

Title: Socio-economic gradients in maternal health-seeking behaviours in Egypt

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Extended Abstract

Introduction

Inequities - avoidable and unfair inequalities - in the coverage of maternal care interventions have gained recent prominence in light of Millennium Development Goal efforts to reduce maternal mortality by 2015 and beyond.¹⁻³ In addition to deaths, maternal near-miss events and other complications resulting in morbidity and long-term disability also carry devastating effects on the lives of women, children and families in the form of physical, psychological and socio-economic sequelae.⁴⁻⁶ Antenatal care (ANC) and delivery care are among the most important interventions to prevent maternal deaths,⁷ but rely on numerous complex interactions influencing availability and quality of care as well as its utilisation by women.

Egypt witnessed large decreases in maternal mortality in the last two decades; a decrease from 174 to 84 per 100,000 live births between 1992-3 and 2000,⁸ and a further decline to 66 by 2010.⁹ This reduction is hypothesised to have been achieved through a combination of increasing ANC coverage, skilled birth attendance, improved quality of care, access to emergency obstetric care and fertility-reducing socio-economic development, namely women's education.¹⁰ The leading causes of maternal mortality in Egypt include haemorrhage and hypertensive disease, both of which are amenable to reduction with skilled care during pregnancy and the peripartum, yet delays in recognizing problems and seeking care were identified as the third most important preventable cause of maternal mortality in 2000.⁸ Between 1992 and 2008, the proportion of pregnant women who received regular ANC increased from 23% to 66% and the percentage of births that took place in a health facility increased from 27% to 72%.¹¹ Despite these improvements, the overall trend of steadily increasing coverage of maternal care interventions in Egypt masks underlying complexities, including socio-economic gradients in access and utilisation of care and increasing private provider use. Whereas 78% of births occurring in the 5-year period before 2008 to women with complete secondary or higher education were preceded by regular antenatal care, only 45% of births among women with no education were.¹¹ Less than half of births to mothers in the lowest wealth quintile occurred in a health facility, compared to 95% of birth to mothers in the wealthiest quintile. Among women delivering in health facilities, the proportion utilising a public provider has steadily declined from 63% (1992) to 27% (2008).¹¹ Perceived and real quality of care deficits may partly be driving this decrease in public provider use despite higher costs of the alternative, private care.¹²

This paper aims to extend the current limited understanding of the association between SEP and maternal health-seeking behaviours in Egypt. Specifically, we aim to test the hypothesis that household-level financial resources mediate the effect of individual socio-cultural factors on health behaviours. Completion of this objective involves three main components: 1) construction of the two SEP measures using latent variable modelling, 2) formal specification of the mediation model to assess the direct, indirect and total effects of individual-level SEP measure on maternal health-seeking behaviours, and 3) the inclusion of relevant confounders of this association in the final models.^{13, 14} In addition, we aim to compare the existence and strength of associations of SEP with health-seeking behaviours in the various steps of maternal care-seeking (service utilisation, timing and intensity of care, provider type selection and cost of care).

Methods

Data source and study sample

The analysis is based on a nationally-representative survey of ever-married women aged 15-49 from the 2008 Egypt Demographic and Health Survey (EDHS). For the purpose of examining health-seeking behaviours related to maternal care, we assessed behaviours surrounding the most recent birth among women who reported having given birth in the 5-year period prior to the survey. This study was approved by the Research Ethics Committee of the London School of Hygiene and Tropical Medicine, UK.

Measures of socio-economic position

We defined and constructed latent variables of individual SEP (causal formative: education and occupation) and household-level SEP (effect-reflective: household assets and dwelling characteristics).

Health-seeking behaviour outcomes

Ante-natal care

Six outcomes describing the utilisation of ANC for the most recent pregnancy were assessed. A binary variable indicated whether the woman received any ANC during the pregnancy. If ANC was utilised, three binary variables described its characteristics in terms of timeliness (whether first ANC visit occurred in first trimester of pregnancy), intensity (whether regular ANC care, consisting of four or more visits during pregnancy, was received) and the type of medical provider approached for ANC care (any private or no private/all public). We created a binary variable reflecting whether the ANC service was free of charge or paid for. If the service was paid for, we analysed the continuous variable reflecting the amount paid.

Delivery care

We used four health-seeking behaviour outcomes to describe women's utilisation of delivery care. Firstly, a binary variable captured whether the most recent delivery in the 5-year recall period occurred in a health facility. Secondly, among the subset of women with facility deliveries, we examined the use of private providers for care. The cost of delivery service (excluding laboratory and medication expenses), as reported by women with a facility-based birth in the 12 months preceding the survey was analysed. We constructed a binary variable capturing whether delivery services were received for free and among women who reported paying for delivery service, a continuous variable was created reflecting the amount paid.

