PROXIMATE DETERMINANTS OF FERTILITY IN MONGOLIA: AN UPDATE USING THE 2008 REPRODUCTIVE HEALTH SURVEY

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Abstract

This short paper extends a previous analysis of fertility changes in Mongolia during the 1990s and early 2000s with the latest data from the 2008 Reproductive Health Survey of Mongolia. Since the previous survey conducted in 2003, Mongolia experienced important fertility changes. After having reached its historical nadir in 2005 with 1.95 children per woman, total fertility has been increasing since then and reached 2.69 children per woman in 2009. Applying the classical proximate determinants of fertility framework, this paper contributes to document and understand further the recent fertility increase in the country. The results indicate that the Mongolian women are increasingly controlling their reproduction using modern contraceptives and are becoming fully aware of its benefits.

Key words: Fertility changes; Proximate determinants; Mongolia

1. Introduction

After having reached for the first time in history a below-replacement level in 2003, total fertility kept declining during the two successive years and reached 1.95 children per woman in 2005 (NSO, 2006). Facing this historical minimum, the Government of Mongolia decided to react and adopted from January 2006 a series of social assistance and allowances programmes with the double objective of reducing poverty and sustaining population growth (for details see Spoorenberg & Enkhtsetseg, 2009). As a likely result, total fertility has been increasing, reaching 2.07 children per woman in 2006, 2.30 in 2007, 2.59 in 2008 and 2.69 in 2009 (NSO, 2007, 2008, 2009, 2010).

While these fertility changes have been analyzed in relation to the recent fertility incentives and family supports that the Government of Mongolia has adopted (Spoorenberg & Enkhtsetseg, 2009), the factors that contributed to shape fertility levels have not been addressed so far. The aim of this short paper is to apply the proximate determinants of fertility framework to the latest data from the 2008 Reproductive Health Survey of Mongolia (hereafter 2008 RHSM) in order to document further the changes in the factors that shape recent fertility level in the country. Proximate determinants of fertility computed from the 2008 RHSM data are put in perspective with the results of a previous study of the determinants of fertility level during the 1990s and early 2000s (Spoorenberg, 2009). The results confirm the trends at work that shape fertility level and add useful knowledge to understand better the recent fertility changes observed in the country.

2. Model

In a seminal article, Bongaarts (1978) has proposed a simple model to understand the variation in fertility levels. In his model, the maximum level of fertility (total *fecundity* rate (*TF*)) is reduced by an increased age at first marriage and marital dissolution, contraception, induced abortion and postpartum infecundability resulting from breast-feeding and postpartum abstinence. Bongaarts developed four indices that allow quantifying the fertility-inhibiting effect of the principal proximate determinants: C_m, the index of female proportion married; C_c, the index of contraception; C_a, the index of induced abortion; and C_i, the index of

postpartum infecundability. Each index ranges between 0 and 1, with 0 indicating a complete fertility-inhibiting effect and 1 no fertility-inhibiting effect. The observed fertility level in a population (total fertility rate (*TFR*)) is achieved as a multiplication of the four indexes and the total fecundity rate (*TF*):

$$TFR = C_m \cdot C_c \cdot C_a \cdot C_i \cdot TF \qquad (1)$$

Due to the fertility-inhibiting effect of the proximate variables, the observed fertility rate (*TFR*) is lower than the estimated theoretical maximum level comprised between 13 and 17 children per woman (with an average of 15.3). In absence of the fertility-inhibiting effect of the proximate determinants (i.e. all indexes equal 1 (all women of reproductive age are married (C_m = 1); contraception and induced abortion are removed (C_c and C_a = 1); and breastfeeding is not practiced (C_i = 1)), the observed fertility rate (*TFR*) will reach the theoretical maximum level of fertility (*TF*).

Because the proximate determinants of fertility framework is one of the most widely tools applied to study fertility and fertility change and it has been presented and illustrated in numerous publications (among many, Bongaarts, 1978, 1982; Bongaarts & Potter, 1983; Bongaarts et al. 1984; Stover 1998; Erfani & McQuillan, 2008), the specific computational formulas for each index will not be repeated in details here. Because in this paper the results from the 2008 RHSM data are compared to results for the 1990s and early 2000s, the present analysis is identical to the procedure followed by Spoorenberg (2009). An appendix section gives however the data used to compute the indexes from the 2008 RHSM.

While the proximate determinants of fertility framework is one of the most widely tools applied to study fertility and fertility changes, it has been applied to understand the contribution of the proximate variables mainly in a context of *fertility decline*, as nicely illustrated in Bongaarts (1982). The present analysis applies however the proximate determinants of fertility framework to understand further a fertility increase.

