Module 4:
Progressivity Analysis

This presentation was prepared by Adam Wagstaff and Caryn Bredenkamp

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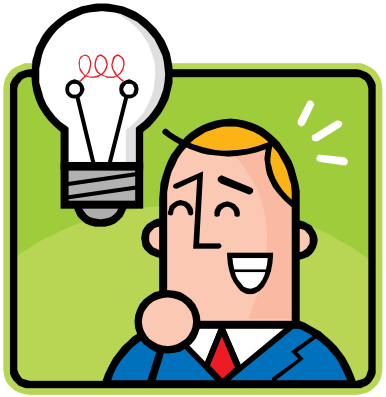
Progressivity in ADePT in a nutshell

- Progressivity analysis asks whether – across all sources of finance (taxes, social insurance, out-of-pocket spending, etc.) – it's the poor or better off who pay a higher share of their income on health care
- It calls for HH data on health spending by different sources, and NHA data on the shares of total health spending being financed through these same sources
- ADePT shows the budget share by source for each income quintile, and reports a summary progressivity index showing the progressivity of each source and all sources combined

The basic idea



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The basic idea

- Equity in health care financing is a question about who pays (most) for health care
  - Note we're interested in payments via all sources, not just through out-of-pocket spending
- A health financing system is equitable if households make payments according to their ability-to-pay (ATP)
- Progressivity analysis compares low- and high-ATP households in terms of the share of their income (or consumption) that they pay towards health care
  - *A progressive health financing system is one where high-ATP households pay a higher share of their income than low-ATP households*

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Why countries' financing systems may differ in their progressivity

- Different sources will likely vary in their progressivity:
  - Some may be progressive, others regressive, and still others proportional
  - Some sources may be more progressive than others
- Countries vary in their financing mixes—e.g. some rely more heavily on out-of-pocket spending than others
- Specific sources vary in their progressivity across countries—e.g. some countries have progressive tax systems, others don't

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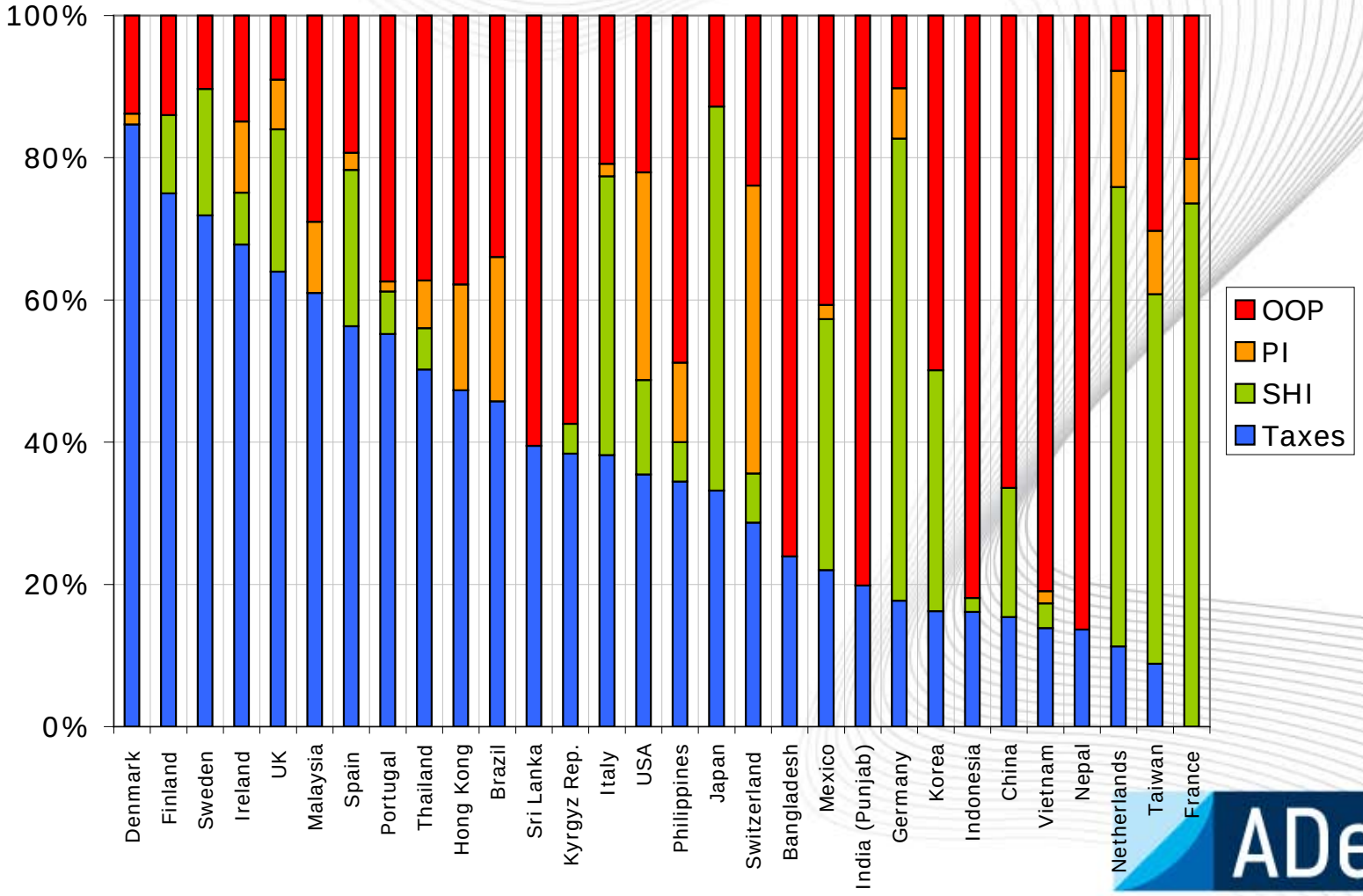
Financing mixes in 30 countries



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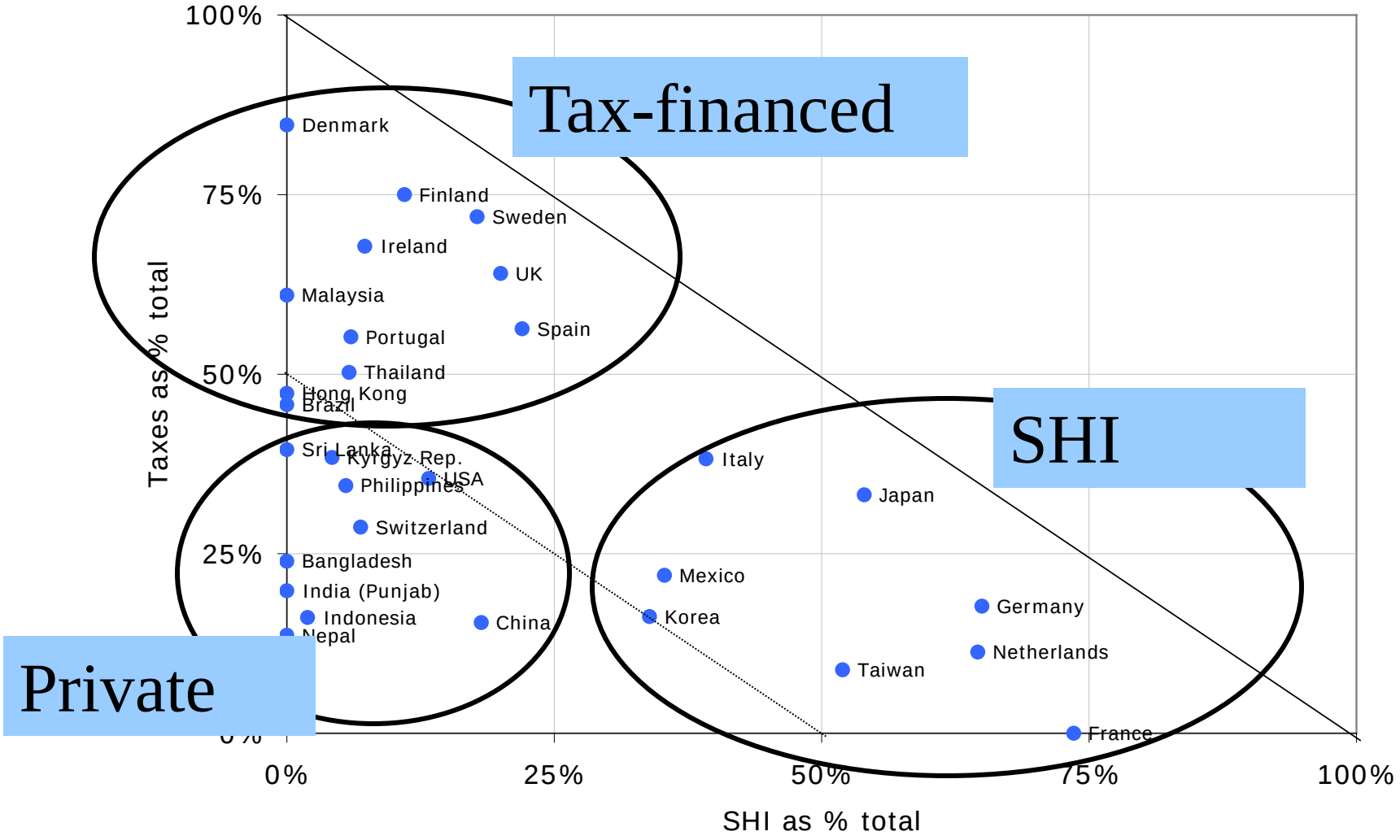
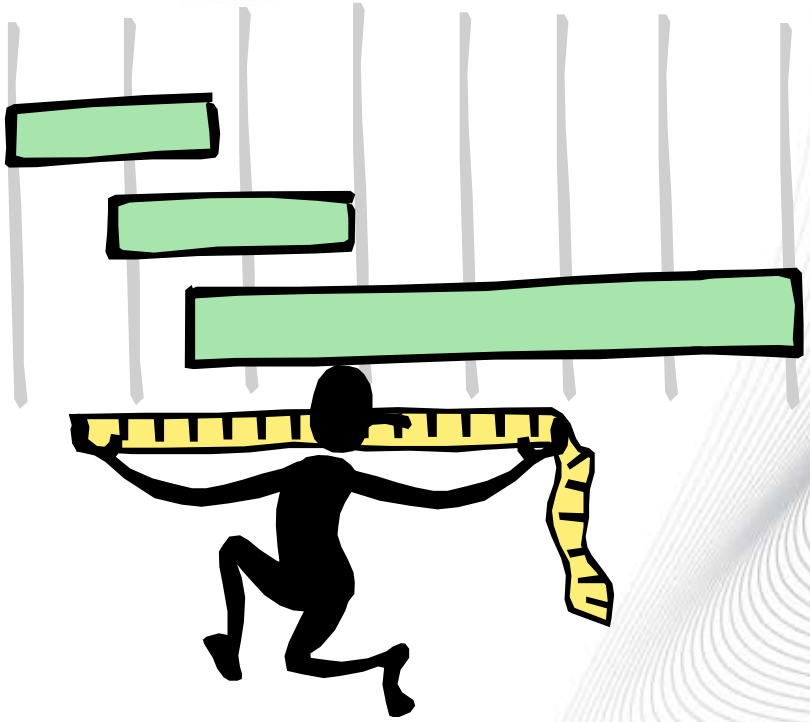
Groupings of countries by dominant source of health finance



Let’s get measuring!



