Don't reinvent the wheel – Unit costs you can use

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Unit cost for outpatient visits and inpatient admissions

Mutually exclusive, collectively exhaustive account of health care spending by type of care and location

Outpatient visit cost =

(THE*OP share of NHA) / (OP visits per capita*Population)

Inpatient admission cost =

(THE*IP share of NHA) / (IP admits per capita*Population)

Outline

1. **Utilisation**

- Methods

- Estimates by age, sex, location, and year

- Decomposition

2. Cost

- Methods

- Unit cost estimates

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Definitions

Outpatient utilization rate = annual number of outpatient visits per capita to a health facility

Inpatient utilization rate = annual number of inpatient admissions of one night or more per capita into a health facility.

Volume = product of utilization rate and GBD 2016 population estimates

Descriptive statistics on administrative and survey data sources by GBD super-region and time period

	Time period				Data Source as percentage of total	
	Pre 1990	1990 - 2005	2005 - 2016	Total	Administrative data	Survey data
Outpatient Total	6	526	643	1175	59.1%	40.9%
High-income	4	168	249	421	60.6%	39.4%
Central Europe, Eastern Europe, and Central Asia	0	176	246	422	85.1%	14.9%
Latin America and Caribbean	2	59	48	109	26.6%	73.4%
Southeast Asia, East Asia, and Oceania	0	46	31	77	29.9%	70.1%
North Africa and Middle East	0	24	19	43	34.9%	65.1%
South Asia	0	9	3	12	0.0%	100.0%
Sub-Saharan Africa	0	44	47	91	14.3%	85.7%
Inpatient Total	369	992	707	2068	80.3%	19.7%
High-income	167	410	327	904	82.5%	17.5%
Central Europe, Eastern Europe, and Central Asia	189	416	271	876	90.9%	9.1%
Latin America and Caribbean	2	58	41	101	42.6%	57.4%
Southeast Asia, East Asia, and Oceania	1	46	26	73	35.6%	64.4%
North Africa and Middle East	10	30	13	53	66.0%	34.0%
South Asia	0	8	2	10	0.0%	100.0%
Sub-Saharan Africa	0	24	27	51	29.4%	70.6%

