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Population Council

One Dag Hammarskjold Plaza
New York, New York 10017 USA
www.popcouncil.org
pubinfo@popcouncil.org

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Sajeda Amin

Bussarawan Teerawichitchainan

Sajeda Amin is Senior Associate, Poverty, Gender, and Youth Program, Population Council, New York. E-mail: samin@popcouncil.org.

Bussarawan Teerawichitchainan is Assistant Professor of Sociology, School of Social Sciences, Singapore Management University. Email: bteerawichit@smu.edu.sg

ABSTRACT

Southeast Asia's rapid economic growth and demographic change have brought divergent fertility behaviors, particularly those of socially excluded groups, into sharper focus. In Vietnam, while the majority Vietnamese and ethnic Chinese, who together account for 85 percent of the country's population and benefit the most from the country's economic progress, have achieved replacement fertility, certain ethnic minority groups still have total fertility rates exceeding 4. This paper explores proximate determinants of fertility across ethnic groups using a new classification system for ethnicity in Vietnam based on poverty indicators, location, and degree of assimilation of ethnic groups. We decompose components of fertility behavior to identify factors that may affect variations by ethnic groups. We draw primarily on the 2001 Vietnam National Health Survey data to estimate the influences of marriage timing, deliberate fertility control, postpartum infecundability, and induced abortion. Low fertility among the majority Vietnamese and ethnic Chinese is accompanied by high prevalence of contraceptive use and abortion. For the ethnic groups that have higher fertility, two major contributors are earlier childbearing and lower rates of abortion due to strong ideological opposition. Our evidence suggests that population policies will need to extend beyond provision of contraception and abortion services to address the question of early childbearing among minority groups. Programs that address a broad set of related issues such as expanded opportunities for young people to delay marriage need to become integral to population policy.

Many countries in Southeast Asia have experienced rapid economic growth and approached replacement fertility by the year 2000. When rapid economic growth is accompanied by demographic and social change, the fertility behaviors of socially excluded groups may become a cause for concern, and divergent fertility behaviors by region and ethnicity come into sharper focus (Agadjanian, 1999; Fischer, 2008). Vietnam is one of the countries of Southeast Asia that reached below-replacement fertility during a time of spectacular economic growth. The country's economy has sustained annual growth rates of gross domestic product (GDP) exceeding 5 percent since 1990. The total fertility rate for the country as a whole declined from 3.6 births per woman in 1990 to 2.1 births in 2005. While the fertility of the majority Kinh population reached 1.5 births per woman, fertility remains higher among the 15 percent of Vietnam's population that belong to ethnic minority groups.

Higher fertility is one of several indicators of deprivation and social exclusion among minority communities (Baulch et al., 2004; van de Walle and Gunawardena, 2001; Swinkels and Turk, 2006). Poverty levels in general are high among these same minority groups, as are poor schooling and health indicators. While there is now some agreement that the disadvantaged position of Vietnam's ethnic minorities is not solely attributable to their residence in remote mountainous areas, less is known about other circumstances responsible for continued lower living standards and well-being among minority groups.

This paper explores the proximate determinants of fertility across ethnic groups using a new classification system for ethnicity in Vietnam based on poverty indicators, location, and degree of assimilation of ethnic groups. We decompose components of fertility behavior to identify factors that may affect variations by ethnic group. We draw primarily on data from the 2001 Vietnam National Health Survey to estimate the influences of marriage timing, deliberate fertility control, postpartum infecundability, and induced abortion. Sufficient heterogeneity exists among ethnic minorities to warrant further differentiation among the various groups. Fertility is low and comparable to the Kinh in two of the five groups examined. For the groups with higher fertility, two major contributors are earlier childbearing and lower rates of abortion as a result of strong ideological opposition. In addition, evidence on the patterns of variation in contraceptive behavior suggests a lesser role for contraceptive use in explaining the observed variability. There is little difference in levels of postpartum infecundability or breastfeeding behavior by ethnic group.

Our analysis suggests that population policies will need to extend beyond provision of contraception and abortion services to address the question of early childbearing among some minority groups. Programs that address related issues such as expanded opportunities for young people to delay marriage need to become integral to population policy. Within health and family planning programs, expanding choice of options has potential for encouraging a fertility regime that will promote well-being among minorities.

BACKGROUND

Vietnam's fertility transition has been remarkable in terms of the rapid pace of decline and the low levels achieved at relatively early stages of economic development. In the early phase of fertility decline, demographic changes were attributed to the socialist government's ongoing support for subsidized health care and family planning services. In the later phase, these declines continued even as the economy underwent a transformation from a centrally planned to a market economy, which resulted in the weakening of government controls and cutbacks in health services. Since the mid-1990s, Vietnam has experienced accelerated economic growth and extensive efforts at poverty reduction, and fertility continued its downward trend to replacement levels. The sustained drop in fertility was accompanied by a parallel rise in contraceptive use and abortion prevalence (Haughton, 1997).

