

PAPUA NEW GUINEA
DEMOGRAPHIC AND HEALTH SURVEY 1996

NATIONAL REPORT

NATIONAL STATISTICAL OFFICE
PORT MORESBY

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PREFACE

The Demographic and Health Survey (DHS) National Report summarises the findings of the 1996/1997 Papua New Guinea (PNG) Demographic and Health Survey conducted by the Population and Social Statistics Division of the National Statistical Office.

One of the major objectives of the DHS was to establish an up-to-date benchmark data set to evaluate population, health and family planning programmes in PNG. The results presented in the report provide a clear picture of the current level of demographic and health indicators and show the likely course for the future. Decision makers especially, are encouraged to use the report. The information available is indeed essential for monitoring and evaluating the performance of health and family planning programmes.

The findings presented in this volume represent a subsample of about 5000 households, from the sample of 25,000 households selected across the country. Women of ages 15-49 were the respondents. Some of the indicators are presented below

Some key indicators from the DHS concerning women and children

Women	Indicator
Literacy rate among all women 15-49 years	56.1%
Awareness of modern methods of contraception, all women 15-49	67.7%
Contraceptive prevalence rate (CPR), all methods, all women 15-49	19.8%
CPR, all methods, currently married women 15-49	25.9%
Average desired family size, all women 15-49	3.5
Unmet need for family planning among all currently married women (age 15-49, want no more children, or are unsure, and don't use a contraceptive method)	45.9%
Total fertility rate in the five years preceding the survey	4.8
Infant mortality rate for the ten years preceding the survey	77
Under-5 mortality rate for the ten years preceding the survey	100
Maternal mortality ratio, circa 1984, per 100,000 deliveries	370

Children born in the past 3 years

Mother received tetanus-toxoid vaccination during pregnancy	68.8%
Mother received professional antenatal care	77.5%
Baby delivered with professional attention	53.2%
Baby delivered my mother alone and by herself	10.2%
Duration of breastfeeding (median, expressed in months)	25
Children 12-23 months old with BCG vaccination	90.7%
Children 12-23 months old fully vaccinated	38.7%
With acute respiratory infection (ARI) in past 2 weeks	12.6%
Those with ARI who were treated in a health facility	74.9%
With diarrhoea in past 2 weeks	16.5%
Those with diarrhoea who were NOT given increased fluids.	64.8%

An important feature of the report is the inclusion of the sampling variability. This should increase users' confidence in the use of this information.

The NSO is indebted to AusAID, the Government of PNG and the 19 Provincial Administrations for the successful execution of this activity.

September 1997

Nick Suvulo
NATIONAL STATISTICIAN

ACKNOWLEDGMENTS

The 1996 Demographic and Health Survey (DHS) was conducted as part of the Papua New Guinea (PNG) Population and Family Planning Project which commenced in August 1993 and is scheduled to end in 1998. The Project was instituted to essentially assist in strengthening capacities within the government agencies involved in health and family planning services deliveries. The major objective of the Demographic and Health Survey component on the other hand was to provide an up to date benchmark data set of health and family planning indicators, including being a data base for evaluating and planning future health and family planning programme efforts.

The undertaking of the survey was inevitably no easy task, as with previous national sample surveys. The eventual successful completion of the DHS signified the extent of coordinated efforts the National Statistical Office has with other organisations and individuals. Funding for the DHS was provided by AusAID and channelled through Sagric International, the Managing Contractor for the Population and Family Planning Project. Short term technical assistance and missions by experts from the Australian Bureau of Statistics were obtained during the questionnaire design and data processing stages. Substantial technical contribution came directly from the resident DHS Adviser, Dr A. M. Marckwardt, who had to cope with a diverse range of situations inherent in PNG. Mr. John Kalamoroh, the DHS Project Director provided the overall direction and management for the DHS. His strong executive leadership provided the motivation and focus for the staff engaged.

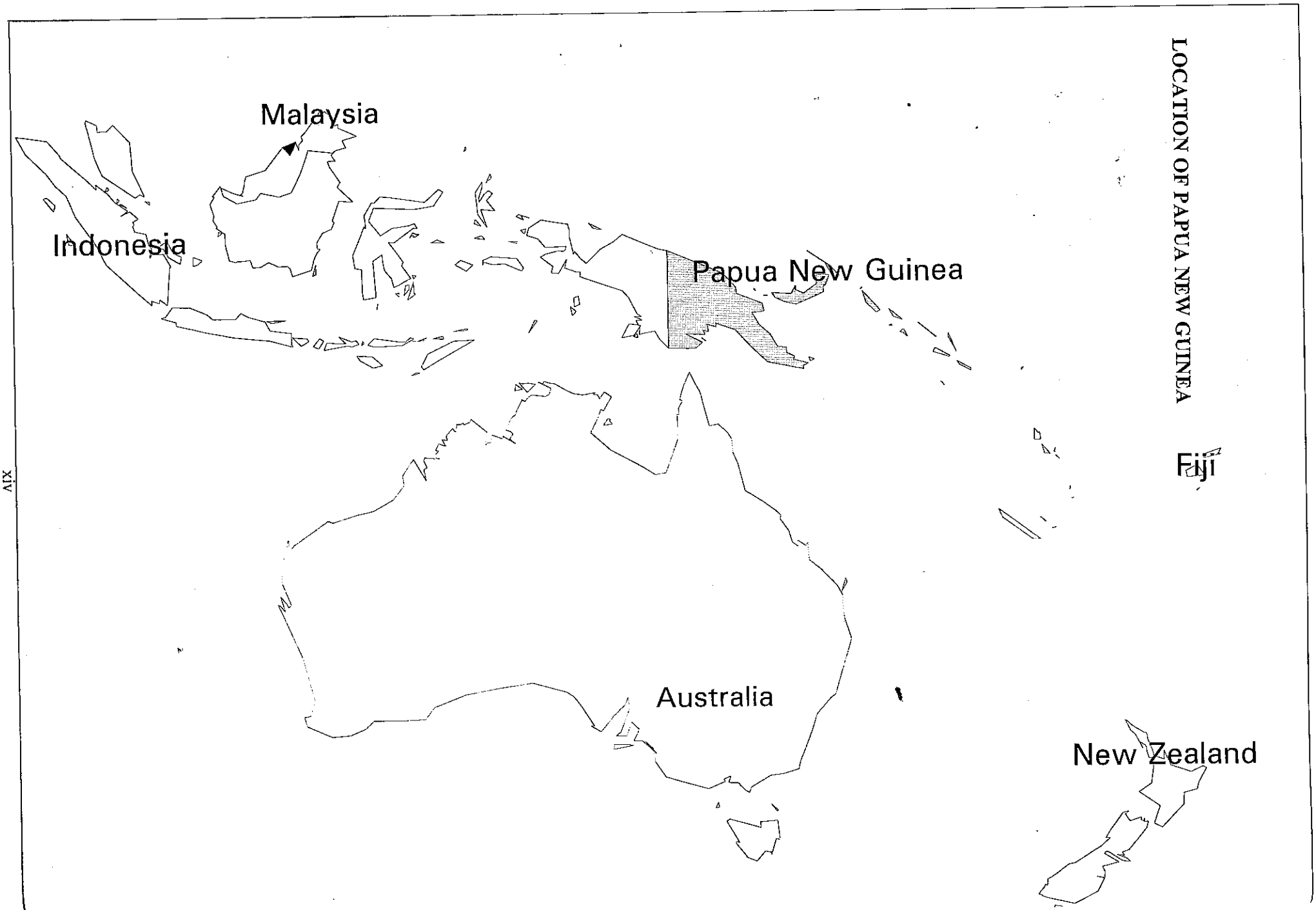
The Population and Social Statistics Division of the NSO undertook the responsibility of implementing the DHS fieldwork and data processing. The huge task has only been completed through their dedication. The provincial field operations were capably coordinated by the DHS coordinators and their assistants. Despite the hardships their commitment never wavered. The ever willingness to assist the NSO displayed by respondents and communities are much appreciated.

Acknowledgment is also due to the authors of the various chapters of this report. These include Arthur Jorari, Lina Bade, Esther Lavu, Rita Pala, Christine Aisoli, Kit Ronga, Dr. Marckwardt, Peter Siopun, John Kalamoroh and Alohai Pochapon. Dr. Marckwardt in turn reviewed all the written chapters. The amount of work put in by Esther Lavu to manage and finalise this report needs to be fully appreciated.

Nick Suvulo
NATIONAL STATISTICIAN

September 1997

LOCATION OF PAPUA NEW GUINEA



CHAPTER 1

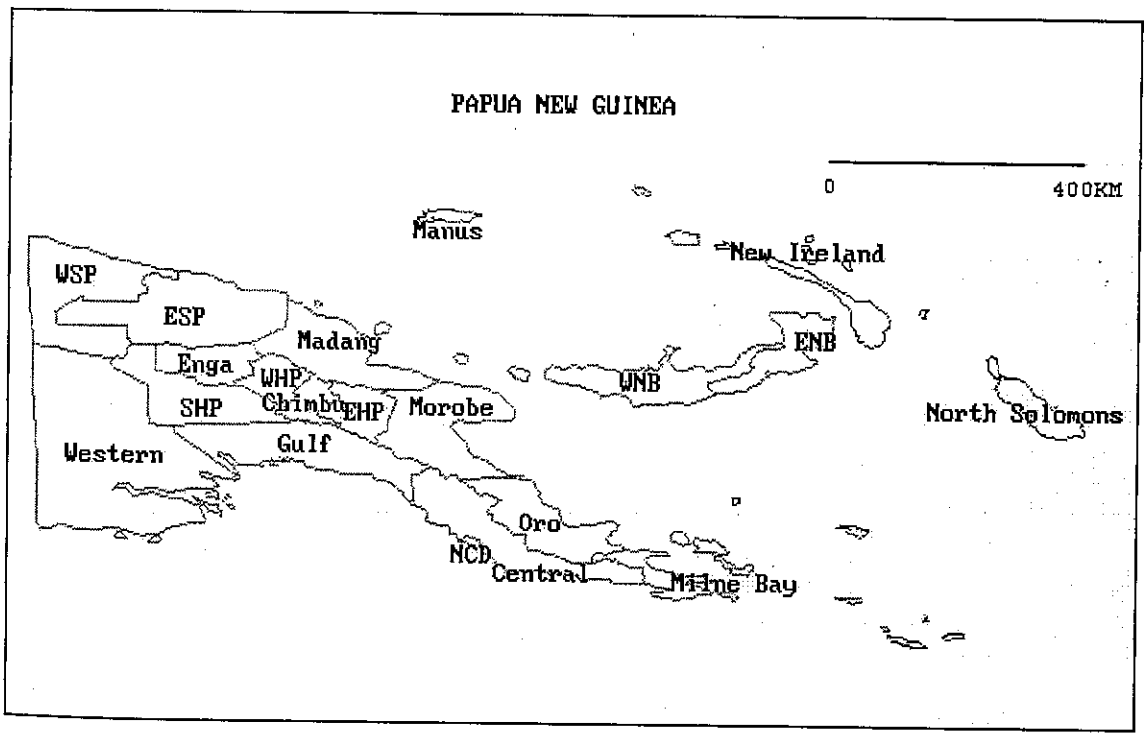
INTRODUCTION

Arthur Jorari & John Kalamoroh

1.1 Geography

Papua New Guinea (PNG) gained independence from Australia in September, 1975. It has a total land area of 463,840 square kilometres and occupies the eastern half of the island of New Guinea and about 600 associated islands. Only 13 per cent of the country is inhabited (NSO, 1994). The terrain is rugged with high mountain ranges, steep valleys and extensive marshes (in the coastal areas). As a result, there are only few roads and many areas of the country are still inaccessible by vehicles.

Administratively, PNG is divided into 20 provinces (see map), including the National Capital District (NCD) which is totally urban. Six provinces, including the NCD are located on the Southern Coastal Region of the country. These are Western, Gulf, Central, NCD, Milne Bay and Northern (Oro). Four provinces are located on the Northern Coastal Region: Morobe, Madang, East Sepik and West Sepik. Five more provinces are found in the densely populated Highlands Region: Southern Highlands, Enga, Western Highlands, Chimbu and Eastern Highlands. An additional five provinces are located in the Islands Region: Manus, New Ireland, East New Britain, West New Britain and North Solomons. For administrative purposes, each of these provinces is divided into districts, community government areas and council wards. Over one third of the population of PNG live in the densely populated Highlands Region of the mainland (NSO, 1994). Papua New Guinea is also noted for its cultural and linguistic diversity with over 700 languages spoken.



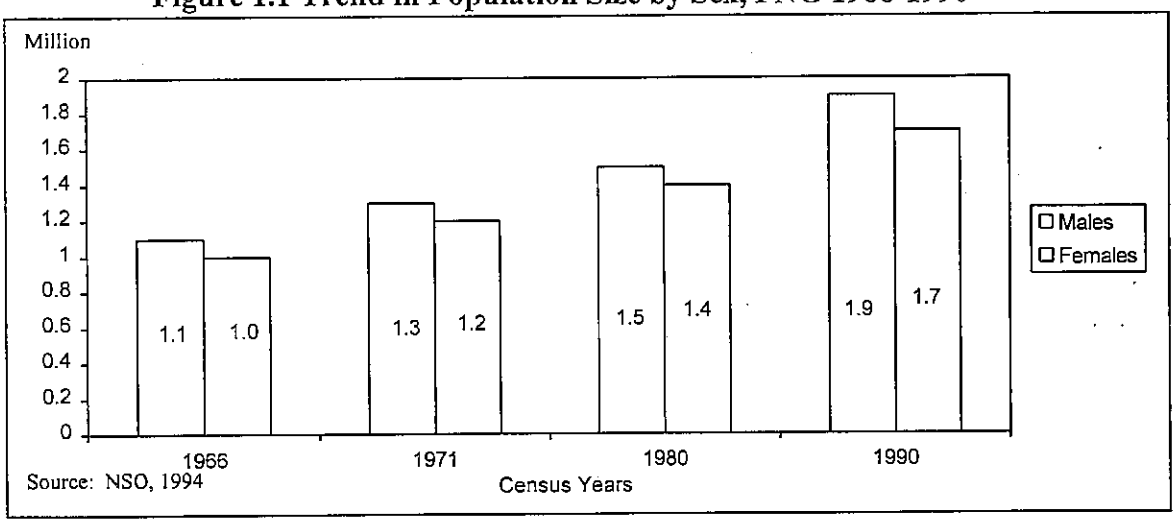
1.2 Demographic and Health Indicators

Population Size, Density and Distribution

The 1995 population of PNG was estimated to be 4.03 million[1], with a sex ratio of about 110.4 (Jorari and Lasia, 1996). This figure represents an increase of around 452,000 from the reported *de-facto* population in the 1990 census[2]. Figure 1.1 shows that, since 1966, the citizen population has increased in size by more than 50 per cent, increasing from about 2.2 to 3.6 million in 1990. Projections indicate that, by the year 2020, the population will reach about 7 million (Jorari and Lasia, 1996). The average growth rate of PNG's citizen population between 1980 and 1990 was 2.3 per cent per annum (NSO, 1994), and at this rate the population will double in about 30 years.

The population density of PNG in 1990 was about 62 people per square kilometre of inhabited area (NSO, 1994). The 1990 census results also show that there is a great variation in the average density by provinces, with a fluctuation from a low of 29 people per square kilometre in Central province to a high of 815 people per square kilometre in the National Capital District (NSO, 1994). Some areas in the urban sector are extremely crowded, particularly, the *squatter settlement* areas, where the densities could be as high as 1,000 people per square kilometre.

Figure 1.1 Trend in Population Size by Sex, PNG 1966-1990



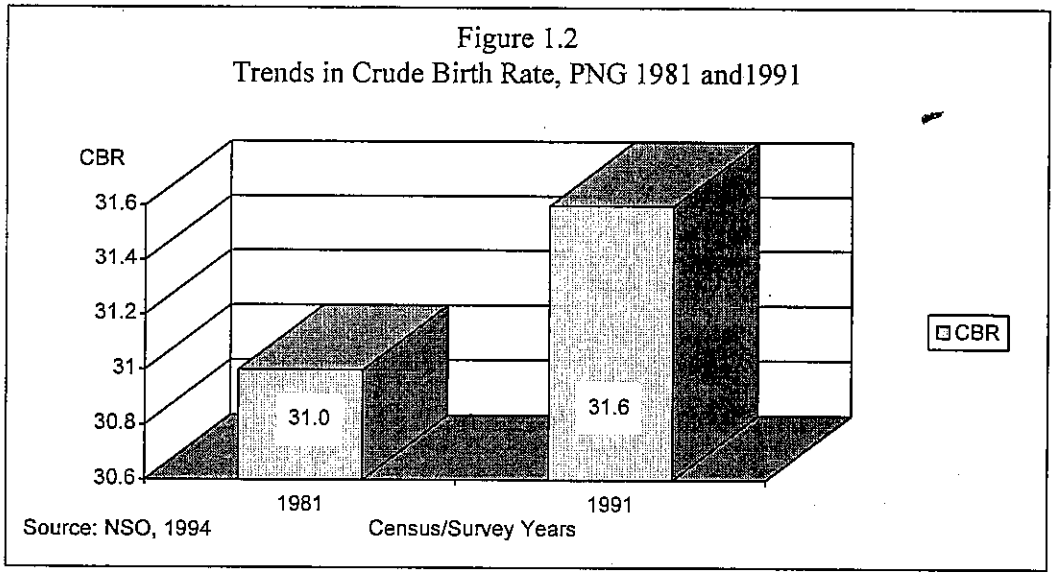
About 85 per cent of PNG's citizen population live in the rural areas. The urban population has been growing since 1966, from 5 per cent to 15 per cent in 1990 (NSO, 1994). The 1980 urban population was estimated at 12 per cent of the total citizen population. The urban population was growing by an average rate of about 4.6 per cent per annum between 1980 and 1990 (NSO, 1994), and it would double by the year 2005 if this growth continues.

[1] Excludes the population of North Solomons Province and PNG citizens who were living abroad.
[2] 1990 Census figures adjusted for age misreporting.

Fertility

Women of the reproductive age (15-49 years) represent about 24 per cent of the PNG population and about half of the female population in 1990 (NSO, 1994). The NSO (1994) estimated that the child-women ratio was 685 children per 1,000 women. The crude birth rate (CBR) was estimated at 31.6 per 1,000 population in 1991 (NSO, 1995), which is about 0.6 higher than the 1981 estimate. The CBR estimates in 1991 varied between provinces, with a low of 23.2 per 1,000 in Western Highlands province to a high of 38.2 per 1,000 in the Western province (NSO, 1995). The highland provinces generally have a much lower level of fertility than the rest of the country.

Figure 1.2
Trends in Crude Birth Rate, PNG 1981 and1991



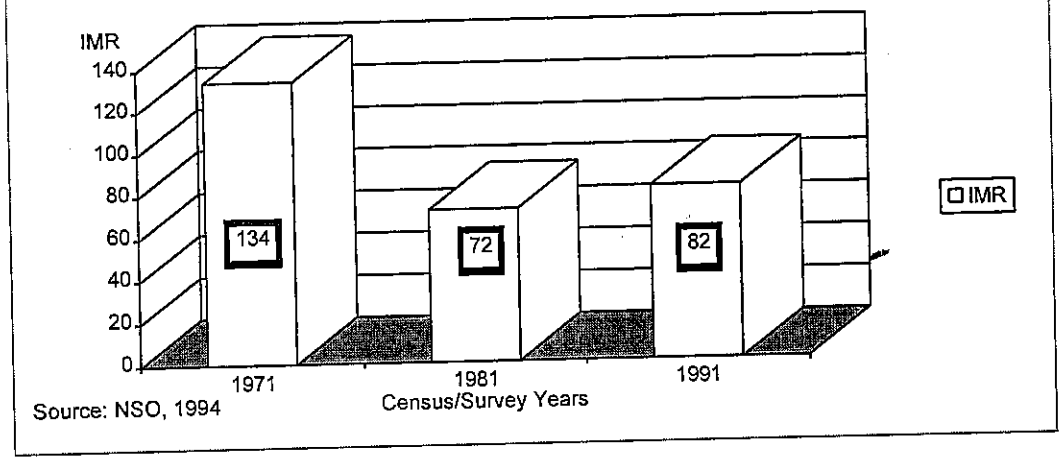
The total fertility rate was estimated to be 5.4 children per women in 1980 (Bakker, 1986). The NSO (1995) estimated that completed fertility was 5.2 children as measured for women in the age group 45-49 years. (This age group is when most women on average complete their reproductive cycle.) These rates of fertility are high and as a result, the age structure of the PNG population is very young, with about 42 per cent of the population under the age of 15 in 1990 (NSO, 1994).

Mortality

Infant (IMR) and child mortality represent the majority of all deaths and are considered as high in PNG. The IMR and child mortality levels were seen to be declining after 1971. Indirect estimation of mortality using the 1980 census and 1981 survey data yielded an infant mortality rate of 72 per 1,000. This was a decline from the 1971 estimate of 134 deaths per 1,000 population (Bakker, 1986). The infant mortality varied between provinces in 1980, with North Solomons and the NCD experiencing the lowest rates of 33 and 35 per 1,000 respectively, while Southern Highlands experienced the highest of 116 infant deaths per 1,000 population. Child mortality (at ages 1 to 4 years) at the national level in 1980 was 42 per 1,000 and variation among provinces prevailed, with the lowest estimated in the North Solomons with 17 deaths while Southern Highlands experienced the highest of 67 deaths (Bakker, 1986).

The IMR was expected to further decline after 1980, however, estimates from the 1990 census and the 1991 DHS show that IMR increased by approximately 14 per cent to about 82 deaths per 1,000 (Hayes, 1996). Hayes (1996) further reported that child mortality also increased in 1991, from 42 to 56 deaths per 1,000.

Figure 1.3
Trends in Infant Mortality Rate, PNG 1981 and1991



The impact of the mortality situation was reflected on the expectation of life at birth. It was estimated to be about only 51.7 years in 1991 (Hayes, 1996), up from 49.6 years in 1981. Life expectance for males was estimated to be higher than that for females in 1991, 52.2 and 51.4 years respectively. In almost all countries, the average life expectancies at birth are higher for females than for males and this was exactly the case in PNG according to the 1981 estimates; 48.8 years for males and 50.7 years for females.

1.3 Population Policy and Programs

PNG's population is characterised by high growth rates, high fertility and mortality rates, high rate of migration to urban centres, high unemployment rates, high illiteracy rates that affect the productivity of the labour force, low average life expectancy rates compared to other developing countries with similar characteristics, among many other related problems.

In 1987, the National Executive Council (NEC) decided that a policy on population should be formulated as soon as possible. NEC Decision Number 3/87 instructed the then Department of Finance and Planning to convene an Expert Committee on Population Policy. This committee was designated the National Advisory Committee on Population Policy (NACPP) and was responsible for the coordination of all activities related to the development of the NPP. The *Integrated National Population Policy for Progress and Development* of PNG was drafted in the late 1980's and early 1990's to address PNG's population problems and it was endorsed by the NEC on the 5 June, 1991. Under this NPP, the NEC also approved the establishment of a National Population Council (NPC) and the Population Planning Unit (PPU) to provide secretarial services to the NPC.

The PPU is currently located in the National Planning Office. Under the NPP, the NPC is the highest decision making body in relation to the population and development activity coordination, policy approval and programming. Technical advice to the NPC is provided by a Technical Advisory Committee (TAC) also established under the NPP.

The NPP (1991) concentrates on the sectors of health, education, family planning, and gives particular emphasis to the issues of migration and urbanisation. Rural agricultural development and equitable distribution of basic socio-economic services are viewed as important means to deter rural-urban migration.

To complement the implementation of the NPP, a number of projects are undertaken by the Government of PNG and aid donors. Firstly, with the assistance of the World Bank, ADB and AusAID, the government is currently implementing a *Population and Family Planning Project*, and the 1996 DHS is a data gathering component of this project. In addition, a number of other projects are being jointly funded by the government and additional aid donors. These include the *Integration of Population Factors into Development Planning*, funded by UNFPA/ILO, *Manpower and Planning Development* funded by UNDP and some others. These all address the NPP objectives and targets in one way or another.

1.4 Health Policies and Programs

Improving the health of the people of PNG is the main objective of the PNG Government's health plan (GoPNG, 1996b). The success of the national health system will be measured by many indicators, including the number of lives saved, reductions in preventable illness and disability, and improved health behaviours of the population (GoPNG, 1996b). To realise this objective, the PNG Health Plan emphasises the following areas:

- Increase health services to the rural majority;
- Expand health promotion and preventive health services;
- Reorganise and restructure the national health system;
- Develop staff professional, technical and management skills;
- Upgrade and maintain investment in health infrastructure (GoPNG, 1996b).

Allocation of resources (both staff and budget) and daily activities in the next five years, will support the above priorities. The single most important aim will be to improve and extend health services to the rural majority. The focus will be on health promotion, information, education and communication, preventive health, and curative health services. The strategies to achieving the above priorities are:

- Health promotion, information, education and communication;
- Preventive health: Family health services;
- Preventive health: Disease control;
- Preventive health: Environmental health;
- Curative health services (GoPNG, 1996b).

Programmes in support of this National Health Plan include the *Population and Family Planning Project*, cited above, where the National Department of Health is also implementing various components. In addition, with the support of the Australian Government, National Department of Health is implementing the *Sexual Health and HIV/AIDS Prevention and Care Project*. A number of other projects are being jointly funded by the government and additional aid donors.

1.5 The DHS Survey

The 1996 DHS is a national level population and health survey. It was implemented under the supervision of the National Population Council (through the National Planning Office) by the National Statistical Office, with financial support from AusAID under the Population and Family Planning Project.

The PNG Government's contribution to the survey covered salaries of the survey personnel, office accommodation and vehicles. Funds from AusAID have been used for the purchase of computers and accessories, allowances of survey personnel, technical assistance, printing of questionnaires and reports, publicity, and running and maintenance of vehicles. The Australian Bureau of Statistics provided some technical assistance, while SAGRIC International provided the project managerial support, as well as a long-term technical adviser, and a short-term expert on computer processing.

Objectives

At the national level, the principal objective of the 1996 DHS was to generate reliable and current information on fertility, infant and child mortality, contraception, and maternal and child health indicators. At the provincial level, the survey was designed to provide planners with both demographic data (fertility, mortality) and socio-economic data (education, employment, housing). Such data are necessary for effective policy formulation as well as programme design, monitoring and evaluation. Other long-term objectives of the survey include:

(i) strengthening the capacity of the National Statistical Office (NSO) to plan, conduct, process and analyse data from complex, large-scale surveys such as the DHS; and
(ii) contributing to the ever-expanding international database on demographic and health related variables.

Sample Design

The 1996 DHS sample was a two phase design. The first phase (household survey) was a two stage self-weighting systematic cluster sample for each province, with the first stage being census units (CUs) and the second stage, households. The sample frame was the 1990 Census register of CUs. All census units are listed in a geographic order within their district, and districts within each province.

A systematic sample of CUs/villages was selected from each province, with probability proportional to the number of households existing at the time of the 1990 Census. The sample was distributed between provinces on a 50/50 equal/proportional basis, so that reliable data would be produced for all provinces, as well as for the nation as a whole. The expected sample 'take' from each CU was 20 households. (If a CU contained less than 20 households according to the 1990 Census, it was combined with its nearest neighbour.) All households in selected CUs were then listed, in a listing operation that took about ten months to complete. Within each selected CU, a sample of approximately 20 households was then selected systematically. This is referred to as a cluster of households. The design ensured an equal probability sample of households for each province (ie. a self-weighting design at the provincial level). In all, 1,250 clusters were selected from the 19 provinces included in the survey universe (which excludes North Solomons). Further information on the survey design is contained in Appendix A.

The second phase (women's survey) was a one-stage national self-weighting systematic cluster sample selected from the first phase cluster sample, maintaining the geographic ordering of the phase one cluster sample from each province. The skip used in selecting clusters within each province was calculated to ensure that the final sample of clusters was self-weighting at the national level. In this phase of the survey, all women of ages 15 to 49 in each selected household were eligible to be interviewed.

The sample size for the household survey was approximately 25,000 households (1,250 clusters) and the second phase was 5,000 households (250 clusters). The sample was distributed between provinces as follows:

1996 Demographic and Health Survey: Sample Distribution of Clusters

Province		Phase 1	Phase 2
1	Western	50	7
2	Gulf	44	4
3	Central	54	9
4	NCD	64	13
5	Milne Bay	60	11
6	Northern	48	6
7	Southern Highlands	84	20
8	Enga	74	16
9	Western Highlands	96	25
10	Chimbu	68	14
11	Eastern Highlands	92	24
12	Morobe	96	25
13	Madang	74	16
14	East Sepik	78	18
15	West Sepik	56	9
16	Manus	38	2
17	New Ireland	50	7
18	East New Britain	68	14
19	West New Britain	56	10
All Provinces		1250	250

Questionnaire Design and Pre-test

Relevant topics for inclusion in the household and women's questionnaires were selected by liaising closely with the Data Users' Advisory Committee, which consisted of members from the Population Planning Unit of the National Planning Office, Departments of Health, Youth and Women's Affairs, Education, the University of PNG and especially its medical faculty, National Research Institute, and representatives from several donor agencies. The final questionnaires used in the survey are presented in Appendix E.

The household questionnaire was developed to permit provincial-level estimates of the following: household composition, ie. age, sex, relationship to head, and marital status; maternal and paternal survivorship (to measure adult mortality); level of education; labour force status and occupation; current levels of fertility and infant mortality; household services and amenities including source of drinking water, toilet facilities, and possession of modern artefacts.

For operational reasons, two household questionnaires were developed. Form A (unlike Form B) contains questions for women of childbearing age on the number of children they have borne, the number still living, and date of last birth. This questionnaire was applied in 80 percent of the sample. Form B, administered in the 20 percent of the clusters comprising the national sample, did not include fertility information, because all women of childbearing age in these clusters would be interviewed with the in-depth individual questionnaire, which contained a full birth history.

The individual questionnaire was a reduced version of the model questionnaire for low contraceptive prevalence countries being used in the international DHS programme, funded by the United States Agency for International Development (USAID) and contracted to MACRO International Inc. This ensured the international comparability of results obtained in PNG. The questionnaire is divided into sections dealing with the respondent's background, including marriage and polygyny; reproduction, including a full birth history; maternal and child health, including antenatal care, immunisations, and childhood diseases; knowledge and use of contraception; fertility preferences; knowledge and attitudes concerning AIDS; and maternal mortality.

The questionnaires were developed over the period July to November, 1995. In preparation for a pre-test, a 109-page Interviewer's Manual was prepared. Thirty women, mostly NSO staff, were trained for 3 weeks. The pre-test was carried out in 300 households selected from 15 CUs in Central Province in December, 1995. It was a success: survey teams were well received; they had no difficulty in administering household questionnaires; and women were very cooperative in responding to the individual questionnaire. Thereafter, only some cosmetic changes were introduced in producing the final versions of the questionnaires.

1.6 Organisation, Activities and Results of the Survey

Organisation and Time Table

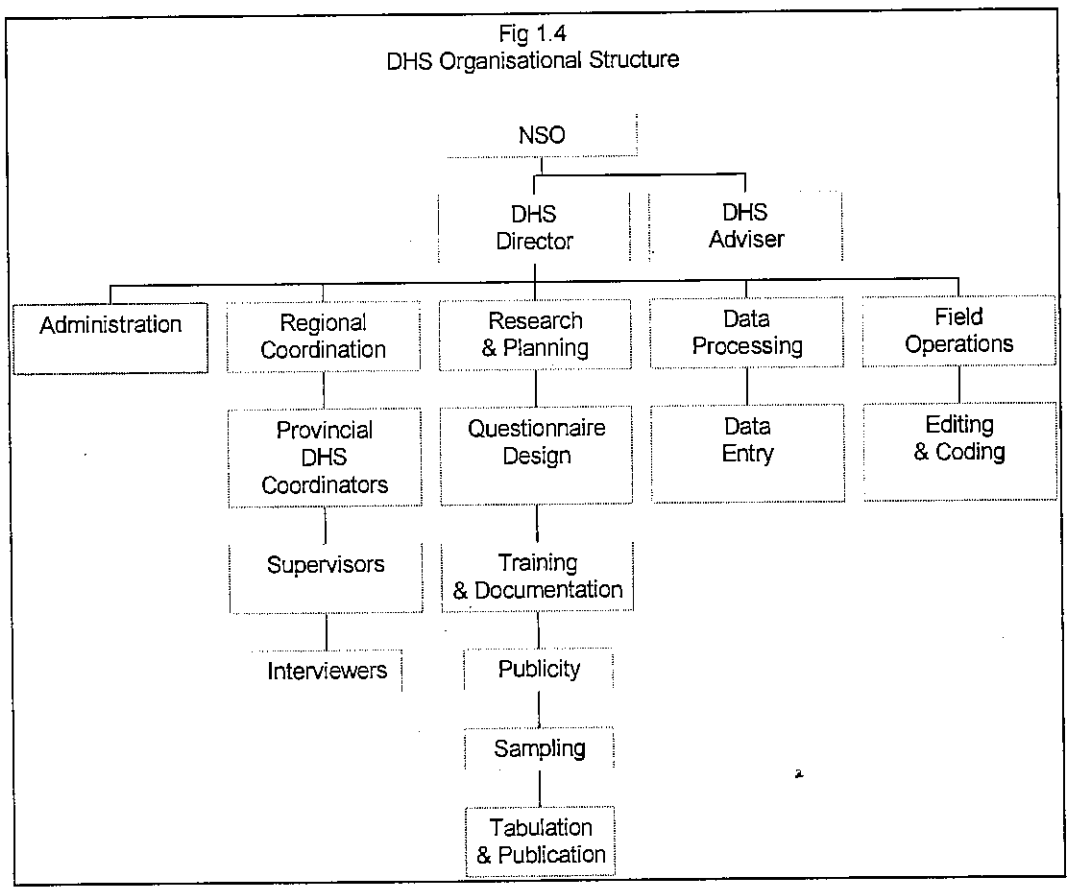
The 1996 DHS was undertaken by the Population and Social Statistics Division of the NSO. The planning, administration and execution of the fieldwork were carried out in close consultation and coordination with the 19 provincial administrations.

Procedures were developed for recruitment and appointment of field staff who were involved in the DHS. The survey personnel appointed possessed good educational background, were mature and responsible.

Provincial DHS coordinators were initially trained as trainers, to impart the Form A training as this was a household questionnaire, a decentralised activity delegated to the provinces. Their assistants who were all females were trained in Form B household questionnaire and the Individual Questionnaire. The Assistant Provincial DHS Coordinators then coordinated the work of interviewing teams specialised in applying the Form B/IQ. The NSO provided Field Editors to each team during all their operations.

Figure 1.4 shows the organisational structure for the 1996 DHS that was finally adopted.

Fig 1.4
DHS Organisational Structure



Planning and scheduling began in 1994, but the actual preparations commenced in 1995.

The broad survey activities timetable which was followed is shown below.

Activity	Started	Finish
1. Planning	1/1/94	31/12/95
2. Framework and Sample Design	1/1/95	31/3/96
3. Selection of Survey Topics	1/1/95	31/12/95
4. Pretesting	1/11/95	31/12/95
5. Field Operations	24/6/96	4/8/97
6. Data Entry and Cleaning (IQ)	1/8/96	24/6/97
7. Tabulations from IQ	25/6/97	31/7/97
8. Presentation of Results	22/9/97	31/3/98

Note that field operations for Form B/IQ were completed in February, 1997. The actual timetable is a reflection of the difficulties that were encountered during the preparatory stages. In fact the draft 1996 DHS timetable envisaged the DHS output by March 1997.

Data Collection Activities

Enumeration began in NCD on 24 June 1996, immediately after the initial training for all Provincial DHS coordinators and their assistants. Form A enumeration was followed by Form B/IQ enumeration on the 28 June 1996.

Whilst Form A was the provincial responsibility, Form B/IQ were centrally controlled. A total of seven teams were formed and those trained fanned out across the country to conduct the Form B/IQ enumeration in Southern, Momase and Islands regions. The Highlands region, which presented special cultural difficulties was trained separately in Mt Hagen in July 1996. Teams of female interviewers were then formed for each respective province and were responsible for the conduct of the Form B/IQ for their province.

Data Processing Activities

As the survey questionnaires arrived from the field to NSO, coverage checks were carried out; then sent for office editing, including occupation coding, and finally keyed into computers. A 3 stage edit process then enabled the creation of clean data files for each province, from which tabulations were produced. Two distinct streams of editing operations occurred at that stage: a highly detailed and complex editing program for the Form B/IQ, and a much simpler routine for the Form A questionnaire.

Data cleaning and the execution of the tabulation plans for the IQ was done using ISSA (Integrated System for Survey Analysis) software. A four week technical assistance mission undertaken by Victor Canales (computer expert), in January/February, 1997 enabled the establishment of the procedure.

An analysis workshop was held prior, from 21st October to 29th November 1996 at the Adelaide Office of the Australian Bureau of Statistics. Six participants from the NSO attended, with the intention of obtaining the technical skills to produce the provincial reports.

Results of the Interviews

In this monograph the information presented relates only to the Form B household questionnaire and the women's Individual Questionnaire. The results of the Form B/IQ operations are shown in Table 1.1. (More detailed results are presented in Appendix A, Table A.2.) Approximately 11 percent of households could not be contacted due to prolonged absence, or because their dwellings were vacant or had been destroyed. Among the households contacted, a response rate of 90 percent was achieved. Within the 4,319 successfully interviewed households, a total of 5,550 women of ages 15 to 49 years were eligible to be interviewed, or about 1.3 per household. Successful interviews were conducted with 89 percent of eligible women. An overall response rate can be calculated as the product of the household and individual response rates (.899 * .886). The overall response rate was 80 percent. It was decidedly better in urban areas (85 percent) than in rural areas (78 percent).

