

Using predicted consumption to analyze equity in health-care financing

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2th Symposium on Health systems research; Oct 31 – 3rd March, 2012
Beijing – China



Background

- Conducting health care financing progressivity requires a money metric measure of living standards (e.g. income or consumption) which can be challenging to collect in a small survey
- National surveys that collect income/expenditure data often do not collect detailed information on health care payments
- However, it can be more feasible to collect detailed information on health care payments by administering a small household survey, **BUT**
- the challenge remains of how to quantify the burden of health care payments in the absence of consumption or income data

Objectives

- Propose a methodology of predicting consumption from the national household survey to a small survey with detailed health expenditure information
- Compare the proposed methodology with the standard approach used in other studies to predict consumption
- Use the predicted consumption to analyze the incidence of health care expenditures

Methodology-I

- Tanzania national Household Budget Survey (HBS) 2007 (sample 10752 households) was used to predict consumption into a small SHIELD survey administered in year 2008 to 2234 households
- HBS collected detailed information on consumption **BUT** insufficient out of pocket data which was instead collected in the SHIELD survey
- Simultaneous quantile regression was used to estimate consumption at 20th, 50th and 80th quantiles, using wealth index, locality and household and head characteristics as explanatory variables

$$\text{Log}(CE_{i_{hbs}}) = \alpha^q + \sum_{i=1}^N \beta^q X_{i_{hbs}} + \varepsilon ; i = 1, 2, \dots, n; q = 0.20, 0.50, 0.80$$

- The resulting coefficients were used to estimate consumption for households at the lower tail, middle and upper tail in the SHIELD survey
- Wealth index was used to construct quantiles (i.e. lower tail, middle and upper tail) in the SHIELD survey
- It was assumed that the wealth index and consumption expenditure have similar distribution pattern

Methodology-II

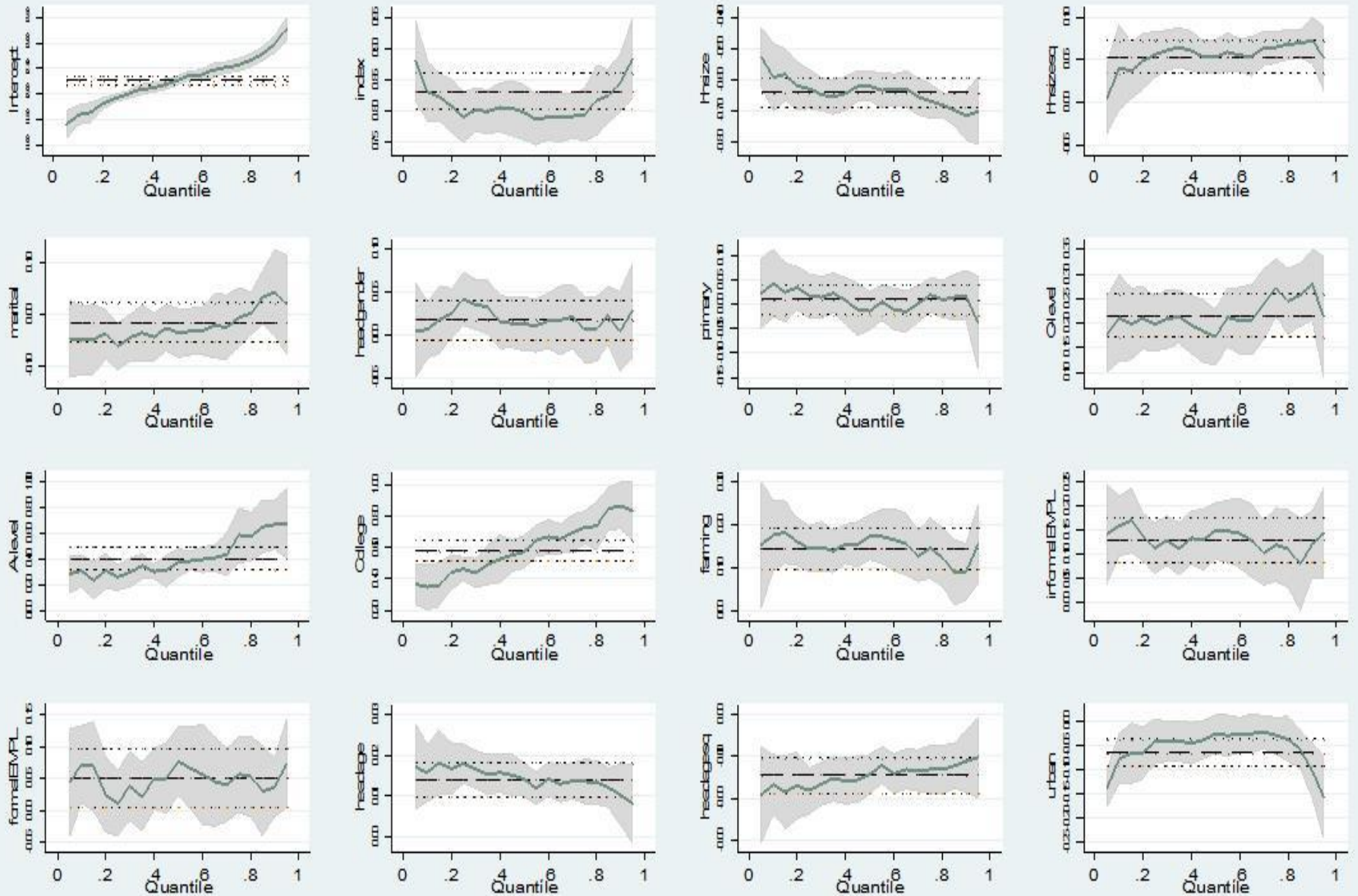
- Cross validation with sample splits method was used to test validity and consistency of the model together with predicted consumption.
- Criteria used for validity test included,
 - Comparison of equity in the distribution between predicted and actual consumption
 - Proportion of households classified as poor by both actual and predicted consumption
 - Share of consumption across socio-economic groups
- Comparison was done between quantile regression prediction with the Ordinary Least Square (OLS) method