Methods

Bayesian Hierarchal Meta-regressions
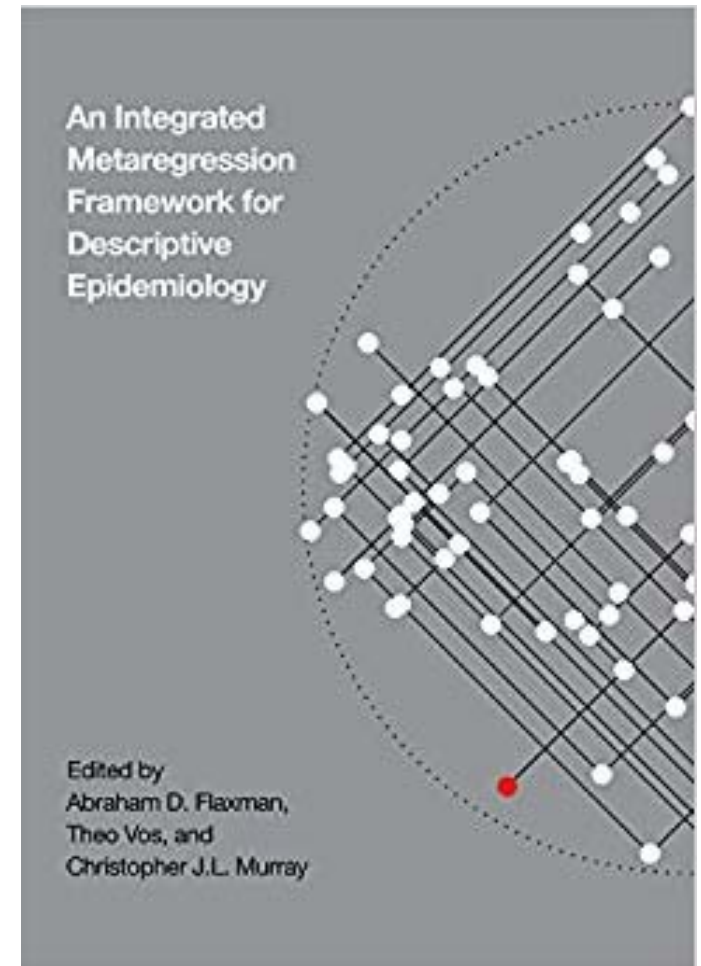
Accommodate different data types
   o Micro data and tabulated reports
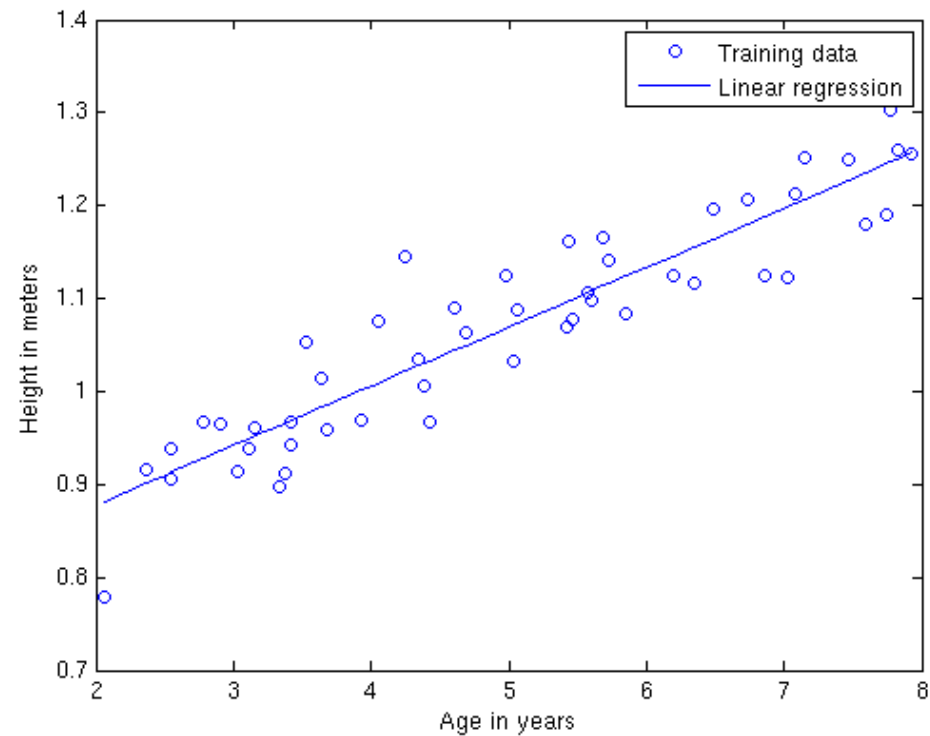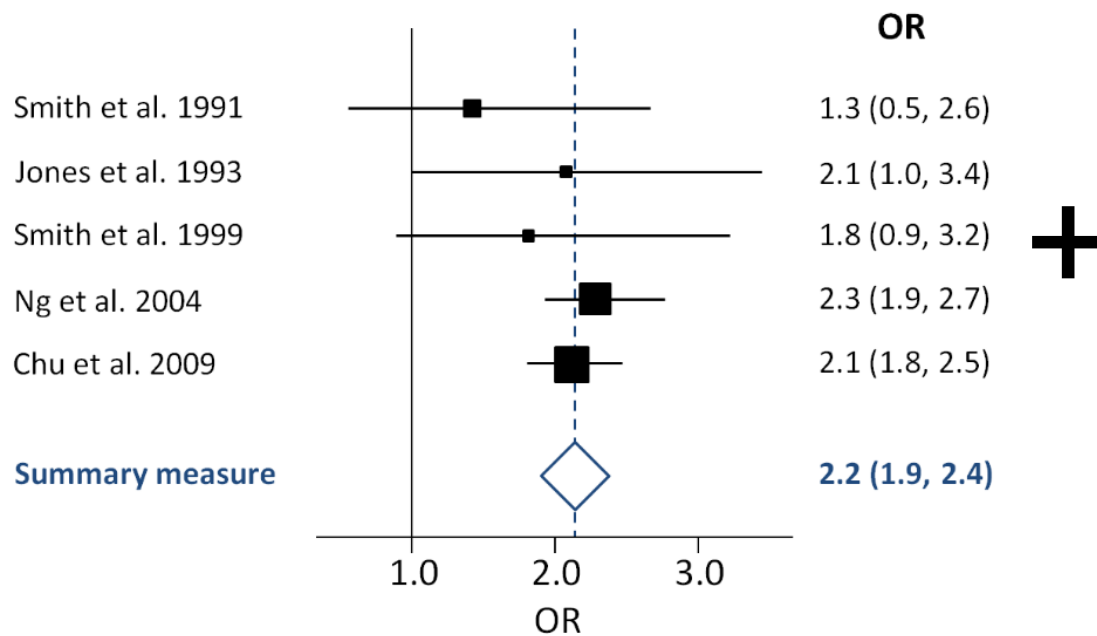Generate estimates in countries with no data
How Reconcile data differences:
   o Data oddities
   o Administrative records/ surveys
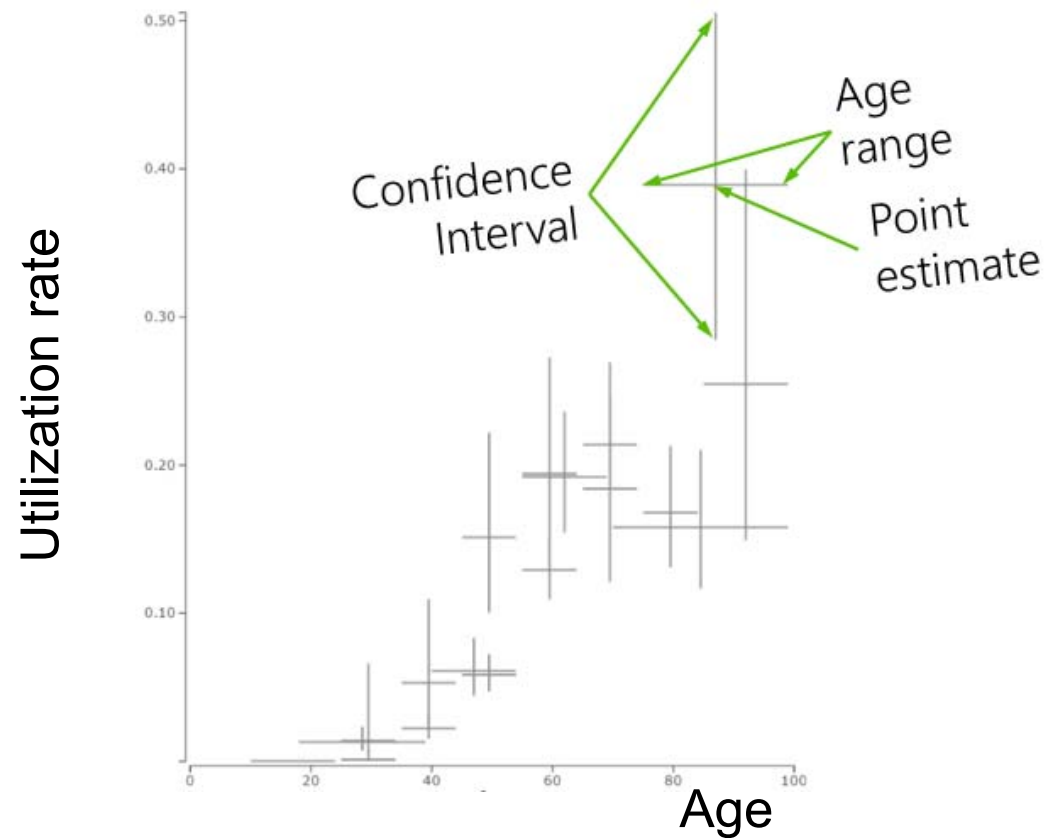   o Survey in different recall periods
Account for age-sex patterns