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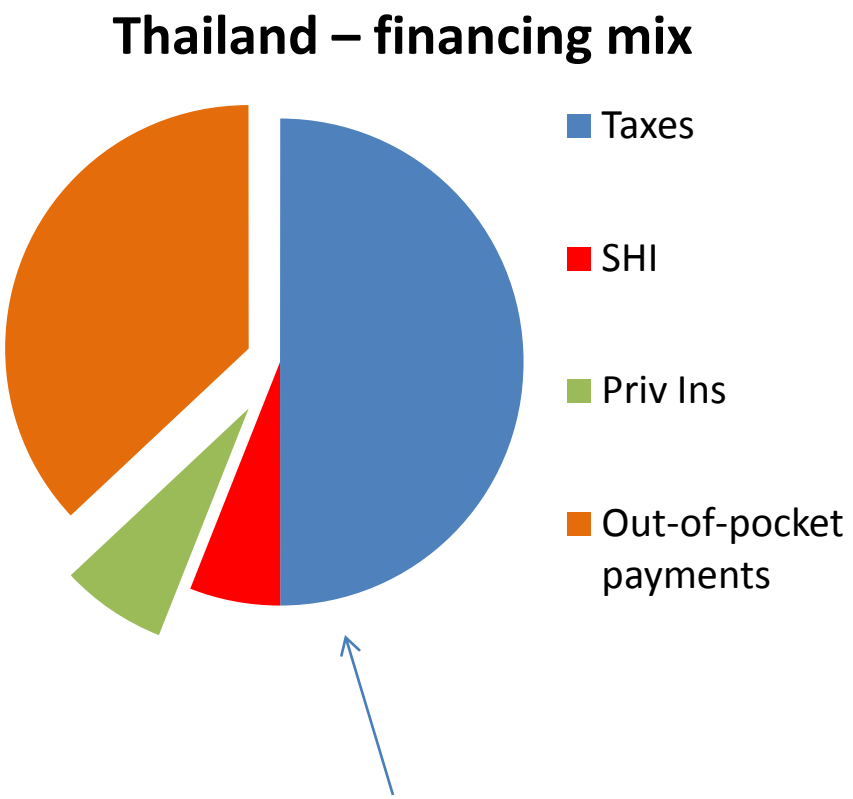
Data for progressivity analysis

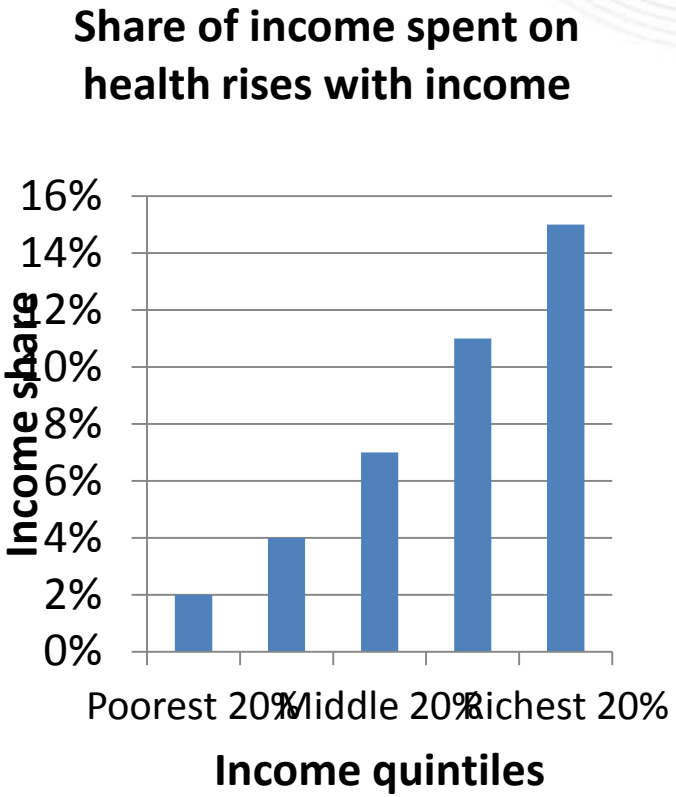
These data come from household survey

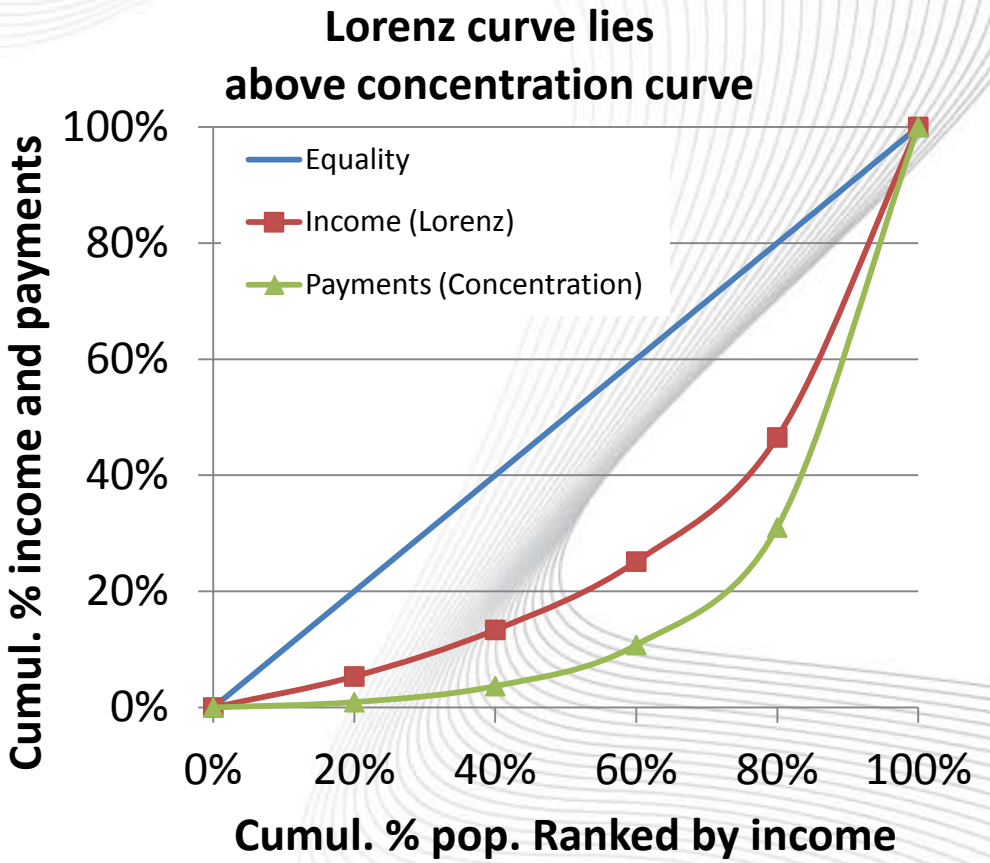


These data come from the NHA

Quintile	HH #	Income	Taxes	SHI contributions	Private insurance	Out-of-pocket spending
	1	100	20	0	0	1
	2	110	22	0	0	10
Poorest 20%	3	120	24	0	0	0
	…	…	…	…	…	…
	1500	1000	200	0	0	300
	1501	1100	220	20	10	20
	1502	1250	250	30	20	500
2nd poorest	1503	1500	300	50	10	1000
	…	…	…	…	…	…
	3000	1900	380	75	20	75
	3001	2000	400	100	30	200
	3002	2200	440	100	10	1000
Middle 20%	3003	2250	450	125	20	25
	…	…	…	…	…	…
	4500	3020	604	250	10	0
	4501	3021	604	400	0	400
	4502	3300	660	450	0	25
2nd richest	4503	3350	670	500	100	1200
	…	…	…	…	…	…
	6000	4950	990	1000	10	10
	6001	5000	1000	1100	0	0
	6002	5100	1020	1250	20	2000
Richest 20%	6003	5250	1050	1250	25	1500
	…	…	…	…	…	…
	7500	8000	1600	1250	10	50

Two charts that <u>both</u> illustrate progressive health care payments

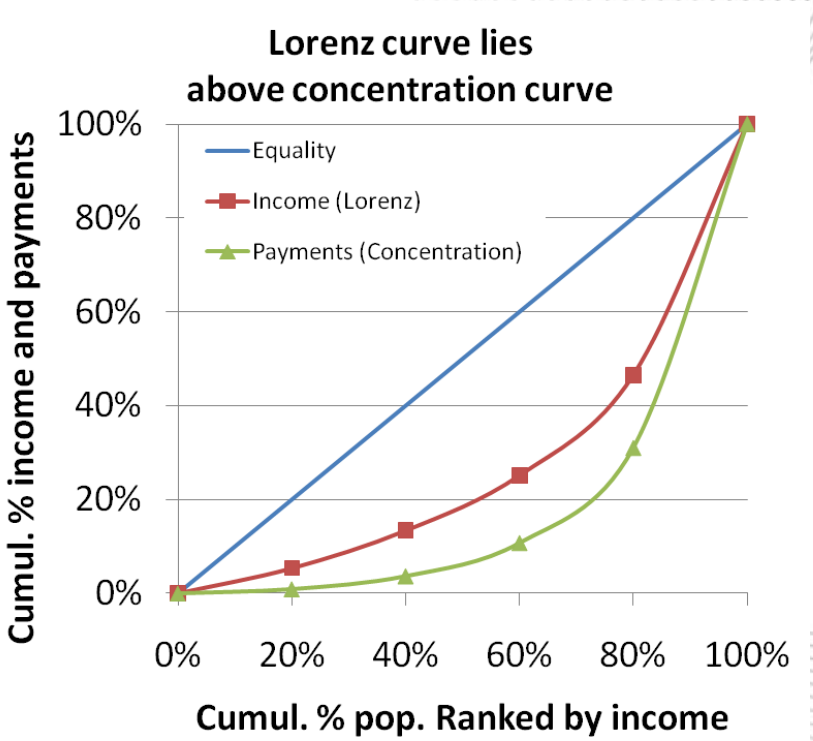




The left-hand chart <u>implies</u> the right-hand chart, and vice versa

The link between progressivity and inequality

- The Lorenz curve shows how unequally distributed income is
- Concentration curve shows how unequally distributed health care payments are <u>across the income distribution</u>
- Progressive payments are more unequally distributed (by income) than income