Table 1.1 Results of the Household and Individual Interviews

Interview Results	Place of residence		Total
	Urban	Rural	
Households Sampled	829	4560	5389
Households to interview	759	4046	4805
Households interviewed	703	3616	4319
Household response rate (as %)	92.6	89.4	89.9
Eligible women	1094	4456	5550
Eligible women interviewed	1009	3908	4917
Eligible women response rate (as %)	92.2	87.7	88.6

REFERENCES

Bakker, L. Martin. 1996. *The Integration of Population Factors into Development Planning in Papua New Guinea: A status Report and some Recommendations for the Future.* UNFPA/ILO Project PNG/94/P01, Port Moresby, Papua New Guinea.

Bakker, L. Martin. 1986. *The Fertility in Papua New Guinea: A study of Levels, Patterns and Change based on Census Data.* Research Monograph No. 6, National Statistical Office, Port Moresby, Papua New Guinea.

Bakker, L. Martin. 1986. *The Mortality Situation in Papua New Guinea: Levels, Differentials, Patterns and Trends.* Research Monograph No. 4, National Statistical Office, Port Moresby, Papua New Guinea.

Bank of PNG. 1996. *Quarterly Economic Bulletin: December Quarter 1996.* Bank of PNG, Port Moresby, Papua New Guinea.

GoPNG. 1991. *Integrated National Population Policy for Progress and Development.* Department of Finance and Planning, Port Moresby, Papua New Guinea.

GoPNG. 1996a. *Medium Term Development Strategy 1997-2002.* National Planning Office, Port Moresby, Papua New Guinea.

GoPNG. 1996b. *National Health Plan 1996-2000, Volume 1.* Department of Health, Port Moresby, Papua New Guinea.

GoPNG and UNICEF. 1996. *Children, Women and Families in Papua New Guinea: A Situation Analysis.* National Planning Office/UNICEF, Port Moresby, Papua New Guinea.

Hayes, Geoffrey. 1996. *Estimates of Mortality in Papua New Guinea based on the 1990 Census and the 1991 Demographic and Health Survey.* Research Report No. 2 of Project PNG/94/P01, UPNG/UNFPA/ILO, Port Moresby, Papua New Guinea.

Jorari, Arthur and Lasia, Mathias. 1996. *Population Projection for the Citizen Population of Papua New Guinea for the period 1990-2020.* Research Report No. 4 of Project PNG/94/P01, NPO/NSO/UNFPA/ILO, Port Moresby, Papua New Guinea. (Forthcoming).

NSO. 1994. *Report on the 1990 National Population and Housing Census in Papua New Guinea.* National Statistical Office, Port Moresby, Papua New Guinea.

NSO. 1995. *Papua New Guinea: Demographic and Health Survey 1991.* National Statistical Office, Port Moresby, Papua New Guinea.

UNDP. 1996. *Human Development Index.* United Nations, New York, United States of America.

UNDP. 1997. *Human Development Index.* United Nations, New York, United States of America.

CHAPTER 2

Household and Respondents' Characteristics

Lina Bade

In this chapter, the background characteristics of the sample households and the respondents to the survey will be presented because they are important in the interpretation of the survey results. In particular, women's characteristics and their environment will influence their behaviour regarding demographic phenomena. More so, analysis of the reported characteristics of the sample households and the respondents can serve to indicate the quality of the data collected in the survey, and how representative the sample was.

The chapter is divided into three parts. The first part deals with age-sex composition, household size and distribution of the population. The second part describes the respondents' housing characteristics and environment, and their possession of durable consumer goods. The third part presents respondents' background characteristics such as education, access to mass media and employment at the time of the survey.

2.1 Household Population by Age and Sex

The household questionnaire used in the 1996 Demographic and Health Survey collected data on the demographic and social characteristics of the members and visitors of each sample household. The definition of a household refers to a person or a group of persons who usually live together and have a common arrangement for preparation and consumption of food. A visitor on the other hand is someone who is not a usual resident of the household, but had slept in that household the night before the time of interview. Table 2.1 presents the population according to the place where they spent the night before the interview known as the 'de-facto' household population.

The age-sex distribution of the population reflects a young population, composed more of young age groups than of the older age groups. For each sex, the proportion below 15 years is higher in the rural than in urban areas, indicating a younger age structure of the rural population. Within the rural areas, the proportion is, however, higher for males than for females. On the contrary, there are more females than males in urban areas. On the whole, it can be said that the composition of the PNG population by age and sex depicts a 'true' pyramid (Figure 2.1). In other words, there is a wide base and a narrow top that reflects a pattern that is typical of high fertility societies.

There seems to be an excess of females over males at age 5-9, particularly in urban areas. It is also possible women at age 45-49 have been pushed to the 50-54 age group, causing a slight irregular bulge at that age group. This pattern is obvious in age group 10-14, as well. This seems to indicate that there was intentional displacement of women from ages 15-19 to ages 10-14 and from ages 45- 49 to ages 50-54.

This was probably done intentionally by the interviewers to reduce their assigned workloads, because respondents for the main questionnaire were women age 15 to 49 years. This is more pronounced among women in rural than in urban areas, because rural women are less certain of their ages, thereby relying on an estimate by the interviewer. The problem of collecting good data on age has always been a concern for analysts in PNG.

Table 2.1 Household Population by Age and Sex

Percentage distribution of the de facto household population by five- year age groups, according to urban - rural residence and sex

	Urban			*Rural*			*Total*		
Age group	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*
0 - 4	15.3	14.9	15.1	15.4	14.6	15.0	15.4	14.7	15.0
5 - 9	13.4	15.3	14.2	15.0	15.6	15.5	15.1	15.5	15.3
10 - 14	12.1	12.3	12.2	13.9	13.7	13.8	13.6	13.4	13.5
15 - 19	11.4	11.3	11.3	9.4	8.2	8.8	9.8	8.7	9.3
20 - 24	10.3	10.8	10.5	7.5	8.2	7.9	8.1	8.7	8.3
25 - 29	9.0	9.9	9.5	7.1	8.1	7.6	7.5	8.4	7.9
30 - 34	7.8	7.3	7.5	6.7	6.9	6.8	6.9	7.0	7.0
35 - 39	6.8	6.8	6.8	5.5	5.7	5.6	5.8	5.9	5.8
40 - 44	5.8	4.8	5.4	4.4	4.1	4.3	4.7	4.2	4.5
45 - 49	3.2	2.5	2.9	3.9	4.1	4.0	3.7	3.8	3.8
50 - 54	2.4	2.0	2.2	3.4	4.3	3.8	3.2	3.9	3.5
55 - 59	1.1	0.7	0.9	2.9	3.2	3.1	2.6	2.8	2.7
60 - 64	0.8	0.7	0.8	2.1	1.7	1.9	1.9	1.5	1.7
65 - 69	0.2	0.3	0.3	1.2	0.8	1.0	1.0	0.7	0.9
70 - 74	0.1	-	0.1	0.6	0.4	0.5	0.5	0.4	0.4
75 - 79	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2	0.2
80+	0.1	-	0.1	0.1	0.2	0.2	0.1	0.2	0.1
Missing/Dont know	0.1	-	-	-	-	-	0.1	-	-
Total	100	100	100	100	100	100	100	100	100
Number	2399	2044	4443	10315	9830	20145	12714	11874	24588

The distribution of the male and female household population by single years of age is presented in Figure 2.2 and in Appendix Table C.1. The data show evidence of a preference to report ages that end in 0s, and to a lesser extent 5s, that is commonly found in countries where ages are not known well. Examination of data presented in the graph show age heaping and digit preference illustrated by troughs and bumps at all ages. The troughs at ages 15 and 50 for females are clearly distinguishable in the graph. During the fieldwork, women of 50 years were declared eligible to be interviewed because women often round their ages upward. (When processing the data from the Individual Questionnaire, women who were determined to be actually older than 49 years, based on their date of birth, were excluded.) Therefore the trough at age 15, and especially that at age 50 and the subsequent rise at 51 and peak at 52 illustrate the displacement introduced by interviewers.

Figure 2.1
Population Pyramid, PNG, 1996

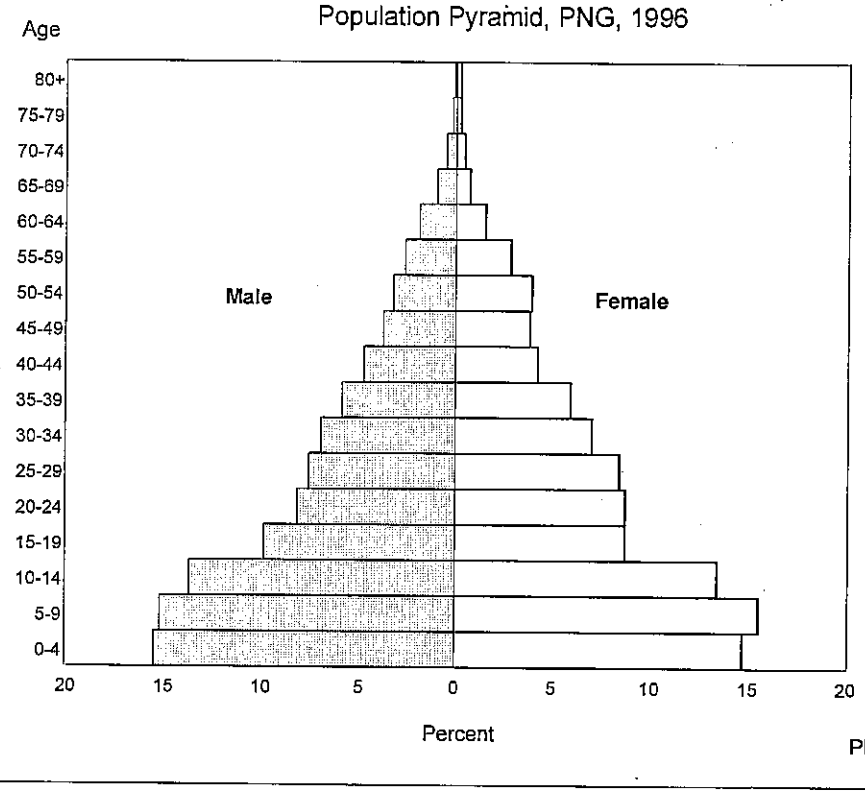


Figure 2.2
Single-year Age Distribution by Sex
PNG, 1996

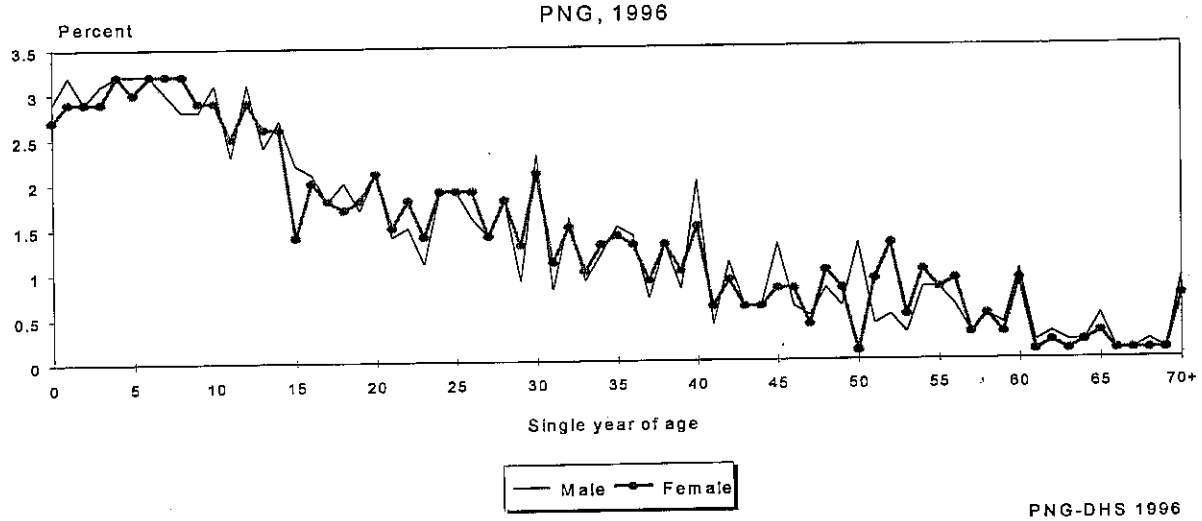


Table 2.2 shows the comparison of the broad age structure of population according to all the censuses conducted in PNG since 1966. It appears that the proportion of population less than 15 years tends to fluctuate in the vicinity of 42 to 46 percent since the first census count in 1966. Similarly, the elderly population 65 and over has fluctuated between 1.1 and 2.5 percent over the years. The fluctuations are statistically insignificant (the first two 'censuses' were samples, not full counts). The dependency ratio, defined as the ratio of persons in the dependent ages (age under 15 and age 65 or over) to those in the "economically active" ages (15-64), has remained fairly constant at around 80 per 100. The median age continues to remain the same over the years. The most likely explanation for the lack of trend in the age structure is continuous high fertility. It is noteworthy that the 1996 DHS survey and the 1990 census data show fairly similar distributions by age, supporting the reliability of the 1996 survey.

Table 2.2 Population by Age from Selected Sources

Percentage distribution of population by age group at different dates

Age Group	Sample Surveys		Population Censuses			
	1996 DHS	1991 DHS	1990 Census	1980 Census	1971 Census	1966 Census
Less than 15	43.8	41.6	41.9	43.0	45.5	42.9
15-64	54.5	55.9	55.6	55.3	52.9	56.0
65 +	1.6	2.5	2.4	1.5	1.5	1.1
Missing/Don't know	-	-		-	0.1	-
Total	100	100	100	100	100	100
Median Age	18.3	18.8	18.7	18.4	17.6	19.1
Dependency ratio per 100	83.0	79.0	80.0	80.0	89.0	79.0

2.2 Household Composition

Information on the size and composition of the sample households by urban and rural residence is presented in Table 2.3. The majority of heads of household are male with over 90 per cent in both urban and rural areas. Female headed households are slightly more common in rural areas (9 per cent) than in the urban areas (7 per cent).

On average, the household size in PNG is 5.7 persons. Household sizes in urban areas are substantially higher than those in rural areas (6.3 verse 5.6). This reveals the crowded situation in urban areas, where housing is a major problem because of the high cost and shortage of housing. Some 18 per cent of households in urban areas consist of 9 or more members as compared to 14 per cent in rural areas.

When considering the adult composition of the household population, about half of the households consist of 3 or more related adults, while 35 per cent consist of two adults of opposite sex. About 7 per cent of the households have one adult member while households with two related adults of the same sex comprise only 2 per cent.

Table 2.3 Household Composition

Percentage distribution of households by sex of head of household, household size, kinship structure, according to urban-rural residence

Characteristics	*Place of residence*		
	Urban	*Rural*	*Total*
Sex			
Male	92.7	91.4	91.6
Female	7.3	8.6	8.4
Total	100	100	100
Household members			
1	4.3	4.6	4.6
2	5.8	8.0	7.7
3	8.0	11.4	10.9
4	9.8	13.8	13.2
5	14.2	15.3	15.2
6	13.7	14.0	14.0
7	15.5	10.5	11.3
8	10.5	8.5	8.9
9+	18.2	13.6	14.4
Total	100	100	100
Mean size	6.3	5.6	5.7
Relationship structure			
One adult	5.1	7.5	7.1
Two related-opposite sex	28.3	36.4	35.1
Two related-same sex	2.1	1.9	1.9
3+ related adults	49.9	49.1	49.3
Other	14.5	5.1	6.6

2.3 Educational Level of the Household Population

Information on the highest level of education attained by the population classified by sex, age residence and regions are presented in Tables 2.4.1, 2.4.2 and 2.4.3. The value of education is not highly regarded by PNG families. Although, the National Constitution of the country regards education as a basic right of all children, not all children have the opportunity to attend at least to grade 6 in community schools. Unfortunately, a high percentage of household members do not have any formal education.

The survey data indicate that 42 per cent of males and 50 percent of females age 5 and above have not attended any formal education. The proportion of both men and women with no education is higher in the rural than in the urban areas. The urban population is much more likely to have attended school than the rural population: 78 versus 54 per cent for males and 73 versus 45 percent for females.

Table 2.4.1 Education Level of Household Population

Percent distribution of the household population age 5 and over by highest education attended

Background Characteristics	Level of Education: No education	Grades 1 - 5	Grade 6	Grade 7 +	Total	Number	Median No.of years
Age							
5-9	82.0	18.0	-	-	100	3747	0.6
10-14	28.1	59.4	9.3	3.1	100	3319	3.0
15-19	18.2	27.3	29.5	25.0	100	2276	6.2
20-24	23.2	17.8	32.6	26.4	100	2052	6.3
25-29	29.5	15.1	31.0	24.3	100	1950	6.2
30-34	35.6	13.6	27.8	23.0	100	1709	6.1
35-39	43.2	14.8	22.6	19.4	100	1428	3.8
40-44	48.5	15.8	16.4	19.3	100	1102	2.0
45-49	60.3	17.2	10.3	12.2	100	932	0
50-54	69.4	18.3	6.3	6.0	100	870	0
55-59	74.8	15.2	5.2	4.7	100	656	0
60-64	80.1	14.1	3.3	2.4	100	418	0
65 +	77.4	16.6	4.0	2.0	100	403	0
Place of residence							
Urban	24.4	21.1	19.4	35.1	100	3772	6.3
Rural	50.5	25.1	15.9	8.6	100	17107	0
Region							
Southern	28.7	25.4	23.8	22.1	100	4717	5.2
Highlands	62.3	21.5	9.0	7.2	100	7778	0
Momase	44.2	24.9	19.4	11.5	100	5848	2.3
Islands	30.3	30.1	19.4	20.2	100	2536	4.4
Total	45.7	24.4	16.5	13.4	100	20879	2.0

Females in the rural areas continue to be in an especially disadvantaged situation in obtaining higher education compared to their peers in the urban areas, with 30 per cent who have attended grade 7 or above in urban areas compared to only 6 per cent in rural areas.

The distribution of the population by highest level of education attended differs greatly among the regions of the country. Southern and Islands are advanced in education compared to other regions. The median duration of schooling is 5 and 4 years respectively, compared to 2 or 0 for other regions (Table 2.4.1).

The median duration of schooling differs greatly by gender in rural and urban areas. Urban residents are more likely to remain at school longer compared with rural; 7 years as against 2 years for males, and 6 years compared to 0 year for females.

Table 2.4.2 Education Level of Male Household Population

Percent distribution of the male household population age 5 and over by highest education attended

Background Characteristics	Level of Education: No education	Grades 1 - 5	Grade 6	Grade 7 +	Total	Number	Median No. of years
Age							
5-9	83.1	16.9	-	-	100	1908	0
10-14	27.1	59.8	9.2	3.9	100	1723	3.0
15-19	17.5	29.2	28.4	25.0	100	1241	6.1
20-24	17.1	19.0	32.5	31.3	100	1024	6.4
25-29	21.7	14.1	32.2	31.9	100	952	6.5
30-34	25.5	12.1	31.1	31.3	100	878	6.4
35-39	33.2	16.0	24.9	26.0	100	732	6.1
40-44	40.4	16.4	17.7	25.5	100	599	4.2
45-49	52.5	15.1	12.4	20.0	100	476	0
50-54	64.6	18.0	7.6	9.8	100	410	0
55-59	66.5	17.7	6.4	9.5	100	328	0
60-64	79.1	12.6	4.6	3.8	100	239	0
65 +	74.0	17.9	5.1	3.0	100	235	0
Place of residence							
Urban	21.8	19.7	18.6	39.8	100	2033	6.5
Rural	46.1	25.7	16.8	11.4	100	8724	1.8
Region							
Southern	25.8	23.6	23.9	26.7	100	2459	6.0
Highlands	57.3	22.5	10.1	10.1	100	3979	0
Momase	39.0	25.8	20.3	14.8	100	3010	3.3
Islands	28.7	29.5	18.7	23.1	100	1309	4.7
Total	41.5	24.5	17.2	16.8	100	10757	2.9

Table 2.4.3 Education Level of Female Household Population

Percent distribution of the female household population age 5 and over by highest education attended

Background Characteristics	Level of Education: No education	Grades 1 - 5	Grade 6	Grade 7 +	Total	Number	Median No. of years
Age							
5-9	80.9	19.1	-	-	100	1839	0
10-14	29.1	59.0	9.5	2.3	100	1596	3.1
15-19	19.1	25.0	30.8	25.0	100	1035	6.2
20-24	29.4	16.5	32.7	21.4	100	1028	6.1
25-29	37.0	16.1	29.9	17.0	100	998	5.1
30-34	46.2	15.3	24.3	14.2	100	831	2.7
35-39	53.7	13.5	20.3	12.5	100	696	0
40-44	58.1	15.1	14.9	11.9	100	503	0
45-49	68.4	19.3	8.1	4.2	100	456	0
50-54	73.7	18.5	5.2	2.6	100	460	0
55-59	83.2	12.8	4.0	-	100	328	0
60-64	81.6	16.2	1.7	0.6	100	179	0
65 +	82.1	14.9	2.4	0.6	100	168	0
Place of residence							
Urban	27.4	22.8	20.2	29.6	100	1739	6.0
Rural	55.0	24.5	14.9	5.6	100	8383	0
Region							
Southern	31.8	27.3	23.8	17.1	100	2258	4.4
Highlands	67.5	20.4	7.8	4.2	100	3799	0
Momase	49.6	23.9	18.4	8.1	100	2838	1.1
Islands	32.0	30.7	20.0	17.2	100	1227	3.9
Total	50.2	24.2	15.9	9.7	100	10122	0

2.4 School Attendance

Table 2.5 shows the percentage distribution of the household population 6-24 years of age attending school by age, sex and urban-rural areas. The proportion of those attending school is nearly 32 per cent of the population age 6-10 and three-fifths of the population age 11-15. Between the age of 6 to 15, about 44 per cent of children are at school. However, the proportion of those attending diminishes significantly after age 16. Only 18 per cent of youth of ages 16 to 20 attend school. The reasons could be economic conditions that draw youth from the school system.

As expected, attendance is higher in the urban areas than in the rural areas. In urban areas, 62 per cent of children of age group 6-15 attend school compared to 41 per cent in rural areas. At age group 6-15, 44 per cent of both boys and girls attend school. For age group 16-20, men are much more likely to attend than women (21 per cent compared to 15 per cent), in part, presumably, because of early marriage and childbearing that cause young women to drop out of school.

Table 2.5 School Attendance

Percentage of the household population 6-24 years of age attending school by age, sex and residence

Age Group	Males			Females			Total		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
6 - 10	50.8	28.1	31.7	47.2	28.2	31.3	49.0	28.1	31.5
11 - 15	79.5	55.4	59.7	75.7	57.1	60.2	77.8	56.2	59.9
6 - 15	64.8	40.4	44.5	59.8	40.8	44.0	62.4	40.6	44.2
16 - 20	34.1	16.8	20.7	28.6	11.3	14.9	31.6	14.2	18.0
21 - 24	11.8	1.6	4.1	3.9	1.3	1.9	7.9	1.4	3.0

2.5 Housing Characteristics

Table 2.6 shows the distribution of households with selected housing characteristics in urban and rural areas. The information on the source of water, type of sanitary facility, type of floor material and number of persons per sleeping room are indicators of the health and socio-economic condition of households. Furthermore, the housing characteristics are associated with demographic behaviour of the household.

Only 12 per cent of the households in PNG consume electricity. However, a significant difference is noted between the urban and rural areas; 59 per cent of urban households have electricity compared to 3 per cent of rural households. Electricity is not accessible to about 97 per cent of the rural households.

Sources of drinking water differ greatly in rural and urban areas. In urban areas, piped water is the major source connected to 61 per cent of the households and 11 per cent obtain water from a public tap in the neighbourhood. In rural areas, only 4 per cent of households have water piped into the household, while 5 per cent of households share a public tap within the neighbourhood. The major sources of water in the rural areas are river or stream (38 per cent) and springs (25 per cent).

A majority of the households in PNG (69 per cent) have traditional pit toilets. About 14 per cent of the households use the bush for toilet purpose as they do not have a toilet facility, while 9 per cent of households use their own flush toilets. Households in both urban and rural areas commonly use the traditional pit (32 per cent and 76 per cent). In urban areas 48 per cent of households have their own flush toilets, while more than 10 per cent of households have shared flush toilets. About 16 per cent of rural households do not have any toilet facilities.

Table 2.6 Housing Characteristics

Percent distribution of households by housing characteristics, according to urban-rural residence

Household Characteristics	*Place of residence*		
	Urban	*Rural*	*Total*
Electricity			
Yes	59.2	3.2	12.3
No	40.8	96.8	87.7
Source of water			
Piped to household	60.5	3.6	12.9
Piped to neighbourhood	11.2	4.9	5.9
Well in yard	0.6	1.6	1.4
Public well	1.3	7.1	6.1
Spring	2.0	24.8	21.1
River/stream	2.8	37.9	32.2
Pond/lake/dam	0.6	6.5	5.5
Communal tank	3.0	5.4	5.0
Rain water	14.7	6.8	8.1
Tanker truck	1.8	0.1	0.3
Other	1.6	1.4	1.4
Total	100.1	100	100
Sanitation facility			
Own flush toilet	47.9	1.5	9.1
Shared flush toilet	10.4	1.0	2.5
Tradtional pit	32.1	76.3	69.1
Improved latrine	2.8	1.6	1.8
Bucket system	3.1	-	0.5
Closet over sea	0.4	3.3	2.8
No facility/bush	3.1	16.3	14.1
Total	100	100	100
Floor material			
Earth	1.4	18.4	15.6
Sand	0.1	1.3	1.1
Wood planks	25.7	10.8	13.2
Palm/bamboo	6.7	57.1	48.9
Polished wood	25.5	1.6	5.5
Vinyl/asp.strips	16.2	2.5	4.7
Ceramic tiles	5.0	0.1	0.9
Cement	12.5	1.0	2.9
Carpet	1.7	0.2	0.5
Other	5.1	7.0	6.7
Total	100	100	100
Persons per sleeping room			
1 - 2	60.5	58.7	59.0
3 - 4	29.4	25.9	26.5
5 - 6	6.5	9.1	8.7
7 +	3.4	6.1	5.6
Missing/don't know	0.1	0.2	0.2
Total	100	100	100
Mean persons per room	2.8	2.9	2.9
Number of households	703	3616	4319

As to the type of flooring material, 49 per cent of the households have palm or bamboo floors. Wood plank flooring is common in urban areas (26 per cent), while palm or bamboo is common in rural areas (57 per cent).

For estimating the extent of crowding, information on the number of rooms that the households use was available in this survey. More than half of the households (59 per cent) have one or two persons per sleeping room, while 27 per cent of households have three or four persons per sleeping room. On average, there were 2.9 persons per sleeping room. In this respect, there was no significant difference noted between the urban and rural areas.

2.6 Durable Consumer Goods

Presented in Table 2.7 is the percentage of households owning specific durable consumer goods. Among the durable goods, radio is the most common consumer good owned by nearly 31 per cent of all households. About 60 per cent of households in urban areas and 25 per cent of the households in rural areas own radios. Electricity is a common item consumed in 59 per cent of households in urban areas. Only 3 per cent of households in rural areas are connected to an electricity web. On average 12 per cent of the total households consume electricity.

The proportion of households with other appliances varies to a large extent between the urban and the rural areas; 49 per cent of urban households reported having a refrigerator, compared to only 2 per cent of rural households; 40 per cent of urban households owned a television set, 20 percent owned a motor vehicle and 14 per cent had a telephone. Television, motor vehicle and telephone are not common durable consumer goods among rural households (about 1 per cent).

Table 2.7 Household Durable Goods

Percentage of households possesing various durable consumer goods, according to residence

Household Possession	*Place of residence*		
	Urban	*Rural*	*Total*
Electricity	59.2	3.2	12.3
Radio	59.6	24.9	30.6
Television	40.0	1.4	7.7
Refridgerator	49.4	1.5	9.3
Motor vehicle	19.9	1.4	4.4
Telephone	14.1	0.4	2.6
Number of households	703	3616	4319

2.7 Characteristics of Women Respondents

In the household questionnaire, a total of 5,550 women were identified as eligible for interview with the Individual Questionnaire. Of these women, 4,917 or 89 per cent were successfully interviewed. In each age group, the proportion of women interviewed was about the same, varying from 85 to 91 per cent (see Appendix C, Table C.2).

The distribution of women in the DHS sample by selected background characteristics is presented in Table 2.8. More than half of the women interviewed in the survey are under the age of 30. However, women of prime child bearing ages, 20 to 39 comprised of 65 per cent. Table 2.8 indicates that about 73 per cent of female respondents are currently married and 21 per cent have never married. About two per cent each are widowed, divorced or separated. Living together is an insignificant practice in the country according to the DHS, that revealed a very low number of such women.

The majority of the respondents, about 61 per cent, have had some education varying from grade 1 to grade 7 and above. About two fifths of the women have no formal education at all.

PNG still remains predominantly rural with approximately four fifths of the women living in rural areas. The distribution of women by region shows that about 36 per cent of the respondents are from the Highlands; Momase has 28 per cent, Southern 24 per cent, and the Islands 12 per cent.

Almost all the women interviewed report themselves as Christians (98 per cent). The mainline churches or denominations are Roman Catholic (27 per cent), Evangelical Lutheran (18 per cent), United Church (15 per cent), and Pentecostal (11 per cent).

Presented in Table 2.9 is the percentage distribution of the female respondents by the highest level of educational attended according to the selected background characteristics of respondents. The results indicate that younger women have higher educational attainment than older women. Among women age 15-19, 57 per cent have attended at least grade 6, and 25 percent have had some secondary schooling. Among women in the age group 45-49 only 14 percent got as far as grade 6. Women with no education accounted for 56 percent of women age 40-44, and for 66 percent of women age 45-49.

As expected, women in the rural areas are more disadvantaged in obtaining education than women in urban areas. About 45 per cent of women in rural areas have not attended school compared to 15 per cent of urban women. Almost half (45 per cent) of the women in urban areas have attended grade 7 and above, and only 10 per cent of them have attended that grade in the rural areas.

Table 2.8 Respondent Background Characteristics

Percent distribution of women by age, urban-rural residence, region and level of education

Background Characteristics	*Female population*	
	Percent	*Number*
Age		
15-19	17.9	881
20-24	18.4	904
25-29	18.2	893
30-34	15.4	758
35-39	12.7	624
40-44	9.1	446
45-49	8.4	411
Marital Status		
Never married	20.9	1026
Married	72.6	3570
Living together	0.3	13
Widowed	2.3	111
Divorced	1.6	77
Separated	2.4	120
Educational Level		
No education	39.0	1916
Grades 1 - 5	17.9	880
Grade 6	26.0	1280
Grade 7 +	17.1	841
Place of residence		
Urban	20.5	1009
Rural	79.5	3908
Region		
Southern	24.4	1202
Highlands	35.6	1751
Momase	28.1	1384
Islands	11.8	580
Religion		
Anglican	4.3	213
Evangelical Alliance	8.8	433
Pentecostal	10.6	523
Evagelical Lutheran	17.8	873
Roman Catholic	26.7	1311
Salvation Army	0.6	28
Seventh Day Adventist	9.0	444
United Church	14.6	716
Other Christian	6.1	299
Non - christian	0.9	46
No religion, missing	0.6	31
Total	100	4917

There are also wide variations in education attainment between regions. In the Southern and Islands regions, less than 20 per cent of women have no formal education. A little over 64 per cent of those in the Highlands reported having no education at all, while women in Momase were in an intermediate situation.

Table 2.9 Respondents Level of Education by Background Characteristics

Percent distribution of women by highest level of education attended, according to age, residence, and region

Background Characteristics	Level of Education: No education	Grades 1 - 5	Grade 6	Grade 7 +	Total	Number
Age						
15-19	17.7	25.3	32.0	25.0	100	881
20-24	28.3	16.7	33.2	21.8	100	904
25-29	35.5	16.7	30.1	17.7	100	893
30-34	43.7	16.0	25.2	15.2	100	758
35-39	53.5	13.3	21.2	12.0	100	624
40-44	55.8	15.9	15.5	12.8	100	446
45-49	66.4	20.0	9.0	4.6	100	411
Place of residence						
Urban	15.1	12.6	27.6	44.8	100	1009
Rural	45.1	19.3	25.6	10.0	100	3908
Region						
Southern	16.8	18.1	36.4	28.7	100	1202
Highlands	64.1	16.0	12.8	7.0	100	1751
Momase	36.8	17.8	31.1	14.2	100	1384
Islands	14.0	23.1	32.6	30.3	100	580
Total	39.0	17.9	26.0	17.1	100	4917

Table 2.10 presents the exposure of respondents to the different types of mass media, according to their background characteristics. The table shows that about 44 per cent of the women listen to radio at least once a week, while 25 percent read newspapers and about 15 percent watch television. Younger women are more likely than older women to be exposed to mass media.

The higher the level of education, the more access there is to the media. Among women with no education, about 2 percent read newspapers, 4 percent watch television, while 23 per cent listen to radio. Among women who attended grade 7 or above, 75 percent read newspapers, 45 percent watch television and 78 percent listen to radio.

Between urban and rural areas, the proportion of women differs greatly for reading newspapers and watching television, but less so for listening to radio. While 70 per cent of women in urban areas listen to radios, only 37 per cent of women in rural areas do so.

Similar to education, women in Southern and Islands have more exposure to mass media than those in either the Highlands or Momase. Women in the Southern region have the most access to all three modes of mass media (43 per cent read newspapers, 31 per cent watch television, and 61 per cent listen to radio), followed by Islands region and Momase. The least exposed women are those in the Highlands to all three media.

Table 2.10 Access to Mass Media

Percent of women who usually read a newspaper, watch television or listen to radio once a week, by selected background characteristics

Background Characteristics	Mass communication media: Read newspaper	Watch television	Listen to radio	Number of women
Age				
15-19	37.6	19.6	52.1	881
20-24	33.6	15.6	50.0	904
25-29	25.5	13.1	43.1	893
30-34	21.2	12.9	42.5	758
35-39	17.3	14.7	38.1	624
40-44	19.1	13.3	37.2	446
45-49	8.3	8.5	30.7	411
Educational Level				
No education	2.3	4.4	22.6	1916
Grades 1 - 5	15.8	8.5	42.2	880
Grade 6	34.1	14.1	53.8	1280
Grade 7 +	74.9	44.5	77.9	841
Place of residence				
Urban	60.8	54.5	71.1	1009
Rural	16.3	4.2	36.6	3908
Region				
Southern	42.5	30.8	61.0	1202
Highlands	13.8	6.5	31.6	1751
Momase	23.0	11.6	38.9	1384
Islands	30.9	12.2	55.7	580
Total	25.4	14.5	43.7	4917

Table 2.11 presents the percentage distribution of female respondents by economic activities according to their background characteristics. Farming and fishing for subsistence are predominant economic activities that women engaged in the last week. By age groups, women are actively engaged in these activities throughout their reproductive years, 15 to 49.

There are wide variations in economic activity by highest educational level attended. Among women who have attended grade 7 or above, 45 percent are working (not counting housework), compared to 74 percent of women with no education. The predominant activity for women with no education is subsistence fishing or farming.

Half of the urban women do housework (50 per cent), while their rural counterparts are mostly engaged in subsistence activities (43 per cent). While a little over 30 per cent of urban women work in non-farm employment, a quarter of rural women do housework (25 per cent) as a second major activity performed by women according to type of residence.

While more women in the Southern and Islands regions engaged in housework activity (41 and 44 per cent), women in the Highlands and the Momase are heavily engaged in subsistence farming, accounting for 44 and 37 per cent, respectively.

Table 2.11 Employment Status by Background Characteristics

Percent distribution of women by economic activities, according to selected characteristics

Background Characteristics	Non-farm work	fish/farm money	fish/farm subsistence	student	unemployed	housework	old/sick	Others	Total	Number
Age										
15-19	5.4	10.1	24.3	19.8	1.0	32.1	0.6	6.7	100	881
20-24	11.1	14.8	33.8	1.7	0.6	33.6	0.3	4.1	100	904
25-29	12.0	16.2	35.8	0.3	0.8	30.2	0.4	4.1	100	893
30-34	11.6	17.5	37.3	0.1	0.3	29.4	0.8	2.9	100	758
35-39	12.8	17.3	37.0	0.5	-	29.0	0.3	3.0	100	624
40-44	15.0	18.8	37.2	-	0.4	23.8	0.4	4.3	100	446
45-49	8.0	20.2	41.6	0.2	-	23.4	2.7	3.9	100	411
Educational Level										
No education	5.4	21.8	46.6	0.4	0.1	20.0	1.2	4.5	100	1907
Grades 1 - 5	6.7	13.5	35.1	2.8	0.2	35.6	0.6	5.4	100	882
Grade 6	8.6	15.3	31.7	2.7	0.3	37.4	0.3	3.8	100	1285
Grade 7 +	29.8	5.5	10.1	15.3	2.0	34.0	0.1	3.2	100	843
Place of residence										
Urban	30.1	4.2	3.0	8.6	1.3	50.0	-	2.8	100	1009
Rural	5.6	18.8	42.5	2.8	0.3	24.5	0.8	4.6	100	3908
Region										
Southern	17.3	11.2	20.0	5.5	0.8	40.6	0.5	4.0	100	1202
Highlands	6.9	19.3	43.7	2.8	0.6	18.9	1.4	6.5	100	1751
Momase	9.2	18.7	37.3	4.2	0.3	28.3	0.2	1.8	100	1384
Islands	11.6	7.6	29.1	4.1	0.2	43.6	-	3.8	100	580
Total	10.6	15.8	34.4	4.0	0.5	29.8	0.7	4.3	100	4917

CHAPTER 3

FERTILITY

Esther T Lavu

One of the objectives of the 1996 Demographic and Health Survey was to collect information on fertility and also measure fertility differences across the country. This chapter addresses the fertility levels, trends and differentials based on the information collected by this survey. Information obtained from this presentation will help us to understand the impact of changes in the use of family planning, and related aspects of change in the study of determinants of fertility in Papua New Guinea (PNG).

