I. INTRODUCTION

This report presents the results of an in-depth analysis of the 2005 Cambodia Demographic and Health Survey (CDHS), conducted to illuminate factors contributing to or impeding achievement of the goals set forth in the National Strategic Development Plan (NSDP).

A. National Strategic Development Plan

The NSDP is an inter-sectoral blueprint for national development over the five-year period 2006 – 2010. It contains 15 goals as follows:

1. Eradicate Poverty and Hunger
2. Enhance Agricultural Production and Productivity
3. Improvements in Health
4. Improvements in Education
5. Rural Development
6. Environmental Sustainability
7. Gender Equity
8. Reforms (Good Governance)
9. Sustain High Macro-Economic Growth
10. Improve Budget Performance
11. Accelerate Industrial Growth and Employment
12. Tourism (Promotion/Enhanced revenue generation from)
13. De-Mining, Victim Assistance
14. Rehabilitation and Construction of Physical Infrastructure
15. Energy (Access to electricity)

The CDHS contains a wealth of data related to health, education, rural development, and gender obtained from over 14,000 Cambodian households with a total population of over 66,000 persons. It also contains information relevant to population growth and trends, but these will not be dealt with as a national census planned for 2008 will provide a much more comprehensive picture than the CDHS's survey estimates can hope to provide. The CDHS is a tool of social research and, while it does contain useful information on household socioeconomic status (SES), types of employment and household expenditures on health care, it is not designed to collect the type of information needed for macro-economic analyses. These are addressed in the periodic Cambodia Socio-economic Surveys (CSES); the most recent of which (2006-7) is ongoing with results anticipated by mid 2008.

Hence, this in-depth analysis focuses exclusively on information relevant to the four "social sector" NSDP goals of (1) improvements in health; (2) improvements in education; (3) rural development and (4) gender equality. It is anticipated that similar analyses of the 2006-7 CSES and 2008 Census may be undertaken in subsequent years to shed similar light on economic growth and population trends respectively.

B. Overview of the Cambodia Demographic and Health Survey 2005

The CDHS was undertaken using a standardized methodology used in more than 80 countries for over 30 years[1] as part of an international effort to collect high quality development data in a uniform manner. The DHS methodology includes rigorous quality control measures both at the level of field data collection and in data entry/analysis with rapid identification of inconsistent responses. The quality of the data is therefore very high, in the sense of accurately reflecting the responses given by randomly selected, nationally representative respondents, using an interview schedule and structure which have been extensively field tested and successfully used in scores of countries, including Cambodia which conducted its first CDHS in 2000.

The data thus obtained is both internally consistent and consistent with observations of the Cambodian context and other data sources, both quantitative and qualitative. There are, however, two areas in which the results are unilluminating – nutritional intake and female sexual behavior. For the former, the standardized questions asked failed to capture Cambodian eating practices, while the latter appears to simply be a case of unwillingness on the part of female respondents to provide frank answers to highly sensitive topics with which considerable social stigma is attached. These two problem areas will be discussed further in the relevant sections of the report. Otherwise, the data appears robust and meaningful in the country context.

The CDHS contained two types of interview main schedules: household and individual. A household schedule was completed for every household in the sample and contains basic socio-demographic information on all household members. Since one of the primary aims of the CDHS was to generate reliable estimates of infant, child and maternal mortality, extreme care was used to determine accurate ages of respondents, using country-specific tools to convert the traditional Cambodian years and months/seasons to international dates. The household schedule also contains detailed information on school attendance and on illness and health care seeking behavior by all household members, and information on household assets and amenities such as water source, sanitation, etc. From these last variables an index of socio-economic status was developed ranking each household into a quintile. It was also possible to assess access to safe water and sanitation, and both the prevalence of illness in every population subgroup and the sources of treatment obtained.

There were 4 schedules for individual interviews: a lengthy one administered to all women of reproductive age in the sample households, a shorter one administered to men of the same age in a sub-set of households only, and topic-specific modules on women's status/gender roles and domestic violence which were administered to a sub-set of women in addition to the regular women's questionnaire. Male interviews were conducted separately from female interviews, and both were conducted in privacy with assurance of confidentiality.

The female individual questionnaires comprehensively covered variables related to infant, child and maternal morbidity and mortality, maternal and child health services and behaviors directly linked to same, and fertility.

In half of the households selected for the survey, all men age 15-49 were also interviewed, using a much shorter interview schedule oriented towards knowledge, attitudes and practices relevant to family planning and HIV/AIDs.

[1] Previously called the World Fertility Survey

HIV testing was conducted (subject to informed consent) on all male and female respondents in the 50% of households in which both men and women were interviewed. In addition, anthropometric data was obtained on women of childbearing age and children under the age of 5. in the same households. These included measurements of under-nutrition and of anemia.

In half of the 50% of households which did not include male interviews , HIV testing or anthropometrics, – i.e. in 25% of the total households in the sample -- women of reproductive age interviews included special modules on women's status and domestic violence.

In summary:

- women of reproductive age were interviewed on a variety of topics relating to maternal and child health, fertility and mortality in all sample households.
- In half of the households, a separate interview was also conducted with men aged 15-49, both men and women were tested for HIV, and women and children were weighed, measured and tested for anemia.
- In 25% of households, the individual women's questionnaire was supplemented by additional modules on women's status/gender relations and domestic violence.
- In 25% of households no additional interviews or measurements were conducted other than the household schedule and main women's questionnaire.

Note that, as a result of this division – done to avoid excessively lengthy interviews – the households for which data is available on women's status/gender roles and domestic violence do not have anthropometric data available not any male interviews.

C. In-depth Analysis Approach and Methodology

The 2005 CDHS report already contains a comprehensive presentation of descriptive statistics with respect to infant, child and maternal mortality rates and trends, fertility rates and trends, contraceptive use and other proximate determinants of fertility, maternal and child health and nutrition, and HIV-related knowledge, attitudes and practices. It is not the purpose of this analysis to rehash what is already available from the original CDHS report, and a basic familiarity with it is assumed. Information already presented in the CDHS report will not be repeated or discussed except in a few rare instances where the in-depth analysis uncovered discrepancies or limitations to the data it presented.

Instead, the in-depth analysis focused on identifying the relative contribution of different factors to the key outcome indicators related to the NSDP strategic goals. This was done by employing statistical techniques whereby the influence of multiple variables on a single outcome measure are assessed controlling for the interaction between them. For example, virtually every health indicator shown in the CDHS report varied significantly by both education level and socio-economic status (SES). However, education and SES are themselves so very closely correlated that anything with a statistical relationship to one is bound to also have it to the other, and there is no telling which of these two is more influential – or if, perhaps, both associations are due to yet some third unexplored factor they both have in common.

Statistical analyses called *regressions* were used to isolate the influence of one factor in the presence of several others. First a careful review of the cross-tabulations contained in the CDHS report was made to identify factors which, taken individually, seemed to have a correlation to an

important outcome indicator. Additional cross-tabulations with Chi Square tests were run of other factors that were not already shown but might logically have an effect on the outcome variable. A regression analysis was then run using all the variables that appeared, individually, to have some relationship to the outcome measure, in order to isolate their individual effects. SES, age and education were always included in this analysis, even if they did not seem to be significant factors in and of themselves, in order to hold their effects constant since they may otherwise confound the effect of other variables.

With respect to SES, the initial CDHS analysis had already developed a wealth index based on assets which was divided into quintiles; no changes were made to this scale.

The type of regression performed was determined by the nature of the dependent variable (the outcome being analyzed). If it was a numerical or scaled indicator then linear regression was used. If it was a dichotomous (yes/no) type of measure then binary logistical regression was done.

In addition to regression analyses, descriptive statistical analyses were done for special population groups and/or issues not covered in the original CDHS report, e.g.:

- the elderly: socioeconomic and living situation, health and health care seeking.
- general morbidity (as opposed to pregnancy-related) and health care seeking of women of reproductive age.
- morbidity and health care of school-aged children and youth.
- a profile of persons living with HIV/AIDs in the general population, with particular attention to risks of husband to wife and mother to child transmission.

All analyses were done using the SPSS software package version 15.0.

D. Important Notes

(1) In order to make this report user-friendly for a wide audience, many of whom are not familiar with the interpretation of the statistics generated by regression analysis, detailed statistical tables appear at the end of each chapter, preceded by a narrative describing the key findings. And policy implications.

(2) As was noted in the introductory section, some variables were available only from sub-sets of the sample. A particular dilemma was encountered with respect to variables related to gender equity, as only 25% of the households were included for that module and almost half of the respondents were never-married women, making many of the questions non-applicable. The information from the women's status and domestic violence modules is available for only 2,869 (unweighted) ever married women. While this sample is sufficient for analyses applicable to the entire group, the numbers shrink considerably when analyses are confined to important sub-groups, such as mothers of children of a particular age, currently pregnant women, etc. This does not preclude analysis but it does mean there is less power to detect relationships.

Normally, when one wishes to conduct a regression analyses using a set of variables some of which are available only for a subset of cases, one simply limits the analysis to those cases for which all variables are available, and this was done with regard to anthropometric data, available for 50% of the cases. However, in the case of gender equity variables, the unusually small size (66% of what was already a 25% sub-sample) was so limiting that confining the entire analysis

only to cases where this data was available would have reduced the power of the analyses to a point where many significant relationships would have been missed. On the other hand, gender equity factors were potentially influential predictors of many of the outcomes of interest.

In order to deal with this a 2-staged analysis was done. First, variables other than those found only in the women's status/domestic violence modules were regressed to obtain measures of the size, direction and statistical significance of the effect of each. Then a partial correlation analysis was done of gender related variables *keeping the other factors already identified as having significance constant.* This approach allowed for a measure of the effect of most variables with a reasonable degree of power, and ensured that any associations found to gender equity variables was not due to their confounding effects. Inevitably, though, the power of detection for the effect of gender equity variables was less than that for other variables, an important caveat to keep in mind.

II. WOMEN OF REPRODUCTIVE AGE

Women of reproductive age (WRA) are selected as the starting point for this analysis not only because life begins in their wombs but because their circumstances directly impact upon not only their own health but the health, education and general welfare of their children.

Most WRA are the only woman of reproductive age in their households. Excluding the age group 15-19 years, most are married and living with their husbands. On average they have had some education but not completed primary school. *More than half watch television at least once a week, and about half listen to the radio. The overwhelming majority are reached by at least one of these mass media.*

Gender Equity is one of the 15 goals stated in the NSDP, as well as one of Cambodia's Millenium Development Goals, not only because it speaks directly to a human rights issue affecting half the world's population but because women's status and the presence or absence of societal restrictions on their autonomy directly affects their ability to care for their children, boys and girls alike. Since various aspects of gender equity/inequity proved to have a significant influence on a wide range of indicators, it will be discussed first.

A. Gender Equality

The CDHS covered five broad areas relating to gender equity: (1) women's knowledge of laws and issues pertaining to their rights, (2) women's own attitudes towards gender roles and gender-specific issues, (3) the degree of decision-making autonomy or participation that women had within their households, (4) the degree of economic autonomy women possessed, and (5) domestic violence and related behaviors.

As noted in the preceding section, special modules on women's status and household relations/domestic violence were administered to WRA in only 25% of sample households. A total of 4, 174 (unweighted) WRA were interviewed, but as a natural result of the age structure of the population (which is overwhelmingly young) 31.3% of these were never married women, almost all of them below the age of 25. This presents no difficulty with respect to knowledge and attitudes but greatly limited the applicability of questions on decision-making (2 out of 6 questions used were answered only by ever married women) and on financial autonomy, and of course the domestic violence questions were completely inapplicable for the never-married. Hence, for 3 of the 5 areas explored, the effective sample size is under 3,000.

1. Knowledge

The CDHS measured women's knowledge of laws pertaining to women's rights and their awareness of the problem of trafficking of women. Fewer than half of all women were aware of any of the 5 laws mentioned; about two thirds were aware of trafficking. In order to better explore factors affecting women's knowledge, a composite variable was created by summing the number of laws a woman was aware of plus her awareness of the issue of trafficking and dividing the resultant score into quartiles.

Knowledge of rights had a significant relationship to the following, in descending order of importance:

- Exposure to mass media
- Education
- Province of residence: knowledge is significantly higher in Phnom Penh, Kandal, Kamping Thom and Kampot/Kep.
- Age: knowledge is highest among the youngest and oldest age groups, i.e. under 25 and over 40.
- Marital status: divorced and separated women knew more than currently or never married women or widows.

SES was *not* a significant factor when the above were controlled for; neither was rural vs. urban residence.

In terms of magnitude, exposure to mass media and education level were many-fold more important than the other factors mentioned. It is interesting to note that although both were major predictive factors, *media had a stronger effect than formal education.*

2. Attitudes

The following attitudes related to gender equality were measured in the CDHS: whether men should make the important decisions in the family, whether husbands should help with chores, whether married women should be allowed to work, whether wives should express their opinions, the acceptability of domestic violence, the relative value of educating sons vs daughters, the acceptability of extramarital sex for men, and lastly, whether and under what circumstances a wife has the right to refuse sexual relations with her husband.

Across all groups there was strong disapproval of extramarital sex. and of the idea that 'a wife should tolerate beatings to keep the family together'. However, in a separate question, more than half of the respondents indicated a belief that domestic violence was justified under at least one specific circumstance, indicating some ambivalence on this matter.

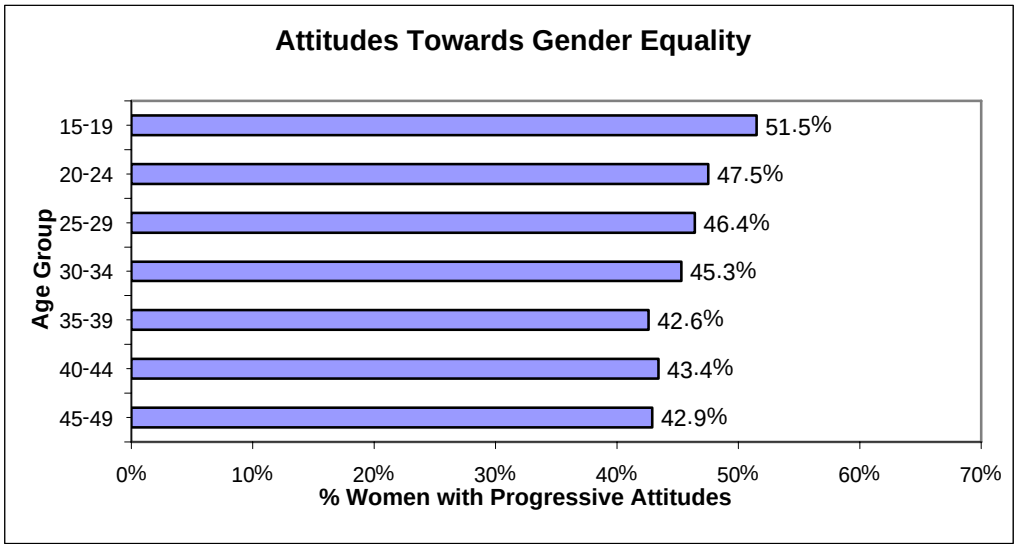
The vast majority of women also agreed that a wife had the right to refuse to have sex with her husband under some circumstances, and most believe she has this right under any (i.e. "tired, not in the mood"). Interestingly, younger, never married women were the most conservative in this regard.

Very few women believed that husbands should help with household chores and this perspective was pervasive across all strata. The vast majority of women also did not believe that wives should have the right to express their opinions, although there was considerable variance by SES; interestingly, the poorest women were the most likely to believe that wives do have this right. Respondents varied widely with respect to wives working, whether men should make the important decisions, and whether the education of boys was more important than of girls.

A composite index of gender equity-related attitudes was composed by summing the number of responses to these 8 issues which reflected an egalitarian viewpoint and dividing the resultant score into quartiles. Progressive attitudes towards gender equality were most strongly associated with the following, in descending order of importance:

- Education
- Marital status: separated/divorced, never married and widowed women hold significantly more progressive attitudes than women who are currently married and living with their husbands.
- Exposure to mass media
- SES

With these effects controlled for, the effect of age was modest , but there does seem to be a steady, gradual shift towards more progressive attitudes in recent years, as shown below. Differences between the women under 25 and those 35 and above are statistically significant:



3. Autonomy

a. Decision-Making

The CDHS measured women's decision-making ability respect to 6 variables: leaving home to visit family/friends, making daily purchases, making large purchases, working outside the home, using contraception, and her own health care.

It should be noted that Table 20.5 in the CDHS report is misleading in that the percentages reported for contraception and for working are not the valid percentages for these questions; both of them were answered only by ever married women. The valid percentages are:

- 73.1% for having a say in whether she works, and
- either 72.8% or 98.0% for using contraception, depending on whether one disregards the "not applicable" response category, as shown below

Final say on: contraception	Percent	Valid Percent	Cumulative Percent	Excluding "not applicable"
Respondent	12.5	**18.6**	18.6	
Respondent with partner	34.8	**51.6**	70.2	
Respondent with someone else	.4	.6	**70.8**	**98.0**
Partner	1.3	2.0	72.8	**2.0**
Someone else	.0	.0	72.8	
Decision not made, not applicable	18.3	27.2	100.0	
Total	67.4	100.0		
Missing	32.6			
Total	100.0			

Decision-making authority of women in Cambodia varies dramatically be marital status. Never-married women, the vast majority of whom are young (mean age is 20.6, and 82.5% are under age 25), have extremely little decision-making power . Their situation of be explored further in Section V: Youth.

The situation changes completely when a woman marries; three-quarters of ever-married women have a say on at least 5 out of the 6 decisions measured, with making large purchases being the matter most often outside their jurisdiction.

Decision-making influence in ever married women is strongly associated with the following, in descending order of importance:

- Age: decision-making authority increases with increasing age
- Attitudes towards gender equality: women with more progressive attitudes reported more participation in decision-making. This may, however, reflect a two-way causality, since people have a tendency to rationalize their circumstances.
- Employment: women who worked had greater decision-making authority than those who did not.
- Knowledge of legal rights had a positive correlation to decision-making.
- SES showed a positive correlation.
- There was a significant negative correlation to controlling behavior on the part of the husband.
- Differences by province of residence were significant.

Neither the woman's nor her husband's level of education are significant when these factors are controlled for.

b. Economic Autonomy

A composite index of economic autonomy was developed out of the following variables: ownership of any assets which can be sold without permission, control of household spending money, employment outside the home, the woman's perceived ability to borrow money from her natal family if necessary, and knowledge about credit programs. The resulting scale was divided into quartiles.

The most important predictors of economic autonomy were, in descending order of importance:

- Exposure to mass media.
- Knowledge of legal rights.
- The presence or absence of emotional/physical abuse from the husband.
- SES: better off women had more economic autonomy than the poor.
- Urban/rural residence: interestingly, the correlation was *positive for rural* residence and negative for urban. Explore further if time…related to wage earning employment by husband?

Age, province of residence and even education are not significant when the above factors are controlled for. It is noteworthy that being or having been in an emotional or physically abusive relationship had a strong negative correlation to financial autonomy.

4. Domestic Violence

The incidence of physical and emotional abuse, and of controlling behavior, appears to have been significantly under-reported by women still living with their spouse:

Reported Behavior by Husband			
Marital Status	**Emotional Abuse**	**Physical Abuse**	**Controlling Behavior**
Divorced/Separated (N= 238)	42.0%	20.2%	67.4%
Widowed (N=108)	22.2%	14.8%	20.6%
Married/living together (N=1799)	21.0%	12.8%	26.2%
Total (N=2037)	22.4%	13.7%	24.5%
			p=.000

It is understandable that more separated/divorced women would have experienced abuse, since abusive behavior may prompt a woman to leave her marriage; it is also not uncommonly seen as a prelude to abandonment on the part of the husband. However, an almost two-fold difference in prevalence strains credulity; in order to be a separated/divorced woman who was abused, one has to have first spent some time as a currently married one being abused. Under-reporting by currently married women may reflect intimidation and/or rationalization.

There is a very strong, highly significant correlation between emotional abuse, physical abuse and controlling behavior, irrespective of the couple's SES or the educational level of either spouse. More than half of all husbands who have ever been emotional abusive to their wife were also reported to have physically abused her; 41.8% of husbands who exhibited multiple controlling behaviors were reported to have physically abused their wives.

Because these behaviors are so closely connected – and because some of them may have been more accurately reported than others – a dichotomous variable for marital relations was developed reflecting either the absence of all three (controlling behavior, emotional abuse, physical abuse) or the presence of any of them, singly or in combination.

Over a third (35.5%) of Cambodian women of reproductive age have experienced abusive and/or controlling behavior in their marriage.

The strongest predictors of both emotional and/or physical abuse are, in descending order of importance:

- Controlling behavior on the part of the husband: men who exhibiting controlling behavior were three times more likely to abuse their wives than those who did not.
- History of domestic violence among wife's parents: women who reported that their fathers had beaten their mothers were more than twice as likely to report that this had also happened to them. However, since domestic violence appears to have been significantly underreported, it is possible that this association is spurious, i.e. that women willing to report their own experience of domestic violence were also more willing to report that it had occurred to their mothers, and vice versa.
- Alcohol use by the husband: men who drink alcohol are twice as likely to abuse their wives as men who do not.
- Weak social support for the wife: women whose relationship with their natal family is close – as measured by frequency of contact and ability to call upon them for shelter and material assistance – were significantly less likely to report abuse than those who reported less support or contact with their families.
- Lack of knowledge of her rights/relevant laws on the part of the wife was associated with an increased risk of abuse.

Neither SES nor the education level of either spouse are significant when the above factors are controlled for.

The factors associated with domestic violence are also predictive of controlling behavior by the husband, with one important and surprising exception: controlling behavior was also related to the circumstances of the marriage. Surprisingly, it was more common in marriages in which the woman chose her spouse, either one her own or in consultation with her family, than in arranged marriages.

This association, shown in descriptive form below, holds true in regression with all other factors controlled for:

	Controlling Behavior by Husband			
Selection of Spouse	**None**	**Somewhat Controlling**	**Extremely Controlling**	**Total**
Husband Chosen by Others	81.2%	9.3%	9.6%	100.0%
Husband selected by her family	75.0%	10.8%	14.1%	100.0%
Woman decided together with her family	78.3%	11.0%	10.7%	100.0%
Woman and husband chose each other	66.8%	13.6%	19.5%	100.0%
Total	75.5%	11.1%	13.4%	100.0%
				p=.000

As noted in the CDHS report, most victims of domestic violence do not seek help, although the percentage has increased over 2000. When they do seek help, it is almost always from their own family members. The strongest predictors of seeking help are, in descending order of importance:

- Severity of the abuse (presence of physical injury or not).
- Frequency of the abuse.
- Independent access to financial resources (economic autonomy).
- A high degree of closeness/ support from the woman's natal family
- Knowledge of legal rights and progressive attitude towards gender equality on the woman's part.

By far the most common reason for not seeking help was a sense of shame (51.4%). In distant second place was a sense of hopelessness/resignation (24.6%). Not knowing where to go and fear of repercussions for seeking help were cited by only 13.5% and 10.6% respectively.

5. Empowerment Index

The previously described measures of knowledge of rights, attitudes towards gender equality, participation in decision-making, economic autonomy and gender relations was used to construct a composite variable for personal empowerment among ever married women against which variables related to health and children's education could be regressed. This was done by combining the sums of:

- Attitudes towards gender equality and (a scale of 1 to 4).
- Knowledge of laws/issues pertaining to women's rights (scale of 1 to 4).
- Participation in household decision-making (scale of 1 to 3)
- Degree of social and economic support from natal family (scale of 1 to 3).
- Independent access to financial resources, including both immediate access to cash and potential ability to independently sell assets or borrow (scale of 1 to 5).

- Gender relations: whether or not the woman's present or most recent marital relationship was free of controlling behavior and abuse. This was as dichotomous value weighted by *-3, so that value was either 0 (no abuse or controlling behavior) or minus 3 (abuse and/or controlling behavior by husband).