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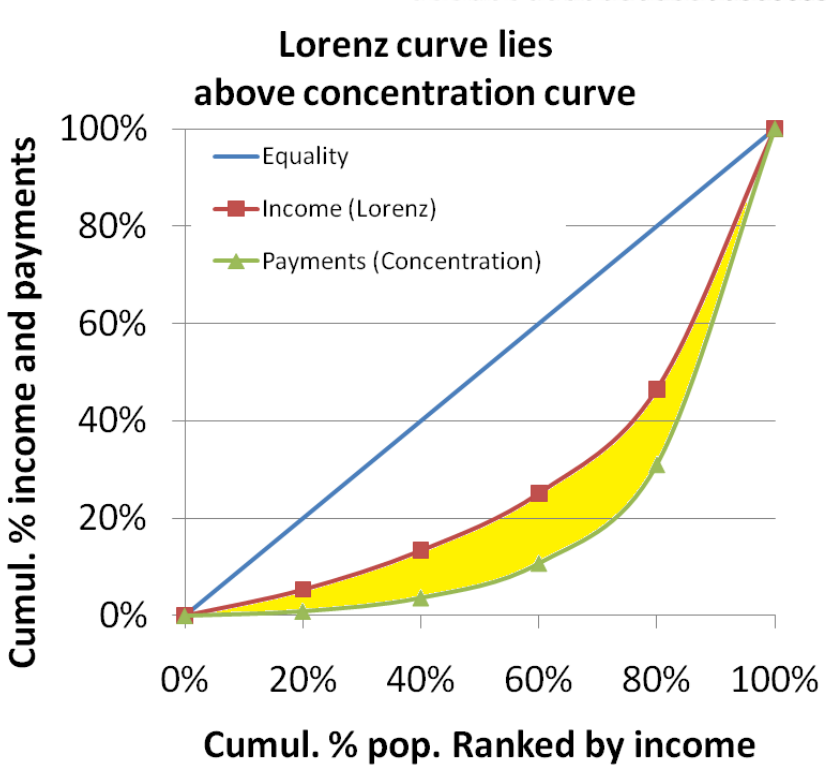
Kakwani's progressivity index

- We measure progressivity as twice the area between the two curves
- This is Kakwani's progressivity index
- By convention it's positive for progressive payments, and negative for regressive ones



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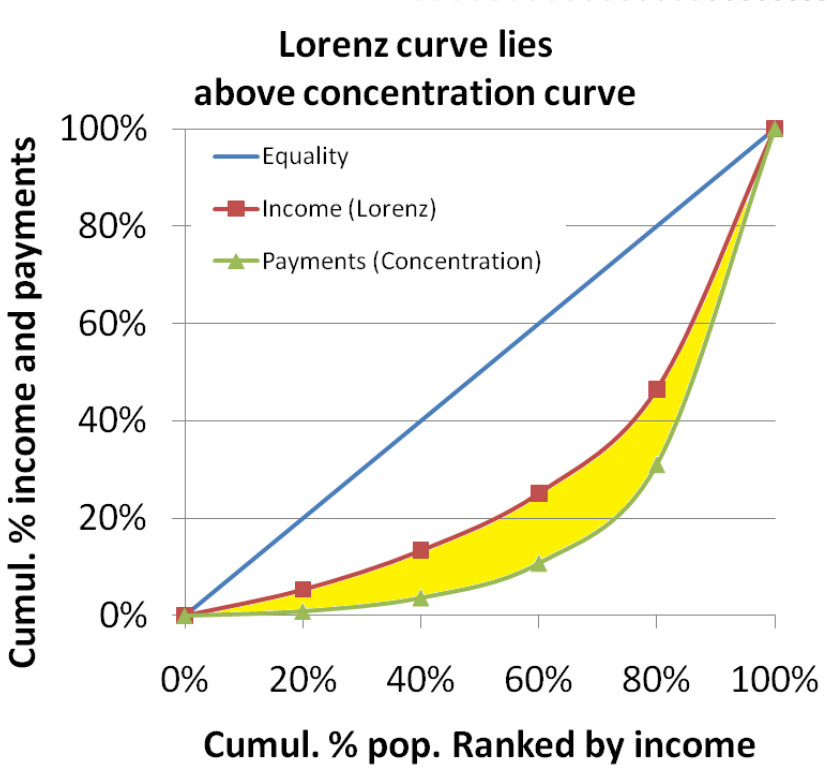
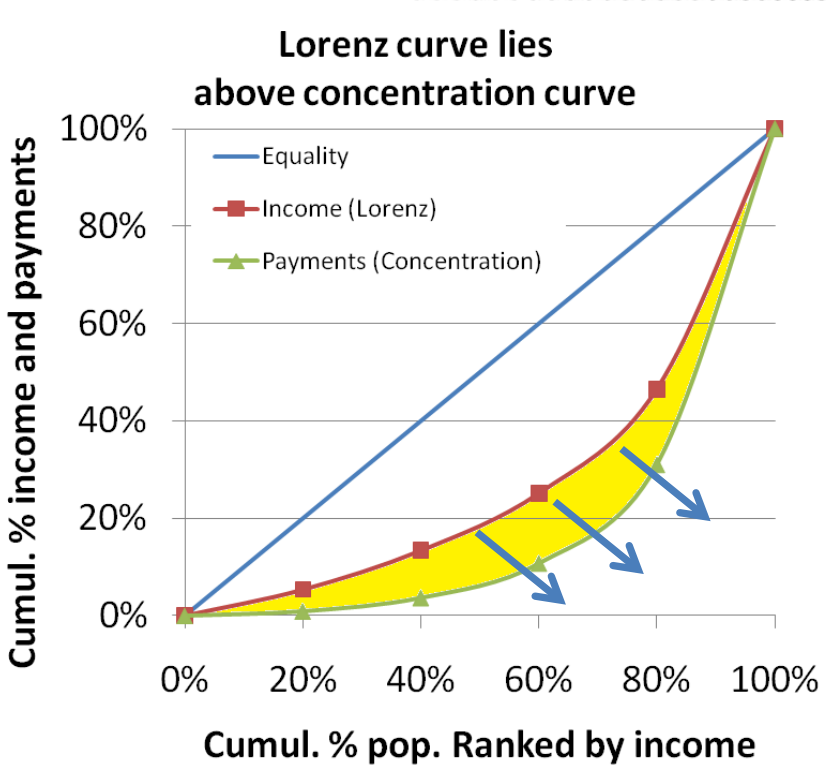
The link between Kakwani and the Gini

- The Kakwani index is also equal to the concentration index for payments minus the Gini coefficient for income, i.e. K = C - G



When payments are regressive

- Under regressive payments, the Lorenz curve lies below the concentration curve
- The Gini coefficient in this case is then larger than the concentration index
- So the Kakwani index K (= C – G) is negative for regressive payments



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Assessing progressivity in total payments

- We want progressivity for each source, and progressivity for health financing in total
- The latter is easily calculated as a weighted average of the Kakwani indices of the individual sources, where the weights are the shares of total revenues coming from each source

$$K = (R_1/R)K_1 + (R_2/R)K_2 + \ldots + (R_N/R)K_N$$

- Here R_1 is the revenue raised from source #1, R is total spending, K_1 is the Kakwani index for source #1

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How to do it in ADePT?

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What ADePT does

- ADePT produces the average amounts households spend on health by source for each quintile, the shares of income (or consumption) spent on health by source, and the shares each quintile accounts of total revenue
- ADePT also outputs the Kakwani index of progressivity, for each source and for total health finance
- Finally, ADePT produces charts showing for each quintile the shares of income spent on health by source, and the Kakwani progressivity chart with the Lorenz and concentration curves

What ADePT asks for

- For the household data, ADePT asks the user to indicate:
  - The income or consumption variable, and the health payment variables—out-of-pocket payments, private insurance, social health insurance contributions, and taxes
  - You'll need household size if you haven't already expressed everything on a per capita basis
- It's best to give ADePT the health financing mix from the NHA
  - It will use these shares to compute the progressivity of total revenues; otherwise ADePT will assume that all taxes go to finance health care!

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Egypt (1997) as an example

- Revenues raised from taxes (direct taxes, indirect taxes, an earmarked cigarette tax), social health insurance, private insurance, and out-of-pocket spending
- NHA data from 1994-95 give the financing mix
- Household data from the 1997 Egypt Integrated Household Survey, which contains data on direct taxes, private insurance, and out-of-pocket payments. Ravi Rannan-Eliya imputed sales and cigarette tax payments, and social health insurance contributions
- N.B. The household totals in the dataset have already been adjusted for household size

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Before opening ADePT

Go to the NHA and obtain the financing mix

Egypt example

Subsector	% of revenues
Direct taxes	4.69
Indirect taxes	28.29
Earmarked cigarette tax	3.00
Social health insurance contributions	6.67
Private insurance	5.57
Out-of-pocket payments	51.77