Fertility in this chapter refers to the reproductive performance of the female population, that is usually affected by various socio-economic factors. The female population is used for fertility measures because they give birth and not men. In PNG, fertility studies have shown that there are differentials within the population. Characteristics such as place of residence, educational level and region have all reflected fertility differentials. The 1981 Sample Survey indicated that the rural fertility was higher than the urban sector and higher levels of education had a negative effect on fertility. Regional differences were also evident. The 1996 DHS dataset obtained from the sample of 4,917 women has been analysed systematically to detail the fertility situation in PNG.

The fertility measures presented in this chapter are based on the reproductive histories of women age 15-49 interviewed in the 1996 DHS. Each woman was asked by trained interviewers whether she ever had a baby or not. Those who ever had a baby were asked to report on the number of sons and daughters living with them, the number living elsewhere, and the number who had died. They were then asked for a history of all their births, including the name, the sex, status of birth (whether single or multiple birth), the month and the year each was born, and if alive, the current age and whether he/she was living with the mother, and if dead, the age at death. Based on this information, measures of completed fertility (number of children ever born) and current fertility (age-specific rates) are examined. These measures are also analysed in connection with various background characteristics.

The chapter begins with current fertility levels and trends; this includes current fertility, fertility by background characteristics, fertility trends and fertility by marital duration. The completed fertility is reflected by children ever born and living. Spacing of births in a woman's childbearing period is reflected by timing of births and birth intervals. The beginning of a woman's childbearing is indicated by age at first birth, and further insights are provided by background characteristics. The chapter concludes with adolescent fertility behaviour.

3.1 Current Fertility

Age-specific fertility rates (ASFR) and total fertility rates (TFR)

The sum of the age-specific fertility rates, i.e., the total fertility rate (TFR), is used to summarise the current level of fertility. It can be interpreted as the number of children a woman would have by the end of her childbearing years if she passed through those years bearing children at the currently observed rates. If fertility remained constant at current levels, a Papua New Guinean women would give birth to an average of 4.8 children as shown in Table 3.1. Close examination of the age-specific fertility rates reveals that there are marked differences between the urban and rural areas. The results indicate that the urban age-specific fertility rates are considerably lower for all ages except the youngest. The TFR for urban women is 4.0 children per woman compared with 5.0 for rural women.

Table 3.1 Current Fertility

Age-specific and cumulative fertility rates and the crude birth rate for the five years preceding the survey, by urban-rural residence

	Residence		
Age group	*Urban*	*Rural*	*Total*
15-19	91	73	77
20-24	207	235	229
25-29	209	240	234
30-34	176	192	189
35-39	86	131	122
40-44	22	94	82
45-49	9	38	35
TFR 15-49	4.00	5.02	4.84
TFR 15-44	3.95	4.83	4.67
GFR	147	171	166
CBR	33.60	33.90	33.90

TFR: Total fertility rate expressed per women

GFR: General fertility rate (births divided by number of women 15-44), expressed per 1,000 women

CBR: Crude birth rate, expressed per 1,000 population

Note: Rates are for the period 1-60 months preceeding the survey.

General Fertility Rate (GFR)

The general fertility rate (GFR) is calculated by dividing the number of births occurring during a specific period of time by the number of women of reproductive age (15-44 years of age) and multiplying the result by 1000. The 1996 DHS estimated the GFR to be 166 for the whole country; that is 166 births to every 1000 women. The observed GFR is higher in rural areas (171) than in urban areas (147).

Crude Birth rate (CBR)

The crude birth can be estimated from the birth history data and the age-sex distribution of the household population. The 1996 DHS calculated CBR by summing the product of the age-specific fertility rates and the proportion of woman in each age group out of the total population at all ages. As ASFR was calculated on the births during the past five years, the CBR calculations are based on the same time period. Overall, there were about 34 births per thousand population over the last 5 years. Close observation of the results indicate there is a small difference between the two sectors; urban (33.6) and rural (33.9). The reason behind this very small difference is the higher concentration of women of childbearing age in urban areas than in rural areas. (This figure is not comparable to census figures, as it excludes from the denominator the non-household population).

Table 3.2 Fertility by Background Characteristics

Total fertility rate for the five-years preceding the survey and the mean number of children ever born to women age 40-49 by selected background characteristics

Background Characteristics	Fertility Rates	
	Total Fertility Rate	Mean No. of CEB age 40-49
Place of residence		
Urban	4.00	4.65
Rural	5.02	5.54
Region		
Southern	4.85	5.30
Highlands	4.36	5.27
Momase	5.33	5.35
Islands	5.26	6.18
Level of education		
No education	4.97	5.40
Grades 1-5	4.74	5.77
Grade 6	5.10	5.46
Grades 7+	3.85	4.54
Total	4.84	5.40

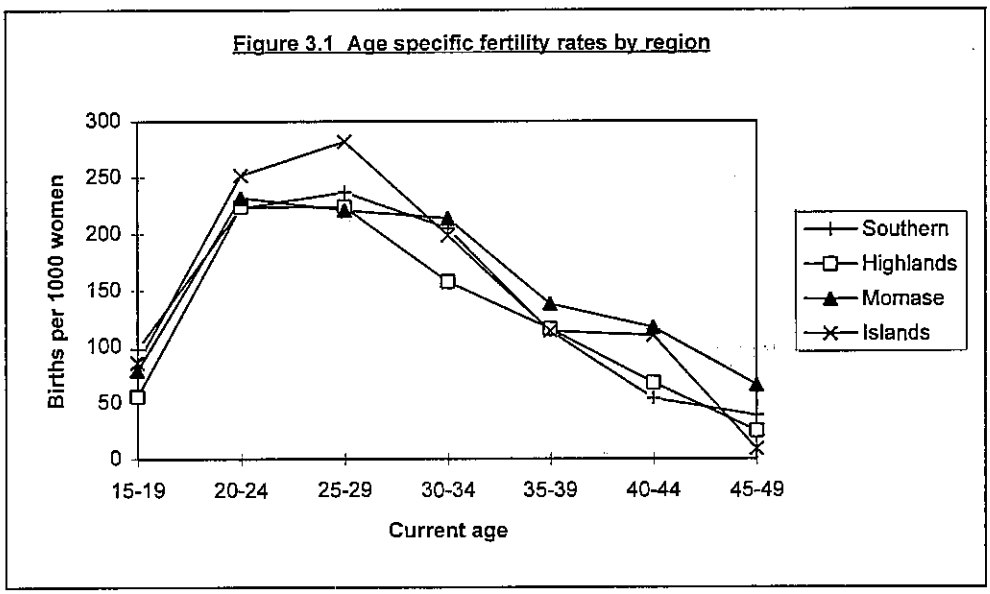
3.2 Fertility Trends and Patterns

Five-year total fertility rates by residence, region and the respondents' level of education are presented in Table 3.2. There are differences in the total fertility rate between all regions. Women in the Momase region tend to give birth to more children than the women in the other three regions. If fertility remains constant at current levels, a Momase woman would give birth to an average of 5.33 children, followed by Islands women (5.26), Southern region (4.85) and Highlands region with the lowest (4.36).

Increasing level of education is associated with reduced fertility as illustrated in Table 3.2, however as one moves up the category of education, the trend fluctuates. Findings indicate that women with grade 7 or higher education give birth to an average of 3.85 children per woman which is lowest compared to all education categories, while women who have completed grade 6 by far have the highest fertility (5.10). Although the depressing effect of higher education on fertility is still evident in PNG, women with no education have on average 4.97 children per woman, which is lower than those who have completed grade 6 education.

Further observations of findings on the mean number of children ever born to women 40-49 years in Table 3.2 provide the information on trends. These women have completed their childbearing years, or are near to doing so. The total number of children born to these women is a reflection of fertility levels in the past 20-25 years. In general, current fertility levels (indicated by the TFR) are slightly lower (about half a child) than the mean number of children born to women 40-49 years, suggesting a small fertility decline. The difference is greatest in two regions; Islands and Highlands.

Figure 3.1 Age specific fertility rates by region



The pattern of fertility can be discussed based on the number of births by mother's current age. Figure 3.1 illustrates fertility rates by current age of mother according to region. The findings indicate that women in Islands region have a high fertility peak between ages 20 and 29. Close observation reveals that women in Southern region commence childbearing earlier than those in other regions, and women in Highlands region have a much lower fertility rate from 25 onward. It is noteworthy that the Southern region tends to drop to a lower fertility level at age 35.

Table 3.3 Fertility Trends

Age-specific fertility rates for five-year periods preceding the survey

Age	Five Year Periods			
	0-4	*5-9*	*10-14*	*15-19*
15-19	77	93	104	107
20-24	229	238	245	237
25-29	234	250	259	248
30-34	189	210	245	237
35-39	122	186	208	-
40-44	82	122	-	-
45-49	35	-	-	-

Note: Age-specific fertility rates are per 1,000 women.

The age-specific fertility rates for five-year periods preceding the survey are shown in Table 3.3. The fertility rates are declining in all age groups. Although there are indications of fertility decline, detailed analysis on births to women in the child bearing age indicate some shifting of birth dates and age misreporting of mothers at the time of the survey. Nevertheless, over the last 15 years there is clearly a decline in fertility among women in their thirties and early forties. Although this may come as a surprise to sceptical demographers, it is attributable to much higher contraceptive prevalence rates than anyone had imagined as will be seen in chapter 4.

Table 3.4 Fertility by Marital Duration

Fertility rates for ever-married women by duration since first marriage for five-year periods preceding the survey

Years Since First Marriage	Five Year Periods			
	0-4	*5-9*	*10-14*	*15-19*
0-4	310	298	308	291
5-9	248	257	269	266
10-14	185	227	258	233
15-19	130	185	210	231
20-24	88	146	191	-
25-29	37	90	-	-

The fertility rates for ever-married women by duration since first marriage for five-year periods preceding the survey are shown in Table 3.4. Childbearing early in marriage often remains resilient to change, even when fertility is declining, because fertility decline usually begins at older ages (when women start to limit the number of births), not among young couples postponing births. Table 3.4 bears out these observations showing a recent decline in fertility, starting at marriage duration of 5-9 years, and accelerating thereafter.

3.3 Completed Fertility

Children Ever Born and Living

In the 1996 DHS questionnaire, the total number of children ever born was ascertained by a sequence of questions designed to maximise recall. The distribution of women by number of children ever born is presented in Table 3.5 for all women and for currently married women. The mean number of children ever born for all women increases rapidly with age, so that by the end of her childbearing years, a woman has given birth to nearly six children. The distribution of women by number of births indicates that 11 percent of teens have already borne a child, and more than one-fourth of women age 45 and over have borne at least eight children.

As in other developing countries childbearing is not confined to marriage; however the findings show that about 73 percent of the women in the sample are married (see chapter 2) and this warrants more emphasis on married women than all women category. This is because married women are at a higher risk of conceiving than unmarried women. According to Table 3.5 married women in PNG have on average more than one living child at age 20-24, more than three at age 30-34, and more than five at age 40-44.

The parity distribution for older, currently married women also provides a measure of primary infertility. Voluntary childlessness is rare in PNG, and married women with no live births are most likely unable to bear children. The 1996 DHS results indicate that about 4 to 5 percent of PNG women are unable to bear children.

Table 3.5 Children Ever Born and Living

Percent distribution of all women and currently married women by number of children ever born and mean number ever born and living, according to five-year age groups

Respondent' Age	Number of Children Ever Born											Total	No. of Women	MCEB	MCEBS
	0	1	2	3	4	5	6	7	8	9	10+				
All Women															
15-19	88.9	9.1	1.8	0.2	-	-	-	-	-	-	-	100	881	0.13	0.12
20-24	40.0	30.4	19.9	6.6	2.2	0.7	0.1	-	-	-	-	100	904	1.03	0.95
25-29	14.8	19.7	25.0	18.9	13.0	6.3	1.3	0.9	0.1	-	-	100	893	2.25	2.04
30-34	8.0	8.8	11.7	21.2	19.1	16.2	9.0	4.2	1.2	0.4	-	100	758	3.50	3.14
35-39	8.3	6.3	9.1	12.5	14.7	17.1	14.1	10.1	3.7	2.4	1.6	100	624	4.29	3.86
40-44	7.8	3.8	6.1	9.9	13.9	14.6	13.0	13.7	8.5	4.7	4.0	100	446	5.02	4.42
45-49	4.6	2.2	6.6	7.5	12.4	9.7	13.9	14.4	11.9	7.8	9.0	100	411	5.81	5.01
All Ages	29.4	13.5	12.6	11.1	9.9	8.1	5.8	4.5	2.4	1.4	1.3	100	4917	2.65	2.36
Currently Married Women															
15-19	53.6	36.1	9.0	1.2	-	-	-	-	-	-	-	100	166	0.58	0.52
20-24	22.7	37.7	26.0	9.3	3.2	0.9	0.2	-	-	-	-	100	634	1.36	1.25
25-29	9.4	18.5	26.5	21.2	14.7	7.1	1.4	1.0	0.1	-	-	100	774	2.46	2.24
30-34	6.5	6.9	11.2	21.9	19.9	17.2	9.9	4.7	1.3	0.4	-	100	679	3.68	3.30
35-39	6.8	5.9	8.2	12.4	15.0	18.0	14.9	10.5	3.8	2.6	1.7	100	572	4.44	4.00
40-44	5.8	2.5	6.0	8.8	14.9	15.4	13.4	15.1	8.8	4.8	4.5	100	397	5.25	4.65
45-49	4.4	1.9	7.2	7.5	11.9	9.7	14.4	15.2	11.4	8.0	8.3	100	361	5.79	5.01
All Ages	11.9	15.1	15.6	14.2	12.8	10.5	7.5	6.0	3.0	1.8	1.6	100	3583	3.37	3.01

Note:

MCEB: Mean Number of Children Ever Born

MCEBS: Mean Number of Children Ever Born Surviving

3.4 Birth Intervals

Age at first marriage, termination of sexual unions through divorce and widowhood and eventually remarriages all contribute in determining childbearing interval lengths. There is overwhelming research evidence that closely spaced children suffer major health disadvantages compared with children spaced further apart. This includes a very high risk of being sickly and poorly nourished, because they are breastfed for shorter periods. This is particularly true for babies born at intervals of less than 24 months. Table 3.6 shows the percent distribution of births in the five years preceding the survey by the number of months since the previous birth. About 25 percent of births occurred after an interval of less than 24 months. The median interval length is 32.4 months.

The mother's health is also affected in that she does not recover fully after short birth intervals and therefore this can deplete her health and energy. Mother's age at birth of the child is an important characteristic influencing the duration of birth intervals. Older mothers tend to have a longer birth interval than the younger mothers. The median length of birth interval ranges from 35 months to 37 months for women age 30 and over, while those under the age of 30 have a birth interval of less than 30 months.

Short birth intervals are more common if the previous child died early in life, because the parents often want another child quickly to replace the dead child. The death of the child leads to truncation of breastfeeding, which leads to earlier resumption of fecundity. This means that there is a better chance of conceiving another child quickly as shown in Table 3.6, with median of 24.6 months interval for a deceased child compared to 33.4 months for a surviving child.

Birth intervals are 2 to 3 months longer in the Highlands region than elsewhere. This may be related to longer breastfeeding duration in the Highlands than in other regions (see Chapter 9). Differences in the median length of birth intervals by urban/rural residence and educational level are minimal.

Table 3.6 Birth Intervals

Percent distribution of births in the five years before survey by interval since previous birth by demographic and background characteristics

Characteristics	*Months Since Previous Birth*					*Total Number*		
	7-17	*18-23*	*24-35*	*36-47*	*48+*	*Total*	*Number*	*Median*
Age of Mother								
15-19	25.0	50.0	25.0	-	-	100	20	21.0
20-29	12.7	17.7	36.3	20.0	13.3	100	1165	29.7
30-39	7.1	13.0	33.1	21.3	25.5	100	1224	34.6
40+	10.1	12.2	25.8	20.2	31.8	100	337	36.8
Birth Order								
2-3	11.0	16.1	32.4	19.9	20.7	100	1263	32.1
4-6	8.0	13.8	34.2	21.6	22.4	100	1076	33.2
7+	12.0	15.7	35.1	19.4	17.7	100	407	31.5
Sex of prior birth								
Male	9.7	16.0	33.8	20.2	20.3	100	1403	32.2
Female	10.3	14.2	33.2	20.8	21.5	100	1343	32.9
Survival of prior birth								
Still alive	8.1	14.7	33.9	21.4	22.0	100	2469	33.4
Deceased	27.1	19.5	30.0	11.9	11.6	100	277	24.6
Place of residence								
Urban	9.9	17.4	29.7	16.8	26.2	100	465	32.7
Rural	10.0	14.7	34.3	21.2	19.8	100	2281	32.4
Region								
Southern	10.1	15.3	35.0	18.6	21.1	100	655	31.9
Highlands	9.5	13.9	30.4	23.7	22.6	100	908	33.9
Momase	10.7	16.3	33.5	18.9	20.6	100	821	31.6
Islands	9.4	15.5	38.7	19.3	17.1	100	362	30.9
Level of Education								
No education	9.9	14.8	31.4	22.3	21.6	100	1214	33.4
Grades 1-5	10.4	14.9	33.9	20.4	20.4	100	422	32.1
Grade 6	10.0	14.7	38.6	18.8	18.0	100	762	30.9
Grades 7+	9.8	17.5	29.3	17.8	25.6	100	348	32.8
Total	10.0	15.1	33.5	20.5	20.9	100	2746	32.4

3.5 Beginning of Women's Childbearing

Age at First Birth

The age at which childbearing begins has important demographic consequences for the society. Increase in the age at marriage and delaying of the first births even after marriage has contributed greatly to overall fertility decline in many countries. The distribution of PNG women by age at first birth, according to their current age is presented in Table 3.7. Overall, the median age at first birth for women in Papua New Guinea is 21 years. Among women currently of age 20-24, about 35 percent became mothers before the age of 20; this is roughly the same percentage as for the older age groups. Therefore, there has been little change in the median age at first birth, which is about 21 years.

Table 3.7 Age at First Birth

Percent distribution of women by age at first birth, according to current age

Respondent's Age	Age at First Birth							Total Number		
	No Births	<15	15-17	18-19	20-21	22-24	25+	Total	Number	Median
15-19	88.9	0.7	5.9	4.5	-	-	-	100	881	-
20-24	40.0	2.2	13.6	18.8	16.8	8.5	-	100	904	-
25-29	14.8	3.4	14.3	18.6	20.9	20.8	7.2	100	893	21.3
30-34	8.0	4.4	14.4	21.1	22.8	16.0	13.3	100	758	20.7
35-39	8.3	3.7	14.4	22.1	19.9	16.2	15.4	100	624	20.9
40-44	7.8	4.5	16.6	19.7	17.3	19.5	14.6	100	446	21.0
45-49	4.6	3.9	11.4	18.0	18.7	21.2	22.1	100	411	21.7

Age at First Birth by background characteristics

Table 3.8 summarises the median age at first birth for different cohorts and compares the entry age into parenthood for different sub-groups of population. (Medians for cohorts 15-19 and 20-24 could not be determined because most women had not given birth by age 20, the lower limit of the cohort 20-24.) The median age at first birth for the population as a whole is 21 years. Findings for older women should be interpreted with caution; for example, the higher medians for older women in Momase region may reflect omission or misdating of early births, rather than a genuine trend. There are however, only small differences between the various subgroups. Across all age categories, women with at least some secondary education give birth for the first time somewhat later (median 21.5 years). All other differences are insignificant.

Table 3.8 Age at First Birth by Background Characteristics

Median age at first birth among women aged 25-49 years, by current age and selected background characteristics

Background Characteristics	Current Age					Women Age 25-49
	25-29	30-34	35-39	40-44	45-49	
Place of residence						
Urban	21.3	20.6	20.3	21.0	21.6	20.9
Rural	21.3	20.8	21.0	21.0	21.8	21.1
Region						
Southern	21.2	20.3	20.1	20.4	22.3	20.7
Highlands	21.1	20.9	21.0	20.2	20.8	20.9
Momase	21.5	21.0	21.7	22.1	22.5	21.6
Islands	21.6	20.9	19.9	21.3	21.5	21.0
Level of education						
No education	20.9	20.7	21.1	20.9	21.8	21.0
Grades 1-5	21.3	20.5	19.7	20.6	21.8	20.8
Grade 6	21.3	20.9	20.8	21.1	21.2	21.1
Grade 7+	22.1	20.8	21.3	21.3	22.3	21.5
Total	21.3	20.7	20.9	21.0	21.7	21.0

Timing of First Births

First births before marriage in a society can bring insecurity to the women in a number of ways. This list ranges from simply bringing shame to the family, to no economic support if unemployed in an urban area, and an extra burden upon herself and the family. Table 3.9 summarises the percent distribution of first births according to their timing with respect to mother's marital status, tabulated by mother's current age, mother's education, place of residence and region of residence. The findings indicate that overall half of the women had conceived their first births before marriage, and that 19 percent of first births occurred before the mother had married.

Certain differences between subgroups are of significance to mention. The current age of women shows that about 18 percent of those who have or are completing their childbearing period had births before marriage. Women who have had secondary or higher education and those in urban areas are more likely to have had their first births before marriage as indicated by about 24 and 26 percent respectively. On a regional basis, women in the Southern region are the most likely to have their first births before marriage, 27 percent, compared to 16 to 18 percent in other regions.

Table 3.9 Timing of First Birth

Percent distribution of first births, according to their timing with respect to mother's marital status, by mother's current age, mother's education, place of residence and region of residence

Background Characteristics	Mother has not married	Before Marriage	0-7 months after marriage	> = 8 months after marriage	Total	No. of cases
Mother's current age						
15-19	10.2	6.1	46.9	36.7	100	98
20-24	3.3	14.8	36.0	45.9	100	542
25-29	1.2	16.3	30.7	51.8	100	761
30-34	1.6	20.1	30.1	48.2	100	697
35-39	-	19.9	27.6	52.3	100	572
40-44	0.5	21.4	24.8	53.3	100	411
45-49	0.3	18.1	26.8	54.8	100	392
Place of residence						
Urban	1.7	24.3	30.0	43.9	100	690
Rural	1.4	16.3	30.3	51.9	100	2783
Region						
Southern	2.7	23.8	32.1	41.3	100	840
Highlands	0.2	16.0	29.4	54.4	100	1231
Momase	2.2	15.6	31.2	51.0	100	981
Islands	1.0	17.3	26.8	54.9	100	421
Mother's Education						
None	0.8	16.6	29.3	53.3	100	1548
Grades 1-5	1.0	19.9	30.1	49.1	100	579
Grades 6	2.7	16.8	31.4	49.1	100	851
Grades 7+	2.0	21.8	31.5	44.6	100	495
Total	1.5	17.9	30.3	50.3	100	3473

3.6 Adolescent Fertility

Teenage Pregnancy and Motherhood

Adolescent fertility in this study refers to births that have occurred to females under the age of 20 irrespective of marital status. Table 3.10 shows the percentage of women age 15-19 who are mothers or pregnant with their first child. About 24 percent of teenagers 18 years of age and 9 percent of teens 17 years of age have begun childbearing (have already given birth, or are pregnant with their first child). Overall, 14 percent of teenagers 15-19 years old have begun childbearing. There are indications that early childbearing is common in the Southern region, where the percentage is 16. It is also much more common among teens with no education; almost one-fourth of these teenagers have a child or are pregnant.

Table 3.10 Adolescent Fertility

Percentage of teenagers 15-19 who are mother or pregnant with their first child by background characteristics

Background Characteristics	Percentage who are: Mothers	Pregnant with 1st child	Percentage who have begun child-bearing	No. of teenagers
Age				
15	-	-	-	137
16	2.6	-	2.6	196
17	6.4	2.1	8.6	187
18	16.9	6.8	23.7	177
19	27.7	4.3	32.1	184
Place residence				
Urban	12.9	1.0	13.8	210
Rural	10.6	3.3	13.9	671
Region				
Southern	14.4	1.2	15.6	250
Highlands	8.2	4.3	12.4	282
Momase	11.4	3.0	14.3	237
Islands	10.7	1.8	12.5	112
Level of Education				
No education	17.9	5.1	23.1	156
Grades 1-5	9.0	1.3	10.3	223
Grade 6	12.1	3.9	16.0	282
Grade 7+	7.3	0.9	8.2	220
Total	11.1	2.7	13.8	881

Children Born to Adolescents

A high number of births to young females reveals a situation that needs to be addressed by policy makers and planners. The distribution of teenagers 15-19 by number of children ever born according to single years of age is presented in Table 3.11. The results show that fertility increases with age. About 2 percent of the women aged 16 have at least 1 child. At the age of 19, around 20 percent have given birth to 1 child; and around 7 percent have given birth to 2 children, which is not a healthy situation. The average number of children born to teenagers is 0.13 for the whole country. While not a startling figure, in comparison with many countries, it is still of concern.

Table 3.11 Children Born to Adolescents

Percent distribution of teenagers 15-19 by number of children ever born according to single years of age

Current Age	Teenager's Children Ever Born 0	1	2+	Total Mean Number Total	Mean CEB	No. of teenagers
15	100.0	-	-	100	-	137
16	97.4	2.0	0.5	100	0.03	196
17	93.6	5.3	1.1	100	0.08	187
18	83.1	15.3	1.7	100	0.19	177
19	72.3	21.2	6.5	100	0.35	184
Total	88.9	9.1	2.0	100	0.13	881

CHAPTER 4

FAMILY PLANNING

Rita Pala

4.1 Knowledge of Methods and Source

Lack of knowledge of family planning methods and their sources is without doubt a major obstacle to the use of contraception. As in other DHS surveys, information about knowledge of family planning methods and of the places where they can be obtained was generated by asking the respondent to name the ways or methods a couple can use to delay or avoid a pregnancy. If the respondent did not spontaneously mention a particular method, the interviewer described that method and asked the respondent if she recognise it. There were nine methods described in the questionnaire. These were: Pill, IUD, Injection, Diaphragm together with Foam and Jelly, Condom, Female Sterilisation, Male Sterilisation, Periodic Abstinence and Withdrawal. Other methods not provided in the questionnaire but mentioned spontaneously by the respondent were also recorded. For all methods mentioned or recognised, the respondent was asked if she knew where a person could go to obtain the method or, in the case of periodic abstinence, advise on how to use periodic abstinence. In this report, the term periodic abstinence is used for natural family planning, rhythm or ovulation methods.

A large majority of all women as well as currently married women know of one or more family planning methods (72 percent and 76 percent respectively) as shown by Table 4.1

Table 4.1 Knowledge of Contraceptive Methods and Source

Percentage of all women and currently married knowing any contraceptive method and knowing a source (for information of services), by specific method

Contraceptive method	Know method		Know a Source	
	All Women	Currently married women	All Women	Currently married women
Any method	71.8	76.4	64.5	69.4
Any modern method	67.7	71.9	63.6	68.4
Pill	58.7	63.1	54.5	59.2
IUD	26.0	28.3	23.1	25.3
Injection	55.5	60.0	51.6	56.6
Diaphrgm, Foam, Jelly	5.9	6.1	5.0	5.3
Condom	44.5	44.7	39.1	39.6
Female sterilisation	47.7	51.8	44.4	48.8
Male sterilisation	19.9	21.4	18.2	19.8
Any traditional method	37.1	40.3	19.2	20.7
Period Abstinence	23.2	24.5	19.2	20.7
Withdrawal	10.5	11.4	-	-
Other	21.8	24.9	-	-
Number of women	4917	3583	4917	3583

The more widely known modern methods are the pill, injection and female sterilisation. It is important to note that the low level of knowledge of the IUD is due to the fact that the insertion requires sterile equipment, environment and a specialist or trained nurse. These are practically not available in many rural areas. The least known modern methods are the diaphragm, foam, jelly. This is related to the fact that they are only available in pharmarcies and chemists.

The low knowledge of male sterilisation is a reflection of how responsive women are to modern contraceptive methods that involve them. In other words, where women are not the actual consumers, their knowledge about the method is low. Less than 25 percent know about periodic abstinence while less than 12 percent of women know about withdrawal.

Not all who claim to know a family planning method know where to obtain it, however, the gap between knowledge of contraceptive methods and their sources among both all women and currently married is small. Almost 60 percent of currently married women and 55 percent of all women know a source for pill, 57 percent and 52 percent for the injections, 40 percent and 39 percent for the condom, 49 percent and 44 percent for female sterilisation. It is not surprising that less than 6 percent of all women and currently married women know a place where one can obtain the diaphragm, foam and jelly because they are not well known contraceptive methods.

4.2 Knowledge of Modern Methods by Background Characteristics

Table 4.2 presents the percentage of currently married women according to knowledge of any method, of at least one modern method, and knowledge of a source by various characteristics, including age, residence, region and education.

The proportion of married women that know of a modern method increases with age up to 39 and then drops. More than 55 percent of all currently married women in each age group know of at least one modern method. In general, about 70 percent (68.4/71.9) of the women who know of a modern method also know of a source. Knowledge of any method, modern methods and sources for modern methods vary slightly by age with the exception of the youngest age group which shows a lower level than older counterparts. There is also marked difference in the levels of knowledge by urban-rural residence, where the urban level is higher by 12-14 percentage points than the rural level.

Table 4.2 Knowledge of Modern Methods and Source by Background Characteristics

Percentage of currently married women knowing at least one modern method and knowing a source (for information or service for a modern method) by selected background characteristics

Background Characteristic	Knowledge of Contraceptives			Number of Women
	Knows			
	Any Method	A Modern Method	A Source of Modern Method	
Age				
15-19	60.2	57.2	48.8	166
20-24	70.8	67.2	63.1	634
25-29	78.4	73.9	70.4	774
30-34	81.0	76.3	73.2	679
35-39	80.4	77.3	75.2	572
40-44	78.3	71.8	68.5	397
45-49	72.3	65.9	62.3	361
Place of Residence				
Urban	85.7	82.5	78.8	698
Rural	74.2	69.3	65.9	2885
Region				
Southern	84.1	77.6	71.5	818
Highlands	76.8	73.9	71.3	1369
Momase	65.0	58.4	55.3	979
Islands	86.8	85.6	83.5	417
Level of Education				
No education	68.6	63.3	60.4	1605
Grades 1 - 5	74.5	69.7	64.6	604
Grade 6	82.8	78.4	73.6	878
Grades 7 +	92.7	90.9	89.5	496
Total	**76.4**	**71.9**	**68.4**	**3583**

When it comes to regional variations, it is the women from the Islands , Southern and Highlands regions that show the highest levels of knowledge and of the source of modern methods as compared to the Momase region which shows the lowest level. There are substantial differentials in the proportion knowing at least one contraceptive method and a source for a modern method by women's education. Table 4.2 clearly shows that as the educational level increases so does the level of knowledge of contraceptive methods.

4.3 Ever Use of Contraception

All women interviewed in the Demographic and Health Survey (DHS) who said that they had heard of family planning were asked if they had ever used it. Table 4.3 shows the percent distribution of all women and currently married women who have ever used any contraceptive method, by specific method and age. Only 22 percent of all women had ever used any modern method (upper panel) compared to 29 percent of married women who had ever used any modern method (lower panel). Corresponding figures for any methods are 29 and 37 percent, respectively.

Ever use is the lowest for those in the youngest age group (15-19), and increases to around 45 percent for women 35-39 years old. In general, women are more likely to have used pill, any traditional method and injection in that order. The least preferred method is diaphragm/foam/jelly.

Table 4.3 Ever Use of Contraception

Percentage of all women and currently married women who have ever used any contraceptive methods, by specific method and age

Age	Any Method	Any Modern Method	Pill	IUD	Injection	Diaphram Foam Jelly	Condom	Female Sterilisation	Male Sterilisation	Any Trad Method	Period Abstinence	Withdrawal	Other	Number Of Women
							All Women							
15-19	3.7	1.9	0.6	-	0.7	-	0.9	-	-	2.0	1.4	0.5	0.7	881
20-24	21.3	15.3	8.0	-	6.6	-	3.5	0.4	-	9.1	6.1	2.3	2.2	904
25-29	32.0	23.2	13.3	0.6	10.9	-	2.9	2.6	0.1	12.7	7.6	2.9	4.5	893
30-34	39.6	30.2	15.8	1.1	12.4	0.1	1.8	6.9	0.7	14.1	8.2	3.0	5.7	758
35-39	44.2	35.9	14.9	0.6	15.4	0.3	2.6	13.8	0.8	13.3	7.5	2.4	4.8	624
40-44	43.0	34.8	12.8	0.9	14.8	-	1.1	15.5	0.4	12.3	4.9	0.9	7.6	446
45-49	35.8	27.3	11.2	2.4	9.5	-	0.2	12.4	0.2	12.2	4.6	0.7	8.5	411
All Ages	29.0	22.0	10.4	0.6	9.3	0.1	2.1	5.8	0.3	10.3	5.8	2.0	4.2	4917
							Currently Married Women							
15-19	13.3	8.4	3.0	-	3.0	-	3.6	-	-	6.0	3.6	2.4	2.4	166
20-24	27.3	19.9	10.3	-	8.8	-	4.1	0.6	-	11.2	7.9	2.8	2.7	634
25-29	34.8	25.5	14.5	0.6	12.0	-	3.1	3.0	0.1	13.4	8.1	3.0	4.5	774
30-34	41.5	32.3	16.6	1.2	13.0	0.1	2.1	7.5	0.7	14.6	8.2	3.1	5.9	679
35-39	46.3	37.8	15.6	0.7	16.4	0.3	2.8	14.5	0.7	13.8	7.7	2.6	4.9	572
40-44	45.3	37.3	13.6	1.0	16.1	-	1.3	16.9	0.5	12.6	5.3	0.8	7.6	397
45-49	36.0	28.0	11.4	2.5	10.0	-	-	12.5	0.3	11.6	3.9	0.8	8.6	361
All Ages	36.9	28.5	13.4	0.8	12.2	0.1	2.5	7.6	0.4	12.7	7.1	2.4	5.2	3583

4.4 Current Method Use.

Information on current use of contraceptives is used to determine estimates of the current contraceptive prevalence rate by method . Table 4.4 presents the distribution of current contraceptive use for all women (upper panel) and currently married (lower panel). The age patterns of current use for all women and currently married are similar to those for ever use, with younger women being less likely to use either modern of traditional methods.

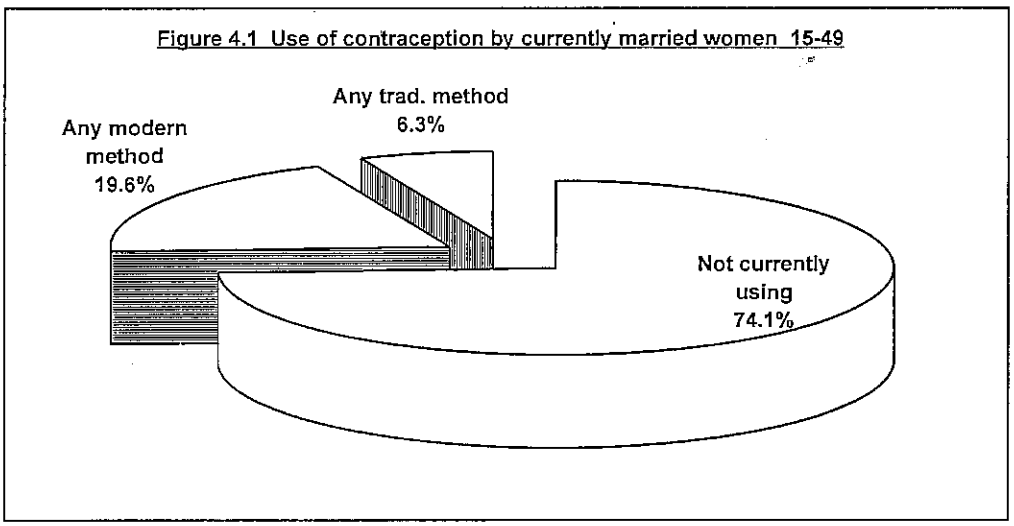
Table 4.4 Current Method Use

Percent distribution of all women and of currently married women by contraceptive method currently used, according to age

Age	Any Method	Any Modern Method	Pill	IUD	Injection	Condom	Female Sterilisation	Male Sterilisation	Any Trad Method	Period Abstinence	Withdrawal	Other	Not Currently Using	Total	Number Of Women
All Women															
15-19	2.3	1.1	0.3	-	0.5	0.3	-	-	1.1	0.7	0.2	0.2	97.7	100	881
20-24	15.0	10.1	4.1	-	4.5	1.0	0.4	-	5.0	2.5	1.0	1.4	85.0	100	904
25-29	21.3	15.0	5.2	0.1	6.4	0.7	2.6	0.1	6.3	3.8	0.6	1.9	78.7	100	893
30-34	25.9	19.3	5.0	0.1	6.6	0.4	6.9	0.3	6.6	3.3	0.8	2.5	74.1	100	758
35-39	32.1	25.5	3.7	-	7.7	0.2	13.8	0.2	6.6	3.0	0.2	3.4	67.9	100	624
40-44	32.1	26.2	3.1	-	7.2	-	15.5	0.4	5.8	1.3	0.2	4.3	67.9	100	446
45-49	21.4	17.0	0.5	-	3.9	-	12.4	0.2	4.4	0.2	-	4.1	78.6	100	411
All Ages	19.8	14.8	3.3	-	5.0	0.4	5.8	0.1	5.0	2.3	0.5	2.2	80.2	100	4917
Currently Married Women															
15-19	9.0	5.4	1.8	-	2.4	1.2	-	-	3.6	1.2	1.2	1.2	91.0	100	166
20-24	20.2	13.6	5.7	-	6.2	1.1	0.6	-	6.6	3.5	1.4	1.7	79.8	100	634
25-29	23.4	16.8	5.6	0.1	7.2	0.8	3.0	0.1	6.6	4.1	0.5	1.9	76.6	100	774
30-34	27.8	21.2	5.6	0.1	7.2	0.4	7.5	0.3	6.6	3.4	0.7	2.5	72.2	100	679
35-39	34.3	27.3	4.0	-	8.4	0.2	14.5	0.2	7.0	3.3	0.2	3.5	65.7	100	572
40-44	35.0	28.7	3.5	-	7.8	-	16.9	0.5	6.3	1.5	0.3	4.5	65.0	100	397
45-49	22.2	17.7	0.6	-	4.4	-	12.5	0.3	4.4	-	-	4.4	77.8	100	361
All Ages	25.9	19.6	4.4	0.1	6.8	0.5	7.6	0.2	6.3	2.9	0.6	2.8	74.1	100	3583

Among all women and currently married women, the most commonly used methods of contraception are female sterilisation, injection and any traditional method with 6 percent, 5 percent and 5 percent respectively for all women, and 8 percent, 7 percent and 6 percent, respectively, for currently married women (also see Figures 4.1). Contraceptive use is highest among women in their late 30s and early 40s, and lowest among women age 15-19. This pattern is most likely due largely to the fact that the younger women are just starting their families, while older women are more likely to have completed their families and to want to stop childbearing altogether. For the same reason, younger women (15-24), are more likely to use less effective methods such as withdrawal or rhythm, or temporary methods such as condoms, while older women are more likely to use more effective methods such as female sterilisation and injection. It is notable that 16 percent of women age 40-44 have been sterilised.

