

Marginal Benefit Incidence of Public Health Spending: Evidence from Indonesian sub-national data

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Motivation

- Objectives
 - How do district revenues translate into health spending?
 - How does district health spending benefit their populations?
 - Effectiveness of public health spending in increasing access to health services
 - Transfer of public resources
- Decentralization in Indonesia in 2001
 - Responsibility for public service delivery with districts
 - Districts free in setting health budgets
 - Variation in district endowments, revenues and health spending but also in poverty, household constraints and access to health care

Existing literature: weak links in the chain

- Cross country data shows little correlation between health outcomes and public health spending, after controlling for income
 - Governance
 - Crowding out
- Within-country heterogeneity
 - Cross country evidence of effect on the poor
 - Sub-national analysis does find evidence of effect of public spending
- Shortcomings of cross country evidence
 - Endogeneity and omitted variable bias
 - Measurement error: inconsistencies in data quality, data collection tools and underlying source of micro-data

Contribution of this paper

- Sub-national analysis of health spending
 - Similar institutional setting and data collection tools
 - Elasticity of health spending w.r.t. revenue
 - Effect of public health spending on health care utilization
 - Outpatient utilization (by provider type)
 - OOP health care spending by households
 - Distributional effects
- Test for crowding out
 - Do increased public services crowd out private sector?
 - Does increased public spending crowd out OOP spending?
- Marginal benefit incidence analysis
 - Control for behavioral response to spending

Benefit incidence analysis

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 - Relate ΔH_q to ΔH
 - Political process driving reforms: early/late capture by the poor
 - Categories of spending: expansion of services, quality upgrade

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$$B_q(S) = \frac{S}{H(S)} H_q(S)$$

$$\frac{\partial B_q}{\partial S} = \frac{H_q}{H} \left[1 + \frac{\partial H_q}{\partial S} \frac{S}{H_q} - \frac{\partial H}{\partial S} \frac{S}{H} \right]$$

Indonesia's health spending

- Decentralization in 2001 to districts
 - Districts have legal responsibility to provide basic health care
 - Accountable to districts parliaments, not to central government
 - Free to set user fees and allocate resources
- District health spending
 - Routine expenditures: salaries and operational costs of providing public health services
 - Development expenditures: investments, upgrading of health facilities, training
 - Increased annually by 23% (in nominal terms) from 2001-2004
- Central influence remains through
 - Civil service regulations
 - Central health spending: social safety net, national hospitals

