Kingdom of Cambodia

Reproductive Preferences in Cambodia

Further Analysis of the Cambodia Demographic and Health Surveys

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Additional information about the survey may be obtained from the National Institute of Statistics (NIS) of Cambodia, (#386, Monivong Blvd, Phnom Penh, Cambodia. Telephone/Fax: 855-23-213-650, Email: hdarith@nis.gov.kh, internet: http://www.nis.gov.kh/). Additional information about the DHS project may be obtained from ICF International, 11785 Beltsville Drive, Calverton, MD 20705, USA; Telephone: 301-572-0200, Fax: 301-572-0999, Email: reports@measuredhs.com, Internet: http://www.measuredhs.com.

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EXECUTIVE SUMMARY

The decline of the total fertility rate (TFR) in Cambodia over the past decade, from 3.8 births per woman in 2000 to 3.0 in 2010, and the related changes in reproductive preferences is the focus of this further analysis of the three Cambodia Demographic and Health Surveys (DHS). Since the wanted total fertility rate (WTFR) declined only from 2.9 to 2.6 over these 10 years, most of the drop of actual fertility must lie in the reduction of unwanted births, through an increase in contraceptive prevalence and in use of abortion.

The factors found to be associated with the desired number of children include education, wealth, and the reduction of child mortality. Regional analyses clearly identify the capital city of Phnom Penh as having the greatest concentration of indicators of low fertility. Multivariate analyses of the number of children desired indicate covariates to include the actual number of children in the family as well as education, wealth, and child mortality. A multivariate analysis of current contraceptive use found the same covariates, along with exposure to television.

Cambodia's relatively low contraceptive prevalence in conjunction with the low level of fertility spurred an examination of the role of abortion in Cambodia's fertility decline. Although there are data quality issues in the self-reporting of abortion, there seems to be clear evidence that abortion has increased over the decade. The analysis found that in the absence of abortion the TFR in 2010 might have been 3.7 births per woman instead of the reported 3.0.

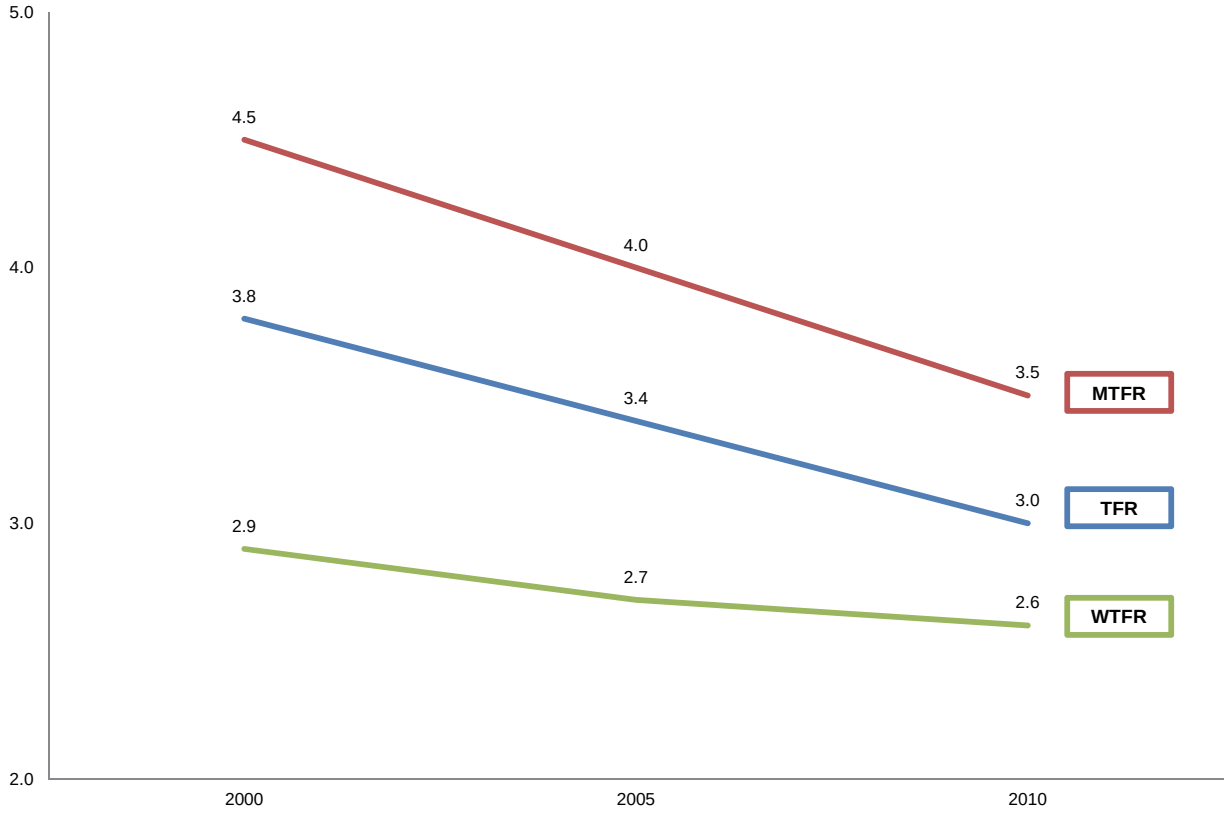
In general, the prospects of further increases in education and wealth, and in mass media exposure, along with continuing reductions of child mortality strongly suggest a continued decline of reproductive preferences and fertility in Cambodia.

1. INTRODUCTION

The following analysis is focused on further exploration of the reproductive preferences of women and men in Cambodia, based on the three Demographic and Health Surveys (DHS) conducted in 2000, 2005, and 2010[1].

The first decade of the 21st century has seen a clear picture of the fertility transition in Cambodia. The total fertility rate (TFR) fell from 3.8 to 3.0 births per woman (Figure 1). The marital total fertility rate[2] (MTFR) declined from 4.5 to 3.5 births per woman. These sharp declines were caused mainly by increases in the use of modern contraception among married women, from 19 percent in 2000 to 35 percent in 2010, which reduced the number of unintended births. Abortion was also a factor. The wanted total fertility rate[3] (WTFR) declined more modestly, from 2.9 to 2.6 births per woman between 2000 and 2010.

Figure 1. Trends in marital, total and wanted fertility



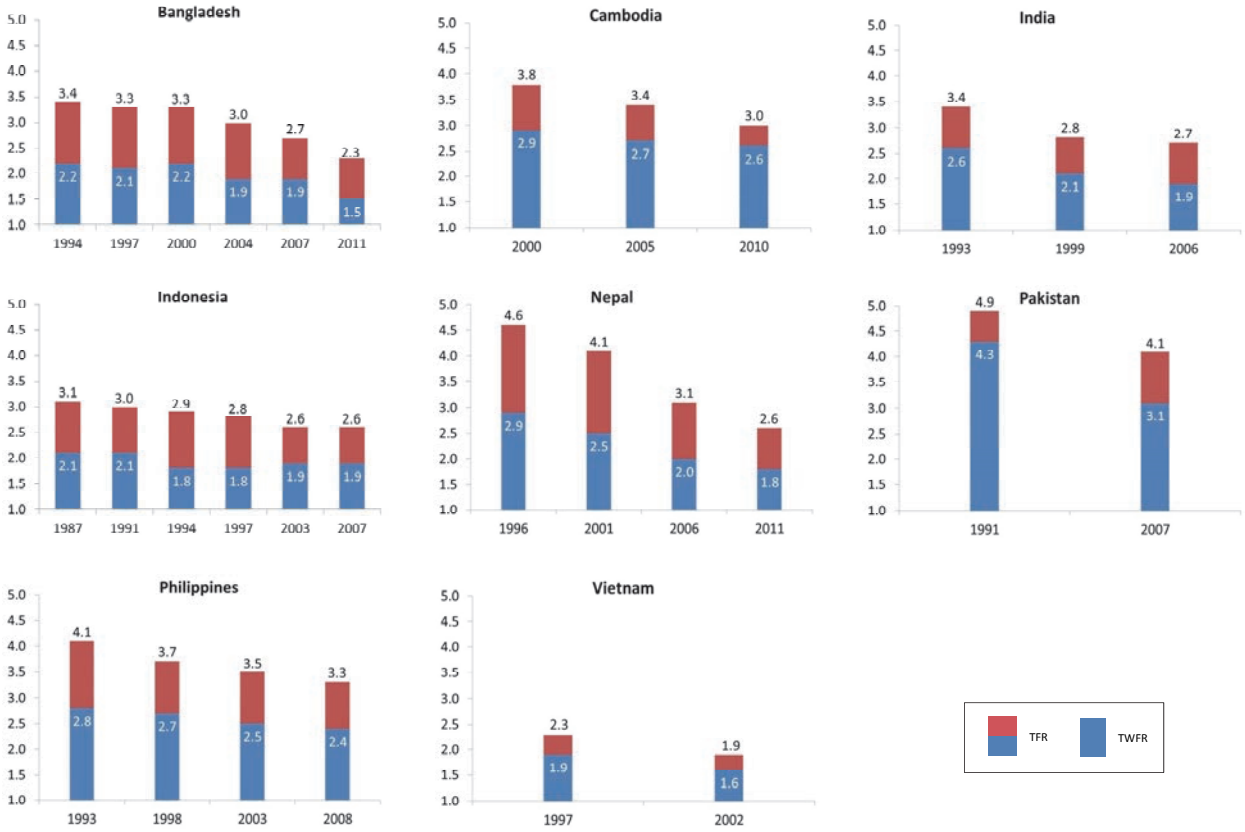
[1] There was no survey of men in 2000, and the survey of men in 2005 did not include the subject of reproductive preferences.