Figure 4.1 Use of contraception by currently married women 15-49



4.5 Current Use by Background Characteristics

Table 4.5 presents the distribution of currently married women by current contraceptive method used, according to selected background characteristics (also Figure 4.2). The proportion using any form of contraception is higher in the urban than the rural areas. Women most likely to be using contraception are those in urban areas, those in the Islands and Southern regions, those with more education, and those with 4 or more children. Both urban and rural women rely primarily on female sterilisation, followed by injection and the pill. But women in the rural areas tend to use traditional methods more than the women in the urban areas.

Table 4.5 Current Use by Background Characteristics

Percent distribution of currently married women by contraceptive method currently used, according to selected background characteristics

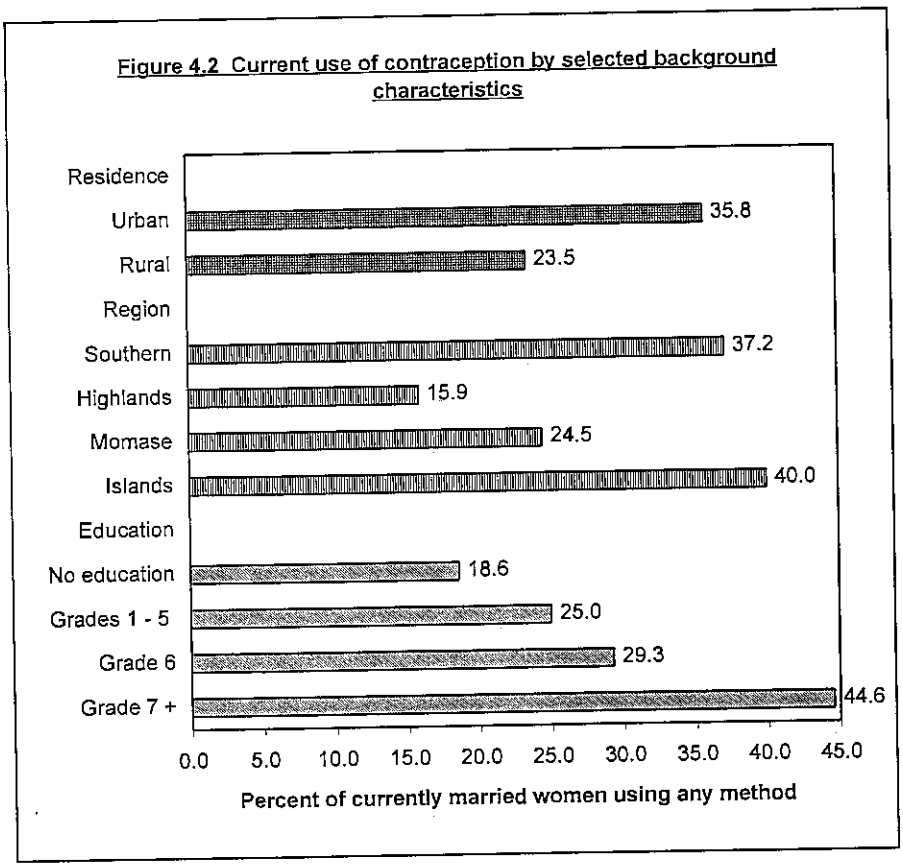
Background Characteristics	Any Method	Any Modern Method	Pill	IUD	Injection	Condom	Female Sterili.	Male Steril.	Any Trad Method	Period Abstin.	Withdrawal	Other	Not Currently Using	Total	Number Of Women
							Currently Married Women								
Residence															
Urban	35.8	30.9	6.7	0.3	8.9	1.7	13.2	0.1	4.9	3.9	0.3	0.7	64.2	100	698
Rural	23.5	16.9	3.9	-	6.3	0.2	6.3	0.2	6.6	2.7	0.7	3.3	76.5	100	2885
Region															
Southern	37.2	29.3	5.6	0.2	11.1	0.9	10.8	0.7	7.8	2.6	0.7	4.5	62.8	100	818
Highlands	15.9	12.9	3.4	-	5.3	0.1	4.0	-	3.0	0.5	0.3	2.2	84.1	100	1369
Momase	24.5	17.8	5.1	-	4.7	0.3	7.6	0.1	6.7	3.6	0.5	2.7	75.5	100	979
Islands	40.0	27.1	3.8	-	7.9	1.9	13.4	-	12.9	9.8	1.7	1.4	60.0	100	417
Education															
No education	18.6	14.6	2.9	-	5.8	0.2	5.5	0.2	4.0	0.4	0.2	3.3	81.4	100	1605
Grades 1 - 5	25.0	18.7	3.5	-	4.8	0.2	9.9	0.3	6.3	3.0	0.7	2.6	75.0	100	604
Grade 6	29.3	21.5	5.1	0.1	8.0	0.8	7.4	0.1	7.7	3.8	0.7	3.3	70.7	100	878
Grades 7 +	44.6	33.5	9.3	0.2	10.3	1.6	11.9	0.2	11.1	9.3	1.6	0.2	55.4	100	496
Number of Living Children															
None	6.3	2.7	1.9	-	0.2	0.4	0.2	-	3.6	2.1	0.4	1.1	93.7	100	473
1	15.5	8.3	2.7	0.2	4.2	0.7	0.7	-	7.2	3.7	1.5	2.0	84.5	100	601
2	25.0	17.6	7.1	-	6.7	1.6	2.1	0.2	7.4	3.8	0.2	3.5	75.0	100	579
3	28.6	22.3	6.5	-	8.0	0.4	7.4	-	6.3	2.7	0.9	2.7	71.4	100	552
4+	36.4	30.1	4.1	0.1	9.7	0.1	15.6	0.4	6.3	2.5	0.4	3.4	63.6	100	1378
Total	25.9	19.6	4.4	0.1	6.8	0.5	7.6	0.2	6.3	2.9	0.6	2.8	74.1	100	3583

The proportion of married women using any method varies by region from 16 percent in the Highlands to 40 percent in the Islands. In the Islands and the Momase, female sterilisation and traditional methods are the most frequently used methods, while in the Southern and Highlands, injection is the most popular method followed by female sterilisation.

There are distinct variations in level of current use by educational attainment. Contraceptive use increases steadily with increasing level of education, from 19 percent of women with no education to more than twice (45 percent) of those with Grade 7 and above. Female sterilisation is common among currently married with Grade 1-5 and those with Grade 7 and above, while injection is the most popular method among those with no education and those with Grade 6.

Contraceptive use of any method increases widely with increasing number of children, from 6 percent of married women with no children to 6 times more (36 percent) with those women with 4 or more children. Women with 4 or more children tend to use the more effective methods such as female sterilisation and injection. Traditional methods are common among women with no children and those with 1 child or 2 children, while injection is common among those with 3 children.

Figure 4.2 Current use of contraception by selected background characteristics



4.6 Method Used by Source of Supply

All current users of modern methods of family planning methods were asked for the source from which they most recently obtained their methods. Table 4.6 presents the percent distribution of current users of modern contraceptive methods by most recent source of supply, according to specific method. Hospitals were the most frequently cited source with 44 percent of users, followed by health centres and health sub centres. Hospitals are largely responsible for sterilisation (91 percent of all female sterilisation). Most users of pill and injection get their supply from health centres.

Table 4.6 Source of Supply

Percent distribution of current users of modern contraceptive methods by most recent source of supply, according to specific method

Source of Supply	Contraceptive methods 1]			
	Pill	Injection	Female Sterilisation	Total
FPA clinic	6.7	5.2	-	4.3
Aid post	5.5	15.7	-	6.7
Health sub centre	19.0	17.7	-	10.3
Health centre	36.8	39.5	7.7	25.4
MCH clinic	9.2	6.0	-	4.3
Hospital	13.5	11.3	91.2	44.3
Private doctor	0.6	1.2	0.7	0.8
Pharmacy/chemist	3.7	-	-	1.1
Shop	-	-	-	0.1
Relative or friend	0.6	-	-	0.4
Other	4.3	3.2	0.4	2.2
Total	100	100	100	100
Number	163	248	285	727

1] The percentage distribution for the IUD, condom and male sterilisation are not shown because there were fewer than 25 users. But they are included in the total column.

4.7 Future Use of Contraception

All women not using contraceptives at the time of the survey, which includes now pregnant as well as past users and never users, were asked whether they might consider adopting contraceptives at a future date, and if so which method they might prefer. Such data provide an indication of future demand for family planning services, and acts as a convenient summary indicator of disposition towards contraception among current non-users. Intention not to use contraception in the future is useful in identifying "hard core" targets for program managers and implementors.

Table 4.7 shows the distribution of women by intention to use in the future, according to the number of living children. Among all currently married non-users, 42 percent do not intend to use a family planning method in future, while 34 percent intend to use in the future. Of those who have used contraceptives previously, 33 percent do not intend to use while 49 percent intend to use, a method in the future.

In general, the proportion intending to use family planning method in the future tends to increase with parity, then decreases among those with 4 or more children. For example, among never users, the proportion intending to use some contraceptive method is 18 percent among those with no living children, and increases to 38 percent among those with only one living child then decreases to 30 percent among those with 4 or more children. The corresponding figures among all non-users are 20, 39, and 33 percent respectively.

In contrast, among previous users the proportion intending to use family planning decreases with the number of living children. Among previous users, the proportion intending to use some contraceptive method is 58 percent among those with only one living child, and 45 percent among those with 4 or more children. But in all cases, the percentage of previous users intending to use in the future is greater than that of never users.

Table 4.7 Future Use of Contraception

Percent distribution of currently married women who are not currently using any contraceptive method by intention to use in the future, according to number of living children and whether ever used contraception

Intentions	*Living Children*					*Total*
	None	*1*	*2*	*3*	*4+*	
Never Used Before						
Intent to use	18.1	38.0	33.2	35.7	29.7	31.1
Unsure as to intent	30.7	26.9	29.0	22.2	21.8	25.5
Does not intent to use	51.3	35.2	37.8	42.2	48.5	43.4
Total	100	100	100	100	100	100
Number of cases	**349**	**495**	**365**	**325**	**728**	**2262**
Previously Used						
Intent to use	*	58.3	49.3	51.3	45.8	49.4
Unsure as to intent	*	16.7	9.6	11.8	8.4	10.2
Does not intent to use	*	25.0	39.7	34.2	32.6	33.3
Missing	*	-	1.4	2.6	13.2	7.1
Total	100	100	100	100	100	100
Number of cases	**18**	**36**	**73**	**76**	**190**	**393**
All non - users						
Intent to use	20.2	39.4	35.8	38.7	33.0	33.8
Unsure as to intent	29.7	26.2	25.8	20.2	19.1	23.2
Does not intent to use	50.1	34.5	38.1	40.6	45.2	41.9
Missing	-	-	0.2	0.5	2.7	1.1
Total	100	100	100	100	100	100
Number of cases	367	531	438	401	918	2655

** Based on too few cases to show*

4.8 Reason for Non-use of Contraception

Women who are not currently using any contraceptive method and do not intend to use any in future were asked to provide the main reason for their intention not to use. Table 4.8 presents the percentage distribution of these women classified into two age ranges - those less than 30 years of age and those 30 years and above, according to reasons for not intending to use. More than one quarter of married non-users cited lack of knowledge as main reason for not intending to use contraceptives. This category represents 35 percent of those under 30 years and 23 percent of those 30 years and above. A smaller number say that they want more children. This group represents 29 percent of those under 30 years and 17 percent of those 30 years and above. Other often cited reasons are "side effects" (11 percent), "menopausal/had hysterectomy" (7 percent) and "religion" (6 percent). A small proportion (5 percent) of non-users cite their partner's opposition as their main reason for not intending to use.

Table 4.8 Reasons for Nonuse

Percent distribution of currently married women who are not using any contraceptive method and who do not intend to use in the future by main reason for not intending to use

Reasons	*Respondent's Age*		*Total*
	<30	*30+*	
Wants children	28.7	17.4	21.3
Lack of knowledge	34.7	23.0	27.1
Partner opposed	4.4	4.7	4.6
Cost too much	0.8	1.1	1.0
Side effects	9.1	11.2	10.5
Hard to get methods	4.7	3.4	3.9
Religion	3.7	7.4	6.1
Fatalistic	-	0.1	0.1
Menopausal, had hyst	-	10.4	6.8
Other	9.1	16.6	14.0
Don't Know	4.7	4.5	4.6
Total	100	100	100
Number	383	729	1112

4.9 Preferred Method

Respondents who are currently non-users, but who *intend* to *use in the future*, were asked to state their preferred methods. Table 4.9 presents the percentage distribution of these married women. Of all the women who intend to use family planning in the future, 38 percent prefer to use injection and more than 34 percent intend to use the pill. Only about 12 percent prefer female sterilisation. A small proportion (less than 5 percent) of non-users preferred periodic abstinence and "other" methods. It is noteworthy that only 1 percent of the women indicated an intention to use condom in future. In summary, women who are currently non-users but who intend to use in the future prefer pills and injection.

Table 4.9 Preferred Method

Percent distribution of currently married women who are not using contraceptive method but who intend to use in the future by preferred method

Method	*Percent*
Pill	34.4
IUD	0.9
Injections	37.5
Diaphragm/Foam/Jelly	0.3
Condom	1.1
Female Sterilization	11.9
Periodic Abstinence	4.0
Withdrawal	0.4
Other	3.6
Missing	5.8
Total	100
Number	898

CHAPTER 5

MARRIAGE AND POLYGYNY

Rita Pala

In this chapter the focus is on the main factors that affect a woman's risk of becoming pregnant. In Papua New Guinea, various types of marriage exist, ranging from customary, civil and religious, to a variety of informal unions. The majority of unions have been formal and sanctioned in accordance with custom. As custom varies from one area to another, definitions of what constitutes a marriage diverge quite widely. The marital status of all respondents which was recorded during the survey is the marital status they reported themselves. Throughout this report, the term 'married' refers to both formal (legal, religious and customary) unions and to informal unions or those persons living in a consensual union (de-facto), defined as a stable, socially accepted marriage union.

5.1 Current Marital Status

The distribution of all women interviewed according to their marital status by five-year age groups is shown in Table 5.1. Women marry at an early age, thus, in the 20-24 cohort only 25 percent remain single. The data shows that only a fifth of those interviewed have never been married. Over 70 percent of the women are found in formal unions. Less than 1 percent reported living together in informal unions. While the widowed and separated are almost identical at 2 percent, they show different patterns by age group. There is a clear relationship between age and marital status. The proportion currently married increases with age up to 40 years. As expected, the proportion widowed increases with age reaching 10 percent among women 45-49 years of age. Most of the separated women though are to be found in the 20-34 age groups. The proportion of never married falls from 79 percent in the age group 15-19 to a low of less than 1 percent for those age 45-49.

Table 5.1 Current Marital Status

Percentage distribution of women by current marital status, according to age

Age Group	Marital Status						Total	Number of women
	Never married	Married	Living together	Widowed	Divorced	Separated		
15-19	79.2	18.2	0.7	0.3	0.7	0.9	100	881
20-24	24.9	70.0	0.1	0.4	1.5	3.0	100	904
25-29	7.2	86.3	0.3	0.9	1.9	3.4	100	893
30-34	3.4	89.4	0.1	1.5	2.0	3.6	100	758
35-39	1.0	91.5	0.2	3.7	1.9	1.8	100	624
40-44	1.3	88.8	0.2	4.9	2.0	2.7	100	446
45-49	0.2	87.8	-	9.7	1.0	1.2	100	411
Total	20.9	72.3	0.3	2.3	1.6	2.4	100	4917

5.2 Polygyny

The extent of the practice of polygamy in Papua New Guinea was measured by asking married women and those in informal unions whether their husbands/partners had other wives. If they had other wives, they were asked how many, and the rank the women themselves were in.

Overall, about 14 per cent of currently married women are in polygynous unions (Table 5.2.). As indicated in the data, women in the older age categories are more likely than the younger women to be in the polygynous unions. Ten percent of the respondents in urban areas are found to be in polygynous unions compared to 15 percent in the rural areas. In comparing the rural and urban sectors by age groups, women in the rural areas start out in the polygynous union as early as age 15-19 years.

The incidence of polygyny varies from one region to the other. The region in which the practice of polygyny is most common is the Highlands region where 25 percent of married women are in polygynous unions. Following are the Islands region and Momase region, each with about 8 percent, and the Southern region with the least percent (7) of married women found to be in polygynous unions. As indicated in the data, 15 percent of the Highlands women of ages 15-19 are found to be in polygynous unions compared to less than 3 percent in the other regions.

There is an inverse relationship between education and polygyny. The proportion of married women in a polygynous union decreases from 19 percent for women with no education to 8 percent for women with at least primary education, then increases to 11 percent for secondary education. It is interesting to observed that those with grade 7 and over education are more likely to be in the polygynous unions than those with grade 6 education. The data reveal that women with less education and no education are found to be in polygynous unions at earlier ages (15-19) than those of their counterparts who are more educated.

The data also reveal that women in the oldest age group (45-49) are more likely than those in younger age group to be in a polygynous union. The difference cannot be interpreted that polygamy is decreasing, as younger women have had less time to enter into a polygynous union.

Table 5.2 Polygyny

Percentage of currently married women in a polygynous union by age, and selected background characteristics

Background Characteristics	Respondent's Age							Total
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Place of residence								
Urban	-	10.9	9.9	10.8	12.5	10.0	10.3	10.3
Rural	8.8	10.7	13.6	17.3	15.9	12.9	25.5	15.2
Region								
Southern	2.4	8.4	5.9	5.8	7.0	9.0	12.0	7.2
Highlands	15.4	17.5	23.3	30.4	26.1	22.8	34.7	25.1
Momase	2.4	6.2	7.7	8.0	8.3	5.7	12.3	7.5
Islands	-	6.8	5.6	8.6	13.8	1.9	18.9	8.2
Educational level								
No education	11.4	11.3	15.5	21.8	20.3	16.6	28.3	18.9
Grades 1 - 5	10.0	13.5	18.5	15.0	12.5	3.2	13.7	13.4
Grades 6	4.6	9.6	6.6	7.6	7.4	11.3	20.0	8.3
Grades 7+	-	8.9	11.9	14.1	10.1	6.1	12.5	10.5
Total	7.2	10.7	12.8	16.1	15.2	12.3	23.8	14.2

5.3 Number of Co-wives.

The question was asked to women whether their husbands/partners had other wives, and if so, how many. The percent distribution of currently married women by number of co-wives according to selected background characteristics is given in Table 5. 3. Overall, 86 percent of respondents who are currently married are in monogamous unions, 9 percent are in the polygynous union with one other wife and 5 percent have two or more co-wives. The data show that women 45-49 are more likely to be in a union with two or more co-wives. The table also reveals that women in the Highlands region are more likely to have two or more co-wives than in the Coastal regions.

Comparing the urban and rural sector, women in the rural sector are most likely than their counterparts in the urban sector to have two or more co-wives. Women who are educated are less likely than those with no education to be in union with 2 or more co-wives.

Table 5.3 Number of Co-Wives

Percent distribution of currently married women by number of co- wives, according to selected background characteristics

Background Characteristics	Number of Co-Wives: No other Wives	One Other Wife	Two + Other Wives	Missing	Total	Number
Respondent's Age						
15-19	92.8	4.2	2.4	0.3	100	166
20-24	89.3	6.9	3.8	-	100	634
25-29	87.2	7.9	4.5	0.4	100	774
30-34	83.9	9.7	5.7	0.6	100	679
35-39	84.8	11.0	3.7	0.5	100	572
40-44	87.7	8.6	3.5	0.3	100	397
45-49	76.2	15.8	7.8	0.3	100	361
Place of residence						
Urban	89.7	7.3	2.4	0.6	100	698
Rural	84.8	9.7	5.1	0.3	100	885
Region						
Southern	92.8	4.6	2.0	0.6	100	818
Highlands	74.9	16.4	8.3	0.4	100	1369
Momase	92.5	4.5	2.7	0.3	100	979
Islands	91.8	6.0	2.2	-	100	417
Educational level						
No education	81.1	12.3	6.2	0.4	100	1605
Grades 1 - 5	86.6	10.3	3.1	-	100	604
Grades 6	91.7	4.7	3.4	0.2	100	878
Grades 7+	89.5	6.3	3.4	0.8	100	496
Total	85.8	9.3	4.6	0.4	100	3583

5.4 Age at First Marriage.

Information on age at first marriage was obtained by asking respondents how old they were when they started living with their (first) husband/partner (Table 5. 4), and those respondents who could not remember were aided by the interviewer to make an estimate. Older respondents had a tendency to hesitate in recalling the exact time. Thus, the data regarding older respondents must be interpreted with caution. The median age at first marriage is 20 years for women age 25-49. With regard to the median age across the age groups, no marked differences are observed.

Table 5.4 Age at First Marriage

Percentage of women ever married by specific exact ages and mean age at first marriage, according to current age

Age Group	Exact Age 15	18	20	22	25	Never Married	Number	Median Age
15-19	0.9	-	-	-	-	79.2	881	-
20-24	0.7	21.2	49.4	-	-	24.9	904	-
25-29	1.3	24.9	50.1	73.3	88.2	7.2	893	20.0
30-34	1.5	20.4	53.0	76.3	89.3	3.4	758	19.8
35-39	0.8	25.0	54.0	77.7	89.9	1.0	624	19.7
40-44	1.1	22.9	51.3	77.1	89.0	1.3	446	19.9
45-49	0.7	22.1	48.7	75.7	91.2	0.2	411	20.1
Total	1.1	23.2	51.6	75.8	89.3	3.3	3132	19.9

5.5 Median Age at First Marriage.

The median age at first marriage for women age 25-49 by selected background characteristics is examined in Table 5. 5. The median age at which urban women marry is slightly higher, 20.3 compared to 19.7 for rural women. Minor variations among regions are also observed. Slightly higher values are observed in Southern and Momase regions with the median age of 20 years. Highlands and Islands have lower values of 19.5 and 19.6 years respectively.

The data also suggest a positive relationship between level of education and age at first marriage: women with no education tend to marry earlier than their educated counterparts. The median age at which women with no education marry is 19.5 years compared to 20.7 years for women with Grade 7+ education. This could indicate a trend toward later age at first marriage as more women become educated.

Table 5.5 Median Age at First Marriage

Median age at first marriage among women age 25 - 49 years, by current age and selected background characteristics

Background Characteristics	*Respondent's Age*					*Age*
	25-29	*30-34*	*35-39*	*40-44*	*45-49*	*25-49*
Place of residence						
Urban	20.4	20.2	20.1	20.6	20.4	20.3
Rural	19.9	19.6	19.6	19.6	20.0	19.7
Region						
Southern	20.4	19.8	20.1	20.2	21.0	20.2
Highlands	19.4	19.7	19.6	19.1	19.4	19.5
Momase	20.3	19.9	19.9	20.2	20.4	20.1
Islands	20.2	19.5	18.5	19.5	20.2	19.6
Educational level						
No education	19.2	19.4	19.5	19.2	19.9	19.5
Grades 1 - 5	19.7	19.8	19.0	20.5	19.8	19.8
Grades 6	20.3	20.0	20.2	19.8	20.6	20.2
Grades 7+	21.3	20.1	20.4	20.8	20.9	20.7
Total	20.0	19.8	19.7	19.9	20.1	19.9

CHAPTER 6

FERTILITY PREFERENCES

Christine Aisoli

Fertility preference was never a concern to Papua New Guinea (PNG) families. Since most PNG societies believed in large families for inheritance, tribal war and security (amongst others) there was generally no rational decision on family planning taking into account ideal family size, spacing of births, sex preferences and most importantly mother's health.

The PNGDHS for the first time has gathered information on women's preferences covering family size and gender of their children. All ever-married women in the reproductive age were asked whether the respondent wanted to have (another) a child or would prefer not to have any (more) children. Women who were pregnant were asked about their desire for another child after the one they were expecting. Future childbearing desires were not asked for sterilised women and those whose husbands were sterilised.

In order to determine the extent of sex preference, the respondent was asked about the preferred sex of the child. Additional questions were: reasons for wanting another child, reasons for not wanting another child, the ideal number of children by sex and interestingly, who decides on the number of children to have. The answers to these questions are useful as they can be the basis to predicting the level of fertility and also in assessing and providing family planning services in the country.

In most PNG societies in the past, it was the husbands who had a major influence on the reproductive decisions. This practise is now rare in most cases due to reasons such as education (for women as well as couples), social pressures, particularly in the urban areas, and family planning services. With the case of family planning services, there is no prior record of the contraceptive prevalence rate being measured in PNG based on reliable, comprehensive and accurate data like recent data from the 1996 PNGDHS, however, it is believed the contraceptive prevalence rate was very low. Moreover, the responses to the questions may be criticised as the husbands were not interviewed at the time of the survey. Despite this, the observed fertility may at least reflect family size preferences.

6.1 Fertility Preferences

Table 6.1 presents information relevant to the potential need for contraceptive services. Of the currently married women interviewed, 38 percent want no more children. The proportion wanting no more children increases from almost 30 percent of women with two children to 70 percent of women with six or more children. The desire to have a second child was prevalent among women who have only one living child (68 percent). The desire for another then drops to 44 percent among women with two children.

Table 6.1 Fertility Preference

Percent distribution of currently married women by desire for children, according to number of living children

Desire for children	Children (+ current pregnancy)							Total
	0	1	2	3	4	5	6+	
Want more	67.5	67.5	43.9	30.1	13.5	6.6	2.8	34.1
Not decided/Not sure	24.7	20.5	24.2	21.3	21.2	18.0	8.6	19.8
Want No More	7.3	11.4	29.7	41.0	52.5	59.7	70.0	38.2
Sterilised (female + male)	0.3	0.6	2.2	7.3	12.5	15.6	18.4	7.8
Missing	0.3	-	-	0.4	0.2	-	0.2	0.1
Total	100	100	100	100	100	100	100	100
Number	397	624	583	559	510	377	533	3583

Table 6.2 shows the distribution of currently married women by desire for children, according to age. It is evident that the interest in limiting childbearing increases rapidly with age, from around 26 percent among women 25-29 to over 70 percent among women 45-49.

Table 6.2 Fertility Preference and Age

Percent distribution of currently married women by desire for children, according to age

Desire for children	Respondent's Age							Total
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Want more	63.9	60.4	45.5	32.0	18.4	10.6	4.7	34.1
Not decided/Not sure	24.1	22.4	25.5	23.0	16.1	12.8	8.3	19.8
Want No More	12.0	16.6	26.0	36.8	50.5	59.2	74.2	38.2
Sterilised (female + male)	-	0.6	3.1	7.8	14.7	17.4	12.7	7.8
Missing	-	-	-	0.4	0.3	-	-	.0.1
Total	100	100	100	100	100	100	99.9	100
Number	166	634	774	679	572	397	361	3583

Table 6.3 looks at the proportion of women who want no more children with the number of living children by selected background characteristics. Overall, 46 percent of currently married women want no more children (this includes the women who have been sterilised). The results show that the urban and rural women narrowly differ in wanting to limit family size in the lower parities. As the number of living children increases, the proportion of women wanting no more children increases but at a faster pace for the urban women compared to that of the rural women at parities 4 and 5. For example, there were around 75 percent of urban women with four children who do not want another child compared to 63 percent of rural women who do not want another child.

For the differentials by regions, the proportion of women wanting no more children living in the Islands region is higher (52 percent) than the other three regions.

The desire to stop childbearing is greater among women with no education (50 percent) than among women who have been to school. But this is due to the fact that they are generally older. Interestingly, the proportion of women with no education and wanting no more children after the third child (50 percent) was similar to that of women who completed grade 7 or over. A similar pattern follows for the rest of the parities.

Table 6.3 Want No More Children by Background Characteristics

Percent of currently married women who want no more children by number of living children by background characteristics

Background Characteristics	Living children (+current pregnancy)							Total
	0	1	2	3	4	5	6	
Place of residence								
Urban	8.7	11.8	29.9	49.2	74.8	82.7	88.9	45.6
Rural	7.3	12.1	32.5	48.0	62.7	73.5	88.3	46.1
Region								
Southern	7.0	13.7	39.1	52.0	66.9	68.5	84.8	49.3
Highlands	6.3	13.4	13.4	49.6	65.9	77.0	92.6	43.3
Momase	10.0	8.6	8.6	42.4	65.3	76.8	88.9	44.6
Islands	10.0	11.6	11.6	50.9	59.2	80.0	84.3	51.6
Education Level								
No education	10.1	16.2	33.0	50.4	63.8	75.5	90.5	50.3
Grades 1 - 5	4.1	11.0	35.4	48.8	65.2	73.4	88.3	45.9
Grades 6	6.7	8.3	31.0	42.6	65.2	74.0	84.0	41.1
Grades 7+	4.3	10.0	28.0	50.6	68.8	80.0	85.4	40.9
Total	**7.6**	**12.0**	**31.9**	**48.3**	**65.1**	**75.3**	**88.4**	**46.0**

6.2 Contraceptive Use and Desire for More Children

Information on fertility preferences alone is not sufficient to assess the need for family planning services. There are women who are already using contraception because they want to space the next birth or do not want to have another child. These women are not exposed to the risk of pregnancy. On the other hand, there are women who are not using contraception because they want another child while other women are not using contraception and want no more children.

There are many contributing factors to decisions made by these women in using or not using contraception. A major factor in PNG is the influence of the place of delivery of contraception which may vary depending on where the towns and villages are situated as well as the delivery and utilisation of health services. Furthermore, there is still a great need to educate women and their husbands on the knowledge and practise of contraception (see Chapter 4).

Table 6.4 Need for Family Planning Services

Percent distribution of currently married women by use of contraception and desire for (more) children, by background characteristics

Background Characteristics	Using			Not using			Total	Number
	Want more	Want no more	Not decided	Want more	Want no more	Not decided		
Age								
15-19	6.0	3.0	-	57.8	9.0	24.1	100	166
20-24	10.9	5.5	3.8	49.5	11.7	18.6	100	634
25-29	8.9	10.2	4.3	36.6	18.9	21.2	100	774
30-34	5.3	18.1	4.4	26.7	26.5	19.0	100	679
35-39	3.1	28.5	2.6	15.2	36.7	13.8	100	572
40-44	2.3	30.0	2.8	8.3	46.6	10.1	100	397
45-49	0.3	20.8	1.1	4.4	66.2	7.2	100	361
Place of residence								
Urban	9.6	22.2	4.0	26.8	23.4	14.0	100	698
Rural	5.0	15.4	3.1	28.5	30.7	17.3	100	2885
Region								
Southern	9.2	23.6	4.4	24.6	25.7	12.6	100	818
Highlands	3.3	11.2	1.3	36.2	32.1	15.9	100	1369
Momase	4.6	15.5	4.4	24.5	29.1	21.9	100	979
Islands	11.3	24.0	4.8	17.5	27.6	14.9	100	417
Education Level								
No education	2.8	13.8	2.0	27.9	36.4	17.1	100	1605
Grades 1 - 5	4.1	17.4	3.5	29.5	28.5	17.1	100	604
Grades 6	7.5	17.5	4.2	28.7	23.6	18.5	100	878
Grades 7+	15.3	23.8	5.4	26.8	17.1	11.5	100	496
Total	**5.9**	**16.7**	**3.3**	**28.2**	**29.3**	**16.6**	**100**	**3583**

Table 6.4 presents information for the currently married women on the use of contraception and desire for (more) children by background characteristics. It is evident that there is a similar pattern when looking at fertility preference by age and using or not using contraception by age. As age increases, the proportion of women using contraception who want no more children also increases. The opposite is shown for women not using contraception and wanting more children. Not surprising is the higher proportion of younger women aged 15-29 who express a desire for more children. Interestingly, the proportion of women not using contraception and wanting no more children also shows a similar pattern as the proportion of women using contraception and wanting no more children. The proportion not using and wanting no more children increases from 27 percent age 30-34 to over 66 percent age 45-49. One would expect these women to use contraception because they want no more children but this is not the case (see Figure 1). This group of women represents those who have an unmet need for contraception, and represent 29 percent of currently married women. Based on projections from the 1990 Census, this would signify approximately 195,000 women in PNG in the year 1996.

In considering the differentials by type of place of residence, generally the proportion of women not using contraception and wanting no more was lower in the urban areas (23 percent) than in the rural areas (31 percent).

Figure 6.1: Contraception and Desire for Children

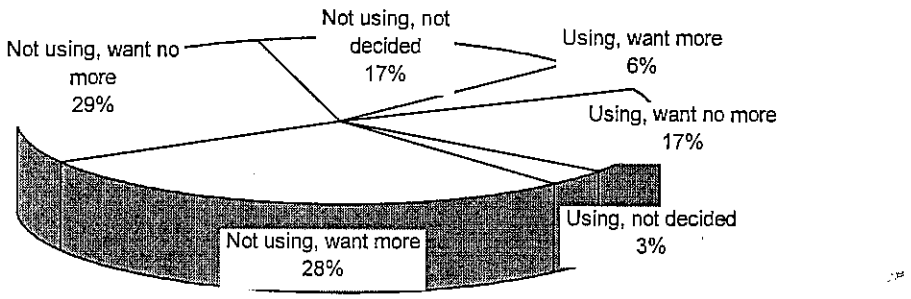
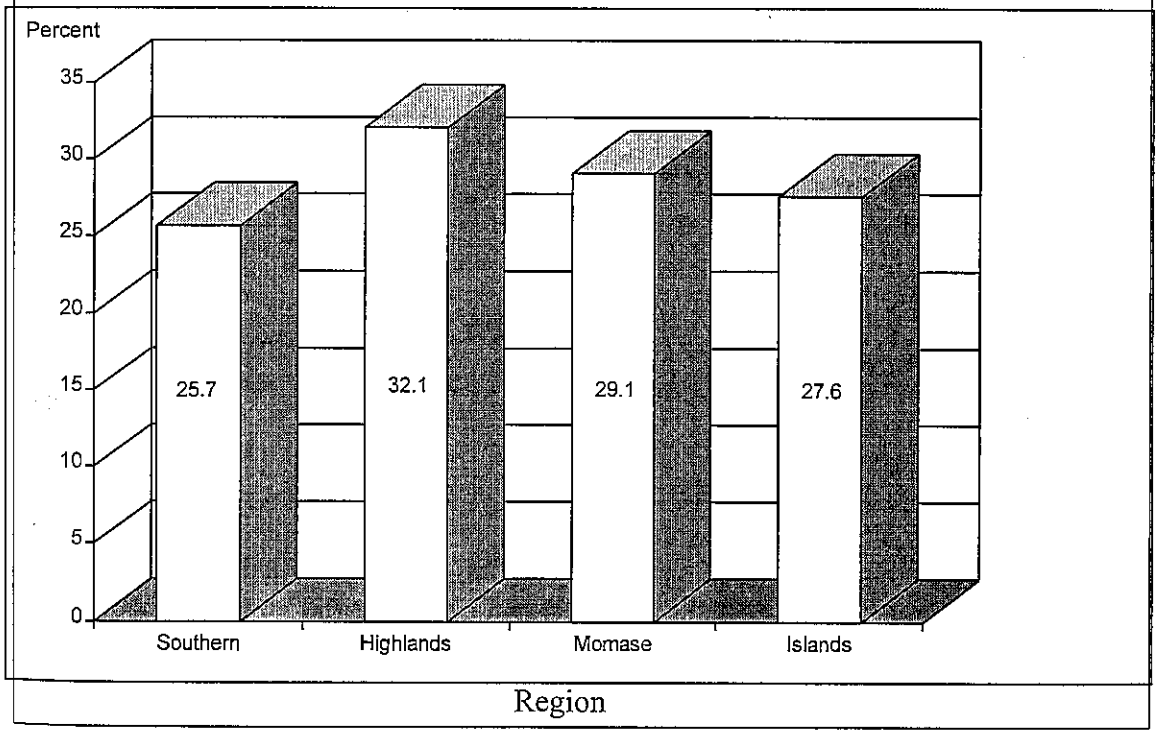
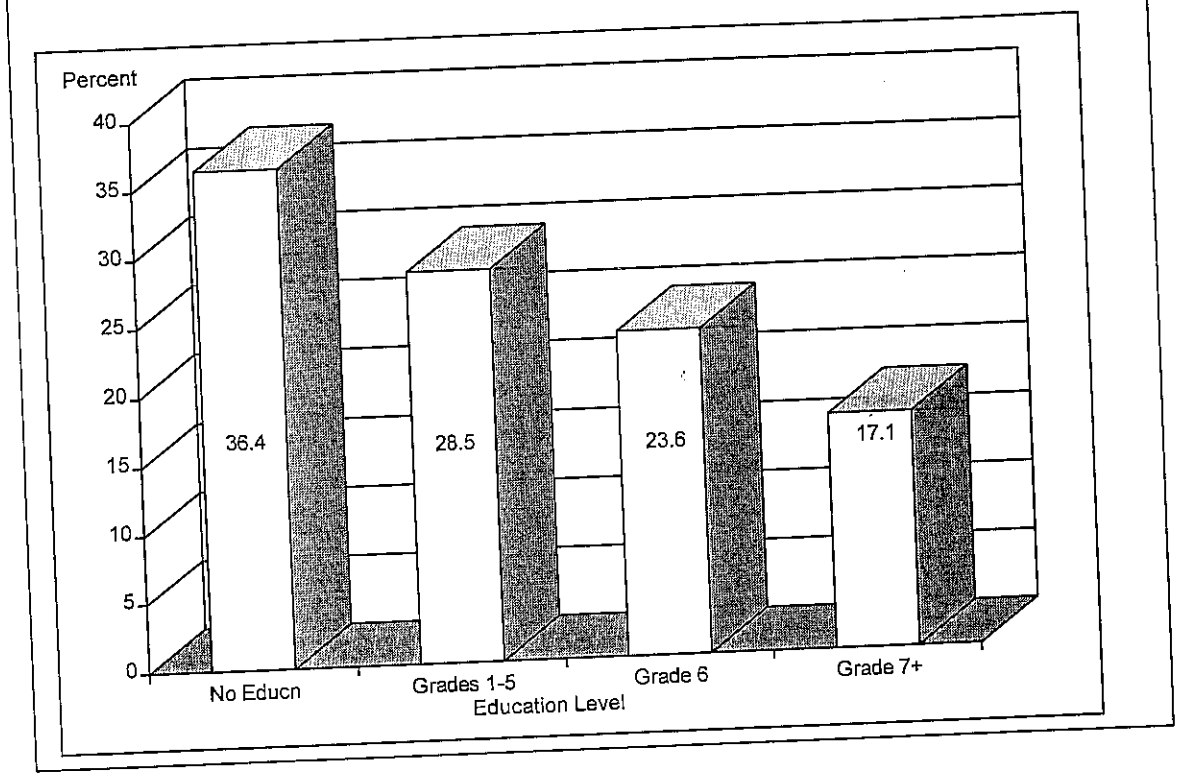


Figure 6.2: Unmet Need by Region



As shown in Figure 2, the unmet need for contraception is highest in the Highlands region (32 percent), and lowest in the Southern region (26 percent). Unmet need varies inversely with level of education. Among women with no education, 36 percent have an unmet need for contraception, while among those at with least secondary education, only 17 percent have an unmet need (see Figure 3).