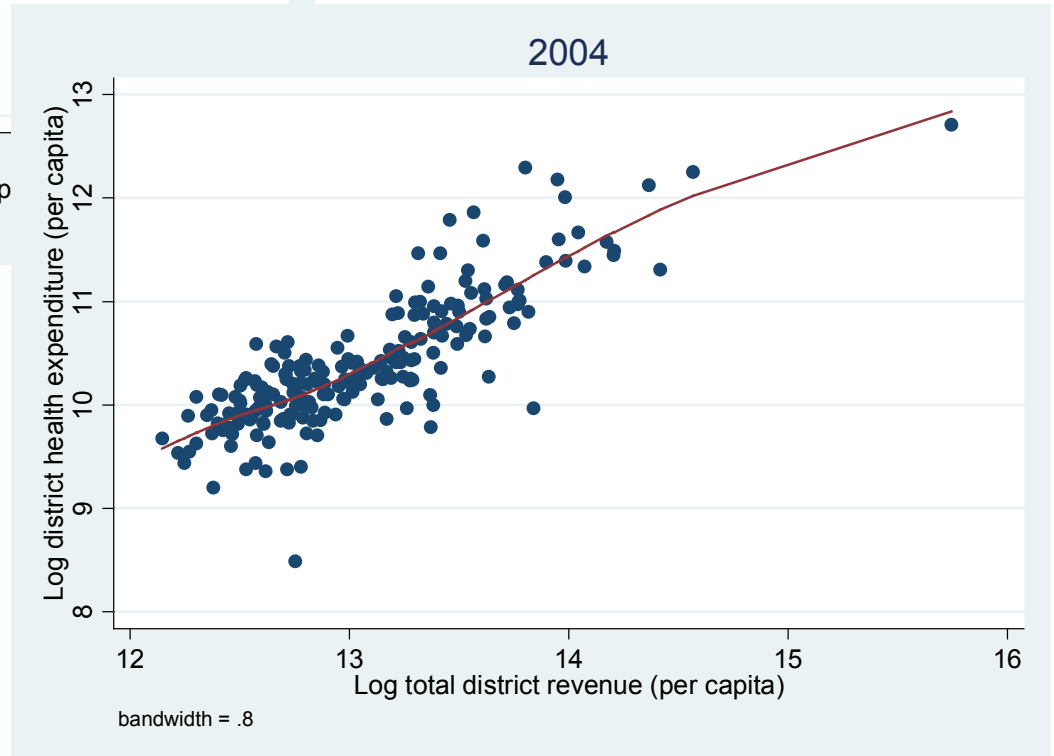
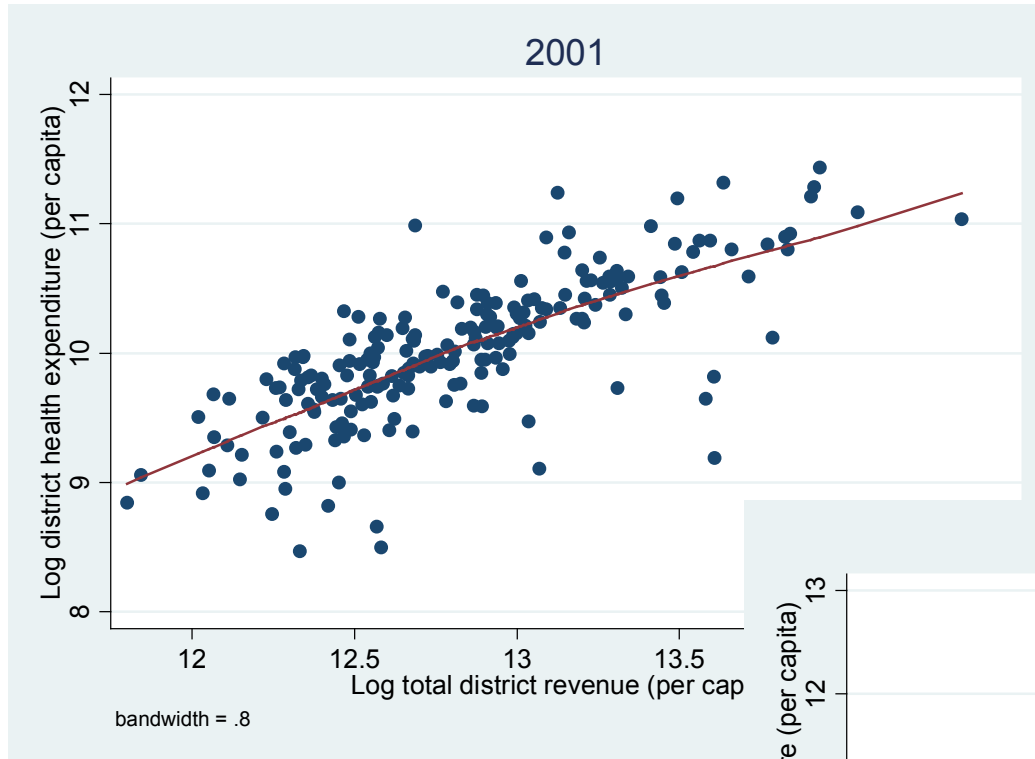
District revenues

- Composition of district government resources in 2001
 - General allocation grant (56 %)
 - Shared tax revenues (property and income tax 11%)
 - Shared non tax revenues (natural resources 12%)
 - District own revenues (15%)
 - Tied grants from center (3%)
- Decentralization resulted in variation in budgets
 - Variation in natural resource endowments
 - Allocation formulas for central allocation grant