Methodology-III

- Financing incidence was analyzed through the share of household consumption on OOPs across wealth groups
- Kakwani index was calculated to quantify the magnitude of progressivity
- The pattern of out of pocket payments distribution when using predicted consumption in the SHIELD survey was compared with the pattern observed using actual consumption in HBS

Consumption prediction results

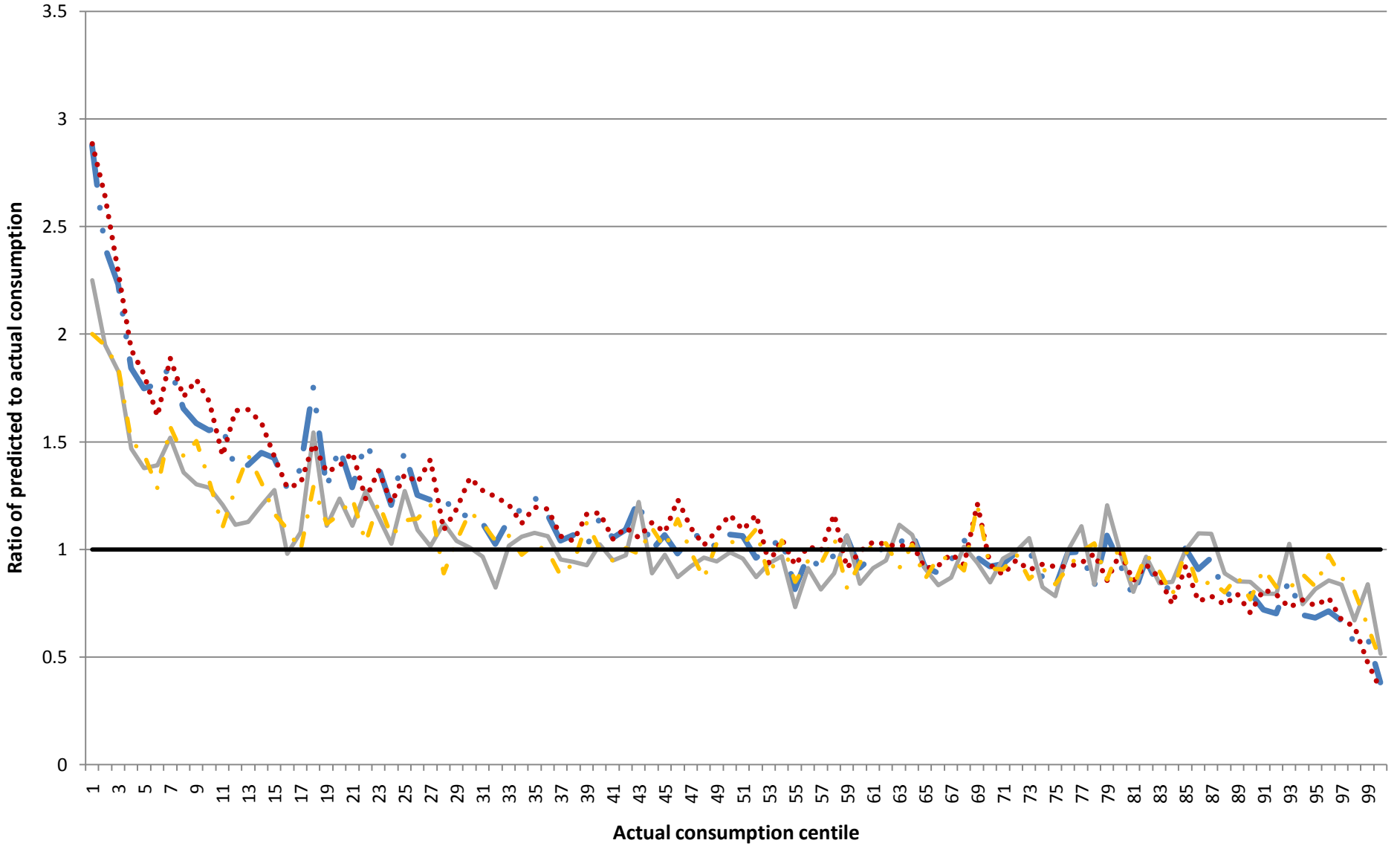
Consumption model estimates across quantiles