Despite this overall fertility decline, current rates vary widely across the country's 54 ethnic minority groups (Figure 1). For example, the majority Vietnamese (Kinh) and ethnic Chinese, who together account for 85 percent of Vietnam's 86 million total population and benefit most from the country's economic growth, have total fertility rates of 1.9 and 1.5 births per woman respectively. Meanwhile, minority groups in the Northern Uplands such as the Dao and Hmong, who are considerably poorer, have total fertility rates of 3.6 and 7.1 births per woman respectively (Table 1).

In Vietnam the welfare of ethnic minority communities has recently become the focus of programs on poverty both because they constitute a substantial portion of the population and because they bear a disproportionate poverty burden. Minority groups differ greatly from one another in their levels of development and assimilation with the majority Kinh (Baulch et al., 2004). Nevertheless, most studies tend to lump ethnic minorities into one group (except the ethnic Chinese, who are included with the Kinh because of their relatively high living standards). This is mainly because nationally representative surveys do not adequately sample distinct minority groups to allow appropriate levels of disaggregation.

For historical reasons many if not most of the ethnic minority populations live in isolated and inaccessible mountain regions, hence policy measures include removing barriers to access to services. Roads, schools, and health centers have been built in remote areas, especially after 2000 following the implementation of pro-poor policies such as P135 and others.[1] A recent article exploring ethnic differences in remote areas found that social and economic differences between the Kinh and non-Kinh remain and in some cases have been exacerbated during periods of economic growth (van de Walle and Gunawardena, 2001). The authors conclude that these differences arise in part out of past discrimination or treatment in access to various services. Differences in health and education may also be related to adaptive behaviors among minority groups to accommodate a presumption of continued discrimination (Teerawichitchainan and Phillips, 2008). If labor markets discriminate against minorities, adaptive behavior choices include entering traditional occupations that entail home cultivation and may motivate early childbearing. These same occupations often also require less education.

Minority groups may also demonstrate a proclivity to engage in occupations such as ethnic tourism or handicrafts where they have exclusive access and that also allow members to live in close-knit social groups that further reinforce traditional family values and large families.

The current economic and social status of minority ethnic groups may also be partially related to a large-scale population resettlement policy enacted by the Vietnamese government. In 1976 an ambitious plan was undertaken to relocate approximately 20 percent of the population from densely populated urban areas and the Red River Delta to more sparsely populated regions (Desbarats, 1987). Another goal of the plan was to move 1.5 million minority inhabitants from inaccessible mountainous regions to lowland areas, called "New Economic Zones," that were more amenable to infrastructural development. Because the resettlement plans had the multiple purpose of national reunification and resettlement of refugees displaced by war, these zones were often a mix of ethnic minorities, refugees, resettled residents of Saigon, and ethnic Khmer refugees from Cambodia (ibid., p. 55). Under a specific policy for the settlement of nomads, lowland populations from the north were brought in. In some parts of the country, these relocations included allotments of commercial agricultural land.

A full exploration of factors explaining ethnic differentials needs to assess factors that influence fertility as well as programmatic factors that influence access to health and family planning services. In particular there is a need to assess the relative contributions of factors affecting childbearing, such as mother's age at first birth, onset and patterns of breastfeeding, and fertility limitation within marriage.

DATA AND ANALYTICAL APPROACH

This study is based primarily on the 2001 Vietnam National Health Survey conducted by the Ministry of Health and the General Statistical office. The large sample size, oversampling of minority populations in the Northern Uplands, and high-quality nationally representative data permit examination of ethnic diversity in Vietnam in a way not allowed by previous survey designs.

We also use qualitative data from the 2006 Ethnic Minority Youth and Family (EMYF) study to propose hypotheses for why certain ethnic minorities have higher fertility levels than other minority groups and the Kinh majority. The EMYF study was carried out by the authors in collaboration with Thai Nguyen Medical University in two remote mountainous communes in Thai Nguyen Province in Vietnam's Northern Uplands (for a full description see http://www.popcouncil.org/projects/TA_VietnamSurvey.html). One of the primary objectives of this study is to assess knowledge, attitudes, and practices related to sexual and reproductive health among Kinh, Dao, and Hmong populations aged 15–29 in comparison with their parents' generation. The study also takes into account the varying levels of socioeconomic assimilation and economic development among ethnic minorities in different geographic locations.

Our ethnic classification scheme attempts to address Vietnam's ethnic diversity. Baulch and colleagues (2004) classified Vietnam's population into five ethnic groups—

Kinh, ethnic Chinese, and minorities in the South, Central Highlands, and Northern Uplands—using criteria such as poverty level and per capita household expenditure (see Table 2). In this study, we slightly modify their classification, dividing the population into the following five groups: 1) Kinh-Chinese; 2) Tay, Thai, Muong, Nung (TTMN); 3) and ethnic minorities (EM) in the South; 4) the Northern Uplands; 5) and the Central Highlands.

The main modification is to disaggregate the minorities in the Northern Uplands on the basis of our observations from the aforementioned study in Thai Nguyen Province. The Tay, Thai, Muong, and Nung (TTMN) reside predominantly in the Northern Uplands and are more economically assimilated to the Kinh than are other minority groups (e.g., Dao and Hmong) from the same region. Table 3 shows the distribution of married women aged 15–49 according to our five major ethnic categories. The number of respondents appears to be adequate for further analysis of ethnic fertility differentials.