The resulting score, which has a normal distribution curve, was divided into quintiles. As will be discussed in sections to follow, such female empowerment it appears to have a significant impact upon maternal and child health and upon children's education.

6. Summary and Policy Implications

Once married, Cambodian women enjoy a high level of authority with respect to household decision-making. Most women also control funds for daily household expenditures, but other aspects of economic autonomy (ability to sell assets or borrow money) show considerable variation. Both decision-making and economic autonomy are significantly related to women's knowledge of their legal rights.

Attitudes towards gender equality, which seem to be more progressive among younger women, are also favorably influenced by knowledge of rights.

A significant minority (35%) of Cambodian women experience abusive and/or controlling behavior in their marriages. Women with better knowledge of their legal rights are less likely to face this situation than those whose knowledge is low. Other important predictors include alcohol use by the husband, controlling tendencies on the husband's part, and lack of close contact/support with the woman's natal family. A sense of shame is the primary factor inhibiting victims of domestic violence from seeking help.

Mass media plays a key role in shaping women's knowledge and attitudes with respect to gender equality and also appears to influence their degree of autonomy.

While knowledge of legal rights is by no means the only factor influencing egalitarian attitudes, autonomy and healthy marital relations, it is probably the one most easily amenable to intervention, and the current level of knowledge among Cambodian women is extremely low.

Policy Recommendations

1. A mass media campaign should be undertaken to inform both men and women about women's legal rights.

2. Mass media approaches should also be used to de-stigmatize victims of domestic abuse and spread awareness of the new domestic violence law.

3. Given the wide-spread sense of shame/stigma, local officials (commune, village) should receive sensitivity training with respect to handling domestic violence cases, and consideration should be given to ensuring the availability of a female official or volunteer to receive such complaints and interview the victim.

7. Regression Statistics

Table II. A. 1: Knowledge of Legal Rights

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.314(a)	.099	.097	1.14682

a Predictors: (Constant), Exposure to Mass Media, Region, Age 5-year groups, Type of place of residence, Current marital status, Highest educational level, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	601.045	7	85.864	65.286	.000(a)
	Residual	5487.851	4173	1.315		
	Total	6088.896	4180			

a Predictors: (Constant), Exposure to Mass Media, Region, Age 5-year groups, Type of place of residence, Current marital status, Highest educational level, Wealth index

b Dependent Variable: Knowledge of Legal Rights

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.652	.135		4.843	.000
	Age	.033	.010	.055	3.258	.001
	Current marital status	.044	.021	.035	2.133	.033
	Education	.303	.030	.174	10.061	.000
	SES	-.007	.016	-.008	-.444	.657
	Urban/rural residence	.039	.052	.012	.748	.455
	Province	-.020	.004	-.080	-5.413	.000
	Exposure to Mass Media	.233	.020	.206	11.871	.000

a Dependent Variable: Knowledge of Legal Rights

Table II.A.2: Attitudes towards Gender Equality

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.226(a)	.051	.049	1.06906

a Predictors: (Constant), Exposure to Mass Media, Region, Age 5-year groups, Type of place of residence, Current marital status, Highest educational level, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	256.072	7	36.582	32.008	.000(a)
	Residual	4762.107	4167	1.143		
	Total	5018.179	4174			

a Predictors: (Constant), Exposure to Mass Media, Region, Age 5-year groups, Type of place of residence, Current marital status, Highest educational level, Wealth index

b Dependent Variable: Attitudes towards Gender Equality

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	2.017	.126		16.056	.000
	Age	-.015	.009	-.027	-1.551	.121
	Current marital status	.063	.019	.056	3.300	.001
	Education	.239	.028	.151	8.498	.000
	SES	.037	.015	.049	2.486	.013
	Urban/rural residence	-.056	.048	-.020	-1.165	.244
	Province	-.002	.003	-.008	-.539	.590
	Exposure to Mass Media	.070	.018	.068	3.848	.000

a Dependent Variable: Attitudes towards Gender Equality

Table II. A. 3: Decision-Making within the Household

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.319(a)	.102	.097	.77524

a Predictors: (Constant), Controlling Behavior by Husband, Respondent currently working, Highest year of education, Attitudes towards Gender Equality, Region, Wealth index, Age 5-year groups, Knowledge of Legal Rights

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	102.863	8	12.858	21.395	.000(a)
	Residual	908.085	1511	.601		
	Total	1010.949	1519			

a Predictors: (Constant), Controlling Behavior by Husband, Respondent currently working, Highest year of education, Attitudes towards Gender Equality, Region, Wealth index, Age 5-year groups, Knowledge of Legal Rights
b Dependent Variable: Decision Making Authority

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	1.172	.102		11.500	.000
	Age	.085	.012	.179	7.122	.000
	Province	.012	.004	.069	2.788	.005
	Education	-.003	.013	-.006	-.232	.816
	SES	.045	.015	.077	3.104	.002
	Respondent currently working	.185	.044	.105	4.207	.000
	Attitudes towards Gender Equality	.102	.019	.133	5.381	.000
	Knowledge of Legal Rights	.062	.017	.092	3.666	.000
	Controlling Behavior by Husband	-.065	.028	-.058	-2.353	.019

a Dependent Variable: Decision Making Authority

Table II. A. 4: Economic Autonomy

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.518(a)	.269	.264	.81010

a Predictors: (Constant), Ever Experienced Emotional or Physical Abuse From Husband, Type of place of residence, Highest year of education, Respondent currently working, Knowledge of Legal Rights, Region, Age 5-year groups, Exposure to Mass Media, Controlling Behavior by Husband, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	412.822	10	41.282	62.905	.000(a)
	Residual	1124.272	1713	.656		
	Total	1537.095	1723			

a Predictors: (Constant), Ever Experienced Emotional or Physical Abuse From Husband, Type of place of residence, Highest year of education, Respondent currently working, Knowledge of Legal Rights, Region, Age 5-year groups, Exposure to Mass Media, Controlling Behavior by Husband, Wealth index

b Dependent Variable: Independent Access to Money (on-hand plus ability to sell assets or borrow)

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	1.733	.159		10.886	.000
	Age	-.001	.012	-.001	-.059	.953
	Province	-.004	.004	-.019	-.890	.374
	Urban/rural residence	.113	.059	.043	1.903	.057
	Education	.018	.013	.030	1.414	.158
	SES	.050	.017	.073	2.918	.004
	Respondent currently working	.883	.043	.437	20.613	.000
	Knowledge of Legal Rights	.079	.017	.101	4.714	.000
	Exposure to Mass Media	.104	.022	.116	4.796	.000
	Controlling Behavior by Husband	.024	.030	.018	.805	.421
	Ever Experienced Emotional or Physical Abuse From Husband	-.187	.051	-.081	-3.645	.000

a Dependent Variable: Independent Access to Money (onhand plus ability to sell assets or borrow)

Table II. A. 5. a: Correllations between Marital Control, Emotional and Physical Abuse

	Controlling Behavior	Physical Abuse	Emotional violence
Controlling Behavior	.	r=.333	r=.362
sig		p=.000	p=.000
Physical Abuse	r=.333	.	r=.566
sig	p=.000		p=.000
Emotional violence	r=.362	p=.566	.
sig	p=.000	p=.000	
Control variables: (1) Husband drinks alcohol; (2) SES; (3) Woman's education; (4) Husband's education			

Table II. A. 5. b: Domestic Violence (Physical and/or Sexual Abuse)

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	256.298	5	.000
	Block	256.298	5	.000
	Model	256.298	5	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1513.033(a)	.139	.216

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1513.033(a)	.139	.216

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Controlling Behavior by Husband	.948	.080	140.206	1	.000	2.580
	Family support	-.297	.083	12.721	1	.000	.743
	Father beat Mother	.810	.153	27.892	1	.000	2.248
	Alcohol	.813	.166	24.029	1	.000	2.254
	Knowledge of legal rights	-.080	.054	2.156	1	.142	.924
	Constant	-1.771	.256	47.995	1	.000	.170

a Variable(s) entered on step 1: SpouseControl, famsup, Parentdv, D113, RIGHTS.

Table II. A. 5. c: Marital Control

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.222(a)	.049	.047	.68422

a Predictors: (Constant), Who chose husband, Wealth index, Partner drinks alcohol, Support Systems: Own Family, Father beat Mother

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.508	5	9.302	19.869	.000(a)
	Residual	900.329	1923	.468		
	Total	946.837	1928			

a Predictors: (Constant), Who chose husband, Wealth index, Partner drinks alcohol, Support Systems: Own Family, Father beat Mother

b Dependent Variable: Controlling Behavior by Husband

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.629	.081		7.746	.000
	Partner drinks alcohol	.130	.035	.083	3.718	.000
	SES	-.017	.011	-.033	-1.482	.139
	Father beat Mother	.277	.042	.150	6.660	.000
	Family Support	-.093	.021	-.098	-4.397	.000
	Who chose husband	-.034	.013	-.060	-2.662	.008

a Dependent Variable: Controlling Behavior by Husband

B. Nutritional Status and General Health

The nutritional status of Cambodian WRA is poor, with almost half suffering from some degree of anemia and almost a fifth being moderately to severely underweight. Although child-bearing takes its toll, most Cambodian women *start* their reproductive careers in poor nutritional state: 47.7% of 15 year old girls are anemic and 43.9% are underweight

Although there is a correlation between underweight and anemia, it is not very strong; 45.8% of women who are not underweight are still anemic. In addition, the contributing factors for anemia and underweight differ.

1. Anemia

As noted above, women enter their child-bearing years already anemic and remain so, to vary extents, for the duration. Anemia is more prevalent among currently pregnant women and – of particular concern – much more likely to be severe.

	Degree of Anemia			
	None	**Mild**	**Moderate or Severe**	**Total**
Not pregnant or DK	54.0%	36.2%	9.8%	100.0%
Pregnant	45.0%	20.6%	34.4%	100.0%
				p=.000

Anemia is also more prevalent among women who have had a birth in the past 24 months and lactating mothers (more or less the same, since most mothers breastfeed for about 2 years):

	Degree of Anemia			
	None	**Mild**	**Moderate or Severe**	**Total**
< 24 Months Post-partum	46.4%	41.4%	12.7%	100.0%
All women	52.8%	35.1%	12.1%	100.0%
				p=.000

.

Anemia is closely connected to reproduction and to the quality of antenatal care. Among <u>all women of reproductive age</u>, the main predictors of anemia are, in descending order of importance:

- Current pregnancy.
- Parity (the total number of children ever born).
- SES.
- Any births in the past 5 years.

Among the sub-set of <u>women who have had a birth in the past 5 years</u>, the main predictors are:

- Current pregnancy.
- SES.
- A short interval between births.
- Receipt of prenatal iron.
- Parity.

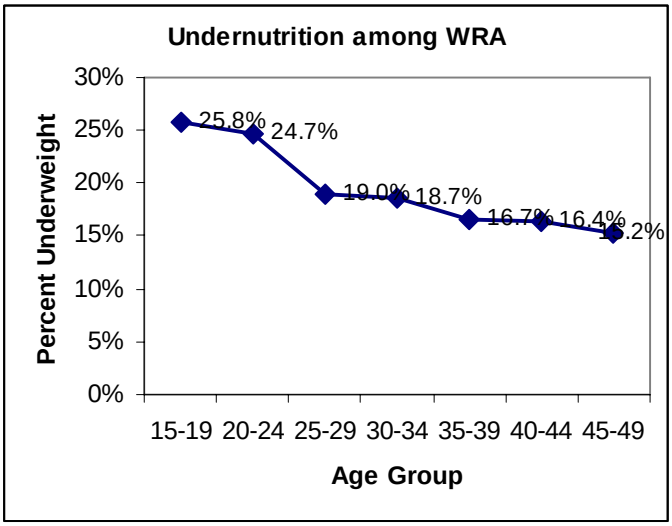
Education is significant when the analysis excludes intake receipt of prenatal iron and closely spaced births, but not when these factors are controlled for. The same applies to province and urban/rural residence.

The effect of intake of foods high in iron is not statistically significant, either for all WRA or those with a birth in the past 5 years. However, it should be noted that the CDHS captured only whether such foods were eaten and not the quantity; poor families in particular are apt to consume meat and vegetables in the form of a watery soup.

2. Underweight

In contrast to anemia, which is primarily related to number and spacing of births and prenatal iron supplementation, significant predictors of underweight among all WRA are:

- SES
- Rural as opposed to urban residence
- The woman's age: underweight is much more prevalent in women 15-24 years old, probably because caloric intake is insufficient for the nutritional demands of the adolescent growth spurt and the onset of child-bearing (the average age at first birth is 21.8 years).



Among women with a birth in the past five years, lactation and total number of children born in that period also increase the likelihood of underweight.

Province of residence has no significance when urban/rural strata and SES are controlled for.

3. Nutrition During Pregnancy

As already noted, anemia is highly prevalent – and often severe – during pregnancy. Receipt of prenatal iron has a protective effect; unfortunately, only about half of Cambodian women receive supplemental iron for 60 days during pregnancy and less than one quarter receive the minimal recommended 90 days of supplementation.

Iron Taken Prenatally	Percent	Cumulative Percent
None	35.3	35.3
Less than 30 Days	14.1	49.3
30 to 60 days	26.5	75.8
More than 60 Days	24.2	100.0
Total	100.0	

The body mass indices in the CDHS are not corrected for pregnancy, so adequacy of weight among pregnant women cannot be directly assessed. However, 14.5% of infants born in the last 5 years were reported to be unusually small, suggesting low birth weight which is frequently the result of inadequate nutrition during pregnancy. For low birth weight – taken here as a proxy indicator of nutrition during pregnancy – the main predictors are, in descending order of importance:

- Province of residence.
- Parity – low birth weight is more common in women who have had many children.
- SES – low birth weight is less common among the more affluent than among the poor.
- Lack of antenatal care (ANC)
- Lack of education.

Exposure to media also had a protective effect independent of SES and education.

It is interesting that province, which is not independently significant for under-nutrition among either WRA or women with a birth in the past 5 years overall, is significant for low birth weight. The following provinces show a higher than average prevalence of reported low birth weight/size. They *do not* have a significantly higher level of under-nutrition among WRA overall, suggesting that the explanation lies either in eating practices during pregnancy or in women's reporting of their infant's size at birth, or some combination thereof:

	% infants reported as smaller than average	significance*
Kampong Speu	29.2%	p=.000
Pursat	28.4%	p=.000
Mondol Kiri & Rattanak Kiri	26.6%	p=.000
Kampong Cham	24.7%	p=.000
Kampong Thom	22.3%	p=.000
Otdar Mean Chey	21.8%	p=.040
Siem Reap	19.4%	p=.001
National Average	14.5%	
* in comparison to national average		

Because anthropometric measurements were not conducted on the women selected for the household relations module, it is not possible to assess the impact of empowerment or other gender variables on women's nutritional status.

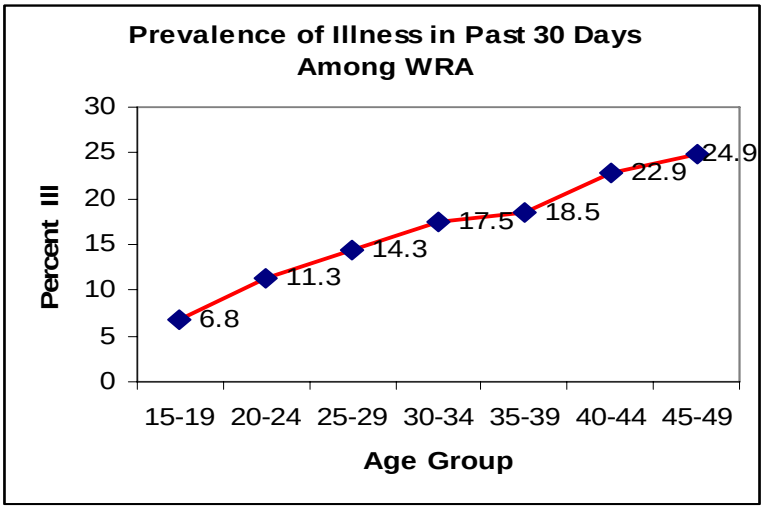
4. General Health

a. Prevalence of Illness

15.1% of women of reproductive age were ill in the 30 days prior to the CDHS, a higher burden of illness than that reported b y men of the same age (10.5%). More than half of these illnesses were categorized as moderate or severe in extent. There was no difference between pregnant and non-pregnant women in the prevalence of illness, but pregnant women were slightly more likely to rate their illness as having been moderate or severe in extent. Prevalence of illness varied significantly with month of interview, suggesting seasonality.

Significant predictors of illness are as follows, in descending order of importance:

- Age: The prevalence of illness has a direct linear correlation to age, with little illness reported among women under 25 compared to about one-quarter of women over 40. This pattern holds true both for any illness and for moderate/severe illness.



- Province of residence. (elaborate – which provinces highest.)
- SES: There is an inverse, linear relationship between SES and the prevalence of (a) any and (b) moderate/severe illness
- Nutritional status: being underweight increases the risk of illness *independent* of SES, age, and urban/rural residence.
- Urban/rural strata: Rural women were both more likely to have been ill and more likely to rate the illness as moderate or severe in extent.
- Access to a safe source drinking water[2].

The effect of education is not significant when age and SES are controlled for.

b. Health-Care Seeking Behavior

90.7% of women who were ill in the 30 days prior to interview reported having sought some type of treatment; this percentage does not differ significantly from men of the same age. The only significant factors influencing nontreatment versus treatment were a low severity of the illness, extreme poverty and residence in a very remote province (Mondulkiri/Rattanakiri or Preah Vihear/Stung Treng).

Treatment by a trained provider at any point in the illness, on the other hand, was obtained by only 69.4% of all women who received treatment at all. This is slightly higher than is the case for men of the same age, for whom the percentage is 65.9% (p=.022).

The main factors affecting the likelihood of treatment by a trained provider are, in descending order:

- Perceived severity of the illness: as one would expect, illnesses perceived to be moderate or severe are more than 3 times as likely to be treated by a trained provider than minor illnesses.
- Pregnancy: women who were pregnant were significantly more likely than women who were not pregnant to have obtained treatment from a trained provider.
- SES
- Age: Older women were less likely to receive treatment than younger ones. the issue of under-treatment of the type of illnesses found in older age groups is discussed further in Section ___:Elderly.

[2] Defined as piped in water (urban), deep tubewell or rainwater. Hand-dug wells, “protected” or otherwise, are not included as a safe source.

Women who obtained treatment from other than a trained source generally self-medicated; use of traditional healers was rare. 32.4% of women who received any treatment self-medicated at some point in their illness[3], a behavior fairly uniform across all sub-segments of this population. A low level of educational and low severity of illness were only mildly predictive.

Although pregnant women were significantly more likely to seek treatment from a trained provider and less likely to self-medicate, it is a matter for concern that 22.1% of pregnant women still self-medicated, a potential cause of birth defects

(change to graphs)

	Treatment from Trained Provider		
	No	Yes	Total
Not pregnant, don't know	31.0%	69.0%	100.0%
Pregnant	20.5%	79.5%	100.0%
Total	30.5%	69.5%	100.0%
			p=.008

	Self-medicated At Any Point in Illness'		
	No	Yes	Total
Not pregnant, don't know	67.2%	32.8%	100.0%
Pregnant	77.9%	22.1%	100.0%
	67.8%	32.2%	100.0%
			p=.008

Gender equity/empowerment does not appear to significantly influence treatment patterns for general illness.

4. Summary and Policy Implications

Women of reproductive age suffer a higher burden of illness than do men, at least in part due to their poor nutritional status. Young rural women, in particular, tend to be underweight. Underweight is most marked in the age group 15 – 24 years, which includes the period in which most women have their first child. Related to this, it appears that about 15% of women do not receive enough food during pregnancy to support the growing child, resulting in low birth weight for the baby, which carries with it an increased risk of infant death.

Poverty is a risk factor for both underweight among WRA and low birth weight. However, the incidence of low birth weight is also affected, independent of SES, by whether or not the mother receives any antenatal care (ANC) and her province of residence. It appears that nutritional advice given during ANC is effective in promoting better nutrition during pregnancy, even among poor women. In addition, exposure to mass media seems to result in better nutritional practices during pregnancy. to eat enough during pregnancy regardless of their SES or receipt of ANC.

[3] In some cases the a woman both sought trained advice and self-medicated in the course of the same illness, so these are not mutually exclusive.

Since these provinces do not have an otherwise higher than average level of undernutrition among WRA, the explanation may lie in indigenous customs/ food taboos for pregnant women.

Anemia is a serious problem for Cambodian women throughout their reproductive lives, a matter for great concern since it substantially increases the risk of maternal death. Particularly alarming is the high rate of serious anemia among pregnant women, which appears directly related to insufficient iron supplementation during pregnancy. Other contributing factors include having given both to a large number of children (high parity) and births which are too closely spaced.

Although disadvantaged compared to men with respect to the occurrence of illness, women compare favorably in obtaining treatment, and gender issues do not appear to play a significant role. The main area of concern regarding treatment of general illness concerns the prevalence of self-medication, especially in urban areas where pharmacies are plentiful. This is particularly worrying in the case of women who are pregnant, since many commercially sold drugs can damage the fetus resulting in miscarriage or birth defects. Although pregnant women self-medicate at a lower rate than women who are not pregnant, it was still reported by almost a fourth of all pregnant women who were ill in the 30 days prior to the survey.

Policy recommendations:

1. Use of mass media to promote proper nutrition during pregnancy should continue/intensify.
2. Specific media campaigns should be undertaken to promote the importance of pre-natal iron supplementation.
3. Social marketing of pre-natal iron/folic acid supplements should be revived[4].
4. Adolescent girls need to be specifically targeted for both nutritional counseling and iron supplementation so that they have adequate nutritional stores when they start child-bearing. This might be done through schools (primary and lower secondary) and also in conjunction with tetanus toxoid immunizations on an outreach basis. In addition, Health Centers might offer pre-marital packages that include testing for anemia and counseling in nutrition and birth-spacing.
5. A mass media campaign should be undertaken to inform women of the dangers of self-medication during pregnancy. Consideration might also be given to requiring pharmacies to post visually-literate warning posters.

[4] A successful pilot was undertaken a few years back but not soloed up due to lack of donor support.