Data

The fertility-inhibiting effects of the intermediate variables are measured based on the Reproductive Health Survey of Mongolia data collected in 2008 by the National Statistical Office of Mongolia with technical and financial help of the United Nations Population Fund (UNFPA) (NSO, UNFPA & MOH, 2009). The 2008 RHSM is the third country representative Reproductive Health Survey (RHS) conducted in Mongolia (the first and second RHS were conducted in 1998 and 2003 (NSO & UNFPA, 1999, 2004). Based on a selection of 8,400 households (8,382 households were actually surveyed), corresponding to 1.3 per cent of all households in the country, 9,585 women of reproductive ages (i.e. age 15-49) who were present in the household on the night prior to the date of the survey were eligible for interview and 9,402 women were actually interviewed. Data were collected during face-to-face interviews between 20 September and 28 December 2008 (NSO, UNFPA & MOH, 2009).

3. Findings and Discussion

Based on the four indexes computed from the 2008 RHSM and the total fecundity (*TF*), the total fertility rate in Mongolia is (information on the computation of the indexes is given in Appendix):

$$TFR = C_m \cdot C_c \cdot C_a \cdot C_i \cdot TF$$

$$TFR = 0.57 \cdot 0.45 \cdot 0.89 \cdot 0.83 \cdot 15.3 = 2.9$$

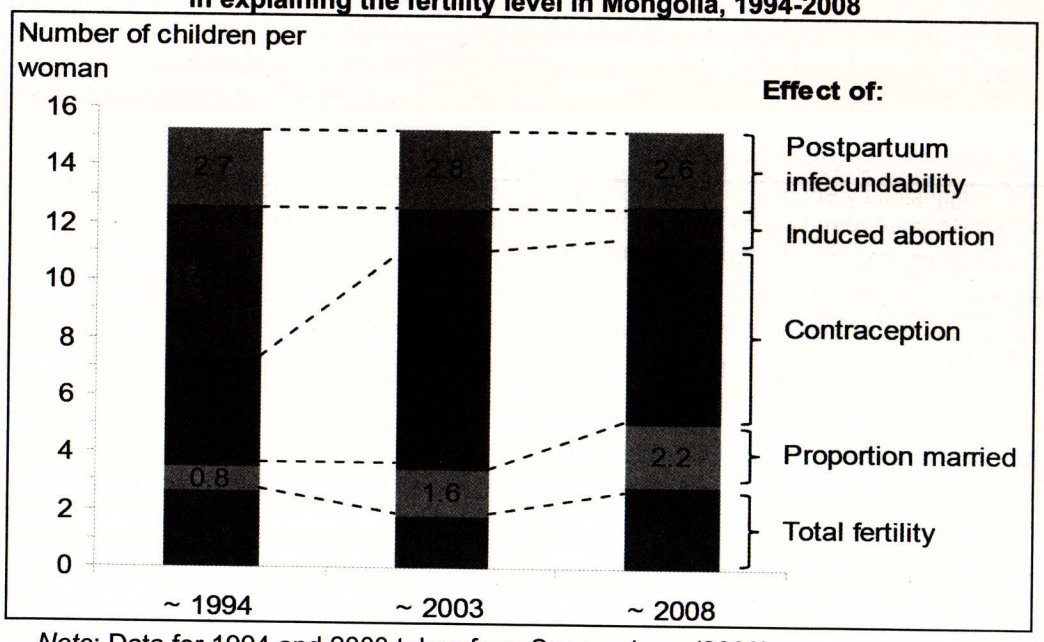
Using a logarithmic transformation, the index of proportion married (C_m) and the index of contraception (C_c) contribute to explain together 82 per cent of the fertility level in Mongolia in 2008 (respectively, 33.6 per cent for C_m and 48.4 per cent for C_c). The index of abortion (C_a) and the index of postpartum infecundability (C_i) contribute for the remaining 18 per cent. With a contribution of less than 7 per cent, abortion plays the smallest role in the explanation of fertility level in the country.

The comparison with the proximate determinants of fertility for 1994 and 2003 (Spoorenberg 2009) allows considering the changes affecting reproduction in Mongolia over the last 15 years *(Figure 1)*. Since the early 1990s, changes in the fertility level went along a re-distribution in the contribution of the proximate determinants of fertility. While postpartum infecundability has remained stable (certainly reflecting strong cultural

values and practices), the contributions of marriage, contraception, and abortion were modified quite substantively.

Results from the 2008 RHSM indicate that the recent fertility increase in Mongolia is the by-product of a reduction in all proximate determinants. But the fertility effect of postpartum infecundability and abortion (i.e. the number of children these factors contribute in determining the fertility level) have remained almost stable between 2003 and 2008, varying by only -0.2 and -0.1 children per woman respectively. On contrary, the proportion of married women and the use of contraception have contributed the most to the recent fertility increase in the country.

