KINGDOM OF CAMBODIA

Nation Religion King

CAMBODIA INTER-CENSAL POPULATION SURVEY 2013

Analysis of CIPS Results
Report 1

Estimates of Fertility and Mortality

National Institute of Statistics, Ministry of Planning
Phnom Penh, Cambodia
Sponsored by

United Nations Population Fund
Japan International Cooperation Agency

December 2013

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FOREWORD

By HE. Senior Minister, Minister of Planning, Cambodia

I have great pleasure in presenting this report on Fertility and Mortality in Cambodia, containing an in-depth analysis of the results of the Cambodia Inter-censal population Survey (CIPS), conducted by the National Institute of Statistics (NIS) in March 2013 under technical and financial support by UNFPA, JICA and Government of Japan. From the point of view of a nationally representative sample survey of 955 Primary Sampling Units and 28,650 households, this survey could be considered as a major statistical exercise in the country in recent time. This database created by the present survey could be useful on an interim basis until the next population census is conducted.

This survey is follow-up of the successful Population Census conducted in 2008 after Population Census 1998. The census results have been widely disseminated within the line Ministries and among large body of data users and public. The National Population Policy for Cambodia formulated in August 2003 was one of the significant outcomes of the census results.

The successful conduct of the next census is crucial to obtain a correct population count and to update the much needed demographic data in the country. Such information is required for planning not only at national and provincial level but also at district, commune and event at village levels.

The present survey is in the nature of preparation for the gigantic task of the census. More than a thousand staff of the NIS and Provincial Planning Office was trained in this survey. Their services will be available for the next census to train a large number of enumerators and supervisors who will be recruited. The CIPS 2013 may therefore be called the harbinger of the next Population in Cambodia due in the year 2018.

On behalf of the Ministry of Planning, I wish to place on record our gratitude to the United Nations Population Fund (UNFPA) for supporting the whole process of CIPS, 2013 including resources and technical assistance program with emphasis on capacity development. Thanks are due to Japan International Cooperation Agency (JICA) for providing technical assistance for mapping villages and Enumeration Area (EAs), and for participating in analysis and dissemination of the results.

I appreciate the hard work put in by the staff of the NIS under the guidance and supervision of H.E. Mrs. Hang Lina, Director General, NIS and the Provincial Planning Offices in making the survey a success as well as in the preparation of this report. I wish to take this opportunity to thanks all staff in the National Institute of Statistics as well as all survey field staff who have taken part and contributed to success of the Cambodia Inter-censal Population Survey, 2013. We are also thankful to technical advisers for the survey: Mr. Nott Rama Rao, Dr. Hans Petterson, Dr. Gouranga Das Varma, Mr. Yi Soktha, Mr. Gregory Martin, Mr. Fumihiko Nishi, Mr. Akihiko Ito, and Mr. Akihito Yamauchi.

I am sure this repo rt would be welcomed by   the line -ministries, international agencies, no n-government organization, polic y mak ers, program implementers, d evelopment planners, and researchers a publication with a plethora of useful information. W e hope to received feedbac k and comments to improve our subsequent publication.

CHHAY THAN

Ministry of Planning   Senior   Minister,
Phnom Penh   Minister of Planning
December 2013

PREFACE

The Cambodia Inter-censal Population Survey, 2013 was conducted not only to obtain the much-needed demographic data following the census, but also to serve as a means to train the staff of the NIS and Provincial Planning Offices in demographic data collection. We are happy to record that the survey achieved both objectives.

This report contains and in-depth analysis on Fertility and Mortality in Cambodia based on the results of CIPS, 2013. A general report at national level and separate report for each province will be prepared later. There was planned to produce more in-depth studies based on the results of the survey, on other topics of interest.

Our special thanks are due to H.E. Chhay Than, Honorable Senior Minister, Minister of Planning, Cambodia whose keen interest in the census and in the survey was always a source of inspiration and encouragement both to the national and international staff of the project.

We sincerely thank to the United Nations Population Fund (UNFPA) for supporting the whole process of CIPS, 2013 including resources and technical assistance program with emphasis on capacity development. Thanks are due to Japan International Cooperation Agency (JICA) for providing technical assistance for mapping villages and Enumeration Area (EAs), and for participating in analysis and dissemination of the results.

The success of the survey was mainly due to the enthusiastic participation of a large number of staff in fieldwork, data processing and other survey activities. To every one of them our thanks are due. The UNFPA and JICA national project staff closely assisted the NIS and the provincial staff. The names of personnel associated with this report are mentioned separately. We are thankful all of them.

Phnom Penh, Cambodia
December, 2013   Director

Hang Lina
General
National Institute of Statistics

Cambodia Inter-censal Population Survey, 2013
Personnel Associated with this report

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List of Abbreviations and Acronyms

ASFR	Age-Specific Fertility Rates
CDHS	Cambodia Demographic and Health Survey
CEB	Children Ever Born
CIPS	Cambodia Inter-censal Population Survey
CMDGs	Cambodia Millennium Development Goals
CS	Children Surviving
CWR	Child Woman Ratio
EA	Enumeration Area
GRR	Gross Reproduction Rate
IMR	Infant Mortality Rate
JICA	Japanese International Cooperation Agency
MOP	Ministry of Planning
NGO	Non-governmental organization
NIS	National Institute of Statistics
NSDP	National Strategic Development Plan
RGC	Royal Government of Cambodia
TFR	Total Fertility Rate
U5MR	Under-Five Mortality Rate
UN	United Nations
UNFPA	United Nations Population Fund
WHO	World Health Organization

Map 1. CAMBODIA - PROVINCES

Cambodia Inter-Censal Population Survey 2013

Final Result

Figures at a Glance

Basic Characteristics of administrative			
Number of municipality	1		
Number of provinces	23		
Number of cities/Krongs	26		
Number of khans	9		
Number of districts	159		
Number of sangkats	204		
Number of communes	1,429		
Number of villages	14,119		
Characteristics	**Total**	**Males**	**Females**
Total population	14,676,591	7,121,508	7,555,083
Urban population	3,146,212	1,527,479	1,618,734
Percentage of urban population	21.4	21.5	21.4
Annual growth Rate	1.46 %		
Population density	82/sq.km		
Percentage of population under 15	29.4	31.2	27.8
Percentage of population 15-64	65.6	64.7	66.4
Percentage of population 65 +	5.0	4.1	5.8
Age dependency ratio			
Total	52.4	54.5	50.5
Urban	41.8	43.0	40.6
Rural	55.6	57.9	53.5
Sex ratio			
Total	94.3		
Urban	94.4		
Rural	94.2		
Median age			
Total	24.5	23.4	25.6
Urban	26.9	25.8	27.8
Rural	23.9	22.8	25.1
Number of Households	3,163,226		
Percent of female headed households	27.1		
Average household size			
Total	4.6		
Urban	4.8		
Rural	4.6		
Percentage of population aged 15 and over by marital status			
Never married	31.1	35.3	27.4
Married	61.9	62.5	61.3
Widowed	5.0	1.3	8.4
Divorced	1.8	0.8	2.7

Separated	0.2	0.1	0.3
Singulate Mean age at Marriage			
Total	25.0	26.2	23.7
Urban	27.5	29.1	25.8
Rural	24.2	25.4	23.0
Adult literacy rate (population aged 15 and more)			
Total	79.7	86.4	73.6
Urban	90.3	94.2	86.8
Rural	76.5	84.1	69.7
Educational attainment of Literate population aged 7+			
No educational level	3.1	2.8	3.4
Primary not completed	40.8	37.5	44.3
Primary completed	29.4	29.4	29.3
Lower secondary	21	23.4	18.5
Secondary/diploma	3.9	4.5	3.2
Beyond Secondary	1.8	2.4	1.3
Proportion currently attending school/educational institution			
Aged 5-11	74.2	73.2	75.2
Aged 12-14	88.2	88.2	88.2
Aged 15-17	61.4	64.1	58.7
Aged 18-24	21.5	25.4	17.6
Aged 25 +	0.7	1.0	0.4
Percentage of disabled population	2.1	2.2	1.9
Percentage of disabled population by type of disability			
Difficulty in seeing	34.8	31.4	38.6
Difficulty in speech	5.4	4.4	6.5
Difficulty in hearing	9.0	7.4	10.8
Difficulty in movement	33.4	41.4	24.7
Mental	12.2	9.8	14.7
Mental retardation	5.2	3.6	6.8
Mental illness	7.0	6.2	7.9
Any other	3.5	3.9	3.1
Multiple disabilities	1.6	1.7	1.6
Employment and Unemployment			
Labour force participation rate	62.3	63.8	60.9
Employment rate	60.8	62.4	59.3
Unemployment rate	1.5	1.4	1.7
Economically inactive rate	37.7	36.2	39.1
Labour force participation rate aged 15-64			
Total	82.2	84.5	80.0
Urban	73.2	79.5	67.4
Rural	84.8	86.0	83.7
Unemployment rate aged 15-64			
Total	2.3	2.1	2.5

Urban	4.4	3.5	5.4
Rural	1.8	1.7	1.9
Employment rate by industrial sector			
Primary	64.3	62.3	66.3
Secondary	11.5	11.6	11.5
Tertiary	23.8	25.6	21.9
Employed population aged 5 + with secondary activity	42.3	44.3	40.4
Percentage of migrant by place of last residence			
Total	28.9	30.0	27.9
Urban	49.4	48.6	50.1
Rural	23.3	24.9	21.8
Percentage of internal migrants by migration stream			
Rural to Rural	58.4	60.3	56.5
Rural to Urban	24.5	23.5	25.5
Urban to Rural	5.1	5.1	5.1
Urban to Urban	12.0	11.1	12.9
Percentage of buildings by nature of construction	**Permanent**	**Semi-Permanen**	**Tem-porary**
Total	73.6	19.7	6.7
Urban	93.0	5.3	1.7
Rural	68.9	23.2	7.9
Percentages of households by source of drinking water			
Piped water	19.8		
Tube/wipe well	29.5		
Protected dug well	6.2		
Unprotected dug well	14.3		
Rain	1.4		
Spring, river, etc	18.7		
Bought	8.6		
Other	1.4		
Percentage of households using electricity as main source of light			
Total	48.0		
Urban	94.0		
Rural	36.0		
Percentage of households by main type of fuel used for cooking			
Firewood	77.9		
Charcoal	8.4		
Kerosene	0.1		
Liquefied Petroleum gas (LPG)	12.1		
Others	1.4		
Percentage of households having toilet facility within premises			
Total	48.7		
Urban	87.5		

Rural	38.5		
Percentage accessibility to internet facility			
No Access	94.5		
Accessed at home	2.6		
Accessed outside home	1.3		
Accessed at home and outside home	1.6		
Total fertility rate per 1,000 live birth			
Total	2.8		
Urban	2.1		
Rural	3.1		
Infant mortality rate per 1,000 live birth			
Total	33		
Urban	9		
Rural	38		
Under five mortality rate per 1,000 live birth			
Total	53		
Urban	15		
Rural	60		
Life expectancy at birth			
Total	68.9		
Urban	76.8		
Rural	67.6		

Chapter 1

Introduction

1.1. Preliminary

This report contains an analysis of fertili ty, early age mortality, types of assistance rece ived a t birth, type of assista nce received during maternal death and the leading causes of death for males and fe males b y age based on the results of the Ca mbodia Inter-censal Popul ation Surve y 2013 (CIPS 2013).

1.2 Background

Demographic and h ealth surve ys are b eing conduc ted with regular frequ ency in Cambodia e ver since the first m odern populati on cens us of the country was com pleted in 1998.The various demographic enqu iries consist of the Ca mbodia De mographic and He alth Surve y (CDHS) 2000, Cambodia Inter-c ensal Population Surv ey (CIPS) 2004, C DHS 2005, Population Census 2008, CDHS 2010 and CIPS 2013. Plans for conducting the next CDHS in 2014-15 have already started.

Although the basi c aim of these enquiries is to collect demographic and r elated data, and produce estimates based on them, they differ in terms of coverage, length of data collection and the amount of training given to enumerators depending on the focus of the survey. For examp le, the censuses and Inter-censal surve ys are designed to capt ure a snap -shot of the population and related characteristics and do not produce much in-depth information, the demographic and health surveys collect more detailed information on the fertility, health and mortality conditions of the population. As s uch, e stimates o f e ven t he b asic d emographic measures on fertil ity and mortality should be taken with the above- mentioned facts in view , particularly when com paring across var ious enquiries.

1.3. Source and quality of data

The main source of data for this anal ytical re port is the 2013 Cam bodia Inter-censal Populati on Survey (CIPS 2013) . . Wher e appropr iate other sour ces such as the 2008 Popul ation census, the Cambodian De mographic and Health Surve ys of 2000 , 2005 and 2010 and the 2 004 Inter-censal Population Survey have also been used.

No post enumeration survey (PES) was c onducted after the CIPS 2013. Therefore, there is no wa y of knowing the extent of enumeration in the surv ey. The qua lity of overall age-sex reporting has been found to be good as indicated by the calculated values of Whipple's index (107 for males and 112 for fem ales on a scale of 100 to 500), indicating alm ost no pre ference or digits 0 and 5) , Myer's index (9.6 for males and 12.1 for females on a scale of 0 to 180,, indicating almost no digit preference) and the UN-age-sex accuracy index (31.6, indicating reasonable a ccuracy).Thus it can be assumed tha t the qualit y of d ata on age and se x collected at CIPS 2013 is g ood in genera l. However, the very low scores on the various age-sex evaluations could be the results of smoothing of the age data prior to the ir being released in the Priorit y Tables. Moreover, large scale under- reporting of births and deaths when dire ct quest ions were as ked about the occur rence of these events in the househ olds in the past 12 months, cannot be ruled out . Further, detailed exam ination of data, particularl y those at th e provincial leve l, reveal possible large sc ale mis-reporting the sex of the child at b irth, producing, at times unusuall y high sex -ratios at b irth. These apparent errors have been discussed at appropriate places later in this chapter.

Chapter 2
Fertility Estimation

2.1. Introduction

Registration of births and deaths in Cambodia is generally considered to be incomplete. Therefore, censuses and surveys have become the main sources of demographic estimates in Cambodia as in other countries with deficient vital registration systems. Because the questions about fertility and mortality, especially infant and child mortality are very sensitive questions to be asked of the respondents in any survey, it requires tact and a great deal of experience to obtain correct answers from the respondents. Further, a an Inter-censal survey is a large operation in which it is not possible to give the enumerators much detailed training and devote a sufficiently long period of time to data collection activities. Therefore, information on fertility and child mortality collected in the survey is liable to be incomplete.