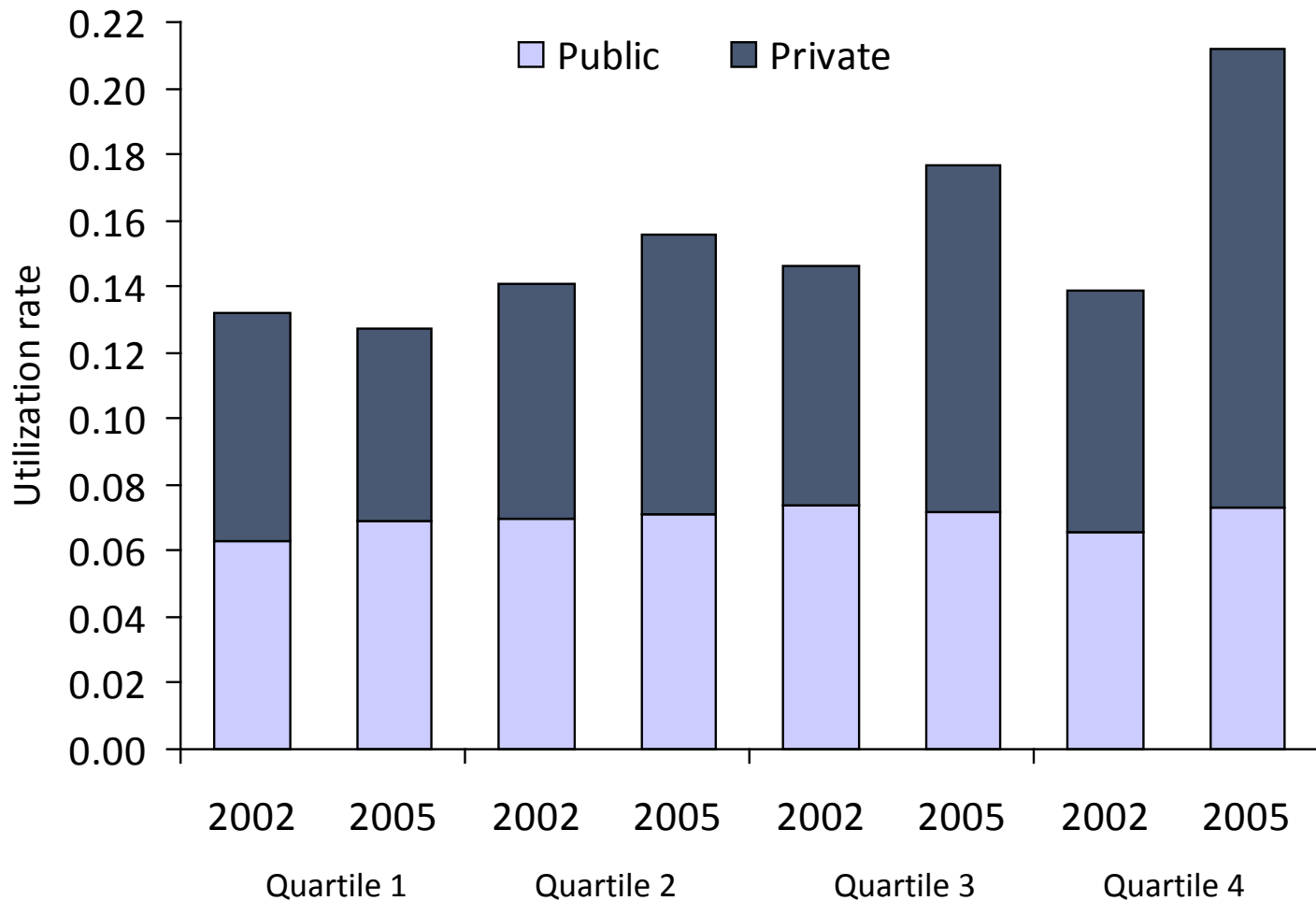
Data

- Panel of 207 districts from 2001 tot 2005
- Ministry of Finance
 - Detailed district revenues
 - Detailed district spending
- Household survey (*Susenas*)
 - Annual cross section; 200,000 HH/year
 - Representative at district level
 - Health care utilization, OOP health spending, demographics, socio-economic information