5. Regression Tables

Table II.B.1.a: Anemia among all Women of Reproductive Age

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.203(a)	.041	.039	.67073

a Predictors: (Constant), Births in last five years, Highest year of education, Currently pregnant, Region, Total children ever born, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.528	6	7.755	17.238	.000(a)
	Residual	1085.252	2412	.450		
	Total	1131.781	2418			

a Predictors: (Constant), Births in last five years, Highest year of education, Currently pregnant, Region, Total children ever born, Wealth index
b Dependent Variable: WRAAnemia

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.593	.057		10.478	.000
	Province	-.003	.003	-.025	-1.237	.216
	Education	-.003	.009	-.008	-.381	.703
	SES	-.048	.010	-.098	-4.743	.000
	Currently pregnant	.350	.054	.130	6.428	.000
	Total children ever born	.031	.006	.100	4.889	.000
	Births in last five years	.040	.018	.045	2.223	.026

a Dependent Variable: WRAAnemia

Table II B. 1. b: Anemia Among Women with a Birth in the Past Five Years

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.223(a)	.050	.045	.69748

a Predictors: (Constant), Currently pregnant, Iron Taken Prenatally Before Last Birth, Woman Ate Foods High in Iron, Preceding Birth Interval <24 Months, Type of place of residence, Total children ever born, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.482	7	5.069	10.419	.000(a)
	Residual	678.800	1395	.486		
	Total	714.282	1402			

a Predictors: (Constant), Currently pregnant, Iron Taken Prenatally Before Last Birth, Woman Ate Foods High in Iron, Preceding Birth Interval <24 Months, Type of place of residence, Total children ever born, Wealth index
b Dependent Variable: MatAnemia

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.914	.139		6.561	.000
	Type of place of residence	-.082	.059	-.039	-1.400	.162
	Woman Ate Foods High in Iron	-.007	.008	-.022	-.815	.415
	Iron Taken Prenatally Before Last Birth	-.035	.016	-.059	-2.188	.029
	Preceding Birth Interval <24 Months	.126	.051	.065	2.464	.014
	Wealth index	-.060	.015	-.118	-4.118	.000
	Total children ever born	.017	.009	.051	1.890	.059
	Currently pregnant	.388	.077	.133	5.024	.000

a Dependent Variable: MatAnemia

Table II B.2: Underweight

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.132(a)	.017	.017	.38799

a Predictors: (Constant), Age of household members, Wealth index, Region, Highest year of education, Type of place of residence

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.131	5	3.226	21.431	.000(a)
	Residual	912.084	6059	.151		
	Total	928.215	6064			

a Predictors: (Constant), Age of household members, Wealth index, Region, Highest year of education, Type of place of residence

b Dependent Variable: WRA Nutritional Status

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.328	.036		9.010	.000
	Region	.001	.001	.008	.650	.516
	Type of place of residence	.023	.012	.026	1.834	.067
	Highest year of education	-.002	.003	-.010	-.744	.457
	Wealth index	-.024	.004	-.086	-6.142	.000
	Age of household members	-.003	.000	-.090	-6.986	.000

a Dependent Variable: WRA Nutritional Status

Table II.B.3.a: Occurrence of Illness

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	260.747	9	.000
	Block	260.747	9	.000
	Model	260.747	9	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	6922.750(a)	.031	.053

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Pregnancy	-.048	.046	1.080	1	.299	.953
	Province	.030	.006	23.472	1	.000	1.031
	Urban/rural	.243	.098	6.099	1	.014	1.275
	SES	-.087	.027	10.247	1	.001	.917
	Age	.040	.003	163.667	1	.000	1.041
	Safe source water	-.010	.065	.022	1	.881	.990
	POU water tx	.134	.068	3.851	1	.050	1.144
	Under weight	-.032	.010	9.667	1	.002	.968
	Anemia	.011	.045	.058	1	.809	1.011
	Constant	-2.794	.326	73.271	1	.000	.061

a Variable(s) entered on step 1: SH28A, HV024, HV025, HV270, HV105, watsafe, POU, BMI, WRAAnemia.

Table II. B. 3.b: Treatment of Illness by Trained provider

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	44.084	7	.000
	Block	44.084	7	.000
	Model	44.084	7	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	461.730(a)	.095	.139

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Access BARRIER	-.093	.074	1.550	1	.213	.912
	Pregnancy	.287	.210	1.856	1	.173	1.332
	HV024	-.014	.023	.363	1	.547	.986
	Urban/rural	.189	.395	.229	1	.632	1.208
	SES	.226	.096	5.547	1	.019	1.254
	Severity	-.925	.196	22.190	1	.000	.397
	Age	-.167	.080	4.391	1	.036	.846
	Constant	3.418	1.152	8.798	1	.003	30.501

a Variable(s) entered on step 1: BARRIER, SH28A, HV024, HV025, HV270, SH68, AgeGrp.

*Coding is 1= Urban, 2=Rural, so an exponent>1 indicates a positive correlation to rural residence, while <1 indicates positive correlation to urban.

** Coding is 1= severe 2= moderate 3=slight, so an exponent <1 indicates a negative association to minor illness and positive association to severe illness.

C. Maternal Health

1. Unplanned Pregnancy

Despite rising use of contraception, almost 30% of ever married women experienced an unplanned pregnancy in the 5 years before the survey[5]. About half of women with unplanned pregnancy chose abortion and half had the child. The predictors of unplanned pregnancy were as follows, in descending order of importance:

- Age: unplanned pregnancies were less commonly reported by women under the age of 20 or over the age of 40 . The lower incidence among young married women is understandable, since most pregnancies to women in that age group are first pregnancies. The low incidence among older women is more surprising, but may reflect lower levels of fertility.
- SES: unplanned pregnancy was much more prevalent among poorer than better off women.
- Urban/rural strata: rural women were significantly more likely to have an unplanned pregnancy than urban ones.
- Province: differences by province were still significant when other factors were controlled.
- Access Barriers: unplanned pregnancies were significantly more common among women who reported barriers in accessing health services such as distance, transport, etc.

Controlling for all of the above factors, a woman's empowerment level (see section II.A.5) had an inverse relationship to unplanned pregnancy, significant at p=.07.

Since an unplanned pregnancy -about half of which were terminated – is unlikely to have affected these variables it is reasonable to assume they are the contributing factors ("cause") rather than an effect.

Ever use of family planning, and knowledge of family planning methods, however, either failed to show a relationship or seemed to show a relationship in other than the logical direction, when examined against having had an unplanned pregnancy in the past 5 years. Ever use had no significant relationship and knowledge had a positive correlation to unplanned pregnancy. This is most likely a problem of time sequence: the measures of knowledge are of knowledge at the time of the survey whereas the unplanned pregnancy may have occurred at any point in the prior 5 years. Also, unlike the socio-demographic and economic variables, it is plausible for causation to be in either direction: having had an unplanned pregnancy could cause a woman to seek out information on family planning (FP) and start using a method.

To get around this problem, a separate analysis of FP variables was done for women currently pregnant with an unplanned pregnancy *at the time of the interview.* This is a small sample (275 women out of 11,472), so only very large effects can be seen. Also, it is likely to be biased towards women who chose to continue the unplanned pregnancy, since women who decided to have an abortion would not still have been pregnant.

---

5 Defined as a pregnancy that was voluntarily terminated or which the woman stated she either did not want at all, or did not want at that time.

On multiple regression, knowledge of family planning methods had no statistically significant relationship to a current unplanned pregnancy. This would tend to confirm the theory that the higher knowledge levels seen among women with an unplanned pregnancy any time in the past 5 years was a consequence rather than a cause of the unplanned pregnancy.

Ever use of FP, however, did show a significant relationship: women who had ever used a modern method were less likely to have a current unplanned pregnancy than either women who had never used any method or women who had only ever used a traditional method.

	Uplanned Current Pregnancy (N=11,472)		
Ever Use of FP	No	Yes	Total
No method	96.8%	3.2%	100.0%
Traditional Method	97.8%	2.2%	100.0%
Modern Method	98.2%	1.8%	100.0%
Total	97.6%	2.4%	100.0%
			p=.000
			Odds Ratio from logistical regression = 0.761

It should be noted that *ever use* does not necessarily mean use at the time the pregnancy occurred. Women who had never used any method were, obviously, not using FP when the unplanned pregnancy occurred, but women who had ever used a traditional or modern method may or may not have been using the method at the time the pregnancy occurred; it is not possible to distinguish between method failure and pregnancy due to having stopped using the method.

In summary, knowledge of FP – which is in any case high for all women -- does not seem to affect the risk of unplanned pregnancy, although women who have had the experience of an unplanned pregnancy seem to acquire a knowledge of more methods afterwards. Not using FP, or using only traditional methods, *is* a significant risk factor for unplanned pregnancy.

The association between non-use and unplanned pregnancy is inevitable, but the association between use of traditional methods and unplanned pregnancy is of concern, especially since traditional methods account for about one third of all family planning use in Cambodia. The most common traditional methods are periodic abstinence ("rhythm") and withdrawal. Both require a high degree of cooperation from the male partner. In addition, more than one quarter of the women currently using periodic abstinence as a method do not have accurate knowledge of the fertile period.

2. Current Use of Family Planning

The single most important predictor of current use of any method of contraception is, understandably, whether or not the woman wishes to become pregnant. When the analysis is confined to women who do not wish to become pregnant now, the single most important predictor is lactation (breast-feeding).

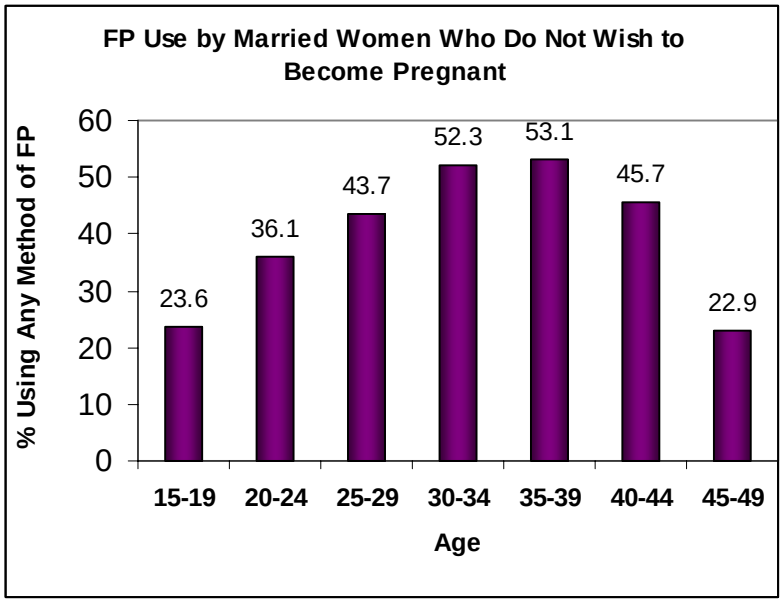
While the risk of conception is certainly lower among woman who are breast-feeding, the protective effect diminishes with time. The majority of women who do not want another child

have not yet begun to use contraception 20 months after delivery, putting some at risk of unplanned pregnancy. It should be noted in this regard that 18% of births in Cambodia (excluding, obviously, first births) occurred less than 24 months after a previous birth, meaning that the mother conceived within 15 months of delivery, despite the fact that virtually all women are still breast-feeding (BF) throughout that period.

Even when women 24 months or less post-partum are taken out of the equation, continued BF remains a significant predictor of non-use of both any method of FP and of modern methods, suggesting that women either over-rely on the protective effect of BF or are concerned about health effects of use of contraception during lactation, or both.

Predictors of any method use among women who do not want to become pregnant are as follows, in descending order of importance:

- Still breast-feeding: as noted, this remains a strong predictor for non-use even after 24 months have passed since the delivery.
- The number of modern FP methods known
- SES: poorer women were less likely to be using a method than better off ones.
- Age: women under the age of 25 and women over 45 are significantly less likely to use FP than women aged 25-44. The lower use by the oldest age group probably reflects perceived infertility or less frequent sexual relations. However, the low use of FP by young married women *who say they do not want to become pregnant now* is of considerable concern.



- Number of children ever born: as one would expect, there is a positive correlation between the total number of children a woman has had and use of FP.

Controlling for all of the above factors, empowerment (see section II.A.5) is significant at p=.02.

The main reason cited by young women (as indeed, by all groups of women) for non-use of FP was health concerns/fear of side effects. There is a common (but incorrect) belief in Cambodia

that modern methods of FP can cause infertility, especially when used before having at least one child. Younger women usually have no or only one child and thus need to use FP to space rather than limit births. It is quite likely that this incorrect belief is preventing many of them from doing so and contributing to the high rate of unplanned pregnancy previously noted.

Determinates of *modern* method use are the same as those for any method use. There seems to be little cross-over between use of traditional and modern methods when patterns of ever use and current use are examined. Few ever users of modern methods switch to a traditional one:

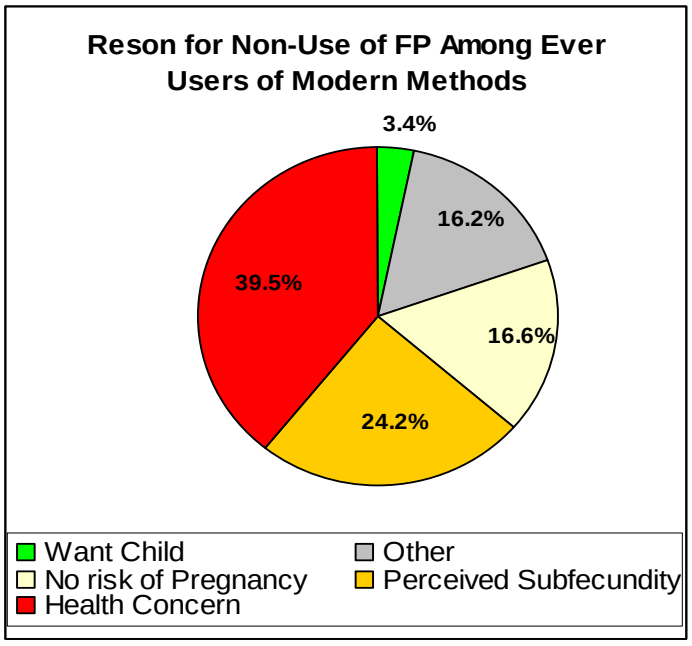
	Current Use of FP			
Ever Use of FP	**None**	**Traditional Method**	**Modern Method**	**Total**
None	100.0%	.0%	.0%	100.0%
Traditional Method Only	27.2%	72.8%	.0%	100.0%
Modern Method Ever[6]	38.8%	9.8%	51.4%	100.0%
Total	60.0%	12.8%	27.2%	100.0%
				p= .000

As previously noted, use of traditional methods appears to be associated with an increased risk of unplanned pregnancies, although to a lesser extent than use of no method at all. Traditional method use is most common among women who are educated, economically better off, and living in urban areas, which is also the demographic most likely to have heard of them. Periodic abstinence – the most commonly used traditional method – is known by 54.2% of urban women vs. only 36.0% of rural ones. By contrast, knowledge of the pill and the injectable – the 2 most common modern methods – is near universal in both strata. However, knowledge of traditional methods does not necessarily mean accurate knowledge. Only 13.4% of Cambodian women overall – and 73.0% of current users of the method – have sufficient knowledge of the fertile period to be able to effectively use periodic abstinence ("rhythm") as a method.[7]

In addition to the apparent tendency not to switch from a modern method to a traditional one, the above table is notable for the fact that only about half of ever users of a modern method are current users.

In the overwhelming majority of cases, this is *not* because they have decided to have a child. As shown below , most are not using due to concerns about health/side effects or perceived subfecundity (reduced risk of pregnancy); about a fourth of the latter group are women who are breast-feeding and, as previously noted, Cambodian women seem to over-estimate the extent and duration of protection this provides. Furthermore, in many cases they are breast-feeding as a result of an unplanned pregnancy; fully 38% of women who have stopped using a modern method of FP report having had an unplanned pregnancy in the past five years.

[6] May include women who also ever used a traditional method, but at some point used a modern one.
[7] Even when correctly used, it is only about 80-85% effective, much less reliable than modern methods



The CDHS did not collect information on reasons for method discontinuation but they can be inferred from the reasons given for non-use by former modern method users who do not wish to become pregnant: fear of side effects/health concerns. This is also the leading reason for non-use among never users of modern methods.

Among women who do not want to become pregnant – both never-users and discontinuers alike -- , there are only 2 main reasons for non-use of FP: a perceived lack of risk of pregnancy, and health concerns/ fear of side effects. While some of the women in the first group may be correct in believing themselves not at risk (for example, due to having reached menopause, or no longer being sexually active), others are likely to be overly confident with respect to the extent and duration of protection afforded by breast-feeding, as discussed in section II.C.2.

The second and larger group represents a persistent problem in Cambodia to which conventional solutions (counseling women that the side effects experienced are not serious and will improve with time) have not been particularly effective. In this regard it is worth noting that micronutrient deficiencies – known to be common in Cambodia due to the reliance on polished rice as a staple – can increase the incidence and severity of side effects from hormonal contraception (pills and injections, the most readily available and common methods). The reverse is also true – use of hormonal contraception increases the requirement for certain micronutrients and this can contribute to deficiencies in women whose intake is low.

A controlled trial conducted by the Reproductive Health Association of Cambodia (RHAC) in 2004 indicated that Vitamin B6 supplementation can substantially reduce side effects in contraceptive pill users. This same study also documented an extraordinarily high level of side effects in the placebo group, suggesting that Cambodian women may in fact suffer more from contraceptive side effects than do better nourished populations.

3. Care Before, During and After Pregnancy

a. Antenatal Care

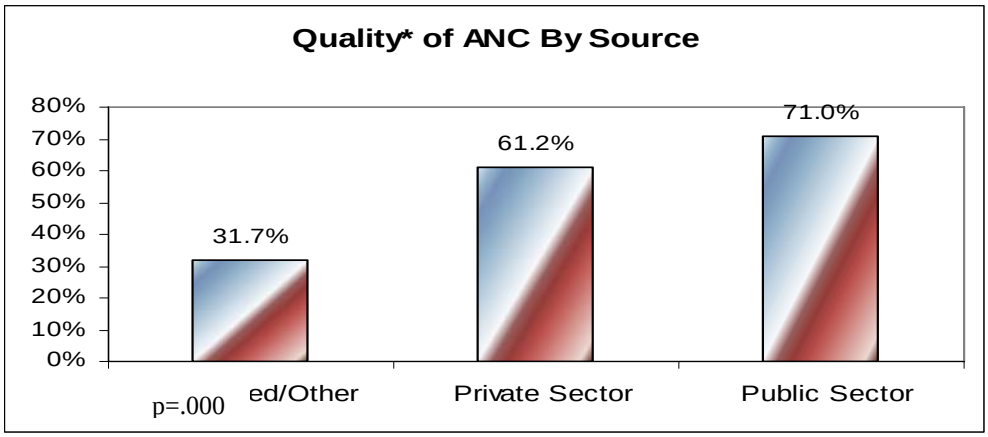
A measure for "adequate" ANC was composed, defined as: at least 2 visits[8], a trained provider, the visits included at least a blood pressure check, and prenatal iron was provided.

The most important predictors of receiving adequate ANC by this definition were:

- Whether or not the pregnancy had been desired at that time. Women with unplanned pregnancies who carry to term are significantly less likely to obtain adequate ANC than women whose pregnancies were planned/wanted.
- SES
- Exposure to mass media: almost equal in impact to SES.
- Age: Younger women are more likely to obtain ANC even when SES, education, empowerment and media exposure are controlled for.
- Province of residence: differences by province were significant even when all other factors were controlled for. Urban/rural strata, however, was not.
- Empowerment has a large impact, significant at p=.000 (r=.12 when all the above factors are controlled for.

The effect of education, on the other hand, is small and significant at only p=.061 when the above factors are controlled for.

Government health centers are the single most important source of ANC in Cambodia. In addition to having the largest reach, the *quality* of ANC (as measured by inclusion of at least a BP check and provision of iron) is higher in the public than the private sector.



Quality= trained provider, blood pressure checked and iron supplement provided

[8] Only 2 ANC visits is, of course, not adequate, but the percentage of women having more than this was too few to form a robust indicator.

b. Safe Delivery

1) Trained Delivery

The predictors of having a trained person perform the delivery differ substantially from those for ANC, as follows:

- Prior receipt of adequate ANC (as previously defined) is the single most important factor; a woman who received such care during pregnancy is 2.5 times more likely to have a trained delivery attendant than one who did not.

- SES plays a much larger role in trained delivery than it does for ANC, and indeed, together with prior receipt of ANC by a trained provider, accounts for most of the variance.

- Rural women are substantially less likely to have a trained attendant at delivery, irrespective of their SES or prior receipt of ANC.

- Reported barriers to accessing health care also play a significant role; service-related ones, financial ones and ones related to distance and transport were all independently significant at p=.000 and exerted a greater influence in combination.

- Empowerment has a smaller effect on trained delivery than it does on ANC, significant at only p=.10.

2) Delivery in a Health Facility

Three factors affect having delivery in health facility (Health Center, hospital or clinic) as opposed to at home:

- Prior receipt of adequate ANC (as previously defined) is the single most important factor; a woman who received such care during pregnancy is 3 times more likely to deliver in a health facility. Government Health Centers (HC) , which are the leading source of ANC, are also the single leading place for delivery among women who do not deliver at home. It appears that many HC midwives are effectively promoting delivery in the HC in the course of their ANC counseling.

- Rural women are substantially less likely to deliver in a facility and more than twice as likely to deliver at home.

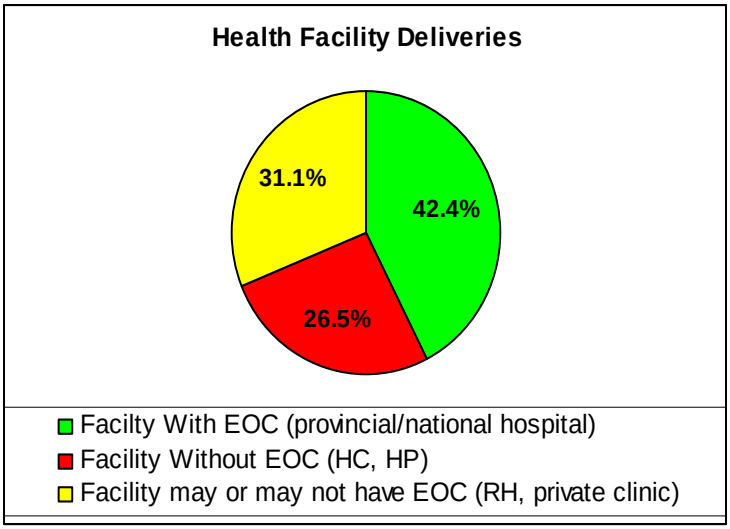
- SES plays a stronger role in facility delivery than it does for any other maternal health variable; wealthier women are twice as likely to deliver in a facility than poorer ones.

Empowerment had no significant effect on delivery in a Health Facility.

Delivery in a health facility is not a guarantee of safe delivery. Over a quarter of deliveries in a health facility took place in either a Health Post (HPs) or Health Center (HC), which while preferable to home delivery in terms of hygiene, lighting, equipment etc, do not have the human or material resources necessary to provide Emergency Obstetric Care (EOC) should complications arise. About a third took place in either a district referral hospital – some of which have EOC capacity and some of which do not – or a private facility; it is unknown what

proportion of the latter have the capacity to provide EOC but it is certainly not all. Less than half of the facility deliveries can be categorized as occurring in a place that would definitely be staffed and equipped for EOC.

Although HCs and HPs are administratively linked to Referral Hospitals, the nearest Referral Hospital does not always provide EOC, and transport can be difficult and above all expensive.



c. Post-Natal Care

Adequate post-natal care (PNC) – defined here as a post-natal check by a trained provider occurring within 24 hours of the delivery – was received by only 37.5% of women with a birth in the past 5 years. Since a continued high level of maternal mortality is one of Cambodia's priority problems, and most maternal deaths occur after delivery as a result of hemorrhage (blood loss), there is an urgent need to increase the level of PNC coverage.

Four factors between them explain most of the variance seen among women in receipt of PNC. These are, in descending order of importance:

- Type of delivery attendant: women who had a trained delivery attendant were much more likely to receive PNC than those delivered by a traditional birth attendant (TBA). Nonetheless, it should be pointed out that more than a third of women with a trained delivery attendant still did not receive PNC within 24 hours of the birth. This was usually due to PNC being provided after a greater than 24 hour interval; it was rare for a trained attendant to make no PNC visit at all. Traditional Birth Attendants (TBAs), on the other hand, failed to make any PNC check in almost half of all cases.
- Place of delivery: receipt of PNC was much more common for women who delivered in a health facility than those who delivered at home, but the association is not as strong as one would expect. Although PNC is almost universal in a health facility deliveries, *in more than a fifth of cases it occurred longer than 24 hours after the delivery.*
- Prior receipt of adequate ANC
- Education

- Exposure to mass media
- Controlling for all of the above, empowerment slightly increases the likelihood of PNC (p=. 09).