Statistical Analysis

Figure 1 shows the conceptual framework of the analysis in which individual-level SEP directly and indirectly (through household-level SEP) determines outcomes of the ten maternal health-seeking behaviours. In the descriptive overview of the sample, we accounted for the complex survey sampling (clustering, stratification and sample weights) by using the `svyset` command in Stata/SEv.13. Standardised continuous latent scores for both SEP variables were entered in the path analytic model, in order to jointly estimate the associations of SEP with each health-seeking behaviour outcome. The Stata *mediation* package was used for mediation analysis.¹⁵ The direct effect of SEP on binary outcomes was modelled in logistic regression (odds ratio as main effect estimate). The direct and total effect of SEP on the continuous outcomes (costs) were modelled using linear regression, with resulting effect estimates being linear regression coefficients.

Results

Overall, among women who reported a birth in the 5-year period preceding the 2008 survey, three quarters received some ANC and 72% delivered in a health facility. The results show that both individual and household-level SEP were directly and significantly associated with receiving any ANC and delivering in a health facility. The strongest direct effect of individual-level SEP was seen in models predicting the choice of private provider among both ANC and delivery facility users. Models predicting the likelihood of obtaining free maternal services showed that free public ANC and delivery care was, to some extent, provided to women of lower mean household-level SEP, but the association was not significant for delivery care. On the whole, however, the SEP gradients in utilisation patterns preceding receipt of free public care resulted in women with average levels of SEP obtaining this free public care. The fact that individual-level SEP is positively associated with receiving free care (significantly for ANC and marginally for delivery services) among users of public services may reflect on women's ability to obtain information about their entitlement to free care and successful negotiation of its application. Other than NGO providers, which constitute less than 5% of the private maternal care market, private providers would not be expected to provide care free-of-charge based on a woman's ability to pay. The results of our analysis confirm that among the small sample (<2% of private ANC and delivery care users) of women who reported receiving private maternal care for free, neither SEP variable was associated with the likelihood of receiving free care.

The costs of care reported by women differed depending on type of provider and care. We found that the average cost of a single ANC visit is an order of magnitude more expensive from private providers compared to public. The average cost of delivery services is five times higher in private compared to public facilities and the cost of a c-section delivery reached three times the cost of a normal delivery. A woman receiving minimum regular ANC care (four visits) and a c-section delivery would be expected to pay between 211 EGP (public care) and EGP 970 (private care) for the services; excluding laboratory charges, medications and indirect costs such as transportation, child-care and time away

from work. To put these amounts into perspective, 40.5% of Egypt's population was estimated to live below the upper poverty line in 2005, having an income of less than EGP 155 per person per month, of which EGP 83 per month was the estimated minimum expense for adequate food intake.¹⁶ Since this estimate was produced, the proportion of population living below this poverty line as well as instability of incomes have increased.¹⁷