[2] Calculated by summing marriage duration-specific fertility rates.

[3] The WTFR is the TFR excluding births exceeding the ideal number in the preceding three years.

Figure 2 displays some international comparisons based on DHS data for eight countries in southern Asia. Although Cambodia's TFR of 3.0 in 2010 is not exceptional compared with this group of countries, Cambodia's WTFR is higher than in the other countries, except for Pakistan. Like Nepal, the Philippines, and Vietnam, Cambodia shows a decrease in the gap between the TFR and the WTFR over the two most recent surveys.

Figure 2. Trends in total fertility and wanted fertility rates: South and Southeast Asia



2. DESIRED OR IDEAL NUMBER OF CHILDREN

This measure of reproductive preferences is based on the following interview question, with instructions to the interviewer to probe for a numeric response: "If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?" Among women, non-numeric responses (such as "whatever God brings") were 2 percent of all responses in 2010, compared with 7 percent in the 2000 survey. Among men, non-numeric responses were under 1 percent in 2010.

The mean number of children considered ideal by all women in 2010 was 3.1, down from 3.6 in 2000 (excluding women with non-numeric responses). Figure 3 shows that the desired number of children declined at every five-year age group among women age 15 to 49. Since the number desired by married women can be influenced by their husbands as well as by their actual number of children, a clearer picture is shown in Figure 4, for never-married women by five-year age groups. The most relevant estimates are for women under age 25, who are the most numerous (81 percent) of the never-married category. The average desired number for this age group in 2010 was 2.6 children, down from 3.1 in 2000.

Figure 3. Mean ideal number of children for all women by age in Cambodia in 2000, 2005, and 2010

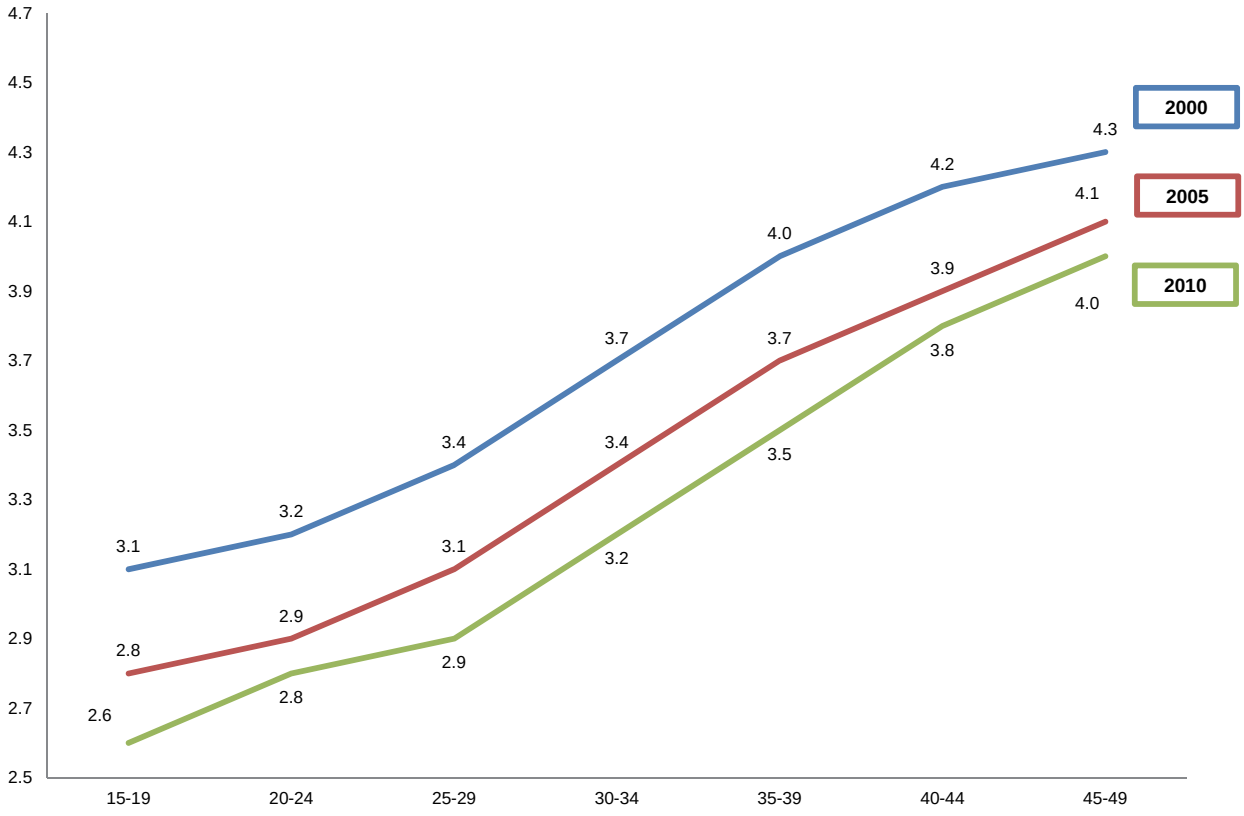
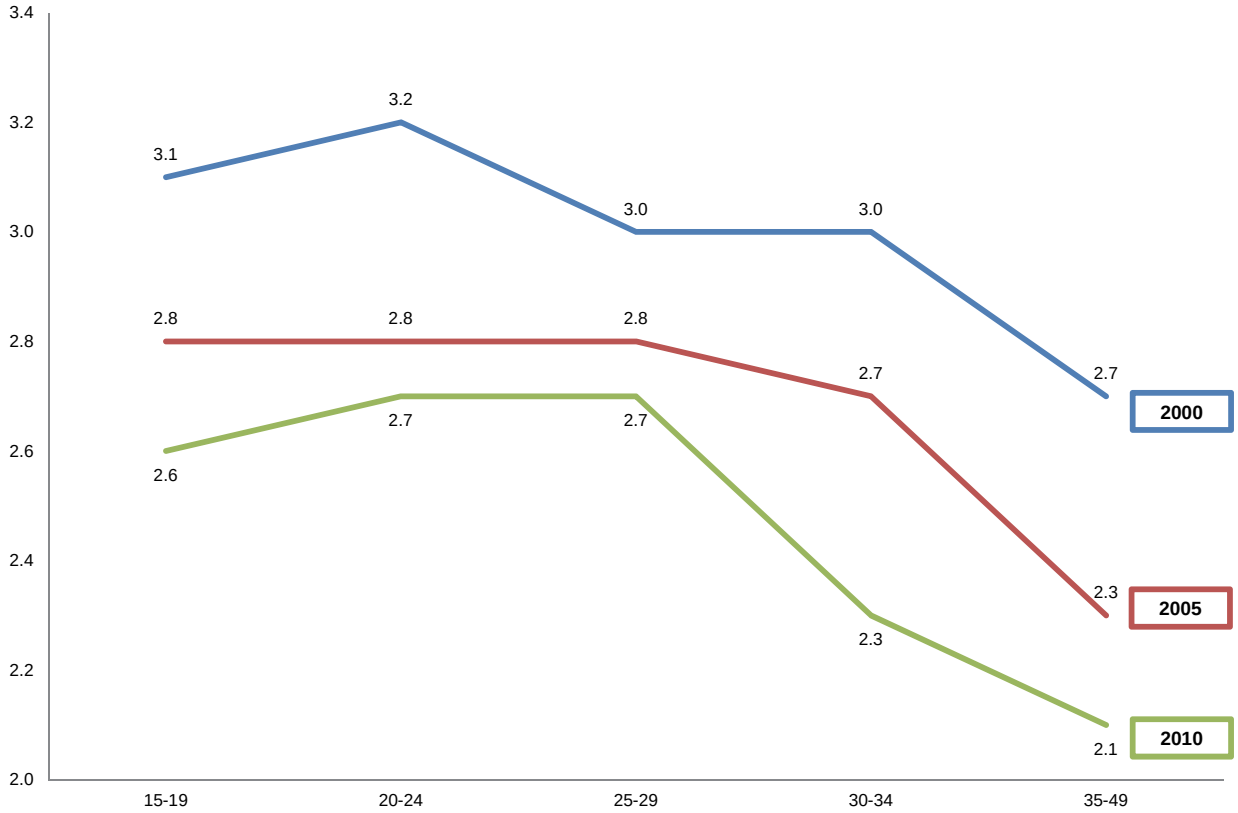


Figure 4. Ideal number of children for never-married women by age in Cambodia in 2000, 2005, and 2010



For men in 2010, the average desired number of children was essentially the same as for women, at 3.1 for all men, and 2.7 for never-married men under age 25.