Our purpose here is to assess the relative contributions to overall fertility of marriage, contraception, postpartum infecundability, and abortion for each of the five ethnic groups. Further, we seek to determine whether the observed total fertility rates based on the 2001 VNHS are consistent with the predicted rates based on the Bongaarts proximate determinant model. We then assess the values of the proximate determinants and their contribution to ethnic fertility differentials.

A parsimonious model such as the one proposed by Bongaarts (1978) is appropriate for our research questions and the data at hand. The modest data requirements of the Bongaarts model allow us to explore a range of factors while maintaining an informative level of disaggregation. In the next section we present the results of the decomposition followed by a discussion of the contribution of each of the proximate determinants of fertility. Conclusions and policy recommendations follow.

RESULTS

We begin by exploring ethnic differences in age patterns of fertility shown in Figure 1. In general all ethnic groups in Vietnam have higher fertility at every age relative to the majority Kinh and Chinese. The fertility differentials are driven by large differences in the age group with the highest fertility, beginning with the 20–24 age group. Fertility differences at younger ages are negligible. The age pattern of the Tay, Thai, Muong, and Nuong (TTMN), who are closest to the Kinh in overall levels, is particularly distinctive in having high early-age fertility that drops rapidly after age 30. Age patterns and levels of fertility vary considerably among the other ethnic minorities.

Table 4 summarizes results of our decomposition exercise, described further in the Appendix. The decomposition allows us to identify the relative contributions of marriage timing, contraceptive behavior, abortion, and biological subfecundity (driven primarily by breastfeeding). All indexes of these proximate determinants are inversely related to fertility. The last two columns show predicted fertility from the model compared to actual fertility from the data, indicating that the model fits well and predicts actual fertility closely for three of the five groups. These data confirm, first, the

considerable differences in fertility among minority groups observed in age-specific fertility patterns shown in Figure 1. While the TTMN and ethnic minorities in the South have fertility levels below replacement levels and only marginally different from the majority, the ethnic minorities in the Northern Uplands and Central Highlands have considerably higher fertility.

Marriage timing

There is considerable variation in the age pattern of marriage for women by ethnic group (Figure 2 and Appendix Table A1). While the Kinh, Chinese, and ethnic minorities in the South tend to marry relatively late, marriage patterns of the other minority groups are early with more than 60 percent of women married by ages 20–24. Among the Hmong (one of the Northern Uplands ethnic minority groups) the pattern is particularly early with 85 percent married by ages 20–24. Age differences between spouses in these Hmong communities are typically small and marriage age is relatively early for men as well (data not shown).

Early marriage has direct implications for exposure to childbearing that can lead to higher cumulative fertility over the lifespan. To assess the impact of marriage timing on fertility, we compare the marriage index (C_m) across ethnic groups. Values for C_m show that marriage timing is particularly important as a determinant of overall fertility among the ethnic minorities in the Northern Uplands (Table 4). For the majority Kinh, ethnic Chinese, and the TTMN, on the other hand, delayed marriage has a substantial fertility-depressing impact. Fertility outside marriage is not socially acceptable and hence occurs rarely.[2] On average, ethnic minority couples marry at young ages relative to the Kinh, but the age pattern of ethnic minorities in the South is comparable to the Kinh-Chinese (Figure 2). While marriage occurs relatively late among the Kinh and ethnic Chinese, it is universal. Thus the marriage index is consequential for fertility in the early years of childbearing and particularly at the peak ages of fecundity.

Our qualitative data from the EMYF study in a Northern Uplands community confirm the general contrast between the TTMN, who have later marriage patterns like the Kinh, and the Hmong and Dao, who marry early. The Hmong marry early both because it is a cultural preference and because their occupational patterns and lifestyles allow such a marriage regime. Studies comparing Asian ethnic populations living in the United States have documented that relative to other ethnic groups such as the Lao or Khmer, Hmong communities tend to continue following family-building patterns characterized by early marriage and early childbearing (Hutchison and McNall, 1994) but are able to reconcile these patterns with high educational aspirations for girls. Hmong girls in the United States who married early continued their education with support from their extended families.

Contraceptive use

Contraceptive use is generally high but varies by ethnic group. Table 5 shows that contraceptive use rates exceed 60 percent for all ethnic groups. These rates are among the

highest in the world, and reported levels are high enough to have raised some skepticism about data quality (Haughton, 1997). The IUD is the most widely used modern method among all ethnic groups, with most women having the method inserted at a local commune health center.

Teerawichitchainan and Amin (2009) analyzed determinants of contraceptive behavior and demonstrated that ethnic variations in contraceptive use remain after controlling for geographic location and various health access variables. After controlling for these differences, significant variation is seen in patterns of modern and traditional method use. In models that control for household poverty, education, and health care access, the analysis showed that the Kinh, Chinese, and the TTMN minorities are much more likely to report use of both modern and traditional methods of contraception, with the TTMN more likely to use modern methods than the Kinh and Chinese. The other ethnic groups have significantly lower rates of modern and traditional method use.