An Integrated Metaregression Framework for Descriptive Epidemiology

Edited by
Abraham D. Flaxman,
Theo Vos, and
Christopher J.L. Murray

Methods: Bayesian Hierarchal Meta Regression

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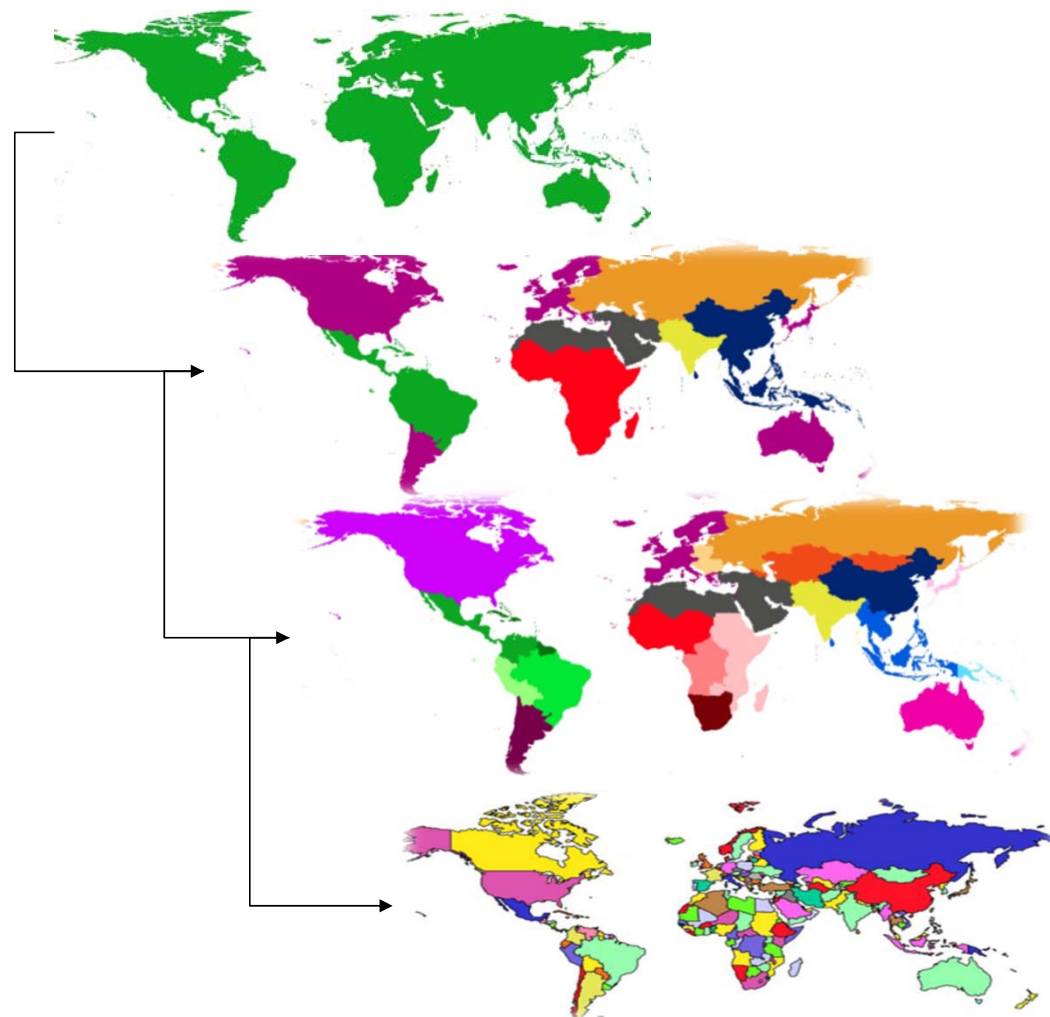
Methods: Extract data by age and sex

Methods: Bayesian Hierarchy

–Neighbors are like neighbors

–Regions without data results driven by Bayesian prior and Covariates

–Inpatient model:

• Log(ldi) and Log(beds/cap)

–Outpatient model

• Log(GDP/cap) and Log(beds/cap)

Global and GBD super-region estimates of outpatient utilization rate in 2016 by age and sex