3. INTENTION TO LIMIT FERTILITY

Another measure of reproductive preference is the desire to have no more children. This measure is obviously related to the existing number of children, as shown in Table 1. In 2010, 51 percent of married women with two children expressed a desire to cease childbearing, up from 28 percent in 2000, when the desire to limit fertility had not reached 51 percent until women had four children. In 2010 among women with four children, 87 percent expressed a desire to have no more children.

Among men in 2010, 44 percent with two children said they wanted no more.

Table 1. Trends in the percentage of married women with 2, 3, or 4 children who want no more children

	Number of children		
Currently married women	**2**	**3**	**4**
2010	51	76	87
2005	47	70	85
2000	28	44	51

	Number of children		
Currently married men	**2**	**3**	**4**
2010	44	66	84

4. COVARIATES OF REPRODUCTIVE PREFERENCES

Table 2 shows several of the characteristics associated with both the ideal number of children and the intention to limit fertility, based on the 2010 survey. The ideal number is inversely related to level of education and to wealth, for both women and men. The association of intention to stop further childbearing with education (among married persons with two children) follows the same pattern among men but does not follow the expected direction among women. The percentage of women who want no more children increases with wealth, but for men there is little association between wealth and desire to limit fertility. Among women, the percentage wanting no more children is slightly lower for urban residents, but men's intentions to limit fertility are unrelated to residence.

Table 2. Covariates of reproductive preference, Cambodia 2010

	Mean ideal number of children		Percent wanting no more children (married, 2 children)	
	Women	Men	Women	Men
Education				
No schooling	3.5	3.4	53	49
Primary	3.2	3.2	49	44
Secondary and higher	2.8	2.9	52	43
Wealth				
Lowest	3.3	3.2	46	41
Second	3.3	3.2	49	48
Middle	3.2	3.1	49	45
Fourth	3.1	3.0	49	44
Highest	2.9	2.9	57	42
Residence				
Urban	2.9	2.9	58	43
Rural	3.2	3.1	49	44
Child deaths				
No	3.0	3.0	50	46
Yes	4.0	3.8	62	54

The experience of child mortality presents a puzzling picture. The number of children desired by both women and men is higher for those who reported a child death, but the intention to have no more children is higher for those with the experience of a child death. This finding may reflect the fact that persons who are older have had more experience with child mortality and, on average, also desire more children, as well as tending to want no more children because they have already reached their desired number.

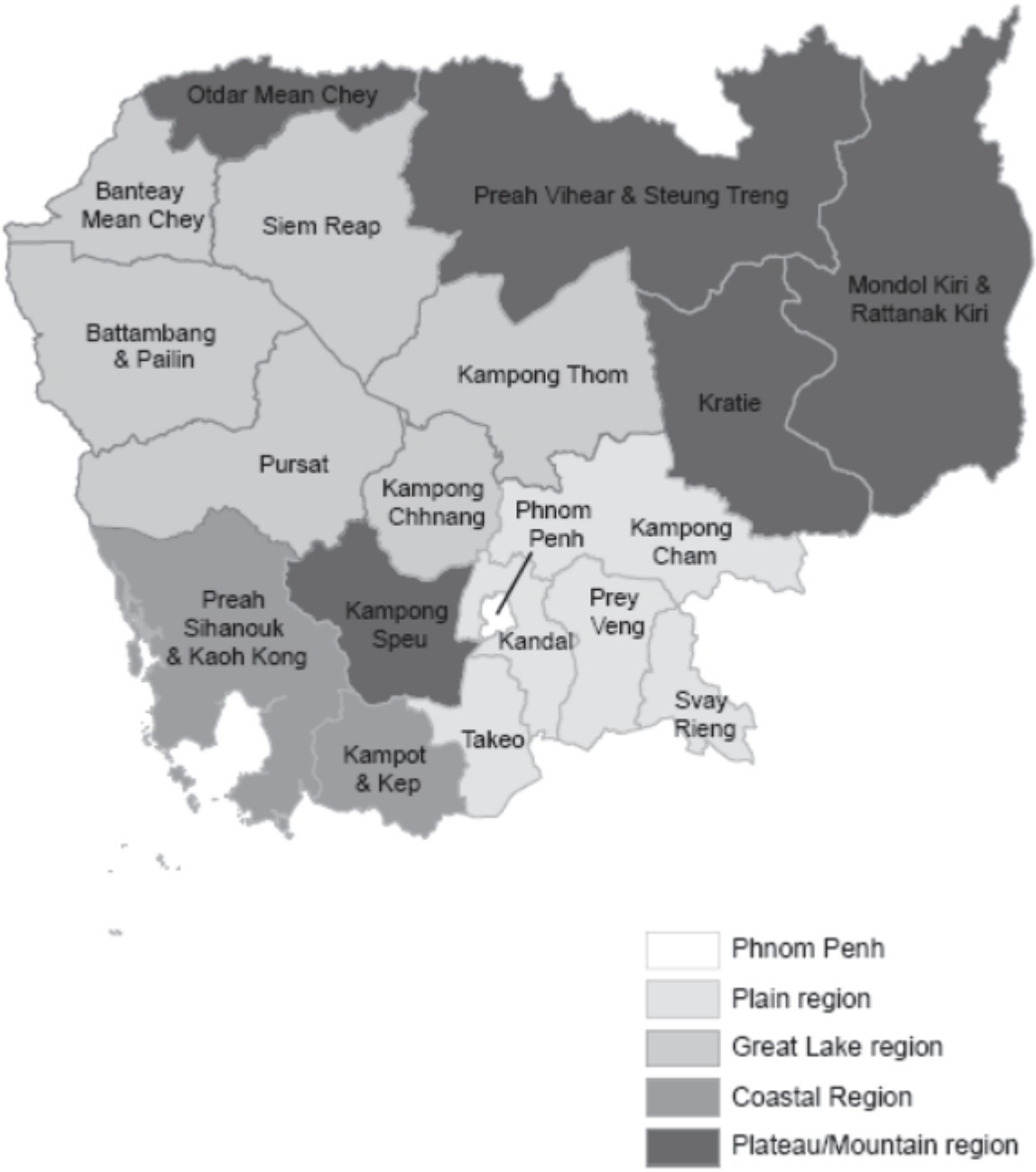
5. REGIONAL DIFFERENCES

Table 3 provides a summary of regional differences in reproductive preferences and behavior. (Map 1 shows the regional and provincial definitions.) The capital city of Phnom Penh, which contains 12 percent of the women interviewed in 2010, clearly shows a concentration of women with the lowest fertility indicators. The Plateau/Mountainous region (with 13 percent of the population) is at the opposite extreme, while the three other regions are fairly similar in these indices of reproductive preferences and behavior. Women in the capital city have the lowest proportion married, the most schooling, and the most exposure to television.

Table 3. Summary of regional differences in measures of reproductive behavior in Cambodia, 2010

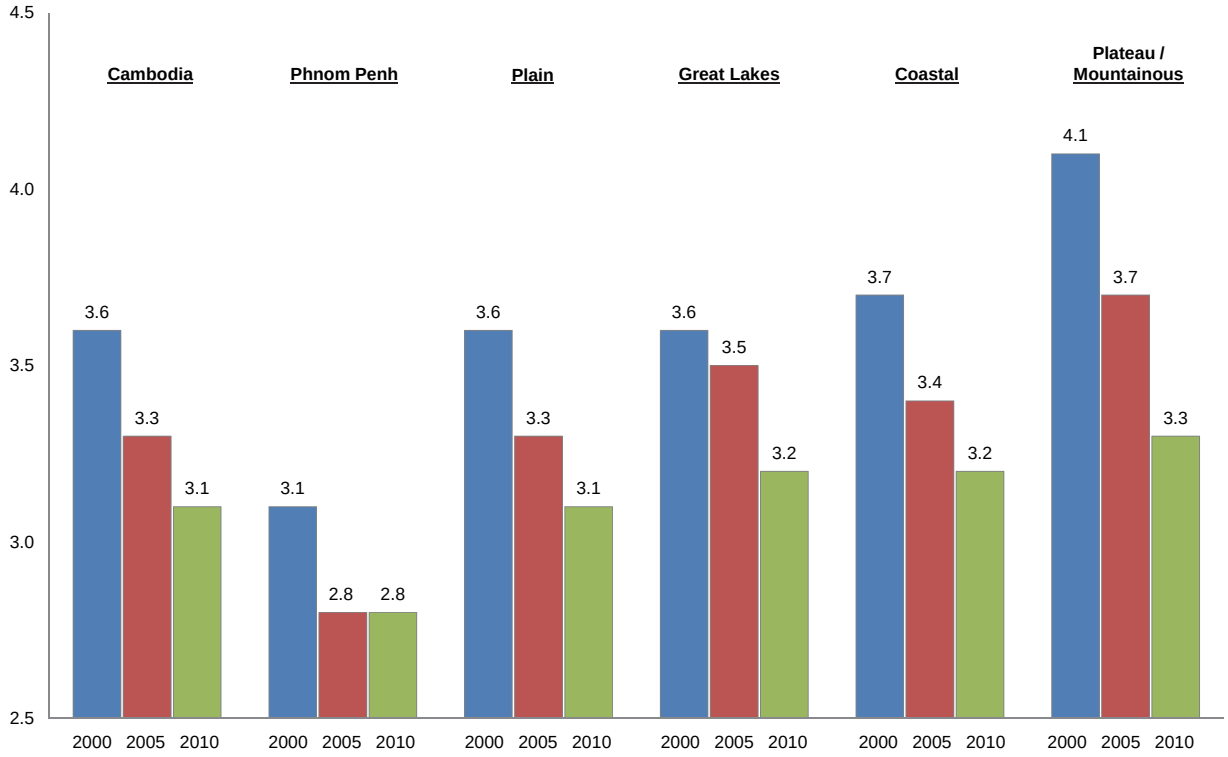
	Cambodia	Phnom Penh	Plain	Great Lake	Coastal	Plateau / Mountainous
Total fertility rate	3.0	2.0	3.1	3.3	2.8	3.5
Total wanted fertility rate	2.6	1.7	2.6	2.7	2.5	2.8
Marital total fertility rate	3.5	2.5	3.5	3.9	3.2	3.9
Ideal number of children (women)	3.1	2.8	3.1	3.2	3.2	3.3
Ideal number of children (men)	3.3	3.2	3.1	3.5	3.4	3.6
Percent of married women with 2 children who want no more	52	66	52	46	58	44
Percent of married women using any method	51	56	53	47	52	46
Percent of married women using modern method	35	29	35	36	34	36
Percent with at least one child death	23	12	25	23	22	23
Percent women currently married	62	50	65	61	63	65
Percent women secondary school+	35	63	32	29	36	30
Percent women watch TV weekly	57	93	55	52	44	52