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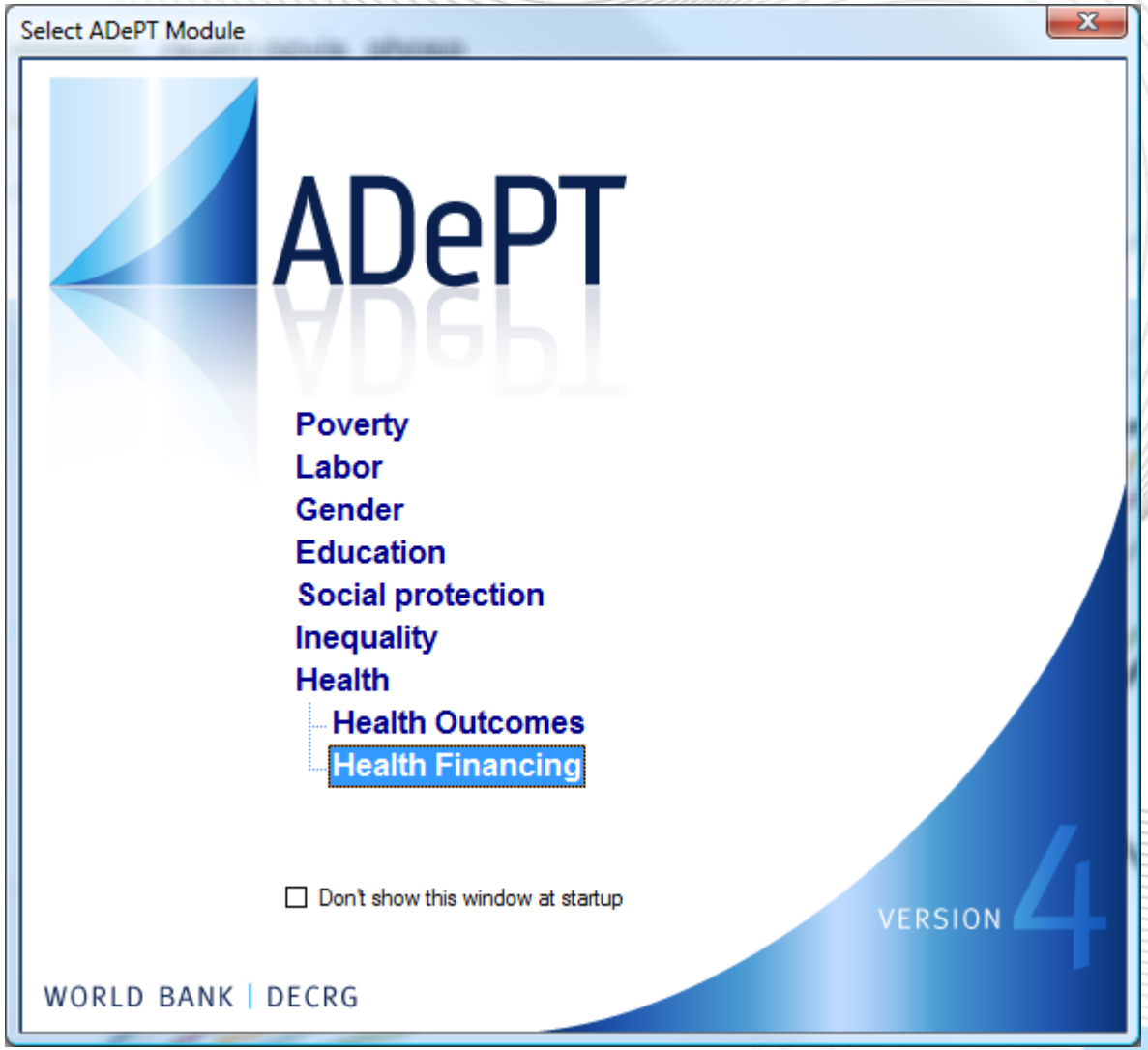
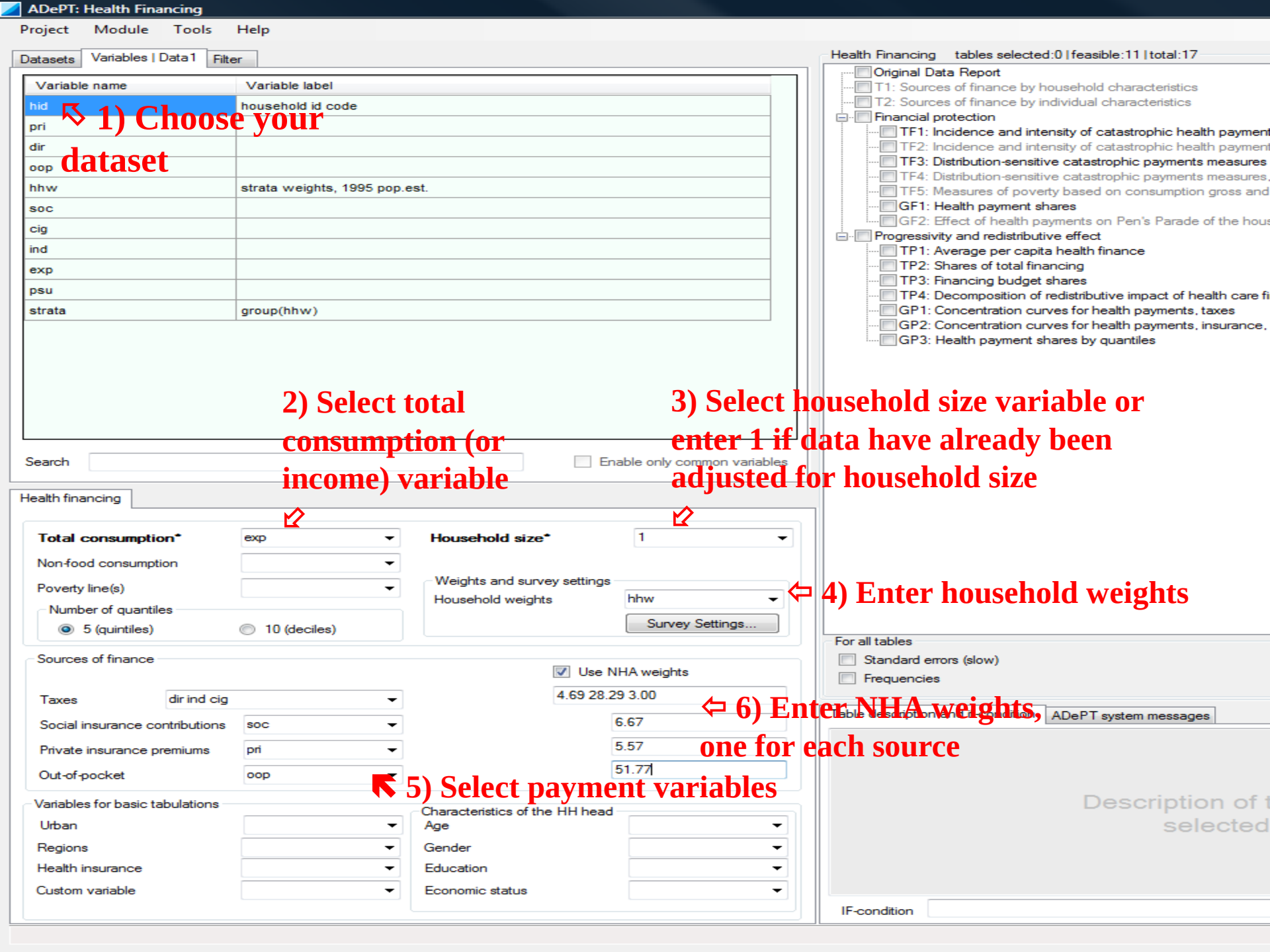

Select ADePT Module
ADePT
Poverty
Labor
Gender
Education
Social protection
Inequality
Health
Health Outcomes
Health Financing
Don't show this window at startup
VERSION 4
WORLD BANK | DECRG

ADePT


ADePT: Health Financing
Project
Module
Tools
Help
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Variables | Data1
Filter
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Variable label
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household id code
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strata
group(hhw)
1) Choose your dataset
Search
Enable only common variables
Health financing
Total consumption*
exp
Household size*
1
Non-food consumption
Poverty line(s)
Number of quantiles
5 (quintiles)
10 (deciles)
Weights and survey settings
Household weights
hhw
Survey Settings...
2) Select total consumption (or income) variable
3) Select household size variable or enter 1 if data have already been adjusted for household size
4) Enter household weights
Sources of finance
Use NHA weights
Taxes
dir ind cig
4.69 28.29 3.00
Social insurance contributions
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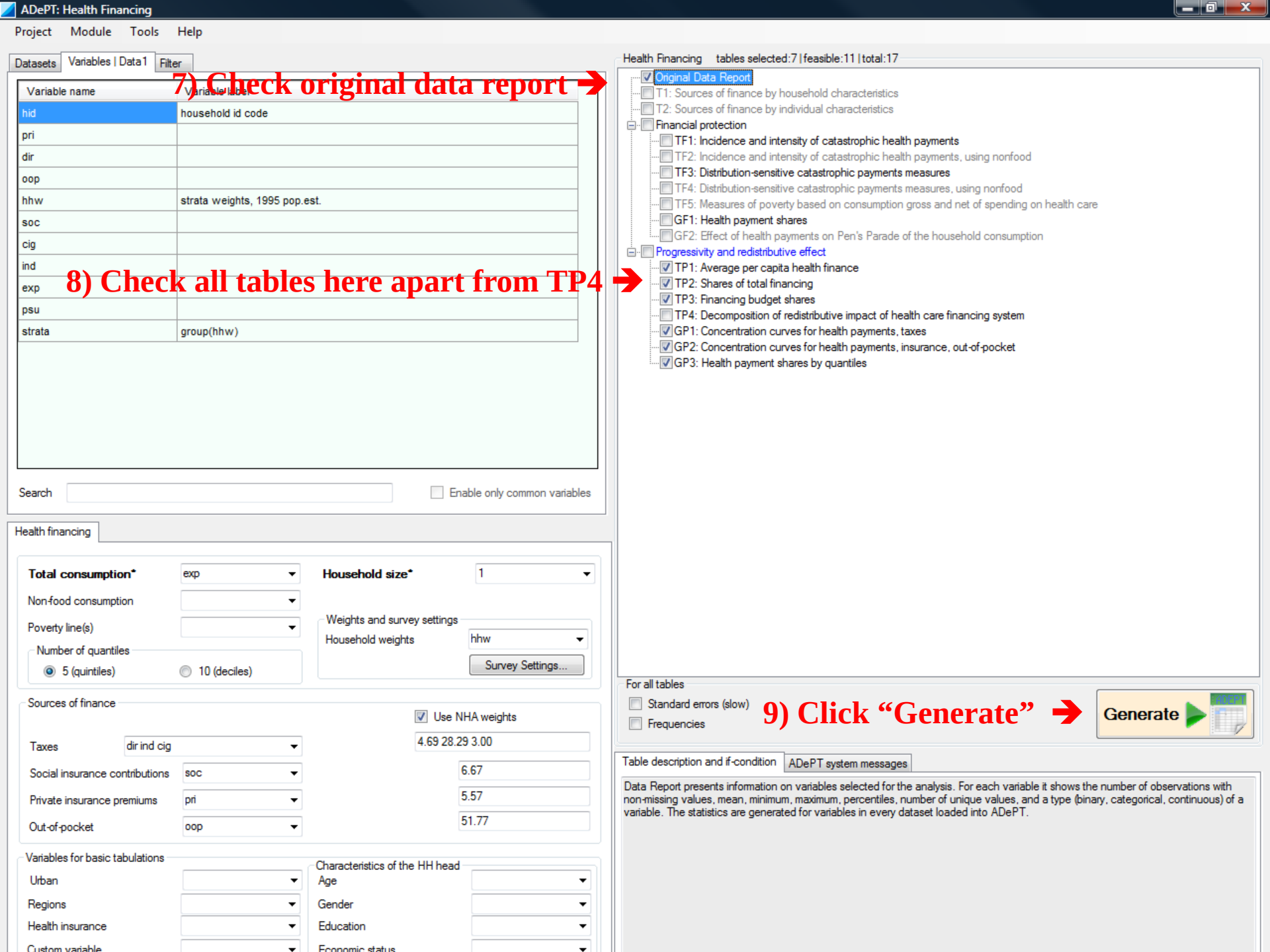
6.67
Private insurance premiums
pri
5.57
Out-of-pocket
oop
51.77
6) Enter NHA weights, one for each source
5) Select payment variables
Variables for basic tabulations
Urban
Regions
Health insurance
Custom variable
Characteristics of the HH head
Age
Gender
Education
Economic status
Health Financing
tables selected:0 | feasible:11 | total:17
Original Data Report
T1: Sources of finance by household characteristics
T2: Sources of finance by individual characteristics
Financial protection
TF1: Incidence and intensity of catastrophic health payment
TF2: Incidence and intensity of catastrophic health payment
TF3: Distribution-sensitive catastrophic payments measures
TF4: Distribution-sensitive catastrophic payments measures,
TF5: Measures of poverty based on consumption gross and
GF1: Health payment shares
GF2: Effect of health payments on Pen's Parade of the hous
Progressivity and redistributive effect
TP1: Average per capita health finance
TP2: Shares of total financing
TP3: Financing budget shares
TP4: Decomposition of redistributive impact of health care fi
GP1: Concentration curves for health payments, taxes
GP2: Concentration curves for health payments, insurance,
GP3: Health payment shares by quantiles
For all tables
Standard errors (slow)
Frequencies
ADePT system messages
Description of t
selected
IF-condition


