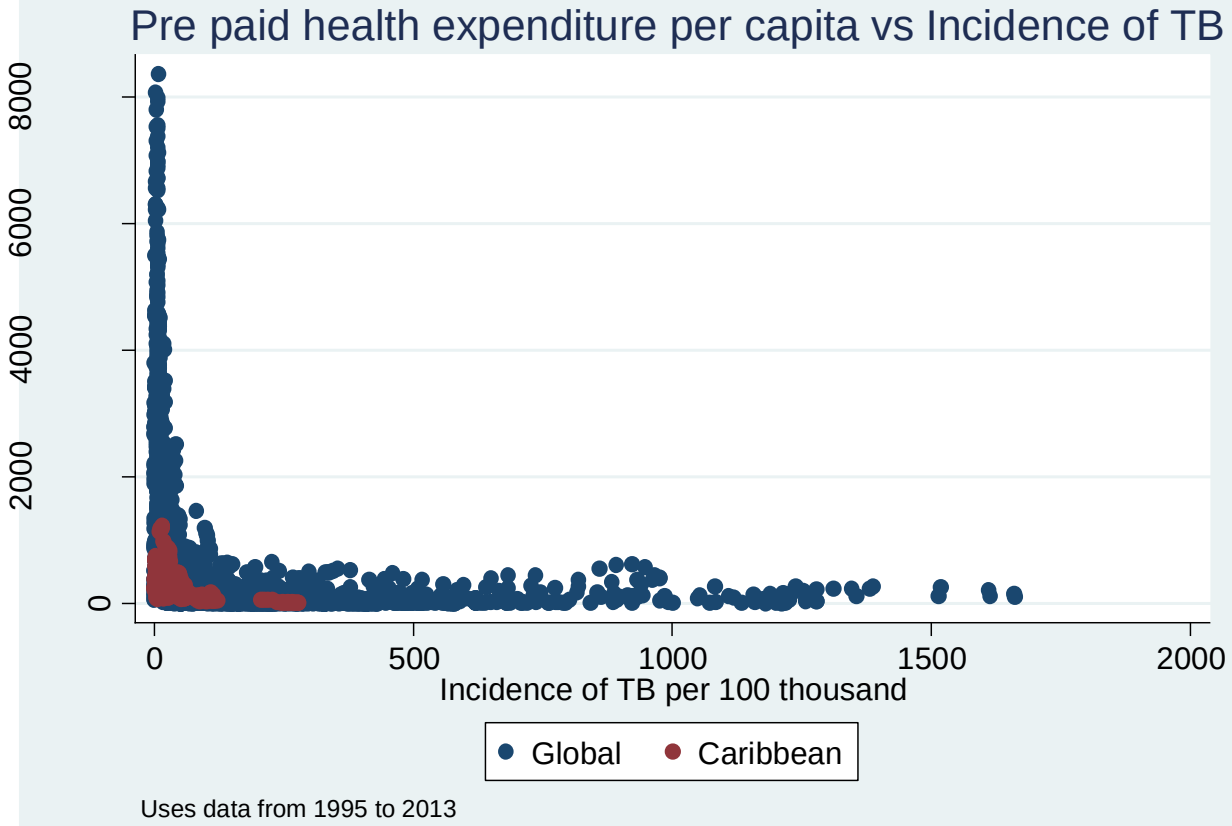


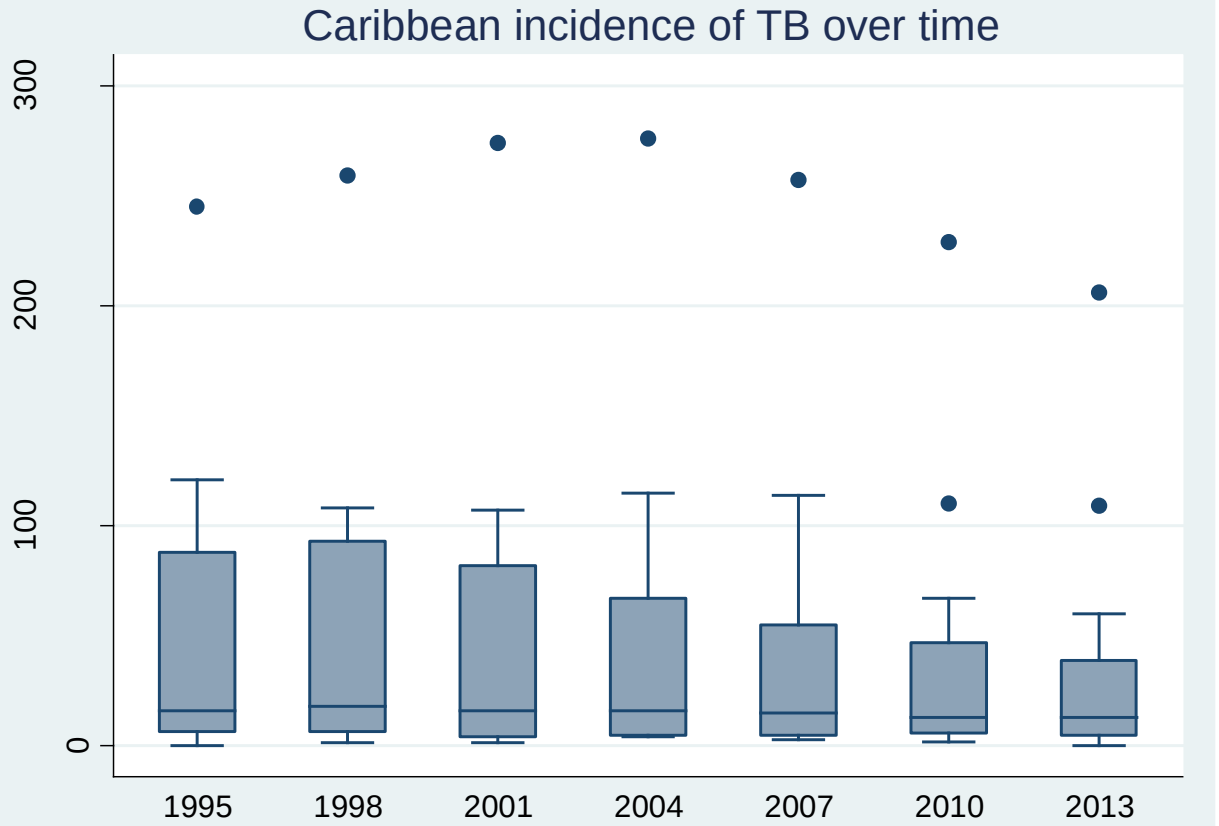
Infant mortality and prepaid health expenditure