Education strongly influences contraceptive use, with use of both modern and traditional methods rising with increasing levels of education. On the other hand, the poor are significantly less likely to use traditional methods, whereas the poverty differential in modern method use is not significant. The quality and accessibility of health services have important implications for modern contraceptive use, but, as may be expected, have relatively little impact on use of traditional methods.

In our study villages in the Northern Uplands, married women can obtain contraceptives free of charge from family planning volunteers who live in the village. The volunteers receive their supplies from the commune health center and are required to maintain a roster of all households in their village indicating whether couples use a method and, if so, which one. In addition to providing supplies, usually birth control pills and condoms, volunteers are also required to advise their clients on proper method use and to motivate those who are not users.

Before the implementation of contraceptive distribution by village volunteers in the 1990s, the main method in the study villages was the IUD, inserted by teams of traveling health workers through mobile clinics. Women had the option of traveling to Thai Nguyen city, now about four hours away by motorbike, but seldom did so because there were no proper roads and the terrain was rough. Some of the village elders, mainly Kinh, reported that prior to the introduction of modern methods such as the pill, condoms, and the IUD, it was common to rely on the rhythm method, withdrawal, and medicinal herbs but not necessarily with the appropriate level of knowledge or accuracy.

When modern methods first became available there was some resistance to and suspicion of them, although such resistance appears to have largely disappeared in the study area. In addition to supplies of IUDs from family planning volunteers, other methods are now commonly available at drug stores in the more developed villages of the commune. The IUD and pill are commonly associated with significant side effects, often compelling women to switch methods or to stop use. Women who stop using birth control have the option of getting an abortion. In the past abortions (also known as menstrual regulation in the case of termination in the first five weeks of pregnancy) were

performed at the commune level. Currently, women seeking abortion are referred to a higher-level health facility in the nearby district town of Dinh Ca.

Family planning volunteers report that condoms are not popular in their communities. Even when men are aware of significant side effects suffered by their partners, they are unwilling to use condoms because birth control is considered a woman's responsibility. Such resistance appears to be stronger among ethnic minority groups than among the Kinh. Another factor that appears to have emerged as a deterrent to condom use for family planning is its promotion as a form of protection against sexually transmitted infections. Some men and women think that using a condom is tantamount to confessing infidelity and prostitution.

Abortion

As shown in Table 4, the index of abortion suggests that abortion has the strongest influence on the fertility of the majority Kinh and Chinese and has a negligible influence among ethnic minorities in the Northern Uplands and Central Highlands. Total abortion rates are 0.68 and 0.80 abortions per woman among the Kinh-Chinese and the TTMN respectively, whereas rates are much lower among the rest of the minority population (see Appendix Table A4). Qualitative data suggest considerable variation in attitudes toward and acceptance of abortion, with ethnic minorities other than the TTMN generally being reluctant to resort to abortion to terminate a pregnancy.

In the VNHS users of traditional methods reported a higher rate of unwanted pregnancies, with almost one-third of women who were currently using a traditional method reporting they had had an unwanted pregnancy in the five years before the survey. Teerawichitchainan and Amin (2009) argue that variation in reports of unwantedness by ethnicity may be driven by differences in the use of abortion. It is unlikely that the use of modern methods is independent of attitudes toward abortion (Bongaarts and Westoff 2000). Ethnic groups that are more strongly opposed to abortion may be more motivated to use modern methods such as the IUD and the pill.

Our fieldwork suggests that while family planning is widely accepted and easily accessible for both Kinh and ethnic minorities in the study area, their attitudes toward induced abortion are quite different. In the event of unwanted pregnancy, Kinh (and the TTMN in our study area) are more likely to resort to induced abortion, particularly for reasons of economic necessity.

Postpartum infecundability

The index of postpartum infecundability is determined primarily by the prevalence and duration of breastfeeding. Data on breastfeeding collected in the VNHS and the VNDHS suggest most women breastfeed their children for relatively long durations, a fact that finds support in qualitative data from Vietnam (Morrow 1996). According to the VNHS, the average duration of breastfeeding among Vietnamese women is 17 months. Breastfeeding duration is slightly shorter among the Kinh-Chinese than among minority populations. Minority mothers in the Central Highlands reported the

longest length of breastfeeding at an average of 22 months per child (see Appendix Table A5). The fact that mean duration of breastfeeding reported in the 2001 VNHS is longer than was shown in earlier surveys could be due in part to the government's continued advocacy of feeding newborns exclusively with breast milk (UNICEF 2008), thus involuntarily suppressing women's fertility

CONCLUSIONS

This analysis shows substantial variation in proximate determinants of fertility between ethnic minority groups that warrants further exploration to inform national and regional population policy. Most noteworthy is the fact that observed fertility levels among two of the larger, more assimilated groups—the Tay, Thai, Muong, and Nung (TTMN) in the North and ethnic minorities in the South—are rapidly approaching levels of fertility observed among the Kinh and Chinese. The influence of age at marriage on fertility is similar, with relatively late marriage observed both among these ethnic minorities and among the majority Kinh and Chinese. Contraceptive levels are high, with some of the minorities being even more likely than the Kinh to use modern contraception. This is reflected in lower age-specific fertility at older ages, which compensates for slightly earlier childbearing among some ethnic minority groups.