Figure 1: **Changing contribution of the proximate determinants of fertility in explaining the fertility level in Mongolia, 1994-2008**



Note: Data for 1994 and 2003 taken from Spoorenberg (2009).

The fertility increase observed over the recent years in Mongolia has been the result of a small increase in the index C_m (from 0.532 in 2003 to 0.573 in 2008), indicating that more women of reproductive age were getting married (to recall, an index C_m of 1 indicates that all women of reproductive age are married) and therefore that marriage still remains an important way of controlling access to reproduction in Mongolia.

Besides marriage, the use of contraception presents the largest reduction in its fertility effect (-1.2 children per woman since 2003). The index C_c has increased from 0.315 to 0.448 between 2003 and 2008, indicating that over the most recent years more women have decided to stop using contraceptives in order to become pregnant.

The fact that both marriage and the use of contraception have contributed the most to the recent fertility increase in Mongolia confirms that Mongolian women are increasingly controlling their reproduction and are becoming fully aware of its benefits.

The changes in the proximate determinants of fertility observed between 2003 and 2008 confirm the modifications identified during the 1990s and early 2000s (Spoorenberg, 2009) and show that abortion as a mean to control fertility keeps declining in Mongolia, possibly bringing to an end a practice that has been widely in use in Mongolian society (Neupert, 1993; Pandey 1997, 2002). However, the very little fertility effect of abortion in the recent fertility increase shows also that abortion still represent for a number of Mongolian women an alternative to control their childbearing. In the absence of recent studies on abortion in Mongolia, it is hard however to understand fully the 'use and practice' of abortion in the country. Clearly, more studies are needed on this very topic in Mongolia.

Appendix. Information on the computation of the indexes

Index of proportion married (C_m)

Table A1: **Calculation of the index of proportion married C_m, Mongolia, 2008**

Age group	Proportion of currently 'in couple' women aged 15-49 $m(a)$	Age-specific marital fertility rate (ASMFR) $g(a)$	$m(a)\cdot g(a)$
15-19	0.065	0.19061[a]	0.01241
20-24	0.588	0.25414	0.14955
25-29	0.832	0.16236	0.13514
30-34	0.876	0.10080	0.08832
35-39	0.872	0.05518	0.04812
40-44	0.801	0.01402	0.01123
45-49	0.791	0.00149	0.00118
Total		0.77860	0.44594
	$C_m = \sum m(a)\cdot g(a) / \sum g(a)$ = 0.44594/0.77860 =	0.573	

Note: [a] As suggested by Bongaarts (1978: 130), the value of $g(15–19)$ was calculated as $0.75 \cdot g(20–24)$. The $m(a)$ values are calculated based on the number of women 'married' and 'living together' at the time of the survey.
Source: All values are computed from the 2008 RHSM.

Index of abortion C_a

Based on the women's experience of abortion during the five years before the 2008 RHSM survey, the total abortion rate (*TA*) reaches 0.6. Using this *TA* value in the calculation of the index of abortion gives an estimated C_a of 0.893.

Index of postpartum infecundability C_i

Following the formulas and the choices concerning the use of data on the duration of postpartum amenorrhea instead of data on duration of breastfeeding made by Spoorenberg (2009: 615-616), the fertility-inhibiting effect of postpartum infecundability (index C_i) is estimated to be 0.830 in 2008. According to the 2008 RHSM, mean duration of postpartum amenorrhea reaches 5.59 months.

Index of contraception (C_c)

Table A2: **Calculation of the index of contraception C_c, Mongolia, 2008**

Contraceptive method	Proportion of 'married' women aged 15-49 using contraceptive method $u(m)$	Method-specific use-effectiveness levels of contraception method $e(m)$	$u(m)\cdot e(m)$
Pill	0.0973	0.9	0.0876
IUD	0.2234	0.95	0.2122
Injections	0.0791	0.99	0.0783
Implants/Norplant	0.0021	0.99	0.0021
Diaphragm/Foam/Jelly	0.0004	0.85	0.0004
Condom (male & female)	0.0673	0.9	0.0606
Sterilization (male & female)	0.0264	1.0	0.0264
Periodic abstinence	0.0513	0.8	0.0411
Withdrawal	0.0033	0.7	0.0023
Other	0.0010	0.3	0.0003
Total	0.5516		0.5111
$e = \sum e(m)\cdot u(m)/u$		0.9266	
$C_c = 1 - (1.08\cdot u\cdot e)$		0.448	

Note: The values of $u(m)$ were calculated based on the number of 'married' and 'living together' women aged 15-49 at the time of the survey. *Source*: $u(m)$ computed from the 2008 RHSM; $e(m)$ taken from Bongaarts and Potter (1983: 84)

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