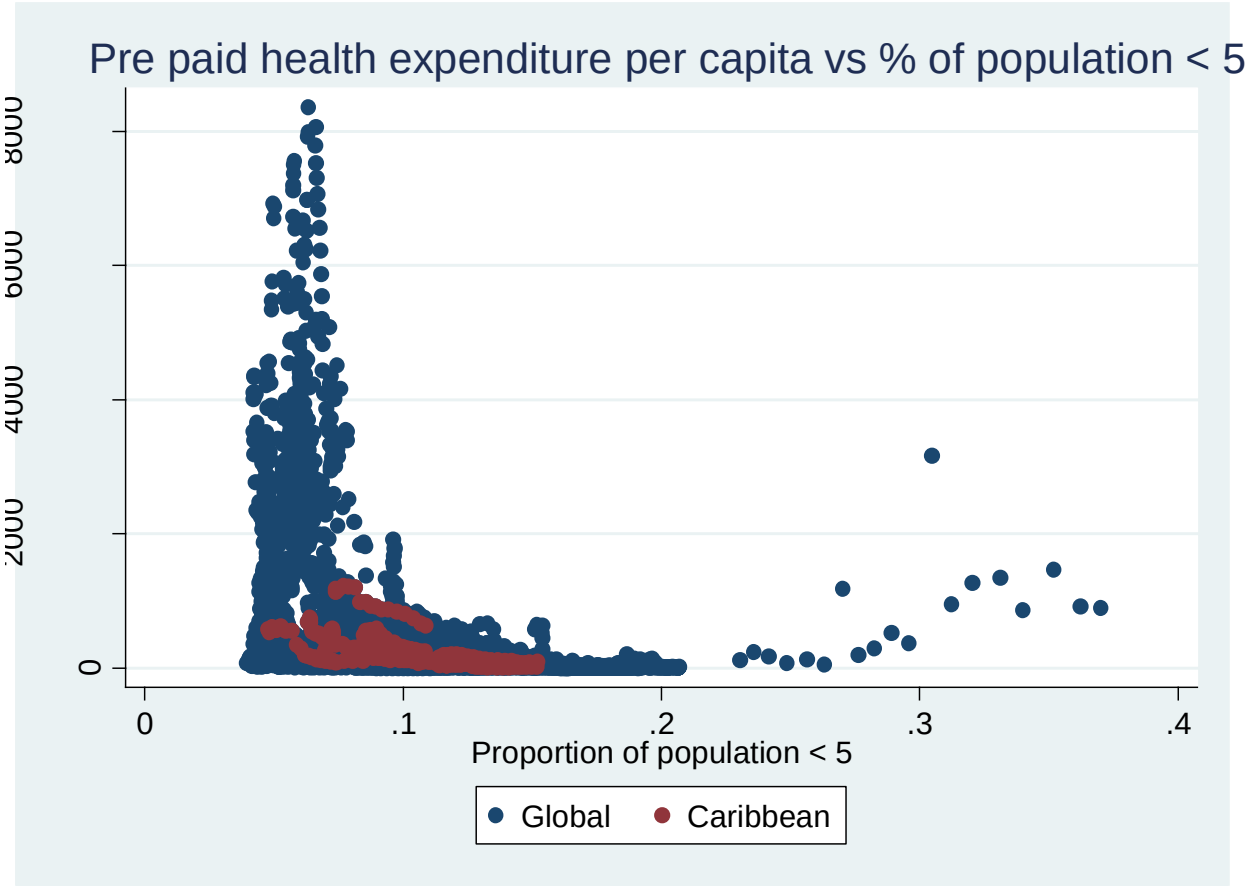


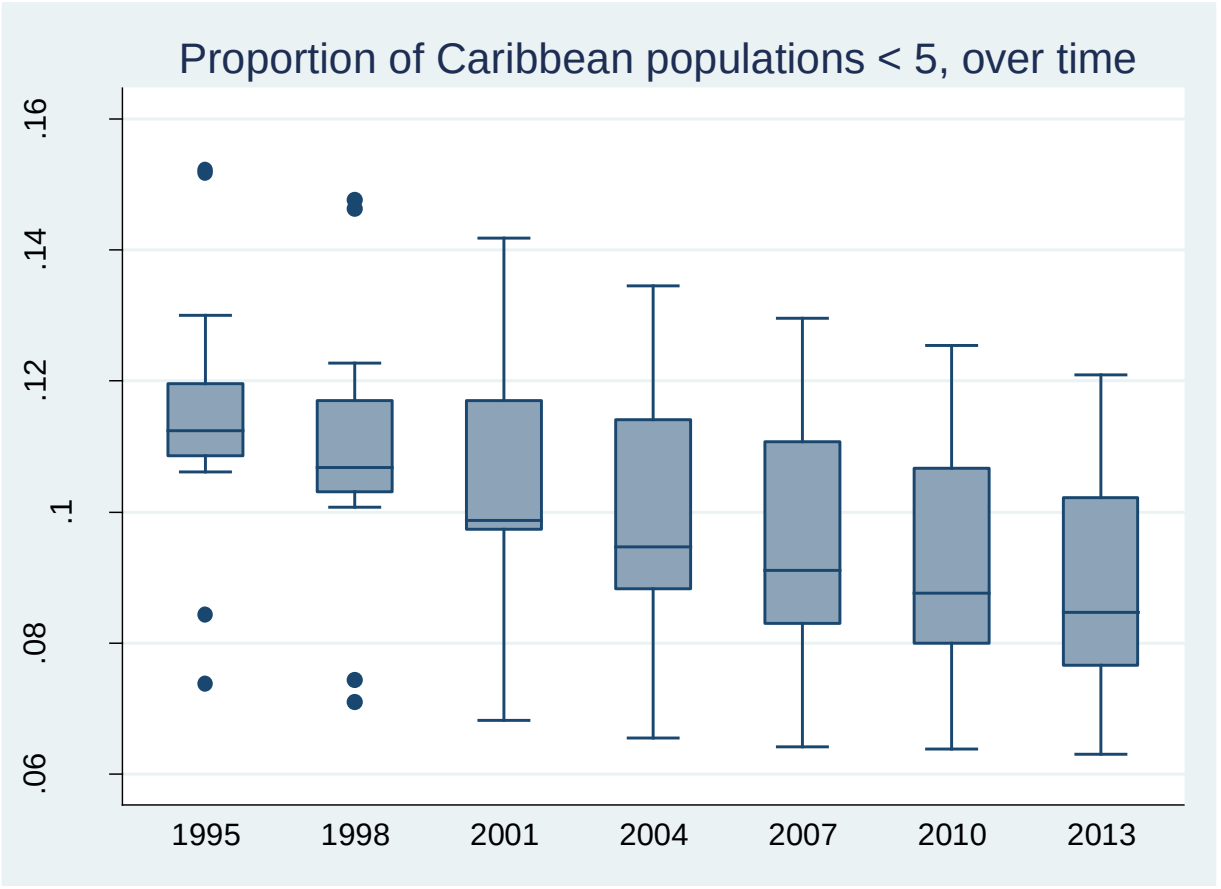
Incidence of TB and prepaid health expenditure