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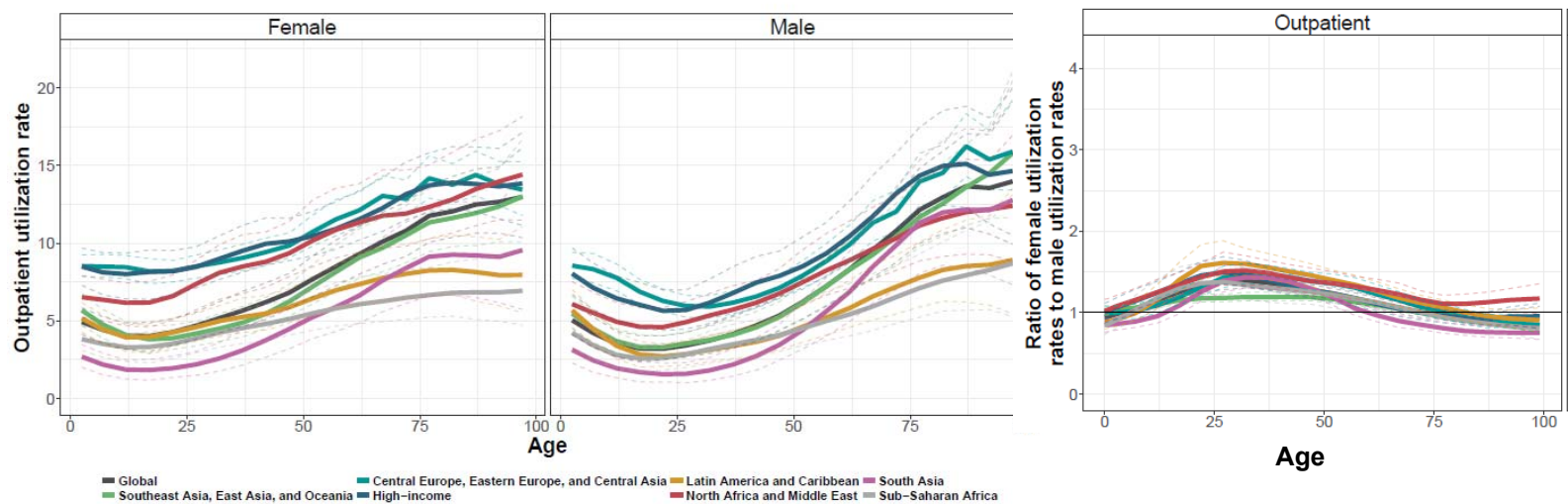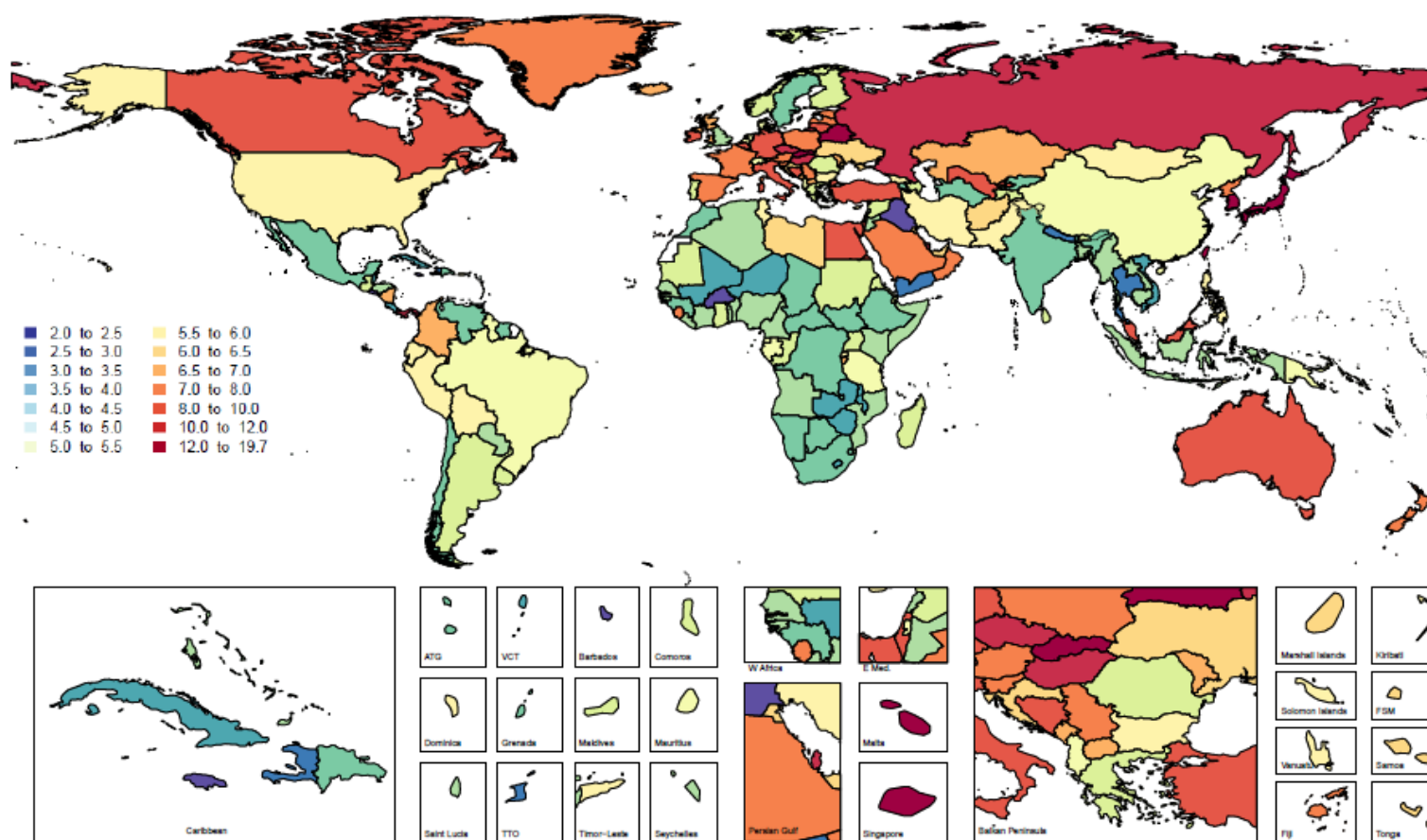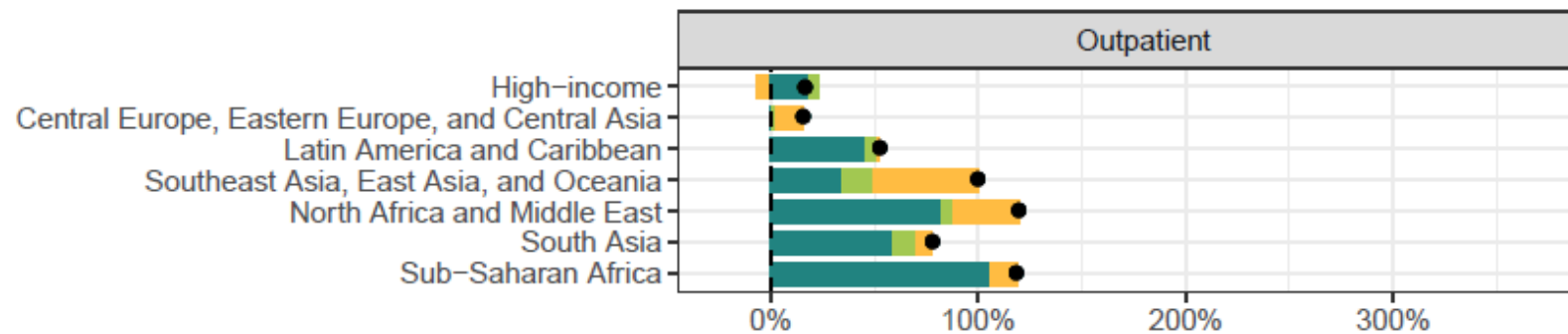
Figure 1: Annual outpatient visits per capita, age-standardized, and both sexes combined, 2016