Converging spending patterns



Health care utilization 2002-2005



Empirical specification

Determinants of district health spending

$$\log H_{it} = c + \beta \log R_{it} + \sum_{r=2}^6 \gamma S_{rt} + f(X_{it}) + \alpha_i + \delta_t + \varepsilon_{it}$$

Empirical specification

Determinants of district health spending

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Determinants of utilization and OOP

$$u_{it} = c + \pi \log H_{it-1} + \eta_d s_{dt} + f(X_{it}) + \alpha_i + \delta_t + v_{it}$$

Elasticity of public health spending

	Routine	Development	Total
Total district revenue	0.83**	1.12**	0.88**

By source of revenue

	Routine	Development	Total
Total district revenue	0.87**	1.05**	0.88**
Interaction revenue shares			
Own revenue	2.03**	1.25	1.44**
Shared tax revenue	0.36	-3.37**	-0.99*
Shared non tax revenue	-0.87	-0.20	-0.70+
DAK revenue	-1.11	3.08*	0.13
Revenue from other sources	-0.50	0.42	-0.29

Public health spending and utilization

	Public	Private	Total	OOP
District health spending	0.0114**	0.0042	0.0156**	-94.42

By source of spending

	Public	Private	Total	OOP
District health spending	0.0111**	0.0059+	0.0170**	-1.40
Interaction development health spending share	0.0037	-0.0234**	-0.0197	-1,269.52

Distribution of health spending effects

	Public	Private	Total	OOP
Quartile 1 (poorest)	0.0175**	-0.0032	0.0143+	-65.80
Quartile 2	0.0164**	0.0032	0.0197**	64.38
Quartile 3	0.0063	0.0005	0.0068	-216.31
Quartile 4 (richest)	-0.0055	-0.0048	-0.0104	-1,685.68

Marginal benefit incidence

	θ_q	$1 + \theta_q - \theta$	$u_{q,2002}$	$u_q (1 + \theta_q - \theta)$
Quartile 1 (poorest)	0.144+	1.054	0.232	0.244
Quartile 2	0.142*	1.052	0.257	0.271
Quartile 3	0.082	0.992	0.272	0.270
Quartile 4 (richest)	-0.040	0.876	0.243	0.213
Overall	0.090+			