Population < 5 and prepaid health expenditure





Econometric model: Static vs Dynamic Model

- Static Model: $y_{it} = \beta' x_{it} + c_i + e_{it}$
  - Fixed effects selected over Random effects (Hausman Test)

- Dynamic Model: $y_{it} = \alpha y_{it-1} + \beta' x_{it} + c_i + e_{it}$
  - Fixed effects bias in an RE model
  - Use Arellano-Bond GMM estimator

Static Model results – Global

This is a regression table for all countries

	LIC		LMIC		UMIC		HIC	
log_gdp	0.956***	(0.0297)	0.973***	(0.0212)	0.965***	(0.0223)	0.947***	(0.0193)
Gov rev to GDP	0.00566***	(0.00138)	0.00283*	(0.00119)	0.00309*	(0.00138)	-0.00167	(0.00146)
real OECD growth	-1.349*	(0.616)	-1.030**	(0.354)	-0.933**	(0.310)	-1.935***	(0.282)
pop_1000	4.86e-08	(0.00000112)	0.00000141	(0.00000109)	0.00000985***	(0.00000243)	0.0000154***	(0.00000289)
pop_u5	2.205	(1.285)	-1.692	(0.919)	-0.384	(0.958)	-0.185	(0.887)
Infant mortalit~1000	-0.0116***	(0.00113)	-0.00815***	(0.00190)	-0.00807**	(0.00273)	-0.0638***	(0.00646)
TB incidence pe~100k	-0.0000814	(0.000140)	0.000183*	(0.0000746)	-0.000277	(0.000143)	0.00303**	(0.00101)
Constant	-2.337**	(0.773)	-2.477***	(0.537)	-2.562***	(0.616)	-1.449**	(0.529)
Observations	811		904		683		748	
Adjusted R-squared	0.854		0.878		0.897		0.932	

Standard errors in parentheses

Source: auto.dta

* p<0.05, ** p<0.01, *** p<0.001

Static Model results – Caribbean

This is a regression table for Caribbean countries

	LIC_CRBN		LMIC_CRBN		UMIC_CRBN		HIC_CRBN	
log_gdp	0.851	(0.417)	0.902***	(0.0914)	0.777***	(0.114)	0.575***	(0.109)
Gov rev to GDP	0.0356	(0.0525)	0.0106	(0.0105)	0.00339	(0.00581)	0.00547	(0.00484)
real OECD growth	1.693	(3.291)	-1.751	(1.356)	-1.973*	(0.758)	-1.851**	(0.631)
pop_1000	0.00320	(0.00201)	-0.000627***	(0.000124)	0.000810**	(0.000250)	0.00194	(0.00160)
pop_u5	210.4	(164.7)	-3.587	(3.100)	-9.123**	(3.190)	1.464	(4.549)
Infant mortalit~1000	0.0283	(0.0212)	-0.0242	(0.0142)	0.00398	(0.0132)	-0.0597**	(0.0192)
TB incidence pe~100k	-0.00419	(0.00971)	-0.00536	(0.00274)	0.00229	(0.00267)	-0.00342	(0.00559)
Constant	-59.06	(44.53)	1.214	(2.354)	1.354	(2.682)	6.059	(3.175)
Observations	17		76		134		47	
Adjusted R-squared	0.947		0.885		0.811		0.921	