ADePT: Health Financing
Project
Module
Tools
Help
Datasets
Variables | Data1
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7) Check original data report
Variable name
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8) Check all tables here apart from TP4
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Health financing
Total consumption*
exp
Household size*
1
Non-food consumption
Poverty line(s)
Number of quantiles
5 (quintiles)
10 (deciles)
Weights and survey settings
Household weights
hhw
Survey Settings...
Sources of finance
Use NHA weights
Taxes
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4.69 28.29 3.00
Social insurance contributions
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tables selected:7 | feasible:11 | total:17
Original Data Report
T1: Sources of finance by household characteristics
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TF1: Incidence and intensity of catastrophic health payments
TF2: Incidence and intensity of catastrophic health payments, using nonfood
TF3: Distribution-sensitive catastrophic payments measures
TF4: Distribution-sensitive catastrophic payments measures, using nonfood
TF5: Measures of poverty based on consumption gross and net of spending on health care
GF1: Health payment shares
GF2: Effect of health payments on Pen's Parade of the household consumption
Progressivity and redistributive effect
TP1: Average per capita health finance
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TP3: Financing budget shares
TP4: Decomposition of redistributive impact of health care financing system
GP1: Concentration curves for health payments, taxes
GP2: Concentration curves for health payments, insurance, out-of-pocket
GP3: Health payment shares by quantiles
For all tables
Standard errors (slow)
Frequencies
9) Click "Generate"
Generate
Table description and if-condition
ADePT system messages
Data Report presents information on variables selected for the analysis. For each variable it shows the number of observations with non-missing values, mean, minimum, maximum, percentiles, number of unique values, and a type (binary, categorical, continuous) of a variable. The statistics are generated for variables in every dataset loaded into ADePT.

Table shows average amounts paid per quintile

Table P1: Average per capita health finance

	Per capita consumption, gross	dir	ind	cig	soc	pri	oop	Total payments	Per capita consumption, net of payments
Quintiles of per capita consumption, gross									
Lowest quintile	2,739.5	3.1	39.0	8.9	14.8	9.6	101.4	176.9	2,562.6
2	4,325.1	8.0	70.3	10.8	23.9	15.9	151.9	280.7	4,044.3
3	5,698.1	13.9	104.3	12.7	37.1	27.3	209.0	404.5	5,293.6
4	7,748.1	24.1	155.4	14.3	43.4	46.8	307.8	591.9	7,156.2
Highest quintile	14,911.8	77.9	396.8	34.5	61.3	51.2	631.5	1,253.1	13,524.1
Total	6,932.0	25.4	153.2	16.3	36.1	30.2	280.4	541.6	6,379.6

Table shows each quintile's share of the total ⇙

Table P2: Shares of total financing

	Per capita consumption, gross	dir	ind	cig	soc	pri	oop	Total payments	Per capita consumption, net of payments
Quintiles of per capita consumption, gross									
Lowest quintile	**8.1**	**2.4**	**5.1**	**11.0**	**8.2**	**6.4**	**7.2**	**6.5**	**8.2**
2	**12.7**	**6.3**	**9.2**	**13.2**	**13.2**	**10.5**	**10.8**	**10.4**	**12.9**
3	**16.8**	**10.9**	**13.6**	**15.7**	**20.5**	**18.1**	**14.9**	**14.9**	**16.9**
4	**22.8**	**19.0**	**20.3**	**17.6**	**24.1**	**31.0**	**22.0**	**21.9**	**22.9**
Highest quintile	**39.7**	**61.3**	**51.8**	**42.5**	**34.0**	**33.9**	**45.1**	**46.3**	**39.1**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Gini coefficient	**0.3341**								**0.3318**
Concentration Index		**0.5865**	**0.4777**	**0.3269**	**0.2837**	**0.3356**	**0.3997**	**0.4171**	
Kakwani index		**0.2524**	**0.1436**	**-0.0072**	**-0.0504**	**0.0015**	**0.0656**	**0.0830**	

Bottom line is key: the progressivity indices ⇗

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Table shows for each quintile the average percentage of consumption spent on health care ↙

Table P3: Financing budget shares

	Per capita consumption, gross	dir	ind	cig	soc	pri	oop	Total payments	Per capita consumption, net of payments
Quintiles of per capita consumption, gross									
Lowest quintile	**100.0**	**0.1**	**1.4**	**0.3**	**0.5**	**0.4**	**3.7**	**6.5**	**93.5**
2	**100.0**	**0.2**	**1.6**	**0.2**	**0.6**	**0.4**	**3.5**	**6.5**	**93.5**
3	**100.0**	**0.2**	**1.8**	**0.2**	**0.7**	**0.5**	**3.7**	**7.1**	**92.9**
4	**100.0**	**0.3**	**2.0**	**0.2**	**0.6**	**0.6**	**4.0**	**7.6**	**92.4**
Highest quintile	**100.0**	**0.6**	**2.9**	**0.3**	**0.5**	**0.4**	**4.7**	**9.3**	**90.7**
Total	**100.0**	**0.4**	**2.3**	**0.2**	**0.5**	**0.4**	**4.1**	**8.0**	**92.0**
Gini coefficient	**0.3341**								**0.3318**
Concentration Index		**0.5865**	**0.4777**	**0.3269**	**0.2837**	**0.3356**	**0.3997**	**0.4171**	
Kakwani index		**0.2524**	**0.1436**	**-0.0072**	**-0.0504**	**0.0015**	**0.0656**	**0.0830**	