Decomposition of the percentage change in volume of outpatient visits from 1990 to 2016

Percentage change since 1990

Change due to age sex utilization rates
Change due to population ageing
Change due to population growth
Change due to sex composition
● Total percent change

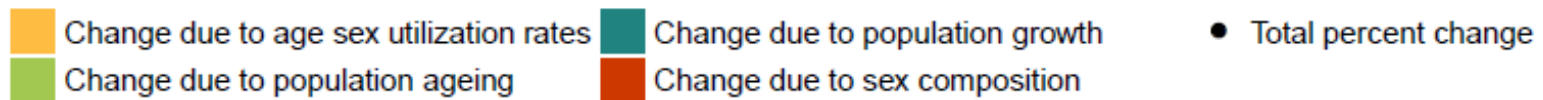# Global and GBD super-region estimates of inpatient utilization rate in 2016 by age and sex
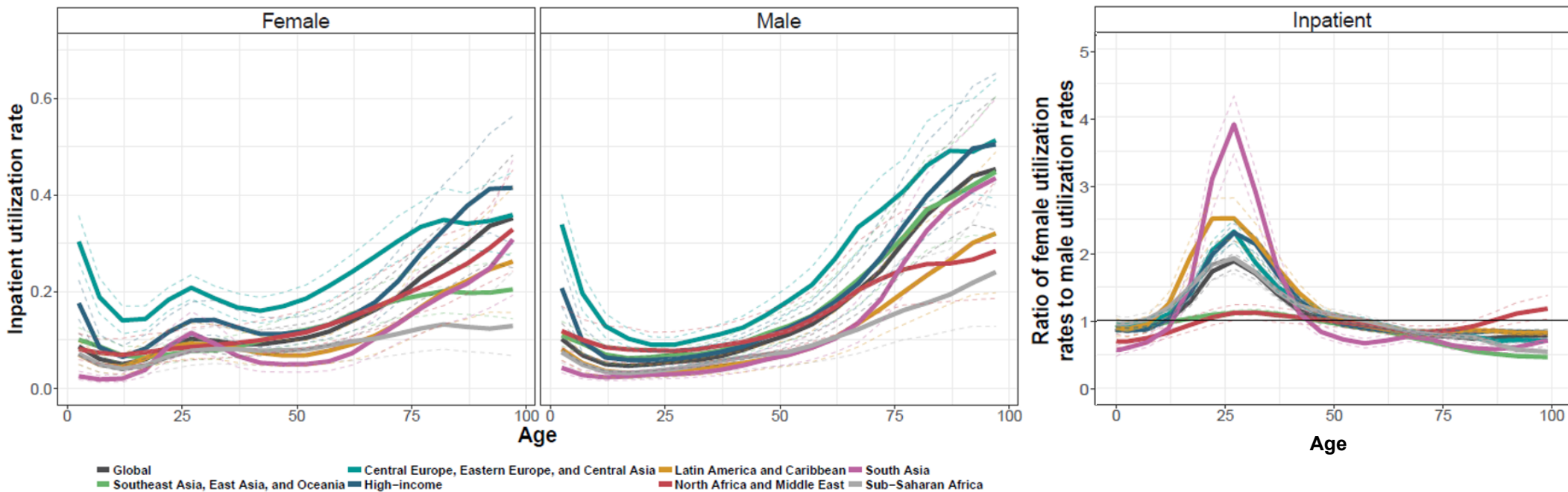
Figure 2: Annual inpatient admissions per capita, age-standardized, and both sexes combined by country in 2016

Legend:
- 0.01 to 0.03
- 0.03 to 0.05
- 0.05 to 0.07
- 0.07 to 0.08
- 0.08 to 0.09
- 0.09 to 0.11
- 0.11 to 0.13
- 0.13 to 0.15
- 0.15 to 0.17
- 0.17 to 0.21
- 0.21 to 0.23
- 0.23 to 0.28

Inset maps: Caribbean, ATG, VCT, Barbados, Comoros, Dominica, Grenada, Maldives, Mauritius, Saint Lucia, TTO, Timor-Leste, Seychelles, W Africa, E Med., Persian Gulf, Malta, Singapore, Balkan Peninsula, Marshall Islands, Kiribati, Solomon Islands, FSM, Vanuatu, Samoa, Fiji, Tonga