Map 1. Regions



As Figure 5 shows, the regional trends in the ideal number of children between 2000 and 2010 are clearly in the direction of wanting smaller families, with little variation. Twenty-three provinces and the capital city are grouped in the five regions, with some distinctive reproductive characteristics, described later in this report.

Figure 5. Trends in ideal number of children for all women by region



6. MULTIVARIATE ANALYSIS

The covariates of reproductive preferences have been examined thus far one at a time. Table 4 shows the ideal number of children simultaneously in relation to numerous covariates for currently married women in all three surveys and for married men in 2010. The standardized regression coefficients are strikingly similar across the surveys, except for the regions in 2010. The number of living children shows the strongest association with the number of desired children, some part of which no doubt reflects the rationalization of unintended births. The number of child deaths is correlated positively with the total desired number of children, implying that as child mortality continues to decline, as it has declined markedly over the decade (Hong and Hor 2013), the number desired will also continue downward. As one would expect, the current use of any method of contraception is negatively associated with the number of children desired.

Table 4. Multivariate analysis of factors associated with ideal number of children (standardized partial regression coefficients)

	Married women			Married men
Ideal Number of children	**2010**	**2005**	**2000**	**2010**
Number of living children	.381	.321	.311	.433
Number of child deaths	.114	.116	.093	.093
Using any contraception	—.045	—0.35	—.053	—.072
Rural residence	.022	(.011)	(.016)	(—.012)
Years of schooling	—.041	—.041	—.049	—.038
Wealth quintile	(—.014)	—.029	NA	—.033
Worked last 12 months	.017	.024	(—.001)	(.019)
Plain region	(—.021)	.054	(.007)	—.132
Great Lake region	(.018)	.107	.040	—.062
Coastal region	(.013)	.051	.039	(—.030)
Plateau / Mountainous region	.044	.158	.137	(—.009)
Age	.089	.063	.066	(.025)
Number of women	11,377	10,004	8,926	4,755
R^2	.265	.213	.186	.261

( ) Not significant at .05 level

Urban versus rural residence does not show an association with the number of children desired when considered simultaneously with education and wealth, both of which are negatively related to reproductive preference. Work status has only a weak connection. Region of residence is defined here in terms of comparisons with Phnom Penh. In 2010, there is little covariation of region with the number of children desired.

7. COUPLES

The 2010 Cambodia DHS survey included both women and men, and 4,471 married couples were interviewed. Among couples with two children (1,098), 71 percent agree on the additional number of children they want to have: 39 percent agree on wanting more children while 32 percent agree they both want no more children (Figure 6). Of the couples in disagreement about future childbearing preferences, it is more common for the husband than for the wife to want more children (18 versus 11 percent).

Figure 6. Agreement of married couples with two children on whether more children are wanted

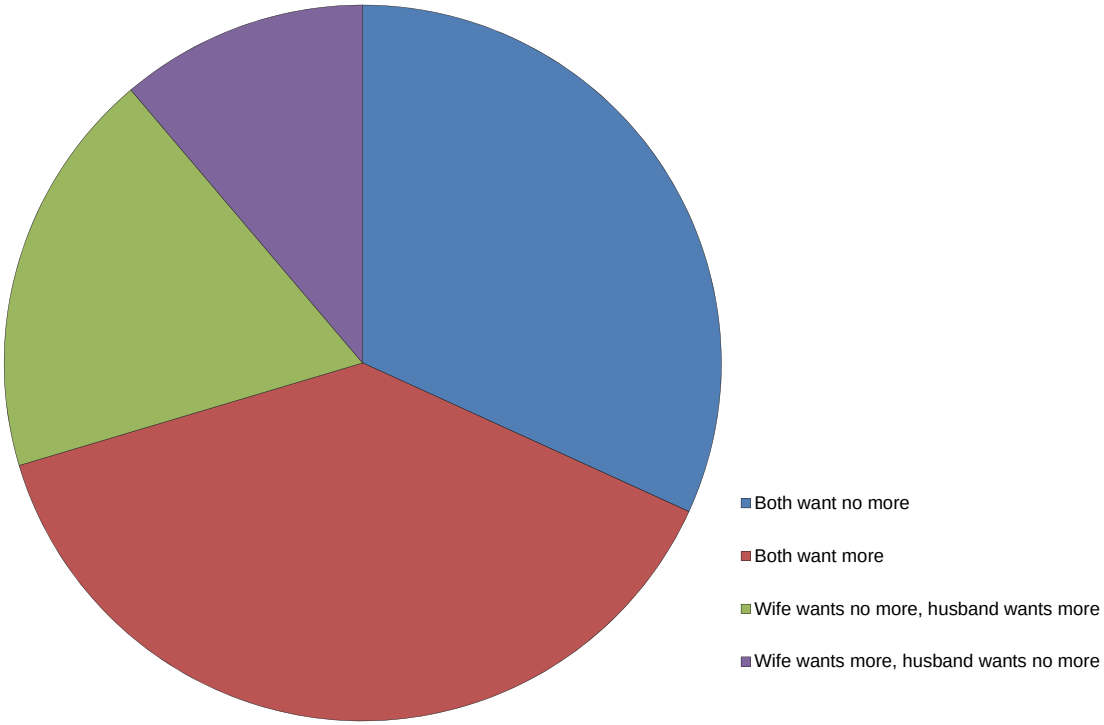


Figure 7 shows a comparison of couples' level of agreement on the ideal number of children. The horizontal axis shows the wife's ideal number of children, while the vertical axis displays the proportion of husbands whose ideal number of children is more, the same, or less than that of their wives. For example, of the women with an ideal of three children, 24 percent of their husbands prefer fewer than three children, 41 percent also want three children, and 34 percent desire more than three children. At no parity is the level of agreement between spouses above 50 percent.