Standard errors in parentheses

Source: auto.dta

* p<0.05, ** p<0.01, *** p<0.001

Dynamic Model results - Global

This is a regression table for all countries

	LIC		LMIC		UMIC		HIC	
L.log_the_prepaid	0.427***	(0.0278)	0.240***	(0.0218)	0.294***	(0.0227)	0.436***	(0.0212)
log_gdp	0.627***	(0.0367)	0.818***	(0.0263)	0.691***	(0.0248)	0.606***	(0.0227)
Gov rev to GDP	0.000151	(0.00113)	0.000785	(0.000621)	0.00181	(0.00112)	-0.00431***	(0.000970)
real OECD growth	-0.196	(0.421)	-0.331	(0.219)	-0.337	(0.190)	-0.793***	(0.162)
pop_1000	0.000000978	(0.00000125)	0.000000365	(0.000000915)	0.00000285	(0.00000230)	0.00000458*	(0.00000211)
pop_u5	-0.595	(1.304)	-0.305	(0.835)	-0.401	(0.819)	1.036	(0.667)
Infant mortalit~1000	-0.00653***	(0.00124)	0.00148	(0.00187)	-0.00672*	(0.00273)	-0.00881*	(0.00441)
TB incidence pe~100k	0.000126	(0.000149)	0.0000207	(0.000101)	-0.0000349	(0.000126)	-0.00138	(0.000731)
Constant	-2.816***	(0.716)	-3.933***	(0.460)	-1.871***	(0.485)	-2.597***	(0.361)
Observations	720		810		637		685	
Adjusted R-squared								

Standard errors in parentheses
Source: auto.dta
* p<0.05, ** p<0.01, *** p<0.001

Dynamic Model results - Caribbean

This is a regression table for Caribbean countries

	LIC_CRBN		LMIC_CRBN		UMIC_CRBN		HIC_CRBN	
L.log_the_prepaid	-0.106	(0.422)	0.223**	(0.0845)	0.644***	(0.0548)	0.545***	(0.135)
log_gdp	0.872	(0.559)	0.823***	(0.0921)	0.370***	(0.0904)	0.434***	(0.113)
Gov rev to GDP	0.0478	(0.0847)	0.00132	(0.00968)	0.00846*	(0.00362)	-0.00461	(0.00359)
real OECD growth	1.719	(4.357)	-0.683	(1.252)	-0.660	(0.467)	-0.0334	(0.626)
pop_1000	0.00397	(0.00407)	-0.000282*	(0.000127)	0.000317*	(0.000130)	0.00157	(0.00167)
pop_u5	275.2	(337.4)	4.292	(3.282)	-1.772	(2.274)	6.678	(5.231)
Infant mortalit~1000	0.0232	(0.0346)	0.000669	(0.0135)	0.0251*	(0.0118)	0.00804	(0.0265)
TB incidence pe~100k	-0.00364	(0.0130)	-0.00200	(0.00252)	0.000499	(0.00168)	-0.00913	(0.00482)
Constant	-73.30	(81.74)	-3.352	(2.247)	-2.160	(1.901)	-2.054	(3.836)
Observations	16		63		125		45	
Adjusted R-squared								

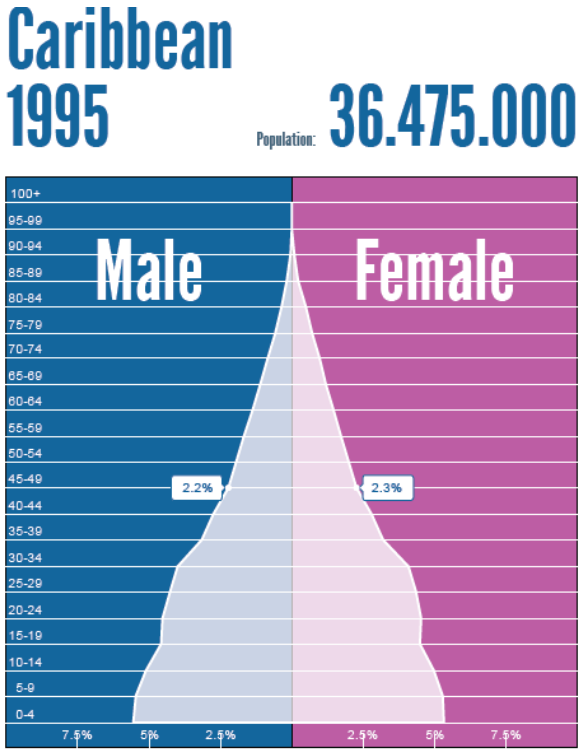
Standard errors in parentheses
Source: auto.dta
* p<0.05, ** p<0.01, *** p<0.001