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Decomposition of the percentage change in volume of inpatient visits from 1990 to 2016
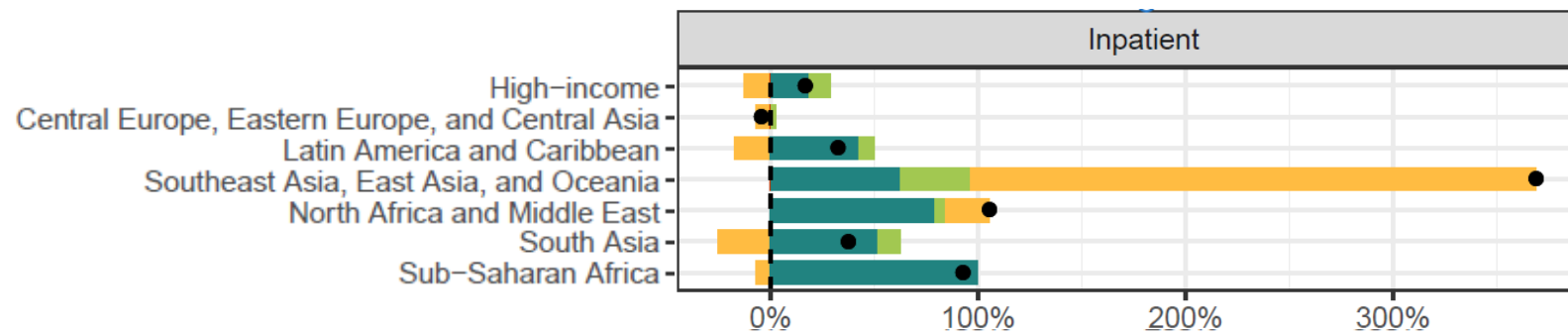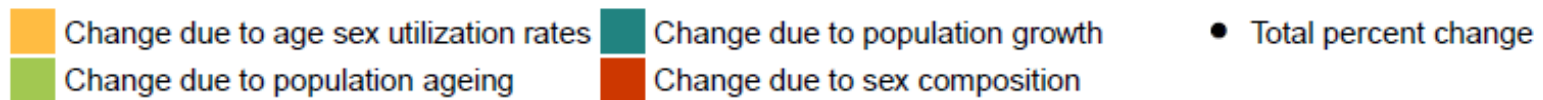
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Data sources for the two elements of expenditures

1. Total Health Expenditure (THE) by year and location from IHME Financing Global Health team

2. Share estimated from NHA functional categories

Spending on health and HIV/AIDS: domestic health spending and development assistance in 188 countries, 1995–2015

Global Burden of Disease Health Financing Collaborator Network *

Summary

Background Comparable estimates of health spending are crucial for the assessment of health systems and to optimally deploy health resources. The methods used to track health spending continue to evolve, but little is known about the distribution of spending across diseases. We developed improved estimates of health spending by source, including development assistance for health, and, for the first time, estimated HIV/AIDS spending on prevention and treatment and by source of funding, for 188 countries.

Methods We collected published data on domestic health spending, from 1995 to 2015, from a diverse set of international agencies. We tracked development assistance for health from 1990 to 2017. We also extracted 5385 datapoints about HIV/AIDS spending, between 2000 and 2015, from online databases, country reports, and proposals submitted to multilateral organisations. We used spatiotemporal Gaussian process regression to generate complete and comparable estimates for health and HIV/AIDS spending. We report most estimates in 2017 purchasing-power parity-adjusted dollars and adjust all estimates for the effect of inflation.

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National Health Account (NHA) shares

SHA Health Care Functions
HC.1 curative care
HC.1.1 Inpatient curative care
HC.1.3 Outpatient curative care
HC.2 Rehabilitative care
HC. 2.1 Inpatient rehabilitative care
HC. 2.3 Outpatient rehabilitative care
HC.3 Long-term care
HC.4 Ancillary services to medical care such as laboratory
HC.5 Medical goods, including pharmaceuticals
HC.6 Prevention, including public health services
HC.7 Governance and health system and financing
HC.9 Other

National Health Account Sample, 1990-2016

GBD super-region	Total number of NHAs across time periods	Number of Countries in GBD super-region	Percentage of countries with at least one NHA
High-income	391	33	79%
Central Europe, Eastern Europe, and Central Asia	155	29	69%
Latin America and Caribbean	33	29	34%
Southeast Asia, East Asia, and Oceania	84	25	44%
North Africa and Middle East	22	21	29%
South Asia	25	5	80%
Sub-Saharan Africa	85	46	61%
Total	795	184	56%

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NHA shares by GBD super-region in 2016

GBD Super-regions	Outpatient Share in NHA		Inpatient Share in NHA	
	Share	UI	Share	UI
Southeast Asia, East Asia, and Oceania	.32	(.19-.57)	.32	(.22-.48)
Central Europe, Eastern Europe, and Central Asia	.23	(.18-.32)	.26	(.21-.33)
High-income	.26	(.24-.29)	.24	(.21-.26)
Latin America and Caribbean	.32	(.26-.41)	.26	(.20-.36)
North Africa and Middle East	.34	(.25-.47)	.24	(.21-.27)
South Asia	.26	(.22-.31)	.19	(.15-.23)
Sub-Saharan Africa	.39	(.29-.54)	.18	(.16-.22)