Figure 7. Comparing couples' ideal number of children

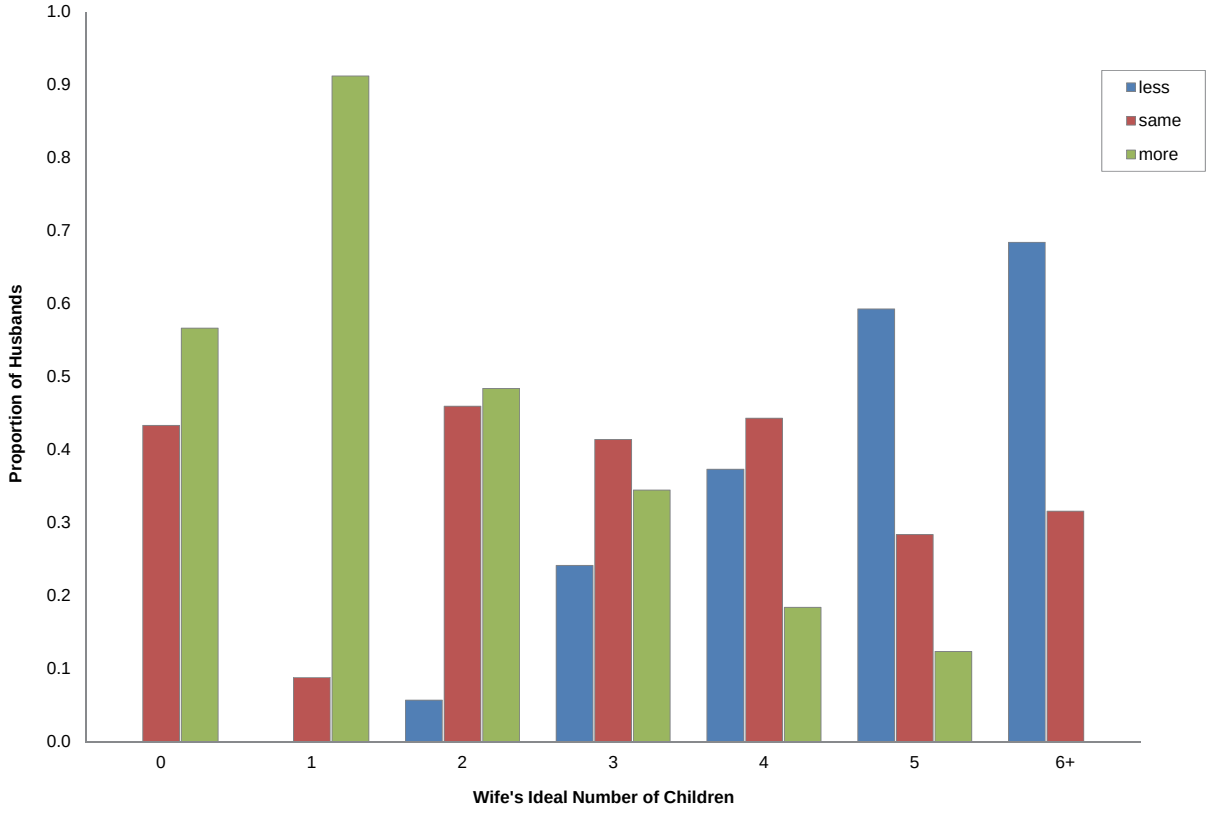


Table 5 shows a regression analysis of the factors associated with the couple's average number of children desired. Aside from age, the experience of child mortality indicates the strongest covariation. Education and wealth also play a role, and the use of contraception shows a significant association with the ideal number of children.

Table 5. Multivariate analysis of couples' average ideal number of children (standardized partial regression coefficients)

Wife's years of schooling	(-0.023)	Great Lake region	(-0.019)
Husband's years of schooling	-0.068	Coastal region	(-0.009)
Wife's age	0.137	Plateau / Mountainous region	0.065
Husband's age	0.253	Any child deaths	0.088
Wealth quintile	-0.065	Using any contraception	-0.035
Rural	(-0.004)	Wife worked last 12 months	(-0.004)
Plain region	-0.087	Husband worked last 12 months	(-0.014)
N	4,471		
R^2	0.21		

( ) Not significant at .05 level

8. CONTRACEPTIVE USE

Contraceptive use has been analyzed thoroughly in another Further Analysis of the Cambodian DHS (Loun, Phan, and Mao 2013), as well as in the first Country DHS Report. In the present study, we return to the subject for several reasons: to look at contraceptive use in a multivariate analysis, which would also connect it with the study of the unmet need for family planning, and to relate it to the prevalence of abortion.

Table 6 contains the odds ratios in a multivariate logistic regression of factors possibly associated with the current use or nonuse of any method of contraception among married women. The actual number of children shows a 4 percent increase in the odds of contraceptive use compared with nonuse at each level. There is a comparable 5 percent decrease in the odds with the number of children desired at each interval. A desire to have no more children shows an odds ratio of 1.97, which means that women who want no more children are twice as likely to be using a method as women wanting more children. Education and wealth are both positively correlated with using contraception, but urban-rural residence shows no association with contraceptive use.

Table 6. Multivariate logistic regression (odds ratios) of factors affecting current use of contraception by married women

Number of living children	1.04	**Television**	
		Not at all	1.00
Ideal number of children	0.95	Less than once a week	(1.07)
		At least once a week	1.25
Want no more children			
Want more	1.00	**Radio**	
Want no more	1.97	Not at all	1.00
		Less than once a week	(0.99)
Education		At least once a week	(0.91)
No education	1.00		
Primary	1.32	**Worked in past year**	
Secondary+	1.55	No	1.00
		Yes	1.42
Wealth quintile			
Lowest	1.00	**Had child death**	
Second	1.14	No	1.00
Middle	1.31	Yes	0.90
Fourth	1.26		
Highest	1.46	**Age**	0.97
Residence			
Urban	1.00		
Rural	(0.98)		
Number of women	11,056		

( ) Not significant at .05 level

Television viewing, but not radio listening, has a significant association with contraceptive use. If the woman has worked in the past 12 months, there is a 42 percent increase in the odds of using a contraceptive method, and women who have experienced a child's death have 10 percent lower odds of using contraception than women who have never lost a child.

This analysis was repeated for married women currently using contraception for limiting fertility in contrast to women with an unmet need for limiting and yielded similar results (not shown here).

9. CONTRACEPTIVE USE AND ABORTION

In Cambodia in 2010, the TFR for the preceding three years was reported to be 3.0 (3.1 for the preceding five years), and contraceptive prevalence was 50 percent (35 percent for use of modern methods) for married couples. The TFR appears to be low for this level of contraceptive use. The basis for evaluating the compatibility of this relationship is the empirical evidence from numerous countries that have both measures. Originally, the simple scatter plot of the association of the TFR and the contraceptive prevalence rate was the basis. In later work on unmet need, interest grew in the question of how much of a decline in the TFR might be expected if unmet need were satisfied (Westoff and Bankole 1996; Westoff 2006; Westoff 2008). Further research led to the knowledge that contraceptive use for limiting the number of births is a much better predictor of fertility rates than is contraceptive use for spacing births. This finding led to a revised formula, presented in a DHS Analytical Study (Bradley et al. 2012). The application of this approach to the Cambodian question is described below.

In Cambodia 32 percent of married women are using contraception for limiting births. Using the prediction equation in the report by Bradley and colleagues (2012): TFR = 5.95 – 0.0715 (use for limiting) yields an estimate for the TFR of 3.7, significantly greater than the observed rate of 3.0. Other than data quality issues, the most likely explanation for the difference would be abortion. Abortion has been legal in Cambodia since 1997, normally restricted to before the 12th week of pregnancy. As in many countries, abortion is a sensitive topic, and reporting of the event is expected to lead to an underestimate. Nonetheless, questions were included in all three Cambodia DHS surveys about use of abortion, and estimates were made for the preceding five years.

In the five years preceding the 2010 survey, 5.4 percent of the interviewed women reported having had (at least) one induced abortion, for a total of 1,471 abortions. If these abortions had all resulted in live births, there would have been a total of 9,670 rather than 8,199 births reported by 18,754 women during the five years preceding the survey, an increase of 18 percent, which is the approximate increase in the expected TFR of 3.7 compared with the reported TFR of 3.0.

Similar calculations were undertaken for the abortions and births reported in the 2005 and 2000 surveys in Cambodia. In the 2005 DHS the reported TFR was 3.4, while the TFR with abortions added would have been a larger TFR of 4.0. In the 2000 survey the corresponding reported TFR was 4.0, and with abortions added would have been a TFR of 5.0.

This procedure has many rough edges, especially the unknown accuracy of the abortion reporting, but there seems little doubt that the prevalence of abortion has had an impact on Cambodian fertility rates. The impact estimated here is probably under-estimated considering the well-known under-reporting of abortion (Philipov et al. 2004). However, since abortion has been legal in Cambodia for the last 17 years, the extent of under-reporting is probably significantly lower than if the procedure had been illegal (which would have encouraged further under-reporting).

There also appears to have been an increase in the abortion rate in recent years, as measured by the proportion of surveyed women reporting at least one abortion in the past five years, at 1.9 percent in 2000, 3.5 percent in 2005, and 5.4 percent in 2010, as reported in the three DHS surveys.

10. PROVINCIAL DIFFERENCES

Table 7 shows a variety of reproductive measures for each of Cambodia's provinces. The capital city of Phnom Penh has the lowest fertility rates, including a TFR of 2.0, an MTFR of 2.5, and a WTFR of 1.8. At the opposite extreme is Mondol Kiri/Rattanak Kiri, one of the least developed provinces, located in the far eastern part of the country, with a TFR of 4.5, an MTFR of 4.7, and a WTFR of 3.6.

Women's ideal number of children is less variable across provinces, all within the range from 2.8 in Phnom Penh to 3.5 in Mondol Kiri/Rattanak Kiri and in Kampong Chhnang. Men's ideal number of children ranges from 2.5 in Kampong Cham to 3.9 in Preah Vihear/Steung Treng.

Among married women with two children, the proportion wanting no more children ranges from 32 percent in Preah Vihear/Steung Treng to 72 percent in Svay Rieng. For married men the range is from 12 percent to 57 percent in these same two provinces, respectively.

As mentioned, on average, 50 percent of women in Cambodia currently use a contraceptive method. Among provinces, the level of contraceptive use is highest in Kandal, at 62 percent, and lowest in Preah Vihear/Steung Treng, at 37 percent.