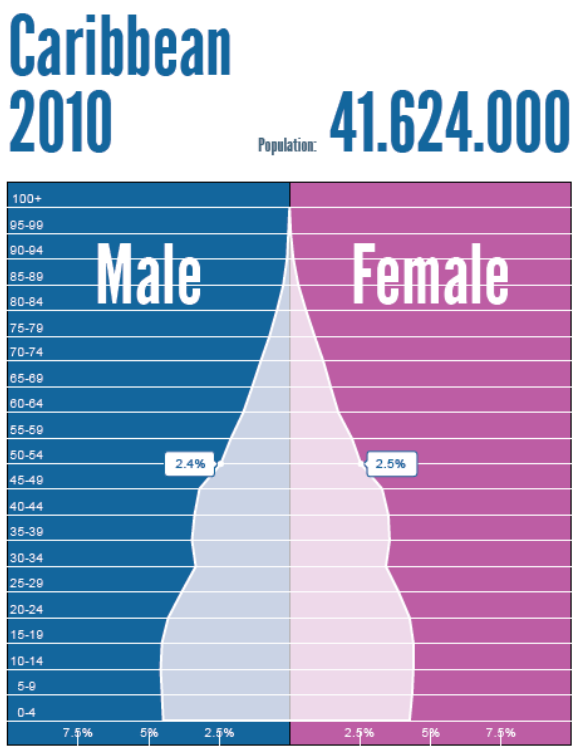
Other factors to consider Caribbean analysis

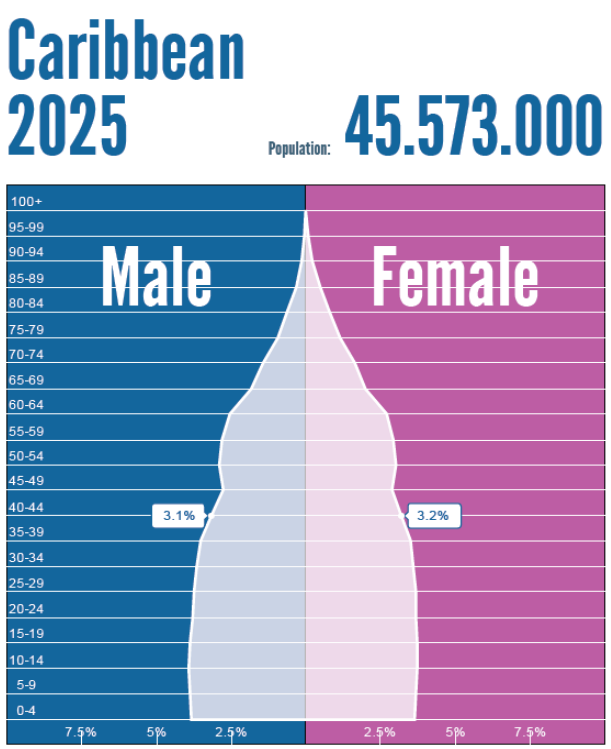
- Demographic transitions
- Epidemiological transitions
- Health infrastructure
- Public/private provision

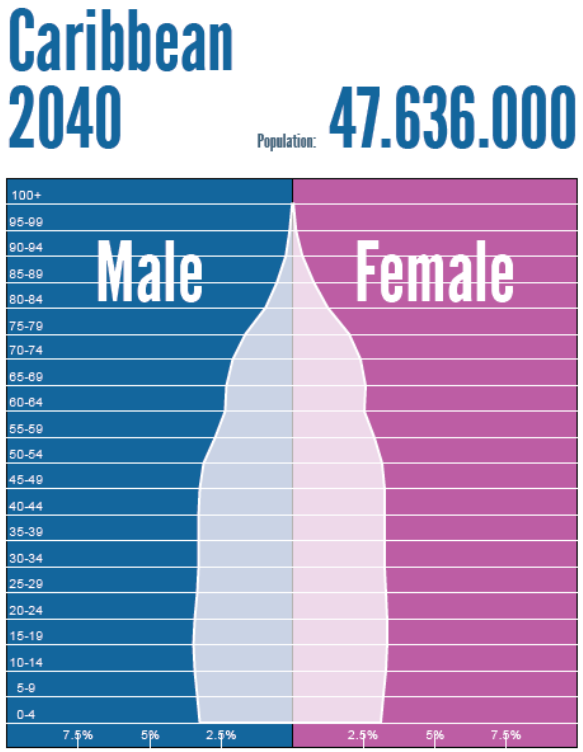
- With more data:
- Human resource composition
- Efficiency
- Equity
- Financing source and agent composition
- Provider payment mechanisms

