

Differences in Length of Stay and Health Expenditure between Public and Private Hospitals in China

Chengxiang Tang

University of New South Wales

(6 July, 2013)

Background

- Chinese private hospitals grew rapidly after the year 2000
- An unbalanced human resource for health exists between public and private hospitals has been detected (Tang, et al 2013)
- However differences in costs, quality and efficiency of health care services needs to be investigated

Question:

Is there any difference in health care services provided by public and private hospitals in China?

Which sector is more efficient in terms of length of stay and total payments?

Confounding Factors

- Patient selection bias
 - intensity of care, and severity of illness
 - differential output
- Organizational characteristics
 - hospital ownership

- **Contribution:**

The utilization of patient-level data allow us to better investigate treatment pattern between public and private hospitals.

By applying an instrumental variable approach, this study is able to address the endogeneity concern on the patient-level selection, and thus explore the effects of ownership on health services provision.

- A large micro inpatients claims data from New Cooperative Medical Scheme (NCMS) over a period of 21 months (01/2010-09/2011) in one Province in China
- A cross-sectional survey of hospitals and their human resources for health
- Additional variables from provincial census

Study Population

- All rural residents (over 20 million) in the province
- NCMS beneficiaries in three cases:
 - Normal delivery
 - C-section
 - Cataract

Outcomes Variables

- Length of Stay (LOS)
- Total Payments
- Pharmaceutical Payments

I. Regression

- Single-equation:

$$Y_i = \beta_0 + \beta_1 Pub_i + \beta_2 X_i + \beta_3 H_i + \beta_4 M_i + u_i \quad Eq(1)$$

Pub_i the dummy variable indicates whether the treating hospital is private

X_i is observable patients' characteristics, including gender, age, marital status, etc

H_i is hospitals' characteristics

M_i is characteristics of local hospital markets

II. Instrumental Variable Model

- Capture the variation in the geographical distance that is related to ownership, two predicted variables created:

$$Y_i = \beta_0 + \beta_1 \widehat{Pub}_i + \beta_2 X_i + \beta_3 H_i + \beta_4 M_i + u_i \quad Eq(2)$$

IV1: distances to the closest public and private hospitals and their squared terms

IV2: the differential distances to alternative hospital type

Validity of IVs

- Similar analysis conducted by McClellan et al., 1994; Sloan et al., 2001; Lien et al., 2008
- Instrumental variables exogenous to outcome variables
- Instrumental variables highly correlated with hospital ownership
- Instrumental variables are consistent by using 2SLS method

Descriptive Analysis

	ND		C-section		Cataract	
	Public	Private	Public	Private	Public	Private
LOS	5.249	4.735	7.545	6.871	9.152	3.414
Total payments	1830.148	1533.116	4940.502	4010.160	4747.497	5826.368
Pharmaceutical payments	246.251	134.400	1245.111	609.261	535.638	212.674
<i>N</i>	187,560		104,951		20,403	

Results

	ND OLS	C-section OLS	Cataract OLS	IV
LOS	-0.185*** (0.006)	-0.071*** (0.008)	-0.442*** (0.005)	-0.104*** (0.021)
Total payments	-0.128*** (0.005)	-0.182*** (0.003)	0.234*** (0.009)	1.322*** (0.027)
Pharmaceutical payments	-0.323*** (0.017)	-0.580*** (0.009)	-1.115*** (0.025)	-1.518*** (0.044)
Patients controls?	Yes	Yes	Yes	Yes
Hospital controls?	Yes	Yes	Yes	Yes
Market controls?	Yes	Yes	Yes	Yes
Hausman test				Yes
<i>N</i>	187,560	104,951	20,403	20,403

- Mixed results
 - Shorter LOS in private hospitals
 - Total payments not necessarily lower in the private
- Still not easy to suggest effects of ownership
- Probably more technology adoptions in private hospitals

Discussion

	Developed Countries	China
Public	Physician paid by salary	Low salary + bonus system that is highly correlated with the number of care provided
Private	Physician practice privately and paid by fee-for-services	-

Further Analysis

- More disease cases
- Other outcome variables, e.g. 30-day rehospitalization rates
- Urban residents