The last measure shown here is the infant mortality rate which, at the national level, indicates that 45 of 1,000 live births do not survive the first year of life. There is a wide range of infant mortality rates across the provinces, from 12 per 1,000 live births in Phnom Penh to 95 per 1,000 live births in Preah Vihear/Steung Treng.

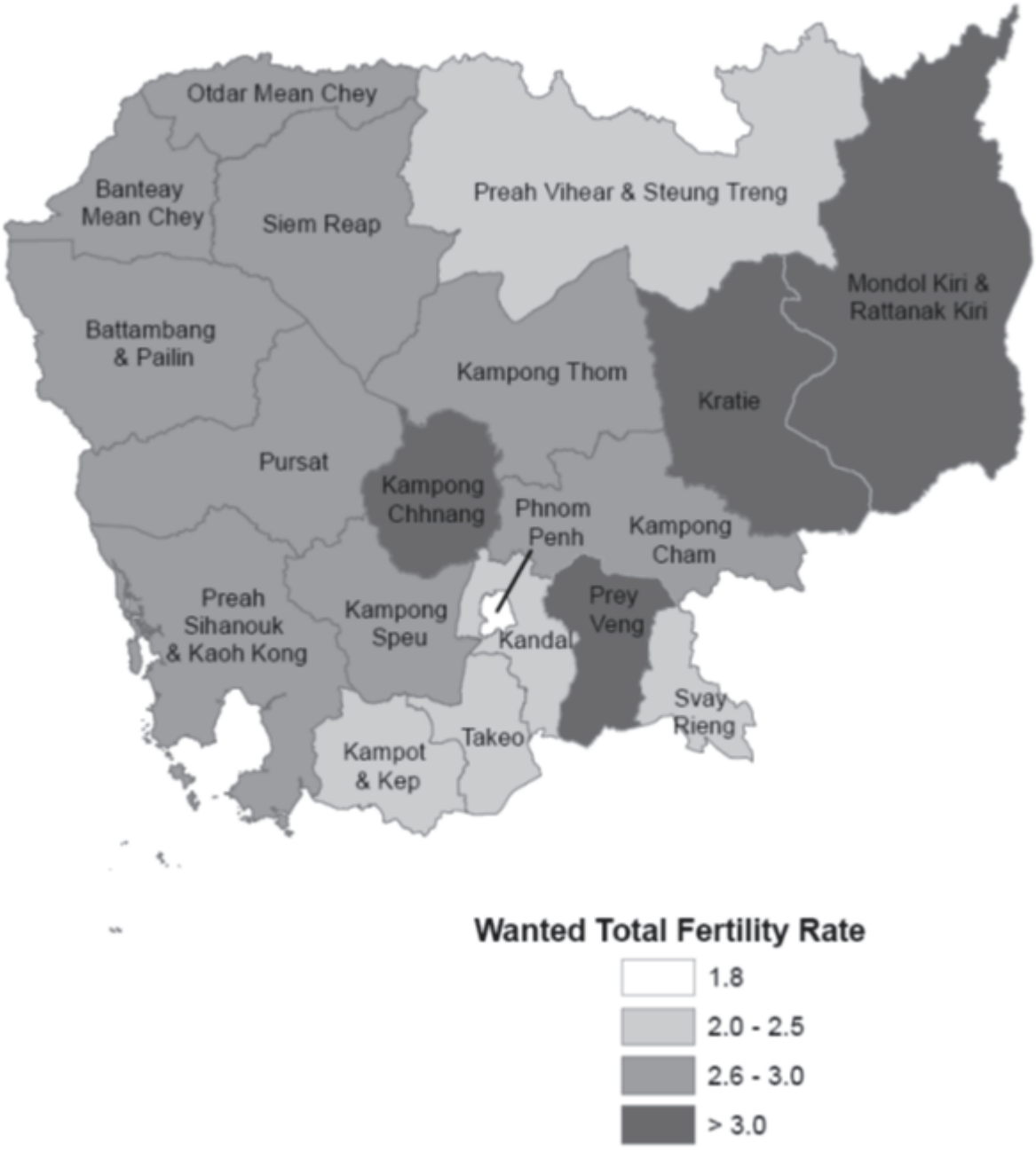
Table 7. Summary of reproductive measures for provinces of Cambodia, 2010

	Total fertility rate	Marital total fertility rate	Wanted total fertility rate	Mean ideal number		Percent wanting no more (have two)*		Percent using contraception*	Median age at first marriage	Infant mortality rate
				Women	Men	Women	Men			
Cambodia	3.0	3.5	2.6	3.1	3.1	51	44	50	20.3	45
Banteay Mean Chey	3.2	3.7	2.9	3.3	3.1	51	43	51	19.7	61
Kampong Cham	3.4	3.7	2.9	3.2	2.5	40	49	52	19.8	54
Kampong Chhnang	3.6	4.4	3.1	3.5	3.3	45	41	40	20.5	78
Kampong Speu	3.1	3.4	2.8	3.3	3.1	43	45	53	19.5	65
Kampong Thom	3.2	3.8	2.8	3.4	3.4	40	26	52	20.3	57
Kandal	2.9	3.3	2.4	3.2	3.4	47	37	62	20.6	61
Kratie	3.9	4.4	3.3	3.4	3.3	50	52	40	20.3	76
Phnom Penh	2.0	2.5	1.8	2.8	2.9	63	38	56	23.0	13
Prey Veng	3.3	3.6	3.1	3.2	3.2	56	51	48	19.5	64
Pursat	3.4	3.9	3.0	2.9	3.2	56	56	41	20.6	53
Siem Reap	3.4	3.8	2.9	3.0	2.8	43	46	45	20.9	50
Svay Rieng	2.6	2.9	2.3	2.9	2.9	72	57	50	19.5	78
Takeo	3.1	3.5	2.5	3.0	3.1	56	52	47	19.8	68
Otdar Mean Chey	3.2	3.5	2.6	3.2	3.4	43	36	47	20.2	42
Battambang/ Krong Pailin	3.2	3.6	2.7	3.2	3.2	43	44	51	20.7	45
Kampot/ Krong Kep	2.8	3.2	2.5	3.1	3.1	62	49	53	19.9	60
Krong Preah Sihanouk/ Kaoh Kong	2.9	3.2	2.6	3.3	3.1	45	32	51	20.6	50
Preah Vihear/ Steung Treng	3.5	4.1	3.0	3.2	3.9	32	12	37	20.1	95
Mondol Kiri/ Rattanak Kiri	4.5	4.7	3.6	3.5	3.5	50	43	43	19.3	82