Predicted consumption-I

Share of household consumption across quintiles									
	HBS	SHIELD		Sample 1			Sample 2		
Quantile	actual CE	Predicted CE (QR)	Predicted CE (OLS)	Actual CE	Predicted CE (QR)	Predicted CE (OLS)	Actual CE	Predicted CE (QR)	Predicted CE (OLS)
Poorest 20%	5.86	6.04	8.61	5.92	5.56	8.14	5.81	5.50	8.18
2nd Poorest 20%	9.84	11.12	12.91	9.91	9.4	11.64	9.81	9.58	12.1
Middle	13.91	15.56	16.43	14.01	14.1	15.48	13.78	14.56	15.89
2nd least poorest 20%	20.53	20.75	21.89	20.76	20.15	21.88	20.29	20.39	21.74
Least poorest 20%	49.86	46.53	40.15	49.4	50.79	42.87	50.31	49.97	42.08
Gini index	0.445	0.427	0.339	0.449	0.440	0.347	0.442	0.449	0.340
Percentage poor	36.33	36.32	31.57	37.36	41.38	35.23	38.61	39.95	35.66
% similarly classified as poor in both actual CE and					71.17	64.98		66.90	62.20
% similarly classified as not poor in both actual CE and					74.23	80.35		77.00	81.03