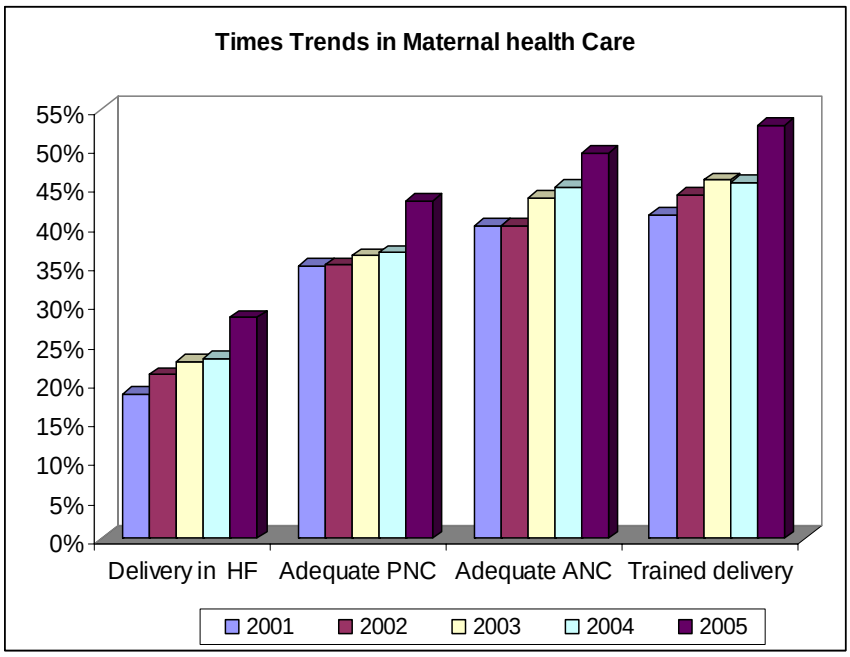
d. Immediate Breast-Feeding

Immediate breast-feeding (BF) is one measure that can reduce maternal mortality without any expenditure of resources by the family. Although rates have improved, a majority of women still do not BF within an hour of delivery. The main predictors of immediate BF are, in descending order:

- Province of residence (apparently reflecting differences in indigenous beliefs/practices)
- Receiving post-natal care from a trained provider
- ANC by a trained provider, suggesting that some midwives are including this important message in their ANC counseling.
- Delivery conducted by a trained provider.
- Exposure to mass media has a small positive correlation.

Although trained delivery is predictive, it is only slightly so (odds ratio of 1.18) and *delivery in a health facility shows no correlation at all,* suggesting that both trained providers in general and those in Health Facilities in particular are not doing as much as they should in this regard. Neither SES nor education are significant when media exposure is controlled for, and the impact of media exposure, while statistically significant, is small (odds ratio = 1.11).

Time trends for ANC, trained delivery and delivery in HFs are favorable, with a steady increase in trained delivery, ANC and facility delivery in the 3 years prior to the CDHS. PNC increased only in the last year before CDHS:



3. Summary and Policy Recommendations:

Despite gains made in the use of family planning (FP) , unplanned pregnancies remain very common in Cambodia: almost a third of married women report one or more unplanned pregnancies in the five years before the survey. These occur as a result of either never using FP, using a less reliable method and/or using it incorrectly, or discontinuing use of FP because of side effects/health concerns. An important factor in never use is the incorrect belief that it is not safe to use FP before having given birth to at least one child.

Reducing the incidence of unplanned pregnancy will require (1) dispelling the incorrect belief that use of modern methods before having had a child causes infertility; (2) better educating women about the extent and duration of protection afforded by breast-feeding, and publicizing the availability of methods suitable for lactating mothers; (3) better educating women regarding the efficacy of traditional methods and their correct use; and (4) effectively addressing the problem of side effects. The first 3 of these tasks are ones of communication/education, but the fourth will require improvements in service delivery.

With respect to care during and after pregnancy, progress has been made with respect to provision of ante-natal care and delivery by a trained attendant, and the trends are favorable. It is noteworthy that gender empowerment/equity plays an important role in women's utilization of these services, as it also does for use of contraception.

Delivery in a health facility is also improving and can be expected to continue to do so, especially as rural road conditions improve. However, it should be noted that just because a women delivers in a health facility does not necessarily guarantee access to emergency obstetric care (EOC). Many of the facility deliveries occur in Health Centers or district hospitals; none of the former and many of the latter are not equipped to provide EOC, and cost and means of transportation can constrain their ability to refer patients with complications in a timely manner.

Two important aspects of maternal health care are not improving as well as they could are immediate breast-feeding and post-natal care. Both can reduce the most common cause of maternal death in Cambodia, which is hemorrhage. Immediate breast-feeding reduces the risk of hemorrhage by helping the uterus (womb) contract, while timely post-natal; care can detect excessive blood loss in time to save the woman's life.

Immediate breast-feeding costs nothing and can be practiced no matter where the woman delivers; it is a matter of ensuring that women and their families have the necessary knowledge and also that delivery attendants promote it. Both trained providers assisting deliveries at home and those delivering women in health facilities need to improve in this regard.

Provision of timely post-natal care is admittedly difficult when the woman delivers at home; one cannot expect a woman to travel within 24 hours of delivery, so the service must come to her. However, it is noteworthy that even when trained midwives are managing to get to the home for the delivery, they often fail to make a timely follow-up visit. In addition, even when a woman delivers in a health facility, she sometimes goes more than 24 hours before a post-natal check is performed.

There has been a gratifying increase in the percentage of women delivering their babies in a health facility, but in order for this to have the desired effect of reducing maternal mortlaity,

measures need to be taken to ensure that all health facilities either provide Emergency Obstetric Care or can promptly refer a patient to one that does without delay or unaffordable cost to the patient.

As noted in Section II.B., anemia is also an important factor in maternal mortality and there is a pressing need to increase the percentage of pregnant women who receive iron supplements as well as to improve the nutritional status of adolescent girls.

Policy recommendations:

1. Mass media campaigns should be undertaken to correct inaccurate beliefs regarding the safety of modern FP in women who have not yet had a child and the extent and duration of protection provided by breast-feeding.

2. Family planning messages should especially target the following groups: (1) young women who have either not had had a child or had only one, but wish to wait before becoming pregnant; and (2) breast-feeding mothers who either want no more children or want to delay the next birth. Information should be provided on appropriate methods which are safe for use by women who want to have children later and women who are breast-feeding.

3. In urban areas especially, information campaigns on the traditional method of periodic abstinence are needed, directed at (1) ensuring that women know how to use it correctly and (2) that they are aware of its rate of effectiveness compared to modern methods.

4. Health services should develop specific protocols for dealing with contraceptive side effects which go beyond verbal reassurance, undertaking operational research as necessary to identify practical and cost effective approaches.

5. Mass media should be used to inform women and their families of the importance of immediate breast-feeding after delivery. Refresher training may need to be considered for trained midwives in this regard as well, and quality assurance and supervisory tools for HCs and hospitals should be sure to assess this point.

6. Mass media should be used to advise women and their families of the importance of obtaining post-natal care within 24 hours (preferably, within 12) of the time of delivery and stress that this is an integral part of delivery services. Refresher training may need to be considered for trained midwives in this regard as well, and quality assurance and supervisory tools for HCs and hospitals should be sure to assess it.

7. The maternity care provided in private clinics/hospitals needs to be assessed and, if necessary, regulated to ensure that it includes (i) access to Emergency Obstetric Care (EOC) (ii) immediate BF and (iii) provision of timely post-natal care.

8. High priority should be given to increasing the percentage of Referral Hospitals with 24 hour, 7 day a week availability of EOC and ensuring that Health Centers, Health Posts and public Hospitals without EOC have an effective and *affordable* transportation system in place to ensure timely referral.

4. Regression Tables:

Table II.C.1.a Any Unplanned Pregnancy Past 5 Years

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.176(a)	.031	.030	.61852

a Predictors: (Constant), Age 5-year groups, Type of place of residence, Region, Highest educational level, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	94.689	5	18.938	49.501	.000(a)
	Residual	2977.367	7783	.383		
	Total	3072.056	7788			

a Predictors: (Constant), Age 5-year groups, Type of place of residence, Region, Highest educational level, Wealth index

b Dependent Variable: Any Unplanned Pregnancy in Past 5 Years

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.375	.055		6.843	.000
	SES	-.014	.006	-.031	-2.398	.016
	Education	-.004	.012	-.004	-.324	.746
	Province	-.004	.001	-.028	-2.525	.012
	Urban/rural	-.039	.022	-.022	-1.800	.072
	Age	.075	.005	.169	15.034	.000

a Dependent Variable: Any Unplanned Pregnancy in Past 5 Years

Correlations

Control Variables			Degree of Personal Empowerment	Any Unplanned Pregnancy in Past 5 Years
Age 5-year groups & Wealth index & Highest educational level & Region & Type of place of residence	Degree of Personal Empowerment	Correlation	1.000	-.357
		Significance (2-tailed)	.	.075
		df	0	24
	Any Unplanned Pregnancy in Past 5 Years	Correlation	-.357	1.000
		Significance (2-tailed)	.075	.
		df	24	0

Table II.C.1.b Current Unplanned Pregnancy

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	105.003	9	.000
	Block	105.003	9	.000
	Model	105.003	9	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1888.457(a)	.012	.059

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Age	-.319	.044	53.248	1	.000	.727
	Media	-.106	.078	1.844	1	.175	.900
	Education	-.041	.045	.796	1	.372	.960
	SES	-.162	.061	7.129	1	.008	.850
	Province	-.037	.015	6.237	1	.013	.964
	Urban/Rural	.509	.267	3.621	1	.057	1.663
	Access BARRIER	.025	.047	.282	1	.595	1.025
	Number of modern FP methods known	.146	.117	1.572	1	.210	1.157
	FP ever use	-.211	.076	7.653	1	.006	.810
	Constant	-2.587	.707	13.405	1	.000	.075

a Variable(s) entered on step 1: V013, Media, V107, V190, V024, V025, BARRIER, FPknow, FPever.

Table II.C.2. Current Use of FP

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.222(a)	.049	.048	.86459

a Predictors: (Constant), Number of modern methods known, StillBF, Highest year of education, Age 5-year groups, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	164.712	5	32.942	44.069	.000(a)
	Residual	3186.979	4263	.748		
	Total	3351.690	4268			

a Predictors: (Constant), Number of modern methods known, StillBF, Highest year of education, Age 5-year groups, Wealth index

b Dependent Variable: Current Use of Modern FP

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.441	.074		5.954	.000
	Still BF	-.284	.027	-.160	-10.499	.000
	SES	.049	.010	.078	5.022	.000
	Education	.007	.008	.013	.842	.400
	Age	-.019	.010	-.031	-1.981	.048
	Number of modern FP methods known	.142	.022	.099	6.458	.000

a Dependent Variable: Current Use of Modern FP

Correlations

Control Variables			Current Use of Modern FP	Degree of Personal Empowerment
Age 5-year groups & Wealth index & Highest year of education & Total children ever born & Number of modern methods known & StillBF	Current Use of Modern FP	Correlation	1.000	.082
		Significance (2-tailed)	.	.020
		df	0	800
	Degree of Personal Empowerment	Correlation	.082	1.000
		Significance (2-tailed)	.020	.
		df	800	0

Table II.C.3.a. Ante-Natal Care

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	415.024	7	.000
	Block	415.024	7	.000
	Model	415.024	7	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	5825.134(a)	.088	.117

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Province	.026	.006	16.278	1	.000	1.026
	urban/rural	-.143	.095	2.269	1	.132	.867
	SES	.249	.026	88.546	1	.000	1.283
	Education	.037	.020	3.522	1	.061	1.038
	Age	-.101	.023	18.468	1	.000	.904
	Wanted Child	.327	.083	15.543	1	.000	1.387
	Media	.245	.034	52.076	1	.000	1.278
	Constant	-1.124	.265	18.017	1	.000	.325

a Variable(s) entered on step 1: V024, V025, V190, V107, V013, Wanted, Media.

Correlations

Control Variables			ADEQANC	Degree of Personal Empowerment
Age 5-year groups & Region & Wealth index & Wanted Child (Then or Later) & Exposure to Mass Media	ADEQANC	Correlation	1.000	.122
		Significance (2-tailed)	.	.000
		df	0	1054
	Degree of Personal Empowerment	Correlation	.122	1.000
		Significance (2-tailed)	.000	.
		df	1054	0

Table II.C.3.b.1. Trained Delivery Attendant

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	1315.862	5	.000
	Block	1315.862	5	.000
	Model	1315.862	5	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	4907.720(a)	.253	.338

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	ADEQ ANC	.938	.070	179.782	1	.000	2.554
	Urban/rural	-.561	.117	23.095	1	.000	.571
	SES	.649	.028	523.819	1	.000	1.914
	Education	.057	.022	6.575	1	.010	1.058
	Access BARRIER	-.114	.024	22.084	1	.000	.893
	Constant	-1.094	.270	16.392	1	.000	.335

a Variable(s) entered on step 1: ADEQANC, V025, V190, V107, BARRIER.

Correlations

Control Variables			Trained Delivery Attendant	Degree of Personal Empowerment
ADEQANC & Degree of Access Barrier & Wealth index & Type of place of residence & Highest year of education	Trained Delivery Attendant	Correlation	1.000	.057
		Significance (2-tailed)	.	.106
		df	0	799
	Degree of Personal Empowerment	Correlation	.057	1.000
		Significance (2-tailed)	.106	.
		df	799	0

Table II.C.3.b.2. Delivery in Health Facility

Table II.C.3.c. Post-Natal Care

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	4537.460	8	.000
	Block	4537.460	8	.000
	Model	4537.460	8	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	3209.851(a)	.539	.735

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	ADEQANC	.503	.094	28.527	1	.000	1.654
	Age	.087	.032	7.435	1	.006	1.090
	Province	-.023	.009	6.439	1	.011	.977
	Education	.283	.080	12.465	1	.000	1.328
	SES	.000	.000	5.131	1	.024	1.000
	Media	.217	.047	21.014	1	.000	1.242
	Delivery HF	.716	.108	44.029	1	.000	2.046
	Trained del	4.566	.144	1008.873	1	.000	96.140
	Constant	-4.682	.221	448.491	1	.000	.009

a Variable(s) entered on step 1: ADEQANC, V013, V024, V106, V191, Media, DelHF, Traindel.

Correlations

Control Variables			Degree of Personal Empowerment	PNC by Trained Provider Within 24 Hours of Delivery
Delivery in a Health Facility & Delivery by Trained Person & ADEQANC & Highest educational level & Exposure to Mass Media	Degree of Personal Empowerment	Correlation	1.000	.047
		Significance (2-tailed)	.	.093
		df	0	1281
	PNC by Trained Provider Within 24 Hours of Delivery	Correlation	.047	1.000
		Significance (2-tailed)	.093	.
		df	1281	0

Table II.C.3.d. Immediate Breast-Feeding

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	361.191	8	.000
	Block	361.191	8	.000
	Model	361.191	8	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	7031.026(a)	.061	.084

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	ADEQANC	.224	.063	12.711	1	.000	1.251
	Province	.073	.006	159.447	1	.000	1.075
	Education	.040	.051	.610	1	.435	1.041
	SES	.033	.026	1.546	1	.214	1.033
	Delivery HF	.017	.084	.041	1	.839	1.017
	Trained del	.168	.099	2.854	1	.091	1.183
	ADEQ PNC	.387	.097	15.817	1	.000	1.472
	Media	.107	.032	11.123	1	.001	1.113
	Constant	-1.887	.091	425.404	1	.000	.152

a Variable(s) entered on step 1: ADEQANC, V024, V106, V190, DelHF, Traindel, ADEQPNC, Media.

D. HIV/AIDS

The CDHS was a survey of general households and, as such, does not provide information on such high risk groups as brothel-based sex workers and men residing in military bases. Male interviews were conducted only in households which also had a woman of reproductive age in residence, thus excluding male migrants living away from home, another high risk group. As such, it is not well suited to identifying factors related to the initial entry of HIV infection into a household, since this is usually a consequence of the husband's engaging in commercial sex. Specialized surveys specifically aimed at high risk groups, such as the HIV Sentinel Surveillance Surveys and Behavioral Surveillance Surveys, are much more appropriate to this purpose.

However, the CDHS does provide a unique opportunity to examine the dynamics of HIV spread within the family, i.e. from husband to wife and from mother to child, in the context of the general population.

1) Risk of Husband to Wife Transmission

Women in the CDHS reported virtually no premarital or extramarital sex. While underreporting no doubt occurred (especially with regard to premarital sex among youth), there is no doubt that the highest HIV risk Cambodian women face is from sexual relations with their own husbands. Among those currently married women whose husbands were also interviewed, 26.8% of husbands gave a history of previous sexual partner other than his wife and 7.2% reported very high risk factors (recent infidelity, commercial sex, an STI, sex with a man).

Only 2.9% of women overall, and 5.2% of those whose husband reported any risk factor, reported that their husband used a condom during their most recent intercourse.

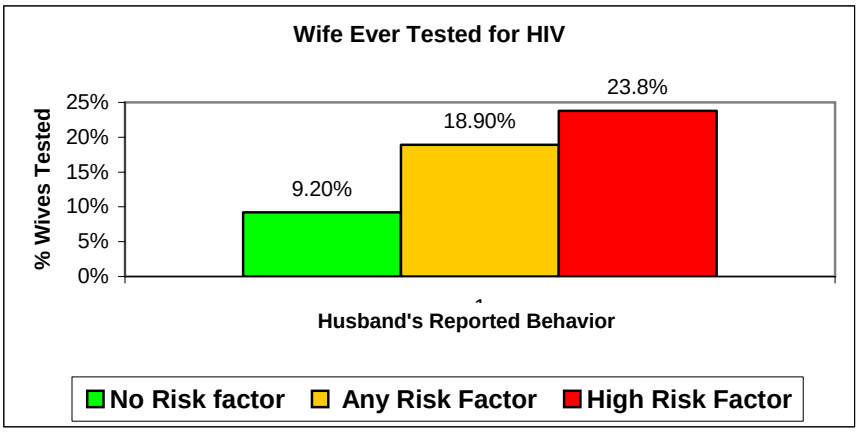
Condom use by HIV positive husbands (based on results of CDHS testing) was higher than condom use by men in general but still quite low. **Only 16.1% of HIV positive men reported having used a condom with their wife.** Clearly women are not being protected from HIV transmission by their husbands through condom use.

It is worth noting, in that regard, in marriages with at least one infected partner, 50% were sero-discordant at the time of the survey – that is, one of the partners – usually the wife -- was as yet uninfected.

To put it in starker terms, for every 5 currently married women who are HIV positive, there are 4 more uninfected women married to a man who is HIV positive, and most of them are not in any way protected.

2. Voluntary and Confidential Counseling and Testing (VCCT)

Cambodian women are also not being tested for HIV very often. Overall, only 10.2% of ever married women have been tested. Although women with husbands with any risk factor were more likely than those without to have had an HIV test (and those whose husbands had higher risk factors even more so), it is notable that even among them, the vast majority had not ever been tested.



In addition, while women whose husbands had been tested were more likely to have been tested themselves, 63.7% of women whose husbands had ever had an HIV test had not been tested. Some, but certainly not all, of this discrepancy may be due to routine premarital testing of men, which has become customary in may segments of Cambodian society.

	Wife ever tested for HIV		Total
Husband Ever tested	No	Yes	No
No	93.2%	6.8%	100.0%
Yes	63.7%	36.3%	100.0%
total	87.7%	12.3%	100.0%
			p=.000

.The main predictors for an ever married woman being tested for HIV [9] are:

- Receipt of ANC in the past 5 years
- SES: testing is much more common among higher SES groups.
- Husband's sexual behavior: women whose husband's reported (in a confidential survey) any risk factor were more likely to have been tested than those whose husbands did not.
- Knowing someone who had died of AIDs
- Urban women were more likely to be tested than rural ones.
- Age: testing is more common among women aged 15 to 24 years and then decreases steadily with age thereafter.
- Education was positively correlated with ever being tested.
- Province of residence: testing is significantly more common among women in Phnom Penh, Siem Reap and Battambang than elsewhere.

Interestingly, AIDs-related attitudes were not statistically significant for having ever been tested.

[9] HIV testing of never married women is very rare except in special high risk populations

It was not possible to test for the influence of empowerment while still controlling for the husband's behavioral risk factors, since male interviews were not conducted in the same households as the women's status modules.

3. The Situation of HIV+ Women in the General Population

70.2% of women who tested HIV positive in the CDHS are married and living with their husbands; 21.7% are already widowed and 8.1% are separated or divorced.

89.1% have one or more child(ren), and 40.4% have one or more child(ren) under the age of five years.

Less than half had ever been tested for HIV (excluding, of course, the CDHS test, which did not provide results back to the respondents), and most are not yet symptomatic as indicated by:

- The percent who reported having been too ill to work or carry out their usual activities: only 14.3%.
- The percent who are underweight: 30.2% compared to a general prevalence of 16.8% -- in other words, the percent of underweight that is above what is usually seen in women of this age group is similar to the percentage who reported being too ill to work.

With approximately 85% of these women not yet ill, and more than half of them having never been tested, it can reasonably be inferred that at least half do not know that they are HIV positive.

4. Risk of Mother to Child Transmission

As noted, less than half of the women in the general population who are HIV positive have ever been tested and given the results, and most are not yet ill, leading to the conclusion that at least half, possibly more, do not know their HIV status. (Among those who have ever been tested, there is no assurance that the testing was done after they became positive; the question asked only about *ever* testing.)

2.2% of the HIV positive women in the survey are currently pregnant. Another 35.9% are less than 24 months post-partum and still breast-feeding a child.

An alarmingly high percentage of the remainder are not using any method of FP:

	Blood test result	
Current Use of FP	**HIV negative**	**HIV positive**
None	59.9%	72.7%
Traditional Method	12.6%	6.1%
Modern Method	27.6%	21.2%
Total	100.0%	100.0%

Much of this nonuse is due to the fact that the woman has either recently had[10], or is planning to have, a child:

[10] See Section II.B.1 and II.B.2 regarding family planning among post-partum women.

Want to Have a Child Now?	Blood test result	
	HIV negative	HIV positive
No	88.8%	78.1%
Yes	11.2%	21.9%
Total	100.0%	100.0%

It should be noted that, due to the small number of HIV+ women (87 unweighted cases), the seemingly higher rate of non-use of FP and desire for a child among HIV positive as opposed to HIV negative women is not statistically significant. It can, however, be safely said that there is no indication that these women are protected from transmitting their infection to a child.

The majority of Cambodian women do not yet know that there are drugs which can be given to prevent mother to child transmission of HIV, and only 15% of women with a delivery in the past 2 years who obtained ANC received counseling/were offered testing for HIV. Multiplying that by the percentage of pregnant women who receive ANC, the total coverage is only about 10%. This situation is likely to improve as efforts are underway to expand the availability of HIV counseling and testing in ANC facilities.

5. Summary and Policy Recommendations:

The CDHS brought good news with respect the prevalence of HIV infection in the general population; it is lower than previously thought. Previous estimates were projections based on prevalence among ANC clients; we now know that ANC clients as a group have a higher prevalence of HIV than pregnant women overall, due to the fact that both HIV infection and ANC are more common among the more affluent segment of the population. With this information a revised estimate of 0.9% prevalence has been calculated.[11]

Unfortunately, the good news stops here. Condom use between spouses – even when the husband has acknowledged risk factors and/or is HIV positive – is extremely low. There is likewise no indication that HIV positive women are aware of and taking appropriate measures to contain the risk of transmission to an unborn or nursing child.

While fewer men are becoming infected through high risk sex, it appears that virtually every new male infection still brings with it probable infection of a wife and, often, one or more children.

There are 3 main lines of defense in preventing HIV infection of the population:

1st line: preventing infection in the course of high risk sex (commercial or promiscuous sex, etc). This has been the primary focus of HIV prevention efforts to date in Cambodia and considerable progress has been made.

2nd line: preventing a man, once infected, from infecting his wife. Here, little or no progress is evident. In consequence the percentage of HIV infected women in the general population is now

[11] The CDHS itself found only 0.6% prevalence, but as previously noted its denominator seriously under-represents such high risk groups as commercial sex workers, military and migrant workers. The 0.9% figure is a revised projection from sentinel surveillance data taking into account the higher prevalence among ANC vs. non-ANC attending pregnant women documented in the CDHS.

equal to that of infected men, and, as previously mentioned, for every 5 infected currently married woman in the general population there are 4 more about to become infected.

3rd line: preventing a married woman, once infected, having an infected child. This in turn has 2 components:

- Prevention of pregnancy among HIV infected women by ensuring women know their HIV status, are aware of the risks of transmission during pregnancy/delivery and BF, and have access to reliable means of contraception[12].
- Routine (voluntary) HIV testing of pregnant women and provision of antiretroviral therapy (ART) and counseling to prevent transmission to the child.