Demographic transitions



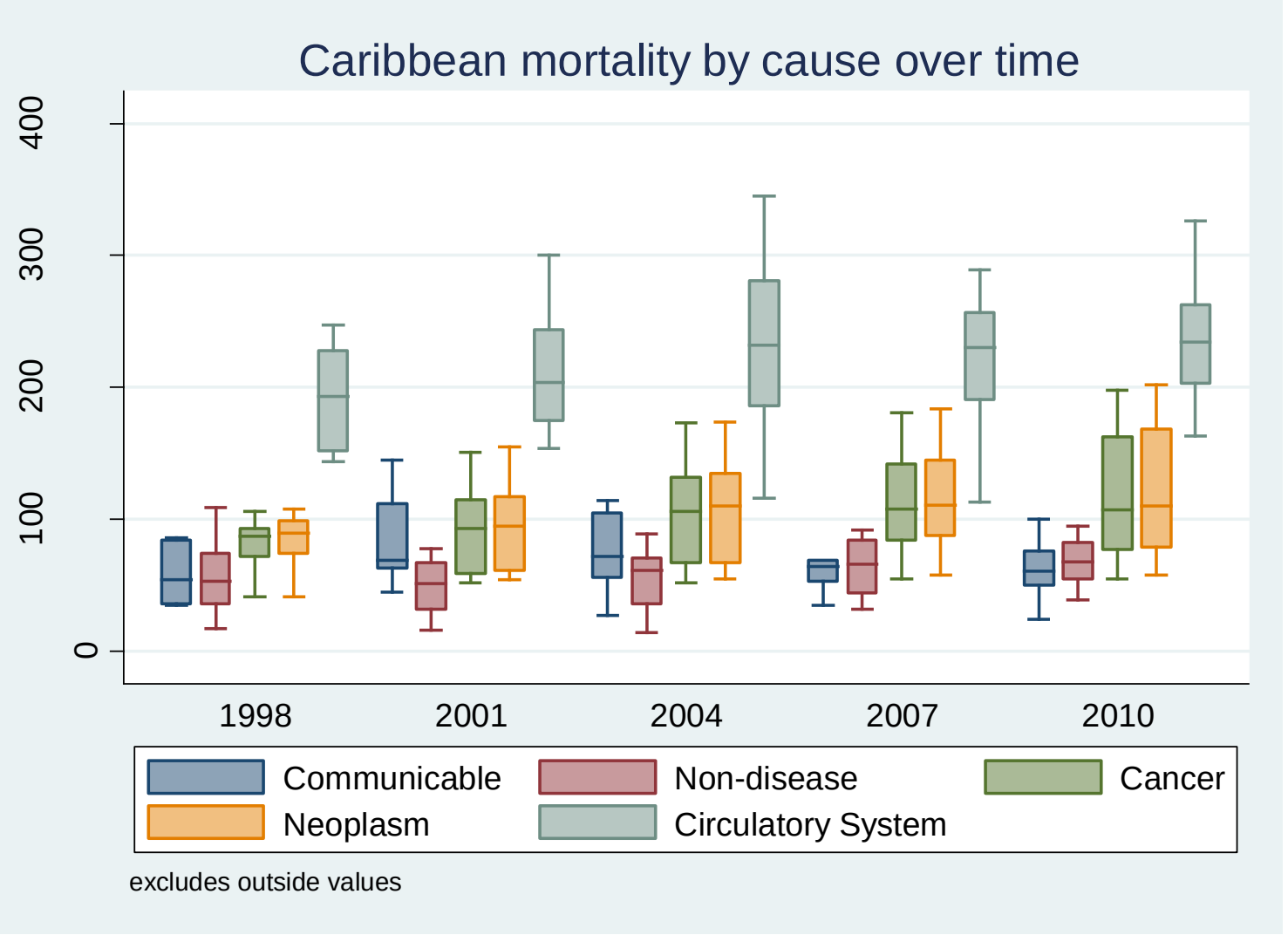




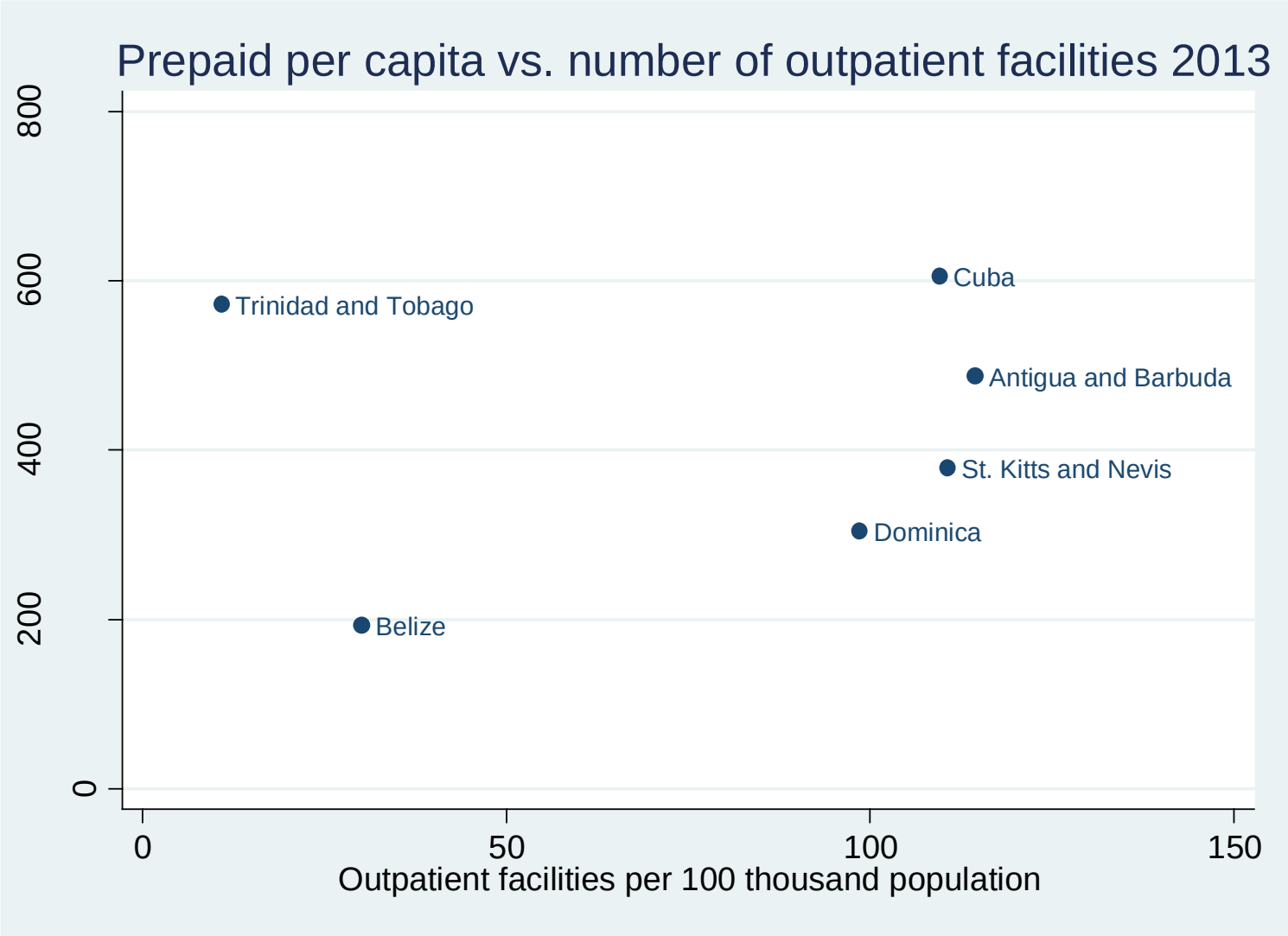


Source: http://populationpyramid.net/caribbean/

Epidemiological transitions



Health infrastructure



Public/private provision