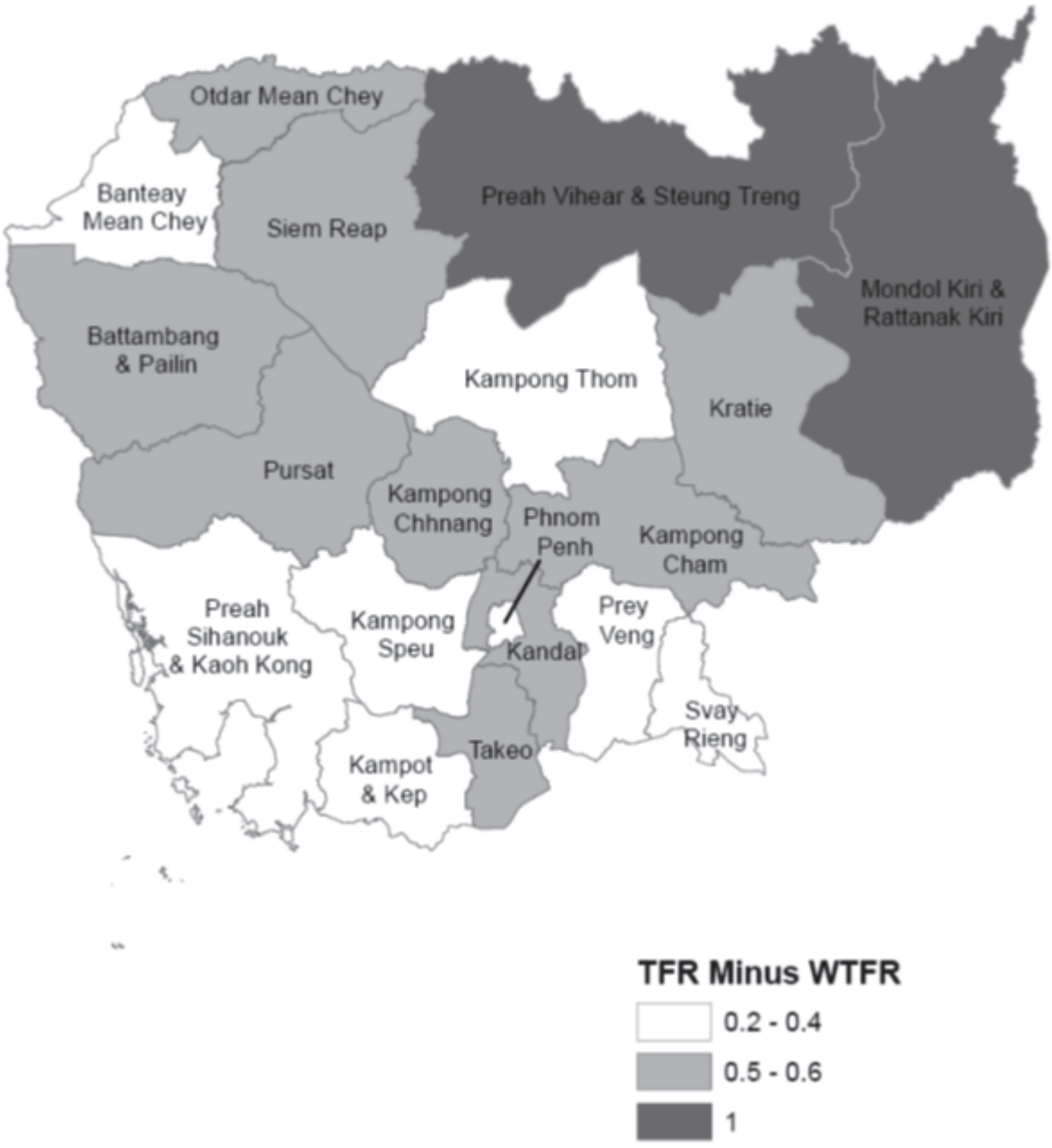
* Currently married

We have mapped some of these reproductive measures by province. Map 2 shows the provincial variations in the WTFR, which is highly correlated with the TFR (.91). As noted earlier, the provinces with the highest WTFRs are Mondol Kiri/Rattanak Kiri and Kratie in the east and Preh Veng and Kampong Chhang in the south. Map 3 shows the provinces by the amount of unwanted fertility, measured by the subtraction of the WTFR from the TFR. Mondol Kiri/Rattanak Kiri and Preah Vihear/Streung Treng stand out in the north with the highest unwanted fertility.

Map 2. Wanted total fertility rate

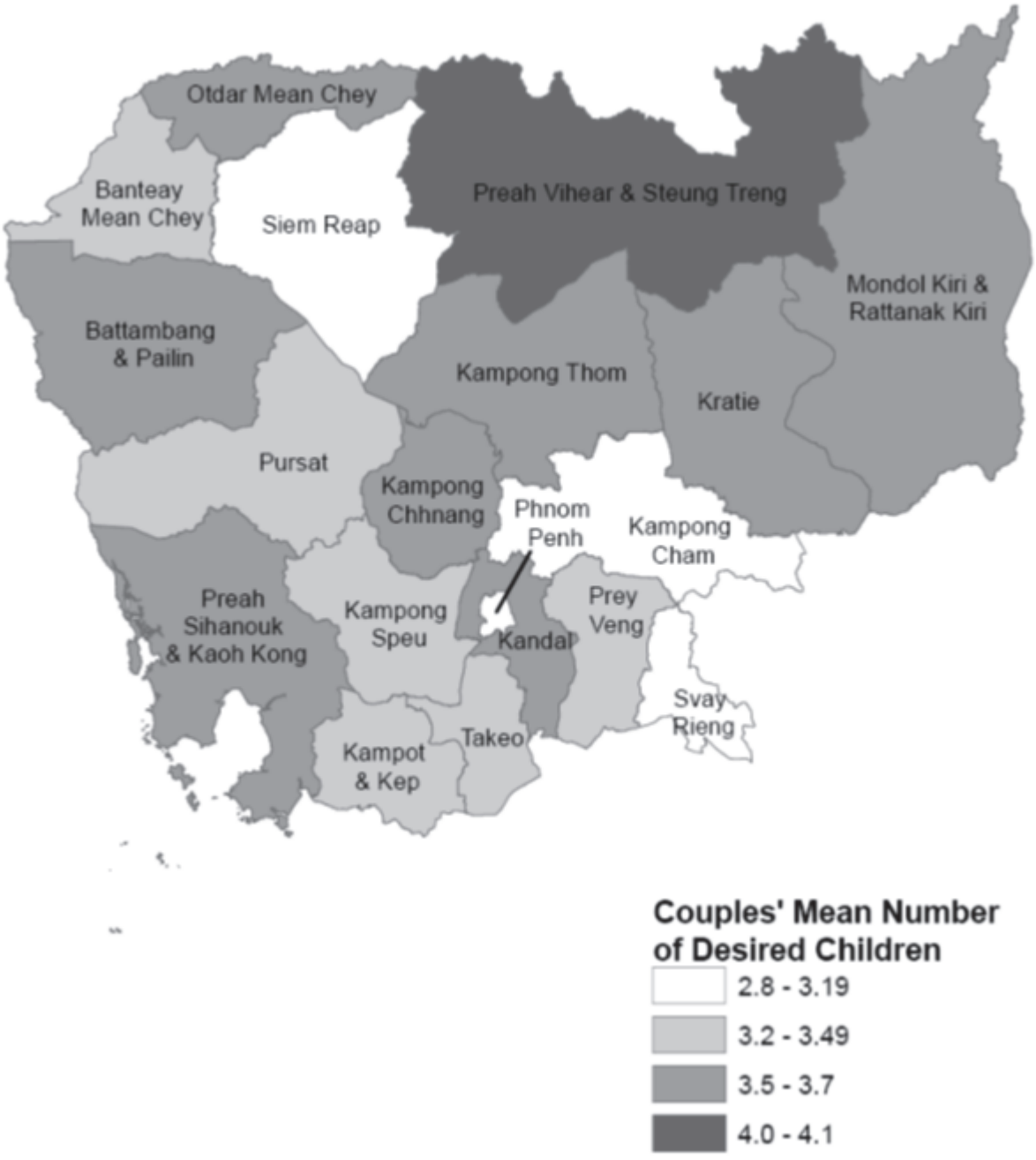


Map 3. Unwanted fertility



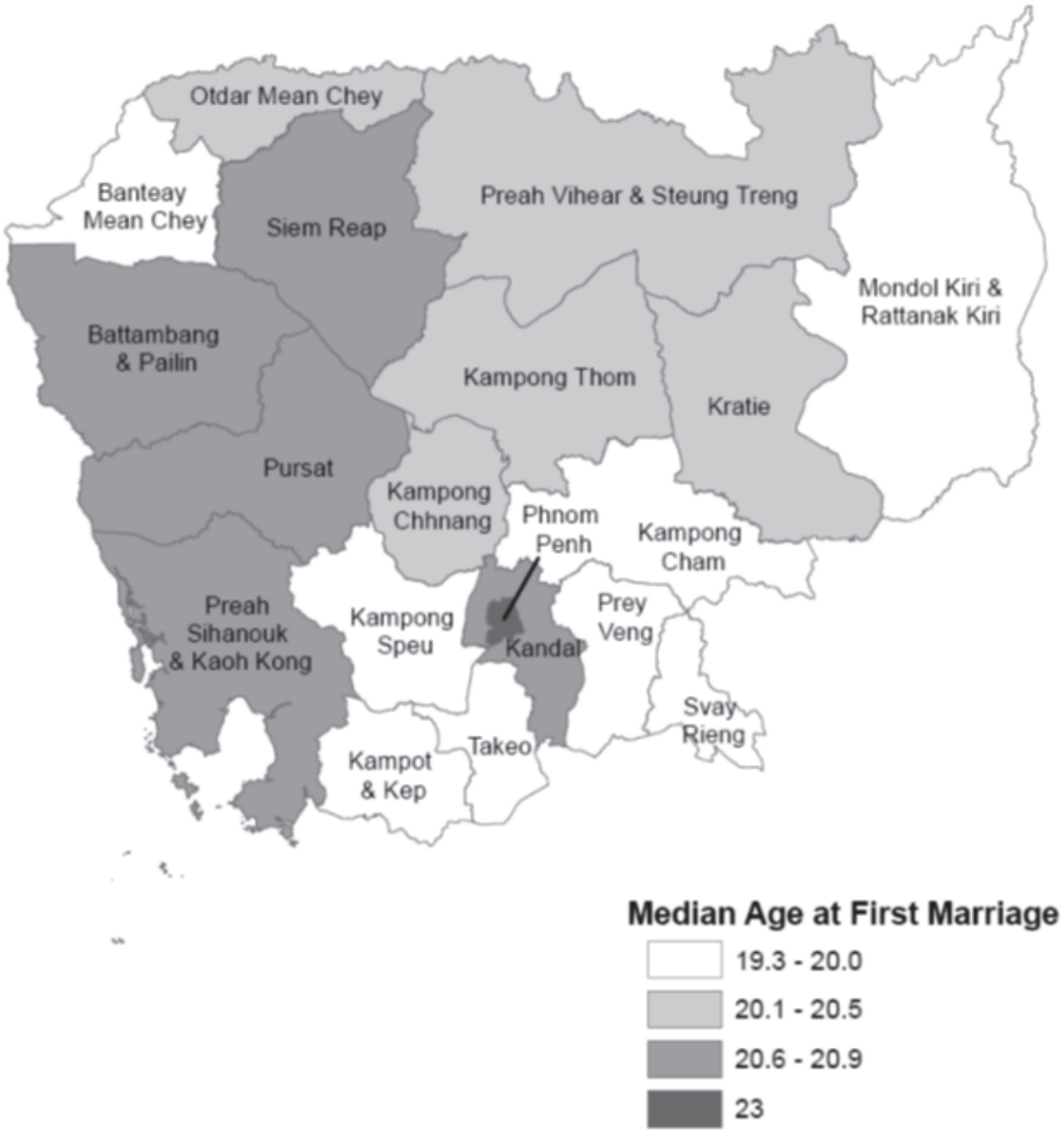
Map 4 plots the average number of children desired by married couples. The provinces with the highest numbers of children desired are mostly in the east, and those with the lowest are Phnom Penh, Kampong Cham, Siem Reap, and Svay Rieng.