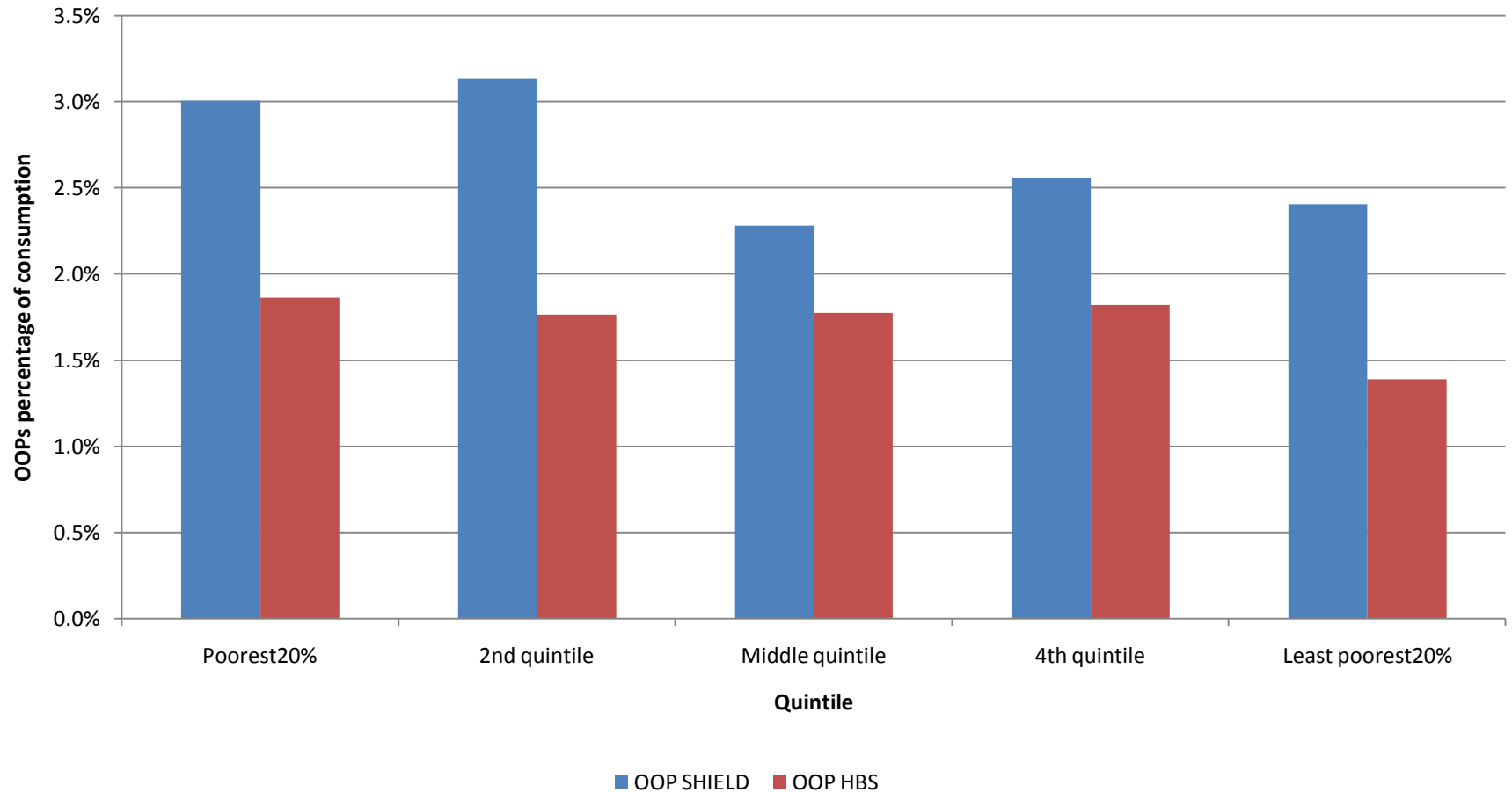
Ratio of predicted to actual consumption



—•— Sample 1 OLS — Sample 1 Quantile ••••• Sample 2 OLS —•— Sample 2 Quantile — Equality

Financing incidence results

Total out of pocket as a proportion of consumption



- The poorest pays higher proportion of consumption as OOPs
- Consistent across both SHIELD and HBS
- Kakwani index – (SHIELD= -0.10; HBS=-0.07)

Out of pocket progressivity by type of care

	ALL care	Outpatient	Inpatient
Total OOP	-0.103	-0.100	-0.140
<i>se</i>	<i>0.047</i>	<i>0.050</i>	<i>0.146</i>
Drugs	-0.112	-0.113	-0.102
<i>se</i>	<i>0.052</i>	<i>0.054</i>	<i>0.155</i>
Other	-0.078	-0.071	-0.181
<i>se</i>	<i>0.105</i>	<i>0.113</i>	<i>0.140</i>
Transport	-0.089	-0.075	-0.245
<i>se</i>	<i>0.070</i>	<i>0.073</i>	<i>0.171</i>

Conclusions-Consumption prediction

- In the absence of data on household consumption, predicted consumption may be used as measure of living standard
- Prediction results showed a significant level of validity and reliability of the predicted consumption
- Comparison showed that prediction using quantile regression gave more valid results compared to OLS
- Future small health-specific surveys might be expanded to include a wider variety of variables that have positive correlation with consumption in order to facilitate more accurate predictions

Conclusion-out of pocket financing incidence

- Out of pocket payments are overall regressive in Tanzania
- Transport cost are highly regressive for inpatient care
 - Need to improve outpatient care for facilities close to the poor households and
 - Increase availability of referral care close to the poor
- Payments for drugs account for the largest proportion of household consumption
 - Need to address the problem of drug stock-outs in the facilities which are close to the poor households
- Overall, a comprehensive health insurance coverage may help to address regressivity of out of pocket payments

Thank you