Therefore, a number of demographic techniques have to be applied in estimating fertility and mortality from the 2013 Cambodia Inter-censal Population Survey (CIPS 2013) data. Some of the data collected require the so called indirect techniques to estimate measures of fertility and mortality while some other data can provide directly calculated measures of fertility and mortality, although the data for direct measurements are generally regarded as incomplete. The indirect techniques of estimating fertility and mortality were first developed by the late William Brass during the 1970s while studying the demography of sub-Saharan Africa (United Nations 1983). The method of estimating fertility basically utilizes information collected at a census or survey on the number of children ever born to women classified by age of women and reported number of child births during a fixed period prior to the census or survey, also classified by age of women. The information on children ever born, together with information on children surviving (or children dead) classified by age of women is used for estimating early age mortality (under the age of five years).

In countries with deficient vital registration systems, the collection of such information has become a regular feature of censuses and surveys. There are a few other indirect methods of estimating fertility. One such method, developed by Rele (1967) converts information on child-woman ratio obtained from tabulations of population age-distribution, to total fertility rates.

2.1. Age-patterns of the average number of children ever born and surviving.

The average number of children ever born (CEB) by age-group of women show the expected increasing pattern with women's age. The sex-ratios of CEB by age-group of women in the reproductive ages 15-49 (Table 1) reveal that, except for the youngest age-groups 15-19 and 20-24, the sex-ratios are in the acceptable range of 105 to 107 male children for every 100 female children. The sex-ratio of CEB for the age-group 15-19 is unusually low at 83 male for 100 female children, while the sex-ratio for the age-group 20-24 is also low at 99 male children for 100 female children. Sex-ratios at birth in the age-group 15-49 should be well over 100 (Mathews and Brady 2005). If the sex-ratios of CEB in the age-groups 15-19 and 20-24 are assumed to be equal to 105, then the male children ever born may be considered to have been under-reported by mothers of these two age-groups by 26% and 6.4% respectively[1]. Taken together, the adjustments in these two age-groups would amount to an overall under-reporting of children ever born (and children surviving) by about 9 percent[2].

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[1]The male CEB for the age-group would be equal to 1.05 times 18,326 (equal to 18,747) and the male CEB in the age-group 20-24 would be equal to 1.05 times 198,121 (i.e., 204,328).

[2]This can be worked out by taking the difference between the "adjusted" CEB in the age-groups 15-19 and 20-24 (i.e., 18,747+204,328) and the enumerated CEB in these two age-groups (15,242+195,535).

Table 1.Number of children ever born by age-group of women, Cambodia 2013. Total

Age-group	Number of women	Number of children ever born (CEB)			Sex ratio of CEB (Males per 100 Females)	Average number of CEB per woman
		Both sexes	Males	Females		
15-19	769,818	33,567	15,242	18,326	83.2	0.044
20-24	802,710	393,656	195,535	198,121	98.7	0.490
25-29	676,517	870,424	450,244	420,180	107.2	1.287
30-34	629,941	1,283,541	662,869	620,672	106.8	2.038
35-39	373,794	1,030,264	529,753	500,511	105.8	2.756
40-44	455,941	1,527,464	788,347	739,116	106.7	3.350
45-49	406,380	1,527,195	790,079	737,116	107.2	3.758
TOTAL	4,115,101	12,888,096	6,607,124	6,280,972	105.2	3.132

Source: Population Census of Cambodia, 2013. Priority Table F3. Females aged 15 and over by Parity, Total Children Ever Born, 5-year Age Group and Educational level.

The average number of children ever born (CEB) by age-group of women shows the expected increasing pattern with age of women at both the 2008 Census and 2013 CIPS. A comparison of the CEB between 2008 and 2013 confirms a general decline in fertility in the last five years since the 2008 Census (Figure 1).
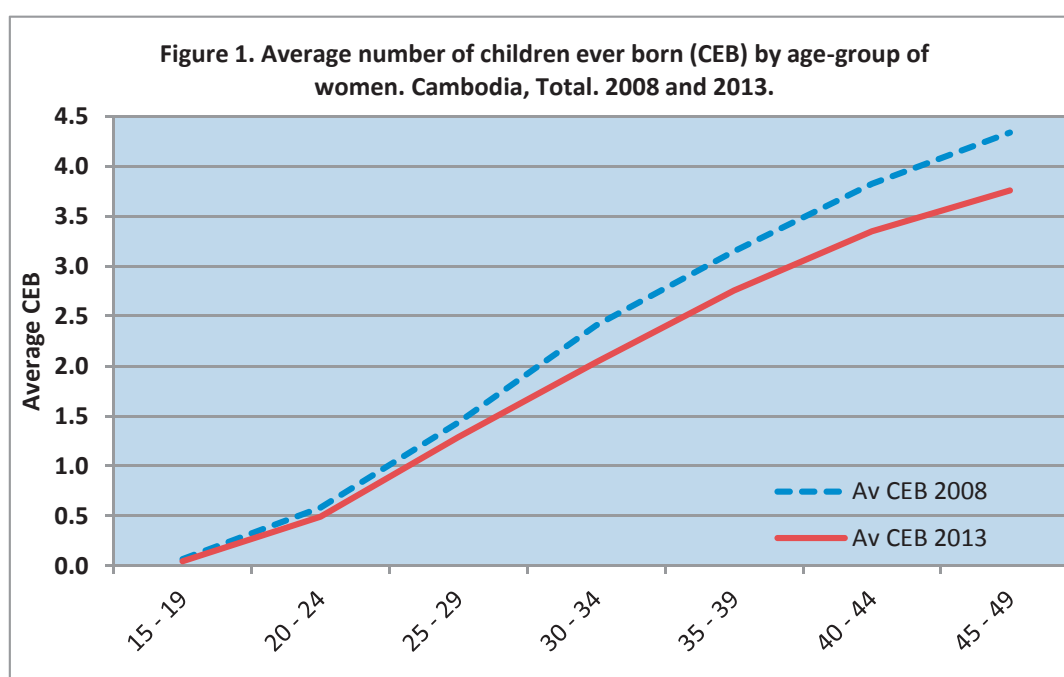
Source: Drawn from and Priority Table F5, 2008 Census, and Priority Table F, 2013 CIPS

Similarly, the pattern of the average number of children surviving by age-group of women show the expected increasing pattern with women's age (Figure 2). However, in both the graphs, the rising shape of the curves of children ever born and children surviving indicates the continuation of fertility till very late in the reproductive span.

Figure 2. Average number of children surviving (CS) by age-group of women. Cambodia, Total. 2008 and 2013.
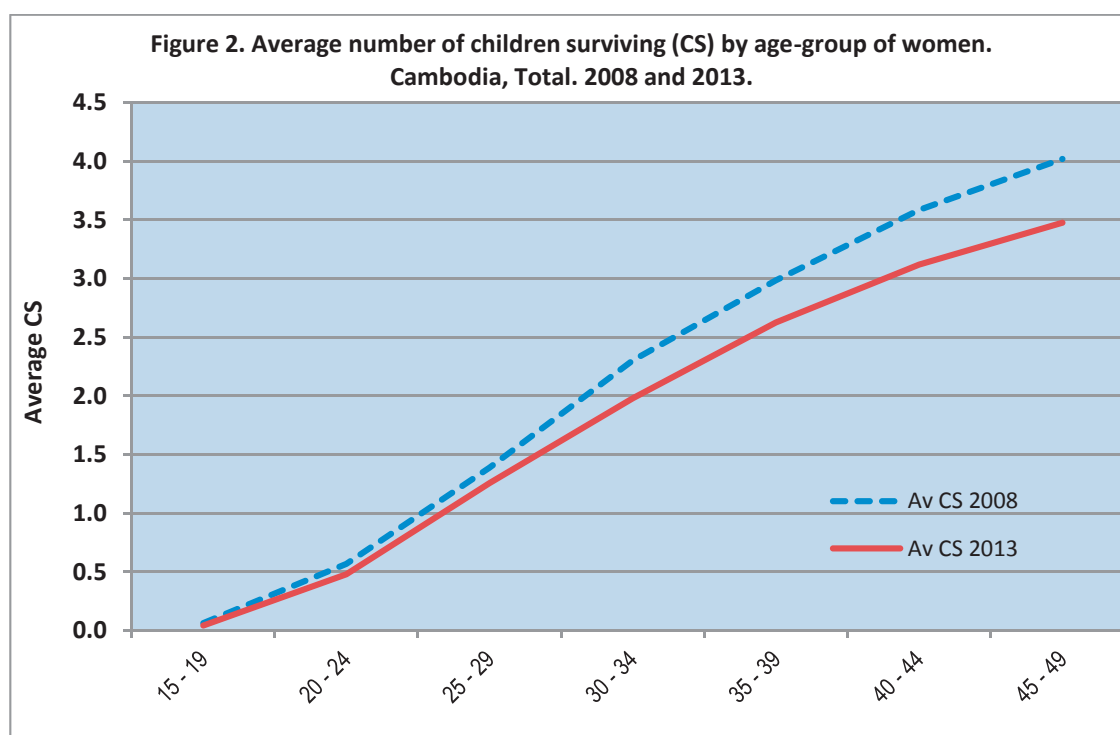
Source: Drawn from and Priority Table F5, 2008 Census, and Priority Table F, 2013 CIPS
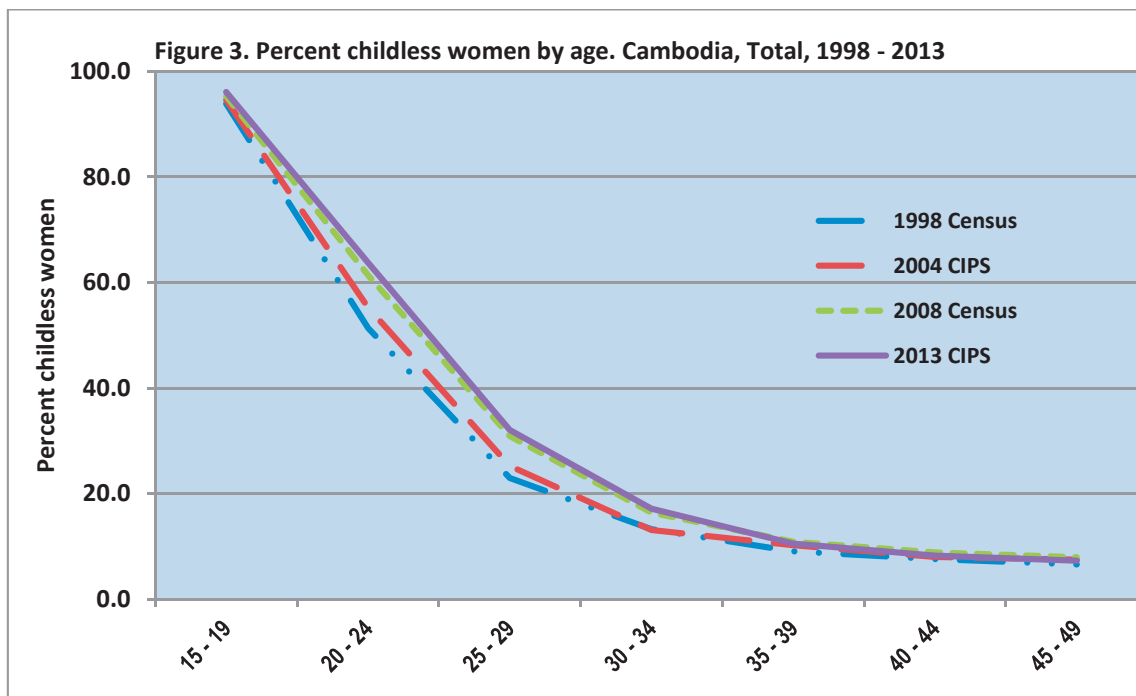
2.2. Childlessness

Childlessness or, the proportions of wo men having had no live birth decreases with age fro m age 15-19. Almost all of the women still childless at age 45-49 are childless due to their incapability to produce a li ve bir th. In other words, the proporti on of women childless at age 45   -49 indicates primary sterility.

Age-group	Table 2. Percent of all women with zero children ever born. Cambodia Total. 1998-2013.						
	1998 Census	CDHS 2000	2004 CIPS	CDHS 2005	2008 Census	CDHS 2010	2013 CIPS
15 - 19	93.9	94.4	94.6	94.8	95.3	94.7	96.1
20 - 24	51.4	56.2	55.3	51.5	61.4	53.8	63.8
25 - 29	23.0	20.4	25.3	23.3	30.9	22.2	32.1
30 - 34	13.3	12.1	13.1	11.0	16.4	11.6	17.2
35 - 39	9.1	8.1	10.2	9.3	10.9	8.5	10.6
40 - 44	7.6	7.6	8.0	8.7	8.9	7.7	8.3
45 - 49	6.6	8.2	7.5	7.2	8.0	8.3	7.3
Total	37.6	36.9	39.6	36.9	42.2	35.9	42.9

Sources: Drwan from priority Table D3 1998 census, CDHS 2000, 2004 CIPS,
CDHS 2005,PriorityTable F32008 Census, CDHS 2010 and Priority Table F, 2013 CIPS

The proportions childless have re   mained fairly stable betw een the 1998 Census and the 2005 CDHS in most of the age-groups, bu t show considerable increases in 2008 and 2013, particularly in the age-groups 20-24 and above (Table 2). Thi   s could reflect a genuine tend ency for a larger

percentage of women to not have children, but this could also indicate under-reporting of children ever born, especially if those children are not living. Such under-reporting would have an impact on both the fertility and mortality estimates. It may be noted that the CDHS 2010 data present a picture more in line with the previous CDHS figures; in fact all the CDHS figures show on average lower levels of childlessness compared to either the Census or the Inter-censal surveys. Without much more information at hand, these differences could be attributed to differences in sampling methods for the CDHS on the one hand and the census or Inter-censal surveys on the other.

Figure 3. Percent childless women by age. Cambodia, Total, 1998 - 2013

Sources: Drawn from Priority Table D3 1998 census, 2004 CIPS, Priority Table F3 2008 Census and Priority Table F CIPS 2013.

Childlessness percentages at the census and Inter-censal surveys from 1998 to 2013, which follow similar sampling and data collection methods in terms of the duration of fieldwork, are show in Figure 3. An interesting pattern to be noted is that the percentage of childlessness by age is very close between the 1998 Census and the 2004 CIPS, and between the 2008 Census and the 2013 CIPS. The comparison of childlessness percentages in the period 1998 -2013 indicates that the major divergence in the percentage of childlessness appears between the prime reproductive ages of 20 and 35 years, which is another indication of fertility decline.