Figure 6.3: Unmet Need by Educational Level



6.3 Ideal Number of Children

Table 6.5 shows the distribution of currently married women by ideal family size, according to number of living children. It is not surprising to find a high proportion (27 percent) of women unable to give a numeric response on their ideal family size. It can be concluded that it is difficult to respond to this type of question. Overall, the proportion of women giving non-numeric answers increased significantly with the number of children a woman already had, as is evident in Table 6.5. It also shows that a woman without a child more often gives a non-numeric answer than a woman with one or two children.

According to the findings, most women now want small families, a change from the typical PNG large families. Almost 23 percent of the currently married women prefer four children, 18 percent prefer a two-child family while 14 percent consider having three children as the ideal family size. More than 14 percent want five or more children. The mean ideal family size for women giving numeric answers is 3.5 children. The mean ideal family size increases from 2.8 children to 5.3 as the number of children increases from 0 to 6 or more. The ideal family size for currently married women does not differ much from that for all women.

Table 6.5 Ideal and Actual Number of Children

Percent distribution of all women by ideal number of children and mean ideal number of children for all women and currently married women, according to number of living children

Ideal Number of Children	*Living children (+ current pregnant)*							
	0	*1*	*2*	*3*	*4*	*5*	*6+*	*Total*
Number								
0	1.1	0.7	0.2	0.2	0.2	0.5	0.2	0.5
1	4.8	9.7	1.9	0.8	1.8	0.3	0.5	3.5
2	28.7	25.2	24.8	8.2	6.3	5.0	1.6	17.7
3	17.8	16.8	15.3	20.7	5.3	6.3	2.7	13.6
4	16.4	23.8	25.9	27.4	38.7	19.6	14.7	22.7
5	3.4	4.8	7.0	10.2	10.9	24.4	10.6	8.3
6+	1.2	1.7	2.5	4.3	8.3	13.6	25.1	6.4
Non-Numeric Response	26.7	17.4	22.5	28.1	28.5	30.5	44.6	27.4
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Number	**1414**	**755**	**645**	**598**	**543**	**397**	**565**	**4917**
All women Mean Ideal	2.8	2.9	3.2	3.7	4.1	4.5	5.3	3.5
All Women	1037	624	500	430	388	277	313	3569
CMW Mean Ideal	3.1	3.1	3.3	3.7	4.1	4.5	5.3	3.8
Currently Married Women	324	516	446	400	368	265	300	2619

Table 6.6 examines the ideal number of children by background characteristics. It is evident that the mean ideal family size also increases as age increases. Generally, the mean ideal number of children for the rural women is higher than for the urban women, 3.6 children compared to 3.3 children.

According to the differential by region, the Highlands women had the highest mean ideal number of children (3.6 children) compared to other regions. The differential by educational level shows women who had never gone to school with a high mean ideal number of children (3.8 children) compared to women who went to school. In summary, the mean ideal number of children increases as age increases; 2.7 children at age 15-19 to 4.7 children at age 45-49. Overall, the mean ideal number of children for women in PNG is 3.5 children.

Table 6.6 Ideal Number of Children by Background Characteristics

Mean ideal number of children for all women by age and selected background characteristics

Background Characteristics	Respondent's Age							
	15-19	20-24	25-29	303-4	35-39	40-44	45-49	Total
Place of residence								
Urban	2.6	2.9	3.3	3.7	4.0	4.2	4.8	3.3
Rural	2.7	3.1	3.4	3.9	4.2	4.4	4.6	3.6
Region								
Southern	2.6	3.0	3.4	3.8	3.9	4.5	4.8	3.4
Highlands	2.8	3.1	3.4	3.9	4.2	4.2	4.5	3.6
Momase	2.6	3.0	3.4	3.9	4.4	4.3	4.6	3.5
Islands	2.6	3.0	3.3	3.9	4.1	4.5	5.0	3.5
Education Level								
No education	2.8	3.2	3.4	3.9	4.3	4.2	4.5	3.8
Grades 1 - 5	2.7	3.2	3.4	3.9	4.2	5.1	4.8	3.6
Grades 6	2.6	2.9	3.4	3.8	4.1	4.2	5.3	3.3
Grades 7+	2.6	2.8	3.3	3.7	4.0	4.3	4.6	3.2
Total	**2.7**	**3.0**	**3.4**	**3.9**	**4.2**	**4.3**	**4.7**	**3.5**

6.4 Fertility Planning

In determining the level of unwanted as well as wanted fertility, the PNGDHS had a question on whether each birth was planned (wanted then), unplanned (wanted later) or not wanted at all.

Table 6.7 presents the percent distribution of births in the three years preceding the survey by fertility planning status according to birth order and mother's age at birth. There were 71 percent of the births that were wanted then, 16 percent wanted later and about 7 percent not wanted when they were conceived. Generally, the proportion of births that were not wanted at all increased with the birth order of the child; 6 percent for the third child to 14 percent for the fourth and higher order births. Similarly, the proportion of births not wanted at all also increased with the mother's age at birth. Over 20 percent of the pregnancies of women over the age of 40 were unwanted. As mothers grow older, it is risky for them and their children because there is increased mortality and morbidity. A greater effort in preventing unwanted pregnancies at the older age is encouraged.

Table 6.7 Fertility Planning

Percent distribution of births in the three years preceding the survey by fertility planning status, according to birth order and mother's age at birth

Birth order and mother's age	Planning Status of Birth: Wanted: Then	Wanted: later	Wanted: No more	Missing	Total	Number
Birth order						
1	76.4	18.0	0.7	4.9	100	556
2	79.5	14.4	2.9	3.2	100	443
3	75.2	14.9	5.8	4.1	100	395
4+	63.2	16.2	13.8	6.8	100	990
Age at birth						
<19	77.1	16.1	1.7	5.1	100	236
20-24	73.5	19.1	2.6	4.8	100	686
25-29	74.2	15.8	6.1	3.9	100	670
30-34	68.6	15.1	10.5	5.7	100	437
35-39	65.1	11.1	17.4	6.4	100	235
40-44	54.0	13.8	23.0	9.2	100	87
45-49	51.5	12.1	21.2	15.2	100	33
Total	**71.3**	**16.1**	**7.4**	**5.2**	**100**	**2384**

Table 6.8 shows the total wanted fertility rate for the three years preceding the survey, and actual fertility rates for the five years preceding the survey, by selected background characteristics. The wanted fertility rate is measured using the same formula used in calculating the total fertility rate, but unwanted births are excluded from the numerator. The unwanted births are defined as those which exceed the number considered by the respondent as ideal. Women who do not report a numeric ideal family size are assumed to want all their births. These rates may be overestimated to the extent that women are unwilling to report an ideal family size lower than their actual family size.

The wanted fertility rate for PNG as a whole is 3.9 births per woman, 0.9 children less than the actual fertility rate. This implies that the total fertility rate is 23 percent higher than it would be if unwanted births were avoided. The gap between the wanted and actual fertility rates is greatest among rural women and women from the Momase and Islands regions. The gap is narrowest among women with at least some secondary education. There is no indication that the fertility level is reaching replacement level since the fertility rates are still very high. However, if fertility were someday to reach replacement level, it would only be when unwanted births were prevented.

Table 6.8 Wanted Fertility Rates

Total wanted fertility rates for the three years preceding the survey, and actual total fertility rates for the five years preceding the survey by selected background characteristics

Background Characteristics	*Fertility Rates*	
	Wanted TFR	*Actual TFR*
Place of residence		
Urban	3.2	4.0
Rural	4.1	5.0
Region		
Southern	3.9	4.8
Highlands	3.6	4.4
Momase	4.3	5.3
Islands	4.0	5.3
Education Level		
No education	4.1	5.0
Grades 1 - 5	3.8	4.7
Grades 6	3.9	5.1
Grades 7+	3.3	3.8
Total	**3.9**	**4.8**

CHAPTER 7

INFANT AND CHILD MORTALITY, AND MATERNAL MORTALITY

Arthur Jorari and Albert Marckwardt

This chapter presents information on levels, trends and differentials in neonatal, post-neonatal, infant and child mortality and on the prevalence of high-risk fertility behaviour. This information is central to an assessment of the demographic situation in Papua New Guinea. It is also important in efforts to improve child survival programs in Papua New Guinea and in identifying those groups of the child population who are at increased (high) risk. The final part of the chapter presents what are perhaps the first reliable statistics ever produced on the level of the maternal mortality ratio in the country.

7.1 Assessment of Data Quality

The infant and child mortality estimates are calculated from the birth history information that was collected in the Reproduction Section of the Individual Questionnaire. The section began with questions about the aggregate child-bearing experience of respondents (that is, the number of sons and daughters who live in the household, who live elsewhere, and who died). These questions were followed by a retrospective birth history in which data were obtained on sex, date of birth, survivorship status, and current age at death of each of the respondents' live births. This information is used to directly estimate mortality rates. In this report, infant and child mortality are measured using five rates:

- *Neonatal mortality* - the probability of dying within the first month of life;
- *Post-neonatal mortality* - the difference between infant and neonatal mortality;
- *Infant mortality* - the probability of dying before the first birthday;
- *Child mortality* - the probability of dying between the first and fifth birthday;
- *Under-five mortality* - the probability of dying before the fifth birthday.

The reliability of the mortality estimates from retrospective birth histories depends upon the completeness with which deaths of children are reported and the extent to which birth dates and ages at death are accurately reported and recorded. Omission of births and deaths directly affects mortality estimates, displacement of dates has an impact on mortality trends, and misreporting of the age at death may distort the age pattern of mortality.

The quality of the birth history data is examined in Table 7.1. It looks at evidence of under-reporting of deaths, particularly of those deaths which occur very early in infancy. If early neonatal deaths are selectively under-reported, the result would be an abnormally low ratio of deaths under seven days to all neonatal deaths. The ratio of deaths in the first six days to all neonatal deaths presented in Table 7.1 appear reasonable for the three most recent time periods. The lower ratios for the earliest two time periods probably reflect omission in the reporting of deaths occurring in the first week after birth. Of course, when a death has not been reported, the corresponding birth has not been recorded either.

Table 7.1 Reporting of Age at Death in Days

Distribution of reported deaths under 1 month of age by age at death in days and the percentage of neonatal deaths reported to occur at ages 0 - 6 days, for five - year periods of birth preceding preceding the survey, PNG 1996

Age at death (in days)	*Number of years preceding the survey*					*Total*
	0 - 4	*5 - 9*	*10 - 14*	*15 - 19*	*20 - 24*	*0 - 24*
Less than 1	23	32	17	11	14	97
1	37	29	24	11	6	104
2	4	9	9	4	4	30
3	7	6	4	4	3	24
4	7	7	2	0	2	18
5	1	5	0	4	5	15
6	3	0	0	1	0	4
7	9	22	7	9	5	52
8	0	2	0	0	1	3
9	1	1	1	0	0	3
10	1	0	2	2	0	5
11	0	1	0	1	0	2
12	0	0	2	1	1	4
13	1	0	0	1	0	2
14	8	6	11	6	6	37
16	0	0	1	0	1	2
18	1	0	0	0	1	2
21	2	5	3	2	3	15
23	1	0	0	0	0	1
24	0	0	0	1	0	1
28	6	1	1	1	2	11
30 (a)	0	2	0	1	1	4
Total 0 - 30	112	128	84	60	55	439
Per cent early neonatal (b)	73	69	67	58	62	67

(a) Deaths occuring on a day 30 are not really neonatal, and are not included in the first row of Table 7.2.

(b) (0 -6 days/0 - 30 days) *100.

The gradual increase in the per cent of early neonatal deaths over the past 15 years (from 67 per cent to 73 per cent) would be consistent with a decline in the infant mortality rate over the same period. This is because improvements in health and living conditions impact more on later stages of infant mortality than on early neonatal mortality. Therefore, the share of the early neonatal mortality, often due to congenital conditions, tends to rise with a concomitant decline in the infant mortality rate. Conversely, this rise could also be interpreted as a gradual deterioration in the recall of events the further removed they are from the date of interview. It seems probable that a combination of both phenomena is involved.

Misreporting of age at death will bias estimates of the age pattern of mortality if the net result of the misreporting is transference of deaths between age segments for which rates are calculated; for example, an overestimate of child mortality relative to infant mortality may result if children who died during the first year of life are reported as having died at age one year or older. In an effort to minimise error in the reporting of age at death, 1996 DHS interviewers were instructed to record deaths under one month in days, and under 2 years of age in months. They were specifically asked to probe for deaths reported at one year to ensure that they had actually occurred at 12 months, neither earlier or later. Nevertheless, in Table 7.2 there is evidence of some heaping on 12 months. However, the pattern of heaping is such as to downwardly bias the infant mortality rate by no more than 1 per cent. Hence, the results in this report are unadjusted for heaping.

With respect to date displacement, Appendix Table C.4 shows significant heaping of deaths on the years 1992 and 1990. The explanation for heaping of both births and deaths on 1992 would be the temptation for interviewers to displace births actually occurring later in order to avoid the long maternal and child health section of the questionnaire, which dealt with all births since January, 1993. The heaping on 1990 may merely reflect digit preference. The net result of all this is probably a slight understatement of infant mortality in the period 0-4 years prior to the survey, and a corresponding overstatement for the period 5-9 years prior. Therefore, the most reliable estimates of current mortality levels in the country are based on figures for the 0-9 year period prior to the survey; these are presented later in Tables 7.5 and 7.6.

To close this discussion, several analyses carried out by the international DHS programme suggest that the effect on the mortality estimates of errors in reporting of the magnitude observed in the 1996 PNG-DHS would not be large (Sullivan et al., 1990; Marckwardt and Rutstein, 1996).

Table 7.2 Reporting of Age at Death in Months

Distribution of reported deaths under 2 years of age by age at death in months and the percentage of infant deaths reported to occur at ages under 1 month, for five year periods of birth preceding the survey, PNG 1996

	Number of years preceding the survey					Total
Age at death (in months)	0 - 4	0 - 19	10 - 14	15 - 19	20 - 24	0 - 24
Less than 1 (a)	112	126	84	59	54	435
1	18	23	11	10	10	72
2	31	19	16	15	5	86
3	16	25	13	18	8	80
4	11	16	5	5	4	41
5	7	20	8	8	3	46
6	16	12	16	9	5	58
7	6	6	4	7	0	23
8	13	11	5	3	3	35
9	5	10	6	2	1	24
10	9	14	7	8	3	41
11	2	2	2	1	1	8
12	14	18	19	20	9	80
13	0	4	1	0	0	5
14	1	1	0	0	1	3
15	2	1	0	0	0	3
16	3	3	2	0	1	9
17	1	0	0	0	0	1
18	6	2	3	4	2	17
19	1	0	0	0	0	1
20	3	0	1	1	0	5
21	1	0	1	0	0	2
22	0	1	0	0	1	2
23	1	1	0	0	0	2
24+	0	0	0	0	1	1
Total	279	315	204	170	112	1080
Per cent neonatal (b)	43	42	43	36	51	42

(a) Includes deaths at days 0 - 29.

(b) (under 1 month/under 1 year)*100.

7.2 Levels and Trends in Infant and Child Mortality

Neonatal, post-neonatal, infant, child and under-five mortality rates are shown in Table 7.3 for five-year periods in the 25 years preceding the survey. Under-five mortality for the most recent period (0-4 years preceding the survey) is about 93 deaths per 1,000 births. This means that about one in every eleven children born in Papua New Guinea die before they reach their fifth birthday. Roughly, three in four under-five deaths occur in the first year of life, infant mortality is about 69 deaths per 1,000 births and child mortality is 25 deaths per 1,000 births. During infancy the risk of neonatal death (32 per 1,000) is nearly the same as the risk of post-neonatal death (38 per 1,000).

The estimates in Table 7.3 indicate that mortality levels have stagnated in Papua New Guinea since the mid-1970s. The current under-five mortality rate is almost the same as the level of 92 deaths per 1,000 births which prevailed during the period 10-14 years before the survey (approximately 1982-1986). An examination of the trend in other mortality indicators suggests the same situation. That is, child mortality in the most recent period was the same as that for 10-14 years before the survey (about 25 per 1,000 births). Similarly, infant mortality during the same period was estimated at about 69 per 1,000 births.

Table 7. 3 Neonatal, Postneonatal, Infant and Childhood Mortality

Neonatal, post neo natal, infant and childhood mortality for the five year periods preceeding the survey. The analysis excludes the month of interview.

	Mortality Rate				
Five year periods of analysis	Neonatal Mortality (NN)	Postneonatal Mortality (PNN)	Infant Mortality (1q0)	Childhood Mortality (4q1)	Under - 5 Mortality 5q0
0 - 4	31.6	37.7	69.3	25.3	92.8
5 - 9	37.9	48.0	85.9	23.8	107.7
10 - 14	31.3	37.4	68.7	25.4	92.3
15 - 19	33.0	46.9	79.9	31.4	108.8
20 - 24	49.9	41.8	91.7	33.8	122.4

Using estimates from the 1971 PNG Census, 1980 Census, 1991 DHS, as well as the 1996 DHS, the trend in infant mortality in Papua New Guinea since the early 1970s is shown in Table 7.4 and Figure 7.1. During the 25 year period, infant mortality declined by about 49 per cent, from 134 deaths per 1,000 births in 1971 to 69 in 1992-1996.

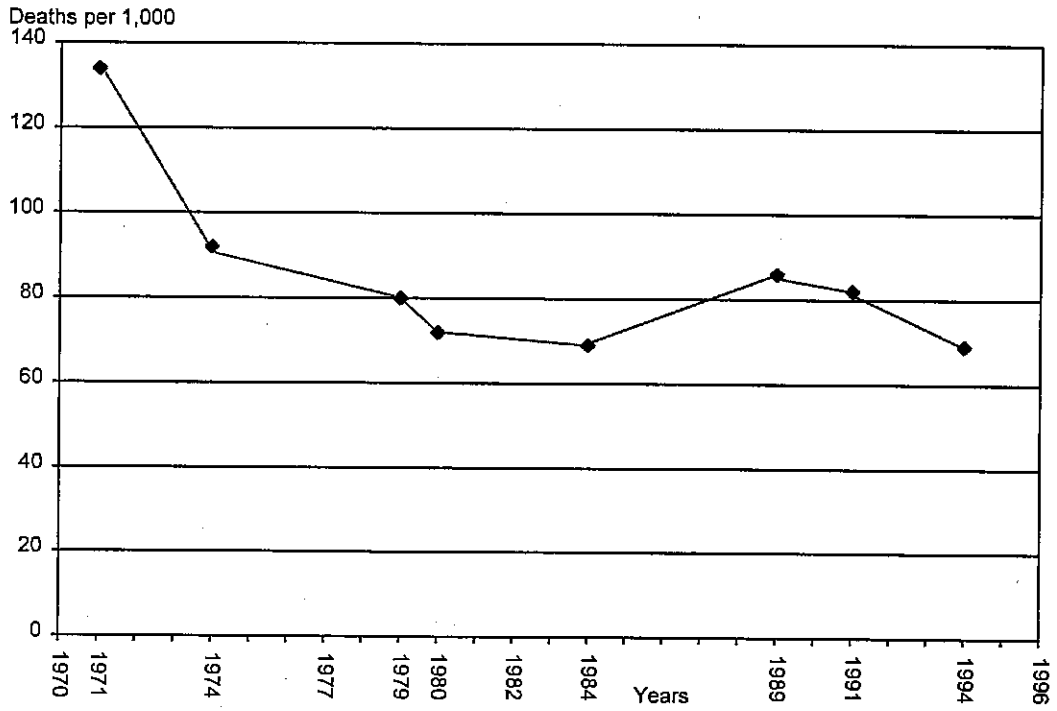
Table 7.4 Trend in Infant Mortality, 1971-1996

Trend in infant mortality in PNG, 1971-1996.

Period	Population Census			DHS
	1971	1980	1991	1996
1971	134			
1972-1976				92
1980		72		
1977-1981				80
1982-1986				69
1987-1991				86
1991			82	
1992-1996				69

Sources: Bakker, (1986) - Summary of key indices of mortality
Hayes (1996) - Table 4.8

Figure 7.1 Trends in Infant Mortality in PNG, 1971-1996



Note: Rates are from censuses and surveys covering the period.

7.3 Socioeconomic Differentials in Mortality

Differentials in the various mortality rates by selected background characteristics are presented in Table 7.5. The table focuses largely on basic socioeconomic characteristics including urban-rural residence, region of residence, mother's educational level and also examines the issue of whether mortality varies according to the maternity care received by the mother prior to the child's birth. A ten-year period is used to calculate the mortality estimates in order to have a sufficient number of cases in each category.

Table 7.5 Neonatal, Postneonatal, Infant and Childhood Mortality by Socio-economic Factors

Neonatal, postneonatal, infant and childhood mortality by selected socio-economic background characteristics for the ten-year period preceding the survey; three-year period for medical maternal care. The month of the interview is excluded from the analysis.

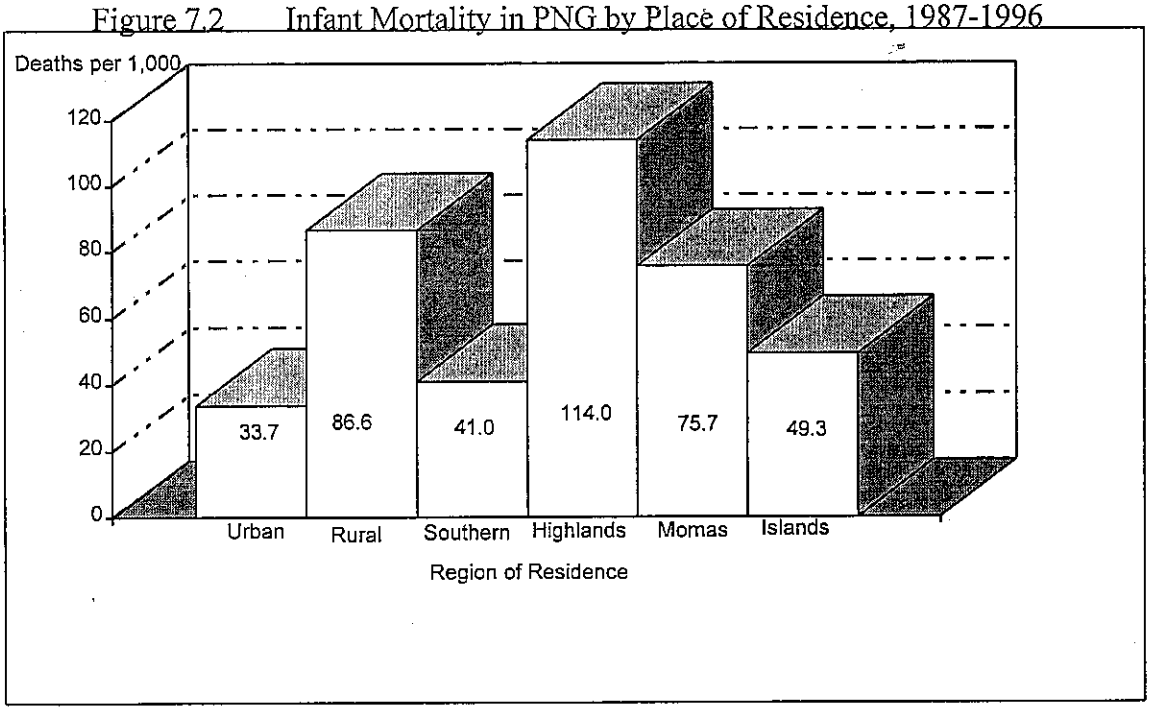
Background Characteristics	*Neonatal Mortality (NN)*	*Postneonatal Mortality (PNN)*	*Infant Mortality (1q0)*	*Childhood Mortality (4q1)*	*Under - 5 Mortality 5q0*
Place of residence					
Urban	21.3	12.4	33.7	12.7	46.0
Rural	37.5	49.1	86.6	27.3	111.5
Region					
Southern	27.3	13.7	41.0	26.3	66.2
Highlands	41.9	72.1	114.0	28.2	139.0
Momase	37.0	38.6	75.7	22.1	96.1
Islands	23.4	25.9	49.3	18.4	66.9
Level of Education					
No education	39.8	65.7	105.5	29.6	132.0
Grade 1 - 5	40.5	27.1	67.6	31.6	97.1
Grade 6	26.9	24.3	51.2	18.1	68.4
Grade 7 +	24.6	15.6	40.2	9.5	49.4
Maternal Maternity Care					
No antenatal/delivery	37.1	52.7	89.8	-	-
Either antenatal/delivery	36.7	45.1	81.8	-	-
Both antenatal/delivery	18.3	20.9	39.2	-	-
Total	34.6	42.7	77.3	24.6	100.0

Urban-rural differences are large at all ages. For example, the under-five mortality in urban areas is about 46 per 1,000 births, 59 percent lower than the rural level (about 112 per 1,000 births). There is also considerable variation in mortality by region of residence (see Figure 7.2). Mortality for all age groups is highest in the Highlands region, where infant mortality is about 114 per 1,000 births and under-five mortality is 139 per 1,000 births. These levels are more than double the mortality observed in the Southern region (about 41 per 1,000 births and 66 per 1,000 births, respectively). Of interest also is the fact that mortality rates for all regions (except the Highlands) are somewhat lower than the observed national averages.

Differences by education are very large. For example, under-five mortality for children of mothers who have completed the secondary level or higher is 49 per 1,000 births, a little over one-third of the level among children whose mothers have never attended school. The educational differential becomes larger with increasing age of the child.

Use of basic maternity care services is generally associated with lower mortality. The level of mortality for children whose mothers had no antenatal care or medical assistance at delivery is more than double the level among children whose mothers had both antenatal care and medical assistance at delivery, and only slightly higher than the level among children whose mothers had either antenatal care or medical assistance at delivery.

Figure 7.2 Infant Mortality in PNG by Place of Residence, 1987-1996



7.4 Demographic Differentials in Mortality

Table 7.6 presents mortality differentials according to demographic characteristics of the child and mother that often have been shown to be related to mortality levels, including the sex of the child, mother's age at the birth, birth order, and the length of the previous birth interval.

Table 7.6 Neonatal, Postneonatal, Infant and Childhood Mortality by Bio-Demographic Factors

Neonatal, postneonatal, infant and childhood mortality by selected bio-demographic background characteristics for the ten-year period preceding the survey. The month of the interview is excluded from the analysis.

Background Characteristics	*Neonatal Mortality (NN)*	*Postneonatal Mortality (PNN)*	*Infant Mortality (1q0)*	*Childhood Mortality (4q1)*	*Under - 5 Mortality (5q0)*
Sex of Child					
Male	36.5	45.7	82.2	28.3	108.2
Female	32.6	39.4	72.0	20.8	91.3
Mother's age at birth					
< 20	44.0	38.3	82.3	32.7	112.4
20 - 29	33.3	41.1	74.4	22.8	95.5
30 - 39	31.9	44.2	76.1	24.2	98.5
40 - 49	43.0	63.1	106.1	27.2	130.5
Birth order					
1	36.6	43.1	79.7	22.7	100.6
2 - 3	29.1	37.6	66.7	20.2	85.5
4 - 6	31.1	46.2	77.4	30.0	105.1
7 +	59.0	48.5	107.5	28.4	132.8
Previous birth interval					
< 2 years	62.0	76.2	138.2	28.6	162.9
2 - 3 years	24.4	34.4	58.8	28.2	85.3
4 years or more	22.8	21.0	43.9	12.4	55.7
Total	34.6	42.7	77.3	24.6	100.0

As expected, mortality levels are typically higher among males than females. The effect of a young maternal age at birth is clear in Table 7.6. Mortality is substantially higher among children of mothers who were less than age 20 at the time of the child's birth. Not surprisingly, the mortality of children born to mothers age 40 and over is also higher than that for the two other maternal age categories. The relationship between mortality and maternal age is typically a U-shaped curve, with peaks for children of youngest and oldest mothers.

Mortality according to birth order shows the expected pattern of higher mortality associated with higher birth order, except for the first birth. Also as expected , the length of the birth interval is strongly associated with higher mortality. For example, the level of under-five mortality found among children born less than two years after a pervious birth (163 per 1,000 births) is a little less than three times the level found among children born four or more years after a previous birth (56 per 1,000 births). The effect of short birth intervals on mortality is clearly evident at all ages. These findings support the importance of child spacing for child survival.

7.5 High-Risk Fertility Behaviour

Previous research and evidence presented above have shown the strong relationship that exists between maternal fertility patterns and children's survival chances. Typically, infants and children have a greater probability of dying if they are born to mothers who are too young or too old, if they are born after a short birth interval, or if they are of high parity. For purposes of the analysis which follows, a mother is classified as "too young" if she is less than 18 years of age, and "too old" if she is over 34 years of age at the time of delivery. A "short birth interval" is defined by a birth occurring less than 24 months after the previous birth, and a child is of 'high birth order" if the mother had previously given birth to three or more living children (i.e., if the child is of birth order 4 or higher).

Table 7.7 presents the distribution of children born in the five years preceding the survey and of currently married women according to these risk factors. The table also examines the relative risk of mortality for children by comparing the proportion dead in each high-risk category with the proportion dead among children not in any high-risk category. First births, although often at increased risk, are not included in this analysis because they are not considered an avoidable risk.

The data presented in the first two columns of Table 7.7 address the issue of high-risk fertility behaviour by looking at the actual prevalence of high-risk births during the five-year period before the survey and its implications with respect to the mortality of those births. As column 1 in Table 7.7 shows, more than 55 per cent of children born in the five year period before the survey are in at least one of the elevated risk categories. A little over a third (39 per cent) of all births at elevated risk had been subject to multiple risk characteristics. A short birth interval and high birth order were the most common high-risk factors.

The risk ratios shown in Column 2 of Table 7.7 illustrate the relationship between the risk factors and mortality levels. The risk ratios for children in the single high-risk categories are generally lower than the risk ratios for children in multiple high-risk categories. The lowest risk ratio (0.9) is found for births to mothers over age 34 and the highest (4.4) for the category combining three of the four high-risk factors (short interval, higher birth order, and old maternal age).

The data presented in the final column of Table 7.7 look to the future, addressing the question: how many married women have the potential for having a high-risk birth? The results were obtained by simulating the distribution of currently married women by the risk category into which a currently conceived birth would fall. A woman's current age, time elapsed since last birth, and parity were used to determine into which risk category the next birth would fall, if the woman were to conceive at the time of the survey. For example, if a woman age 37, who has five children, and had her last birth three years ago were to become pregnant, she would fall into the multiple high-risk category of being too old (35 or older) and at too high a parity (4 or more children).

Overall, 67 per cent of women have the potential to give birth to a child with an elevated risk of mortality. A greater proportion of married women exhibit the potential for having a birth in multiple high-risk category than in single high-risk category (37 per cent and 30 per cent, respectively). In terms of the risk categories themselves, the potential is greatest for births at elevated risk due to high birth order (14 per cent) and old maternal age and high birth order (24 per cent).

Table 7.7 High-Risk Fertility Behaviour

Percent of children born in the last 5 years preceding the survey who are at elevated risk of mortality, and percent currently married women at risk of conceiving a child with an elevated risk of mortality, by category of increased risk, PNG 1996

Risk Category	Births in the 5 year preceding the survey		Percentage of currently married women
	Percentage of births	Risk ratio	
Not in high-risk category	44.6	1.00	33.4
Single high-risk category			
Mother's age <18	2.8	1.51	0.6
Mother's age > 34	1.0	0.92	6.6
Birth interval < 24	9.2	1.6	9.1
Birth order > 3	21.0	1.13	13.5
Sub-total	34.0	1.28	29.7
Multiple high-risk			
Age < 18 and birth interval < 24	0.3	3.7	0.1
Age > 34 and Birth interval < 24	0.3	3.7	0.2
Age > 34 and birth order > 3	11.0	1.2	23.5
Age > 34 and birth interval < 24 and birth order > 3	2.8	4.37	3.8
Birth interval < 24 and birth order > 3	7.0	1.95	9.3
Sub-total	21.4	1.93	36.9
In any high-risk category	55.4	1.53	66.6
Total	100	-	100
Number	3512	-	3583

7.6 Maternal Mortality

In 1986 the World Health Organisation (WHO) put out a call for countries in the developing areas of the world to pay increased attention to the maternal side of the maternal and child health binomial (WHO, 1986). Specifically, WHO recommended that all member nations produce reliable estimates of maternal mortality by 1995. Improved data should permit the identification of groups at high risk of mortality, and provide baseline information for programs designed to reduce maternal mortality. Although a year late, PNG has responded to this call.

There are three principal sources of data on maternal mortality: vital registration systems, hospital records, and sample surveys (AbouZahr and Royston, 1991). Unfortunately, vital registration systems in developing countries providing accurate information on cause of death typically either do not exist, or are woefully incomplete where they do exist. Statistics based on hospital records, while generally accurate, are biased in the sense that they reflect mortality conditions among those sectors of the population with access to hospitals. The third source of data on maternal mortality is the sample survey, whether community based, regional or national in scope. The most common type of survey is the household survey, in which respondents are queried retrospectively on the causes of death of relatives.

At the time of designing the questionnaire for the 1996 DHS in PNG, an advisory panel was set up by the NSO for advice on the content of the survey; the panel consisted of experts from various ministries, including the Department of Health, plus the National Planning Office, and the University of PNG, especially its medical faculty, among others. The panel considered the measurement of maternal mortality to be of extreme importance. This advice was accepted by the NSO, which then set out to review possible mechanisms for collecting the necessary information. In fact, there are just two methodologies in common use, both involving questioning respondents about the survivorship of sisters. The direct method involves collecting information on the date of birth of all sisters, then determining their survivorship, and for each sister who has died, asking for the age at death, the number of years ago that the death occurred, and whether the death coincided with pregnancy, delivery or puerperium. This method permits direct estimation of the maternal mortality ratio for various time periods, employing life table techniques. However, it is very data-demanding, and of questionable accuracy if employed in societies where dates and ages are often not known.

The alternative to the direct method of estimation is the indirect sisterhood method, developed at the London School of Hygiene and Tropical Medicine (Graham, Brass and Snow, 1989). It is an outgrowth of the sibling survivorship method of estimating early adult mortality. Only four basic questions need to be asked of a sample of adults: how many sisters born to the same mother as the respondent ever reached the age of 12 years, how many of these are still living, how many have died, and how many of the dead sisters died of maternal causes. The final question, for practical reasons, is normally split into three: how many died while pregnant, how many during childbirth, and how many during the six weeks after the end of a pregnancy. The collection of information required for the direct method typically requires up to 10 minutes of interview time, while for the indirect method the time required is only 1 - 2 minutes. Given that the PNG questionnaire was to include a full birth history of respondents, thereby already straining both respondents' and interviewers' patience in trying to remember and record exact dates of events, the NSO decided on opting for the indirect method. The principal disadvantage of the method is that, in contrast to the direct methodology, it provides only one figure: an estimate of the maternal mortality ratio (MMR) for a point in time approximately 12 years prior to the survey, where the sample has consisted of adults of ages 15-49 years. But the advantages far outweighed this: ease of application in the field, and the possibility of providing for the first time an accurate estimate of maternal mortality in PNG, regardless of the point in time of the estimate.