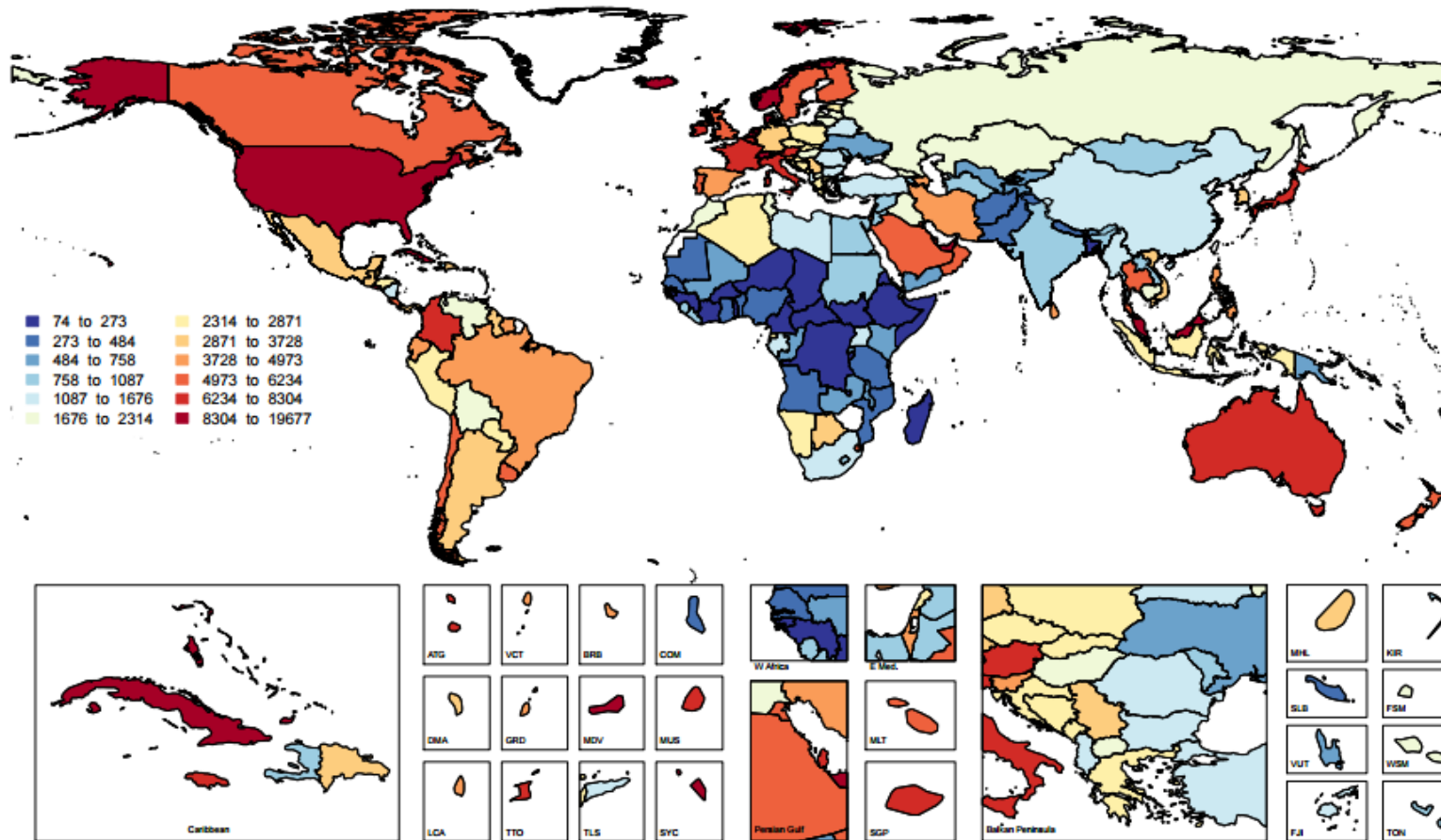IHME | UNIVERSITY of WASHINGTON   Institute for Health Metrics and Evaluation

Unit cost estimates by GBD super-region in 2016 in $Int'l

GBD Super-regions	Outpatient Unit Cost		Inpatient Unit Cost	
	Mean	UI	Mean	UI
Southeast Asia, East Asia, and Oceania	41	(23-75)	2,229	(1,608-3,127)
Central Europe, Eastern Europe, and Central Asia	37	(28-49)	1,867	(1,452-2,446)
High-income	210	(179-247)	9,647	(8,255-11,381)
Latin America and Caribbean	79	(60-106)	3,778	(2,754-5,220)
North Africa and Middle East	60	(43-82)	2,246	(1,810-2,783)
South Asia	19	(15-25)	838	(638-1085)
Sub-Saharan Africa	22	(16-32)	477	(356-631)

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National outpatient cost per visit in 2016 in $Int'l

Legend:
- 2 to 7
- 7 to 11
- 11 to 17
- 17 to 23
- 23 to 30
- 30 to 42
- 42 to 57
- 57 to 77
- 77 to 93
- 93 to 110
- 110 to 163
- 163 to 448

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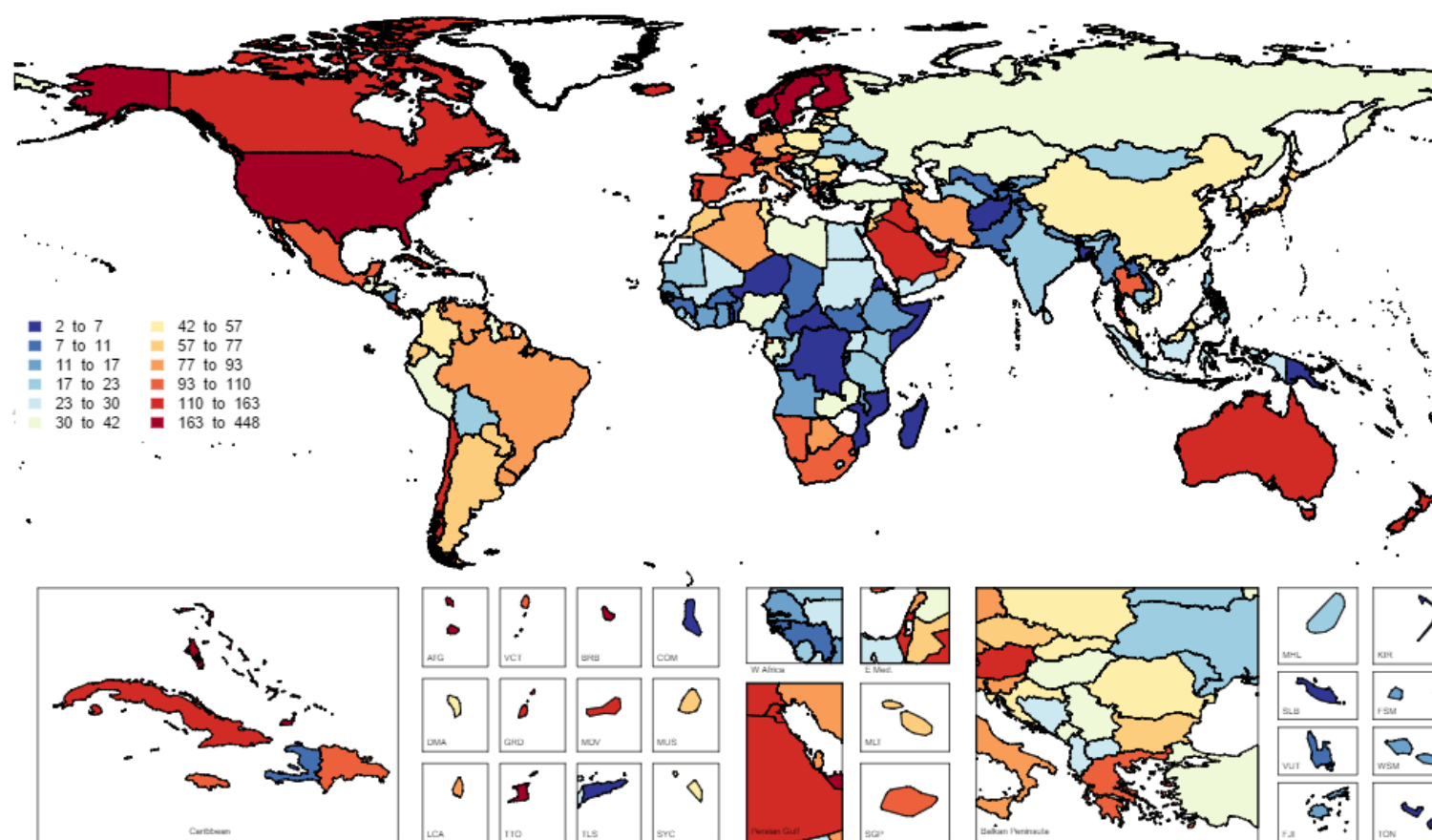
National inpatient cost per admission, 2016 in $Int'l