There has been some progress in these two areas when the present situation is compared to that of 5 years ago , but it has been very small.

The barrier to protecting wives is lack of condom use between spouses. Condoms in Cambodia are associated with disease prevention rather than family planning (although its effectiveness as a family planning method is widely known) and carry a stigma and implication of distrust which inhibits use between married couples.

In addition, although both men and women support the idea that women can insist on condom usage if the husband has HIV or other sexually transmitted disease, acting on this requires that the woman know her partner's HIV status. Low rates of HIV testing hamper this. In addition, results are confidential and there is no assurance that a husband will inform his wife if he tests positive for HIV or has any other type of STI.

Several factors create an unnecessary risk of mother to child transmission of HIV: low rates of HIV testing among women, with the result that many infected women are unaware of their status and fail to take measures to prevent pregnancy; low access to HIV counseling and testing during ANC, and low awareness of the existence of drugs to prevent transmission during pregnancy and delivery.

Policy Recommendations:

1. Ongoing efforts to promote 100% condom use in high risk sexual encounters should, of course, continue, and the success to date should not lead to an decrease in intensity of efforts or resource allocation. Cambodia's population structure is such that every year a large number of men and women newly become sexually active, and it is only through continued effort that the gains made can be sustained. However, there needs to be *increased focus on -- and resource allocation to -- prevention of HIV transmission from husband to wife and from mother to child.*

2. Mass media efforts to promote condom use between married couples need to intensify and also explore new approaches since the ones used thus far ("protect the one you love" etc) have not had much success. Promoting condoms as a means *of family planning* that is side-effect free might be one avenue which might both appeal to women and give them a means of negotiating condom use without having to imply infidelity.

[12] The assumption here is that the majority of HIV positive women, if aware of their HIV status and the risks of transmission to a child, would chose not to become pregnant. Of course, HIV+ retain the right to have children if they so choose, but it should be a fully informed choice.

3. Mainstream married women need to be specifically targeted for promotion of HIV counseling and testing, with mass media campaigns that emphasize that many wives are exposed to HIV without knowing it, and that a woman should ascertain her HIV status first if she is thinking of having a child.
4. The government might consider capitalizing on the spontaneous demand for premarital HIV testing of boys to offer a more comprehensive pre-marital service in Health Centers and government hospitals, consisting of not only HIV testing for the boy but counseling of the couple on FP (stressing the dual protection offered by condoms) and private counseling of the woman on the risks of HIV, her right to negotiate condom use, and the importance of HIV testing before planning a pregnancy and as a part of ANC. As noted in Section II.B, this would also be an opportune time to detect and treat anemia in women of child-bearing age, thereby also contributing to the NSDP goal of decreasing maternal mortality.

5. Efforts to expand the availability of services to prevent mother-to-child transmission (MTCT) of HIV should be intensified and, as they are put in place, be accompanied by aggressive information campaigns. This could have the added benefit of increasing ANC coverage as well as decreasing MTCT.

6. Regression Tables:

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	160.662	12	.000
	Block	160.662	12	.000
	Model	160.662	12	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	417.200(a)	.221	.373

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	willing to care for PLHA	-.057	.088	.420	1	.517	.944
	knows someone died	.384	.268	2.059	1	.151	1.468
	Age	-.319	.100	10.234	1	.001	.727
	Province	.001	.030	.001	1	.974	1.001
	Urban/rural	-.875	.321	7.452	1	.006	.417
	Migration	-.005	.003	2.901	1	.089	.995
	Education	.102	.224	.207	1	.649	1.107
	SES	.540	.132	16.677	1	.000	1.716
	Knowledge PMTCT	-.083	.067	1.513	1	.219	.920
	ADEQ ANC	1.108	.312	12.648	1	.000	3.030
	Media	.163	.154	1.131	1	.288	1.178
	risk behavior (husband)	.486	.129	14.069	1	.000	1.625
	Constant	-2.166	1.033	4.395	1	.036	.115

a Variable(s) entered on step 1: V778, V775, V013, V024, V025, V104, V106, V190, V774A, ADEQANC, Media, risk.

III. CHILDREN UNDER THE AGE OF FIVE YEARS

A. Exclusive Breast-feeding (BF)

There has been substantial improvement in reported exclusive BF of children under the age of 6 months since 2000; 60.0% of children aged 0-5 months are now reported to have received only breast-milk in the 24 hours prior to the survey. The main predictors of exclusive BF are, in descending order of importance:

- ANC by trained provider
- SES *has a negative correlation:* better-off women are less likely to BF exclusively than poorer ones.
- Education has a positive correlation, with more exclusive BF by educated than by uneducated mothers..

Little effect is seen from media exposure and *none at all from delivery by trained attendant or facility delivery.* It appears that trained midwives may be including counseling about appropriate BF practices as part of ANC, but the same does not seem to be true post-delivery. As noted in Section II.C. , a similar trend prevails regarding immediate BF.

mom working?

As will be seen shortly, exclusive BF has a strong impact on infant health, particularly with respect to the incidence of diarrhea and malnutrition .

B. Infant and Young Child Feeding

Ever breast-feeding is virtually universal, and continued breast-feeding is so widespread in Cambodia that these behaviors will not be discussed further.

The indicators for complementary feeding collected in the CDHS (frequency, diversity, specific foods) are not effective predictors of nutritional status. No significant association is seen between these data and to malnutrition in the 6-23 month age group and only weak one is seen between frequency of food and malnutrition from age 24 month onward. The missing link is most likely *quantity* of food consumed at each feeding. The typical rural Cambodian meal consists of a water-based soup (*samlaw)* with white rice. The poorer the family, the more watery the soup and the less vegetable and meat or fish it contains, although there will usually be some vegetable and at least a trace of fish or meat. As a result, much of the reported consumption of vegetables, fish and meat may actually have been just broth of a soup which contained small amounts of them. In addition, although the number of times a child ate was reported, there is no indication of the amount of rice (the main meal component in Cambodia and chief source of calories) consumed.

C. Malnutrition

Predictors of malnutrition vary by the age of the child. In children *under the age of 6 months*, the only significant predictors of underweight are:

- Exclusive BF: babies who were not exclusively BF were more likely to be underweight.

- Birth weight: babies reported as having been smaller than average at birth were more likely to be underweight.

- Maternal nutritional status: mothers who are underweight are more likely to have an underweight infant, although the relationship is significant at only p=.09. (Note the small sample size since only a six month cohort of children is involved).

SES becomes significant from age 6 months onward. For the age group 6 – 11 months, the main predictors of underweight are:

- Low birth weight
- SES: underweight among both mothers and children is most common in poorer households, as one would expect. this effect does not show up in infants until after the age of 6 months because prior to that time they are adequately nourished by breastmilk alone.
- Maternal nutritional status: the association is stronger than it was for children 0-5 months. This is probably because children aged 6 months and onward are starting to eat complementary food, and the data clearly show a strong correlation between the intake of mothers and their children in terms of number of times food was taken as well as the type of foods consumed.
- Continued breastfeeding: although it was rare for children in this age group not to still be BF, those few who were not had a higher risk of being underweight.

The mother's nutritional status, continued BF, and birth weight remain significant predictors for being underweight in the *12 – 23 month age group.* SES assumes more influence, and diarrhea starts to play a role. It is noteworthy that the nutritional effects of low birthweight persist for a full two years.

From birth to age 23 months, the mother's education is not a significant factor when SES, BF practices, birth weight and the mother's nutritional status are controlled for.

The epidemiology of child malnutrition changes from age 24 months onward, reflecting a greater influence from maternal behavior. Low birth weight has finally ceased being predictive, and diarrhea has less effect than it did in the 12 -23 month old group. The main predictors of underweight for children in their third year of life (24 to 35 months) are:

- Exposure to mass media by the mother is not only a strong factor but *the single most significant one.*

- Mother's nutritional status (as mentioned above, the food intake of mothers and children are strongly correlated).

- BF: children who are no longer BF are more likely to be underweight than those who continue.

Neither SES nor mother's education are significant when media exposure is controlled for, although they are in its absence.

The following variables, although not statistically significant on their own, add to the fit of the model and appear to have a combined effect on the risk of undernutrition in children aged 24 months and over: diarrhea, the number of times the child is reported to have been fed (inverse relationship) and having a younger sibling with a close birth interval (24 months or less).

D. Immunization

Child immunization rates improved considerably in Cambodia between 2000 – 2005 and no doubt played an important part in the corresponding decline in under five mortality. The main predictors of a child being fully immunized are as follows, in descending order of importance:

- Mother's education s the most important factor and increases the odds of a child being fully immunized 1.7 times.
- Mother's *exposure to mass media* is the second most important factor.
- Differences between provinces were still significant when other factors were controlled for, suggesting supply side constraints in particular locations.

Urban/rural differences were not significant when province and the other factors mentioned were controlled for. Neither was SES.

Most children who are not fully immunized are partially so. It is rare for a child to have received no immunizations at all; only 7.2% of children fall into that category. While a number of factors, some supply side and some related to maternal behaviors and demand, influence full immunization, the presence of a significant number of *never* immunized children is an almost certain sign that health services are not reaching the population in that area.

More than 15% of children are *never* immunized in the following locations:

- Kampot/Kep
- Mondulkiri/Ratanakiri

The constraints to immunization in Mondulkiri/Rattanakiri are well known as these are mountainous areas with low population density. With respect to Kampot, the reasons are less obvious. While there has been some improvement in the past 5 years, but there are clearly still sizable pockets where immunization outreach is not taking place

E. VAC Supplementation and De-worming

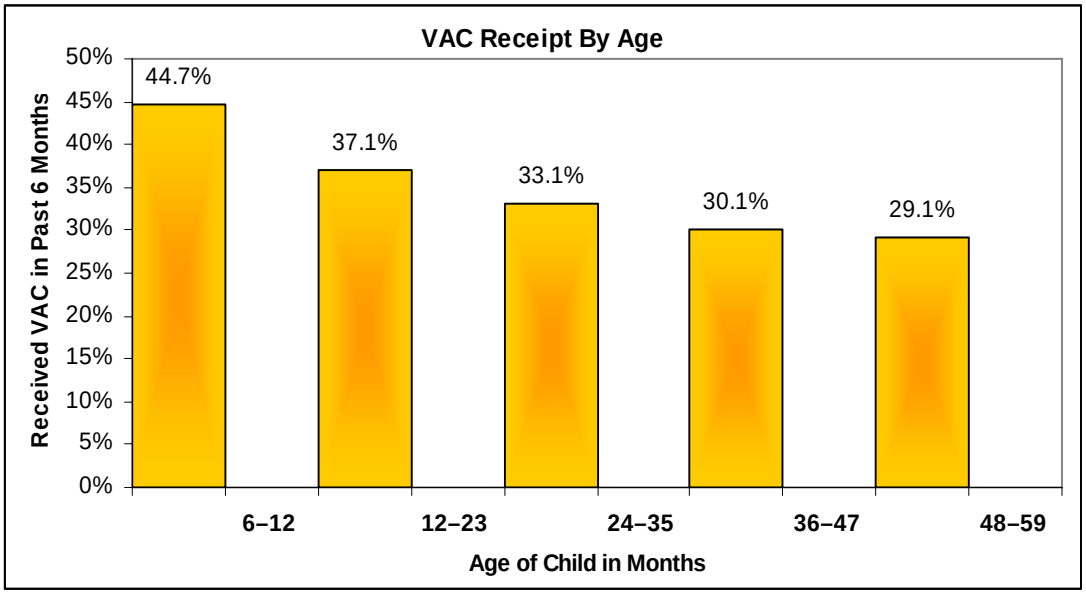
Vitamin A Capsule (VAC) supplementation, unlike immunization, has not improved much in Cambodia over the past five years. The main predictors for receipt of VAC by children aged 6 – 59 months are as follows, in descending order of importance:

- Province: The same provinces mentioned as having an unusually high percent of never immunized children also have unusually low levels of VAC coverage, as one would expect. In addition, coverage is quite low in Kampong Cham (only 11.4%) and

surprisingly low in Phnom Penh (26%) despite reasonably high levels of immunization in those two provinces. Furthermore, their very large population size means that low VAC coverage in these 2 locations significantly lowers the overall national rate.

- Urban/rural strata
- Mother's exposure to mass media
- Child's age: coverage levels decrease with steadily age, probably because the distribution mechanism is linked with immunization which targets children up to age one year (see graph)
- Mother's education

However, even in concert these variables explain only a fraction of the variance seen. Presumably supply-side factors that prevail at a lower level than the provincial account for the rest, since no combination of family or maternal characteristics seem to.

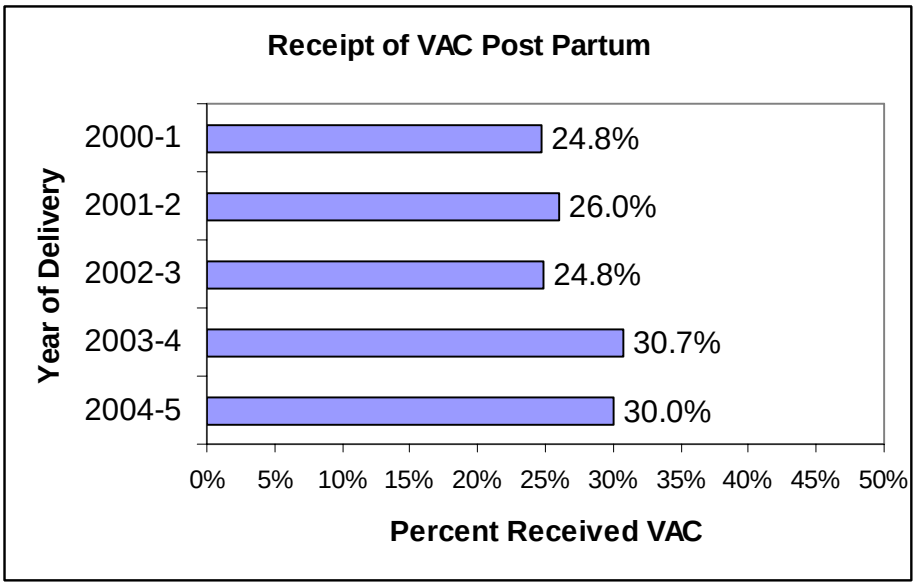


Not only is VAC coverage low, but VAC does not seem to be reaching children in special need of it. In addition to routine distribution, VAC supplementation should be given to children suffering from malnutrition and/or diarrhea. VAC receipt for children in either of these categories was only marginally better than for children overall.

Received VAC in Past 6 Months			
	No	**Yes**	**Total**
No diarrhea	66.9%	33.1%	100.0%
Had diarrhea	61.7%	38.3%	100.0%
Total	65.9%	34.1%	100.0%
			p=.001

Received VAC in Past 6 Months			
	No	**Yes**	**Total**
Not malnourished	67.4%	32.6%	100.0%
Moderately/severely underweight	64.3%	35.7%	100.0%
Total	66.2%	33.8%	100.0%
			p=.08

Receipt of VAC by post-partum women is also still quite low, although there has been some improvement in the past two years:



The main predictors of receiving VAC supplementation post-partum are, in descending order of importance:

- ANC from a trained provider during pregnancy
- SES
- Access barriers: women who report that they face barriers in accessing health care such as transportation, distance, etc are less likely to receive VAC
- PNC from a trained provider after delivery

Controlling for all the above, empowerment is also a highly significant factor (p=.p001, r=.11). This is interesting since it is *not* significant for child VAC.

E. Illnesses

1. Predictive Factors for Illness

46.4% of children under five were reported to have been ill in the 2 weeks prior to the survey with either diarrhea, ARI or some combination thereof. About a third of children with both ARI and/or diarrhea were also reported to have had a fever. Very few children (6.2%) were reported to have had a fever without accompanying cough or diarrhea, tending to confirm that ARI and diarrheal diseases are the most common illnesses in this age group.

Predictive factors for the occurrence of these illness varied by both type (respiratory vs. diarrheal) and child's age.

a. Diarrhea

Among children aged 0-5 months the only factors showing a statistically significant influence on the occurrence of diarrhea are:

- Exclusive BF: the practice of exclusive BF reduces the risk of diarrhea in infants of this age by almost one third.
- Province of residence

Higher SES and maternal education were protective but at levels not statistically significant at this sample size. There is no association between source or treatment of drinking water and diarrhea in children less than 6 months old, which is not surprising since most of these children have limited or no exposure to plain water.

For the age group 6-23 months, more factors come into play:

- Provincial differences remain highly significant.
- Safe Drinking water: Point-of-Use (POU) disinfection of water (which in Cambodia 2005 was almost always through boiling the water) reduces the risk of diarrhea by about 25%. Differences according to water source are not statistically significant when this practice is controlled for.
- Hygiene: the CDHS did not collect information directly on hand-washing; it would be hard to do so, since reported practices are often inaccurate. However it did record where the family's general water source was located, a good proxy indicator since hand-washing practices and overall hygiene are almost certainly better when water is easily available and does not have to be carried from far away. Having a source of water within the home or yard reduces the risk of diarrhea.
- Sanitation: the mother's reported practices with regard to disposal of the child's feces has an important impact; sanitary disposal reduced the risk of diarrhea.
- Seasonality (as reflected in the month of the interview) has a small but significant effect.

BF practices were not significant, but it should be noted that they are fairly uniform in this age group (continued and non-exclusive).

For children aged 24 – 59 months, the mother's education, and presence of a toilet or latrine in the household assumed importance, and continued BF had a positive effect. There was also a strong association to under-nutrition, although the causality for this is most likely bi-directional.

b. ARI

Factors associated with ARI do not vary much by age, and are, in descending order of importance:

- SES
- Province of residence
- Undernutrition: Reported low birth weight/small size was a strong predictor of ARI in children 0-5 months, as was underweight for children 6 months and over. As with diarrhea, causality may be bi-directional .
- The giving of colostrum: as this was not directly asked in the CDHS, the proxy indicator of having initiated BF within 24 hours of BF was used, and shows a strong negative correlation to the occurrence of an ARI.

These factors account, however, for only a small fraction of the variance seen. Respiratory infections in children are to a large degree unpreventable; it is a natural part of growing up, even in highly developed countries. The key issues then are (1) ensuring that children have healthy immune systems capable of fighting these infections, which is basically a matter of nutrition, and (2) ensuring that infections of the lower respiratory tract (respiratory infections that are not simple common colds) – which appear to be the single leading cause of death in Cambodian infants and children – are appropriately and promptly treated.

2. Management of Illness

a. Diarrhea

For the purposes of analysis a score for appropriate management of diarrhea was developed composed of the following: giving of Oral Rehydration Therapy (ORT), giving of increased fluids, giving of the same or increased food, and taking the child to a trained provider.

Predictors of appropriate management of diarrhea are as follows:

- *Exposure to mass media* is the single most important factor influencing appropriate management of diarrhea.
- Severity: children who also had a fever were more appropriately managed than those without.
- SES
- Province of residence.

Mother's education was not significant when mass media and SES were controlled for.

b. Management of Acute Respiratory Infection (ARI)

Important Note: The CDHS report provides information on treatment only of children who with an apparent respiratory infection (fever/cough) who were *also* reported by the mother to show signs of trouble breathing (shallow, rapid breaths). As a proxy indicator for pneumonia, this has a high degree of *specificity* but questionable *sensitivity,* since it relies on the mother having accurately observed breathing symptoms. Naturally, mothers who perceive that their child is not breathing normally are more likely to seek treatment than mothers who do not; the question is whether or not the mother – who is not medically trained – can accurately determine this. There have been no large scale efforts in Cambodia as yet to train mothers in observing for such signs.

For this reason, as well as because rapid /hallow breathing may not yet be apparent in early pneumonia, and children with only upper respiratory infections are at risk of developing a lower tract infection (especially the many who are undernourished), the in-depth analysis took as its ARI denominator all children reported to have had fever/cough. As a result, the rates for treatment differ from those shown in the main CDHS report.

Appropriate management of ARI was defined as taking the child to a trained health provider. It is most strongly predicted by:

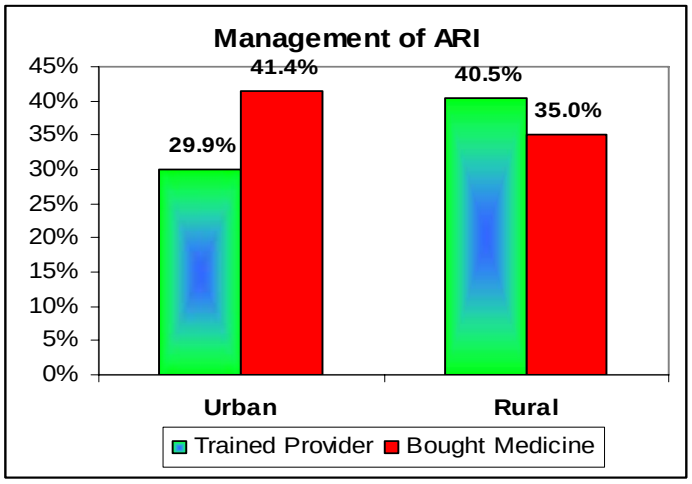
- Access to services: mothers who reported that they faced a distance/transport barrier to obtaining health care were significantly less likely to take their child to a trained provider.
- Rural rather than urban residence: *rural children were almost twice as likely as urban ones to be taken to a trained provider* (most often, a government Health Center).
- Severity of illness as indicated by reported shortness of breath
- Mother's education
- Mother's age (with older mothers less likely than younger ones to take the child to a trained provider) and province of residence exerted small effects.

Surprisingly, SES was not at all significant when these factors were controlled for. However, the *mother's financial autonomy* exerted an influence significant at p=.12.

The lower rate of trained treatment in urban areas is surprising, and may in part reflect the greater availability of pharmacies there; treatment of the child by the mother with drugs bought at a pharmacy was more prevalent in urban areas and accounts for most cases in which a child was not taken to a trained provider.

Treatment by the mother with drugs bought without the child being examined by a trained provider is of concern for several reasons:

- The child will not have been examined to determine whether or not the illness was a simple cold or a more serious lower respiratory tract infection.
- The mother will not have been counseled on danger signs to watch for.
- Infants and children are much more easily harmed by incorrect choice of drugs and dosage (which in the case of children, must be adjusted to the child's weight) than are older children and adults.



p=.001 for trained provider
p=.05 for medicine bought

G. Summary and Policy Implications:

Substantial improvements have occurred in the past five years with respect to infant/child health, and these have born fruit in terms of lower levels of mortality. Increased immunization and better breast-feeding practices have probably been important contributors to this achievement. With respect to immunization, while coverage increased dramatically between 2000 – 2005, it is still below the goal of 80% coverage, the level needed to provide adequate immunity among the child population as a whole. In addition, it should be remembered that immunization coverage rates have to be re-achieved on an annual basis as every year a new cohort of children are born; they are not cumulative. Hence it is important to guard against complacency and to ensure that resources and intensity of effort for this essential life-saving intervention remain high. In addition, coverage levels have now reached the point where there are clearly specific underserved geographical locations holding down the overall national rate, and the time is ripe to focus in on identifying and solving area-specific constraints. In some cases these are already well known, e.g. in remote areas with difficult terrain like Mondulkiri/Rattanakiri and Stung Treng/Preah Vihear. However, the data indicate that services are completely failing to reach over a quarter of children in Kampot/Kep.

Progress with respect to provision of Vitamin A Capsule (VAC) supplementation lags behind what has been achieved in immunization and is of concern since this is an intervention capable of significantly reducing infant and child deaths. As with immunization, there are specific provinces which lag behind the rest and pull the national average down; in addition to the remote areas and Kampot/Kep, Kampong Cham province is one of these, and, due to its very large size, exerts a substantial effect on the national rates. In addition to what are almost certainly supply-side weaknesses in specific geographical areas, the data indicate that the current strategy of providing VAC in tandem with immunization is resulting in VAC primarily reaching children in the 6 – 18 month old age group, whereas it needs to reach children up to the age of five years.