The same progressivity indices as in the last slide ↗

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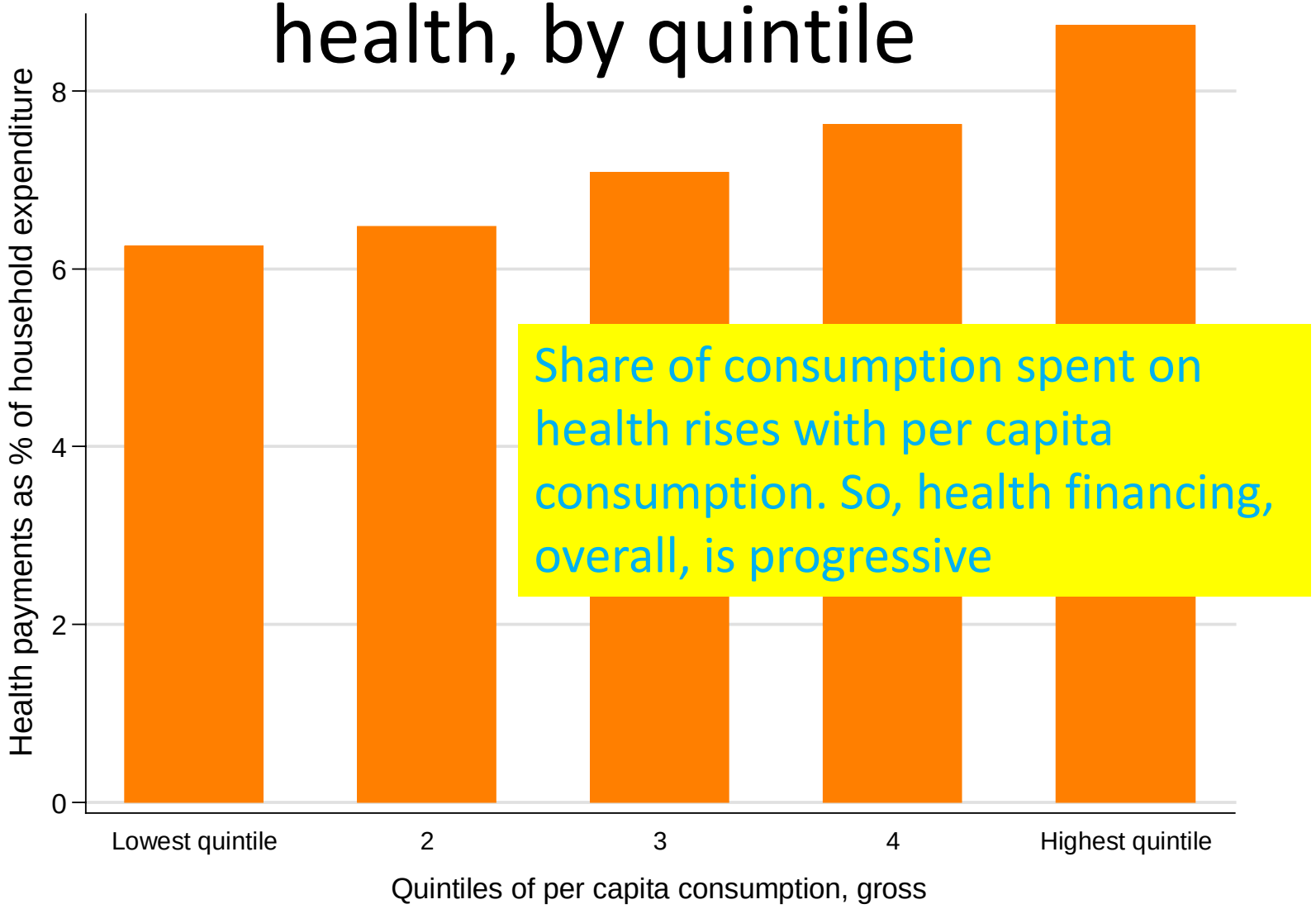
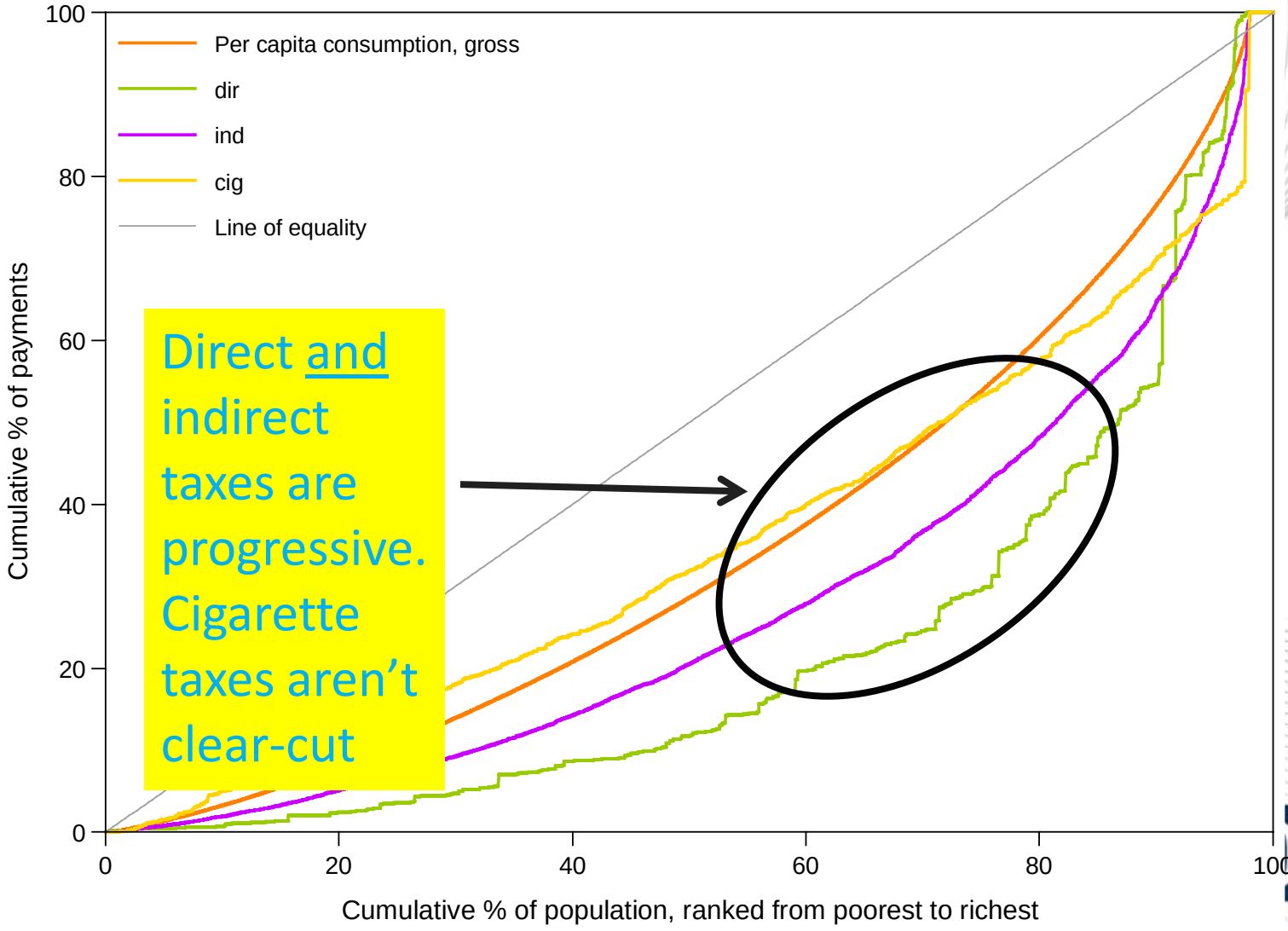
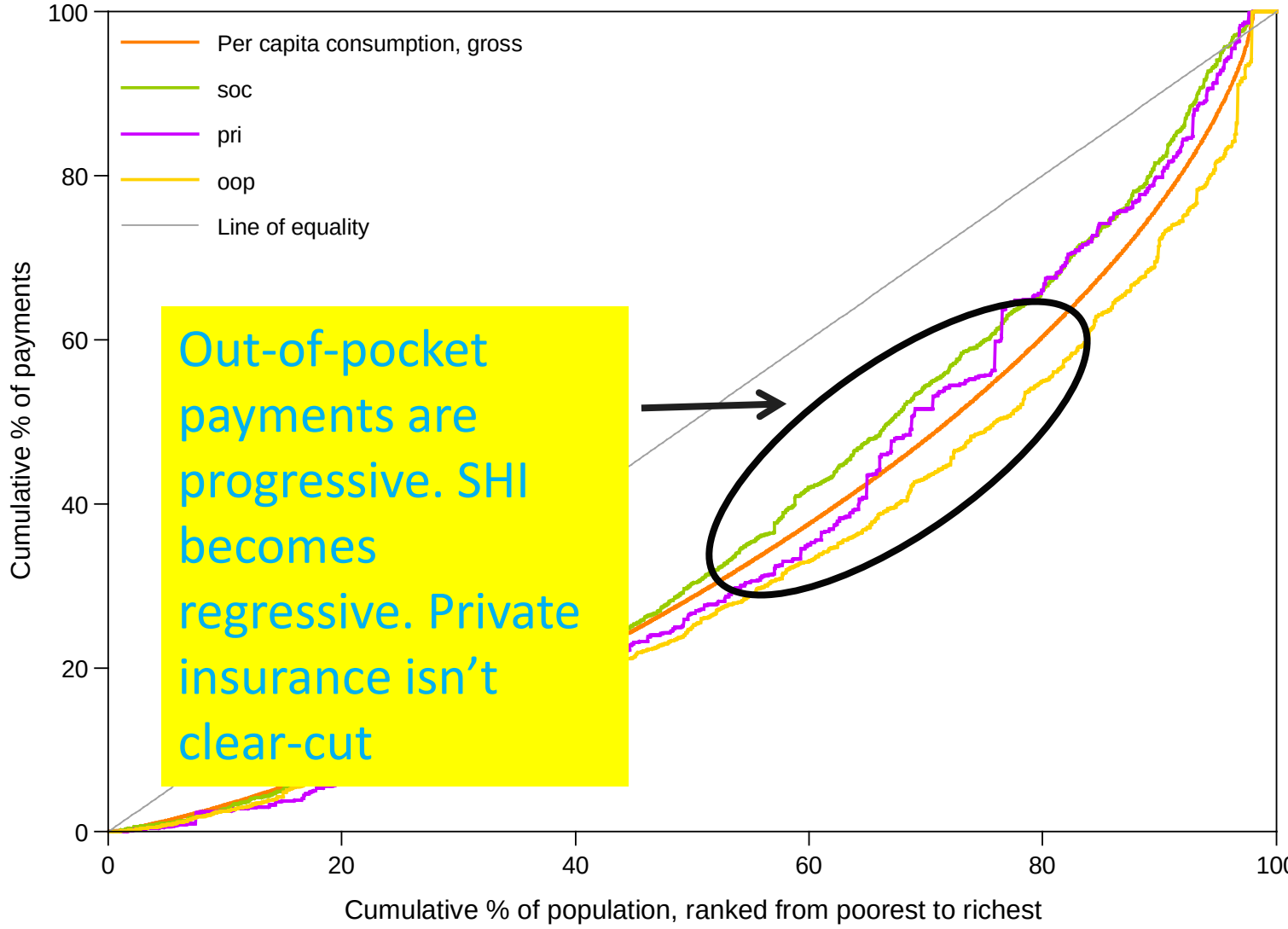
Shares of consumption spent on health, by quintile