Results of the application of the indirect sisterhood method to the data collected in the 1996 PNG-DHS are shown in Table 7.8. The table includes only sisters who have ever reached the age of 12 years. (For the two youngest age groups instead of using their number of sisters aged 12 years and over directly, they have been assigned a value of 2.117, the mean number of sisters of those 30 - 49. This is because the former still have younger sisters who will some day reach the age of 12.) An adjustment factor (Ai) is then introduced to convert the number of sisters reaching age 12 into units of risk. It reflects the proportion of their adult lives during which they are exposed to the risk of maternal death. The number of maternal deaths for each age group is then divided by the sister units of risk to produce an estimate of the lifetime risk of maternal death. The figures for the lifetime risk, as well as those in the final column of Table 7.8 showing the percentage of sisters dying of maternal causes, display no clear pattern by age, ie. no trend. Approximately 18 percent of deaths were due to maternal causes.

Table 7.8 Indirect Estimate of Maternal Mortality, *circa* 1984

THE BASIC CALCULATIONS

Age	a Respondents N	b Sisters Reaching Age 12	c Sisters Dead at Age 12 or Over	d Number of Maternal Deaths	e Adjustment Factor (Ai)	f (b*e) Sister Units of Risk	g (d/f) Lifetime Risk of Maternal Death	h (d/c) % Dead Sisters Dying of Maternal Causes
15-19	881	1865*	26	5	0.107	199.6	0.025	19.2
20-24	904	1914*	68	9	0.206	394.2	0.023	13.2
25-29	893	1980	86	20	0.343	679.1	0.029	23.3
30-34	758	1695	89	17	0.503	852.6	0.020	19.1
35-39	624	1335	87	17	0.664	886.4	0.019	19.5
40-44	446	974	85	12	0.802	781.2	0.015	14.1
45-49	411	736	94	18	0.900	662.4	0.027	19.1
TOTAL	4917	10499	535	98		4455.5	0.021995	18.3
Highlands	1751	3089	179	46		1358.1	0.033871	25.7
Other regions	3166	7410	356	52		3097.4	0.016788	14.6

THE ASSUMPTIONS

Total Fertility Rates in mid-1980s:
(see Chapter 3)

Papua New Guinea	6.0
Highlands	5.5
Other regions	6.2

THE RESULTS: MATERNAL MORTALITY RATIOS

Papua New Guinea:	Maternal Mortality Ratio (MMR) = 370 100 000 [1- (1- .021995) exp 1/6.0]
Highlands:	Maternal Mortality Ratio (MMR) = 625 100 000 [1- (1- .033871) exp 1/5.5]
Other regions:	Maternal Mortality Ratio (MMR) = 273 100 000 [1- (1- .016788) exp 1/6.2]

* Since these young women have sisters yet to reach age 12, they have been assigned the mean of those 30 - 49 years: 2.117, assuming unchanged fertility until about a decade ago.

The overall lifetime risk of maternal death (LTR) is 0.022 for a point in time calculated to be about 12 years prior to the survey, approximately 1984. This means that at that time, approximately 1 of every 45 women once having reached the age of 12 was dying of maternal causes. To convert the lifetime risk into the risk per birth, ie. the maternal mortality ratio, one would intuitively divide the lifetime risk by the average number of children women were having during their lives at that time. This is accomplished by the formula:

$$MMR = 100{,}000\{1-(1-LTR)\exp 1/TFR\},$$

where TFR refers to the total fertility rate for the mid-1980s, which, according to Chapter 3, stood at about 6.0. The resulting maternal mortality ratio for PNG, centred on 1984, is 370 per 100,000 live births.

Perhaps the most interesting finding, and in line with previous findings, is the very large difference between the Highlands and the coastal provinces. The lifetime risk in the Highlands is calculated at 0.034, meaning that about 1 of every 30 women was dying of maternal causes in 1984. That is almost exactly double the lifetime risk of coastal women (given the assumption that the sisters of a respondent live in the same region as the respondent herself). The resulting maternal mortality ratios are 625 and 273 per 100,000 live births for the Highlands and for coastal provinces, respectively.

How do the findings presented here compare with earlier findings? Perhaps the figure most often cited in the past year has been that of 930 per 100,000. This figure arose out of a new methodological approach undertaken by WHO and UNICEF (1996). It is based on regression modelling which includes only two pieces of 'hard' data for each country: an estimated general fertility rate (GFR), and the percentage of live births assisted by a trained attendant (physician, nurse, trained midwife). The value used for attended births in the model for PNG was 43 percent (Stanton et al., 1995); Chapter 8, Table 8.5 of *this* publication reveals that during the three years prior to the DHS, 53 percent of births were attended by trained personnel. Two key factors *not* considered in the model are the general physical stature of women, and their nutritional status, both inversely related to maternal mortality. Both of these are positives for PNG in comparison with most developing countries at a comparable level of economic development. Therefore, the value of 930 emerging from the model greatly overstates the true maternal mortality ratio for PNG.

Since the mid-1970s, there have been three articles published in the **Papua New Guinea Medical Journal** tracing maternal deaths for the years 1973-75, 1976-83 and 1984-86, respectively (Vacca and Bird, 1977; Mola and Aitken, 1984; and Mola, 1989). None of these studies had true denominators with which to work, and all three estimated that only about 10 percent of maternal deaths were registered for the periods cited. However, based on the scanty evidence available, they valiantly hypothesised maternal mortality ratios of 700 per 100,000 live births for the period 1973-75; 800 for 1976-83; and back to 700 for 1984-86.

But let us examine more closely the previous 'hard' data for PNG. A most fascinating aspect of Mola's 1989 article is the evidence he presents for Chimbu Province. Citing a "...provincial health team which has been most diligent in obtaining health statistics from aid posts and health centres", he presents a table showing maternal deaths recorded in connection with both supervised and unsupervised births annually for the period from 1982 to 1986 (his Table 3). The number of unsupervised births (ie., a necessary component of the overall denominator) is estimated from projected figures of the total provincial population and the crude birth rate based on the 1980 Census, prepared by the Department of Health. The figures shown in the table, according to the author, "...substantiate many of the 'educated guesses' which have appeared in Papua New Guinea maternal mortality papers over the years...the rate for provincial hospitals...is [200-300 per 100,000], and the rate for unsupervised village deliveries [600-1200 per 100,000]." (Note: the brackets are used here because the author expresses his 'rates' variously in terms of 100s, 1000s, and 10,000s.)

With the evidence contained in his 1989 article, the author missed a real opportunity to refute prior estimates of the maternal mortality ratio. He failed to put together the figures in his Table 3 for supervised and unsupervised deliveries in Chimbu. Had he done so, the results would have shown maternal mortality ratios of 710 per 100,000 births for 1982, decreasing steadily to 450 for 1986, and an overall ratio of 530 for the period 1982-86. These estimates are very much in line with those calculated for the Highlands from the DHS: 625 per 100,000 centred on 1984. Given the known differentials in antenatal care, unattended births, and infant and child mortality for the Highlands and coastal provinces, the overall ratio of 370 per 100,000 for the country as a whole for 1984 seems quite reasonable, and not out of line with Mola's figures for Chimbu in 1982-86.

The only other figures available for the region of Oceania (PRB, 1997) are for Australia: 5 per 100,000; New Zealand, 10 per 100,000; Western Somoa, 35 per 100,000; Fiji, 90 per 100,000; and Vanuatu, 280 per 100,000. So there is still room for much improvement in PNG. We stand by the quality of data collected in the 1996 DHS, and the accompanying estimate of 370 maternal deaths per 100,000 live births centred on 1984.

REFERENCES

AbouZahr, C. and E. Royston. 1991. **Maternal Mortality: A Global Factbook.** World Health Organization, Geneva.

Bakker, L. Martin. 1986. *The Mortality Situation in Papua New Guinea: Levels, Differentials, Patterns and Trends.* Research Monograph No.4, National Statistical Office, Port Moresby, PNG.

Graham, W., W. Brass, and R.W. Snow. 1989. *Estimating Maternal Mortality: The Sisterhood Method.* **Studies in Family Planning** 20(3): 125-135. New York.

Hayes, Geoffrey. 1996. *Estimates of Mortality in Papua New Guinea based on the 1990 Census and the 1991 Demographic and Health Survey.* **Research Report No.2 of Project PNG/94/P01, UPNG/UNFPA/ILO**, Port Moresby, PNG.

Jorari, Arthur and M Lasia. 1996. *Population Projection for the Citizen Population of Papua New Guinea for the period 1990-2020.* **Research Report No.4 of Project PNG/94/P01, NPO/NSO/UNFPA/ILO**, Port Moresby, PNG. (Forthcoming).

Marckwardt, A. M. and S. O. Rutstein. 1996. *Accuracy of DHS-II Demographic Data: Gains and Losses in Comparison with Earlier Surveys.* **DHS Working Papers, No. 19.** Macro International Inc., Calverton, Maryland.

Mola, G. 1989. *Maternal Death in Papua New Guinea, 1984-1986.* **Papua New Guinea Medical Journal** 32(1): 27-31. Port Moresby.

Mola, G. and I. Aitken. 1984. *Maternal Mortality in Papua New Guinea 1976-1983.* **Papua New Guinea Medical Journal** 27(2): 65-71. Port Moresby.

Population Reference Bureau (PRB). 1997. *World Population Data Sheet.* Washington, D.C.

Stanton, C., K. Hill, C. AbouZahr and T. Wardlaw. 1995. *Modelling Maternal Mortality in the Developing World.* WHO and UNICEF, Geneva.

Sullivan, J., G. T. Bicego, and S. O. Rutstein. 1990. *Assessment of the quality of data used for the direct estimation of infant and child mortality in the Demographic and Health Surveys;* in **An Assessment of DHS-I Data Quality**, DHS Methodological Reports, No.1. Institute for Resource Development/Macro Systems, Inc., Columbia, Maryland.

Vacca, A. and G.C. Bird. 1977. *Maternal Mortality in Papua New Guinea 1973-1975.* **Papua New Guinea Medical Journal** 20(4): 180-186. Port Moresby.

World Health Organization (WHO). 1986. *Maternal Mortality: Helping Women Off the Road to Death.* **WHO Chronicles** 40: 175-183. Geneva.

World Health Organization (WHO) and UNICEF. 1996. *Revised 1990 Estimates of Maternal Mortality: A New Approach by WHO and UNICEF.* WHO/UNICEF/FRH/MSM/96.11. Geneva.

CHAPTER 8

MATERNAL AND CHILD HEALTH CARE

Kit Ronga

When the list of topics for inclusion in the questionnaire was being considered in the planning stage of the DHS, a strong case was put forward by the Ministry of Health for the inclusion of topics relating to maternal and child health care. Thus relevant questions were included in the DHS individual questionnaire to obtain information on antenatal care, delivery characteristics, childhood vaccinations, common childhood diseases and their treatment, and infant breast-feeding practices. The high incidence of early childhood and maternal mortality are a growing concern for the Government in recent years. Therefore, the information presented here should assist health planners in developing appropriate strategies to improve and monitor the trends in the maternal and child health care.

8.1 Antenatal Care

Antenatal care holds a very prominent position within the health system of the country, as it is the branch which facilitates the early detection and treatment of problems associated with pregnancy, such as anaemia and infections, and provides a channel through which information on the general health of mothers and children is more readily provided to women and their families. Furthermore the provision of adequate antenatal care during pregnancy enhances more efficient child delivery services, if problems occur. The percent distribution of births in the three years preceding the survey, by source of antenatal care received during the pregnancy, according to selected background characteristics, is shown in table 8.1 below. Note that the births included in this and subsequent tables are those born 0 - 35 months prior to the date of interview.

Table 8.1 Antenatal Care

Percent distribution of live births in the last three years by source of antenatal care (ANC) during pregnancy, according to maternal and other selected background characteristics

Maternal and other Selected background Characteristics	Antenatal Care Provider						Number of Births	
	Doctor	Nurse/ trained midwife	Village midwife	Trad. birth Attend	Other	No One	Total Percent	Total Number
Mother's age at birth								
< 20	15.3	65.3	0.9	3.2	0.9	14.4	100	216
20-34	10.1	67.5	0.6	0.6	1.8	19.4	100	1574
35+	7.8	61.4	1.6	0.7	1.0	27.5	100	306
Birth order								
1	14.0	66.4	0.8	1.9	1.3	15.7	100	479
3 - 4	11.7	68.1	0.8	0.7	1.3	17.4	100	745
4 - 5	8.1	68.5	0.2	0.2	2.7	20.3	100	518
6+	5.6	59.9	1.7	0.8	0.8	31.1	100	354
Residence								
Urban	28.3	66.2	0.3	0.5	-	4.7	100	382
Rural	6.3	66.5	0.9	0.9	1.9	23.5	100	1714
Region								
Southern	23.3	56.3	1.9	0.9	4.7	12.9	100	533
Highlands	4.7	69.6	0.6	1.1	0.3	23.8	100	644
Momase	5.5	65.2	0.3	0.8	0.6	27.6	100	641
Islands	9.7	81.3	0.4	0.4	0.7	7.6	100	278
Mother's education								
No education	4.2	60.0	1.3	1.3	1.0	32.2	100	819
Grades 1 - 5	8.1	71.1	0.6	0.9	0.6	18.8	100	346
Grades 6	11.7	71.4	0.3	0.3	3.2	13.0	100	616
Grades 7+	26.0	68.3	0.6	0.6	1.0	3.5	100	315
All Births	10.3	66.4	0.8	0.9	1.6	20.0	100	2096

Considering the data by age of the mothers at birth, the antenatal care received from doctors accounts for about 15 percent of births to women under the age of 20 years, whilst the antenatal care provided by midwives and nurses accounts for about 66 percent of births in the same group. In age groups 20-34, where the highest number of births occurred during the last three years, 68 percent of births received antenatal care from the nurses and midwives while 19 percent of the births occurred without any antenatal care from anyone. The proportion of births which did not receive antenatal care is high for women in the age group 35 or over, 28 percent. The data by birth order show a strong association with receiving antenatal care. The absence of antenatal care is lower (16 percent) for the mothers who had their first births, but this percentage ascends to 31 percent for birth order 6 or higher.

Comparing the rates shown for receiving antenatal care from doctors indicates marked differences according to the urban-rural residential classification. Fully 28 percent of the births to women in urban areas received antenatal care from doctors as compared to a mere 6 percent of births in the rural areas. Such a significant difference can be attributed to the fact that professionally trained doctors are concentrated in major urban hospitals and private clinics. The percentages of births which received antenatal care from nurses and midwives in the urban and rural areas show little variation. However the births which received no antenatal care was higher (24 percent) for rural areas than for the urban areas (5 percent).

The percentage distribution of births by the source of antenatal care according to the regional background shows significant variation between the four geographical regions of the country. The percentage of births having received antenatal care from doctors is by far the highest (23 percent) in the Southern region. Antenatal care received from nurse/midwife is high (82 percent) in the Islands region while the Southern region has the lowest with 58 percent. The Highlands and Momase regions have higher percentages of births (24 percent and 28 percent, respectively) which did not receive antenatal care from anyone.

As education increases, so does the likelihood that a woman will consult a doctor during pregnancy. Only 4 percent of births to mothers with no education received antenatal care from doctors compared to 26 percent of births to women with secondary education (i.e. Grades 7+). At the other extreme, 32 percent of births to mothers with no education received no antenatal care, compared to only 4 percent of births to women with secondary education.

8.2 Antenatal Care Visits

The antenatal care can become much more effective when it is sought early in the pregnancy and continues at regular and recommended intervals through to parturition. Obstetricians and other trained medical professionals (nurses/midwives) in the field generally recommend that antenatal care should be made on a monthly basis to the 28th week, fortnightly to the 36th week, and then weekly until birth. Regular visits allow proper monitoring of the prenatal conditions of both the mother and the child throughout the duration of pregnancy.

Information about the number of antenatal care visits by women during the pregnancy is presented in Table 8.2 below.

Table 8.2 Number of Antenatal Care visits

Percent distribution of live births in the last three years by the number of antenatal care (ANC) visits

Number of ANC visits	*Percent*
None	20.0
1 visit	4.7
2 - 3 visits	18.8
4+ visits	48.9
Don't know/missing	7.5
Total	100
Median number of visits	5.1
Total live births	2096

In 49 percent of births, mothers made four or more antenatal visits, an indication that only one-half of women are aware of the importance of regular attendance for antenatal care. This is further evidenced by the fact that one fifth (20 percent) of all births occurred to mothers not making a single visit for antenatal care.

The median number of antenatal care visits stands at 5.1, far less than the recommended number of 12. The inaccessibility in terms of transport, lack of proper understanding of the importance of antenatal care itself, the strong traditional cultures and shortage of the required health manpower in this field may be some of the major constraints on adequate antenatal care.

8.3 Tetanus Toxoid Vaccinations

Even with highly developed health services some infants will die from prematurity, tetanus and other congenital conditions. The death rate in early infancy therefore can be reduced by proper medical supervision of pregnancy and delivery. Tetanus toxoid vaccination of women during pregnancy is essential for prevention of tetanus in the new-born, one of the leading causes of deaths among infants, particularly in the rural areas. For full protection, a pregnant woman should receive two doses of toxoid. In cases where a woman has received vaccination during a previous pregnancy, one dose of toxoid should be adequate for her current pregnancy. Table 8.3 below presents data on tetanus toxoid coverage during pregnancy for all births in the last three years preceding the survey. Almost 72 percent of births to women in the youngest age group (under 20 years) and 69 percent of those between 20-34 years received a tetanus toxoid vaccination, compared to only 63 percent for births to women of 35 years or older.

Table 8.3 Tetanus Toxiod Vaccination

Percent distribution of live births in the last three years by whether or not mother received teanus toxoid injection during pregnancy, according to maternal and other selected background characteristics

Maternal and other Selected background Characteristics	Received Teanus Toxoid Vaccination				Total Number of Births
	Yes	No	Don't Know	Total	
Mother's age at birth					
< 20	71.8	27.8	0.5	100	216
20-34	69.4	29.9	0.6	100	1574
35+	63.1	35.3	1.6	100	306
Birth order					
1	71.8	27.6	0.6	100	479
3 - 4	70.7	28.6	0.7	100	745
4 - 5	69.3	29.7	1.0	100	518
6+	59.6	39.5	0.8	100	354
Residence					
Urban	85.6	13.9	0.5	100	382
Rural	65.0	34.2	0.8	100	1714
Region					
Southern	72.0	28.0	-	100	533
Highlands	64.8	34.0	1.2	100	644
Momase	64.4	34.5	1.1	100	641
Islands	81.7	18.0	0.4	100	278
Mother's education					
No education	56.9	41.8	1.3	100	819
Grades 1 - 5	70.8	28.3	0.9	100	346
Grades 6	74.4	25.6	-	100	616
Grades 7+	86.3	13.0	0.6	100	315
All Births	68.8	30.5	0.8	100	2096

The vaccination for tetanus according to birth order shows the same types of differences. The percentage of births not receiving vaccination against tetanus increases with the ascending order of births. This pattern is universal with the likelihood that women in the high birth orders have received vaccination in previous pregnancies.

Births occurring to women in the rural areas are more than twice as likely not to have received vaccination as those in the urban areas, as the data in Table 8.3 show. The percentage of births receiving tetanus vaccination is higher in the Southern and Islands regions than the other two regions of the country. The figure for the Southern region should be accepted with caution, as it is likely to be distorted by the inclusion of the National Capital District, the most urbanised district of the country.

There is a strong association between education and receiving antenatal care. The percentage of births not receiving vaccination is much higher (42 percent) for women with no education than for those who have had some form of formal education. The pregnant women who have secondary education are more likely to be vaccinated, highlighting the impact that education has on mothers' understanding, attitudes and actions toward the utilisation of antenatal care services.

8.4 Antenatal Care: Place of Delivery

Another crucial factor that determines the survivorship of infants and mothers is the place of delivery. Proper medical attention and facilities coupled with better hygienic conditions can reduce the risk of complications and infections during the delivery process, which can cause death or serious illness to either the mother or the child. The respondents to the PNG-DHS were asked to report the place of birth of all children born in the three years before the survey; the results are shown in Table 8.4.

Table 8.4 Place of Delivery

Percent distribution of live births in the last three years by place of delivery, according to maternal and other selected background characteristics

Maternal and other Selected background Characteristics	Place of delivery: Health Facility	Place of delivery: At Home	Place of delivery: Other	Total	Total Number of Births
Mother's age at birth					
< 20	60.6	38.4	0.9	100	216
20-34	52.0	46.6	1.5	100	1574
35+	39.2	58.2	2.6	100	306
Birth order					
1	62.8	35.9	1.3	100	479
2 - 3	53.6	44.7	1.7	100	745
4 - 5	46.9	51.9	1.2	100	518
6+	35.6	62.1	2.3	100	354
Place of Residence					
Urban	87.4	11.8	0.8	100	382
Rural	42.9	55.4	1.8	100	1714
Region of Residence					
Southern	59.8	38.5	1.7	100	533
Highlands	41.8	55.0	3.3	100	644
Momase	44.8	54.8	0.5	100	641
Islands	69.8	30.2	-	100	278
Mother's education					
No education	33.1	65.0	2.0	100	819
Grades 1 - 5	50.9	48.6	0.6	100	346
Grades 6	58.0	39.8	2.3	100	616
Grades 7+	84.1	15.6	0.3	100	315
Antenatal Care Visits					
None	10.7	88.3	1.0	100	420
1 - 3 visits	48.5	50.5	1.0	100	493
4+ Visits	68.0	29.9	2.1	100	1025
Don't Know / missing	55.7	43.0	1.3	100	158
All Births	51.0	47.4	1.6	100	2096

Overall, just under half (47 percent) of the births in PNG are delivered at home while the remainder (51 percent) are delivered in places with medical facilities. Delivery of births at home is much more common in rural areas (55 percent) than in urban areas (12 percent). Home deliveries are also more common in the Highlands and Momase regions. They are also more common for women who are older (aged 35 years and above), who have had many children (6 or more), who reported having no formal education, and for those mothers who did not make any antenatal visit during the time they were pregnant.

This indicates that those women with greater exposure to antenatal services through regular antenatal visits (4 or more), are more likely to deliver in health facilities than those who reported having no such visits, 68 percent as against 11 percent. The impact of education of women towards their choice of place of delivery is also significant. Only 33 percent of deliveries of women with no education occurred in health facilities, contrasting with 84 percent of deliveries of women with secondary education.

8.5 Assistance during Delivery

The survival of both the mother and infant is the most crucial issue when providing assistance during child birth. Common causes of maternal deaths include infection, bleeding after delivery, and obstructed labour. These can be substantially reduced if child birth is given proper medical supervision and assistance at the critical stage of delivery. Because mortality tends to be high for women having their first births and then again for those with four or more children, it is especially important that these women get help. Hence the type of assistance a woman receives during the birth of her child has health implications both for herself and her child. Table 8.5 presents the distribution of live births in the last three years by type of assistance received during delivery, according to selected characteristics of the mother. If a birth was attended by more than one type of person, it is classified according to the best qualified person.

Table 8.5 Assistance During Delivery

Percent distribution of live births in the last three years by type of assistance recieved during delivery, according to maternal and other selected background characteristics

Maternal and other Selected background Characteristics	*Assitance during delivery*								
	Doctor	*Nurses/ trained midwife*	*Village midwife*	*Trad. Birth Atten.*	*Female relative*	*Other*	*No one*	*Total*	*Number of Live births*
Mother's age at birth									
< 20	6.0	54.6	2.3	3.2	26.9	6.0	0.9	100	216
20-34	6.2	45.9	2.0	4.6	26.2	5.8	9.3	100	1574
35+	4.6	35.6	1.0	4.6	24.8	8.5	20.9	100	306
Birth order									
1	7.7	54.9	1.9	3.1	25.9	5.0	1.5	100	479
3 - 4	7.4	46.8	1.9	4.8	26.6	5.5	7.0	100	745
4 - 5	4.1	42.7	1.9	4.6	25.7	6.0	15.1	100	518
6+	3.4	33.1	1.7	5.1	25.7	9.6	21.5	100	354
Place of Residence									
Urban	18.8	70.4	0.3	0.8	6.0	1.8	1.8	100	382
Rural	3.1	39.7	2.2	5.3	30.5	7.2	12.0	100	1714
Region of Residence									
Southern	12.8	46.9	4.1	6.6	23.1	3.2	3.4	100	533
Highlands	2.0	41.9	0.9	3.4	25.6	4.7	21.4	100	644
Momase	5.0	39.3	1.4	5.1	31.8	10.9	6.4	100	641
Islands	4.3	64.0	0.7	1.1	19.4	4.7	5.8	100	278
Mother's education									
No education	2.0	32.0	2.2	3.4	33.6	8.4	18.4	100	819
Grades 1 - 5	4.9	44.5	2.0	7.2	25.7	6.4	9.2	100	346
Grades 6	6.8	50.8	1.8	5.2	25.6	5.4	4.4	100	616
Grades 7+	15.9	70.2	1.0	2.5	7.6	1.9	1.0	100	315
Antenatal Care Visits									
None	0.7	10.0	2.1	5.7	46.9	12.1	22.4	100	420
1 - 3 visits	5.9	43.0	3.4	4.3	27.4	4.7	11.4	100	493
4+ Visits	8.0	60.9	0.8	3.9	16.2	4.8	5.5	100	1025
Don't Know / missi	7.0	45.6	3.2	5.1	30.4	4.4	4.4	100	158
All Births	6.0	45.3	1.9	4.4	26.0	6.2	10.2	100	2096

Given a rather high proportion of deliveries occurring at home as indicated in Table 8.4, it is not surprising to see that only half of births (53 percent) are assisted by medically trained personnel (doctors, nurses or mid wives). Young women, those of low parity, those resident in urban areas, and those with secondary education are the most likely to be assisted by medically trained personnel. It is notable that over 20 percent of births to women of age 35 or over, of parity 6 or higher, and of those living in the Highlands region were delivered without assistance. What should be particular concern to health authorities is the fact that more than one-fifth (22 percent) of births to women who had no antenatal attention were delivered without any assistance. These women and children are clearly at high risk of mortality.

8.6 Delivery Complications

Naturally, every pregnancy that a woman has involves a risk of complications that could occur at the time of delivery. The types of risk and complication may vary according to women's socio-demographic backgrounds. Women who are educated and exposed to better antenatal care services in urban areas are more likely to be at little risk during child delivery than those in the rural areas. Table 8.6 presents the percentage of live births in the last three years with complications of delivery, as reported by respondents to the DHS, according to antenatal and delivery care, and early neonatal death status. Since a birth may involve more than one complication, the percentages in each row may sum to more than 100.

Table 8.6 Delivery Complications

Percent distribution of live births in the last three years by type of complications encountered at delivery, according to antenatal and delivery care received, and early neonatal death status

Antenatal and delivery care, and early neonatal death status	*Complication of Delivery*					*Number of Live Births*
	Prolonged labour	*Excessive bleeding*	*Vaginal infection/ fever*	*Convulsions*	*None*	
Medical Maternity Care						
None	17.6	23.3	12.6	9.0	66.0	421
Antenatal care only	15.5	25.2	13.2	9.0	66.9	634
Delivery care only	24.0	22.0	14.0	4.0	64.0	50
Both types of care	21.7	21.7	9.5	5.9	65.7	91
Early Neonatal Death						
Not early neonatal	18.6	22.9	11.1	7.3	66.4	2053
Early neonatal death	41.9	30.2	25.6	14.0	48.8	43
All Births	19.0	23.1	11.4	7.4	66.1	2096

Table 8.6 shows that there were no complications associated with 66 percent of births. The most common complications are excessive bleeding, accompanying 23 percent of births, and prolonged labour, in 19 percent of deliveries. There appears to be no correlation between experiencing complications and whether or not the woman received medical attention during the pregnancy or at delivery.

(This may well be a spurious non-correlation, since those women experiencing complications during their pregnancy may have sought medical advice, thereby avoiding later complications upon giving birth.). Prolonged labour seems to be the major complication in early neonatal deaths (42 percent), followed by excessive bleeding (30 percent).

8.7 Vaccination by Source of Information.

The attempt to protect infants and young children against the common diseases and epidemics such as tuberculosis, diphtheria, pertussis (whooping cough) and tetanus through the Expanded Programme on Immunisation (EPI) is universal. EPI embraces the international guidelines recommended by the World Health Organisation (WHO), which among other things recommends that all children receive a BCG vaccination against tuberculosis; three doses of DPT vaccine against diphtheria, pertussis and tetanus; three doses of polio vaccine; and vaccination against measles. WHO recommends that children are to receive all these vaccines before their first birthday, and that the vaccinations received are to be recorded on a health card given to the parents. In Papua New Guinea, the Health Department further recommends that all children receive three doses of vaccine against hepatitis B prior to their first birthday. Thus, all children are expected to be fully vaccinated by the age of 12 months. Therefore, in the analyses which follow, attention is restricted to children 12-23 months of age.

In the DHS survey, mothers were asked to show the interviewers the health cards of all children born during the three years before the survey. The interviewer recorded from the card each vaccination given to the child. DPT and polio are recorded together, as they are almost always given at the same time. If a mother never received a health card for her child, or she was unable to show the card to the interviewer, she was asked to recall whether the child had received a BCG, polio/DPT, hepatitis or measles vaccination, including the number of doses for polio/DPT and hepatitis vaccinations.

Information on vaccination coverage according to the source of information is presented in Table 8.7. In all, vaccination cards could be produced for only 68 percent of children age 12-23 months. Of the 68 percent with vaccination cards, only 33 percent had been fully vaccinated. Among those without cards (32 percent), only 6 percent had received all the recommended vaccines. Thus, if maternal report is taken into consideration, the percentage of children receiving full immunisation is 39 percent. Subsequent discussion will refer to the combined information from both vaccination cards and maternal report.

Children are more likely to receive BCG (91 percent). The coverage for the first doses of hepatitis and polio/DPT is somewhat lower at 86 and 79 percent, respectively. However, the percentage receiving second and third doses falls off rapidly; in the case of DPT/polio, fewer than half (47 percent) of the children have received the third dose. The percentage having received the measles vaccination (76 percent) is surprisingly high, considering that it is normally given at the time of the third doses of DPT and polio. It apparently is often given at an earlier date.

Table 8.7 Vaccination by Source of Information

Among children 12 - 23 months of age, the percentage who have received specific vaccination at any time before the interview, by whether the infromation was from the vaccination card or from the mother

Source of Information		DPT/Polio			Hepatitis				Total			
	BCG	1	2	3	1	2	3	Measles	All	None	Percent	cases
Vaccination card	65.4	55.2	44.1	34.4	65.4	57.2	48.2	58.1	32.7	1.7	67.8	479
Mother's report	25.2	23.7	19.4	12.0	20.4	15.3	9.2	17.6	5.9	6.2	32.2	227
Either source	90.7	78.9	63.5	46.5	85.8	72.5	57.4	75.6	38.7	7.9	100.0	706

8.8 Vaccination Coverage

Vaccination coverage by selected background characteristics is presented in Table 8.8. Vaccination status does not differ significantly by sex of the child; however, it does differ appreciably by birth order, with the fully vaccinated declining from 46 percent among first-born children to 23 percent among the children whose mothers already have more than 5 births. Children in urban areas have a distinct advantage in terms of accessibility to facilities provided for the vaccination. The data indicate that 70 percent of children in urban areas are fully vaccinated, compared to only 32 percent in rural areas.

The differences in vaccination coverage by region and educational level are also quite significant. The proportion of children who were reported to be fully immunised is higher in Islands and Southern regions, with 43 percent, in each. The proportion of children fully vaccinated in Momase and Highlands regions are 38 percent and 33 percent, respectively. As seen in other sections of this chapter, once again the proportion of children who received all recommended vaccines is highly correlated with the educational level of mothers. The children of mothers who have completed some form of education are more likely to receive vaccination than those with mothers having no education at all. This is reflected in the data presented in Table 8.8 below which indicate that 65 percent of children of mothers with at least some secondary education are fully vaccinated, compared to only 24 percent for children whose mothers have no form of education.

Table 8.8 Vaccination by Selected Background Characteristics

Among children 12 - 23 months of age, the percentage who have received each vaccine by the time of the survey (according to the vaccination card or the mother's report), and the percentage with a vaccination card seen by the the interviewer, by maternal and other selected background characteristics

Maternal and other Selected background Characteristics	BCG	DPT/Polio 1	DPT/Polio 2	DPT/Polio 3	Hepatitis 1	Hepatitis 2	Hepatitis 3	Measles	All	None	Total: Card seen	Total: Cases
Child's sex												
Male	89.4	78.5	62.1	46.7	84.6	70.6	56.8	74.8	39.3	9.3	67.9	377
Female	92.1	79.3	65.0	46.2	87.2	74.8	58.1	76.6	38.0	6.4	67.8	329
Birth order												
1	91.6	81.9	69.3	53.6	84.3	75.3	63.9	78.3	45.8	7.2	69.9	166
2 - 3	92.8	82.2	65.5	49.2	89.4	77.7	60.2	79.2	42.0	6.1	68.2	264
4 - 5	90.6	81.3	64.4	44.4	87.5	70.0	56.3	75.0	36.9	7.5	66.9	160
6+	84.5	63.8	49.1	32.8	77.6	60.3	43.1	64.7	23.3	13.8	65.5	116
Place of Residence												
Urban	98.3	96.6	86.6	75.6	97.5	94.1	80.7	95.0	69.7	-	88.2	119
Rural	89.1	75.3	58.8	40.5	83.5	68.1	52.6	71.7	32.4	9.5	63.7	587
Region of Residence												
Southern	93.4	82.4	67.6	49.5	91.2	81.3	64.3	82.4	43.4	5.5	80.2	182
Highlands	90.7	80.1	65.7	45.8	83.3	67.6	49.1	70.8	33.3	6.9	45.8	216
Momase	86.9	70.9	54.5	41.8	81.7	68.1	55.9	69.0	38.0	12.7	76.1	213
Islands	93.7	87.4	70.5	52.6	90.5	76.8	66.3	88.4	43.2	4.2	75.8	95
Mother's education												
No education	84.8	70.7	54.4	33.7	77.0	61.5	43.7	63.3	24.1	11.9	56.7	270
Grades 1 - 5	92.4	77.3	64.7	51.3	87.4	76.5	63.9	78.2	45.4	7.6	67.2	119
Grades 6	93.0	81.7	64.8	47.9	91.1	76.5	59.6	81.2	40.4	6.6	75.6	213
Grades 7+	99.0	96.2	82.7	71.2	96.2	88.5	80.8	93.3	65.4	1.0	81.7	104
Total	90.7	78.9	63.5	46.5	85.8	72.5	57.4	75.6	38.7	7.9	67.8	706

8.9 Prevalence of Acute Respiratory Infection (ARI) and of Fever

Acute Respiratory Infection (ARI) is a leading cause of childhood morbidity and mortality in Papua New Guinea. Measles and pertussis, which still exist widely in the country, also contribute significantly to childhood morbidity. The high prevalence of malnutrition, diarrhoea and malaria make children and infants more vulnerable to ARI, and increases the risk of death due to pneumonia. Medical records show that pneumonia is indeed one of the major causes of infant mortality in PNG. Its prevalence is estimated in the DHS by asking mothers if their children under 3 years had been ill with a cough accompanied by short rapid breathing, in the two weeks preceding the survey. These symptoms are compatible with pneumonia and thus early diagnosis and treatment with appropriate medication and antibiotics can prevent a large proportion of deaths of infants. Mothers also were asked whether their children had experienced fever in the two weeks preceding the survey.

Information on the prevalence and treatment of ARI is presented in Table 8.9. The DHS results indicate that 13 percent of the children under three years had cough with rapid breathing, while 34 percent of the children were reported to have had fever sometime in the two weeks preceding the survey. ARI is slightly less common among the children over 24 months of age than it is among the children under 2 years of age. There are no significant differences in ARI prevalence by sex or birth order of the child, nor by urban and rural residence or the regions of the country. Similarly, the educational level of the mothers appears to have little impact on the prevalence of ARI. The importance of taking children to a health facility appears to be recognised by mothers of the children who were reported ill with coughing and fast breathing. Fully three-quarters (75 percent) of these children were taken to a health facility, with little variation by background characteristics, except for the children of women with no education. Almost half (48 percent) of the children who were reported to have had fever in the two weeks prior to the interview were taken to a health facility. This amount of contact with health facilities is a good sign.

Table 8.9 Prevalence of Acute Respiratory Infection and of Fever and Contact with a Health Facility.