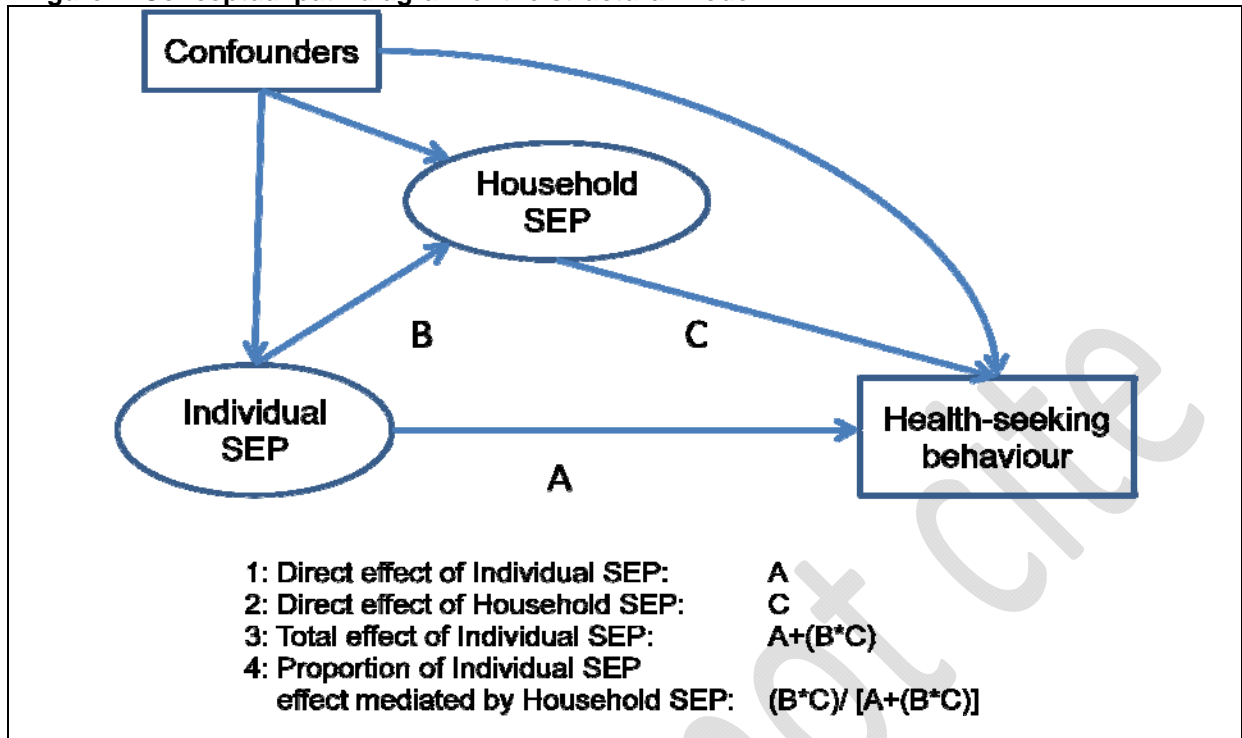
In order to target potential interventions to address the remaining gap in coverage of maternal interventions, detailed analysis of determinants for receiving maternal care is crucial. In this paper, we constructed a latent individual-level SEP variable capturing the socio-cultural capital of the woman whose maternal health-seeking behaviour is being evaluated in combination with that of her husband. The variable capturing household-level SEP reflected the latent construct of accumulated economic and financial capital available to household members to meet economic emergencies.^{18, 19} Together, they described the individual and household-level factors that are hypothesised to be associated with the process of choice related to pregnancy and delivery care, resulting in health-seeking behaviours.²⁰ Our conceptual framework was analysed with a path analysis that examined the effects of individual and household-level SEP on maternal care coverage, provider choice, as well as intensity and cost of care. The results of this study showed that in Egypt, a middle income country with success in decreasing the level of maternal mortality, socio-economic conditions remain significant predictors of progression through every step of maternal health-seeking behaviours. Such gradients act cumulatively, resulting in large inequities in maternal care coverage.

Conclusions

Inequities in health coverage play a significant role in gaps in maternal health coverage^{21, 22 23} and further improvements in indicators of maternal health outcomes are highly dependent on increasing coverage among the poorest and most disadvantaged segments of society.^{2, 24, 25} To our knowledge, this is the first analysis of socio-economic gradients in several consecutive maternal health-seeking behaviours in Egypt employing a formally specified mediation path analytic framework. The results show that although Egypt accomplished commendable increases in the coverage of essential maternal health interventions in recent decades, cumulative socio-economic gradients in coverage of basic maternal health interventions still exist. By analysing the effects of socio-cultural and economic resources separately, this analysis provides preliminary insights into the potential mechanisms through which socio-economic position determines health-seeking behaviours.

A systematic review of targeted interventions to improve maternal health among socio-economically disadvantaged populations in low and middle income countries, despite different study designs and interventions, showed that studies assessing coverage in ANC use and facility delivery suggest that various incentive schemes (cash transfers to women and/or providers, vouchers and general conditional cash transfers) have increased maternal care utilization.²⁶ This may mean that in contexts where health care is available, the effect of poverty and other forms of social disadvantage on inequalities in maternal health utilization can be augmented. In order to inform the design of effective interventions to reduce the remaining gradients in maternal care coverage, further research is needed. Analysis of quality of care and perceptions of benefits of different provider types would be particularly pertinent in light of the common occurrence of medical staff simultaneously practicing in both public and private sectors. Urgency of action may be heightened by an updated understanding of the social and economic impact of costs of maternal care on women and their families. Lastly, an exploration of other determinants of maternal care utilisation among socio-economically vulnerable women could help explore other remaining enabling factors or barriers to accessing maternal care.