Fertility levels are highest among other (non-TTMN) ethnic minorities in the Northern Uplands and the Central Highlands. For both of these groups higher fertility is attributable to earlier marriage, low rates of abortion, and, to some extent, the non-use of contraception. Although prevalence of contraceptive use is low relative to the TTMN and the majority Vietnamese, overall reported levels of contraceptive use in the Northern Uplands and Central Highlands is high by global standards. Reported IUD use is particularly high and traditional method use is low. It is possible that there is some level of over-reporting and that use-effectiveness even among users of modern methods is low because of high rates of discontinuation (Do and Koenig, 2007). Relative to the rest of Vietnam, where abortion is common, the low rates of abortion among ethnic groups in the Northern Uplands and Central Highlands are striking. Also striking are their early ages at marriage and childbearing. The qualitative data show considerable aversion to abortion among the Hmong, who also have the country's highest fertility rates. Thus, population policies that aim to alter fertility behavior need to address a range of issues that can affect motivations for early marriage and childbearing as well as access to services. Recent projections that Vietnam is on track to achieve the Millennium Development Goals at the national level have called attention to poorer social development indicators among ethnic minorities. Attempts to address the specific needs of ethnic minority populations have focused on reducing maternal mortality and improving child health (UNFPA, 2007), in particular calling on health care services to cater to minority youth who may lack appropriate knowledge about accessing services. In addition to such a reorientation of the target groups within the health sector, a broadening of population policy should also take into account the substantially earlier marriage patterns that determine exposure to childbearing and that are not addressed by policies to

increase access to services. Although education and labor force participation are widely acknowledged factors that can delay marriage and childbearing, there is considerable evidence that educational and occupational opportunities are sorely lacking among high-fertility ethnic minority groups.

NOTES

1 Introduced in 1998, Program 135 (P135) is one of Vietnam's major pro-poor social programs that focus on developing commune- and village-level infrastructure (e.g., roads, electrification, safe water supply, health facilities) and supporting agricultural extension in selected communes. In 2005, P135 was implemented in 2,374 communes in 52 provinces throughout Vietnam.

2 Our in-depth interviews as part of the EMYF study showed that while out-of-wedlock births are uncommon there are circumstances under which such childbearing is tolerated. In one of our study villages, a woman who had a relationship with a married man decided to have a child by him. The woman and her child were accepted in the community mainly because being childless is considered more stigmatizing than having an illegitimate birth, and this woman was old enough so that waiting any longer would mean she would remain childless.

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Table 1. Total fertility rates among selected ethnic groups, 1989 and 1999

Ethnic group	Total fertility rate	
	1989	1999
Kinh	3.6	1.9
Chinese	2.9	1.5
Tay	4.3	2.1
Thai	5.7	2.6
Muong	4.4	2.0
Nung	5.1	2.9
Khmer	5.3	2.3
Dao	6.9	3.6
Hmong	9.3	7.1
Gia Rai	5.5	5.3

Source: Adapted from General Statistics Office (2001)

Table 2. Key indicators for ethnic minority groups, 1993 and 1998, based on Vietnam Living Standards Surveys

Ethnic group	Poverty level (% of population)		Expenditure per capita ('000 VND), 1998 prices		Household size	
	1993	1998	1993	1998	1993	1998
Kinh	52	30	2105	2899	4.86	5.36
Chinese	11	8	3843	5119	6.55	6.12
EM- South	70	57	1521	1882	5.44	6.17
EM-Central Highlands	92	91	1021	1090	6.28	6.68
EM-Northern Uplands	84	73	1323	1594	5.33	5.88

Notes: 1. Central Highlands minorities: Ba-Na, Co-Ho, E-De, Gie-Tieng, Hre, Ma, Ra Giai, Xo-Dang.

2. Northern Uplands minorities: Dao, Hmong, Muong, Nung, Tay, Thai, San Diu, San Chay, Tho.

3. Minorities in the South are Khmer and Cham

Source: Adapted from Baulch et al. (2004)

Table 3. Distribution of married women aged 15–49 in VNHS by ethnic group

Ethnic group	Percent	N
Total	100%	27418
Kinh-Chinese	84.7	23225
Tay, Thai, Muong, Nung (TTMN)	7.6	2096
EM-South	1.6	432
EM-Northern Uplands	3.5	961
EM-Central Highlands	2.6	704

Note:

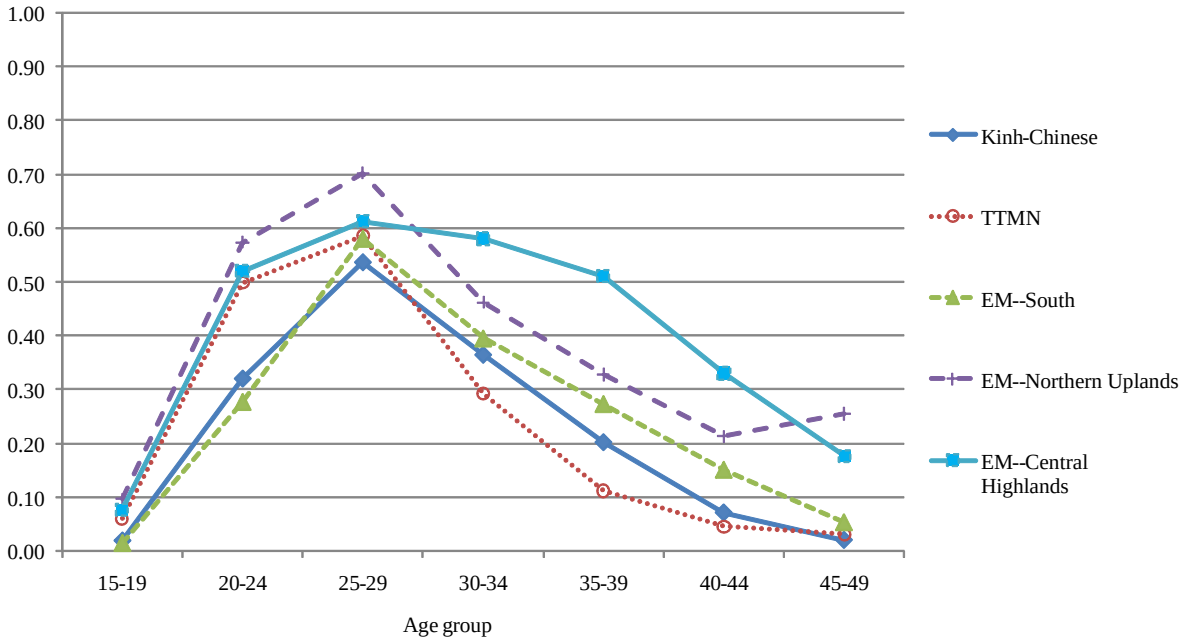
Ethnic minorities in the South include Khmer, Cham, Xtieng, and Cho-ro ethnic groups.

Ethnic minorities in the Northern Uplands include Hmong, Dao, Ngai, San Chay, San Diu, Giay, Kho-mu, Khang, Xinh-mun, Ha Nhi, Lao, La Chi, La Ha, Phu La, La Hu, Lu, Lo Lo, Mang, Pa Then, Co Lao, Cong, Bo Y, Si La, and Pu Peo.

Minorities in the Central Highlands include Gia-rai, Ede, Ba na, Xo-dang, Co ho, Mnong, Gie Trieng, Ma, Chu ru, Brau, Ro mam, Hre, Ra-glai, Bru Van Kieu, Tho, Cotu, Co, Ta-oi, Chut, and O-du.

Source: VNHS 2001

Figure 1. Age-Specific Fertility Rates, 1997-2001, by Ethnic Group



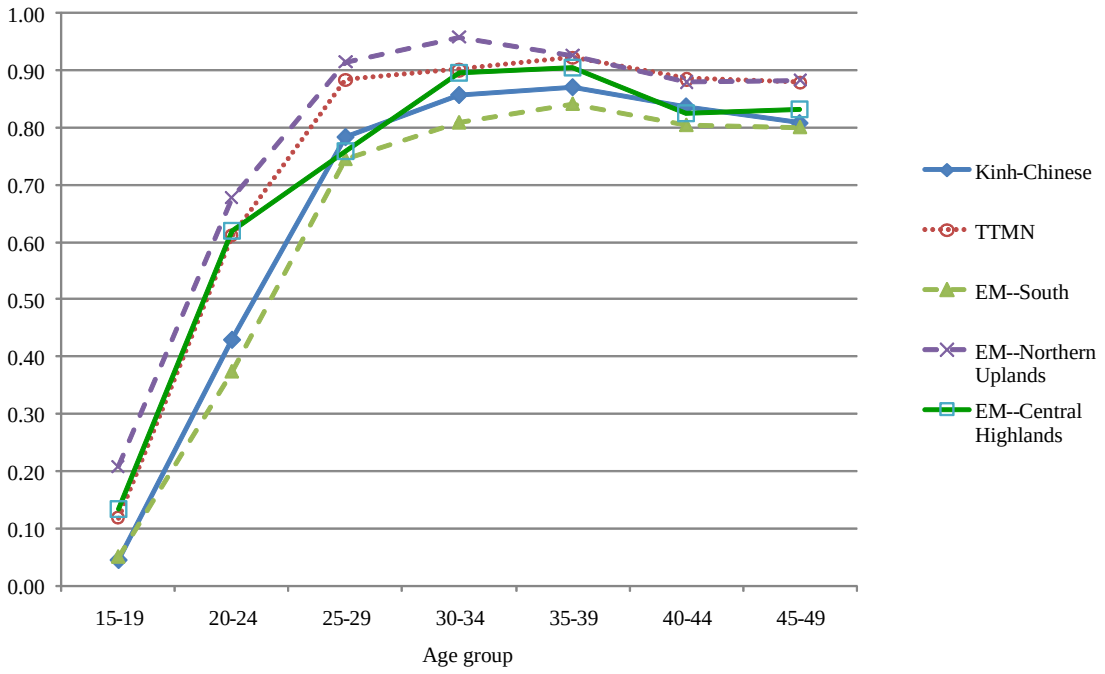
Source: VNHS 2001

Table 4. Ethnic differences in proximate determinants of fertility using the Bongaarts model

