

Income Concentration and Price Differentiation in Low and Middle Income Pharmaceutical Markets

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Pharmaceutical Pricing and Reimbursement
Information (PPRI) Conference

September 2011
Vienna, Austria

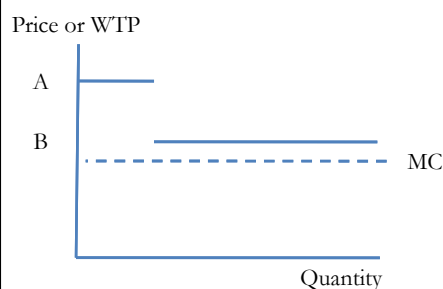
Conflict of Interest Statement

- No conflict of interest
- Academic researcher
- Prior consulting experience with pharmaceutical industry, multilaterals, NGOs

Cross-National Pharmaceutical Prices

- In high income countries, pharmaceutical prices generally are correlated with income per capita (Danzon and Furukawa 2006)
- In prior select comparisons with middle-income countries, the prices in the middle income countries are sometimes relatively high in relation to income per capita (e.g. US vs. Mexico)
- One possible explanation: Profit maximizing prices (especially in the private sector) focus on the upper income strata within these middle income countries

Pharmaceutical Price Setting Choice Simple “One Price” Case (On Patent, OOP Market)




- Given marginal cost of production and distribution (MC) and distribution of consumer demand, profit-maximizing firm sets price at A rather than B (volume vs. price tradeoff)

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Within-Country Pharmaceutical Prices


- The capacity to differentially price products both across and within-countries potentially allows for improved access across different income levels (Towse et al., 2011)...although debate exists
- Anecdotal evidence on mechanisms to differentiate prices in lower and middle income markets exists, but little empirical data to support whether this occurs and to what extent.
- Whether differential pricing occurs has important policy implications for low and middle income countries (transparency vs. confidentiality debate)

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Important Differences between High vs. Low/Middle Income Pharmaceutical Systems

	High Income	Low/Middle Income
Primary Finance Source	Gov't Insurance	Individual (OOP)
Supply Chain	Competitive, Efficient	Limited Competition, Less Efficient, Bifurcated (Public vs. Private)
Regulatory Capacity	Strong: High Quality Medicines	Weaker Regulation and Governance: Lower quality

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Key Questions

- 1) Does more recent, extensive data indicate that cross national prices in low and middle income countries are sensitive to:
 - A) GDP per capita?
 - B) Income Concentration Measures?
 - C) Market Size?

- 2) If yes, which products (generic vs. patent; expensive vs. inexpensive) and market segments (private sector, public sector) appear to be most sensitive to these factors?

- 3) Do differences in pricing factors across product type or market segments suggest that within-country price differentiation also occurs?

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Data

Health Action International (HAI) Surveys


- 69 Surveys, 49 Countries
- Global and Regional Medicines (branded and generic)

Price Data

- Median Price Ratios (Relative to MSH reference price) for Medicines by Sector (75th percentile, 25th percentile also reported)
- Private Sector (retail only) and Public Sector (retail and procurement price)

Economic / Market Data

- World Bank (Gini Index, % share inc measures for top 10 or 20 percent of population, GDP/cap, Population)

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Outcome Measures: How to Generate Country-Level MPRs

Across Facility	Product 1	Across Products	Outcome Measures
A	Price _{A1} /MSH ₁	MPR ₁ MPR ₂ MPR ₃ MPR ₄ MPR ₅	75 th Percentile MPR Median MPR 25 th Percentile MPR
B	Price _{B1} /MSH ₁		
C	Price _{C1} /MSH ₁		
D	Price _{D1} /MSH ₁		
E	Price _{E1} /MSH ₁		

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Income Concentration in Low and Middle Income Countries

Countries with GNI/cap (2010) < \$12,275; Larger Circles = HAI sample countries

- Low and middle income countries exhibit a wide variation in degree of income concentration

Gini Index Summary Statistics (n=121)	
Median	41.5
Min	27.2
Max	74.3
25 th Percentile	36.7
75 th Percentile	49.0

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Methods

Basic Model:

$$\text{Median MPR}_{ist} = \alpha + \beta_{it} \text{GDP} / \text{cap} + \beta_{it} \text{Gini} + \beta_{it} \text{Pop} + \varepsilon_{ist}$$

Alternative Dependent Variables:
 A) 75th percentile MPR (proxy for more expensive products?)
 B) 25th percentile MPR (proxy for less expensive products?)

Note: Initial results do not account for inflation and/or PPP adjustment at product level

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Initial Results: Median MPRs

Outcome	Branded Median MPR (n=57)			Generic Median MPR (n=54)		
	1	2	3	1	2	3
GDP/Cap (\$1000s)	-0.46 ^{NS}	-0.03 ^{NS}	-0.46 ^{NS}	0.74 ^{NS}	0.90 ^{NS}	0.82 ^{NS}
GINI Index	0.58 ^{**}			0.16 ^{NS}		
Income Share 10 %		0.61 [*]			0.14 ^{NS}	
Income Share 20 %			0.64 ^{**}			0.15 ^{NS}
Population (Mill.)	-0.01 ^{**}	-0.01 ^{**}	-0.01 ^{**}	-0.003 ^{**}	-0.004 [*]	-0.004 [*]
R ²	.36			.22		
p [*]	.32			.21		

*p<.05, **p<.01, NS-Not Significant

Price Ratio Elasticity
 Given important assumptions, each 1% increase in income share among the Top 10% increases median price ratio for branded products by .61 (MSH units). No statistical effect detected for generics.

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Initial Results: Distribution of MPRs

Outcome	Branded MPRs (n=57)			Generic MPRs (n=54)		
	25 th Percentile MPR	Median MPR	75 th Percentile MPR	25 th Percentile MPR	Median MPR	75 th Percentile MPR
GDP/Cap (\$1000s)	-.02 ^{NS}	.02 ^{NS}	+1.0 ^{NS}	0.11 ^{NS}	0.90 ^{NS}	1.87 ^{NS}
Income Share 10 %	.22 ^{NS}	0.61*	1.41**	0.11 ^{NS}	0.14 ^{NS}	0.31 ^{NS}
Population (Mill.)	-0.006**	-0.011**	-0.020**	-0.002*	-0.004*	-.005*
R ²	.25	.32	.43	.13	.20	.24

*p<.05, **p<.01, NS-Not Significant

Relative Effect of Income Concentration


The effect of income concentration appears more pronounced on the higher end of the MPR distribution in the branded market. If similar drugs occupy the upper end of the distribution across countries (say, more expensive branded products), then this suggests the manufacturers / firms focus mark-ups on particular products *within* countries.

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Important Caveats

- Potential for differential product selection across countries to influence results
- Aggregation Bias (Median of Medians)
- Compare specific products, not median levels across all products
- Adjustment for PPP/inflation (survey across years)
- Ideal price differentiation evidence relies on *within* country analysis (product level)
- Private sector prices are retail (manufacturer, distributor or retailer markup?)
- No quantity information (just price)

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Initial Conclusions

Given prior caveats,

- A) In low and middle income markets, income concentration appear to be the more relevant factor than income level in price setting for private sector
- B) Volume-price tradeoff (Larger populations → Slightly lower prices)
- C) Price differentiation at retail level appears to exist in the private market, but is likely concentrated in particular product segments

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Policy Implications

Regulator: Understand factors driving price in private market

Firm: Price differentiation appears possible (but who captures the rent?)

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Thank You