Concentration curves for taxes



Concentration indices for other sources



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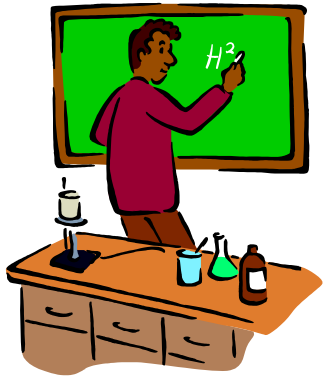
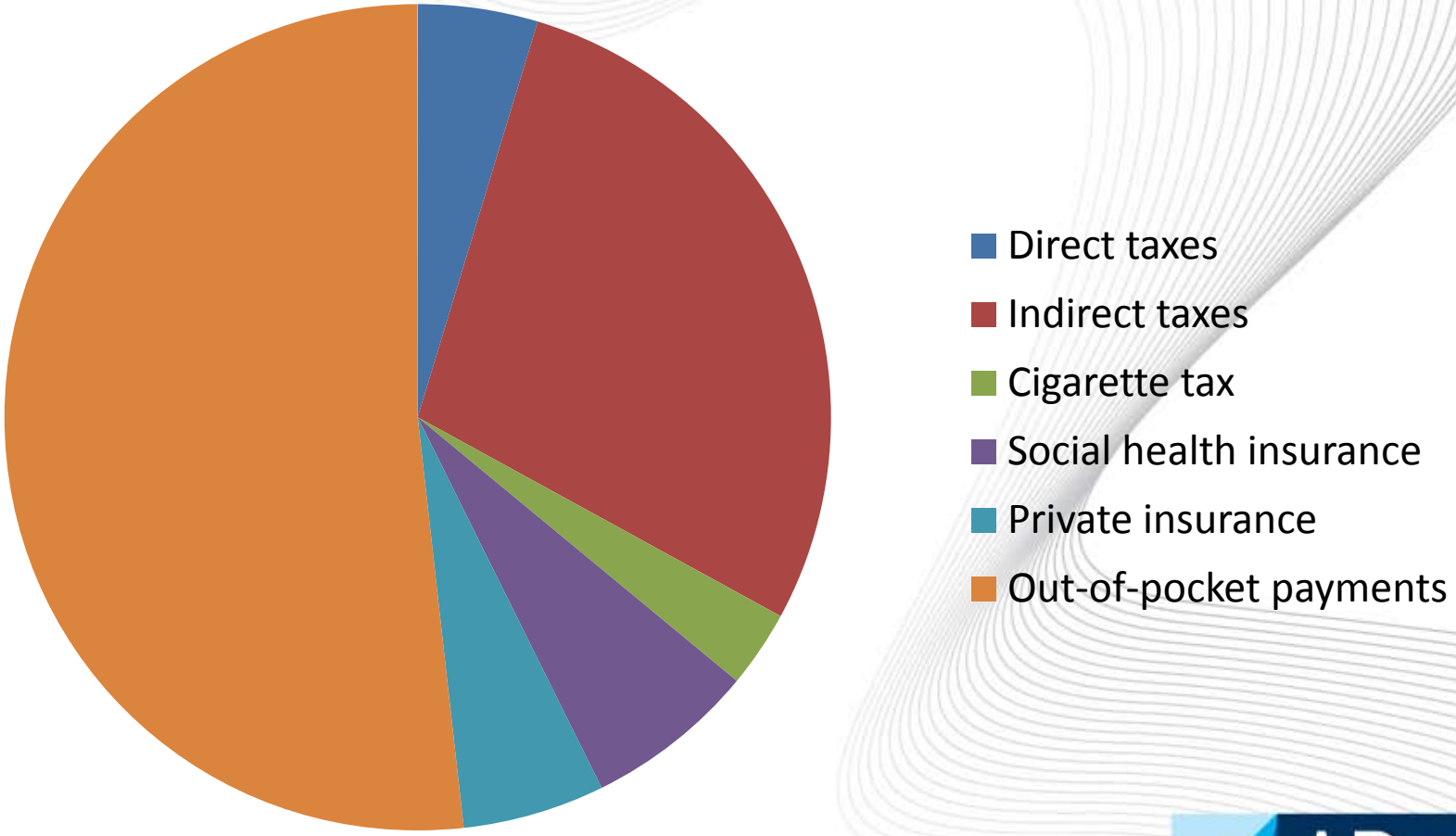
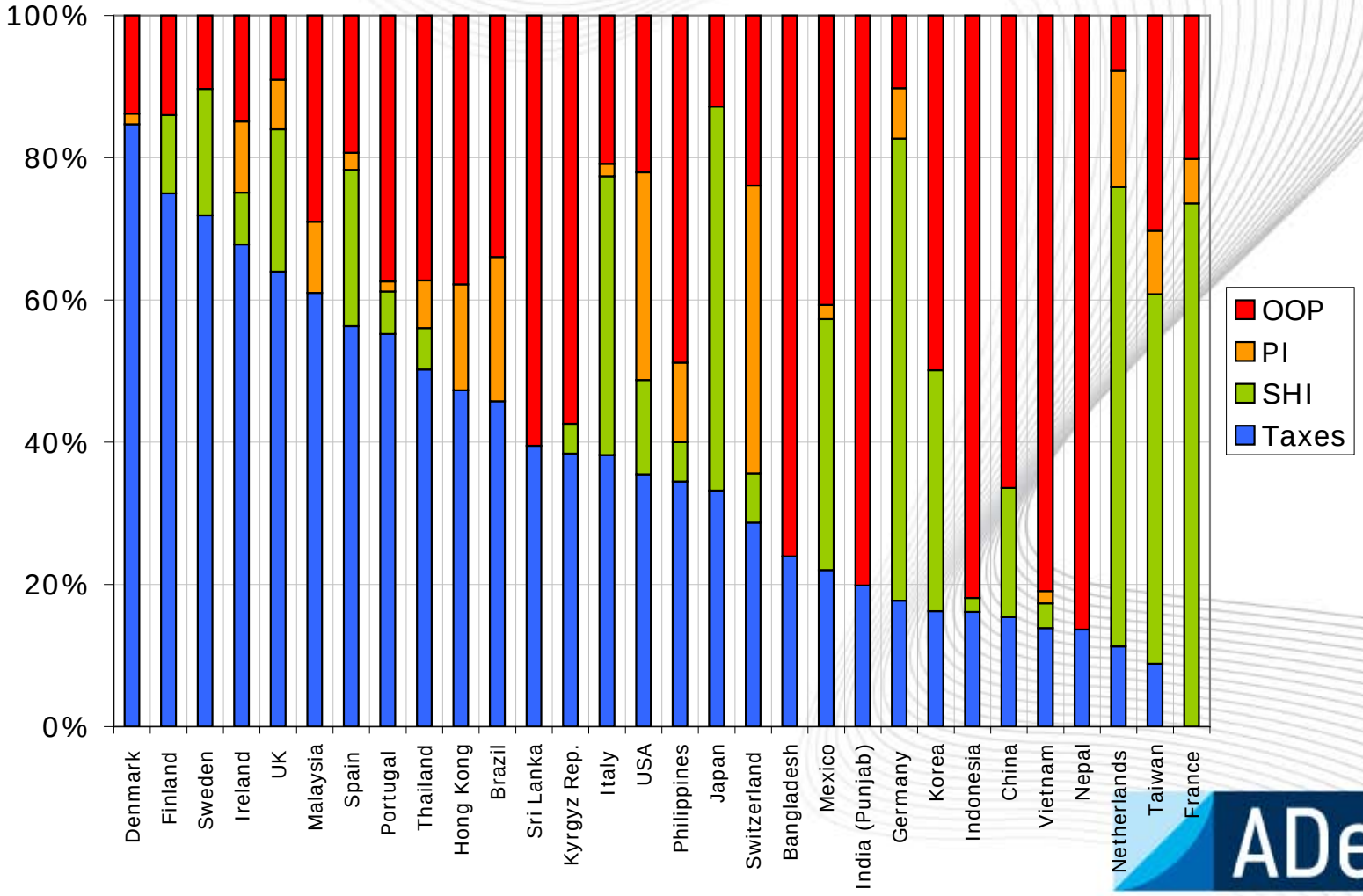
Presenting your results to policymakers



Show the financing mix



Indicate how Egypt compares with other countries



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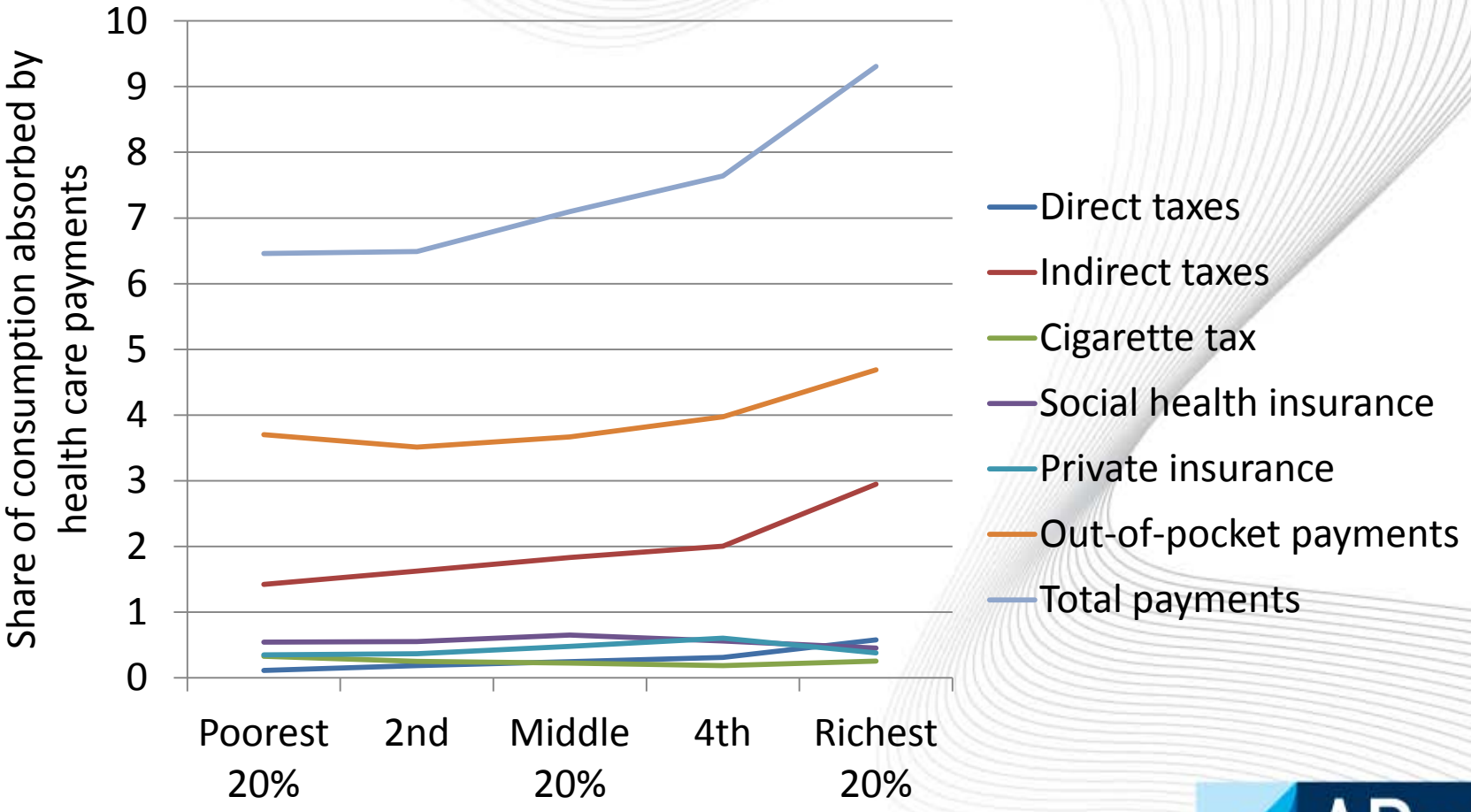
Show how the financial burden of health finance varies with income