	Index of Marriage (C_m)	**Index of Contraception (C_c)**	**Index of Abortion (C_a)**	**Index of Postpartum Infecundability (C_i)**	**Total Fecundity (TF)**	**Predicted TFR**	**Actual TFR**
All women	0.59	0.34	0.77	0.68	15.30	1.60	1.59
Kinh-Chinese	0.60	0.33	0.77	0.68	15.30	1.60	1.54
TTMN	0.64	0.32	0.74	0.66	15.30	1.53	1.62
EM-South	0.67	0.39	0.84	0.67	15.30	2.27	1.74
EM-Northern Uplands	0.82	0.48	0.89	0.65	15.30	3.45	2.63
EM-Central Highlands	0.73	0.46	0.94	0.59	15.30	2.85	2.80

Source: VNHS 2001

Figure 2. Proportions of Women Currently Married by Ethnic Group



Source: VNHS 2001

Table 5. Current prevalence of contraceptive use and current type of primary method of contraception by ethnic group among currently married women ages 15-49.

Method	Ethnic group				
	Kinh-Chinese	**TTMN**	**EM-South**	**EM-Northern Uplands**	**EM-Central Highlands**
	(N=22,969)	**(N=2,076)**	**(N=418)**	**(N=946)**	**(N=688)**
% Any modern method	**59**	**70**	**56**	**54**	**55**
IUD	35	48	35	42	24
Condom	9	4	3	1	3
Pill	7	7	10	7	14
Female sterilization	6	8	7	3	10
Other	1	2	2	1	4
% Any traditional method	**21**	**10**	**17**	**8**	**10**
Withdrawal	8	2	9	3	5
Periodic abstinence	13	8	7	6	5
% Non-use	**20**	**19**	**27**	**38**	**36**

Source: VNHS 2001

APPENDIX

We use Bongaarts's model of proximate determinants (Bongaarts 1978) to decompose fertility rates for each of Vietnam's five major ethnic groups. This section describes how we derive data for each index and how we evaluate our findings.

$$\mathbf{TFR} = C_m * C_c * C_a * C_i * \mathbf{TF}$$

in which C_m is an index of proportions married
C_c is an index of contraception
C_a is an index of induced abortion
C_i is an index of postpartum infecundability
TF is the total fecundity rate

Index of marriage (C_m)

$$C_m = \sum m(a)g(a) / \sum g(a) = TFR/TM,$$

where $m(a)$ is the age-specific proportion married and $g(a)$ equals age-specific marital fertility rates. In this study, $m(a)$ is derived from the 1999 census and $g(a)$ from the 2001 VNHS. The VNHS asked married women of reproductive age (15–49) how many children they had given birth to over the last five years (i.e., 1997–2001).

Table A1 presents age-specific proportions married by ethnic group, and Table A2 shows age-specific marital fertility rates and total marital fertility rates by ethnic group.

Table A1. Age-specific proportions married by ethnic group

Age group	All Women	Kinh-Chinese	TTMN	EM--South	EM--Northern Uplands	EM--Central Highlands
15–19	0.08	0.07	0.10	0.12	0.31	0.20
20–24	0.51	0.49	0.62	0.53	0.78	0.68
25–29	0.80	0.79	0.86	0.77	0.92	0.85
30–34	0.87	0.86	0.91	0.84	0.96	0.89
35–39	0.87	0.86	0.92	0.87	0.92	0.90
40–44	0.84	0.84	0.89	0.83	0.91	0.84
45–49	0.80	0.80	0.85	0.80	0.88	0.81
15–49	**0.64**	**0.63**	**0.68**	**0.62**	**0.75**	**0.66**

Source: Vietnam Census 1999

Table A2. Age-specific marital fertility rates and total marital fertility rates by ethnic group

Age group	All women	Kinh-Chinese	TTMN	EM--South	EM--Northern Uplands	EM--Central Highlands
15–19	0.67	0.44	0.50	0.27	0.38	0.58
20–24	0.92	0.75	0.81	0.74	0.92	0.84
25–29	0.79	0.68	0.66	0.78	0.63	0.80
30–34	0.48	0.43	0.32	0.49	0.51	0.65
35–39	0.27	0.23	0.12	0.32	0.37	0.56
40–44	0.11	0.09	0.05	0.19	0.39	0.40
45–49	0.04	0.03	0.03	0.06	0.27	0.21
TMFR	**3.28**	**2.64**	**2.50**	**2.84**	**3.47**	**4.04**

Source: VNHS 2001

Index of contraception (C_c)

$$C_c = 1\text{-}1.18*e*u,$$

where u is the prevalence of current contraceptive use (including male methods and sterilization) among currently married women. Estimates can be derived from the VNHS, which asked married women whether they and their spouse practiced any contraception during the time of survey and what their main contraceptive method was. Table A3 shows age-specific rates of use of any contraceptive method by ethnic group.