Before the age of six months, VAC supplementation for children is provided through giving t to the mother, so that it can pass through the breastmilk. This also, of course, has the desirable effect of improving the mother's nutritional status as well. The provision of VAC to women post-partum has improved in recent years but coverage is still very low. As noted in Section II.C._, this is also the case for post-natal care in general.

Diarrhea and respiratory diseases remain the main diseases affecting children under age 5; they are also apparently still the main causes of death in infants and children more than one month old. In children aged less than 6 months old, the incidence of diarrhea is linked to non-exclusive breast-feeding and can be substantially reduced if more mothers adapt this practice. In children aged over 6 months, safe drinking water and hygiene/sanitation play an important role. Interestingly, point-of-use (POU) disinfection of water has more impact than the original source of the drinking water. This suggests that, even when the water comes from a safe source such as a deep tubewell, it often becomes contaminated before it is consumed as a result of poor water handling and/or storage practices. Although many mothers report POU disinfection of their chil's drinking water, the only POU method widely used in Cambodia at present is boiling, which is both time-consuming and expensive. As a result, even in households where it is practiced it may not be done 100% of the time. Use of other methods such as filters, chlorine (bleach) and solar disinfection is almost nil. Filters are admittedly expensive and many people dislike the taste chlorine gives to water, but the non-use of solar disinfection, which costs nothing, is easy to do and does not affect taste, is almost certainly just due to lack of knowledge.

In addition to POU disinfection of drinking water, having a general source of water (for hand-washing and bathing) located in the house or yard reduces the incidence of diarrhea in children, probably because it promotes more frequent hand-washing by the mother. Sanitary disposal of children's feces is also important but probably dependent upon the ready availability of water. Having a toilet or latrine within the house or yard significantly reduces the incidence of diarrhea in children aged over two years.

The single most important factor in mothers' managing diarrhea correctly is exposure to mass media. Mass media is also playing an important role with respect to immunization and receipt of VAC, It is noteworthy that exposure to messages on child health care can reduce or in many cases eliminate the higher risk usually associated with low maternal education. *Cambodian women are hearing important health messages through the media and acting, whether they are educated or not, they act on them.*

Low birth weight/underweight[13] and Vitamin A deficiency are both significant predictors of acute respiratory infection. They are also well known to increase the risk that what might otherwise have remained a simple cold will advance to a more serious lower respiratory infection, and they are also strong risk factors for death when that happens. As already mentioned, progress in ensuring VAC supplementation to mothers after delivery and to children under age 5 has not been very good and the majority of children remain unprotected by it. There has been a significant decrease in the percentage of Cambodian children who are underweight since 2000, but still over a third are moderately to severely undernourished and thus at increased risk of death from common infectious diseases.

Improving child nutrition will require, in addition to general poverty reduction, improvements in nutrition during pregnancy. About 15% of Cambodian infants are born with low birthweight and

[13] Low birth weight in the case of children less than 6 months old, under-weight in the case of children 6 to 59 months old.

the nutritional effects of this linger for at least 2 years. Low birth weight is overwhelmingly the result of inadequate food intake during pregnancy, as was discussed in Section II.C.__. In addition, proper breast-feeding practices and proper compelmentary feeding after the age of 6 months are important; mass media messages are effective tools in improving both of these.

In addition to strengthening a child's immune system through adequate food intake and VAC supplementation, the other important aspect of reducing death from respiratory infection is ensuring that the child is treated by a trained provider. This currently occurs in fewer than half of all cases, although there has been improvement in the past 5 years, especially in rural areas where government Health Centers are now the leading source of care. In urban areas, however, there has been no significant increase, mainly because of the tendency of mothers there to treat the child with drugs bought from a pharmacy, a potentially dangerous practice.

Policy Recommendations:

1. Increased use of mass media should be made to explain the importance of exclusive (and, as mentioned in Section II.C., immediate) BF.
2. Refresher training may be considered for midwives on the importance of providing BF counseling post-delivery, and this aspect of delivery care should be included in supervisory and quality assurance tools.

3. Mass media should also focus on the importance of nutrition during pregnancy, tio decrease the incidence of low birth weight. See other recommendations regarding maternal nutrition in Section II.B.

4. The next CDHS, and any other surveys which attempt to examine infant/children feeding practices, should carefully distinguish between consumption of solid pieces of vegetable, meat and fish and consumption of them as soup broth; it should also attempt to measure the quantity of at least the rice taken.

5. Current efforts to ensure immunization of children (and women for tetanus toxoid) should remain vigilant and on-going. In addition, special efforts need to be made to identify and address the reasons for low coverage in specific provinces.

6. Serious consideration should be given to modifying the strategy for mass administration of VAC to children under fives. This might include special efforts to ensure that all children under age five (as opposed to children eligible for immunization) are mobilized and routine conduct of "mop-up" sessions to reach children who do not get VAC on the initial distribution day.

7. Special attention should be given to increasing the currently low VAC coverage in the Kampong Cham and Phnom Penh, since these two provinces account for a significant percent of the total population.

8. Refresher training should be given to Health enter and hospital consultation staff on the importance of giving VAC to children with diarrhea and children who are underweight.

9. Mass media should be used to increase awareness of the need of VAC post-partum and the fact that this is an essential part of post-natal care.

10. Government and NGO partners should aggressively promote awareness of the importance of POU disinfection of household drinking water and increased knowledge of methods that can be employed other than boiling. Solar disinfection, in particular, should be advertised and taught since it is both easier and less expensive than boiling.

11. Mass media should be used to improve management of ARI in children as follows:
    - Promote awareness of early danger signs
    - Publicize the importance of getting trained advise before giving an infant or child any medications other than paracetemol, ORS or vitamins.
    - Publicize the fact that medication dosages for children must be based on their body weight, and consider other measures to ensure this in urban pharmacies (posters, inspection to ensure that a scale is available, etc).

Table III.A: Exclusive Breast-Feeding (Children 0-5 Months)

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	31.909	5	.000
	Block	31.909	5	.000
	Model	31.909	5	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	981.698(a)	.042	.056

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	ADEQ ANC	.658	.168	15.359	1	.000	1.931
	Province	-.019	.015	1.680	1	.195	.981
	Education	.295	.141	4.364	1	.037	1.343
	SES	-.227	.069	10.623	1	.001	.797
	Media	-.071	.084	.715	1	.398	.932
	Constant	.680	.224	9.257	1	.002	1.974

a Variable(s) entered on step 1: ADEQANC, V024, V106, V190, Media.

Table III. C. 1: Malnutrition in Children Aged 0 – 5 Months Old

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.248(a)	.061	.049	.18328

a Predictors: (Constant), Maternal Nutritional Status, Reported Size at Birth, Exclusively BF, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.678	4	.169	5.044	.001(a)
	Residual	10.382	309	.034		
	Total	11.060	313			

a Predictors: (Constant), Maternal Nutritional Status, Reported Size at Birth, Exclusively BF, Wealth index
b Dependent Variable: Underwt

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.143	.034		4.269	.000
	SES	-.005	.008	-.035	-.632	.528
	Reported Size at Birth	-.046	.025	-.101	-1.824	.069
	Exclusively BF	-.080	.021	-.207	-3.727	.000
	Maternal Nutritional Status	-.048	.028	-.094	-1.696	.091

a Dependent Variable: Underwt

Table III.C.2: Malnutrition in Children Aged 6 – 11 Months Old

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.267(a)	.071	.060	.46859

a Predictors: (Constant), Illness in past 2 weeks, Reported Size at Birth, StillBF, Maternal Nutritional Status, Highest year of education, Region, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.302	7	1.329	6.052	.000(a)
	Residual	120.841	550	.220		
	Total	130.143	557			

a Predictors: (Constant), Illness in past 2 weeks, Reported Size at Birth, StillBF, Maternal Nutritional Status, Highest year of education, Region, Wealth index
b Dependent Variable: Underwt

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.619	.092		6.764	.000
	SES	-.048	.015	-.143	-3.329	.001
	Education	.008	.013	.025	.596	.551
	Still BF	.077	.044	.073	1.749	.081
	Maternal Nutritional Status	.093	.048	.081	1.933	.054
	Province	.001	.004	.014	.338	.735
	Reported Size at Birth	-.231	.058	-.166	-3.968	.000
	Illness in past 2 weeks	-.027	.041	-.028	-.676	.500

a Dependent Variable: Underwt

Table III.C.3: Malnutrition in Children Aged 12 – 23 Months Old

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.278(a)	.077	.067	.46692

a Predictors: (Constant), diarrhea, Reported Size at Birth, Highest year of education , Maternal Nutritional Status, StillBF, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.057	6	1.676	7.689	.000(a)
	Residual	120.337	552	.218		
	Total	130.394	558			

a Predictors: (Constant), diarrhea, Reported Size at Birth, Highest year of education, Maternal Nutritional Status, StillBF, Wealth index

b Dependent Variable: Underwt

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.642	.084		7.666	.000
	SES	-.048	.014	-.143	-3.365	.001
	Education	.007	.013	.024	.568	.570
	Still BF	.072	.043	.069	1.659	.098
	Maternal Nutritional Status	.096	.048	.083	1.997	.046
	Reported Size at Birth	-.231	.057	-.166	-4.032	.000
	diarrhea	-.086	.045	-.078	-1.897	.058

a Dependent Variable: Underwt

Table III.C.3: Malnutrition in Children Aged 24-35 Months Old

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.298(a)	.089	.076	.47032

a Predictors: (Constant), Succeeding Birth Interval <24 Months, StillBF, Maternal Nutritional Status, Number of Times Child Ate Solid Food, diarrhea, Exposure to Mass Media, Highest year of education, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.478	8	1.560	7.051	.000(a)
	Residual	128.260	580	.221		
	Total	140.738	588			

a Predictors: (Constant), Succeeding Birth Interval <24 Months, StillBF, Maternal Nutritional Status, Number of Times Child Ate Solid Food, diarrhea, Exposure to Mass Media, Highest year of education, Wealth index
b Dependent Variable: Underwt

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	.623	.073		8.482	.000
	Maternal Nutritional Status	.142	.054	.106	2.629	.009
	diarrhea	.074	.061	.049	1.221	.223
	StillBF	.182	.081	.090	2.237	.026
	Number of Times Child Ate	-.018	.016	-.046	-1.152	.250
	Exposure to Mass Media	-.088	.021	-.185	-4.205	.000
	Wealth index	-.020	.016	-.055	-1.260	.208
	Highest year of education	-.008	.012	-.028	-.684	.494
	Succeeding Birth Interval <24 Months	.463	.392	.047	1.182	.238

a Dependent Variable: Underwt

Table III.D: Child Immunization

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	111.757	7	.000
	Block	111.757	7	.000
	Model	111.757	7	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1808.096(a)	.071	.099

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Province	-.037	.011	10.984	1	.001	.964
	Urban/rural	.160	.181	.781	1	.377	1.174
	SES	.069	.051	1.821	1	.177	1.071
	Mother's Education	.527	.102	26.538	1	.000	1.695
	Media	.251	.065	15.110	1	.000	1.285
	Father's Education	.032	.047	.450	1	.502	1.032
	Distance Barrier	-.024	.120	.041	1	.839	.976
	Constant	-.300	.431	.484	1	.487	.741

a Variable(s) entered on step 1: V024, V025, V190, V106, Media, V701, Distance.

Table III.D.1: Child VAC

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	120.029	6	.000
	Block	120.029	6	.000
	Model	120.029	6	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	7713.946(a)	.019	.027

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Province	.030	.005	29.523	1	.000	1.030
	Urban/rural	.183	.085	4.685	1	.030	1.201
	SES	-.041	.024	2.829	1	.093	.960
	Education	.118	.048	6.182	1	.013	1.125
	Media	.140	.031	20.602	1	.000	1.151
	Child's Age	-.164	.021	63.941	1	.000	.849
	Constant	-1.116	.204	29.804	1	.000	.328

a Variable(s) entered on step 1: V024, V025, V190, V106, Media, B8.

Table III.D.1: Post-partum VAC

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	53.516	7	.000
	Block	53.516	7	.000
	Model	53.516	7	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1665.545(a)	.036	.052

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	ADEQANC	.602	.129	21.842	1	.000	1.826
	ADEQPNC	.310	.148	4.355	1	.037	1.363
	BARRIER	-.109	.044	6.308	1	.012	.896
	V024	-.021	.012	2.935	1	.087	.979
	V025	.207	.193	1.146	1	.284	1.230
	V106	.138	.111	1.543	1	.214	1.148
	V190	-.198	.054	13.469	1	.000	.821
	Constant	-.934	.465	4.029	1	.045	.393

a Variable(s) entered on step 1: ADEQANC, ADEQPNC, BARRIER, V024, V025, V106, V190.

Correlations

Control Variables			Degree of Personal Empowerment	Received Vitamin A dose in first 2 months after delivery
Region & Highest educational level & Type of place of residence & ADEQANC & PNC by Trained Provider Within 24 Hours of Delivery & Wealth index & Degree of Access Barrier	Degree of Personal Empowerment	Correlation	1.000	.105
		Significance (2-tailed)	.	.001
		df	0	1051
	Received Vitamin A dose in first 2 months after delivery	Correlation	.105	1.000
		Significance (2-tailed)	.001	.
		df	1051	0

Table III.E.1.a: Diarrhea

(i) Children 0 – 5 Months Old

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	35.845	4	.000
	Block	35.845	4	.000
	Model	35.845	4	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1031.646(a)	.031	.051

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	ExclusBF	-.360	.161	5.010	1	.025	.698
	V024	-.063	.016	15.950	1	.000	.939
	V190	-.162	.066	6.125	1	.013	.850
	V106	-.232	.143	2.610	1	.106	.793
	Constant	-.186	.235	.628	1	.428	.830

a Variable(s) entered on step 1: ExclusBF, V024, V190, V106.

(ii) Children 6 – 23 Months Old

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	58.081	9	.000
	Block	58.081	9	.000
	Model	58.081	9	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2399.928(a)	.029	.040

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Still BF	-.239	.127	3.524	1	.061	.788
	Province	-.053	.010	28.843	1	.000	.948
	SES	.036	.048	.560	1	.454	1.036
	Mother's Education	.019	.090	.042	1	.837	1.019
	POU	-.287	.109	6.936	1	.008	.750
	Seasonality	-.025	.011	4.608	1	.032	.976
	Stool Disposal	-.134	.104	1.655	1	.198	.875
	hand-washing	-.142	.107	1.770	1	.183	.867
	Media	-.106	.057	3.455	1	.063	.899
	Constant	.274	.195	1.972	1	.160	1.315

a Variable(s) entered on step 1: StillBF, V024, V190, V106, POU, V006, Stool, hw, Media.

(iii) Children 24 – 59 Months Old

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	59.254	6	.000
	Block	59.254	6	.000
	Model	59.254	6	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	3468.430(a)	.014	.025

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Still BF	.594	.133	19.973	1	.000	1.812
	Urban/rural	-.200	.141	2.016	1	.156	.819
	Province	-.030	.009	11.492	1	.001	.971
	SES	-.071	.043	2.745	1	.098	.932
	Mother's Education	-.131	.077	2.918	1	.088	.877
	Toilet	-.336	.156	4.649	1	.031	.715
	Constant	-.839	.323	6.757	1	.009	.432

a Variable(s) entered on step 1: StillBF, V025, V024, V190, V106, Toilet.

Table III.E.1.b: ARI

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	72.630	7	.000
	Block	72.630	7	.000
	Model	72.630	7	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	4161.034(a)	.021	.030

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Province	-.027	.007	13.138	1	.000	.973
	Urban/Rural	.164	.124	1.771	1	.183	1.179
	SES	-.122	.029	17.742	1	.000	.885
	Underwt	.208	.079	6.915	1	.009	1.231
	Colostrum	-.202	.080	6.358	1	.012	.817
	Seasonality	-.007	.008	.704	1	.402	.993
	Birthwt	-.247	.105	5.579	1	.018	.781
	Constant	-.233	.302	.594	1	.441	.792

a Variable(s) entered on step 1: V024, V025, V190, Underwt, Colostrum, V006, Birthwt.

Table III.F.2.a: Management of Diarrhea

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.153(a)	.023	.020	1.05854

a Predictors: (Constant), Region, fever, Highest educational level, Exposure to Mass Media, Wealth index

ANOVA(b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.174	5	7.035	6.278	.000(a)
	Residual	1468.379	1310	1.121		
	Total	1503.553	1315			

a Predictors: (Constant), Region, fever, Highest educational level, Exposure to Mass Media, Wealth index
b Dependent Variable: TXSCORED

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	B	Std. Error
1	(Constant)	1.800	.093		19.379	.000
	fever	.160	.059	.074	2.701	.007
	Exposure to Mass Media	.145	.035	.133	4.158	.000
	SES	-.063	.025	-.082	-2.523	.012
	Mother's Education	.002	.052	.001	.030	.976
	Province	-.012	.006	-.058	-2.096	.036

a Dependent Variable: TXSCORED

Table III.F.2.b: Management of ARI

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	57.657	7	.000
	Block	57.657	7	.000
	Model	57.657	7	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	2917.674(a)	.026	.035

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	V106	.153	.079	3.710	1	.054	1.165
	V190	.072	.037	3.778	1	.052	1.075
	V013	-.090	.032	7.798	1	.005	.914
	dyspnea	.216	.090	5.782	1	.016	1.242
	V024	-.017	.008	4.058	1	.044	.983
	V025	.643	.157	16.861	1	.000	1.902
	BARRIER	-.095	.031	9.534	1	.002	.910
	Constant	-1.383	.388	12.694	1	.000	.251

a Variable(s) entered on step 1: V106, V190, V013, dyspnea, V024, V025, BARRIER.

Control Variables			Fever/cough: medical treatment	Independent Access to Money
Highest educational level & dyspnea & Type of place of residence & Distance & Wealth index	Fever/cough: medical treatment	Correlation	1.000	.072
		Significance (2-tailed)	.	.123
		df	0	464
	Independent Access to Money	Correlation	.072	1.000
		Significance (2-tailed)	.123	.
		df	464	0

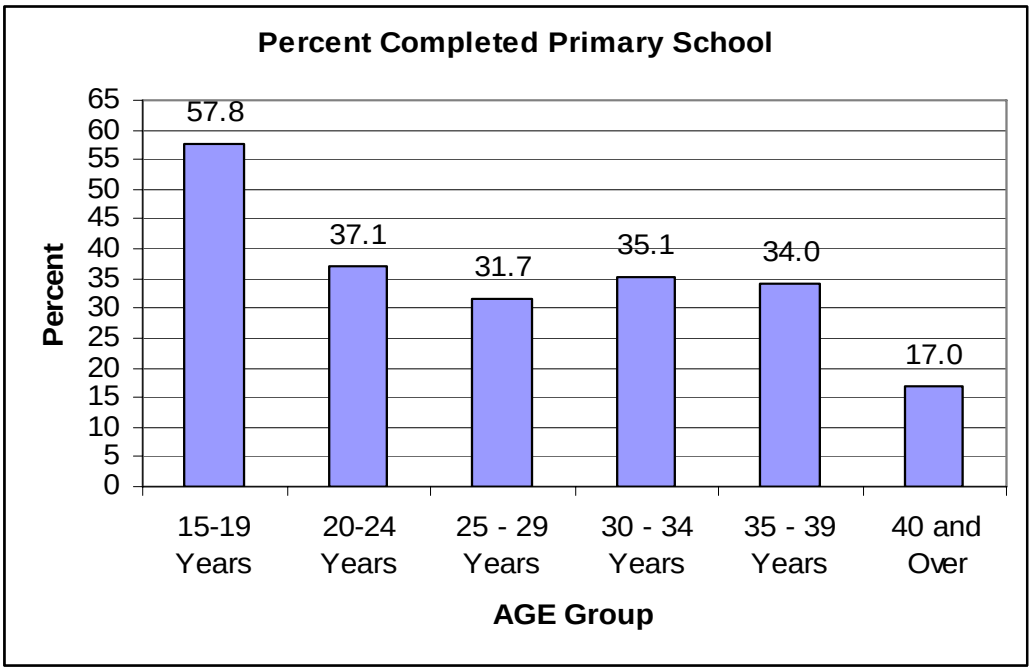
IV. SCHOOL-AGED CHILDREN

A. Education

1. Trends in Educational Attainment:

As the following graph demonstrates, there has been a dramatic increase in educational attainment in Cambodia in the past decade. 57.8% of the age cohort now between 15 and 19 years old have completed primary school[14], a more than 20 percentage point increase over the age group immediately ahead of them.

The eventual primary completion rate for this cohort is likely to be higher still, since a full 26.1% of youth this age are still attending primary school.



Both males and females have benefited from this increase and the gap between the genders is decreasing. For the age group 20 to 24 years the female:male ratio for completion of primary school is .68, whereas for the age group 15 to 19 years it has risen to .92.

The trends towards increased completion of primary school and gender equity in primary education seem certain to continue, as the net attendance ratio for primary school (percentage of children aged 6 to 12 now in school) has risen significantly, and the gender parity index for net attendance now stands at 1.02.

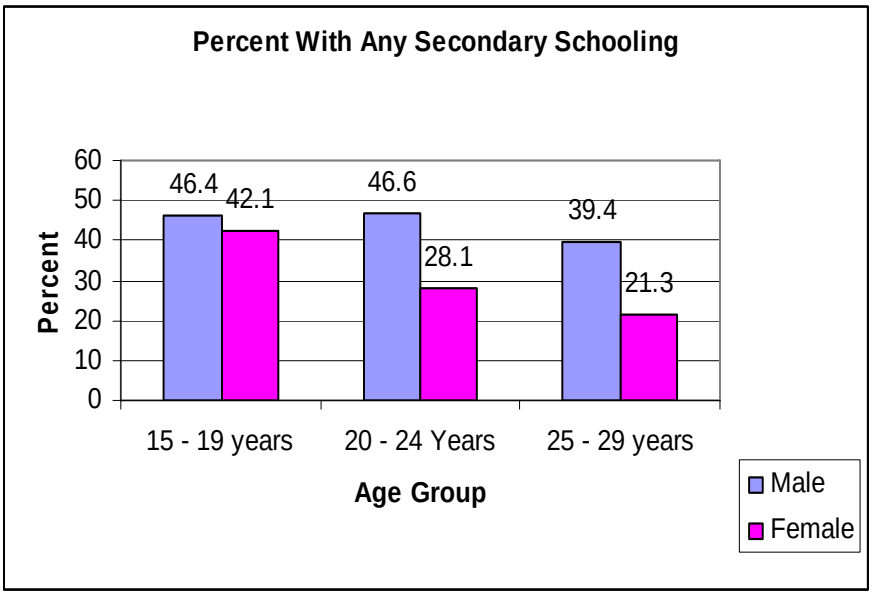
It should be noted that the primary net attendance ratio given in the 2005 CDHS report of 77.3% includes in its denominator children who were between the ages of 6 and 7 at the time of the survey interview; many of these children would have not yet been age 6 at the start of the school year and hence ineligible for enrolment. *A revised primary net attendance ration using as its*

[14] Included in this percentage are many with at least some secondary education.

denominator the six year age group children aged 7 – 12 at the time of interview yields an NAR of 86.5%.

Virtually all (i.e. over 95%) Cambodian children now enroll in and attend primary school at some point between the ages of 6 and 12, with the exceptions of those residing in the provinces of Kratie, Stung Treng/Preah Vihear[15], Mondulkiri and Rattanakiri. Only about half ever enter school in Mondulkiri and Rattanakiri, while around eighty percent do so in Kratie and Stung Treng/Preah Vihear. Due to their comparatively small populations, low enrolment in these provinces has only a small impact on the overall national rate, although it is obviously of concern for development in those provinces. Although still lower than average, primary school enrollment in Kratie, Steung Treng and Preah Vihear has improved considerably in the past 5 years. However, there is as yet no improvement seen in Mondulkiri and Rattanakiri.

Male secondary school enrollment increased at a more modest level, with most of the gain occurring 5-10 years before the survey. Female secondary school enrolment, on the other hand, has shown a dramatic increase in the past five years, causing an overall total rise in the percent of the population with some secondary education and a reduction (although not as yet elimination) in gender disparity at secondary level.