2.3. Estimates of fertility

At the 2013Inter-censal Population Survey of Cambodia two types of data were collected that were specifically related to fertility, namely:

- Number of children ever born to women. When tabulated by five year age-group of women this information can provide indirect estimates of fertility, and
- Births occurring to women in during the 12 months immediately preceding the census. When tabulated by five year age-group of women, this information can provide direct measures of fertility.

There are several indirect techniques which can be applied to data on children ever born for estimating age specific and total fertility rates. However, some of the indirect techniques require certain assumptions regarding the past course of fertility. For example, the Brass P/F Ratio method

requires fertility to h ave remained unchanged. If th is method is applied to data w hen fertility has been decli ning, as is currentl y the case in Ca mbodia, it overestim ates curren t fer tility. This was also the c ase with the estimat e of total fertility rate based o n the 1998 Population census data. Data on the number of births during the last 12 months provide direct measures of age-specific and total fer tility rates b ut, as commonl y ob served in m ost deve loping countries; the se data tend to under-report the nu mber of children b orn in the past 12 months and therefor e, underest imate fertility.

In addition, the fol lowing fertility related information has been derived from data collected at the 2008 Census:

- Child-woman ratio, and
- Own Children.

These two provide indirect estimates of fertility.

Child-woman ra tio (CWR): Rele (1966) found a li near r elationship be tween CWR and gross reproduction rate (GRR) for given lev els of li fe expectancy at birth be tween 20 a nd 70 years. The GRR, which is the total fer tility rate for female births onl y, can be conver ted to total fertility rate (TFR) for both sexes com bined by assuming a suit able sex ratio at bir th. Two ty pes of CWR can be used for esti mating TFR: (i) CWR as a r atio of the num ber of children (both sexes) aged 0 -4 years to the number of women aged 15 to 49 years, and (ii) the ratio of children (both sexes) aged 5-9 years to the nu mber of wom en aged 20 to 54 years. In the present anal ysis, the CWR used is the ratio of the nu mber of children aged 0-4 to the num ber of women aged 15 -49. The reference period of fertil ity e stimates based on the CWR is five years preceding the c ensus or surve y. However, the TFR based on the Rele method is liable to be underestimated because the population aged 0-4 is generally under-enumerated (NIS, 2005).

Own children: In the absence of a li ne num ber linking mothers to her own chi ldren, the Own Children tab les were constructe d fro m informati on on rela tionship to the head of the household, and as such are liable to some errors in completely linking the mothers to their biological children, particularly when more than one mother resides in a household in extended families. However, this type of error appears to have been redu ced given the observed transi tion to nu clear fa milies as indicated b y the s maller av erage hou sehold sizes (4.7) in 2008 com pared to larger average household sizes (5.3) in 2008.

2.4. Estimates of fertilityat the national level

2.4.1. Overall fertility

Tables 3 gives the e stimates of Cam bodian fe rtility based on the 2013 for Cam bodia Tot al. The tables a lso provide estim ates of Ca mbodian fe rtility for other periods fro m o ther sources for comparative purpose s. Table 3 show s that the est imates of TFR for Ca mbodia Total, based o n Arriaga Brass P/F Ratio, Arri aga-Arretx (Children Ever B orn), the R ele and the Re lational-Geompertz methods are 2.17, 2.34, 2.25 and 2.71 respectively. The average of these is 2.37. Based on reported births in the last 12 months the TFR works out to be 2.05, which is an underestimate. The other indirect es timates are also c onsidered somewhat underestimates because of the reasons mentioned above.

One of the im pacts of fertil ity decli ne in a popu lation is the shrinking of the base of the age pyramid (the 0-4 age-group). The age pyramids of the population of Cambodia in 1998 and 2008 show that the proportion of the population aged 0-4 has declined from 12.8 percent in 1998 to 10.3

percent in 2008 and to 8.9 percent in 201 3, indicating a continuation of fertility decline which has started before 1998. Thi s is true notwi thstanding possible u nder enum erations o f the populati on aged 0-4 years. A rough idea of the extent of decline in fertility during 2008-2013 may be obtained from the quinquennial percentage d ecline in the proportio n of the populati on age 0 -4 years between 2008 and 2 013, which works o ut to be a bout 13.3 percent. The 2010 CDHS gave a TFR of 3.0 for Cam bodia Total, which is cen tred on mid-2008. A 13.3 percent decli ne over five years would imply a TFR of 2.6centred on mid – 2013.

Therefore, tak ing into account the above argu ments and the decli ning tren d in fertilit y in Cambodia sinc e 200 0, it may be concluded that the total fertili ty ra te in Ca mbodia during 2008 - 2013 falls within the range 2. 6 to 3.0, or an average of the two, na mely 2.8. The directl y calculated total fer tility r ate ba sed on bir ths in the household in the last 12 months is 2 .05. Thi s means that the estimat ed total ferti lity r ate is 1.3 7 times hi gher t han the directl y calculated total fertility rate (2.8 divided by 2.05 or 1.37).
Assuming that the pattern of fertility by age of women is correctly reflected in the reported number of births in the last 12 months (this assumption is the basis of the indirect techniques of fertilit y estimation based on Brass type methods or their modifications), the directly calculated age-specific fertility rates (ASFRs) are inflated by the factor of 1.37 and shown below in Table 2a.

In Urban Ca mbodia the population aged 0-4 has shrunk fro m 7.9 percent to 7.56 percent between 2008 and 2013, which is a 4.37 percent decli ne in five years. The 2010 CDHS gave a TFR of 2.2 for Cambodia Urban, which is centred on mid-2008. A 4.37 percent decline over five years would imply a TFR of 2. 1centred on mid – 2013. The average of 2.1 and 2.2 is 2.1 5. The directl y calculated total fer tility r ate ba sed on bir ths in the household in the last 12 months is 1.45. Thi s means that the estimat ed total ferti lity r ate is 1.48 times hi gher t han the directl y calculated total fertility rate (2.15divided by 1.45 or 1.48).

In Rural Cambodia the population aged 0-4 has shrunk from 10.82 percent to 9.24 percent between 2008 and 2013, which is a 14.53 percent decline in five years. The 2010 CDHS ga ve a TFR of 3.3 for Cambodia Rural, which is centred on mid-2008. A 14.53 percent decline over five years would imply a TFR of 2. 8centred on mid – 2013. The average of 3.3 and 2.8 is 3.0 5. The directl y calculated total fer tility r ate based on bir ths in the household in the last 12 months is 2.52. Thi s means that the estimat ed total ferti lity r ate is 1.21 times hi gher t han the directl y calculated total fertility rate (3.05 divided by 2.52 or 1.21).

Assuming that the pattern of fertility by age of women is correctly reflected in the reported number of births in the last 12 months (this assumption is the basis of the indirect techniques of fertilit y estimation based on Brass type methods or their modifications), the directly calculated age-specific fertility rates (ASFRs) are inflated by the factor of 1.37 and shown below in Table 3a.

The data in Table 3a suggest that almost all of the de cline in fertility in Cambodia between 20 08 and 2013 appears to have taken place in rural areas, as the urban TF R does not show any change in this period. However, this can also be an artifact of the data.

Figure 4 shows a comparison of the age-specific fertility rates for Cambodia (Total) based on data from the Cambodia Demographic and Health Surveys of 2005 and 2010, the Cambodian Population Census of 2008 and the Cambodia Inter-censal Population Survey 2013 (CIPS 2013).While the levels of the curves indicate a decline in fertility in Cambodia over time, it may also be noted that the CDHS2010 and CIPS 2013 data suggest a peaking of women's childbearing at ages 25-29 years, indicating a tendency among Cambodian women to start to postpone their child birth, particularly in the recent past.

Figure 4. Age specific fertility rates (ASFR) Cambodia, Total.
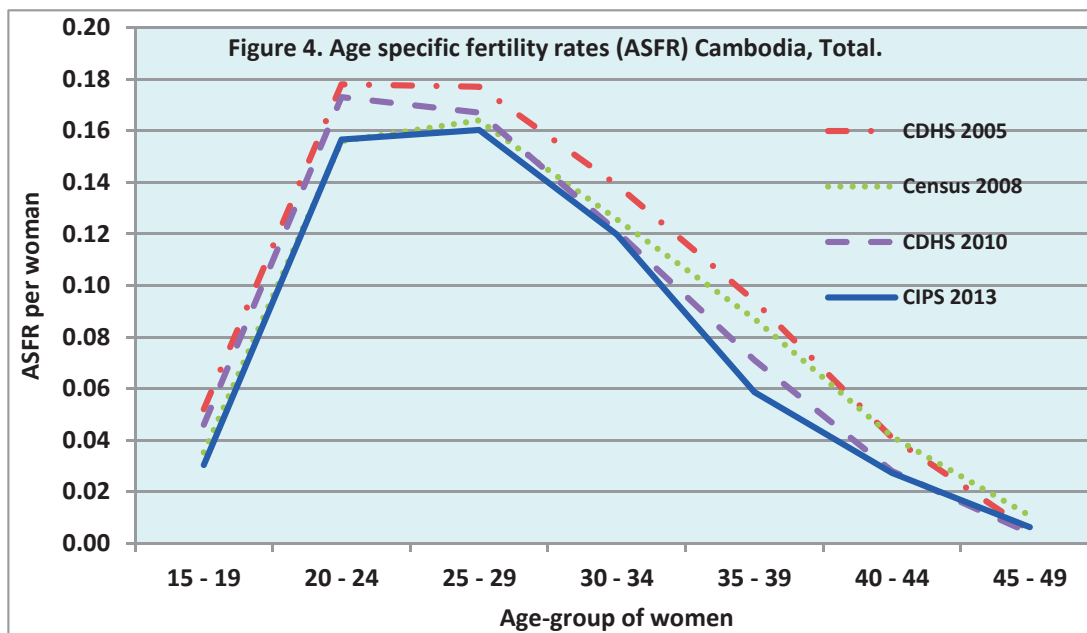
Source: Computed from various CDHS reports and the current estimate of ASFR given in Table 2a.

Tables 3 and 4 present the estimates of fertility for Cambodia Urban and Cambodia Rural respectively according to the same indirect techniques that have been used for Cambodia Total. Following similar arguments as those for Cambodia Total, the directly calculated TFRs for Cambodia Urban and Cambodia Rural (Tables 4 and 5) are adjusted upwards by multiplying them with the factor 1.3. These estimates are shown in Table 2a above.

Table 3: Estimates of fertility based on the Cambodia Inter-censal Population Survey 2013 (CIPS 2013): Cambodia Total

Method	Estimated Total Fertility Rate (TFR) per woman	Estimated crude birth rate per 1,000 population	Reference Period	Reference Point
Based on 2013 CIPS				
Arriaga Brass P/F Ratio	2.17	N.A.	March 2012-March 2013	Sept 2012
Arriaga-Arretx (Children Ever Born)	2.34[3]	N.A.	March 2012-March 2013	Sept 2012
Rele (CWR 0-4,15-49); (e_0=66.4)	2.25	N.A	March 2008-March 2013	Sept 2010
Relational Geompertz Model (3+3 point, average of age 20 to 35)	**2.71**	**N.A.**	**March 2012- March 2013**	**Sept 2012**
Direct estimate (based on reported births in the past 12 months)	2.05	18.45	March 2012-March 2013	Sept 2012
Other estimates				
2010 CDHS	3.0	24.2	2007.-2010	June 2008
2005 CDHS	3.4	N.A	2002-2005	June 2004

Source: Based on computations of direct and indirect estimates of fertility from data obtained from Priority Tables F (Total)

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[3]The estimates of TFR by the Arriaga-Arretx method , applied on data on the average number of children ever born to women classified by age-group from the 2008 Census and the 2013 CIPS present an anomalous situation where the TFR for Cambodia Total is 2.34, Cambodia Urban is 2.53 and Cambodia Rural is 2.34. Therefore, these estimates should be ignored.

Table 3a.Directly calculated and adjusted age-specific fertility rates, Cambodia 2013.Total, Urban and Rural.

| Age-group of women | Age-specific fertility rate | | | | | |
| | Before adjustment | | | After adjustment | | |
	Total	Urban	Rural	Total	Urban	Rural
15-19	0.022	0.009	0.026	0.030	0.014	0.031
20-24	0.115	0.067	0.140	0.157	0.100	0.170
25-29	0.117	0.071	0.147	0.160	0.105	0.178
30-34	0.088	0.087	0.110	0.120	0.129	0.133
35-39	0.043	0.041	0.049	0.059	0.061	0.060
40-44	0.020	0.006	0.026	0.027	0.008	0.031
45-49	0.005	0.009	0.006	0.006	0.013	0.007
Total fertility rate	2.05	1.45	2.52	2.80	2.15	3.05

Source: Calculated from priority Table F1, 2013 CIPS.

Table 4: Estimates of fertility based on the Cambodia Inter-censal Population Survey 2013 (CIPS 2013): Cambodia Urban

Method	Estimated Total Fertility Rate (TFR) per woman	Estimated crude birth rate per 1,000 population	Reference Period	Reference Point
Based on 2008 census				
Arriaga Brass P/F Ratio	2.06	N.A.	March 2012-March 2013	Sept 2012
Arriaga-Arretx (Children Ever Born)	2.53[4]	N.A	March 2012-March 2013	Sept 2012
Rele (CWR 0-4,15-49); (e_0=66.4)	1.77	N.A	March 2008-March 20138	Sept 2010
Relational Geompertz Model **(3+3 point, average of age 20 to 35)**	2.71	N.A.	**March 2012-March 2013**	**Sept 2012**
Direct estimate (based on reported births in the past 12 months)	1.45	14.3	March 2012-March 2013	Sept 2012
Other estimates				
2010CDHS	2.2	N.A	2007-2010	June 2008
2005CDHS	2.8	N.A	2002-2005	June 2004

Source: Based on computations of direct and indirect estimates of fertility from data obtained from Priority Tables F (Urban)

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[4]The estimates of TFR by the Arriaga-Arretx method, applied on data on the average number of children ever born to women classified by age-group from the 2008 Census and the 2013 CIPS present an anomalous situation where the TFR for Cambodia Total is 2.34, Cambodia Urban is 2.53 and Cambodia Rural is 2.34. Therefore, these estimates should be ignored.