Comparison: IHME & WHO-Choice unit cost, 2008

Legend:
- Southeast Asia, East Asia, and Oceania
- Central Europe, Eastern Europe, and Central Asia
- High-income
- Latin America and Caribbean
- North Africa and Middle East
- South Asia
- Sub-Saharan Africa
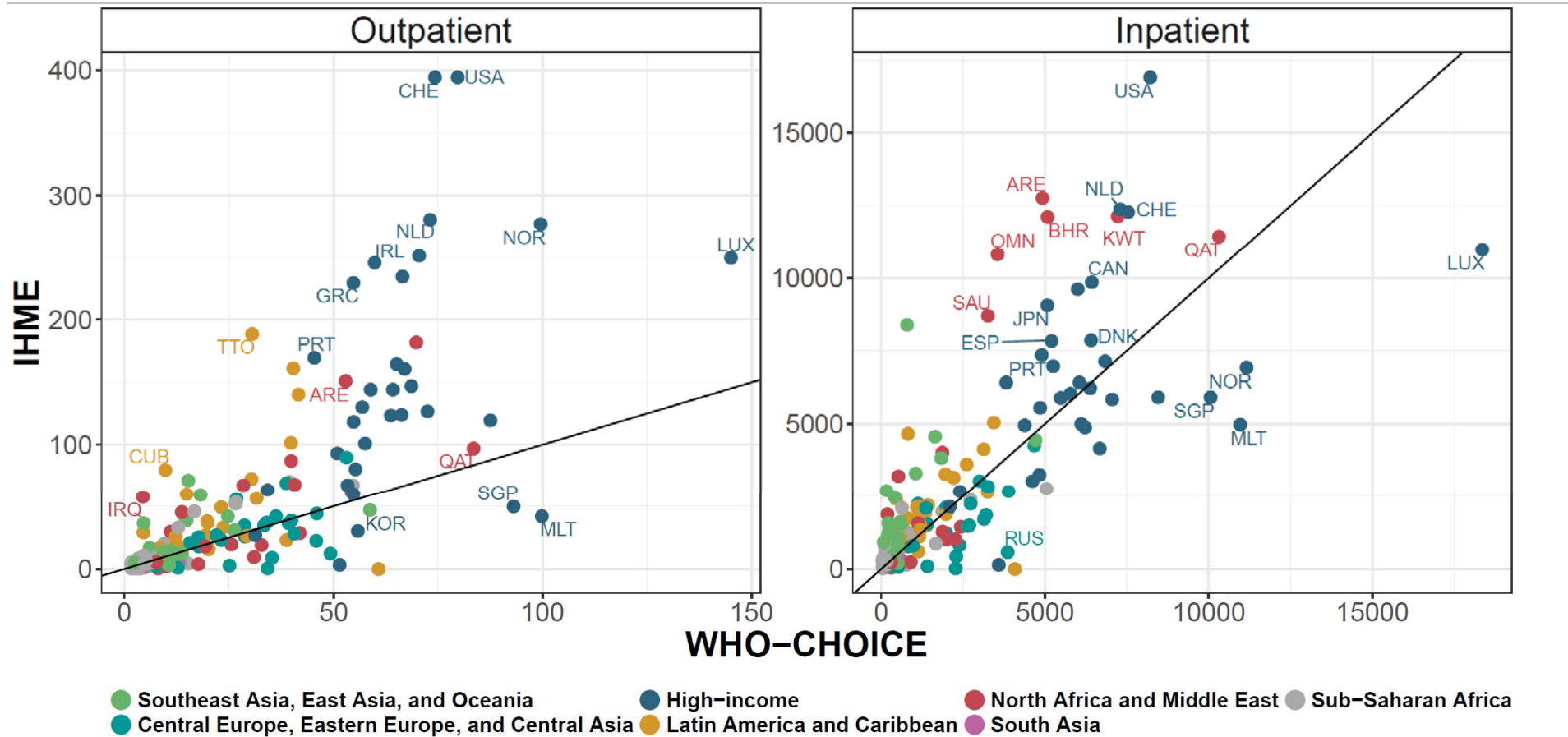
Applications

Ongoing estimates of utilisation rates by age and sex could track changes in volume of health services from expansion of health coverage, and other health policies.

Global unit costs are a resource for estimating the cost of benefit packages in every country

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