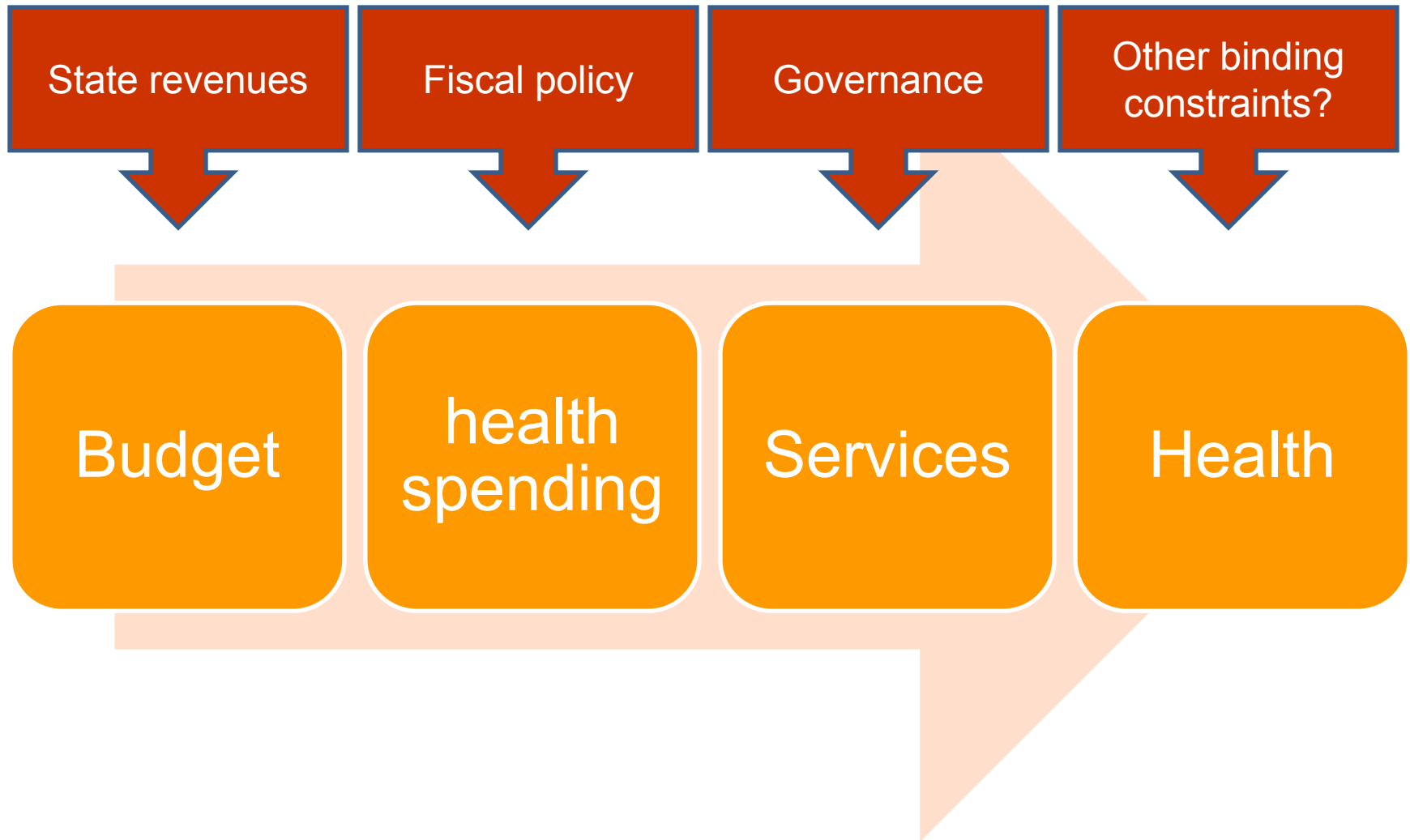
Conclusions

- Revenues translate into health spending
 - Mainly driven by central transfers and local revenues
 - Center retains influential fiscal instruments
- More spending translates into
 - Higher utilization of public services by the poor
 - No crowding out with private services
 - No change in private health expenditures
- Increased public spending improves targeting
 - Net resource transfer from richest to poorest
 - But initial shares dominate marginal benefit