Table 5: Estimates of fertility based on the Cambodia Inter-censal Population Survey 2013 (CIPS 2013)::Cambodia Rural

Method	Estimated Total Fertility Rate (TFR) per woman	Estimated crude birth rate per 1,000 population	Reference Period	Reference Point
Based on 2008 census				
Arriaga Brass P/F Ratio	2.28	N.A.	March 2012-March 2013	Sept 2012
Arriaga-Arretx(Children Ever Born)	2.34[5]	N.A	March 2007-March 2008	Sept 2007
Rele (CWR 0-4,15-49); $(e_0=63.94)$	2.39	N.A	March 2008-March 2013	Sept 2010
Relational Geompertz Model (3+3 point, average of age 20 to 35)	2.99	N.A.	**March 2012-March 2013**	**Sept 2012**
Direct estimate (based on reported births in the past 12 months)	2.52	19.6	March 2012-March 2013	Sept 2012
Other estimates				
2010 CDHS	3.3	N.A	2007-2010	June 2008
2005CDHS	3.5	N.A	2002-2005	Sep 2007

Source: Based on computations of direct and indirect estimates of fertility from data obtained from Priority Tables F1 to F4. (Rural)

2.4.2. National fertility by background characteristics

The total fertility rates, estimated according to education and type of economic activity of women are shown in Table 6.

It is found that, at the nationa l level, the various indirect methods provide vary ing ranges of fertility estimates for Cambodia Total, Urban and Rural. Therefore in the end, the estimates of the total fertility rate (TFR) at the national level were arrived at by taking into account the decline in the proportion of the 0-4 year age-group in the last five years (between the 2008 census and the 2013 CIPS) together with the fertility estimated at the Cambodia Demographic and Health Surve y 2010 which, when compared to the TFR measured from the reported births in the last year at CIPS 2013, yielded adjustment factors to infla te the directly measured TFRs to produce the estimat es of fertility for Total, Urban and Rural areas.

However, it is not possible to estimate the extent of decline in the proportions of the 0 -4 year age-group for the v arious background categories of educ ation and econo mic activity (because data on education refer to ages 7 years and above and data on economic activity refer to ages 15 years and above). Therefore, it is not possible to estimate the adjustment factors for fertility for each of these background categori es as it was done fo r the n ational leve l estimates. Therefore, the adjustment factor for C ambodia 2013 Total h as been used for adju sting the TFRs based on b irths reported in the last year for each of the background categories. Further, since the estimates of fertility by these background characteristics refer to Camb odia Total, no separate adjustment factor s for Urban and Rural areas have been used.

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[5]The estimates of TFR by the Arriaga-Arretx method , applied on data on the average number of children ever born to women classified by age-group from the 2008 Census and the 2013 CIPS present an anomalous situation where the TFR for Cambodia Total is 2.34, Cambodia Urban is 2.53 and Cambodia Rural is 2.34. Therefore, these estimates should be ignored.

The estimates given in Table 6 show that Literate women have lower fertility than illiterate women, as expected. Further, among the literate women, increasing educational level is associated with decreasing fertility, which again is the expected pattern. These findings are consistent with those of the Cambodia Demographic Health Survey of 2010 (CDHS 2010), and show where estimates are available, a decline in fertility by background characteristics between the period implied by the CDHS2010 and CIPS 2013.

Table 6: Estimates of fertility based on the Cambodia Inter-censal Population Survey 2013 (CIPS 2013): Cambodia Total.

Education	Estimated Total Fertility Rate (TFR)	
	CIPS 2013	CDHS 2010
Illiterate	3.67	N.A.
Literate	2.66	N.A.
Below Primary including no schooling	3.17	3.7*
Primary and Lower Secondary	2.57	3.4
Secondary and above	1.81	2.4
Economic activity		
Economically inactive	3.74	N.A
Economically active unemployed	4.07	N.A.
Economically active employed	2.74	N.A.

* No schooling
Source: The TFRs for CIPS 2013 have been computed by adjusting the directly calculated TFRs based on births in the last year according to educational categories. The adjustment factor is 1.37, the same as that used for adjusting the total fertility rate for Cambodia 2013 Total. The data for Education are obtained from Priority Tables F1 and F3 for Cambodia2013 Total, and those for Activity Status are obtained from Priority Tables F2 and F4 for Cambodia 2013 Total. The CDHS 2010 data are obtained from the main report of CDHS 2010.

However, fertility according to economic activity of women exhibits an unexpected pattern. While economically active employed women have the lowest fertility of the three categories, it is interesting to find that economically inactive women (i.e., those who are not working, nor actively seeking work) have lower fertility than the economically active unemployed women. There could be several reasons for this, such as these women could belong to a high socio-economic category which would conducive to small family sizes, or their husbands could be working in higher class occupations which would not require these women to look for work. However, without more detailed information about the quality of data on women's economic activity and the number of children borne by them (during their lifetime or in the last year), it is not possible to make further interpretation of these estimates.

2.4.3. Births according to type assistance received during delivery

For births during the 12 months preceding the survey, , information was also collected about the type of assistance that women received when they gave birth. There were 264,335 women aged between 15 and 49 years who reported having given birth to 270,758 live born children during the 12 months preceding the survey. Thus there were 6,423 births more than the number of women who gave birth in the 12 month period prior to the survey. Therefore, there were some women who gave birth to more than one child in the previous year, either in the form of multiple births or by giving birth more than once in the one year period preceding the survey. The excess number of 6,423 births to 264,335 women amounts to a multiple birth rate of 23.7 per 1,000 births. This is a very high multiple birth rate compared to the recorded multiple birth rate of 15 per 1,000 births

among Cambodian women in the United States[6]. Therefore, it cannot be ruled out that some of these 264,335 women were incorrect in reporting their births in the past year.

Information on the type of assistance received by these women during their delivery in the past 12 months is shown in percentages in Table 7, which reveals that there was a very high level of skilled birth attendance for the deliveries occurring in the 12-month period preceding the survey. Ninety percent of all women aged 15-49 years were assisted by a medically qualified person, comprising 7.7 percent by a doctor, 14.7 percent by a nurse and 67.6 percent by a midwife. The other 10 percent was assisted by a traditional birth attendant. This high level of assistance by qualified health personnel was true for women of all age-groups. This is a significant change from the situation reported at the 2008 census, when a large percentage of women giving birth (one-third or more) was assisted by traditional birth attendants

Table 7. Births in the last year according to type of assistance received during delivery, by age-group of women. CIPS 2013.Total.

Age-group	Women giving birth during last year		Doctor	Nurse	Midwife	Traditional Birth Attendant	Other	None
	Number	Percent						
15-19	16,735	100.0	3.8	14.4	72.8	9.0	0.0	0.0
20-24	90,462	100.0	7.6	14.7	67.0	10.6	0.1	0.0
25-29	77,546	100.0	7.3	15.6	66.4	10.3	0.3	0.0
30-34	53,042	100.0	9.4	15.0	66.9	8.2	0.0	0.6
35-39	15,718	100.0	11.5	9.1	70.8	8.6	0.0	0.0
40-44	8,952	100.0	1.6	14.1	73.6	10.6	0.0	0.1
45-49	1,879	100.0	14.3	17.6	61.9	6.2	0.0	0.0
Total	264,335	100.0	7.7	14.7	67.6	9.8	0.1	0.1

Source: Computed from Priority table F7.

The high level of skilled birth attendance is an indicator of Cambodia's good progress towards achieving the Millennium Development Goals on universal access to maternal health.

2.5. Estimates of fertility at the provincial level

The estimates of fertility at the province level were made following a similar methodology to that of the national level estimate, namely by applying the adjustment factor to scale up the total fertility rates calculated from the reported births in the 12 months preceding the survey. The resulting estimates of total fertility rate (TFR) by province are shown in Table 8, which also shows the estimates of TFR from CDHS 2010 and Census 2008. For a visual presentation, the trends and differentials in fertility (as measured by TFR) are also shown in Figures 5 and 6.

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[6]Patel A, Patel D, Keith L, Piotrowski ZH, Chi P.1997. "Epidemiologic paradox in multiple births among Asians in Illinois.Correlation between risk factors and outcomes".*J Reprod Med.* 1997 Nov;42(11):735-9.

Table 8.Esti   mates o f total   fertility rate (TFR) b   y   province, Total (Rural+Urban).Cambodia 2013 CIPS.

Province	Estimates of TFR		
	2013 CIPS	2010 CDHS	2008 Census
	(March 2011-March 2012)	(2007-2010)	(March 2007-March 2008)
1. Banteay Meanchey	2.0	3.2	2.7
2. Battambang	2.9	3.2	3.2
3. Kampong Cham	3.5	3.4	3.1
4. Kampong Chhnang	3.3	3.6	3.6
5. Kampong Speu	2.4	3.1	3.4
6. Kampong Thom	3.1	3.2	3.3
7. Kampot	2.4	2.8	3.1
8. Kandal	2.8	2.9	2.8
9. Koh Kong	3.8	2.9	3.6
10. Kratie	3.4	3.9	3.7
11. Mondul Kiri	4.2	4.5	4.5
12. Phnom Penh	1.3	2.0	2.0
13. Preah Vihear	3.9	3.5	4.0
14. Prey Veng	3.3	3.3	2.9
15. Pursat	3.2	3.4	3.6
16. Ratnak Kiri	3.6	4.5	4.9
17. Siem Reap	3.3	3.4	3.2
18. Preah Sihanouk	2.1	2.9	3.1
19. Stung Treng	3.8	3.5	4.2
20. Svay Rieng	3.5	2.6	2.8
21. Takeo	2.7	3.1	3.0
22. Otdar Meanchey	4.0	3.2	3.3
23. Kep	3.1	2.8	3.3
24. Pailin	3.4	3.2	3.6
Total Cambodia	2.8	3.0	3.1

Source: Based on computations of direct and indirect estimates of fertility from data obtained from Priority Tables F1 to F4 for the provinces. The 2010 CDHS and 2008 Census estimates are obtained from the respective reports.
Note: Parentheses denote the reference periods

When com pared wi th the estimat es of total fertil ity rate derived fro m the 20 10 Cambodia Demographic and Health Survey (CDHS 2010) and Census 2008, it can be seen that all but 12 provinces show continuous decline   s in TFR during 2007   -2012. Provinces such as Kampong Cha m, Pr ey Veng and Otdar Meanchey have experienced apparent increases   in fertility Kandal, Siem Reap and Mondul Kiri appear to have had no change in fertility in the last five years, while Koh Kong, Pre y Vihear, Stung Treng, Kep and Paili n appear to have experienced a decli ne between 2007 and 2010, foll owed b y very s mall increase thereafter. However, the chang es (increase or decline) ar e too small to be of any significance, as is the case w ith t he n ational f ertility, w hich has decli ned fro m 3.1 in 2007 -2008 to 3.0 in 2007-2010 and to 2.8 in 2012-2013.

Figure 5. Trends in total fertility rates (TFR) by province, Cambodia Total. Census 2008, CDHS 2010 and CIPS 2013
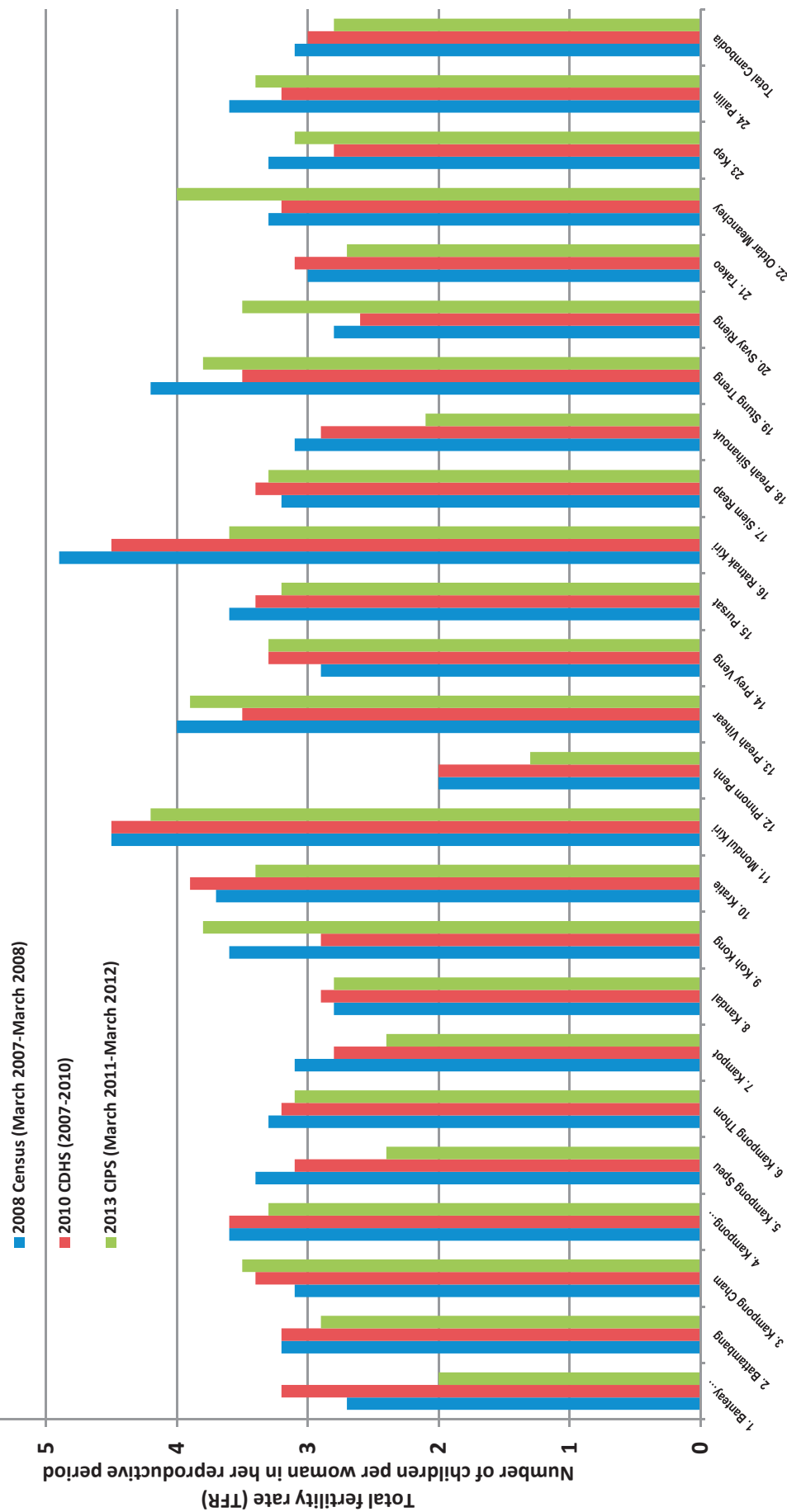
Source: Table 8.