Map 4. Couples' desired number of children

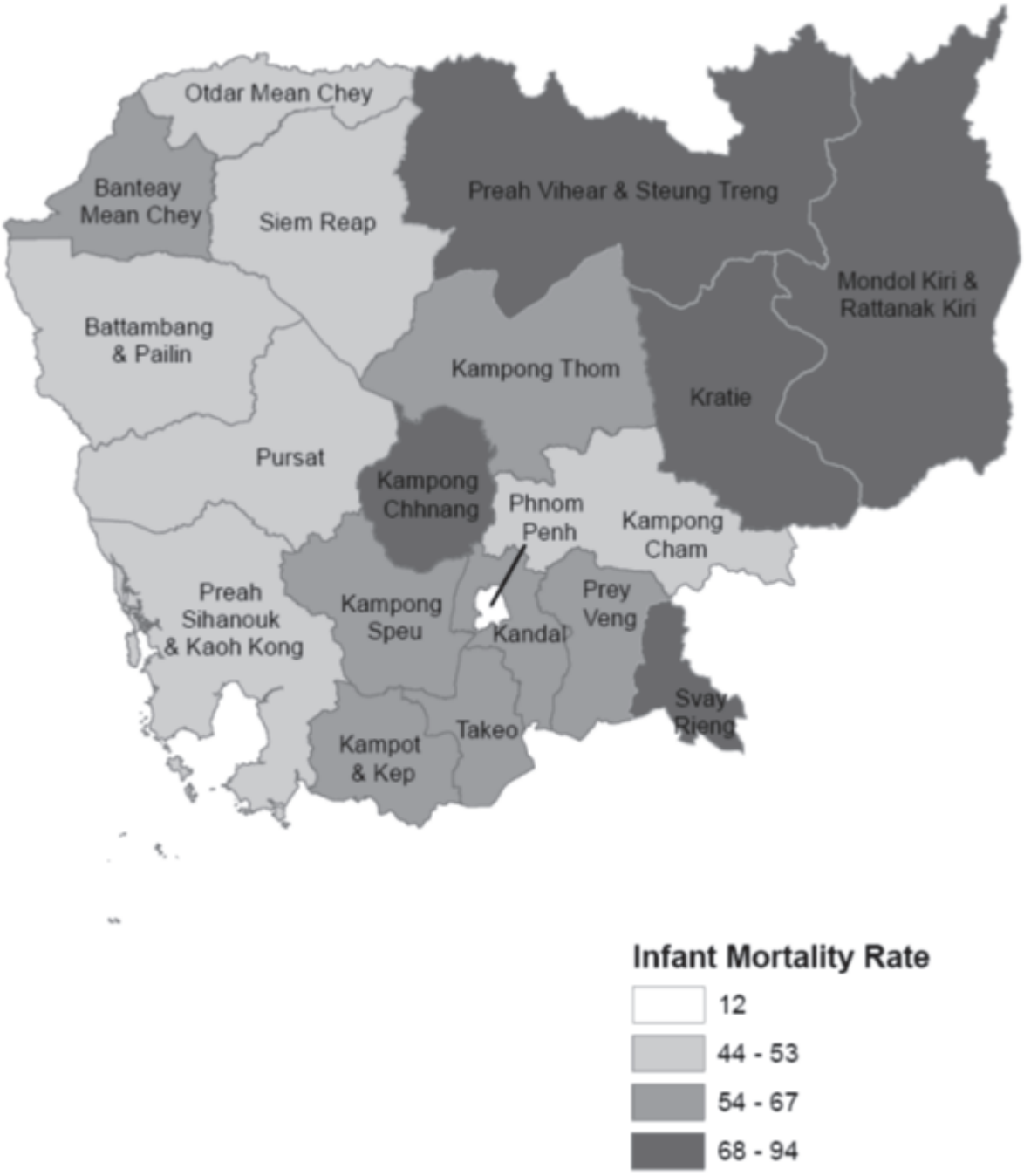


Two additional maps show the geographic distribution of the provinces by women's age at first marriage (Map 5) and by infant mortality (Map 6). The oldest median age at marriage is clearly in the capital city, at 23.0, and in several western provinces; the youngest median age is in Mondol Kiri/Rattanak Kiri, at 19.3. There is a considerable range of infant mortality, with the lowest level in Phnom Penh and the highest in the east and in several other provinces.

Map 5. Women's median age at first marriage



Map 6. Infant mortality



11. INTERRELATIONS OF PROVINCIAL MEASURES

We constructed a data file for the provinces, showing 27 different reproductive and socioeconomic measures, in order to study the interrelations of various characteristics at the aggregate level. We look first at the covariates of the WTFR, which is highly correlated (.91) with the TFR across the 19 provinces. It is inversely related to the percent having had at least some secondary schooling (-.74) and to wealth (-.60), which is measured here as the percent of households in the highest wealth quintile[4]. The WTFR is also correlated positively with the infant mortality rate (.51), and negatively (-.49) with a measure of the status of women (the percentage of women who decide how the wife's earnings are spent) and with the use of contraception (-.53). To a lesser extent, watching television is also negatively correlated with the WTFR (-.33).

Other variables of interest are women's age at first marriage and the use of contraception. Older ages at marriage are correlated positively with wealth (.84), with education (.74), and with watching television (.55), and negatively with infant mortality (-.72). Whether contraception is currently used is correlated positively with education (.61), with watching television (.49), and inversely with infant mortality (-.54).

As noted above, the infant mortality rate is directly related to the WTFR (.51) and negatively with age at marriage (-.72) and with the use of contraception (-.54). It is also negatively correlated with education (-.71) and with wealth (-.74).

[4] The quintiles of wealth are developed for the national level.

12. CONCLUSION

Both the fertility rate and the level of wanted fertility have declined in Cambodia since the first DHS in 2000. The analysis found that ideal or desired number of children is inversely related to years of schooling and to wealth. Multivariate analyses showed inverse associations between reproductive preferences and education, wealth, and current use of contraception, and showed positive associations between reproductive preferences and women's number of children and child mortality. A multivariate analysis of factors influencing the current use of contraception showed the connection with the number of children desired and positive associations with television exposure, as well as with education, wealth, women's work, and a negative relation with child mortality.

Because the TFR of 3.0 in 2010 seems low in the context of the level of contraceptive use, an analysis of the abortion rate in Cambodia was undertaken, which indicated that the TFR in the absence of abortion might have been 3.7 births per woman. The abortion rate in Cambodia appears to have increased since 2000.

While Cambodia has experienced a rapid decline from 2000 to 2010 in fertility and a number of related reproductive measures, this decline hides regional and provincial variations in reproductive preferences and outcomes. Nonetheless, in general, the prospects of further increases in education and wealth and in mass media exposure, along with continuing reductions of child mortality, strongly suggest that the decline of reproductive preferences and fertility in Cambodia will continue.

REFERENCES

Bradley, S., T.N. Croft, J.D. Fishel, and C.F. Westoff. 2012. *Revising Unmet Need for Family Planning*. DHS Analytical Studies No.25. Calverton, Maryland, USA: ICF International.

Hong, R., and D. Hor. 2013. *Factors Associated with the Decline of Under-Five Mortality in Cambodia, 2000-2010: Further Analysis of the Demographic and Health Surveys.* DHS Further Analysis Reports N.84. Calverton, Maryland, USA: ICF International.

Loun, M., C. Phan, and S. Mao. 2013. *Levels and Trends of Contraceptive Prevalence and Unmet Need for Family Planning in Cambodia.* Phnom Penh, Cambodia: National Institute of Statistics, Ministry of Planning, Directorate General for Health, and Ministry of Health.

Philipov, D., E.Andreev, T. Kharkova, and V. Shkolnikov. 2004. "Induced Abortion in Russia: Recent Trends and Underreporting in Surveys." *European Journal of Population* 20(2): 95-117.

Westoff, C.F. 2008. *A New Approach to Estimating Abortion Rates*. DHS Analytical Studies No. 13. Calverton, Maryland, USA: Macro International.

Westoff, C.F. 2006. *New Estimates of Unmet Need and the Demand for Family Planning.* DHS Comparative Reports No. 14. Calverton, Maryland, USA: Macro International Inc.

Westoff, C.F., and A. Bankole. 1996. "The Potential Demographic Significance of Unmet Need." *International Family Planning Perspectives* 22(1): 16-20.