Table A3. Age-specific contraceptive use (any method) by ethnic group.

Age group	All Women	Kinh-Chinese	TTMN	EM--South	EM--Northern Uplands	EM--Central Highlands
15–19	0.27	0.29	0.27	0.32	0.12	0.27
20–24	0.57	0.58	0.59	0.37	0.34	0.57
25–29	0.78	0.78	0.81	0.79	0.67	0.69
30–34	0.86	0.86	0.94	0.77	0.76	0.78
35–39	0.91	0.91	0.94	0.87	0.82	0.77
40–44	0.89	0.89	0.90	0.83	0.78	0.70
45–49	0.69	0.69	0.71	0.66	0.55	0.46
15–49	**0.79**	**0.80**	**0.81**	**0.73**	**0.62**	**0.64**

Source: VNHS 2001

Here e, the average use-effectiveness of contraception, takes the values used by Bongaarts (1982) and Haughton (1997) as follows:

Contraceptive method	Estimated use-effectiveness (e)
Sterilization	1.00
Pill	0.90
IUD	0.95
Other	0.70

Where women used more than one method of contraception, we take the highest applicable value of e.

Index of induced abortion (C_a)

$$C_a = \text{TFR}/ [\text{TFR} + 0.4 * (1+u) * \text{TA}]$$

For each ethnic group, the total fertility rate (TFR) is calculated using the age-specific fertility rates derived from the VNHS, which asked women of reproductive age how many children they had borne over the past five years. Here u is the proportion of married women of reproductive age who use contraception.

TA is the total abortion rate among married women. We calculated the rate using data from the 2001 VNHS. The survey asked married women of reproductive age whether they had had an abortion or menstrual regulation in the past five years and, if so, how many. Table A4 shows age-specific abortion rates and total abortion rates by ethnic group.

Table A4. Age-specific abortion rates by ethnic group.

Age	All women	Kinh-Chinese	TTMN	EM--South	EM--Northern Uplands	EM--Central Highlands
15–19	0.01	0.01	0.00	0.00	0.01	0.00
20–24	0.08	0.08	0.09	0.00	0.03	0.02
25–29	0.14	0.14	0.20	0.09	0.13	0.05
30–34	0.15	0.16	0.18	0.15	0.08	0.03
35–39	0.14	0.14	0.13	0.10	0.13	0.02
40–44	0.11	0.11	0.13	0.12	0.07	0.18
45–49	0.05	0.05	0.07	0.04	0.04	0.00
TA	**0.67**	**0.68**	**0.80**	**0.49**	**0.49**	**0.30**

Source: VNHS 2001

A large discrepancy between the number of abortions reported by the Ministry of Health and the number reported by women who are interviewed has been recognized in past studies (Haughton 1997).

The total abortion rate of 0.67 based on the VNHS is much lower than the total abortion rate of 2.5 per woman reported in 1992 (Goodkind 1994) and than the rates reported in Haughton (1997). The discrepancy likely results from the fact that these earlier studies calculated abortion rates on the basis of information from service providers, whereas our estimates are based on a population-based survey (Teerawichitchainan and Amin 2009).

Index of postpartum infecundability (C_i)

$$C_i = 20/ (18.5 + i),$$

where i is the mean duration of postpartum infecundability. We calculated an approximate value of i from the mean duration of breastfeeding (B), which we obtained from the 2001 VNHS. The survey asked all women in the sample who had children under age five about the length of breastfeeding for their youngest child. Bongaarts (1982) proposed that

$$i = 1.753 \exp (0.1396 * B – 0.001872 * B^2)$$

Based on the analysis of the VNHS, Table A5 shows the mean durations of breastfeeding for women by ethnic group.

Table A5. Duration of breastfeeding (in months) by ethnic group.

Ethnic group	Mean	S.D.
All women	17.1	5.6
Kinh-Chinese	16.9	5.4
TTMN	18.1	6.0
EM-South	17.3	5.7
EM-Northern Uplands	18.7	6.2
EM-Central Highlands	22.2	7.3

Source: VNHS 2001

Past studies indicated that the mean duration of breastfeeding in Vietnam ranged from 14.5 months based on the 1988 DHS to 13.8 months in the 1992–93 Vietnam Living Standards Survey. Mean durations of breastfeeding found in the 2001 VNHS were longer than earlier estimates. The Kinh-Chinese had the shortest duration, whereas ethnic minorities in the Central Highlands reported the lengthiest breastfeeding period.

Total fecundity rate (TF)

TF represents the maximum potential number of births per woman, after adjusting for miscarriages, stillbirths, and natural sterility. Following Bongaarts (1982), we use a value of 15.3.

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