Figure 6 shows the provinces ranked according to TFR estimated from the 2008 Census. Phnom Penh has the lowest TFR at 2.0, which is just below replacement level fertility. Being the most urbanised province of the country, where the nation's capital is located it is not surprising that Phnom Penh has the country's lowest fertility. The highest TFR of 4.9 belongs to Ratanak Kiri, although Mondul Kiri is not far behind with a TFR of 4.5. In all, there are four provinces in Cambodia, namely Preah Vihear, Stung Treng, Mondul Kiri and Ratanak Kiri which still show a TFR of 4 and above.
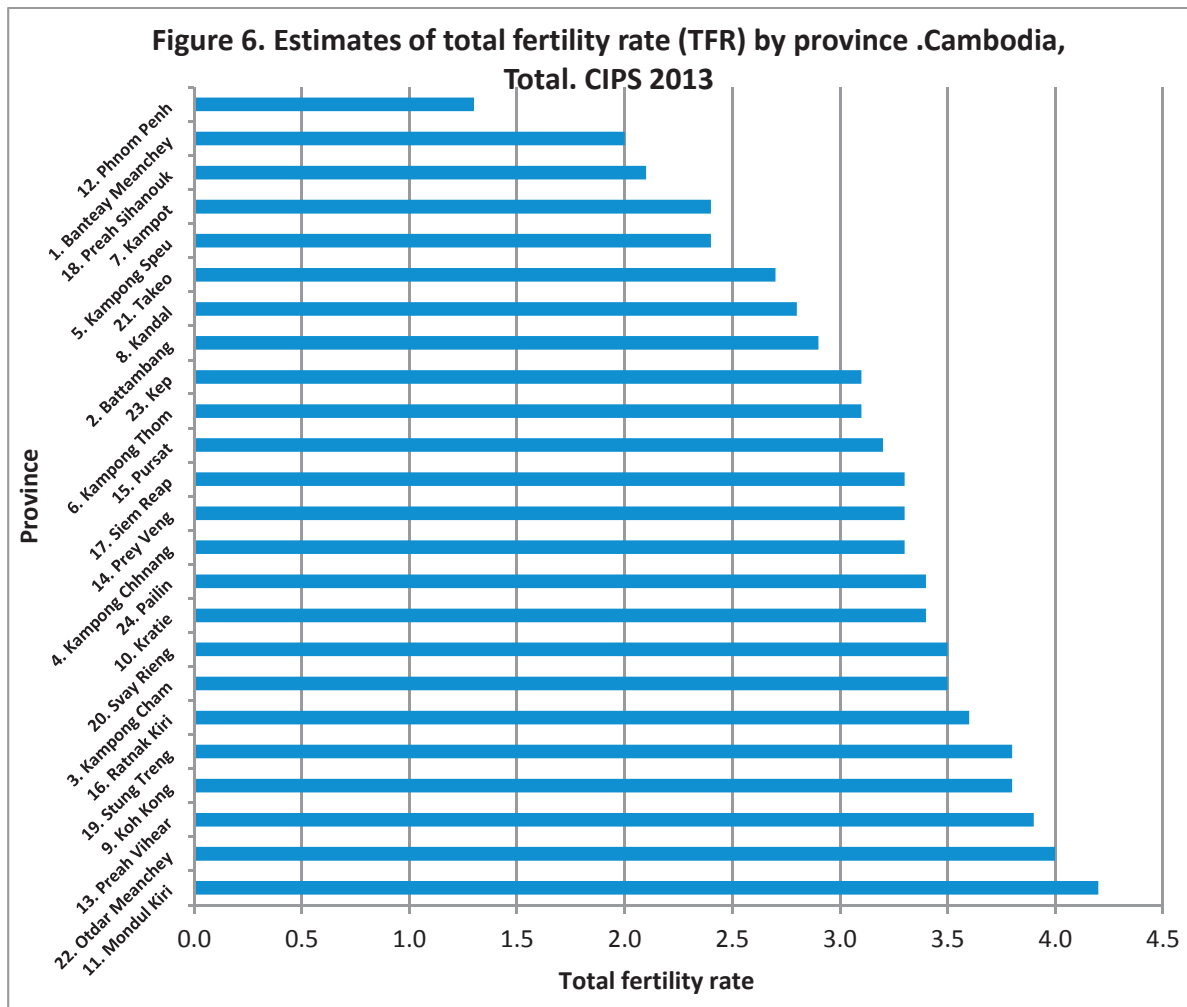
Source: Table 8, Column 2.

Chapter 3

Estimation of mortality

3.1. Introduction.

The following mortality related data are available from the 2 013Inter-censal Population Survey (CIPS 2013):

- Number of children ever born and surviving to women of reproductive ages 15 and above, classified by 5 year age-group of women. This can provide indirect estimates of early age mortality.
- Deaths occurring in the household during the 1 2 months immediately preceding the survey, classified by age of the deceased. This type of data can provide direct estimates of early age and adult mortality. These data also included information on deaths of women of reproductive ages due to maternal causes, i.e., deaths related to pregnancy and child birth, and their seque l for up to 42 days after deli very. This type of data can provide direct estimate of maternal mortality.

In the present analysis, estimates of early age mortality, comprising infant and child mortality (for both sexes combined and by sex), and maternal mortality will be presented.

The method of indirectly estimating infant and child mortality from information on children ever born and children surviving, classified by age-group of women consists of calculating the proportions of children dead (as a complement of the proportions of children surviving) and converting them to measures of probability of dying under various ages under 5 with use of multipliers developed by Brass (see United Nations, 1983: for a description of the method). The software QFIVE of MORTPAK 4.3, developed by the United Nations has been used for estimating early age mortality in Cambodia.
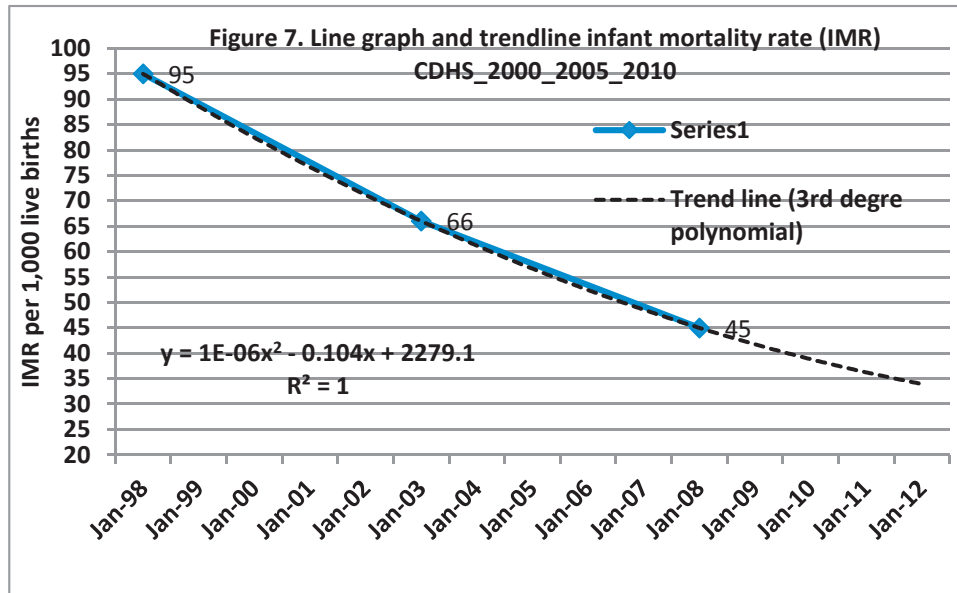
3.2.Estimates of mortality at the national level – Total, Urban and Rural

3.2.1. Early age mortality

The estimates of infant mortality for both sexes combined, derived by the Trussell (Model West) variant and the Polloni-Heligman (UN General Model) variant of the Brass method from information on children ever born and children surviving for Cambodia total, urban and rural are of the order of 22-23, 7-8 and 25-26 per 1,000 live births respectively (Tables 10, 11 and 12). The approximate measure of infant mortality obtained by taking the ratio of the deaths under the age of one year to the number of live births in past 12 months shows a figure of 25, 7 and 29 infant deaths per 1,000 live births for Cambodia Total, urban and rural respectively (Table 9). These estimates are rather low, as are the estimates of child and under-five mortality, particularly in the context of the immediately past declines in early age mortality indicated by the 2000, 2005 and 2010 Cambodian Demographic and Health Survey, and the estimates of early age mortality derived from the 2008Population Census.
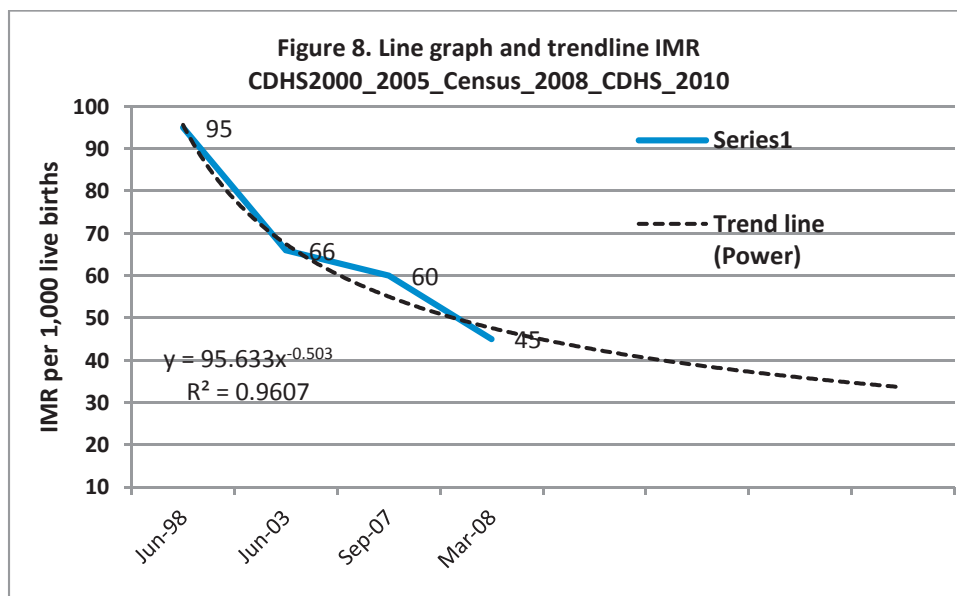
The trends in infant mortality according to the CDHS 2000, 2005 and 2010 are shown in Figure 7. This figure also shows the fitted trend line and the forecast for the period corresponding to CIPS 2013. The trend line is third degree polynomial, which provides a perfect fit as indicated by the R^2 value of 1. The forecast based on this trend line gives an expected IMR of about 34 per 1,000 live births for the period corresponding to CIPS 2013. Figure 8 shows the trends in infant mortality in Cambodia according to the CDHS 2000, CDHS 2005, Census 2008 and CDHS 2010, and a fitted

Power trend line wi th R^2 va lue of 0.96. The fore cast b ased on this Power trend li ne gives an expected IMR of about 32 per 1,000 li ve births for the perio d corresponding to CIPS 2013. The average of these two expected valu es of IMR (i.e., 34 and 32) is 33.0, which may be taken as the infant mortality rate for Cam bodia Total as of CIPS 2013. The ratio of this va lue (33) to the directly estimated IMR of 25 is 1. 32, which may be used as the correc tion factor for the directl y calculated IMR for urban and rural area s, for th e provinces and for males and females for T otal Cambodia 2013.

Figure 7. Line graph and trendline infant mortality rate (IMR) CDHS_2000_2005_2010

$$y = 1E\text{-}06x^2 - 0.104x + 2279.1$$
$$R^2 = 1$$

Source: Drawn from data obtained from the various surveys mentioned above.

Despite the apparent gross under- reporting of the num bers of births and deaths during the past 12 months, as evident from the questionably low crude bir th r ate (and cru de death rate (given in Tables 3 and 9, together the y a ppear to provide a reasonabl e meas ure of infant mortality. T his indicates similar levels of under-reporting of births and deaths at the census.

Figure 8. Line graph and trendline IMR CDHS2000_2005_Census_2008_CDHS_2010

$$y = 95.633x^{-0.503}$$
$$R^2 = 0.9607$$

Source: Drawn from data obtained from the various surveys mentioned above.

Thus t he p lausible estimates o f i nfant mortality for both s exes com bined for Cambodia 2013, Total, Urban and Rural areas can be stated as follows:

Table 9: Adjusted infant mortality rates and under five mortality rates per 1,000 live birth, Cambodia 2013 (Both sexes combined) (Reference period: March 2012-March 2013)

	(Adjustment factor = 1.3	
	Infant Mortality Rate	
	Before adjustment	After adjustment
Total	25	33
Urban	7	9
Rural	29	38
	Under Five Mortality Rate	
	Before adjustment	After adjustment
Total	40	53
Urban	12	15
Rural	46	60

Source: Calculated from Tables 10, 11 and 12 based on adjustment factor discussed above

The estimate of under-five mortality(U5MR) from CDHS 20 10 for Cam bodia (Total, both sexes combined) is 54 per 1,000 live births for the period 2005-2010. The estimates of U5MR for Urban and Rural areas from CDHD 2010 are 29 and 75 per 1,000 live births for the p eriod 2000-2010. Therefore, the adjusted estimated of U5MR from CIPS 2013 appear to be consistent with the trend implied by the CDHS 2010 estimates. However, even though the urban and rural U5MR appear to have recorded declines from 29 and 75 to 15 and 60 respectively, the Total U5MR seems to have declined from 54 to only 53.

3.2.2 Life expectancy at birth

Life expectancy at birth for Total, Urban and Rural areas, implied by the adjusted infant mortality rates(Table 9) are estimated by assuming the mortality patterns of the Coale-Demeny West Model Life Tables and given in Table 9a.

Table 9a. Life expectancy at birth implied by the estimated infant mortality rates

	Life expectancy at birth (years)		
	Both sexes	Males	Females
Total	68.9	67.1	71.0
Urban	76.8	75.0	78.5
Rural	67.6	65.6	69.5

Source: Calculated from the adjusted infant mortality rates given in Table 9, assuming Coale and Demeny Model West Life Tables.

These estimates, particularly those of urban areas appear to on the high side.

Table 10: Estimates of early age mortalityand crude death rate based on the Cambodia Inter-censal Population Survey 2013 (CIPS 2013):Cambodia Total

Method Infant	mortality rate ($_1q_0$)	Child mortality rate ($_4q_1$)	Under five mortality ($_5q_0$)	Crude death rate per 1,000 population	Reference Period	Reference Point
(i) Palloni-Heligman: UN General Model	0.022	0.005	0.027	N.A	N.A	Feb 2011
(ii) Trussell: Coale-Demeny West Model	0.023	0.007	0.027	N.A	N.A	March 2011
	0.025	N.A	0.040	3.95	March 2012-March 2013	Sept 2012
2010 CDHS	0.045	0.009	0.054		Mar 2006-Mar 2010	March 2008
(i) Palloni-Heligman: UN General Model	0.026	0.006	0.027	N.A	N.A	Jan 2006
(ii) Trussell: Coale-Demeny West Model	0.026	0.007	0.044	N.A	N.A	Feb 2006
	60	NA N	A	NA	Mar 2007-Sep 2008	Sep 2007
2005 CDHS	0.066	0.019	0.083		1995-2005	June 2000

Source: Based on computations of direct and indirect estimates of infant mortality from data obtained from Priority Mortality Table F1, 2013 CIPS (Total) and other relevant publications.