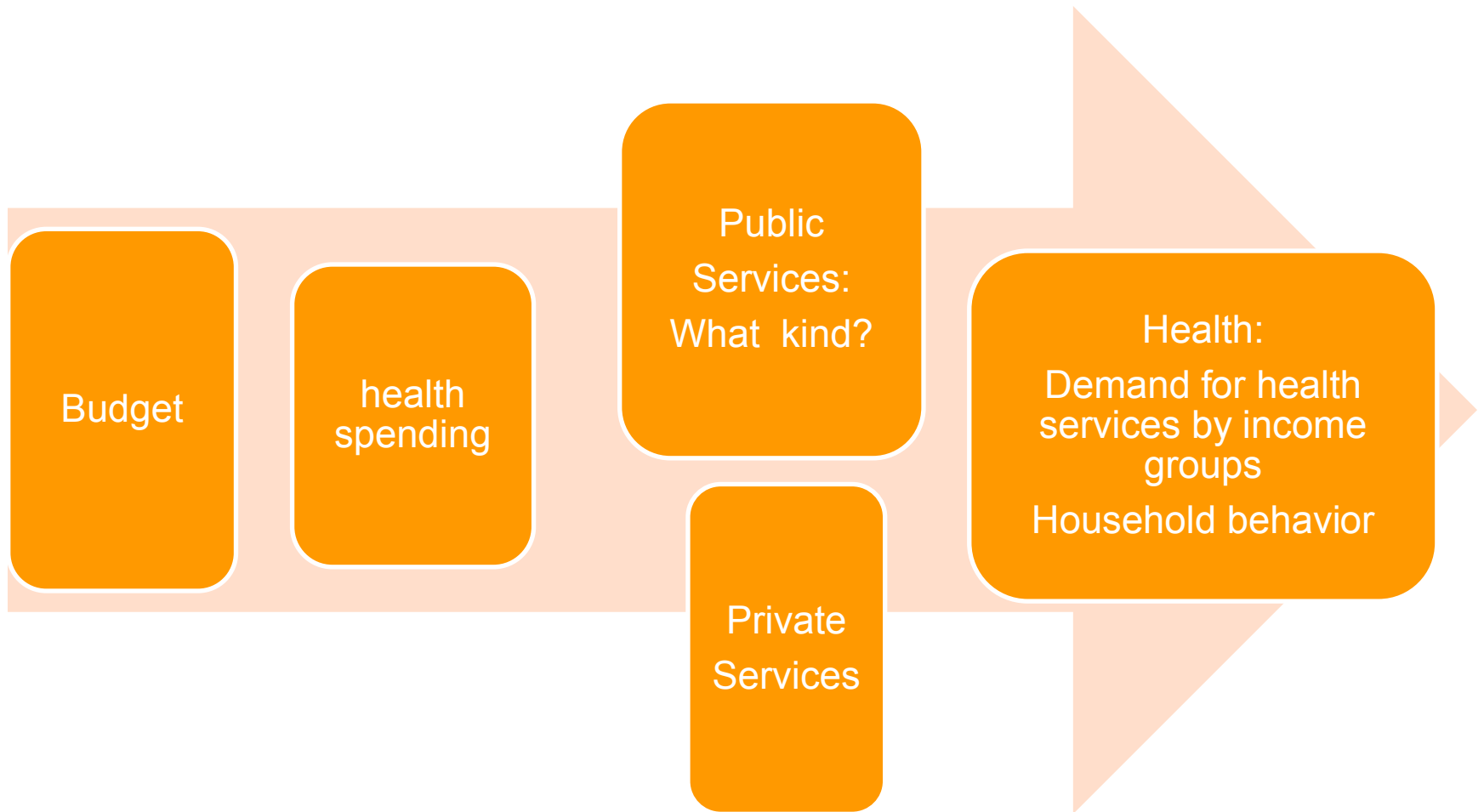
Health care utilization 2002-2005

	Public		Private		Total	
	2002	2005	2002	2005	2002	2005
Quartile 1 (poorest)	0.063	0.069	0.058	0.053	0.122	0.122
Quartile 2	0.070	0.071	0.085	0.074	0.156	0.145
Quartile 3	0.074	0.072	0.105	0.091	0.179	0.163
Quartile 4 (richest)	0.066	0.073	0.139	0.115	0.205	0.188
Urban	0.065	0.067	0.109	0.087	0.174	0.154
Rural	0.071	0.075	0.087	0.080	0.159	0.155
Indonesia	0.068	0.071	0.097	0.083	0.165	0.155

The Chain



The Chain



Indonesia: 17,000 islands



Indonesia's population

Province size shows the proportion of provincial population relative to national population

Indonesia's economy



Province size shows the proportion of provincial GDP relative to national GDP

Indonesia's fiscal decentralization



Province size shows the proportion of provincial fiscal revenue relative to national fiscal revenue