Full completion of secondary school remains rare, at only 9.3% of youth aged 20-24 years, and the mean number of years completed by youth currently aged 19 is only 6.25 years. However, with over a third of youth now aged between 15 and 18 years old currently attending secondary school, this figure will likely increase, although it is not possible to predict by how much.

The following section explores in detail the factors most critical to achieving universal basic education in Cambodia given that entry into the school system is close to being universal outside of a few remote areas of low population density. These include: 9i) age of entry into primary school; (ii) frequency of grade repetition; and (iii) retention (drop-out).

15 These 2 provinces are combined as one strata in the CDHS.

2. Age of School Entry

Despite nearly universal attendance in primary school, entry is often delayed, as shown below:

Age	Percent attended school during current school year
6	32.1%
7	61.4%
8	82.3%
9	89.5%
10	92.7%
11	94.8%
12	93.3%
Total	77.3%

The most significant factors influencing timely[16] school entry are, in descending order of importance:

- The mother's own level of education
- Family's socioeconomic status
- Province of residence

Holding these factors constant, the mother's attitudes towards gender equity are highly significant (p=.005, r=.125).

Gender and urban/rural residence separately exerts only a small influence; however, the combination of urban residence and female gender is significant at p<.000. Urban girls are significantly more likely to be attending school by age 7 than are urban boys or rural children of either sex.

Percent 6 and 7 Year Olds Attending School		
	Rural	Urban
Male	44.9%	48.7%
Female	46.8%	56.3%
Total	45.9%	52.2%
p<.000 for urban female		

The mother's decision-making authority within the household and the extent to which she holds egalitarian views of gender roles favorably influence timely enrollment.

16 Defined as the percentage of 6 and 7 years olds who attended school at any time during the school year. 7 year olds are included because some of the children aged 6 at the time of the CDGHS would not yet have been six at the start of the school year and hence ineligible for enrolment.

3. Grade Repetition

About 6% of students overall in the CDHS were repeating the same grade they had attended the year before. Repetition is very high in grade one (25.3%) and then below 10% in each grade thereafter.

Controlling for the child's age and grade, factors which each exert a significant independent effect on repetition are as follows in descending order of importance:

- Mother's own level of education: Children whose mothers have no education are much more likely to repeat a grade than those whose mother's have had any. The risk of repetition decreases further if the mother has completed primary school or had some secondary education, but the greatest drop off in repetition occurs between no maternal education and some primary.

- The number of adults in the household shows a negative correlation to grade repetition.

- Sex: in both urban and rural areas, boys are substantially more likely to repeat a grade than girls.

- While the mother's overall empowerment score was not significantly related to grade repetition by either male or female children, there was a direct correlation between the mother's experience of emotional/physical abuse or controlling behavior from her husband and grade repetition by children of both sexes (p=.01).

Although socioeconomic status and urban rather than rural residence both had a negative correlation to repetition, they are not statistically significant when the factors listed above are controlled for.

In summary, the most important predictors of grade repetition – aside from being young and in first grade -- are an uneducated mother, male sex, and family problems, the latter including too few adults in the HH and abusive or otherwise unhealthy marital relations between the parents.

4. Drop Out rates:

Overall, 1.4% of children who were in school in the year prior to the CDHS were not attending during the year of the survey. Unlike repetition rates, which are highest in grade 1 and steadily decrease thereafter, drop-out rates rise with each passing year of primary school, starting from 0.6% in grade 1 and reaching 3.0% by grade 6, and then leaping to 33.3% by grade 8. . In terms of age – which as a result of delayed school entry and fairly high rates of grade repetition, does not correlate as closely to grade as one might expect – drop out rates are less than 0.5% through age 11 for both sexes. Among girls, dropping out increases from age 12 onward, while among boys it does so starting from age 14.

Attended School Last Year But Not Attending Now		
Age	**Boys**	**Girls**
6	.0%	.0%
7	.0%	.1%
8	.0%	.1%
9	.0%	.1%
10	.4%	.1%
11	.1%	.1%
12	.2%	.7%
13	.3%	1.6%
14	1.7%	.8%
15	2.7%	4.0%
16	2.1%	3.4%
17	4.3%	4.4%
Total	0.9%	1.2%

Dropping out shares with grade repetition a significant correlation to household structure (number of children under 5 and number of adults in the household) and to abusive marital relations between the parents. However, it differs in three important respects:

- Controlling for age and grade*, the single most important factor in dropping out is the occurrence of a death in the household in the past 12 months*. By contrast the correlation between death in the household and grade repetition is not significant.

- Gender is a significant factor, but compared with grade repetition, the directionality is reversed: girls, who are much less likely to repeat a grade, are more likely to drop out. Although true at every age, this effect is most prominent age 12 onward:

- Among girls only, marital status has a very strong correlation to dropping out of school That this effect is limited to girls reflects two factors: (1) the percentage of girls aged 15-18 who are married, although small, is more than four tomes greater than the percentage of boys in the same age group who are married; and (2) girls almost never attend school once married, while about a quarter of boys do.

Marital status of Youth Aged 15-18				
Sex	**Never married**	**Married**	**Widowed**	**Divorced**
Male	97.9%	1.5%	.0%	.5%
Female	92.7%	6.9%	.0%	.4%
Total	95.4%	4.2%	.0%	.5%
				p<.000

School Attendance By Married youth Aged 15-18 Years			
Sex	**Not Attended**	**Attended School**	**Total**
Male	73.1%	26.9%	100.0%
Female	95.7%	4.3%	100.0%
Total	91.5%	8.5%	100.0%
			p<.000

Urban/rural residence does not exert a statistically significant effect on dropping out when other factors re controlled for.

Province of residence has a significant relationship to dropping out for both sexes, but the strength of the relationship is much weaker for girls when marriage is controlled for. In other words, a higher prevalence of marriage among teenage girls accounts for some of the province by province differences in drop out rates.

In summary, the main predictors of dropping-out of school are the child's age (irrespective of grade completed), the occurrence of a death in the household, female sex, , and family problems, the latter including younger relatives in need of care, and abusive or otherwise unhealthy marital relations between the parents. In addition, among girls only, getting married is a significant factor associated with dropping out of school.

When children who are currently in grade 1 (and therefore would not have been expected to have been in school the year prior) are excluded, only 4.4% of children who did not attend school in the year prior to the survey were attending during the survey year, suggesting that dropping out is usually a prolonged, if not permanent, event. The likelihood that a child who did not attend school the year before will have returned the following year is strongly influenced by the child's age, the mother's education, and the province of residence (in that order). Younger children are far more likely to return the following year than older children regardless of what grade they were in when they left school. The *grade* at which the child dropped out has no effect in the likelihood of returning the next year when age is controlled for. The effect of SES on returning after dropping out is small, and gender is important only after the age of 12 at which point girls are less likely to return than boys.

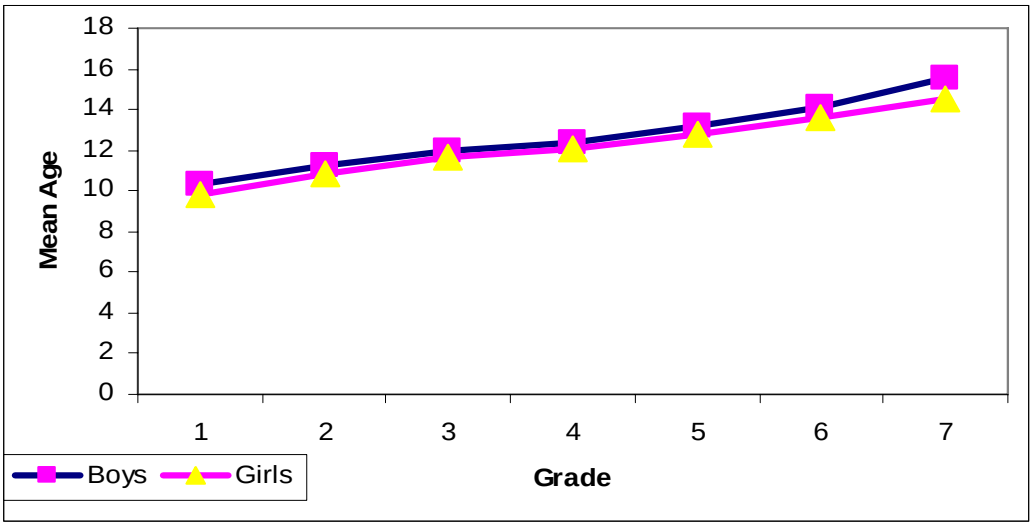
5. Age in Grade and Primary School Completion

As a result of delayed entry, grade repetition and (to a lesser extent) dropping out, the average age of children in grades 1 through 6 is considerably higher than it would otherwise be, and up to the age of 14 the majority of children are still in primary school.

Age	Out of School	In Primary School	Ín Secondary School
6	76.2%	23.8%	.0%
7	42.7%	57.3%	.0%
8	19.8%	80.2%	.0%
9	10.7%	89.3%	.0%
10	7.8%	92.1%	.1%
11	5.1%	94.3%	.6%
12	7.3%	90.3%	2.4%
13	9.9%	79.5%	10.6%
14	16.1%	60.1%	23.8%
15	26.2%	41.1%	32.7%
16	40.4%	23.0%	36.6%
17	53.2%	10.6%	36.2%
18	64.7%	4.0%	31.3%

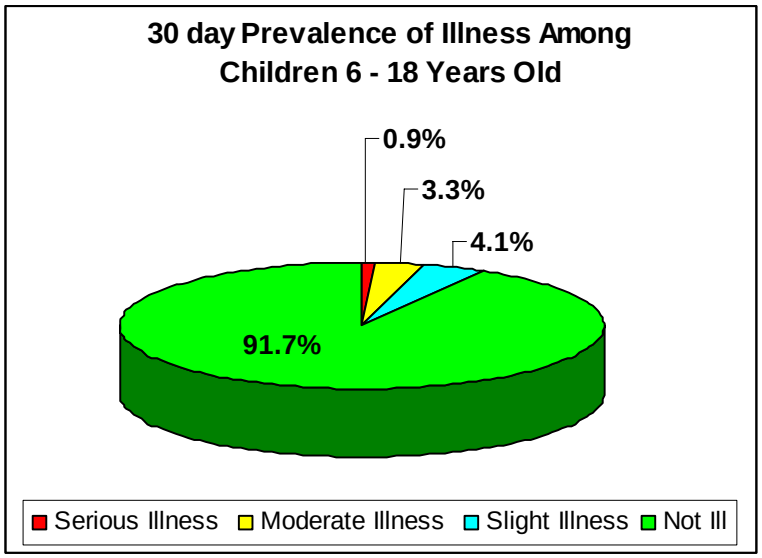
A majority of girls are out of school by age 16, whereas most boys remain in school until age 18. However, for both sexes, the majority of students aged 13-18 years are still in primary school; only 28.3% are in secondary schools.

Girls, with both an earlier age of entry and much lower repetition rate, are younger than boys at the same grade.; by grade 7 the gap has reached a full year.



B. Illness among Children Aged 6 – 18

8.3% of children aged 6 – 18 years were reported to have been ill in the 30 days before the survey, a much lower percentage than is seen with children under 5 or with adults. Half of their illness were described as minor.



92.7% of the ill children received treatment, although only 65.4% of them received treatment from a trained provider. However, this figure rises to 91.6% for the most severe illnesses.

	Treatment from Trained Provider		
Severity	**No**	**Yes**	**Total**
Serious	8.4%	91.6%	100.0%
Moderate	25.8%	74.2%	100.0%
Slight	48.2%	51.8%	100.0%
DK	.0%	100.0%	100.0%
Total	34.6%	65.4%	100.0%
			p=.000

The opposite pattern is seen with respect to self-medication (or medication by the mother, but without benefit of trained advice). It was rare for serious illnesses but predominate for minor ones.

These treatment patterns mirror those of the Cambodian population as a whole.

C. Summary and Policy Implications

Cambodia has made remarkable strides in ensuring access to basic education in the past decade and ,except in the most remote provinces, virtually all Cambodian children, of both sexes, now enroll in primary school at some point, although enrolment is frequently delayed to age 8 or later. The majority also go on to complete primary school – a big change from the past – but there is still quite a long way to go before the goal of universal education to grade 9 is achieved. The mean number of years of schooling completed (judging by youth now aged 19) is 6.25 years.

A leading factor in both repeating a grade and dropping out is problems at home/family responsibilities: a death or sickness in the household, younger siblings with insufficient adults in the household to care for them, and conflict/domestic violence. Other factors are age (as mentioned, children tend to start to leave school around the time of puberty), grade (repetition is highest in first grade) and the mother's own level of education.

Among girls openly, early marriage has a strong negative effect on education; girls almost never continue their schooling after marriage, and although the percentage of girls marrying before age 18 is only 3% nationally, it is significantly higher in certain provinces. Of course, the relationship between education and marriage for teenage girls can be two-way; girls without access to continued education may be more likely to marry and vice versa.

Although many of these factors are beyond the capacity of government and donors to influence, problems that *can* be addressed are the tendency not to enroll children as soon as they reach age 6 and the high rate of repetition in first grade. Both of these factors in turn decrease the number of years of schooling a child will have completed when he or she reaches the age at which family responsibilities may force them to leave school.

Another factor, which relates both to education and gender equity, is the tendency of girls to drop out much earlier than boys. This effect is especially seen in rural areas and may be partly due to concerns for the girl's physical security once she reaches puberty.

Policy Recommendations:

1. A campaign to ensure that children enroll for school at age 6 or, at the latest, 7 should commence via mass media, timed to coincide with the Cambodian New Year (an easy time for reckoning ages by the Khmer calendar) and then again in the month leading up to the new enrolment period, reminding parents to enroll their children and specifying the Khmer year of birth which is now of eligible age.

2. At community level, Health Center staff (who target children up to the age of 5 years for specific health interventions) and district education officials and school committees should form linkages to facilitate referral of children to the school system as they "age out" of being the target group for health interventions.

3. Remedial education classes should be provided to students in grade one who are having difficulty, especially in schools with unusually high repetition rates.

4. Recently begun secondary school scholarship programs for girls should continue and, if possible, expand, in an effort to keep girls in school longer and reduce gender disparity at secondary level. This is particularly important given the close association between maternal education and the education of children.

5. Community mobilization to ensure safe travel by girls to and from school should be undertaken, perhaps by the Government's NGO partners and/or MORD and MOWA filed staff.

D. Regression Tables

Table IV.A.2. Age of Entry

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	231.453	8	.000
	Block	231.453	8	.000
	Model	231.453	8	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	3866.041(a)	.075	.100

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Province	-.018	.008	5.550	1	.018	.982
	urban/rural	.156	.123	1.595	1	.207	1.168
	Death in family	-.679	.440	2.380	1	.123	.507
	SES	.255	.032	64.661	1	.000	1.290
	Number children under 5 in HH	.076	.052	2.107	1	.147	1.079
	Child's Sex	.145	.077	3.546	1	.060	1.156
	Mother's Marital Status	-.032	.063	.257	1	.612	.969
	Mother's Education	.561	.066	72.567	1	.000	1.753
	Constant	-1.707	.331	26.583	1	.000	.181

a Variable(s) entered on step 1: HV024, HV025, HV249, HV270, U5, HV104, MOMMAR, momedlevel.

Correlations

Control Variables			Member attended school during current school year	Attitudes towards Gender Equality
Highest educational level & Region & Wealth index & Type of place of residence	Member attended school during current school year	Correlation	1.000	.125
		Significance (2-tailed)	.	.005
		df	0	511
	Attitudes towards Gender Equality	Correlation	.125	1.000
		Significance (2-tailed)	.005	.
		df	511	0

Table IV.A.3. Grade Repetition

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	414.995	10	.000
	Block	414.995	10	.000
	Model	414.995	10	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	903.811(a)	.203	.395

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Province	-.029	.017	2.913	1	.088	.971
	Urban/rural	.312	.298	1.099	1	.295	1.366
	SES	-.106	.073	2.117	1	.146	.899
	Sickness in HH	-.045	.187	.057	1	.811	.956
	Number children under 5 in HH	.033	.117	.079	1	.778	1.034
	Child's Sex	-.320	.173	3.430	1	.064	.726
	Child's Age	-.020	.037	.288	1	.591	.980
	Child's Grade	-1.420	.119	142.538	1	.000	.242
	Mother's Education	-.302	.143	4.431	1	.035	.739
	Number of Adults HH	-.174	.085	4.183	1	.041	.840
	Constant	2.726	.880	9.591	1	.002	15.278

a Variable(s) entered on step 1: HV024, HV025, HV270, Sick, U5, HV104, HV105, HV123, momedlevel, HV217.

Correlations

Control Variables			Repeated Grade	Spousal Relations
Mother's educational attainment & Wealth index & Region & Sex of household member & Grade of education during current school year & Any Person in HH Sick Past 30 days & Relationship structure & Number of Children Under 5 in HH & Type of place of residence	Repeated Grade	Correlation	1.000	.061
		Significance (2-tailed)	.	.010
		df	0	1815
	Spousal Relations	Correlation	.061	1.000
		Significance (2-tailed)	.010	.
		df	1815	0

Table IV.A.4. 1. Drop Out: All Children

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	315.089	9	.000
	Block	315.089	9	.000
	Model	315.089	9	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1761.330(a)	.016	.159

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Province	-.044	.016	8.083	1	.004	.957
	SES	.006	.059	.011	1	.916	1.006
	Child's Sex	.333	.151	4.821	1	.028	1.395
	Child's Age	.502	.040	157.408	1	.000	1.653
	Number of Children Under 5 in the HH	.235	.106	4.934	1	.026	1.265
	Sickness in the HH	.042	.154	.073	1	.787	1.043
	Number of Adults in the HH	-.131	.109	1.450	1	.229	.877
	Mother's Education	-.159	.134	1.416	1	.234	.853
	Death in the family	2.291	.395	33.646	1	.000	9.882
	Constant	-11.212	.669	281.307	1	.000	.000

a Variable(s) entered on step 1: HV024, HV270, HV104, HV105, U5, Sick, HV217, momedlevel, HV249.

Correlations

Control Variables			Attended School Last year But Not Attending Now	Spousal Relations
Member of the HH died last 12 months & Sex of household member & Age of household members & Region & Relationship structure & Type of place of residence & Number of Children Under 5 in HH	Attended School Last year But Not Attending Now	Correlation	1.000	.056
		Significance (2-tailed)	.	.002
		df	0	3127
	Spousal Relations	Correlation	.056	1.000
		Significance (2-tailed)	.002	.
		df	3127	0

Table IV.A.4. 2. Returning to School after Dropping Out

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	1247.271(a)	.065	.213

.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Province	.042	.016	7.306	1	.007	1.043
	Urban/Rural	.297	.262	1.280	1	.258	1.345
	SES	.047	.066	.496	1	.481	1.048
	Child's Sex	-.081	.158	.261	1	.609	.922
	Child's Age	-.344	.044	61.027	1	.000	.709
	Number Children under 5 in HH	-.145	.114	1.615	1	.204	.865
	Sicknss in HH	-.072	.169	.179	1	.673	.931
	child sick	-.002	.264	.000	1	.995	.998
	Mother's Age	-.125	.066	3.601	1	.058	.882
	Mother's Education	.548	.136	16.233	1	.000	1.730
	Death in Family	-.265	.935	.080	1	.777	.767
	Constant	-1.121	.755	2.206	1	.137	.326

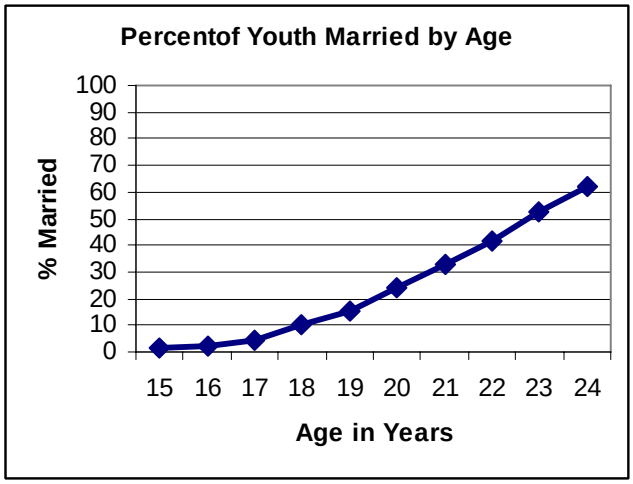
a Variable(s) entered on step 1: HV024, HV025, HV270, HV104, HV105, U5, Sick, childsick, MOMAGE, momedlevel, HV249, HV122.

V. Youth

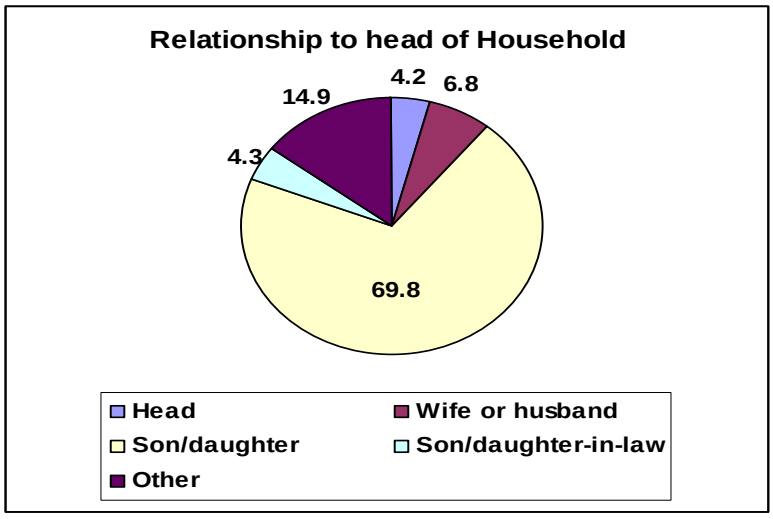
A. General Characteristics

Persons aged 15 – 24 account for almost a fifth of the country's population. This "baby boom" generation will have enormous impact on the country's development in the near future. Their circumstances, attitudes and practices are thus of considerable interest.

The majority (76%) of youth are unmarried, although this naturally varies by age:



Young women marry a few years earlier than boys. However the situation of married women under age 25 is covered in Section II: Women of Reproductive Age. This section will focus primarily on *unmarried* youth. Most live with their parents or (in the case of married youth) parents in law::

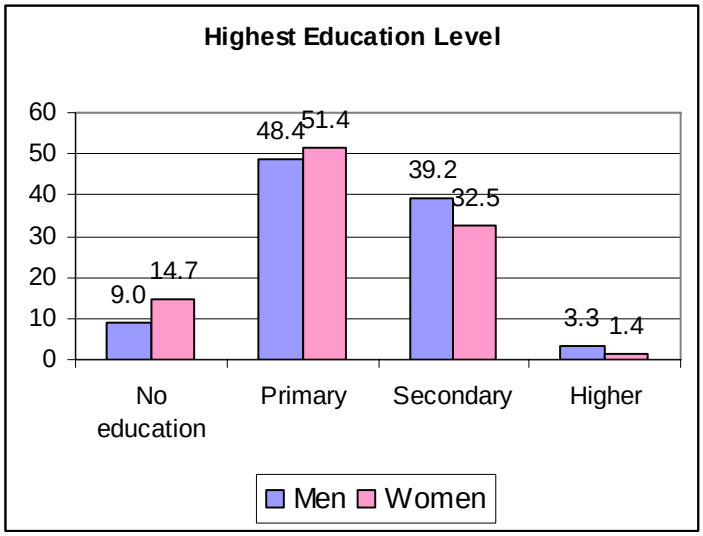


This generation has what is probably the highest percentage of educated persons in the country's history, with almost all having some schooling and a majority having completed primary school. In addition, almost a third (31.9%) are still studying.