Table 11: Estimates of early age mortality and crude death rate based on the Cambodia Inter-censal Population Survey 2013:Cambodia Urban

Method Infant	mortality rate ($_1q_0$)	Child mortality rate ($_4q_1$)	Under five mortality ($_5q_0$)	Crude death rate per 1,000 population	Reference Period	Reference Point
(i) Palloni-Heligman: UN General Model	0.007	0.002	0.009	N.A	N.A	Feb 2011
(ii) Trussell: Coale-Demeny West Model	0.008	0.001	0.009	N.A	N.A	March 2011
	0.007	N.A	0.011549 .A	2.48	March 2012-March 2013	Sep 2012
2010 CDHS	0.022	0.007	0.029	N.A	2000-2010	March 2005
(i) Palloni-Heligman: UN General Model	Less than 0.024	0.005	0.021	N.A	N.A	Jan 2006
(ii) Trussell: Coale-Demeny West Model	0.017	0.002	0.022	N.A	N.A	Feb 2006
	35	NA N	A	NA	Mar 2007-Mar 2008	Sep 2007
2005 CDHS	0.065	0.012	0.076	N.A	1995-2005	June 2000

Source: Based on computations of direct and indirect estimates of infant mortality from data obtained from
Priority Mortality Table F1, 2013 CIPS (Urban) and other relevant publications

Table 12: Estimates of early age mortality and crude death rate based on the Cambodia Inter-censal Population Survey 2013:Cambodia Rural

Method Infant	mortality rate ($_1q_0$)	Child mortality rate ($_4q_1$)	Under five mortality ($_5q_0$)	Crude death rate per 1,000 population	Reference Period	Reference Point
(i) Palloni-Heligman: UN General Model	0.025	0.006	0.031	N.A.	N.A	Feb 2011
(ii) Trussell: Coale-Demeny West Model	0.026	0.004	0.030	N.A	N.A	March 2011
	0.029	N.A	N.A	3.64	N.A	N.A
2010 CDHS	0.064	0.012	0.075	N.A	2000-2010	March 2005
(i) Palloni-Heligman: UN General Model	0.027	0.006	0.031	N.A	N.A	Feb 2006
(ii) Trussell: Coale-Demeny West Model	0.026	0.004	0.030	N.A	N.A	March 2006
	62	NA N	A N	A	Mar 2007-Mar 2008	Sep 2007
2005 CDHS	0.092	0.021	0.111	N.A	1995-2005	June 2000

Source: Based on computations of direct and indirect estimates of infant mortality from data obtained from Priority Mortality Table F1, 2013 CIPS (Rural) and other relevant publications

3.3. Early age mortality at the provincial level

Mortality between birth and the first birthday, measured by the infant mortality rate (IMR) and mortality between birth and the fifth birthday, measured by the under-five mortality rate (U5MR) are powerful indicators of child health, and the basic indicators of the Millenniu m Development Goal 4 for the reduction of child mortality.

However, while the estimates of IMR and U5MR from CIPS 2013 have been estim ated by a combination of indir ect and dire ct techniques a nd presented in this report for Cam bodia Total, Urban and Tot al at the nationa l level, the sa me is not a ttempted for the provinces of the countr y because of the unsuitability of provincial data for the application of either the dir ect methods of measurement or the indirect techniques of estimation.

3.3.1. Problems with direct measurement

Information on deaths in the household during the 12 months preceding the survey is available by age at death and sex. The age at death is classified in years as follows: 0,1-4, 5-14, 15 – 44, 45 – 59, 60 – 74 and 75+. Deaths at age 0 year and the number of births occurring in the household in the last 12 months provide the numerator and denominator respectively for the calculation of infant mortality rate. Deaths at ages 0 and 1-4 years and the number of births occurring in the household in the last 12 months provide the numerator and denominator respectively for the calculation of under-five mortality rate. However, for two provinces, no deaths were reported at age 0 in the 12 months preceding the survey[7]. Further for several provinces, no deaths were reported at age 1-4 in the 12 months preceding the survey[8]. Non-occurrence of infant or under-five deaths in any one year may not be impossible, particularly at relatively low levels of infant and child mortality. For these reasons it is advisable to take an average of the number of deaths for three or five years around a census or a survey to overcome the problems of yearly fluctuations in mortality, but it is not possible to do so with the data at hand, because the survey collected information on the deaths occurring in only 12 months before the survey. An alternative means of estimation of IMR and U5MR is to use indirect techniques, which take into account the lifetime experience of child bearing and child mortality among women of reproductive ages that does not rely on births and deaths occurring in a single year.

3.3.2. Problems with indirect estimation

Information on the average numbers of children ever born (CEB) and surviving (CS) classified by age of the women can be converted to measures of infant and under-five mortality by the application of the so-called child survivorship method, developed by William Brass and later modified by James Trussell and Larry Heligman and Alberto Polloni. However, in addition to CEB and CS, the computer software MORTPAK (the current version in MORTPAK 4.3) to be used for the child survivorship methods requires other information such as the mean age at child bearing and sex-ratio at birth. Although information on both of these is available, that on sex-ratio at birth appears to be highly inaccurate. The normal range of sex-ratio at birth is between 102 and 107 male births per 100 female births. However, the sex-ratio at birth calculated for the provinces appears to be highly erroneous, with values in excess of 110 for many provinces and more than 200 for some others.

Therefore, there will be no attempt to estimate infant and under-five mortality for the provinces or natural regions because using the available data will be fraught with risks of gross miscalculations. Consequently, there will be no attempt to estimate life expectancy at birth for the provinces from the estimates of infant mortality rate.

Similarly, estimates of maternal mortality will likewise not be presented for the national level and for the provinces for reasons of data quality.

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[7] These provinces are Kandal and Phnom Penh
[8] These provinces are Battambang, Kampong Speu, Kandal, Koh Kong, Kratie, Phnom Penh, Preah Sihanouk, Stung Treng, Takeo and Pailin

3.4.Deaths of females aged 15-49 years during pregnancy according to type of assistance received at the time of death and place of death

In this section, informati on is presented about deaths of women aged between 15 an d 49 years during their pregnanc y, all of which ma y no t strict ly be regarded as m aternal deaths (as discussed in the section dealing with maternal mortality). Information about the type of assistance received at the time of death during pregnancy and the place where the death occurred as of CIPS 2013 is given in Table 1 5a. For com parison, th e corresponding table as of the 2008 Cens us is given in Table 15b.

Of the 8 95 d eaths during pregnanc y w hich were reported to have occurred in the 12 months before the surve y, 71 percent were a ttended b y qua lified medical personne l (22 percent b y doctors, six percent by nurses and 43 p ercent by midwives). The corresponding figure for the 2008 Census is 63 percent (39 percent b y doctors , eigh t pe rcent b y nurses and 16 percent b y midwives). Note that proportionately man y more deaths during pregnanc y w ere attend ed b y midwives in 2013 tha n in 2008, and pro portionately much f ewer deaths during pregnancy were attended b y doctors in 2013. About 29 percent of these deaths were attended b y medically non-qualified personnel such as traditi onal birth attenda nts (TBAs) (1.2 percent) and others such as relatives or friends (28 percent). I t is notewort hy that the pro portion of deaths during pregnanc y attended by TBAs has declined from 13 percent in 2008 to just 1 percent in 2013. Unlike the large percentage of deaths during pregnanc y attended by no o ne (2 1.5%) in 2008, there was no deaths during pregnancy in 2013 which was not attended by anyone.
About two-thirds (67%) of these deaths as of 2013 occ urred in a health facility (hospital or health centre) and on-third (33%) occurred at home. Again, this provides a contrast with the 2008 figures in terms of the use of health facilities.

As can be expected, m ost of th e deaths attended b y medically qualified persons happened at a health facility su ch as hospital or health cent re, whereas an overwhelm ing m ajority of maternal deaths attended b y medically non-qualified persons happene d at ho me or o ther places (i.e., at a non-health facility).

Table 13.Deaths of f emales during p regnancy by place of death an d type of assista nce received during delivery. Cambodia 2008 Census Total. All ages (15-49).

Type of assistance	Place of death					
	Hospital	Health centre	Home	Other	Total (assistance)	
					Number	Percent
Doctor	194	0	0	0	194	21.7
Nurse	-	52	0	0	52	5.8
Midwife	307	44	40	0	390	43.6
Traditional Birth Attendant	0	0	11	0	11	1.2
Other	0	0	248	0	248	27.7
None	0	0	0	0	0	0.0
Total (Place) Number	501	96	299	0	895	100.0
Total (Place) Percent	56.0	10.7	33.4	0.0	100.0	

Source: Computed from Priority Mortality Table F.

Table 14. Deaths o f females during pregnancy by place of death and t ype of a ssistance received during delivery. Cambodia 2008 Census Total. All ages (15-49).

Type of assistance	Place of death					
	Hospital	Health centre	Home	Other	Total (assistance)	
					Number	Percent
Doctor	258	12	41	2	313	38.9
Nurse	17	24	20	3	64	8.0
Midwife	39	33	54	3	129	16.0
Traditional Birth Attendant	0	0	96	8	104	12.9
Other	5	0	10	6	21	2.6
None	1	0	143	29	173	21.5
Total (Place) Number	320	69	64	51	804	100.0
Total (Place) Percent	39.8	8.6	8.0	6.3	100.0	

Source: Computed from Priority Table G3, 2008 Census.

3.5. Causes of death

In collecting data o n the num ber of deaths oc curring in the household in the past 12 m onths, information was also collected about the cause of death. This section discussed the percentages of death by cause of de ath (i) for children u nder five, (ii) for males by broad age-groups and (iii) for females by broad age-groups.

3.5.1. Cause of death among children under five

In general, the infectious and parasitic diseases have accounted for more than 60 percent of deaths of children of both s exes under five in Ca mbodia as of the 2013 CIPS . This sho ws a decli ne in deaths from such diseases b y about 20 percen tage points since the 2008 Census. However, the broadly defined cau se of death "Fever"still accounts for nearly 30 percent of chi ld deaths (Tables 16a and 16b). Deng ue fever and malaria together a ccounted for nearl y 18 percent of the child deaths. The proportion of child d eaths from T etanus has been reduced fro m nearly 12 percent to just under 5 percent, while various for ms of accidents accounted for near ly 13 p ercent of child deaths. The proportion of deaths from diarrhea has also declined com pared to 2008. Fever is a loosely defined cause of de ath and efforts should be made to obtain more precise infor mation about causes of death in future enquiri es. The decli ne in the percentage of child deaths fro m unknown causes (the category "Don't know") between 2008 and 2013 at first sight indicates a slight improvement in ascertaining c ause of death, but the fa ct that " fever" and " other illnesses" still account for a lar ge percentage of child deaths for males and female children a like, means that many of the unknow n causes of death h ave been simply grouped under these two loosely defined causes (fever and o ther illnesses). Ther efore, in future surveys the enumerators s hould be given more training in ascertaining the cause of death, perhaps wi th the he lp of a list of s ymptoms to help assign the cause of death.

Table 16a. Cause of death among children under five, Cambodia 2013 CIPS. Total

Both sexes		Males		Females	
Cause of death	Percent of deaths	Cause of death	Percent of deaths	Cause of death	Percent of deaths
Fever	29.7	Fever	22.7	Fever	40.5
Other Illnesses	17.2	Dengue Fever	16.2	Other Illnesses	27.2
Dengue Fever	13.4	Other Illnesses	10.6	Dengue Fever	9.2
Drowning	6.1	Drowning	8.4	Heart Disease	6.7
Heart Disease	6.0	Tuberculosis	8.2	Other Accident	4.9
Tuberculosis	5.4	Tetanus	7.7	Diarrhea	2.7
Tetanus	4.8	Malaria	6.9	Don't Know	2.7
Malaria	4.3	Heart Disease	5.5	Drowning	2.5
Diarrhea	4.3	Diarrhea	5.3	Road Accident	1.8
Road Accident	3.8	Road Accident	5.1	Tuberculosis	1.1
Other Accident	3.0	Other Accident	1.8	Malaria	0.4
Don't Know	2.0	Don't Know	1.6	Tetanus	0.4
All causes	100.0	All causes	100.0	All causes	100.0

Source: Computed from Priority Mortality Table F.2013 CIPS

Table 16b.Cause of death among children under five, Cambodia 2008 Census. Total

Both sexes		Males		Females	
Cause of death	Percent of deaths	Cause of death	Percent of deaths	Cause of death	Percent of deaths
Fever	31.5	Fever	33.0	Fever	31.7
Dengue fever & malaria	18.4	Tetanus	15.5	Dengue fever & malaria	19.8
Tetanus	12.2	Other illness	13.7	Tetanus	12.1
Other illness	11.7	Dengue fever & malaria	11.9	Other illness	11.5
Accidents	6.8	Not Known	8.0	Diarrhea	6.6
Diarrhea	6.5	Diarrhea	5.2	Accidents	5.7
Not Known	5.6	Accidents	5.1	Not Known	5.4
Heart disease	3.7	Heart disease	4.1	Heart disease	3.8
Tuberculosis	3.2	Tuberculosis	3.0	Tuberculosis	2.8
HIV/AIDS	0.5	HIV/AIDS	0.4	HIV/AIDS	0.6
All causes	All causes	All causes	All causes	All causes	All causes

Source: Computed from Priority Table G2. 2008 Census

Fever is still the most dominant cause of death for each of male and female children under five, but the other causes of death appear to affect the male and female children differently. For example, male children appear to be more prone to dying from drowning, road accidents, dengue, tuberculosis, malaria and tetanus than female children, whereas female children appear to be slightly more susceptible to dying from heart diseases. The cause of death structure by sex in 2013 is different from that of 2008. A very small percentage of children, both male and female have

been reported to have died fro m HIV/AIDS, which is presumably due to vertical transmission of the diseases from mother to child during the mother's pregnancy.

These findi ngs in dicate th at effort s to reduce child mortality in Cambodia sho uld in clude the prevention and trea tment of a range of diseases, but in particular, th e diseases related to fever , dengue and malaria.