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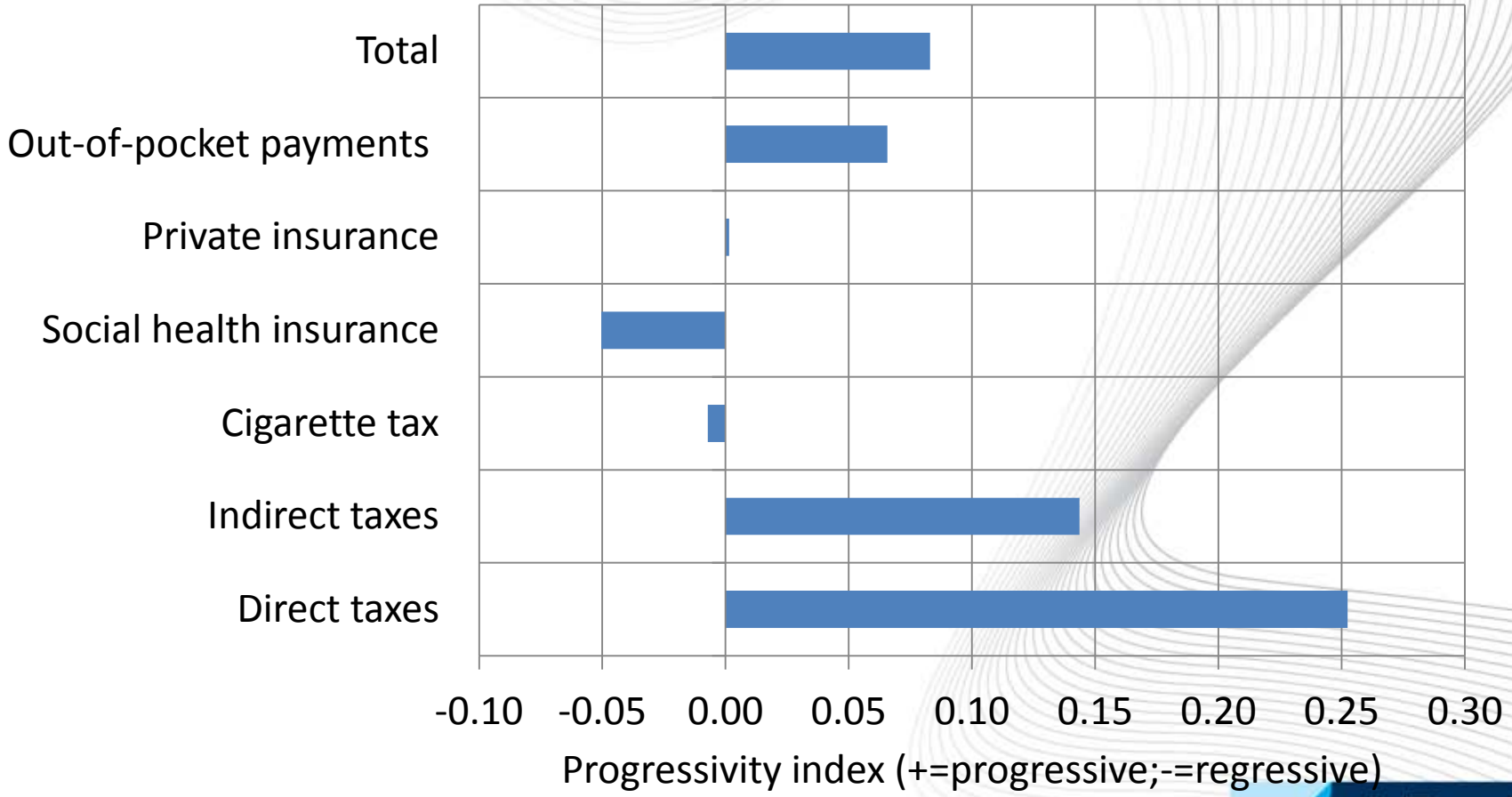
Show the progressivity of different sources



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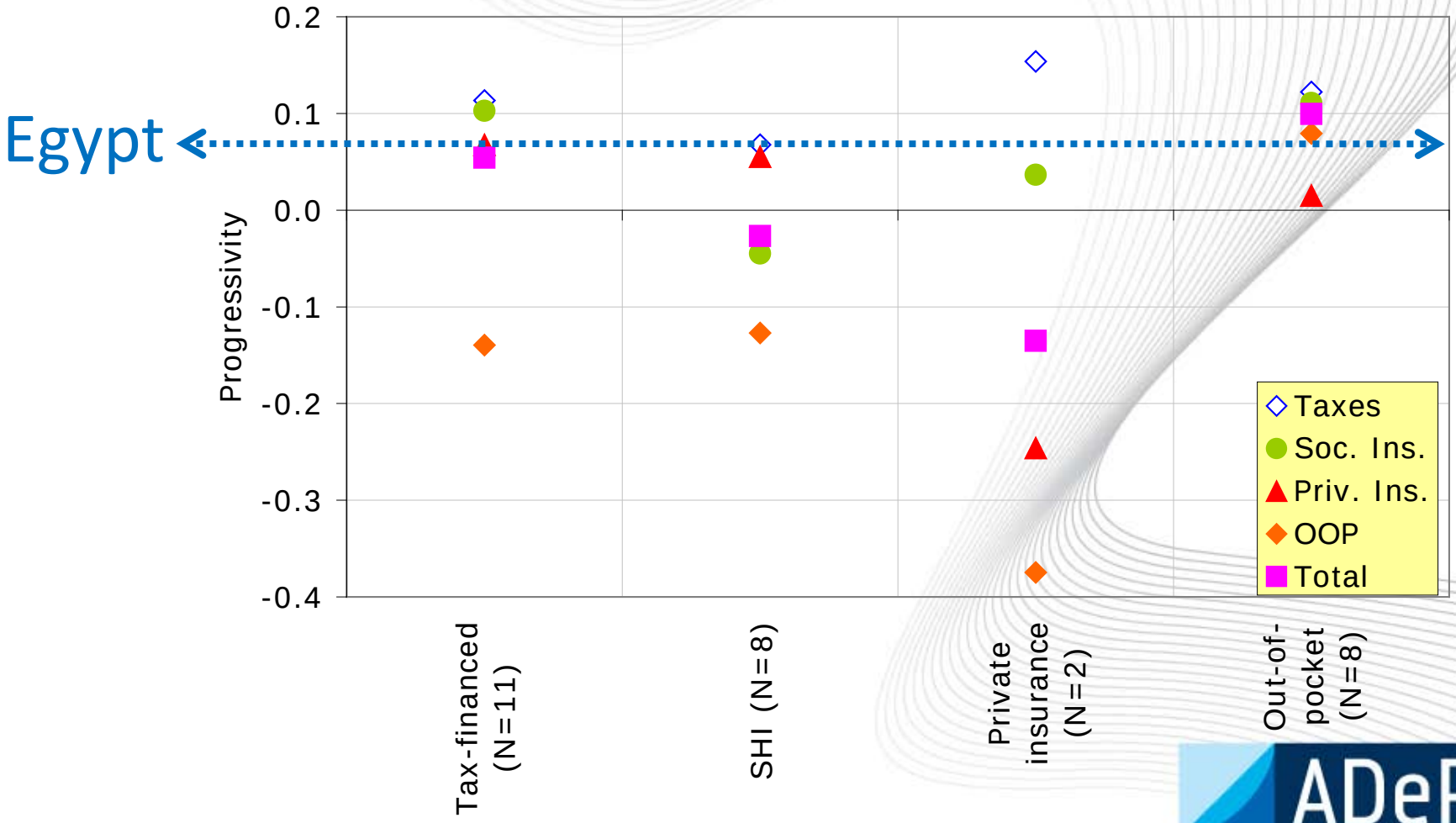
Egypt's financing system is quite progressive by international standards



Countries are as follows. PI: Switzerland , USA; OOP: Bangladesh, China, India (Punjab), Indonesia, Kyrgyz Rep., Nepal, Philippines, Sri Lanka; SHI: France , Germany , Italy , Japan, Korea, Mexico, Netherlands , Taiwan, Brazil; Tax: Denmark , Finland , Hong Kong, Ireland , Malaysia, Portugal , Spain , Sweden , Thailand, UK.

Policy levers-i

- The progressivity analysis points to 2 types of policy lever:
  1. Make a financing source more progressive, or less regressive
     - Health ministries have limited scope to affect the progressivity of taxation. But they can raise or eliminate ceilings on SHI contributions, exempt the poor from copayments, etc.
  2. Shift the financing mix toward progressive sources, and away from regressive sources
     - Health ministries can raise the share of revenues financed publicly, reduce the out-of-pocket payments share, etc.
- ADePT results give a sense of how progressivity might change following different interventions

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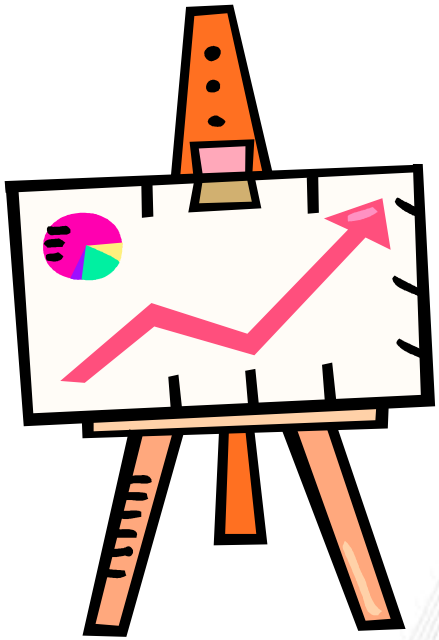
Policy levers-ii

- Examples of reforms that make a financing source more progressive, or less regressive:
  - Multiple examples of programs exempting the poor from copayments making out-of-pocket payments less regressive
- Examples of a reform that shifts the financing mix toward progressive sources, and away from regressive sources:
  - Mexico's Seguro Popular and Vietnam's Health Care for the Poor program both reduced out-of-pocket payments and introduced means-tested contributions supplemented by general revenues

Where to go from here?



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Data sources for progressivity analysis

- For household data:
  - Household expenditure or budget surveys that capture:
    - Out-of-pocket payments
    - Private insurance payments
    - Social health insurance contributions—may need estimating
    - Direct and indirect tax payments—may need estimating
- For health financing mix:
  - NHA containing revenues raised from different sources (WHO NHA's contain this information)

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Some cautionary notes

- Out-of-pocket payments
  - Make sure when you aggregate across different types of service, you're expressing everything in a common time-unit, e.g. annualize everything
  - Out-of-pocket payments should be net of any insurance reimbursement
- Taxes
  - Taxes account for quite a large share of health finance in most countries. Yet household expenditure datasets often have little if any information on taxes paid
  - Other people may already have imputed taxes for your survey. Get their data!
  - Otherwise you'll have to impute them yourself using tax rules. It's a huge job, and a heroic one because of evasion and avoidance, and because of lots of missing information. Seek specialist help!
  - In imputing taxes, incidence assumptions are needed

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Topics in the 2nd equity-in-health-finance module

- Progressivity is one aspect of equity in health finance. It relates to the idea of vertical equity—the idea that households with greater ability-to-pay should pay more
- There's another aspect of equity—horizontal equity. Two households with the same ability-to-pay may end up (unfairly) spending different amounts on health care
  - For example, households in one social insurance scheme may pay less than people in another scheme even if they have the same income, because their contribution rates differ
  - One scheme may have a more risky membership profile, so that the household with the higher contribution rate has to cross-subsidize the elderly while the household with the lower contribution rate doesn't
- ADePT measures horizontal equity, via a decomposition of the redistributive effect of health financing

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Related materials

- Guide to methods: Analyzing Health Equity Using Household Survey Data
- ADePT – Health Manual: Health Equity and Financial Protection
- Online video tutorials
- Health Equity and Financial Protection reports
- Health Equity and Financial Protection datasheets
- Book Attacking Inequality in the Health Sector
- Training events
- www.worldbank.org/povertyandhealth and www.worldbank.org/adept