Fertility rate, use of cesarean delivery, and the role of information gap: Evidence from Taiwan

Author: Ma, Ke-Zong

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Abstract: Economists are interested in the financial incentives affecting health care providers. More specifically, the case of clinically unnecessary cesarean delivery (c-section) often attracts their attention because it is invasive and has an increasing trend in many developed and developing countries. Empirically, changes in the fertility rate can serve as an exogenous shock to identify the impact of financial pressure on the use of c-sections. However, the validity of such studies could be questioned for the endogeneity problem because the increasing use of c-sections may also reflect higher social value of newborns as the fertility rate decreases, and this alternative explanation leaves open the question of the magnitude of inducement due to the rapidly declining fertility rate.

To better understand the effect of the shrinking fertility on the choice of the delivery modes, this study takes advantages of the dramatic decline fertility in Taiwan from 1996 to 2004 to examine whether an exogenous and negative income shock to ob/gyns may affect the use of c-sections, which has a higher reimbursement rate under Taiwan's National Health Insurance system than vaginal deliveries. To conduct a systematic population-based study, the primary data are obtained from the 1996 to 2004 National Health Insurance Research Database in Taiwan. The main research hypothesis is that a negative income shock to ob/gyns would cause ob/gyns to provide more c-sections on less medically-informed individuals to make up their income difference. Moreover, this study will also examine the spillover of the declining fertility by testing the effect of negative income shock on the use of inpatient tocolysis.

Results first show that the declining fertility or the increasing number of ob/gyn per 100 births lead to an increase in the probability of having c-sections, while the marginal effects are small but highly significant. Findings from multinomial logit models further suggest that maternal request contributes significantly to the increasing use of c-sections, and such requests possibility stemmed from anxiety or fear about the safety of themselves or their baby given the lower and lower fertility rate. For the role of health information gap, the marginal effects of the interaction terms "fertility×information" and "ob/gyn per 100 births×information" are not statistically significant in the empirical specifications, i.e., the inducement effect does not exist in c-sections. The empirical test of the spillover effect on tocolytic hospitalization revealed that ob/gyns, hospitals, and clinics could recoup the income loss due to declining fertility by providing more inpatient tocolysis. The negative income effect is especially stronger for regional or district hospitals, teaching hospitals, and private non-profit hospitals.

Because of the unusual, exogenous occurrence of fertility decline in Taiwan and the use of detailed medical information and crucial demographic attributes of pregnant women, this dissertation research will be able to avoid the endogeneity problem that has threatened the validity of existing health economics research on c-sections. It will also provide more accurate estimates of physicians' ability to induce demand because of their expertise in medical knowledge. Results of this study, therefore, will contribute to the literature and provide policy recommendations with regard to physician behavior and practice.

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Subject: Obstetrics; Gynecology; Economics; Public health; Fertility; Cesarean section;

Classification: 0380: Obstetrics; 0380: Gynecology; 0501: Economics; 0573: Public health

Identifier / keyword: Health and environmental sciences, Social sciences, Fertility, Cesarean delivery, Information gap, Taiwan, China

Pages: n/a

Number of pages: 141

Publication year: 2007

Degree date: 2007

School code: 0153

Source: DAI-B 68/06, Dec 2007

Place of publication: Ann Arbor

Country of publication: United States

ISBN: 9780549123965

Advisor: Norton, Edward C.

Committee member: Chou, Shin-Yi, Guilkey, David K., Harris, Dean M., Lee, Shoou-Yih D.

University/institution: The University of North Carolina at Chapel Hill

Department: Health Policy & Administration

University location: United States -- North Carolina

Degree: Ph.D.

Source type: Dissertations & Theses

Language: English

Document type: Dissertation/Thesis

Dissertation/thesis number: 3272692

ProQuest document ID: 304831200

Document URL:
http://libproxy.lib.unc.edu/login?url=http://search.proquest.com/docview/304831200?accountid=14244

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