3.5.2. Cause of death among males by broad age-group

Table 17ashows the cause of death structure among males aged 5-59 years and 60 years and over as of CIPS 2013 . These causes of de ath structures are different fro m those among male children under five in that inf ectious and parasitic diseases do not figure in death causation as prominently as they do in the cas e of children under give. Further, among males aged five years and over, the cause of death struc ture is differ ent be tween the two bro ad age -groups: 5-59 a nd 60 years and over. Accidents , comprising la nd mines, road accidents, drowning and " other" accidents accounted for more than 35 percent of all deaths among males aged 5-59 years, followed by heart disease, fever and malaria. "Other" illnesses form a major category with nearly a fifth (19.4%) of deaths of males of this age-group. Among males aged 60 years and over, the two major causes of death are heart disease (37.9%) and the category "Other illnesses" (33.4%) of deaths (Table 17a). The situa tion was d ifferent in 2008 (Table 17b) where deaths due t o dengue and malaria a nd tuberculosis (especially among males aged 60 plus) were more prevalent.

Table 17a.Cause of death among males age-groups 5-59 and 60+, Cambodia 2013 CIPS. Total

Males aged 5-59 years		Males aged 60+ years	
Cause of death	**Percent of deaths**	**Cause of death**	**Percent of deaths**
Fever	9.0	Fever	5.1
Diarrhea	1.7	Diarrhea	3.7
Tuberculosis	4.8	Tuberculosis	5.0
Heart disease	10.6	Heart disease	37.9
Dengue fever	0.5	Dengue fever	0.0
Malaria	6.7	Malaria	1.6
Tetanus	5.3	Tetanus	3.2
HIV/AIDS	3.9	HIV/AIDS	0.0
Pregnancy complications	0.0	Pregnancy complications	0.0
Delivery complications	0.0	Delivery complications	0.0
Other illnesses	19.4	Other illnesses	33.6
Land mines	1.5	Land mines	0.0
Road accidents	15.4	Road accidents	1.5
Drowning	8.3	Drowning	0.0
Other accidents	10.4	Other accidents	6.0
Don't know	2.5	Don't know	2.4
Total (N) = 15,295	100.0	Total (N) = 9,351	100.0

Table 17b.Cause of death among males age-groups 5-59 and 60+, Cambodia 2008 Census. Total

Males aged 5-59 years		Males aged 60 years +	
Cause of death	**Percent**	**Cause of death**	**Percent**
All causes	100.0	All causes	100.0
Accidents	24.6	Other illness	41.7
Dengue fever and malaria	18.6	Heart disease	17.8
Other illness	15.0	Tuberculosis	13.9
Fever	12.6	Fever	7.7
Heart disease	7.7	Accidents	6.2
Tuberculosis	6.0	Not Known	5.4
Tetanus	4.8	Dengue fever and malaria	3.1
Not Known	4.5	Diarrhea	2.5
Diarrhea	3.7	Tetanus	1.6
HIV/AIDS	2.5	HIV/AIDS	0.2

Source: Computed from Priority Table G2.

3.5.3 Cause of death among females by broad age-group

Table 18 shows the cause of de ath struc ture a mong fe males aged 5 -59 years and 60 years and over. Further, the cause of death structure among females over their reproductive ages 15-49 years is also shown. Similar to males, death causation among females aged 5 years and over is different from that among female children aged under five years, particularly with respect to infectious and parasitic d iseases. Further, si milar to males, the cause of death structure among females is different with respe ct to the thre e broa d ag e-groups: 5-59, 60 years and over a nd 15-49 years. Dengue and malaria, fever, accidents and heart disease account for 63 percent o f deaths a mong females aged 5 -59 years. Deaths am ong women aged 60 years and over were caused m ainly by the group defined as "other illnesses" which accounted for nearly one half of female deaths in this age-group. A mong the defined causes o f death he art disease, fever, tuberculosis and accid ents comprised the leadin g causes of death in this age -group. Women who died in their reproducti ve ages 15 and 49 years, died mainly fro m dengue and malaria, heart d isease, accid ents and fever. Delivery and pregnancy complications accounted for just under a tenth of female s deaths in their reproductive ages.

Table 18b.Cause o f death a mong f emales age-groups 5-5 9, and 60+ a nd 15 -49, Cam bodia 2008 Census. Total

Females aged 5-59 years		Females aged 60 years and more		Females aged 15-49 years	
Cause of death	Percent	Cause of death	Percent	Cause of death	Percent
All causes	100.0	All causes	100.0	All causes	100.0
Dengue fever and malaria	18.3	Other illness	48.9	Other illness	20.8
Other illness	16.6	Heart disease	14.6	Dengue fever and malaria	17.4
Fever	15.6	Tuberculosis	12.7	Heart disease	13.4
Accidents	12.3	Fever	6.9	Accidents	11.8
Heart disease	9.7	Accidents	6.5	Fever	10.8
Tuberculosis	7.2	Not Known	4.4	Tuberculosis	9.8
Tetanus	4.7	Diarrhea	3.1	Delivery complications	6.4
Delivery complications	4.1	Dengue fever and malaria	1.5	Not Known	4.1
Diarrhea	3.7	Tetanus	1.0	Tetanus	3.9
Not Known	3.6	Pregnancy complications	0.3	HIV/AIDS	3.5
HIV/AIDS	2.6	Delivery complications	0.1	Pregnancy complications	2.6
Pregnancy complications	1.7	HIV/AIDS	0.0	Diarrhea	2.5

Source: Computed from Priority Table G2.

3.5.4. Deaths reported in the households

In most developing countries vital events such as births and deaths are consider ed to be vast ly unregistered. It may be possible in sample surveys or censuses to elicit more complete information about these events if sufficient t ime i s gi ven to well-trained intervi ewers to obta in suc h information through probing questi ons, but the report ed nu mber of deaths (and births) in the household in the last 12 months is deemed to be very much under-reported.

A question was asked at CIPS 2013 whether the deaths reported to have occurred in the household in the last 12 months were registered with the civil registration authorities. Table 19 shows what percentage of deaths reported in the household in the last 12 months are also registered. It is found that less than one ha lf (43%) of al l deaths reported in the household were registe red in the civil registration s ystem. Thus, a surve y or a census ca n be consi dered to provide better coverage of deaths than c ivil r egistration, bu t this is not even half as good enough. Further, the extent of registration of the re ported nu mber de aths in th e household is seen to var y with the age of th e deceased. Deaths of young persons aged under 15 years are the least registered. In fact no d eaths of persons aged 10 -14 were regist ered. The registration of household deaths appears to become a little better from age 15 onwards, but these do not appear to follow any pattern (see Figure 9).

Table 19. Number of Deaths in Households in the year and the percentage registered

Age-group (years)	Deaths reported in the household in the last 12 months	
	Number reported	Percentage registered
0 - 4	10,871	15.79
5 - 9	3,796	16.81
10-14	834	0.00
15 - 19	1,744	52.29
20 - 24	2,654	39.64
25 - 29	3,131	59.18
30 - 34	2,232	49.19
35 - 39	1,368	60.23
40 - 44	1,914	45.98
45 - 49	1,837	33.70
50 - 54	4,250	56.94
55 - 59	3,675	64.11
60 - 64	2,994	47.63
65 - 69	2,552	68.42
70 - 74	4,125	56.80
75 - 79	3,942	48.30
80 - 84	2,577	52.85
85 - 89	1,891	43.15
90 - 94	420	45.48
95+	1,223	61.32
Total	58,031	42.92

Source: Computed from Priority Table G 4

Figure 9. Percentage of deaths in the household in the last 12 months which are registered
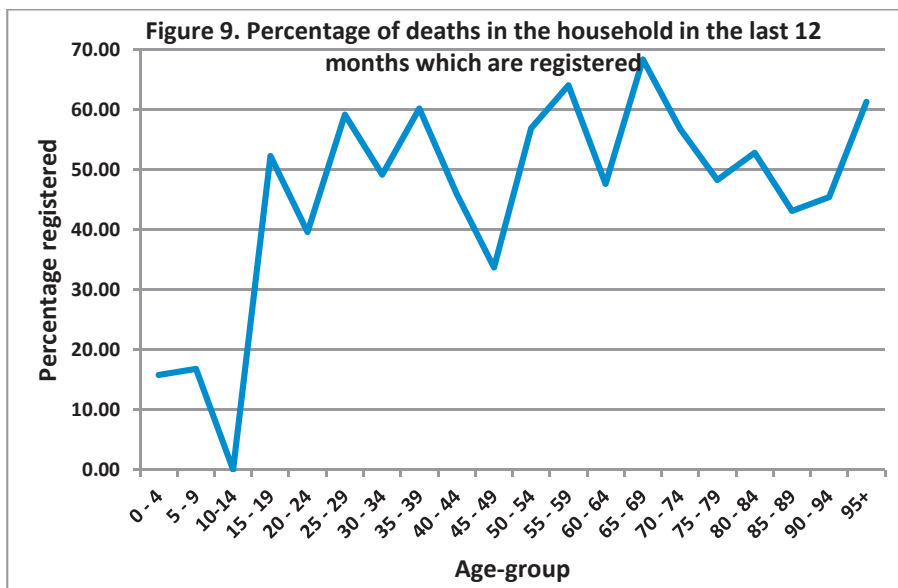
Source: Computed from Table 19

CHAPTER 4

Conclusion

The best source of infor mation on fer tility a nd mortality is a com plete and accurate vital registration system. Until such time as a vital regi stration system is op erating in Cambodia, data collected at censuses and surve ys have to be depended upon for estimating fertility and mortality. In a properl y conducted surve y, more resources and time can be devoted to training o f interviewers and data collection, which cannot be done in a census. However, some data from the Cambodia Inter-c ensal Population Surv ey 2013, part icularly those at th e prov incial level are believed to m uch deficient in quality. As such, estim ates of f ertility and mortality based on these data should be interpreted as providing indications of trends in these demographic parameters and of the range in which the values of parameters could lie.

Considering all the factors mentioned a bove and ta king into account the tr ends in de mographic parameters from other sources and v arious estimates derived in this chapter, it may be concluded that the total fertility rate in C ambodia derived from the CIPS 2013 data is around 2.80, 2.15 and 3.05 for Total, Urban and Rural areas respecti vely (with a reference period of March 2012-March 2013), the infant mortality rate is around 33, 9 a nd 38 per 1,000 li ve births for the Tot al, Urban and Rural areas respectively (reference period March 2012-March 2013), the under-five mortality rate (U5MR) is around 53, 15 and 60 per 1,000 li ve b irths for Tot al, Urban and Rural areas respectively. and the maternal mortality ratio is around 250, 67 and 299 per 100,000 live births for Total, Urban and Ru ral areas respectively (reference period March 2012-March 2013). Figures 10 and 11 show that the declining trend in fertilit y and infant mortality is continuing, although the speed of decline appears to have slowed down a li ttle, whi ch is to be expected at com paratively moderate levels of these parameters.

Figure 10. Trend in total fertility rate, Cambodia Total. CDHS 2000 - CIPS 2013

Figure 11. Trend in infant mortality rate, Cambodia. Total. CDHS 2000 - CIPS 2013
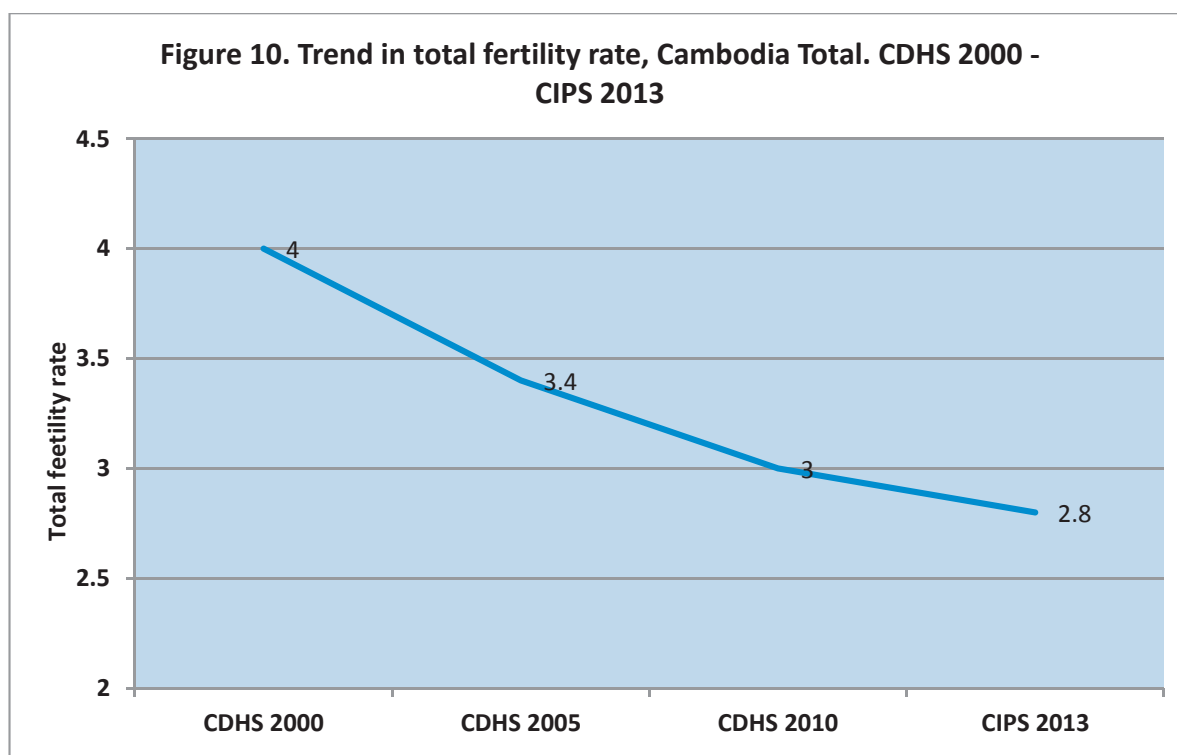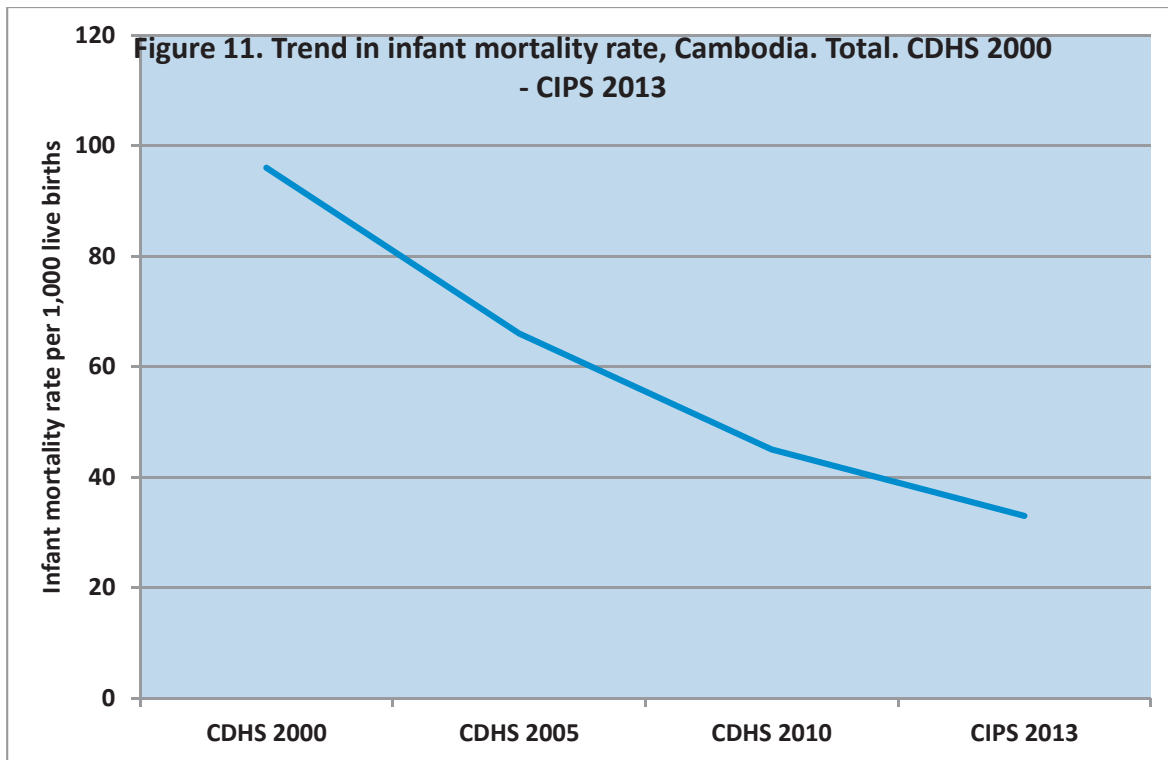
An analysis of the cause of death structure show s the predominance of infe ctious and parasitic diseases in the causation of death of children unde r five years of age. The cause of death structur e among older males and females is differ ent from that of childre n under five , with accidents and degenerative diseases playing major roles in the deaths of men and women above the age of f ive years, although the infectious and parasitic diseases are still found to be very prominent.