Among children under three years of age, the percentage who were ill with a cough accompanied by fast breathing and the percentage who were ill with fever, during the two weeks before the survey, and the percentage among the ill who had contact with a health facility, according to maternal and other background characteristics

Maternal and other selected background characteristics	Respiratory Infection and Fever				
	Cough, fast breathing	Cough/ taken to HF	Fever	Fever/ taken to HF	Number
Child's age					
Under 6 months	13.6	77.8	34.3	61.5	265
6 - 11 months	15.2	80.8	39.4	48.9	343
12 - 23 months	13.6	73.2	36.2	48.1	712
24 - 35 months	9.6	71.0	29.5	39.8	648
Child's sex					
Male	13.7	76.9	35.0	48.8	1044
Female	11.3	72.1	33.5	46.5	924
Birth order					
1					
2 - 3	11.9	69.8	33.4	45.0	446
4 - 5	12.8	80.2	32.3	55.5	710
6+	11.6	76.8	35.5	43.0	484
Residence					
Urban	10.8	82.5	31.7	59.8	369
Rural	12.9	73.4	34.9	45.2	1599
Region					
Southern	10.2	82.7	33.3	48.8	510
Highlands	14.7	68.2	34.5	44.0	580
Momase	13.7	74.7	34.6	48.6	607
Islands	10.0	81.5	35.1	51.6	271
Mother's Education					
No education	14.5	67.9	37.2	42.3	751
Grades 1-5	12.2	79.5	33.5	52.3	319
Grade 6	10.4	80.6	34.0	48.0	594
Grades 7+	12.2	81.1	28.6	58.6	304
Total	12.6	74.9	34.3	47.7	1968

8.10 Diarrhoea Prevalence

In the PNG-DHS mothers were asked to provide information on whether or not their children under three years had diarrhoea anytime during the two weeks before the survey, and if so, whether they experienced it within the last 24 hours. Dehydration associated with severe diarrhoea is recognised as a major cause of morbidity and even death among young children. As indicated in Table 8.10, 17 percent of the children had experienced diarrhoea at some time in the two weeks preceding the survey. In contrast, approximately 2.0 percent of the children under three years had bloody diarrhoea during the same period; bloody diarrhoea is usually associated with dysentery. Nearly 6 percent of children were still having a bout of diarrhoea at the time of the survey (i.e. within the last 24 hours)

Overall, the prevalence of diarrhoea is notably higher among the children age 6-23 months than among either the older or the younger children. It is especially uncommon among the children less than 6 months of age who are presumably protected by breast-feeding.

Differences in the prevalence of diarrhoea according to other selected background characteristics are less notable, although three differentials stand out: the rather high prevalence of diarrhoea in the Highlands, and its relatively low prevalence in urban areas and among children of women with secondary school education. These differences are all statistically significant (see Appendix B).

Table 8.10 Diarrhoea Prevalence.

Percentage of children under three years of age with diarrhoea and bloody diarrhoea during the two weeks before the survey, and the percentage with diarrhoea in the 24 hours before the survey, according to maternal and other selected background characteristics

Maternal and other selected background characteristics	*Diarrhoea Prevalence*			
	Diarrhoea in past 2 weeks	*Diarrhoea with blood in past 2 weeks*	*Diarrhoea in past 24 hours*	*Number of children*
Child's age				
Under 6 months	7.5	1.1	2.3	265
6 - 11 months	18.1	0.9	7.3	343
12 - 23 months	22.5	2.4	6.3	712
24 - 35 months	12.7	1.2	5.7	648
Child's sex				
Male	17.7	1.7	6.2	1044
Female	15.0	1.4	5.2	924
Birth order				
1	16.8	1.8	5.2	446
2 - 3	17.2	2.0	6.1	710
4 - 5	16.3	1.4	5.8	484
6+	14.6	0.6	5.8	328
Place of Residence				
Urban	12.5	0.8	5.4	369
Rural	17.4	1.8	5.8	1599
Region of Residence				
Southern	14.3	0.6	5.1	510
Highlands	21.7	2.4	7.2	580
Momase	13.5	2.0	5.1	607
Islands	15.9	0.7	5.2	271
Mother's Education				
No education	18.0	2.1	8.3	751
Grades 1-5	16.6	0.9	4.4	319
Grade 6	16.0	1.7	3.9	594
Grades 7+	13.5	0.7	4.6	304
Total	16.5	1.6	5.7	1968

8.11 Diarrhoea Treatment

Timely treatment of diarrhoea is essential to avoid serious morbidity due to dehydration. Table 8.11 indicates the percentage of children with recent bouts of diarrhoea who were given various treatments. About one third (33 percent) of the children who had recent bouts of diarrhoea were taken to a health facility for consultation and/or treatment. Almost the same proportion (32 percent) of the children with diarrhoea in the past two weeks were treated through home remedy and other treatments. Of the two universally recommended diarrhoea treatment methods, 22 percent of the children were treated using a recommended home solution (RHS) whilst 17 percent of the children were treated with an oral rehydration solution (ORS). Despite these encouraging statistics, it is important to note that almost two thirds (65 percent) of the children with diarrhoea were given neither ORS or RHS, nor increased fluids to drink, an indication that other medications (antibiotics, pills and syrups) may have been preferred instead of these more recommended forms of diarrhoea treatment.

About one third of children with diarrhoea were given nothing to treat diarrhoea. This is especially high for the children of mothers who live in rural areas, are of high parity (6 or higher) and have relatively low educational status. Children of mothers living in the Islands region are more likely to be treated for diarrhoea at a health facility than those in the other three regions, with the Highlands region faring lowest in this respect. The use of RHS is more common with the most educated and urban based mothers and, curiously, those residing in the Highlands, perhaps due to campaigns within the Highlands provinces.

Table 8.11 Diarrhoea Treatment.

Among children under three years of age who had diarrhoea in the past two weeks, the percentage taken for treatment to a health facility or provider, the percentage who received an oral rehydration solution (ORS) packet or a recommended home solution (RHS), the percentage who received neither ORS or RHS, and the percentages given other treatments and given no treatment, according to maternal and other selected background characteristics

Maternal and other selected background characteristic	*Diarrhoea Treatment*							
	Health facility	*ORS packet*	*RHS*	*No ORS RHS, incl. fluids*	*Injection*	*Other home remedies*	*None*	*Children with diarrhoea*
Child's age								
Under 6 months	35.0	5.0	20.0	75.0	5.0	30.0	45.0	20
6 - 11 months	30.6	17.7	9.7	72.6	6.5	27.4	41.9	62
12 - 23 months	34.4	16.3	24.4	63.8	8.1	35.0	31.9	160
24 - 35 months	30.5	19.5	26.8	58.5	3.7	31.7	31.7	82
Child's sex								
Male	34.6	18.4	21.1	63.8	6.5	34.1	31.9	185
Female	30.2	14.4	23.0	66.2	6.5	30.2	38.1	139
Birth order								
1	36.0	24.0	18.7	61.3	5.3	25.3	38.7	75
2 - 3	34.4	16.4	25.4	63.1	8.2	36.9	31.1	122
4 - 5	26.6	10.1	25.3	65.8	2.5	38.0	27.8	79
6+	33.3	16.7	12.5	72.9	10.4	22.9	47.9	48
Place of Residence								
Urban	50.0	26.1	28.3	50.0	13.0	28.3	19.6	46
Rural	29.9	15.1	20.9	67.3	5.4	33.1	37.1	278
Region of Residence								
Southern	32.9	16.4	23.3	64.4	8.2	31.5	34.2	73
Highlands	21.4	12.7	31.7	58.7	0.8	23.0	40.5	126
Momase	37.8	19.5	9.8	74.4	13.4	31.7	36.6	82
Islands	55.8	23.3	14.0	65.1	7.0	62.8	14.0	43
Mother's Education								
No education	27.4	13.3	20.0	68.9	6.7	28.1	42.2	135
Grades 1-5	39.6	24.5	26.4	52.8	5.7	22.6	34.0	53
Grade 6	33.7	17.9	16.8	68.4	7.4	40.0	28.4	95
Grades 7+	39.0	14.6	34.1	58.5	4.9	41.5	24.4	41
Total	32.7	16.7	21.9	64.8	86.5	32.4	34.6	320

CHAPTER 9

INFANT FEEDING PRACTICES

Peter Siopun

Breastfeeding is important to both the mother and the child. It prolongs the duration of postpartum amenorrhoea, thereby widening the birth interval. It is the best source of nourishment for infants, especially in the first six months of life. Infants who are not breastfed and who live in environments where adequate breast milk substitutes are not available are often at risk of both malnutrition and disease, and are at greater risk of dying.

Table 9.1 shows the percentage of all children, born in the last three years, who have ever been breastfed. It shows that ninety seven percent of all children born in the past three years were ever breastfed. The proportion ever breastfed does not vary much by either sex or residence. There are also essentially no differences in the likelihood of breastfeeding by any other of the remaining background characteristics: mother's education, type of delivery assistance, and place of delivery.

Table 9.1 Initial Breast feeding

Percent of all children who were ever breastfed among children born in the three years before the survey, according to background characteristics

Background Characteristics	*Breastfeeding*		
	Ever breastfed	*Never breastfed*	*No. of cases*
Sex			
Male	97.2	2.8	1112
Female	96.7	3.3	984
Place of residence			
Urban	96.1	3.9	382
Rural	97.2	2.8	1714
Region			
Southern	96.8	3.2	533
Highlands	96.4	3.6	644
Momase	97.2	2.8	641
Islands	98.2	1.8	278
Educational level			
No education	96.8	3.2	819
Grades 1 - 5	96.5	3.5	346
Grade 6	97.9	2.1	616
Grades 7 +	96.2	3.8	315
Who assisted at delivery			
Health personnel	97.3	2.7	1114
Female relative	96.5	3.5	546
Other (including no one)	96.8	3.2	436
Place of Delivery			
Health facility	97.0	3.0	1069
Other	97.0	3.0	1027
Total	97.0	3.0	2096

Breast milk provides all the child's nutritional requirements until the age of 4-6 months when food supplements become necessary. Even at this stage breastfeeding may continue until after the child's second birthday. Table 9.2 shows the distribution of children under three years of age by breastfeeding status at the time of the survey. These data are based on the mother's report of what the child received on the day prior to the interview. At the time of the survey, 59 percent of all children under three years were on breast milk and food supplements and 26 percent were not breastfeeding. Only 13 percent were exclusively breastfed. Another 1.5 percent were on breast milk and water.

At age 2-3 months 63 percent of all children are exclusively breastfed. Food supplementation starts very early. By 2-3 months 34 percent of all children are breastfeeding and having some form of food supplementation. This proportion increases with the age of the child to reach a maximum at around 14-15 months, and then declines as more and more children are weaned. More than 34 percent of all children stop breastfeeding of any kind by age 22-23 months. By 34-35 months of age, only 25 percent are still receiving some type of breastfeeding.

Table 9.2 Breastfeeding Status by Child's Age

Percent distribution of living children under three years of age by breastfeeding status, according to child's age in months.

Months since birth	*Not Breastfeeding*	*Exclusive Breastfeeding*	*Breast & plain water*	*Breast & supplement*	*Total*	*Living Children*
0 - 1	-	87.7	3.1	9.2	100	65
2 - 3	-	62.6	3.3	34.1	100	123
4 - 5	1.0	34.4	3.1	61.5	100	96
6 - 7	2.7	21.2	3.5	72.6	100	113
8 - 9	4.0	16.8	4.0	75.2	100	101
10 - 11	4.7	11.0	3.1	81.1	100	127
12 - 13	8.8	8.8	0.7	81.8	100	137
14 - 15	6.7	5.2	1.5	86.7	100	135
16 - 17	13.1	4.4	1.5	81.0	100	137
18 - 19	17.3	2.7	1.8	78.2	100	110
20 - 21	33.7	1.0	-	65.3	100	98
22 - 23	34.8	1.1	-	64.0	100	89
24 - 25	42.5	0.9	0.9	55.8	100	113
26 -27	44.2	1.0	1.0	53.8	100	104
28 - 29	62.9	1.7	-	35.3	100	116
30 - 31	67.7	-	-	32.3	100	96
32 -33	70.6	-	-	29.4	100	102
34 - 35	75.5	0.9	-	23.6	100	106
Total	26.4	13.1	1.5	59.0	100	1968

Table 9.3 presents the median duration of breastfeeding of children born in the past three years, according to whether it is exclusive, full or any breastfeeding. Exclusive breastfeeding, the period during which a child receives only milk from the breast, is quite short: a median duration of only slightly more than 3 months. Full breastfeeding, in which the child may also receive plain water, is also less than 4 months.

The median duration of any type of breastfeeding is 25 months. The median duration is five months longer for rural children than for urban children. It is 29 months for women with no education, 25 months for those with grade six school education and 21 months for those with secondary or higher education. There are large differences among the regions. Southern and Islands have median duration of under 23 months whereas the Highlands region has a median duration of 30 months. This might help to explain the longer birth intervals encountered in the Highlands region (see Chapter 3).

Table 9.3 Median Duration of Breast feeding

Median durations of any exclusive and full breastfeeding among children born in the three years before the survey, according to background characteristics.

Background Characteristics	*Median Breastfeeding Duration*			
	Any breastfeeding	*Exclusive breastfeeding*	*Full Breastfeeding*	*Number of cases*
Sex				
Male	25.3	3.9	4.4	1112
Female	25.4	2.5	2.7	984
Place of residence				
Urban	20.4	2.2	2.5	382
Rural	25.8	3.6	3.9	1714
Region				
Southern	22.5	3.4	3.7	533
Highlands	30.0	2.3	2.4	644
Momase	25.2	4.6	5.0	641
Islands	20.9	3.5	3.8	278
Educational level				
No education	29.4	3.3	3.8	819
Grades 1 - 5	24.4	3.7	4.2	346
Grade 6	25.4	3.8	3.9	616
Grades 7 +	20.7	2.3	2.5	315
Who assisted at delivery				
Health personnel	25.4	2.9	3.3	1114
Female relative	24.0	4.4	4.7	546
Other (including no one)	26.6	3.8	4.4	436
Place of Delivery				
Health facility	25.5	3.0	3.3	1069
Other	25.4	3.9	4.3	1027
Total	25.4	3.3	3.7	2096

Table 9.4 presents the type of supplementation given to breastfeeding children, according to their age. As noted earlier, supplementation starts early. By the age of 4-5 months, over one-half (58 percent) of breastfeeding children are receiving solid or mushy food, 45 percent receive water, 19 percent receive milk (additional to breastmilk), while 25 percent receive other liquids. (Note that these figures are not additive, since a child may receive more than one type of supplement.) At age 10-11 months, over 80 percent of children received solid or mushy food on the day prior to interview.

Table 9.4 Type of Supplementation by Child's Age

Percent of breastfeeding children under three years of age receiving food supplementation by type, according to child's age in months.

Months since birth	Type of Supplementation				
	Plain water	Milk	Other Liquid	Solid mushy-food	Breastfeeding Children
0 - 1	9.2	6.2	6.2	6.2	65
2 - 3	19.5	13.8	13.0	26.8	123
4 - 5	45.3	18.9	25.3	57.9	95
6 - 7	62.7	20.0	43.6	70.9	110
8 - 9	60.8	24.7	39.2	73.2	97
10 - 11	73.6	27.3	52.9	81.8	121
12 - 13	76.0	28.0	53.6	86.4	125
14 - 15	75.4	22.2	51.6	90.5	126
16 - 17	82.4	21.0	63.0	89.9	119
18 - 19	87.9	19.8	59.3	93.4	91
20 - 21	90.8	27.7	61.5	96.9	65
22 - 23	93.1	22.4	58.6	98.3	58
24 - 25	89.2	30.8	55.4	96.9	65
26 -27	87.9	27.6	58.6	91.4	58
28 - 29	86.0	20.9	62.8	93.0	43
30 - 31	83.9	25.8	48.4	93.5	31
32 -33	96.7	30.0	63.3	100.0	30
34 - 35	88.5	19.2	50.0	96.2	26

The overall picture of infant feeding practices in Papua New Guinea, as painted in the four tables discussed above, is a positive one. Breastfeeding is nearly universal, most babies are breastfed for more than two years, and supplementation with liquids and solids starts early.

Chapter 10

Acquired Immunodeficiency Syndrome (AIDS) Knowledge and Behaviour

John Kalamoroh

The chapter on AIDS is made up of three sections. The first section presents data on the knowledge of AIDS, and ways to avoid AIDS, while second section covers the prevention aspects of AIDS, including the perception of risk of AIDS, and AIDS prevention behaviour. The final section presents information on knowledge of other sexually transmitted diseases.

Acquired Immunodeficiency Syndrome (AIDS) is the disease caused by the Human Immunodeficiency Virus (HIV) through infection. Sexual intercourse, blood transfusion and intravenous drug use are some of the ways that the disease is passed from one person to another. The spreading nature of the disease and its almost unavoidable outcome is a serious social concern for any government. The first reported case of AIDS in PNG was in 1987. By 1988, Meijden & Malau of the Department of Health reported that PNG led 21 Pacific Islands Nations (excluding Australia & New Zealand) in the number of reported cases (Courier 1991).

A National AIDS Advisory Committee (NAAC) was immediately formed in 1987, to initiate and encourage the formulation of a national policy on AIDS through the NDOH. Ensuring a safe blood supply and the training of laboratory technicians were among the immediate controls put in place. In 1988, health education efforts became part of the control programme. The seriousness of AIDS led to the study on the STD/AIDS knowledge, attitudes, beliefs and practice which was conducted in five major towns in 1989.

The growing concern about AIDS in PNG is the ease of contracting it. The future course of AIDS depends on the level of awareness among the general public. The 1996 PNG Demographic and Health Survey's coverage of the questions relating to AIDS and other STD diseases is timely and indeed essential to monitor the situation. The target population was women of ages 15-49 in the sample households. A series of questions was asked to determine the extent of their awareness, perceived risks, knowledge of preventive measures and their sexual behaviour.

10.1 Knowledge of AIDS

This section provides a descriptive scenario of the knowledge of AIDS and the sources of information available to women in Papua New Guinea. Ways to avoid AIDS are also presented. Table 10.1 indicates the extent of AIDS awareness among Papua New Guinean women and the sources from which they obtained their information. Multiple responses were allowed for each woman. The mean number of sources however is only based on women who reported knowing about AIDS.

Some 65 percent of the women in PNG have knowledge of the AIDS disease. The main sources of their knowledge have been learning from the health workers (41 percent), learning from friends/relatives (38 percent), and learning through listening to the radio (28 percent). Women in the age group 20-24 appear to the most knowledgeable, while those in the age group 40-49, least knowledgeable. The 15-19 age group, also benefit from learning through school/teachers (20 percent).

Knowledge of AIDS by current marital status was over 60 percent for all three categories. The knowledge of AIDS for the never married was at 64 percent, the currently married was at 65 percent and the formerly married at 67 percent. However there were more women in the urban (76 percent) than rural areas (62 percent), who had knowledge of AIDS. This urban bias came from the influences of TV (34 percent) and reading about AIDS in the print media (37 percent).

Table 10.1 Knowledge of AIDS

Percentage of women by Knowledge of AIDS and by source of knowledge, and mean number of sources mentioned, according to background characteristics

Background Characteristics	Knows AIDS	Sources of AIDS information												
		Radio	TV	Newspaper	Pamphlets	Health Workers	Mosque Church	School	Comm. meetings	Friends relatives	Work place	Other sources	No. of cases	Mean
Age 5-year groups														
15-19	62.4	27.2	10.2	16.1	10.2	30.4	8.1	19.8	6.1	38.0	0.2	1.0	881	1.7
20-24	70.4	30.4	10.2	15.8	9.5	42.9	9.7	7.7	6.6	38.8	2.0	2.1	904	1.8
25-29	68.8	29.9	9.2	13.8	8.7	45.7	8.5	3.7	7.7	41.0	2.2	2.6	893	1.7
30-39	66.4	28.4	8.6	12.1	9.3	46.5	11.7	3.0	8.5	40.6	2.2	1.1	1382	1.7
40-49	53.7	20.8	6.5	8.2	6.4	35.5	9.7	1.2	8.1	31.4	1.8	0.9	857	1.3
Current marital status														
Never married	64.3	29.2	12.1	19.7	12.2	31.4	8.6	19.4	4.6	37.1	1.2	1.4	1026	1.8
Currently married	64.5	27.3	8.2	11.2	8.1	43.1	10.1	3.4	8.4	38.3	1.8	1.6	3583	1.6
Formerly married	66.9	24.0	7.1	14.0	6.8	46.4	10.1	2.9	6.8	41.6	2.3	0.3	308	1.6
Place of residence														
Urban	76.1	44.7	33.9	37.2	18.3	39.0	8.3	10.9	6.2	34.2	5.6	2.5	1009	2.4
Rural	61.6	23.1	2.5	6.9	6.4	41.4	10.1	5.6	7.8	39.3	0.7	1.3	3908	1.5
Region of residence														
Southern	58.9	29.8	20.5	24.1	12.0	29.5	6.7	7.7	6.2	26.2	2.8	1.9	1202	1.7
Highlands	74.3	25.4	2.8	5.1	4.7	54.3	16.4	5.5	10.7	57.3	0.7	1.2	1751	1.8
Momase	50.4	21.2	7.8	11.5	8.5	26.7	4.6	6.6	4.3	26.0	1.4	1.4	1384	1.2
Islands	81.2	44.3	6.2	18.3	16.0	57.9	8.3	8.3	8.1	35.2	3.3	1.7	580	2.1
Level of Education														
No education	54.4	15.9	1.6	1.4	2.2	36.7	10.2	1.4	7.4	38.2	0.2	1.0	1916	1.2
Grades 1 - 5	60.9	24.0	3.6	5.3	4.4	39.1	10.6	4.0	7.6	40.9	0.2	2.0	880	1.4
Grades 6	66.2	30.7	8.5	12.6	9.2	41.9	8.0	5.1	7.2	34.5	0.5	1.7	1280	1.6
Grades 7 +	89.4	52.8	31.9	48.9	28.2	50.9	10.5	24.0	8.1	41.5	8.7	1.7	841	3.1
Total	64.6	27.5	8.9	13.1	8.9	40.9	9.8	6.7	7.5	38.3	1.7	1.5	4917	1.6

The level of awareness of AIDS by the different regions of PNG, show that the women in the Island Region, (81 percent), were the most knowledgeable about AIDS. The women in the Momase Region (50 percent) were the least knowledgeable about AIDS The results also show that education contributes towards AIDS awareness. Women with a minimum of grade seven or above, were the most knowledgeable about AIDS (89 percent). On the other hand women with no formal education were the least knowledgeable (54 percent).

The urban bias in relation to the knowledge of AIDS is to some extent, reflected in the urban mean number of sources of information at 2.4, while it was only 1.5 percent for the rural. Access to education and the higher educational level attained may have also contributed. The mean number of sources is 3.1 at grade 7 and above in contrast with 1.2 sources for those with no education, indicating the lack of opportunities for this latter group.

Table 10.2 presents percentages of women who are aware of how to avoid AIDS, according to selected background characteristics. The three main ways of avoiding AIDS, are one sex partner mentioned by 61 percent, avoiding sex with prostitutes, (44 percent), and the use of condoms during sexual intercourse (19 percent). Whilst the level of knowledge of how to avoid AIDS by means of having only one sex partner is over 60 percent for women in the age groups 20-49, it is only at 54 percent for the younger women (age 15-19). Women who are currently married (63 percent) also reported that one sex partner is the main way of avoiding AIDS. This factor is mentioned by only 57 percent of the never married women and 59 percent of the formerly married. The pattern is similar for avoiding sex with prostitutes. More of the never married women (26 percent) however reported that one can avoid AIDS by using condoms. This is in contrast to those formerly married at 18 percent and those who are currently married (17 percent).

Awareness of the three main ways to avoid AIDS reflect a higher level of knowledge among urban women than their counterparts living in the rural areas. The level of awareness by the different regions of PNG however indicate a high 72 percent of Islands women reporting one sex partner, while it was only 56 percent for the Southern and Momase women. Avoiding sex with prostitutes was mentioned by 69 percent of women in the Highlands region, and only 21 percent of women in the Southern region. Prevention of AIDS through the use of condoms was mentioned by 29 percent of the women in the Southern region, but only 10 percent in the Highland region.

On the other hand, the level of knowledge of ways to avoid AIDS appears to increase with education among the women. About 76 percent of the women with secondary education reported that sex with one partner is the main way of avoiding AIDS, while only 56 percent of the women with no education think so. Furthermore, 38 percent of women with secondary education see condoms as means of preventing AIDS, in contrast to only 8 percent of women with no education.

Table 10.2 suggests that about 4 percent of the women were misinformed about how a person could contract AIDS. There are more women in the rural areas (about 4 percent) who were misinformed, in contrast to about 2 percent in the urban areas. There are also more young and old women who were misinformed about AIDS. Misinformation includes contracting AIDS through kissing, through mosquito bites, and through traditional practices.

Table 10.2 Knowledge of Ways to Avoid AIDS

Among women who know about AIDS, the percentage who know of ways to avoid AIDS and with misinformation, according to background characteristics

Background Characteristics	Ways to avoid AIDS														
	No way to avoid AIDS	Abstain from sex	Use Condoms	One sex partner	Avoid sex with prostitutes	Avoid sex with homosexual	Avoid transfusion	Aviod injections	Avoid kissing	Avoid mosquitor bites	Trad. healer	Other ways	Does not know	mis. inform	No. of cases
Age 5-year groups															
15-19	11.8	6.7	22.5	54.4	43.3	2.7	3.3	2.7	2.0	0.9	0.2	2.0	17.6	4.7	550
20-24	9.9	4.4	23.1	61.2	40.7	2.7	2.8	2.7	0.3	0.8	0.3	2.2	17.0	3.5	636
25-29	13.5	3.3	18.9	63.0	42.7	2.3	3.6	2.9	0.3	0.2	-	1.8	15.1	2.1	614
30-39	7.5	4.3	17.0	65.2	47.1	3.6	2.8	1.9	1.0	1.0	0.1	2.5	18.3	4.1	917
40-49	10.2	4.6	15.0	60.0	44.8	2.0	2.6	2.0	0.4	1.3	-	3.5	19.3	5.2	460
Current marital status															
Never married	10.9	7.3	26.2	57.0	40.5	3.9	4.4	3.0	1.7	0.6	0.2	1.5	16.8	3.8	660
Currently married	10.2	3.7	17.4	62.8	45.3	2.5	2.5	2.3	0.6	0.8	0.1	2.6	17.3	3.9	2311
Formerly married	9.7	5.8	18.4	58.7	40.3	2.4	4.9	1.9	0.5	1.9	-	2.4	21.4	4.4	206
Place of residence															
Urban	9.9	6.4	36.5	69.0	34.6	4.9	4.7	2.5	0.5	0.3	0.1	1.3	12.5	2.1	768
Rural	10.4	4.0	13.8	58.9	46.9	2.1	2.5	2.4	0.9	1.0	0.1	2.7	19.1	4.4	2409
Region of residence															
Southern	13.4	8.2	29.4	55.6	20.5	5.5	4.4	2.1	0.3	0.1	0.4	1.8	20.1	2.5	708
Highlands	7.4	4.5	9.5	63.2	69.2	2.2	2.7	3.1	1.7	1.8	0.1	4.5	13.7	7.5	1301
Momase	14.3	3.6	25.4	56.4	25.4	1.7	2.0	1.3	0.3	-	-	0.1	21.7	0.4	697
Islands	7.6	0.8	21.9	72.2	37.2	1.9	3.4	2.5	-	0.4	-	0.4	17.8	0.8	471
Level of Education															
No education	10.5	3.7	7.6	56.1	54.3	0.9	1.2	1.2	0.5	1.2	0.1	3.8	20.7	5.3	1042
Grades 1 - 5	11.9	4.5	13.4	55.8	42.2	2.1	2.1	2.1	0.6	0.7	0.2	2.2	20.3	3.7	536
Grades 6	12.5	3.0	21.0	57.7	34.8	2.6	2.2	2.5	1.1	0.6	0.2	1.2	20.3	2.7	847
Grades 7 +	6.4	7.6	37.6	76.6	41.2	6.1	7.0	4.1	1.2	0.5	-	1.7	7.7	3.3	752
Total	10.3	4.6	19.3	61.3	44.0	2.8	3.0	2.4	0.8	0.8	0.1	2.4	17.5	3.9	3177

10.2 Perception of risk of AIDS

This section presents the perception of the risk of getting AIDS among women and how their knowledge of AIDS has influenced their sexual behaviour.

Table 10.3 indicates for women who know about AIDS, their perception of risk of AIDS according to selected background characteristics. Most of the women reported that any healthy looking person can have AIDS. Over 82 percent stated that a person with AIDS will almost always die. But about 73 percent of the women said they were at no risk.

The general level of perception of risk of AIDS however is lower for the women in the age group 40-49 years. This is reflected by about 67 percent of them responding that a healthy looking person can have AIDS, and only 79 percent stating that AIDS is a fatal disease. Perception of risk of AIDS by current marital status indicate a lesser level of awareness among the formerly married women. Similarly the women in the urban areas have a high level of knowledge about the risk of AIDS. On a regional distribution, the women in Momase appear to be ill informed about the risk of AIDS. However women with secondary education are more aware of the risk of contracting AIDS, than those with no education, and the ones with only primary level education.

Table 10.3 Perception of Risk of AIDS

Among women who know about AIDS, the percentage distribution of perception of risk of AIDS, according to background characteristics

Background Characteristics	Can a Healthy person have AIDS			Is AIDS a fatal disease				Chances of getting AIDS					
	No	Yes	Don't Know missing	Almost never	Sometimes	Almost always	Don't know missing	No risk at all	small	moderate	Great	Has AIDS	No. of Cases
Age 5-year groups													
15-19	12.7	70.0	17.3	0.9	10.7	81.6	6.7	72.7	16.0	4.0	7.3	-	550
20-24	15.1	68.6	16.4	0.5	10.1	82.4	7.1	74.2	13.2	4.2	8.2	0.2	636
25-29	11.7	69.5	18.7	0.7	7.8	84.7	6.8	69.9	17.8	5.0	7.2	0.2	614
30-39	9.5	70.7	19.8	0.8	8.6	82.6	8.1	71.1	17.0	3.7	8.1	0.1	917
40-49	10.2	66.7	23.0	0.7	11.1	78.7	9.6	78.0	13.3	2.6	6.1	-	460
Current marital status													
Never married	13.6	70.5	15.9	0.8	12.6	80.3	6.4	75.6	14.2	2.7	7.1	0.3	660
Currently married	11.3	69.4	19.3	0.7	8.7	82.9	7.8	72.1	15.8	4.4	7.6	-	2311
Formerly married	10.7	65.0	24.3	0.5	8.7	81.1	9.7	71.4	18.4	2.9	7.3	-	206
Place of residence													
Urban	11.1	77.1	11.8	0.4	8.1	88.3	3.3	75.5	14.5	2.6	7.3	0.1	768
Rural	11.9	66.9	21.2	0.8	9.9	80.3	9.0	71.9	16.1	4.4	7.6	0.1	2409
Region of residence													
Southern	13.8	68.1	18.1	0.3	8.5	83.3	7.9	80.9	10.0	2.7	6.2	0.1	708
Highlands	7.6	75.3	17.1	0.5	2.3	80.1	7.1	59.3	24.1	7.5	9.1	-	1301
Momase	19.1	59.1	21.8	1.6	9.3	79.2	9.9	81.3	12.1	1.1	5.2	0.3	697
Islands	8.9	69.9	21.2	0.6	3.4	90.9	5.1	85.1	6.2	0.4	8.3	-	471
Level of Education													
No education	11.5	63.6	24.9	0.8	1.3	76.3	11.6	67.6	20.1	4.9	7.3	0.2	1042
Grades 1 - 5	12.7	65.7	21.6	0.4	9.7	81.9	8.0	68.8	18.1	4.3	8.8	-	536
Grades 6	15.2	63.8	21.0	0.8	8.5	83.6	7.1	77.2	10.6	3.5	8.5	0.1	847
Grades 7 +	7.3	86.2	6.5	0.7	7.8	89.1	2.4	77.8	13.6	2.9	5.7	-	752
Total	11.7	69.3	18.9	0.7	9.5	82.2	7.6	72.8	15.7	4.0	7.5	0.1	3177

Table 10.4 on the other hand shows whether women have changed their sexual behaviour since learning about AIDS. The results suggest that the knowledge of AIDS among women has not really influenced their sexual behaviour. Over 55 percent of the women who knew that AIDS is a fatal disease, but felt themselves at small risk, did not change their sexual behaviour. However, for those who felt themselves at risk, over 71 percent said they had changed their behaviour. (The pattern is same for those who feel AIDS is not always fatal.). It is more the older women who appear less likely to change their behaviour. Differentials by marital status and urban - rural residence are small. The highest resistance towards change is among women in Momase region (70 percent).

The results however indicate that the educational attainment of women may assist in encouraging women to change their sexual behaviour in relation to AIDS prevention. Women with secondary education appear to be more adaptable than those with only primary education and those with no education. The most frequently mentioned change of behaviour, in all groups, is restricting sex to one partner. It is noteworthy that 14 percent of women 15-19 years old said that they had decided to keep their virginity, which is presumably equivalent to no change in behaviour.

Table 10.4 AIDS Prevention Behaviour

Among women who know about AIDS, the percentage who made changes in behaviour in order to avoid AIDS, according to perception of AIDS risk and background characteristics

Background Characteristics	*Changed Sexual Behaviour*							
	No sex behaviour change	*Kept viginity*	*Stopped sex*	*Began using condom*	*Restricted sex to one partner*	*Fewer partners*	*Others*	*Number*
Aids Always Fatal								
No/Small Risk	55.7	3.9	3.8	3.0	33.4	3.7	3.6	2303
Moderate/great/has AIDS	28.5	2.6	12.3	12.6	48.2	18.4	9.4	309
AIDS Not Always Fatal or DK								
No/Small Risk	66.3	5.1	5.1	1.8	18.9	2.8	4.3	507
Moderate/great/has AIDS	41.4	3.4	12.1	13.8	31.0	13.8	10.3	58
Age 5-year groups								
15-19	54.4	13.6	3.6	3.6	2.5	5.6	3.8	550
20-24	49.5	4.4	5.2	5.2	6.9	5.3	5.3	636
25-29	49.3	2.3	4.1	3.7	8.1	6.0	5.2	614
30-39	57.5	0.7	5.7	4.5	4.0	5.3	3.7	917
40-49	62.4	0.7	6.3	1.5	7.8	2.8	4.1	460
Current marital status								
Never married	53.9	16.4	3.9	3.3	20.6	4.8	4.4	660
Currently married	55.1	0.6	4.1	4.0	36.5	5.1	4.3	2311
Formerly married	49.5	2.4	18.9	4.9	26.2	6.3	5.3	206
Place of residence								
Urban	52.9	4.3	3.4	3.8	35.7	5.3	2.5	768
Rural	55.0	3.9	5.5	3.9	31.5	5.1	5.0	2409
Region of residence								
Southern	57.8	4.8	4.4	2.1	28.8	3.1	3.2	708
Highlands	46.6	5.1	8.0	6.1	34.7	8.8	8.4	1301
Momase	70.4	1.3	1.4	0.3	24.7	2.3	0.4	697
Islands	47.8	3.4	3.0	5.9	43.7	2.5	1.1	471
Level of Education								
No education	55.2	3.0	7.6	3.0	30.6	5.1	6.1	1042
Grades 1 - 5	54.3	3.5	3.5	4.3	32.3	6.2	4.9	536
Grades 6	56.7	2.6	3.8	4.1	32.9	4.6	3.2	847
Grades 7 +	51.2	7.2	3.9	4.7	34.6	5.2	3.1	752
Total	54.5	4.0	5.0	3.9	32.5	5.2	4.4	3177

10.3 Knowledge of Other STDs

Table 10.5 presents the knowledge of sexually transmitted diseases (STDs) other than AIDS among women who know about AIDS. The two most known STDs that women were aware of are gonorrhoea and syphilis. Women of ages 25-39 appear to be the most knowledgeable about gonorrhoea. The younger women of ages 15-19 are the least knowledgeable. On the other hand this group of women are the most knowledgeable about syphilis (40 percent) in comparison to only 31 percent of the women ages 40-49. Knowledge of STDs in relation to the current marital status of women does not favour the never married women. Only 63 percent of them reported having knowledge of gonorrhoea, in comparison to over 70 percent of the currently married and the formerly married. However, 40 percent of the never married know about syphilis.

The distribution of knowledge of gonorrhoea among women in both the rural and urban areas is quite even at about 69 percent, but a much higher percentage of urban women know about syphilis (53 percent) than rural women (33 percent). There were about 80 percent of the women in the Islands region who knew about gonorrhoea, in contrast to only 56 percent of the women in the Momase region. The same pattern occurs for the knowledge of syphilis, but this time the Highlands women are disadvantaged. The results also show that women with higher educational attainment are more knowledgeable about STDs. The women with secondary education are the most knowledgeable about both gonorrhoea and syphilis as well as other STDs.

Table 10.5 Knowledge of STDs other than AIDS

Among women who know about AIDS, the percentage who know of sexually transmitted diseases other than AIDS according to background characteristics

Background Characteristics	*Knows about*					*Number of cases*
	Gonorrhoea	*Syphilis*	*Herpes*	*Hepatitis*	*Other STD*	
Age 5-year groups						
15-19	63.3	40.0	1.6	2.7	0.9	550
20-24	65.6	39.6	1.6	2.2	1.6	636
25-29	72.5	39.6	1.8	2.1	1.8	614
30-39	73.5	37.6	2.2	3.1	1.6	917
40-49	65.4	31.3	2.6	3.9	2.2	460
Current marital status						
Never married	63.2	40.0	2.1	2.9	2.4	660
Currently married	70.2	37.3	2.0	2.8	1.4	2311
Formerly married	70.9	38.3	1.0	1.9	1.0	206
Place of residence						
Urban	69.0	52.5	4.3	4.8	3.1	768
Rural	68.7	33.3	1.2	2.1	1.1	2409
Region of residence						
Southern	59.2	42.5	5.1	4.9	3.1	708
Highlands	76.9	30.1	0.5	1.5	1.2	1301
Momase	56.0	36.2	1.9	1.6	1.4	697
Islands	79.6	55.0	1.3	4.9	0.8	471
Level of Education						
No education	66.1	20.7	0.1	1.2	0.7	1042
Grades 1 - 5	65.3	31.2	1.1	1.7	0.7	536
Grades 6	62.0	37.1	1.1	1.9	1.4	847
Grades 7 +	82.6	67.4	6.1	6.8	3.7	752
Total	68.8	37.9	2.0	2.8	1.6	3177

REFERENCE

Meijden, W., and Malau, C. 1991 "STD/AIDS control programme in Papua New Guinea ", in Courier No. 126 (61-64).