Educational attainment: Youth Aged 15 - 24

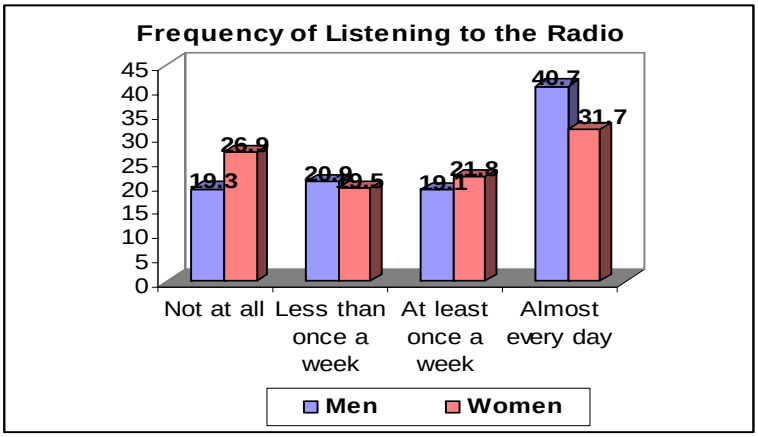
	Frequency	Percent
No education	1344	9.1
Incomplete primary	5537	37.3
Complete primary	1922	13.0
Incomplete secondary	5229	35.2
Complete secondary	445	3.0
Higher	343	2.3
DK	11	.1
Total	14830	100.0

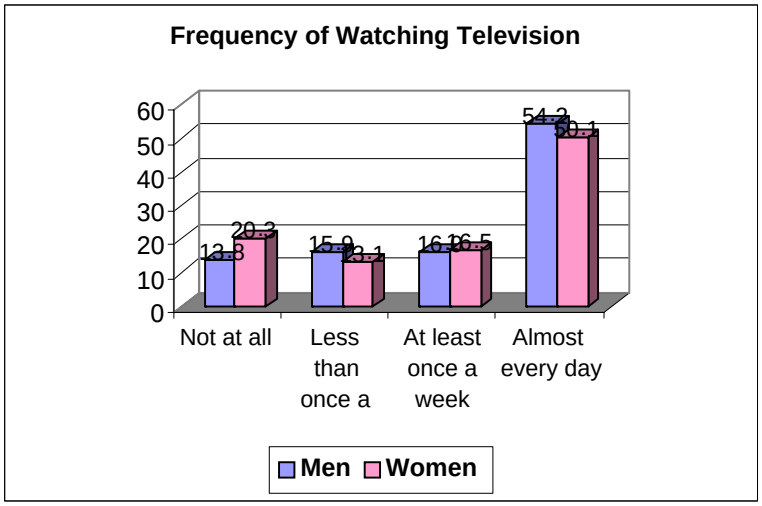
In addition to their much higher level if education as a group, this generation stands out from its predecessors in the extent to which females have been educated. Although a gender gap is still evident it is far smaller than in any of the age cohorts preceding this one, and steadily vanishing with respect at least to primary schooling. For the age group 20 to 24 years the female:male ratio for completion of primary school is .68, whereas for the age group 15 to 19 years it has risen to .92. The gender parity index for net attendance among current primary school aged children stands at 1.02, so this change seems likely to last.



In addition to markedly higher education – and less difference in education levels between the sexes – perhaps the most dramatic difference between youth and their elders is in the area of communication and mass media. 26.7% of all youth – and 65.6% of urban youth – have a mobile telephone (their own or in their family), as compared to 21.2% of the population aged over 25. The vast majority regularly listen to radio and watch television; half watch television on a daily or almost daily basis. Young men listen to radio slightly more than young women. Given

what has been shown in prior sections regarding the impact of media on both knowledge and behavior, this is extremely good news and bodes well for continued gains in positive health and social behaviors provided investments in mass media for this purpose continue.





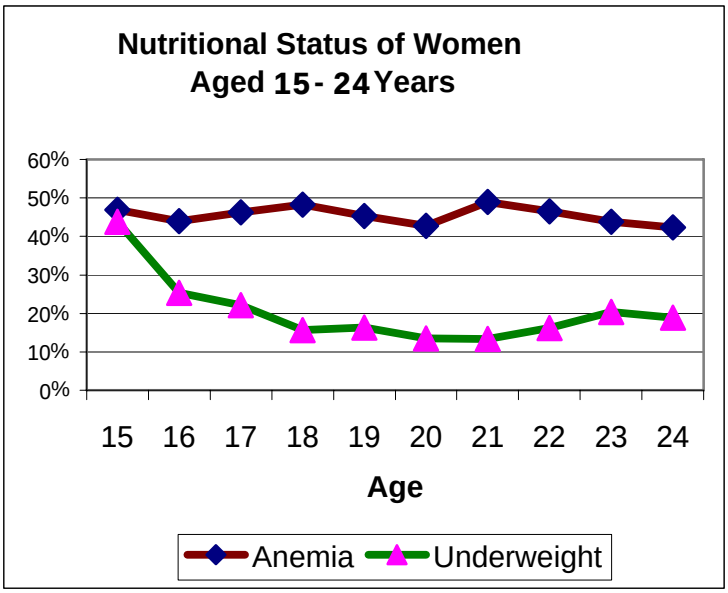
As described in Section II.A., women aged 15-24 have higher knowledge of their legal rights and more progressive attitudes towards gender equality than do woman aged 25 and over. However, within their families, those who are not yet married (the majority in this age group) have extremely limited autonomy. The only matter in which a majority have any say is with regard to their own health care, and even that is decided for them in 23.7% of cases. Only about half have a say in going out to visit friends or family and few influence large or small expenditures, although 59.2% are employed in some capacity, usually agricultural.

B. General Health

There is little illness in this age group; only 9.3% reported having been ill in past 30 days. The greatest health concern relates to the nutritional status of young women, which is very poor and sets the stage for serious health problems for themselves and their offspring once they marry

and start having children.[17] Underweight is very high among 15 year olds, probably as a result of food intake insufficient for the rapid growth which occurs at that age. It improves somewhat as the girl stops growing, but remains around 20% for most of this period. Anemia starts out as a problem and never resolves. This is of particular concern given its contribution to excess maternal mortality.

Although iron supplementation is provided as a part of antenatal care, there are as yet no programs to provide it to young women in their pre-child bearing period.



C. Reproductive Health

Reproductive health – especially prevention of HIV/AIDs and other sexually transmitted diseases – is an area of special interest with respect to youth for several reasons: life-long attitudes and behavior patterns are established during this time, and many new HIV infections are acquired at this age. The CDHS endeavored to obtain detailed information on sexual behavior, use of condoms, and knowledge regarding HIV. Unfortunately, a review of the data presented in the relevant chapter of the CDHS report by anyone familiar with the country quickly shows that there was so much reporting bias in the responses as to make the data largely useless.

It is simply not credible, for example, that over a third of urban males aged 15 – 24 do not know a single source for obtaining a condom. Likewise, the reported sexual behavior of unmarried youth says more about cultural norms than it does about actual behavior: premarital sex is frowned upon for both sexes but much, much more taboo and stigmatizing for girls.

11.5% of unmarried young men admitted to having ever had sexual intercourse compared to only 1.2% of unmarried women. While commercial sex can account for some of this gap it

[17] Some young women in this age group have already started families; their health is covered in Section II: Women of Reprodicutive Age. This section focuses primarily focuses on unmarried youth.

certainly cannot explain all of it. As the table below shows, over a third of unmarried young men who acknowledge being sexually active state that their most recent partner was a *girl-friend.*

Together with the qualitative observations of organizations active in adolescent reproductive health – who report increasingly common pre-marital sex among unmarried girls – and it becomes evident that the near universal denial of sexual activity by unmarried women says more about the degree of stigma attached to loss of virginity than it says about actual behavior.

Relationship with Last Sexual Partner Unmarried Men 15 – 24 Years Old[18]		
	Frequency	Percent
Live-in partner	1	.6
Girlfriend not living with respondent	68	**34.3**
Casual acquaintance	21	10.7
Commercial sex worker	106	**54.0**
other	1	.4
Total	197	100.0

With respect to that stigma, it is interesting to look at the extent to which standards of sexual conduct differ for men and women. Only a slight majority (55.3%) of men believe a man should wait until he is married to have sex. Significantly more (67.3%) believed that a woman should wait. Although fewer young men than older ones hold a double standard regarding premarital sex, the difference is not very large:

	Double Standard Premarital Sex		
Age	**No**	**Yes**	**Total**
25 – 49 years old	83.4%	16.6%	100.0%
15 – 24 years old	85.4%	14.6%	100.0%
Total	84.2%	15.8%	100.0%
			p=.02

With respect to extramarital sex, a majority of men (78.3%) believe that it is wrong for men and 96.0% believe it was wrong for women, a larger double standard than prevails regarding premarital sex. Again there is a slight difference between younger and older men, but less significant.

Age	**Double Standard Extramarital**		**Total**
	No	**Yes**	**.00**

[18] Responses limited to men who report having had sex in past 12 months

25 – 49 years old	80.7%	19.3%	100.0%
15 – 24 years old	82.5%	17.5%	100.0%
Total	81.4%	18.6%	100.0%
			p = .06

All in all, close to a third of men hold a double standard regarding male and female sexual behavior, and young men are only slightly different from older ones in this regard:

Age	**Any Double Standard**		
	No	**Yes**	**Total**
25 – 49 years old	68.2%	31.8%	100.0%
15 – 24 years old	71.0%	29.0%	100.0%
Total	69.4%	30.6%	100.0%
			p=.014

These questions were, unfortunately, not asked of women so no comparison can be made.

Although it is common for increased premarital sex among youth to be attributed to a decline in morals, there is a more practical explanation: as countries develop and nutritional status improves, the age of puberty falls while the age of marriage tends to rise. The result is a shift from a situation in which young people had a gap of only a few years between sexual maturity and marriage to one in which there is a ten year gap or more. While the age of marriage has no changed much yet in Cambodia, nutritional status has and anecdotal evidence suggests that there has been a dramatic change in the age of puberty.

Given the considerable bias in self-reporting of sexual behavior by youth, it is probably more useful to look at their reports of what they believe "most people" do. Here again, the data comes only from the male interviews:

Percent Male Youth Who Believe
"Most young men wait for sex until marriage"

	Frequency	**Percent**
No	1111	38.5
Yes	960	33.3
DK, not sure, depends	813	28.2
Total	2884	100.0

Percent Male Youth Who Believe
"Most young women wait for sex until marriage"

	Frequency	Percent
No	462	16.0
Yes	1600	55.5
DK, not sure, depends	822	28.5
Total	2884	100.0

These replies are interesting in that they conform to the reported types of last sex partners unmarried young men have had (although not to the percentage of young men admitting to premarital sex). That is to say, more unmarried men than unmarried women are sexually active, and the gap is taken filled by commercial sex workers, but "sweet-heart" sex between unmarried youth is far from rare.

Although most young men reported having used condoms with their girlfriend the percentage was noticeably lower than for sex with commercial sex workers:

Reported Condom Use By Unmarried Male Youth

Relationship with last sex partner	Last intercourse used condom		
	No	Yes	Total
cohabiting partner	100.0%	.0%	100.0%
Girlfriend/fiancee	26.5%	73.5%	100.0%
Casual acquaintance	13.6%	86.4%	100.0%
Commercial sex worker	.9%	99.1%	100.0%
Total	12.1%	87.9%	100.0%
			p=.000

The reasons given by young men for condom use are almost always confined to disease prevention; rarely is FP or dual protection (prevent both pregnancy and HIV) mentioned.

D. Summary and Policy Implications

(still to write – will include recs for social marketing of iron, school-based and factory-based screening for and treatment of anemia, formative research and youth-targeted BCC on condom use)

VI. The Elderly

A. Description

Persons aged 65 and over currently account for only 3.6% of Cambodia's population, but this situation is apt to change rapidly; there are nearly twice as many people in the 10 year age group immediately preceding them.

Although the CDHS identified persons as old as 97 years+, the mean age of the elderly in Cambodia is 72.3 years, and the median is only 70. More than two thirds are under the age of 75, and ninety percent of the elderly are aged under 80 years. Taken altogether these figures indicate an unusually high degree of mortality among the "young elderly", i.e. persons 65-75 years old.

The elderly are disproportionately female, with a female to male ratio of 1.5 to 1.

Persons Age 65 and Over	Frequency	Percent
Male	1298	39.6
Female	1981	60.4
Total	3280	100.0

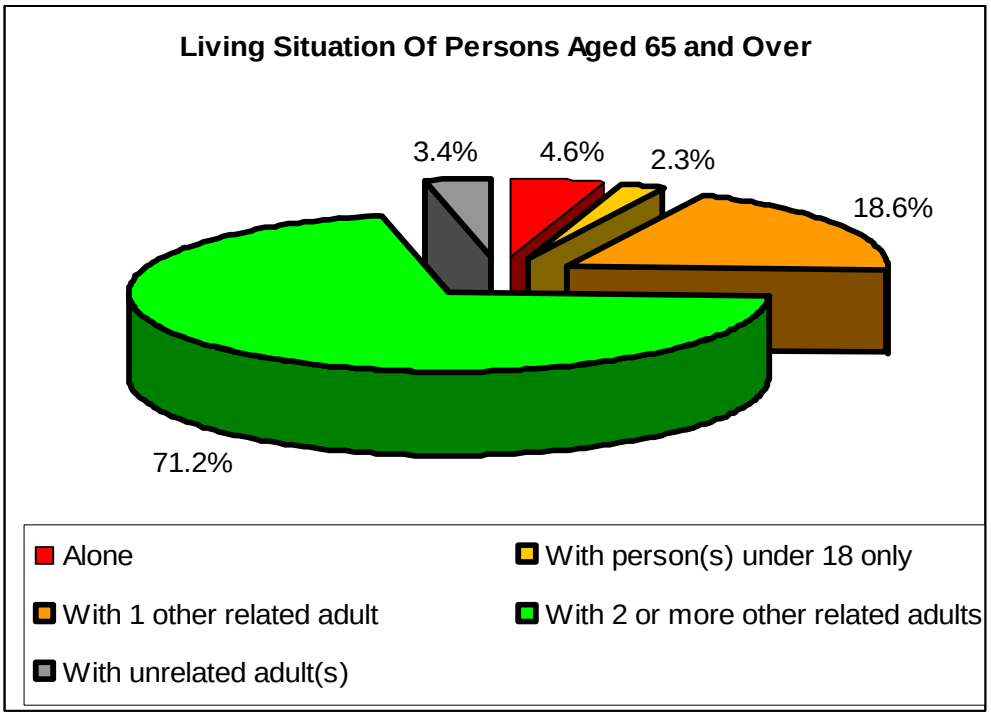
The SES of elderly persons in Cambodia is slightly better than that for persons under the age of 65; only 16.8% of the elderly are in the lowest socio-economic quartile. While this could reflect higher adult mortality rates in very poor households, it may also reflect a tendency for the most economically able relatives to take care of their aged relatives.

SES	Under 65	Aged 65 and over	Total
Poorest	20.1%	16.8%	19.9%
Poorer	19.9%	20.4%	20.0%
Middle	19.9%	21.7%	19.9%
Richer	19.9%	22.2%	20.0%
Richest	20.2%	18.8%	20.1%
Total	100.0%	100.0%	100.0%
			p=.000

The elderly are more likely than persons under age 65 to reside in a rural area, although the difference is small:

Place of residence	Under 65	Aged 65 and over	Total
Urban	15.4%	13.9%	15.4%
Rural	84.6%	86.1%	84.6%
Total	100.0%	100.0%	100.0%
			p = .02

The majority of the elderly live in family situations with more than one other related adult in the household. 4.6% live entirely alone while another 2.3% live only with a person(s) under the age of 18 years. Another 18.6% live with just one other adult, often an also elderly spouse.

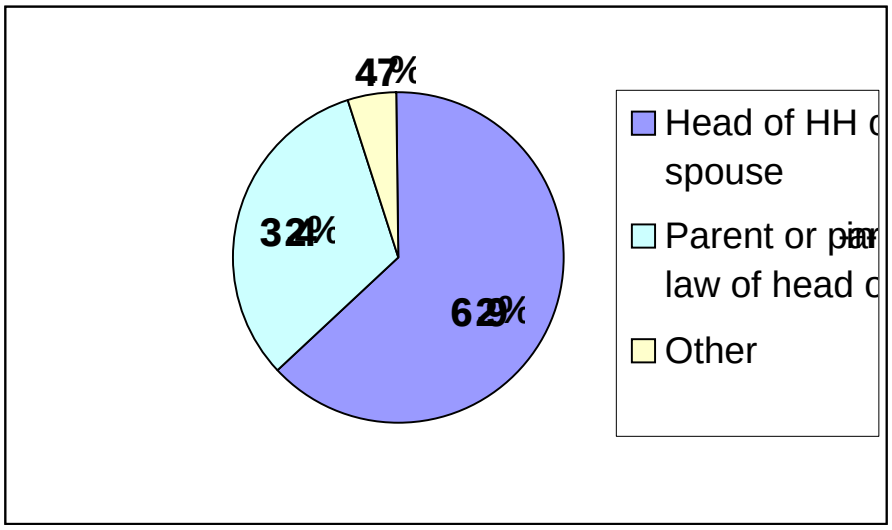


The percentage of elderly persons living alone or with only a child is higher than that for persons under age 65, and significantly fewer reside with an adult of the opposite sex, no doubt reflected the effect of widowhood.

It should be noted that, as a household survey, the CDHS does not include persons living outside of normal household structures. Since it is common in Cambodia for elderly persons – especially those with no children to care for them – to take up residence in pagodas, the true percentage of elderly not living with families may be higher than the above data suggests.

Relationship structure of HH	Under 65	Aged 65 and over	Total
One adult	2.8%	6.9%	3.0%
Two adults, opp. sex	29.4%	13.4%	28.6%
Two adults, same sex	1.9%	5.2%	2.0%
Three+ related adult	62.0%	71.1%	62.5%
Unrelated adults	3.9%	3.4%	3.9%
Total	100.0%	100.0%	100.0%
			p=.000

49.3% of the elderly were described as being the Head of Household and 13.6% as the spouse of same, meaning that in total almost two-thirds are seen as holding a leadership position relative to any younger adults in the household in their families. 32.4% are the parent or parent-in-law of the Head of Household, while only 4.7% have some other relationship to the Household Head. Another way of looking at this information would be that approximately one-third of the elderly are viewed as being in a dependent or subordinate position within their families.



Corresponding to their slightly more advantaged SES – and despite a slightly higher rural residence – the elderly are more likely than younger persons to live in a household with access to safe drinking water and some type of latrine/toilet. Again, this may well reflect a tendency for the elderly to move in with the relations best situated to care for them.

Although somewhat better off than younger persons, the majority of elderly still lack access to both a safe source of drinking water and basic sanitation.

(replace with graphs if time)

HH Has Toilet or Latrine	Under 65	Aged 65 and over	Total
No	71.5%	68.2%	71.4%
Yes	28.5%	31.8%	28.6%
Total	100.0%	100.0%	100.0%
			p=.000

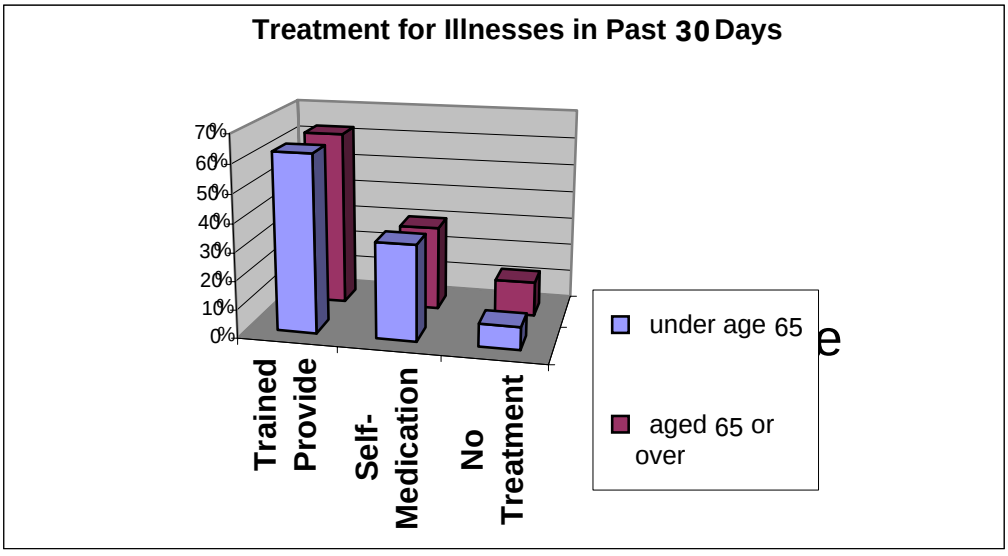
Safe Source of Drinking Water Year Round	Under 65	Aged 65 and over	Total
No	60.0%	58.1%	59.9%
Yes	40.0%	41.9%	40.1%
Total	100.0%	100.0%	100.0%

If reported Point of Use (POU) disinfection practices are taken at face value, a total of 83.2% have safe drinking water. Since most reported POU consisted of boiling, a time consuming and expensive practice, it is highly unlikely that it is practiced consistently or as widely as reported. The true figure for safe drinking water probably falls somewhere between 41.9% and 83.2%, but closer to the former.

The prevalence of illness among the elderly, as reported for the 30 day period prior to the survey, is higher than the for population as a whole in all categories, but especially so with respect to illness described as moderate or severe in extent. In interpreting this data, it must be remembered that information on illnesses among family members was usually obtained from the head of the household or their wife, and not from the elderly person themselves. Elderly people may fail to mention minor illnesses, and/or their younger relatives may regard these as "normal" for an older person, leading to under-reporting of "slight" illnesses.

Illness in Past 30 Days		
	Elderly	**All Ages**
Not ill	70.2%	85.5%
Serious	4.8%	1.7%
Moderate	14.8%	6.2%
Slight	10.1%	6.6%
Any Illness	29.7%	14.5%
% illnesses "moderate/severe"	65.9%	55.6%
		p=.000

Although more likely to be sick, and also more likely to have an illnesses of significant severity, the elderly were significantly less likely to receive any sort of treatment. Among those elderly who did receive treatment, 71.2% at some point were seen by a trained provider, a slightly higher percentage than for the non-elderly. *However, taking those who received no treatment at all into account, only 62.5% of ill elderly were treated by a trained provider.* The elderly were slightly less likely to self-medicate than the non-elderly, but this was still far from uncommon.



B. Summary and Policy Implications

Although currently a very small segment of the population, the percentage of persons aged 65 and over will rapidly increase in Cambodia. The overall living situation of elderly persons at present is good by Cambodian standards; most are in family situations with 2 or more other related adults in the household and their overall socio-economic status is slightly above average. This last may be the result of selective care-taking, i.e. the children most able to provide well for their parents may tend to be the ones they live with.

Although most elderly are in such family situations, slightly more than 6% are in very vulnerable circumstances, living either alone or with only a child. The true percentage may be higher since the CDHS was a household survey and therefore did not include elderly persons living in pagodas, a common location for elderly who are alone.

The biggest area of concern regarding the elderly is health care. The burden of illness in this age group is quite high and their illnesses tend to be more serious than those of younger people, yet they have the highest rate of non-treatment of any segment of Cambodian society. There are also some indications that mortality rates for the “young elderly” (i.e. persons 65-70 years old, and perhaps also the age groups immediately preceding them) may be unusually high, even by developing world standards, although this is best assessed after the forthcoming census.

Cambodia has made great strides in the past decade in developing a primary health care system, but it has understandably given first priority to ensuring treatment for the infectious diseases which commonly affect young children. Appropriate care for the chronic diseases which tend to prevail in older people is still scarce, especially in rural areas.

Policy Recommendations:

1. The 2008 census should attempt to enumerate, if possible, the number and age/sex of persons living in pagodas so that amore accurate picture of the circumstances of the elderly (as well as of orphans) can be obtained.

2. As part of the analysis pf the 2008 census, estimates should be made of adult mortality for the age groups 50 and above to determine if, in fact, there is unusually high mortality.

3. In the next 5 year Health Strategic Plan attention should be given to the management of chronic diseases, particularly providing access to appropriate curative care in rural areas. This may require an expansion of services now provided at primary level and additional training of health care providers.