Figure 1. Conceptual path diagram of the structural model



References

1. Barros AJD, Ronsmans C, Axelson H, et al. Equity in maternal, newborn, and child health interventions in Countdown to 2015: a retrospective review of survey data from 54 countries. *The Lancet* 2012; **379**(9822): 1225-33.
2. Victora CG, Barros AJ, Axelson H, et al. How changes in coverage affect equity in maternal and child health interventions in 35 Countdown to 2015 countries: an analysis of national surveys. *Lancet* 2012; **380**(9848): 1149-56.
3. Langer A, Horton R, Chalamilla G. A manifesto for maternal health post-2015. *Lancet* 2013; **381**(9867): 601-2.
4. Tabassum F, Chou D, von Dadelszen P, et al. Measuring maternal health: focus on maternal morbidity. *Bull World Health Organ* 2013; **TBD**.
5. World Health Organization. The World Health Report 2005: Make every mother and child count. Geneva: WHO, 2000.
6. Ashford L. Hidden Suffering: Disabilities from pregnancy and childbirth in less developed countries. Washington DC: Population Reference Bureau, 2002.
7. Campbell OM, Graham WJ. Strategies for reducing maternal mortality: getting on with what works. *Lancet* 2006; **368**(9543): 1284-99.
8. Campbell O, Gipson R, Issa AH, et al. National maternal mortality ratio in Egypt halved between 1992-93 and 2000. *Bulletin of the World Health Organization* 2005; **83**(6): 462-71.
9. World Health Organization, United Nations Children's Fund. Countdown to 2015: Building a Future for women and children - the 2012 Report (Egypt). 2012. http://www.countdown2015mnch.org/documents/2012Report/2012/2012_Egypt.pdf (accessed July 24, 2013).
10. Gipson R, El Mohandes A, Campbell O, Issa AH, Matta N, Mansour E. The trend of maternal mortality in Egypt from 1992-2000: An emphasis on regional differences. *Maternal and Child Health Journal* 2005; **9** (1): 71-82.
11. El-Zanaty F, Way A. Egypt Demographic and Health Survey 2008. Cairo, Egypt: Ministry of Health, El-Zanaty and Associates, and Macro International, 2009.
12. Gawayed H, Benova L. This is all Koosa: Health-seeking for children in a Cairo slum: Balancing need, money and mistrust. Health, Illness and Disease. Oxford, UK; 2009.
13. Singh-Manoux A, Clarke P, Marmot M. Multiple measures of socio-economic position and psychosocial health: proximal and distal measures. *International Journal of Epidemiology* 2002; **31**: 1192-9.
14. Hafeman DM, Schwartz S. Opening the Black Box: a motivation for the assessment of mediation. *International Journal of Epidemiology* 2009; **38**(3): 838-45.
15. Hicks R, Tingley D. Causal Mediation Analysis. *Stata Journal* 2011; **11**(4): 609-15.
16. World Bank. Arab Republic of Egypt: Poverty Assessment Update. Egypt: Social and Economic Development Group, Middle East and North Africa Region, The World Bank, 2007.
17. Breisinger C, Al-Riffai P, Ecker O, et al. Tackling Egypt's Rising Food Insecurity in a Time of Transition. Cairo, Egypt: IFPRI, WFP, Cairo University, 2013.
18. Ichoku HE. On the use of socioeconomic status indicators in the analysis of health inequalities and poverty in Africa. *Journal of International Development* 2011; **23**: 1004-12.
19. Shavers V. Measurement of socioeconomic status in health disparities research. *Journal of the National Medical Association* 2007; **99**(9): 1013-23.
20. Lynch J, Kaplan G, Salonen J. Why do poor people behave poorly? Variation in adult health behaviors and psychological characteristics by stages of the socioeconomic life course. *Social Science & Medicine* 1997; **44**: 809-19.
21. Boerma JT, Bryce J, Kinfu Y, Axelson H, Victora CG. Mind the gap: equity and trends in coverage of maternal, newborn, and child health services in 54 Countdown countries. *Lancet* 2008; **371**(9620): 1259-67.

22. Thomsen S, Hoa DT, Malqvist M, et al. Promoting equity to achieve maternal and child health. *Reprod Health Matters* 2011; **19**(38): 176-82.
23. Bustreo F, Say L, Koblinsky M, Pullum TW, Temmerman M, Pablos-Méndez A. Ending preventable maternal deaths: the time is now. *The Lancet Global Health* 2013: doi:10.1016/S2214-109X(13)70059-7.
24. Mechanic D. Disadvantage, Inequality, And Social Policy. *Health Affairs* 2002; **21**(2): 48-59.
25. Mumtaz Z, Salway S, Bhatti A, McIntyre L. Addressing invisibility, inferiority, and powerlessness to achieve gains in maternal health for ultra-poor women. *The Lancet* 2013; [http://dx.doi.org/10.1016/S0140-6736\(13\)61646-3](http://dx.doi.org/10.1016/S0140-6736(13)61646-3).
26. Malqvist M, Yuan B, Trygg N, Selling K, Thomsen S. Targeted interventions for improved equity in maternal and child health in low- and middle-income settings: a systematic review and meta-analysis. *PLoS One* 2013; **8**(6): e66453.

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