It is found that onl y 43 percent of the deaths reported in the household in the last 12 m onths had been registered. It is not known what percentage of the bir ths reported in the last 12 m onths was registered, but it would be very usefu l to ask question about the registra tion of births as well. Combining the extent of registration of r eported births and de aths in the househol d could provide better estimates of early age and maternal mortality by direct calculations.

Finally, a word about the Cambodian M illennium Dev elopment Goals (CMDG) on c hild health. The estimates of fertility and infant mortality appear to be on course for m eeting the target set for 2015; in fact the target for total fertility rate (TFR) appears to have been already achieved. In this respect, perhaps the target for the TFR needs to be reviewed and a new target aiming for a TFR of 2.5 for the year 2015 should be set.

GLOSSARY

Adult Literacy Rate
Percentage of lit erate populati on aged 1 5 and m ore to total populati on aged 15 and m ore in a given area.

Age
Total years completed by a person on his/her last birthday.

Age Dependency Ratio
The percentage of populati on in the younger (0-14) and older (65 +) age groups t o population in the age group 15-64.

Age-Specific Economic Activity Rate
Percentage of economically active population in an age group to total population in that age group

Age-Specific Fertility Rate
The number of births to women of a given age group per 1,000 women in that age group

Annual Exponential Growth Rate

$$r = \frac{\log_e P_t - \log_e P_o}{t}$$

$$P_t = P_o e^{rt}$$

Where, Po is the population at the base year, Pt is the population at year 't' and 't' is the number of years betwe en Po and Pt. Here the com pounding with the rate of growth 'r' is done on a continuous basis.

Average Household Size
This is the average number of persons in normal or regular households (i.e. excluding institutional and homeless households and households of boat and transient population).

Child-Woman Ratio
This is the ratio of children under 5 years old in a population to women in the age group 15 -49. It is com puted b y d ividing the nu mber of children aged 0 -4 in the populati on b y the nu mber of women aged 15-49.

Crude Birth Rate (CBR)
The number of live births in a year per 1,000 population
Crude Death Rate
The number of deaths per 1,000 population in a given year

Fertility
Fertility is defined a s the childbearing pe rformance of a woman or group of wom en measured in terms of the actual number of children born.

Infant Mortality Rate
Infant Mortality Rate is the number of deaths of infants under age one year per 1,000 live births in a given year.

Live Birth

This refers to the complete expulsion (delivery) or extraction from its mother of a product of conception (baby), irrespective of the duration of pregnancy. The baby after such separation breathes or shows other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached. Each product of such birth is considered as live birth.

Maternal Mortality

This refers to the number of women who die while pregnant, during delivery or within 42 days after delivery.

Median Age

It is defined as the age, which divides the population into two equal size groups, one of which is younger and the other of which older than the median.

Myer's Index

This is a measure of heaping on individual ages or terminal digits. The tendency of enumerators or respondents to report certain ages at the expense of others is called age heaping, age preference or digit preference (e.g. ages ending in 0 or 5). The theoretical range of Myer's index extends from the minimum of 0, when there is neither preference nor avoidance of any particular digit at all, to the maximum of 90 when all ages are reported in a single terminal digit.

Total Fertility Rate (TFR)

The total fertility rate is the number of children which a woman of hypothetical cohort would bear during her life time if she were to bear children throughout her life at the rates specified by the schedule of age specific fertility rates for the particular year and if none of the m dies before crossing the age of reproduction. Therefore Total fertility rate is the number of births a woman would have if she experienced a given set of age specific birth rates throughout her reproductive span. It is the sum of age-specific fertility rates.

UN Age accuracy Index

It is the sum of (i) the mean deviation of the age ratio for males from 100 (ii) the mean deviation of the age ratios for females from 100 and (iii) three times the mean of the age-to-age differences in reported sex ratios. In this procedure the age ratio is defined as the ratio of the population in a given age group to one-half the sum of population in the preceding and following groups.

Whipple's Index

Whipple's Index is a measure of preference for ages ending in 0 and 5. Its range is from 100, indicating no preference for 0 and 5, up to 500 indicating that only 0 and 5 were reported.

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ANNEXES

Cambodia Inter-Censal Population Survey 2013 (CIPS 2013)
List of Priority Tables

The List of Prior ity Tables for CIPS is drawn from the correspondin g List of 20 08 Census with som e revision s, additi ons and deleti ons in view of the various chang es in the questionnaire. The f ollowing L ist contains th e old Tab les, the new Ta bles and the revised Tables as indicated.

Table No. Title

(i) A Series. General Population Tables
1. A1 Population by Single Years of Age and Sex.
2. A2 Population by Marital Status, 5-year Age Group and Sex.
3. A3 Population by Mother Tongue, 5-year Age Group and Sex.
4. A3A Population by Mother Tongue (Minority Languages), 5-year Age Group and Sex.
5. A4 Population by Religion, 5-year Age Group and Sex.
6. A5 Population by Relationship to Head of Household, 5-year Age Group and Sex.
7. A6 Population by Place of Enumeration (classified by Total, Urban and Rural), Place of Birth and Sex.

(ii) B Series. Literacy and Education Tables

8. B1 (Revised) Population aged 7 and over by Literacy in any language, Level of Education, Usual Activity Status, Age Group and Sex.
9. B1A Population aged 7 and over by Language Literacy, Age Group and Sex.
10. B2 (Revised) Population aged 5 and over Attending School/Educational Institution by Literacy, Level of Education, Age Group and Sex.
11. B3 (New). Population aged 7 and Over by Completed Level of Education, Main Subject of Study and Sex

(iii) C Series. Economic Tables

12. C1 Population by Usual Activity Status, 5-year Age Group and Sex.
13. C2 Employed Persons aged 5 and over by Status in Employment, 5-year Age Group and Sex.
14. C3 Employed Persons aged 5 and over by Sector of Employment, 5-year Age Group and Sex.
15. C4 Unemployed Persons aged 5 and over by Status in last Employment, 5-year Age Group and Sex.
16. C5 Economically Active Population aged 5 and over by Secondary Economic Activity, 5-year Age Group and Sex.
17. C6 Economically Inactive Population aged 5 and over by Secondary Economic Activity, 5-year Age Group and Sex.
18. C7 Employed Persons aged 5 and over by Employment Status, 5-year Age Group and Sex.
19. C8 Economically Active Population aged 5 and over by Industrial Section, Major Group of Occupation and Sex.
20. C9 Economically Inactive Population aged 5 and over by Functional Categories, 5-year Age Group and Sex.
21. C10 Employed Population aged 5 and over by Industrial Section, 5-year Age Group and Sex.
22. C11 Employed Population aged 5 and over by Major Group of Occupation, Age Groups and Sex.
23. C12 Employed Population aged 5 and over by Main Status in Employment, Industry and Sex.
24. C13 Employed Population aged 5 and over by Main Status in Employment, Occupation and Sex.
25. C14 Employed Population aged 5 and over by Literacy in any language, Level of Education, Occupation and Sex.
26. C15 Employed Females aged 5 and over by Industrial Sections and Marital Status.
27. C16 Employed Females aged 5 and over by Occupational Group and Marital Status.
28. C17 Employed Population aged 5 to 20 by School Attendance, Single Year of Age and Sex.

(iv) D Series. Migration Tables

29. D1 Migrants classified by Place of Last Residence, Duration of Residence in Place of Enumeration and Sex.
30. D2 Migrants from other Provinces classified by Province of Enumeration, Province of Previous Residence, Duration of Stay and Sex.
31. D3 Migrants by Place of Last Residence, Reason for Migration, Duration of Residence and Sex.
32. D4 Migrants Economically Active Population aged 5 and over by Place of Last Residence, Industrial Section and Sex.
33. D5 Migrants Economically Active Population aged 5 and over by Place of Last Residence, Major Group of Occupation and Sex.
34. D6 Migrants from Place of Last Residence aged 7 and over by Educational Level, Usual Activity Status, 5-year Age Group and Sex.
35. D7 Migrants in the previous five years by 5-year Age Group and Sex.

(v) E Series. Disability Tables

36. E1 (Revised) Physically/Mentally Disabled Persons by 5-year Age Group and Sex.
37. E2 (Revised) Physically/Mentally Disabled Persons by Category of Disability, Marital Status and Sex.
38. E3 (Revised) Physically/Mentally Disabled Persons by Literacy in any language, Level of Education, 5-year Age Group and Sex.
39. E3A (Revised) Physically/Mentally Disabled Persons by Category of Disability, Literacy in any Language, Level of Education and Sex.
40. E4(Revised) Physically/Mentally Disabled Persons by Main Activity, 5-year Age Group and Sex.
41. E4A (Revised) Physically/Mentally Disabled Persons by Category of Disability, Main Activity and Sex.

(vi) F Series. Fertility Tables

42. F1 Females aged 15 to 49 bearing children during last year by 5-year Age Group, Educational level and Births during last year by Birth order.
43. F2 Females aged 15 to 49 bearing children during last year by 5-year Age Group, Usual Activity Status and Births
during last year by Birth order.
44. F3 Females aged 15 and over by Parity, Total Children Ever Born, 5-year Age Group and Educational Level.
45. F4 Females aged 15 and over by Parity, Total Children Ever Born, 5-year Age Group and Usual Activity Status.
46. F5 Females aged 15 and over by Number of Surviving Children, 5-year Age Group and Educational level.
47. F6 Females aged 15 and over by Number of Surviving Children, 5-year Age Group and Usual Activity Status.
48. F7 Females aged 15 to 49 bearing children during last year by 5-year Age Group and Type of Assistance during Delivery.
49. F8 (New) Registration of Birth in the last year by Educational Level of Mother
50. F9. (New)Ever Married Females Aged 15 and above by Age at First Marriage and Current Age
51. F10. (New) Ever Married Females Aged 15 and above by Age at First Marriage and by Number of Children Ever Born
52. F11. (New)Ever Married Females Aged 15 and above by Age at First Marriage and Number of Children Ever Born
53. F12. (New)Ever Married Females Aged 15 and above by Parity, Total Children Ever Born, Age at First Marriage
54. F13. (New)Children Living with Own Mother by Age and Age of Mother
55. F14. (New)Females Aged 15 and above Living with Own Children by Parity, Total children Ever Born and Age
56. F15. (New)Ever Married Females Aged 15 and above by Age at First Child Birth and Current Age
57. F16. (New)Ever Married Females Aged 15 and above by Age at First Child Birth and Number of Children Ever Born
58. F17. (New)Ever Married Females Aged 15 and above by Age at First Child Birth and Number of Children
59. F18. (New)Ever Married Females Aged 15 and above by Parity, Total Children Ever Born, Age at First Child
60. F19. (New) Ever Married Population by Age at First Married and Sex of Respondent

(vii) G Series. Mortality Tables

61. G1 Population, Number of Deaths in Households in the last year by broad Age Group and Sex.
62. G2 Deaths in Households in the last year by Cause of Death, broad Age Group and Sex.
63. G3 Maternal Deaths by Type of Assistance, Place of Death and 5-year Age Group.
64. G4. (New) Number of Deaths in Households in the Year by Death Registration, Broad Age Groups and Sex

(viii) H Series. Household and Housing Amenity Tables
65. H1 Buildings/Structures with Households by Type of Use.
66. H2 Buildings/Structures (Residential + Partly Residential) by Predominant material of Roof, Wall and Floor.
67. H3 Households by Tenure Status of Dwelling, Household Size and Number of Rooms Occupied.
68. H4 Households by Size of Households, Number of Economically Active Members and Sex of Head of Household
69. H5 Head of Households (aged 10 and over) by Usual Activity Status, 5-year Age Group and Sex.
70. H6 Households by Main source of Light used and Household Size.
71. H7 Households by Type of Fuel used for Cooking and Household Size.
72. H8 Households classified by Main source of Drinking Water, Location of Source and Household Size.
73. H9 Households by Tenure Status of Dwelling and Toilet Facility Category.
74. H10 Households and Population (in 10,000's) by Tenure Status of Dwelling, Availability of Electric Power and Toilet Facility.
75. H11 Households classified by source of Drinking Water, Availability of Electric Power and Toilet Facility.
76. H12 (Revised)Households by Type and Number of Assets owned.
77. H13 (Revised)Households by Household Size and Access to Internet.
78. H14 (New) Households with Separate Kitchen by Household Size and Number of Rooms Occupied

Note: The lowest level of presentation of all tables is Province except Tables D2 and D3 which are presented at National Level

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