APPENDIX A

SAMPLE DESIGN

APPENDIX A

SAMPLE DESIGN

Albert Marckwardt

A.1 Objectives of the Survey Design

At the national level, the principal objective of the 1996 Demographic and Health Survey (DHS) was to generate reliable and current information on fertility, infant and child mortality, contraceptive knowledge and use, and maternal and child health indicators. This information was also to be representative at the level of urban-rural residence, and at the level of the four geographic regions: Southern, Highlands, Momase and Islands. At the provincial level, the survey was designed to provide planners with both demographic data (especially fertility and mortality) and socio-economic data on education, employment and housing. To meet these objectives, two different kinds of questionnaire were developed for use in the data collection: a household questionnaire to collect the data needed at the provincial level, and an individual woman's questionnaire used to collect information from women of childbearing age, representative at the regional and national levels.

The sample design utilised to meet these objectives was constructed by Mr. John Palmer, of the Australian Bureau of Statistics in Adelaide, with inputs from the author and staff at the NSO. The NSO and the author express their deep appreciation to Mr. Palmer.

A.2 Sampling Frame

The PNG National Statistical Office (NSO) maintains a complete list of all Census Units (CUs) with population and household statistics from the 1980 and 1990 National Population Censuses, called the CU register. Before the register was used as the sampling frame for the DHS, certain growth areas were re-listed in order to update the number of households. The areas re-listed were parts of Port Moresby, Lae, Goroka, Mt. Hagen, Madang, Wewak and Rabaul towns. The CU register is stratified into two main strata, urban and rural.

A.3 Sample Design and Allocation

The 1996 DHS sample consists of two phases. The first phase (household survey) was a two stage self-weighting systematic cluster sample for each province, with the first stage being census units (CUs) and the second stage, households. It was determined that sufficient funding was available to permit aiming for a sample of 25,000 completed household interviews, assuming a 90 percent response rate.

The sample was allocated between provinces on a 50/50 equal/proportional basis, based upon the projected number of households in 1996, so that reliable data would be

produced for all provinces, as well as for the nation as a whole. A systematic sample of CUs/villages was then selected from each province, with probability proportional to the number of households existing at the time of the 1990 Census. The expected 'take' from each CU was 20 households. If a CU contained less than 20 households according to the 1990 Census, it was combined with its nearest neighbour. In all, 1,250 clusters were selected from the 19 provinces included in the survey universe (which excludes North Solomons.).

All households in selected CUs were then listed, in a massive listing operation organised within each of the 19 provinces, which, due to delays inevitable in a decentralised operation such as this, took about six months to complete. The listings were sent to headquarters in Port Moresby for sample selection. Within each of the selected CUs a sample of approximately 22 households was then selected systematically, taking into account an expected 10 percent non-response rate. If the current size of a CU was greater than the 1996 projected size, more than 22 households would be selected; and if the CU was smaller, fewer than 22 would be selected. In fact, as in many countries using this methodology, the number of selected households varied greatly from CU to CU, from about 7 to 60; factors such as drought, floods and tribal warfare contribute to the mobility of the population. The average number of households selected per CU in the provinces varied from 19 to 25, depending upon either the accuracy of the 1990 Census in that province, or how assiduously the current listers pursued their task, or both. Note, however, that it is quite possible that the assumed *population* growth rate since 1990 does not translate directly into the rate of growth of *households*. Doubling-up of families often translates into a slower growth rate for households. In this case, the assumed number of 22 might be unrealistic. (No further allusion to this problem will be made here). The group of selected households is referred to as a cluster. The design ensured an equal probability sample of households for each province (ie. a self-weighting design at the provincial level). Details of the selection procedure, and the sampling fractions utilised are shown in Table A.1.

For the second phase, the women's survey, it was determined that a national sample of approximately of 5,000 women of childbearing age would be sufficient, taking into consideration that it was necessary to have results representative at the level of only 4 regions, and also considering the costs involved and the available manpower (actually woman-power) to carry out the necessary interviewing. Experience in many countries backed the decision for a sample of 5,000 women. To achieve this, a sub-sample of 250 clusters was required. It was therefore decided that the second phase would be a one-stage national self-weighting (ie. equal probability) systematic sample selected from the first phase of sample clusters, maintaining the geographic ordering of the phase-one sample from each province. The decision to adopt an equal probability sample means that no weights have to be attached to each sample case prior to tabulation, and greatly simplifies the data-processing stage. The skip interval used in selecting clusters within each province for the second phase was therefore chosen to produce a self-weighting sample at the national level, based upon the proportional representation of each province in the 1996 censal projection (the second column of figures in Table A.1). In this phase of the survey, all women of ages 15 to 49 years in each selected household would be eligible to be interviewed.

Table A.1 Sampling Parameters for the 1996 Papua New Guinea D. H. S.

Province	*1990 H-H Population*	*1996 Estimated H - H*	*No. of Phase 1 sample points*	*First stage intv'l*	*Overall phase 1 sampling fraction*	*No. of phase 2 sample points*	*Phase 2 sampling fraction*
Western	18208	21762	50	364.2	0.051052	7	-
Gulf	11580	12082	44	263.2	0.074491	4	-
Central	23344	26181	54	432.3	0.045835	9	-
NCD	31739	38805	64	495.9	0.036253	13	-
Milne Bay	29035	33104	60	483.9	0.040267	11	-
Northern	16450	18799	48	342.7	0.056758	6	-
S. Highlands	52660	62732	84	626.9	0.029762	20	-
Enga	39829	49216	74	538.2	0.033404	16	-
W. Highlands	66031	75780	96	687.8	0.028147	25	-
Simbu	41493	42271	68	610.2	0.032646	14	-
E. Highlands	67466	70989	92	733.3	0.027258	24	-
Morobe	68509	77148	96	713.6	0.027648	25	-
Madang	44077	49242	74	595.6	0.033386	16	-
East Sepik	50057	54387	78	641.7	0.030890	18	-
West Sepik	25717	29098	56	459.2	0.042752	9	-
Manus	6051	6964	38	159.2	0.121195	2	-
New Ireland	17846	21087	50	356.9	0.052686	7	-
E. New Britain	32277	42605	68	474.7	0.035465	14	-
W. New Britain	22579	28405	56	403.2	0.043795	10	-
TOTAL	664948	760657	1250			250	0.007213

A.4 Sample Implementation

Table A.2 provides a summary of the sample implementation of the phase-two national sample. Despite the recency of the household listings, approximately 11 percent of households could not be contacted due to prolonged absence, or because their dwellings were vacant or had been destroyed. Among the households contacted, a response rate of 90 percent was achieved. Within the 4,319 successfully interviewed households, a total of 5,550 women of ages 15 to 49 years were eligible to be interviewed, roughly 1.3 per household. Successful interviews were conducted with 89 percent of eligible women (4,917). The most common cause of non-response was absence (6 percent). The overall response rate, calculated as the product of the household and individual response rates, was 80 percent. Among the regions, the rate of success was highest in Southern (86 percent), and lowest in the Highlands (74 percent). Response rates were significantly better in urban areas (85 percent) than in rural areas (78 percent). The designers of the sample had optimistically expected a somewhat higher rate of response, 90 rather than 80. But the results recorded here are not untypical of those in many countries.

Table A. 2 Sample Implementation

Percent distribution of Households (HH) and Eligible Women (EW) in the DHS National Sample by Result of the Interview; and Household, Eligible Women and Overall response rates, according to Region and Urban/Rural Residence.

HH & EW Results &	*Region*				*Place of residence*		
Response Rate	*Southern*	*Highlands*	*Momase*	*Islands*	*Urban*	*Rural*	*Total*
HH/Completed	84.7	77.9	79.3	82.0	84.8	79.3	80.1
HH/No competent respondent	1.1	3.7	2.2	2.0	1.4	2.7	2.5
HH/Postponed	-	0.2	-	-	-	0.1	0.1
HH/Refused	1.5	3.1	2.0	1.6	1.8	2.4	2.3
HH/Dwelling not found	0.5	0.3	1.4	0.9	0.6	0.8	0.7
HH/Absent**	4.0	7.5	7.2	8.2	3.3	7.5	6.8
HH/Dwelling vacant**	5.2	2.3	2.9	2.4	4.9	2.7	3.1
HH/Dwelling destroy**	0.3	1.6	0.9	0.3	0.2	1.1	0.9
HH/Other	2.7	3.3	4.1	2.6	2.9	3.4	3.3
HH------> Total percent	100	100	100	100	100	100	100
HH ------> Number	1033	2046	1614	696	829	4560	5389
HH ------> Response rate	93.6	87.9	89.0	92.1	92.6	89.4	89.9
EW/Completed	92.1	84.3	90.8	90.2	92.2	87.7	88.6
EW/Not at home	4.4	7.1	4.8	7.3	4.8	6.1	5.9
EW/Postponed	-	0.3	0.1	0.5	-	0.2	0.2
EW/Refused	0.9	2.9	1.9	0.5	0.9	2.1	1.9
EW/Partly Completed	0.2	0.7	0.1	-	0.1	0.4	0.3
EW/Incapacitated	0.9	0.5	0.5	0.5	0.8	0.6	0.6
EW/Other	1.5	4.2	1.8	1.1	1.2	2.9	2.5
EW------>Total percent	100	100	100	100	100	100	100
EW------> Number	1305	2078	1524	643	1094	4456	5550
EW------> Response rate	92.1	84.3	90.8	90.2	92.2	87.7	88.6
Overall resp. rate	86.2	74.1	80.8	83.1	85.4	78.4	79.6

*** These categories are excluded from the denominator in calculating the household response rate.*

APPENDIX B

SAMPLING VARIABILITY

APPENDIX B

SAMPLING VARIABILITY

Albert Marckwardt

The results from sample surveys are affected by two types of errors, nonsampling error and sampling error. Nonsampling error is due to mistakes made in carrying out field activities, such as failure to locate and interview the correct household, errors in the way the questions are asked, misunderstanding on the part of either the interviewer or the respondent, data entry errors, etc. Although efforts were made during the design and implementation of the 1996 DHS to minimize this type of error, nonsampling errors are impossible to avoid and difficult to evaluate statistically.

Sampling errors, on the other hand, can be measured statistically. The sample of households selected for the 1996 DHS is only one of many samples that could have been selected from the same population, using the same design and expected size. Each one would have yielded results that differed somewhat from the actual sample selected. The sampling error is a measure of the variability between all possible samples; although it is not known exactly, it can be estimated from the survey results.

Sampling error is usually measured in terms of *standard error* of a particular statistic (mean, percentage, etc.), which is the square root of the variance of the statistic. The standard error can be used to calculate confidence intervals within which, apart from nonsampling errors, the true value for the population can reasonably be assumed to fall. For example, for any given statistic calculated from a sample survey, the value of that same statistic as measured in 95 percent of all possible samples with the same design (and expected size) will fall within a range of plus or minus two times the standard error of that statistic.

If the sample of households had been selected as a simple random sample, it would have been possible to use straightforward formulas for calculating sampling errors. However, the 1996 DHS sample design depended on stratification, stages and clusters. Consequently, it is necessary to utilize more complex formulas. The computer package CLUSTERS, developed for the World Fertility Survey programme by the International Statistical Institute, has been used to assist in computing the sampling errors with the proper statistical methodology.

The CLUSTERS program treats any percentage or average as a ratio estimate, $r = y/x$, where y represents the total sample value for variable y, and x represents the total number of cases in the group or subgroup under consideration. The variance of r is computed using the formula given below, with the standard error being the square root of the variance:

$$var(r) = \frac{1-f}{x^2} \sum_{h=1}^{H} \left[\frac{m_h}{m_h - 1} \left(\sum_{i=1}^{m_h} z_{hi}^2 - \frac{z_h^2}{m_h} \right) \right]$$

in which

$$z_{hi} = y_{hi} - r.x_{hi}\,, \; and \; z_h = y_h - r.x_h$$

where h represents the stratum, which varies from 1 to H,
m_h is the total number of clusters selected in stratum 'h',
y_{hi} is the sum of the values of variable y in cluster 'i' in stratum 'h',
x_{hi} is the sum of the number of cases in cluster 'i' in stratum 'h',
f is the overall sampling fraction, which is so small that CLUSTERS ignores it.

In addition to the standard errors, CLUSTERS computes the design effect (DEFT) for each estimate, which is defined as the ratio between the standard error using the given sample design and standard error that would result if a simple random sample had been used. A DEFT value of 1.0 indicates that the sample design is as efficient as a simple random sample, whereas a value greater than 1.0 indicates the increase in the sampling error due to the use of a more complex and less statistically efficient design. CLUSTERS also computes the relative error and confidence limits for the estimates.

Sampling errors are presented in Tables B.2 - B.15 for variables considered to be of major interest. Results are presented for the whole country, for urban and rural areas separately, for each of the four regions, for each of four education groups, and for each of three age groups. For each variable, the type of statistic (percentage or mean) and the base population are given in Table B.1. For each variable, Tables B.2 -B.15 present the value of the statistic (R), its standard error (SE), the number of cases (N), the design effect (DEFT), the relative standard error (SE/R), and the 95 percent confidence limits (R-2SE, R+2SE)

The confidence limits have the following interpretation. For the percentage of women in union currently using a contraceptive method (CUAM), the overall average from the sample is 25.9%, and its standard error is 1.17%. Therefore, to obtain the 95 percent confidence limits, one adds and subtracts twice the standard error to the sample estimate, which means that there is a high probability (95 percent) the true percentage currently using is between 23.6% and 28.2%.

The relative standard errors for most estimates for the country as a whole are small, except for estimates of very small percentages. The magnitude of the error increases as estimates for sub-populations such as geographical areas are considered. For the variable CUAM, for instance, the relative standard error (as a percentage of the estimated parameter) for the whole country and for urban and rural areas is 4.5 percent, 5.5 percent, and 5.8 percent, respectively. The relative standard error of CUAM averages out at approximately 8 percent for the four regions.

Table B.1	List of Selected Variables for Sampling Error, Papua New Guinea, 1996	
Variable	Description	Base Population
LRAD	% listening to radio weekly	All women
CEB	Mean number of children ever born	All women
CMAR	% currently in union	All women
CUAM	% currently using any method	Women in union
CUMM	% currently using modern method	Women in union
CUFS	% using female sterilization	Women in union
CUIN	% currently using injections	Women in union
IDCH	Mean ideal number of children	Women with numeric response
WNMC	% who want no more children	Women in union
AIDS	% who have heard of AIDS	All women
PRENAT	% with antenatal care before birth	Births last 3 years
TETAN	% mother received tetanus injection	Births last 3 years
DELIV	% delivered in health facility	Births last 3 years
VACARD	% vaccin. card seen by interviewer	Children 12-23 months
MEAVAC	% who have received measles vaccine	Children 12-23 months
FULVAC	% fully vaccinated	Children 12-23 months
ARI	% with respir. infect. last 2 weeks	Children under 3 years
FEVER	% with fever last 2 weeks	Children under 3 years
DIAR	% with diarrhoea last 2 weeks	Children under 3 years

Table B.2 Sampling Errors - National Sample, Papua New Guinea, 1996

Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	Confidence Limits R+2SE
LRAD	43.685	1.479	4917	2.091	0.034	40.726	46.644
CEB	2.647	0.047	4917	1.275	0.018	2.553	2.742
CMAR	72.870	0.736	4917	1.160	0.010	71.398	74.341
CUAM	25.900	1.167	3583	1.594	0.045	23.566	28.234
CUMM	19.620	1.073	3583	1.617	0.055	17.474	21.767
CUFS	7.619	0.601	3583	1.356	0.079	6.417	8.821
CUIN	6.782	0.621	3583	1.479	0.092	5.540	8.024
IDCH	3.501	0.035	3569	1.327	0.010	3.432	3.570
WNMC	45.995	1.061	3583	1.275	0.023	43.872	48.118
AIDS	64.613	1.420	4917	2.082	0.022	61.773	67.452
PRENAT	79.962	1.720	2096	1.967	0.022	76.522	83.402
TETAN	68.750	1.916	2096	1.892	0.028	64.917	72.583
DELIV	51.002	2.282	2096	2.090	0.045	46.437	55.566
VACARD	67.847	2.481	706	1.410	0.037	62.886	72.808
MEAVAC	75.637	2.381	706	1.473	0.031	70.876	80.399
FULVAC	38.669	2.523	706	1.374	0.065	33.623	43.715
ARI	12.551	0.901	1968	1.206	0.072	10.749	14.353
FEVER	34.299	1.419	1968	1.325	0.041	31.461	37.136
DIAR	16.463	1.127	1968	1.348	0.068	14.209	18.717

Table B.3 Sampling Errors - Urban Areas, Papua New Guinea, 1996							
Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	R+2SE
LRAD	71.060	3.245	1009	2.272	0.046	64.570	77.551
CEB	2.194	0.100	1009	1.454	0.045	1.995	2.394
CMAR	69.177	1.745	1009	1.200	0.025	65.688	72.667
CUAM	35.817	1.961	698	1.080	0.055	31.895	39.738
CUMM	30.946	1.916	698	1.094	0.062	27.113	34.778
CUFS	13.181	1.588	698	1.239	0.120	10.005	16.356
CUIN	8.883	0.968	698	0.898	0.109	6.947	10.818
IDCH	3.334	0.083	854	1.634	0.025	3.167	3.500
WNMC	45.559	2.302	698	1.221	0.051	40.954	50.164
AIDS	76.115	2.905	1009	2.163	0.038	70.305	81.925
PRENAT	95.288	1.512	382	1.393	0.016	92.263	98.313
TETAN	85.602	2.129	382	1.183	0.025	81.345	89.859
DELIV	87.435	3.323	382	1.957	0.038	80.788	94.081
VACARD	88.235	2.886	119	0.973	0.033	82.464	94.007
MEAVAC	94.958	2.266	119	1.125	0.024	90.426	99.490
FULVAC	69.748	4.887	119	1.165	0.069	59.974	79.522
ARI	10.840	1.733	369	1.070	0.160	7.373	14.307
FEVER	31.707	3.077	369	1.268	0.097	25.554	37.860
DIAR	12.466	1.790	369	1.040	0.144	8.886	16.047

Table B.4 Sampling Errors - Rural Areas, Papua New Guinea, 1996

Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	Confidence Limits R+2SE
LRAD	36.617	1.507	3908	1.956	0.041	33.603	39.632
CEB	2.764	0.053	3908	1.231	0.019	2.658	2.870
CMAR	73.823	0.836	3908	1.188	0.011	72.151	75.495
CUAM	23.501	1.359	2885	1.721	0.058	20.783	26.219
CUMM	16.880	1.198	2885	1.717	0.071	14.485	19.276
CUFS	6.274	0.591	2885	1.309	0.094	5.092	7.456
CUIN	6.274	0.725	2885	1.606	0.116	4.824	7.724
IDCH	3.554	0.042	2715	1.395	0.012	3.470	3.638
WNMC	46.101	1.251	2885	1.348	0.027	43.599	48.602
AIDS	61.643	1.734	3908	2.229	0.028	58.175	65.111
PRENAT	76.546	2.072	1714	2.024	0.027	72.402	80.690
TETAN	64.994	2.274	1714	1.973	0.035	60.446	69.542
DELIV	42.882	2.302	1714	1.925	0.054	38.278	47.487
VACARD	63.714	2.872	587	1.446	0.045	57.970	69.457
MEAVAC	71.721	2.739	587	1.472	0.038	66.243	77.198
FULVAC	32.368	2.620	587	1.355	0.081	27.129	37.607
ARI	12.946	0.989	1599	1.178	0.076	10.968	14.924
FEVER	34.897	1.581	1599	1.326	0.045	31.736	38.058
DIAR	17.386	1.314	1599	1.386	0.076	14.758	20.014

Table B.5 Sampling Errors - Southern Region, Papua New Guinea, 1996

Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	Confidence Limits R+2SE
LRAD	60.982	2.503	1202	1.778	0.041	55.975	65.988
CEB	2.538	0.088	1202	1.219	0.035	2.362	2.714
CMAR	68.053	1.315	1202	0.977	0.019	65.423	70.683
CUAM	37.164	3.134	818	1.853	0.084	30.897	43.431
CUMM	29.340	2.529	818	1.588	0.086	24.282	34.398
CUFS	10.758	1.503	818	1.386	0.140	7.753	13.763
CUIN	11.125	1.528	818	1.389	0.137	8.068	14.181
IDCH	3.417	0.064	993	1.239	0.019	3.289	3.544
WNMC	49.267	2.277	818	1.302	0.046	44.713	53.820
AIDS	58.902	2.771	1202	1.952	0.047	53.359	64.445
PRENAT	87.054	2.614	533	1.796	0.030	81.827	92.282
TETAN	72.045	3.596	533	1.848	0.050	64.853	79.237
DELIV	59.850	5.382	533	2.532	0.090	49.086	70.614
VACARD	80.220	3.235	182	1.093	0.040	73.750	86.690
MEAVAC	82.418	4.247	182	1.501	0.052	73.924	90.911
FULVAC	43.407	5.143	182	1.394	0.117	33.121	53.693
ARI	10.196	1.746	510	1.301	0.171	6.705	13.687
FEVER	33.333	2.771	510	1.326	0.083	27.790	38.876
DIAR	14.314	1.716	510	1.106	0.120	10.881	17.746

Table B.6 Sampling Errors - Highlands Region, Papua New Guinea, 1996							
Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	R+2SE
LRAD	31.582	2.005	1751	1.804	0.063	27.573	35.591
CEB	2.647	0.079	1751	1.287	0.030	2.488	2.806
CMAR	78.184	1.103	1751	1.117	0.014	75.978	80.389
CUAM	15.851	1.383	1369	1.401	0.087	13.084	18.618
CUMM	12.856	1.279	1369	1.413	0.099	10.299	15.414
CUFS	4.018	0.491	1369	0.924	0.122	3.036	4.999
CUIN	5.332	0.843	1369	1.387	0.158	3.647	7.017
IDCH	3.585	0.056	1016	1.266	0.016	3.473	3.697
WNMC	43.316	1.673	1369	1.249	0.039	39.971	46.662
AIDS	74.300	2.103	1751	2.014	0.028	70.094	78.507
PRENAT	76.242	2.606	644	1.553	0.034	71.030	81.454
TETAN	64.752	2.969	644	1.576	0.046	58.813	70.691
DELIV	41.770	3.420	644	1.758	0.082	34.931	48.609
VACARD	45.833	4.148	216	1.221	0.091	37.537	54.129
MEAVAC	70.833	3.750	216	1.210	0.053	63.333	78.333
FULVAC	33.333	4.510	216	1.403	0.135	24.314	42.353
ARI	14.655	1.532	580	1.042	0.105	11.591	17.719
FEVER	34.483	2.365	580	1.197	0.069	29.753	39.212
DIAR	21.724	2.731	580	1.594	0.126	16.262	27.186

Table B.7 Sampling Errors - Momase Region, Papua New Guinea, 1996							
Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	R+2SE
LRAD	38.945	3.418	1384	2.607	0.088	32.109	45.781
CEB	2.615	0.093	1384	1.330	0.035	2.429	2.800
CMAR	70.737	1.515	1384	1.239	0.021	67.706	73.768
CUAM	24.515	1.861	979	1.353	0.076	20.792	28.237
CUMM	17.773	2.138	979	1.749	0.120	13.497	22.049
CUFS	7.559	1.204	979	1.424	0.159	5.152	9.966
CUIN	4.699	1.058	979	1.563	0.225	2.583	6.814
IDCH	3.509	0.070	1089	1.532	0.020	3.368	3.649
WNMC	44.637	2.047	979	1.288	0.046	40.542	48.732
AIDS	50.361	3.175	1384	2.361	0.063	44.012	56.711
PRENAT	72.387	4.155	641	2.351	0.057	64.076	80.698
TETAN	64.431	4.272	641	2.258	0.066	55.886	72.975
DELIV	44.774	3.983	641	2.027	0.089	36.807	52.740
VACARD	76.056	5.856	213	1.998	0.077	64.343	87.769
MEAVAC	69.014	5.446	213	1.715	0.079	58.122	79.906
FULVAC	38.028	4.722	213	1.416	0.124	28.583	47.473
ARI	13.674	1.652	607	1.184	0.121	10.369	16.978
FEVER	34.596	2.959	607	1.531	0.086	28.679	40.514
DIAR	13.509	1.995	607	1.437	0.148	9.519	17.499

Table B.8 Sampling Errors - Islands Region, Papua New Guinea, 1996

Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits	
						R-2SE	R+2SE
LRAD	55.690	4.004	580	1.940	0.072	47.681	63.698
CEB	2.950	0.135	580	1.145	0.046	2.680	3.220
CMAR	71.897	2.651	580	1.419	0.037	66.595	77.198
CUAM	40.048	3.064	417	1.275	0.077	33.920	46.176
CUMM	27.098	3.211	417	1.474	0.118	20.676	33.521
CUFS	13.429	2.540	417	1.519	0.189	8.349	18.509
CUIN	7.914	2.129	417	1.609	0.269	3.655	12.172
IDCH	3.482	0.093	471	1.129	0.027	3.296	3.668
WNMC	51.559	2.851	417	1.163	0.055	45.858	57.260
AIDS	81.207	3.114	580	1.918	0.038	74.978	87.436
PRENAT	92.446	2.853	278	1.797	0.031	86.739	98.153
TETAN	81.655	3.881	278	1.669	0.048	73.892	89.417
DELIV	69.784	7.588	278	2.750	0.109	54.609	84.960
VACARD	75.789	4.571	95	1.035	0.060	66.647	84.932
MEAVAC	88.421	2.242	95	0.679	0.025	83.937	92.905
FULVAC	43.158	6.778	95	1.327	0.157	29.603	56.713
ARI	9.963	2.877	271	1.578	0.289	4.210	15.717
FEVER	35.055	2.960	271	1.019	0.084	29.135	40.975
DIAR	15.867	1.706	271	0.767	0.108	12.454	19.280

Table B.9 Sampling Errors - Women with no Education, Papua New Guinea, 1996

Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits	
						R-2SE	R+2SE
LRAD	22.599	1.361	1916	1.424	0.060	19.877	25.322
CEB	3.374	0.089	1916	1.444	0.026	3.195	3.552
CMAR	83.768	0.994	1916	1.180	0.012	81.780	85.757
CUAM	18.629	1.386	1605	1.426	0.074	15.856	21.402
CUMM	14.642	1.340	1605	1.519	0.092	11.961	17.323
CUFS	5.545	0.672	1605	1.176	0.121	4.201	6.890
CUIN	5.794	0.826	1605	1.415	0.142	4.143	7.446
IDCH	3.775	0.053	1202	1.196	0.014	3.670	3.881
WNMC	50.280	1.559	1605	1.249	0.031	47.163	53.398
AIDS	54.384	2.256	1916	1.982	0.041	49.873	58.895
PRENAT	67.766	2.831	819	1.733	0.042	62.103	73.428
TETAN	56.899	2.838	819	1.639	0.050	51.222	62.576
DELIV	33.089	2.389	819	1.452	0.072	28.311	37.867
VACARD	56.667	3.957	270	1.310	0.070	48.753	64.581
MEAVAC	63.333	3.910	270	1.331	0.062	55.512	71.154
FULVAC	24.074	3.017	270	1.157	0.125	18.040	30.109
ARI	14.514	1.563	751	1.216	0.108	11.387	17.641
FEVER	37.150	2.405	751	1.363	0.065	32.340	41.961
DIAR	17.976	1.919	751	1.369	0.107	14.138	21.814

Table B.10 Sampling Errors - Women with Grades 1 - 5, Papua New Guinea, 1996							
Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	R+2SE
LRAD	42.159	2.277	880	1.367	0.054	37.604	46.714
CEB	2.569	0.112	880	1.191	0.044	2.345	2.794
CMAR	68.636	1.675	880	1.070	0.024	65.286	71.987
CUAM	25.000	1.888	604	1.071	0.076	21.225	28.775
CUMM	18.709	1.718	604	1.082	0.092	15.273	22.144
CUFS	9.934	1.469	604	1.206	0.148	6.996	12.872
CUIN	4.801	1.029	604	1.182	0.214	2.743	6.860
IDCH	3.556	0.076	649	1.110	0.021	3.404	3.708
WNMC	45.861	2.399	604	1.182	0.052	41.062	50.659
AIDS	60.909	2.414	880	1.466	0.040	56.082	65.736
PRENAT	81.214	2.667	346	1.268	0.033	75.880	86.548
TETAN	70.809	3.297	346	1.347	0.047	64.215	77.403
DELIV	50.867	3.707	346	1.377	0.073	43.452	58.282
VACARD	67.227	6.042	119	1.398	0.090	55.144	79.310
MEAVAC	78.151	4.703	119	1.236	0.060	68.746	87.557
FULVAC	45.378	5.318	119	1.160	0.117	34.742	56.015
ARI	12.226	1.849	319	1.006	0.151	8.528	15.923
FEVER	33.542	3.143	319	1.187	0.094	27.256	39.829
DIAR	16.614	2.060	319	0.987	0.124	12.494	20.735

Table B.11 Sampling Errors - Women with Grade 6, Papua New Guinea, 1996							
Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	R+2SE
LRAD	53.828	1.808	1280	1.297	0.034	50.213	57.443
CEB	2.202	0.074	1280	1.137	0.034	2.053	2.350
CMAR	68.594	1.560	1280	1.202	0.023	65.474	71.713
CUAM	29.271	2.134	878	1.389	0.073	25.003	33.539
CUMM	21.526	1.680	878	1.211	0.078	18.166	24.886
CUFS	7.403	1.029	878	1.164	0.139	5.346	9.461
CUIN	7.973	1.191	878	1.302	0.149	5.591	10.354
IDCH	3.337	0.053	1000	1.118	0.016	3.230	3.444
WNMC	41.116	1.823	878	1.097	0.044	37.470	44.762
AIDS	66.172	1.951	1280	1.475	0.029	62.269	70.075
PRENAT	87.013	2.229	616	1.644	0.026	82.555	91.471
TETAN	74.351	2.685	616	1.524	0.036	68.982	79.720
DELIV	57.955	3.647	616	1.832	0.063	50.660	65.249
VACARD	75.587	2.927	213	0.992	0.039	69.734	81.440
MEAVAC	81.221	2.713	213	1.012	0.033	75.794	86.647
FULVAC	40.376	3.814	213	1.130	0.093	32.748	48.004
ARI	10.438	1.484	594	1.182	0.142	7.470	13.406
FEVER	34.007	2.300	594	1.182	0.068	29.408	38.606
DIAR	15.993	1.589	594	1.056	0.099	12.815	19.172

Table B.12 Sampling Errors - Women with Grades 7 or more, Papua New Guinea, 1996

Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	Confidence Limits R+2SE
LRAD	77.883	2.139	841	1.494	0.027	73.606	82.161
CEB	1.751	0.090	841	1.292	0.051	1.572	1.931
CMAR	58.977	2.281	841	1.344	0.039	54.415	63.540
CUAM	44.556	2.254	496	1.009	0.051	40.048	49.065
CUMM	33.468	2.073	496	0.977	0.062	29.321	37.614
CUFS	11.895	1.207	496	0.829	0.101	9.482	14.309
CUIN	10.282	1.554	496	1.139	0.151	7.173	13.391
IDCH	3.221	0.063	718	1.216	0.020	3.095	3.348
WNMC	40.927	1.938	496	0.877	0.047	37.052	44.803
AIDS	89.417	1.008	841	0.950	0.011	87.401	91.434
PRENAT	96.508	1.324	315	1.278	0.014	93.860	99.156
TETAN	86.349	2.085	315	1.076	0.024	82.180	90.518
DELIV	84.127	2.567	315	1.245	0.031	78.993	89.261
VACARD	81.731	3.924	104	1.031	0.048	73.883	89.578
MEAVAC	93.269	2.473	104	1.002	0.027	88.324	98.215
FULVAC	65.385	4.935	104	1.053	0.075	55.514	75.255
ARI	12.171	1.960	304	1.043	0.161	8.252	16.090
FEVER	28.618	2.434	304	0.938	0.085	23.749	33.487
DIAR	13.487	2.211	304	1.127	0.164	9.065	17.909

Table B.13 Sampling Errors - Women age 15 - 24 years, Papua New Guinea, 1996							
Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	R+2SE
LRAD	51.036	1.945	1785	1.643	0.038	47.146	54.926
CEB	0.588	0.026	1785	1.144	0.043	0.537	0.639
CMAR	44.818	1.438	1785	1.221	0.032	41.942	47.694
CUAM	17.875	1.494	800	1.102	0.084	14.887	20.863
CUMM	11.875	1.099	800	0.960	0.093	9.677	14.073
CUFS	0.500	0.249	800	0.996	0.497	0.003	0.997
CUIN	5.375	0.696	800	0.872	0.129	3.983	6.767
IDCH	2.857	0.038	1401	1.122	0.013	2.781	2.934
WNMC	16.125	1.439	800	1.106	0.089	13.246	19.004
AIDS	66.443	1.587	1785	1.419	0.024	63.269	69.616
PRENAT	82.704	2.240	636	1.492	0.027	78.225	87.184
TETAN	70.126	2.557	636	1.408	0.036	65.011	75.240
DELIV	56.761	2.900	636	1.475	0.051	50.962	62.560
VACARD	64.530	3.224	234	1.029	0.050	58.081	70.979
MEAVAC	76.923	3.434	234	1.244	0.045	70.056	83.790
FULVAC	40.171	4.008	234	1.248	0.100	32.155	48.186
ARI	12.167	1.748	600	1.309	0.144	8.670	15.663
FEVER	32.500	2.382	600	1.245	0.073	27.735	37.265
DIAR	15.833	1.599	600	1.072	0.101	12.636	19.031

Table B.14 Sampling Errors - Women age 25 - 34 years, Papua New Guinea, 1996							
Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits	
						R-2SE	R+2SE
LRAD	42.823	1.649	1651	1.354	0.039	39.525	46.120
CEB	2.824	0.062	1651	1.365	0.022	2.700	2.949
CMAR	88.007	0.980	1651	1.225	0.011	86.047	89.967
CUAM	25.465	1.482	1453	1.296	0.058	22.501	28.428
CUMM	18.858	1.339	1453	1.304	0.071	16.180	21.535
CUFS	5.093	0.604	1453	1.047	0.119	3.885	6.301
CUIN	7.226	0.805	1453	1.184	0.111	5.617	8.836
IDCH	3.582	0.044	1214	1.085	0.012	3.494	3.669
WNMC	36.339	1.484	1453	1.176	0.041	33.371	39.306
AIDS	68.686	1.823	1651	1.596	0.027	65.041	72.331
PRENAT	80.849	1.848	1060	1.528	0.023	77.153	84.545
TETAN	70.189	2.141	1060	1.523	0.030	65.907	74.470
DELIV	51.321	2.518	1060	1.639	0.049	46.285	56.357
VACARD	70.674	2.966	341	1.201	0.042	64.743	76.606
MEAVAC	80.059	2.551	341	1.177	0.032	74.957	85.160
FULVAC	42.522	2.910	341	1.085	0.068	36.702	48.342
ARI	12.513	1.094	999	1.044	0.087	10.325	14.700
FEVER	33.534	1.749	999	1.170	0.052	30.035	37.032
DIAR	17.317	1.408	999	1.175	0.081	14.501	20.133

Table B.15 Sampling Errors - Women age 35 - 49 years, Papua New Guinea, 1996							
Variable	Value (R)	Standard error (SE)	No. of cases (N)	Design effect (DEFT)	Relative error (SE/R)	Confidence Limits R-2SE	R+2SE
LRAD	35.787	1.679	1481	1.348	0.047	32.428	39.146
CEB	4.932	0.093	1481	1.335	0.019	4.746	5.117
CMAR	89.804	0.751	1481	0.954	0.008	88.303	91.306
CUAM	31.203	1.749	1330	1.376	0.056	27.705	34.701
CUMM	25.113	1.658	1330	1.393	0.066	21.798	28.428
CUFS	14.662	1.311	1330	1.351	0.089	12.039	17.284
CUIN	7.143	0.976	1330	1.382	0.137	5.190	9.096
IDCH	4.345	0.062	954	1.141	0.014	4.221	4.469
WNMC	74.511	1.567	1330	1.311	0.021	71.377	77.646
AIDS	57.866	1.820	1481	1.418	0.031	54.226	61.507
PRENAT	73.250	2.755	400	1.243	0.038	67.741	78.759
TETAN	62.750	3.152	400	1.302	0.050	56.446	69.054
DELIV	41.000	3.527	400	1.432	0.086	33.947	48.053
VACARD	66.412	4.793	131	1.157	0.072	56.825	75.999
MEAVAC	61.832	4.928	131	1.157	0.080	51.975	71.689
FULVAC	26.718	4.167	131	1.074	0.156	18.384	35.051
ARI	13.279	1.903	369	1.076	0.143	9.473	17.086
FEVER	39.295	2.773	369	1.089	0.071	33.750	44.841
DIAR	15.176	2.190	369	1.171	0.144	10.796	19.556

APPENDIX C

QUALITY OF THE DATA: NONSAMPLING ERROR

APPENDIX C

QUALITY OF THE DATA: NONSAMPLING ERROR

Alohai Pochapon

This appendix provides data users with an overview of the quality of the data of the DHS. Nonsampling errors arise in surveys (and in censuses) from a variety of causes. Below are some of these causes:

(a) Failure to locate and interview the selected household
(b) Mistakes in the way questions were asked
(c) Misunderstanding on the part of either the interviewer or respondent
(d) Coding errors
(e) Data entry errors, etc.

Although it is impossible to avoid nonsampling errors entirely, great efforts were expended in the DHS to keep them under control. These efforts included:

(a) Careful questionnaire design
(b) Pretest of survey instruments to guarantee their functionality
(c) A three- week interviewers' and supervisors' training course
(d) Careful fieldwork supervision including field visits by headquarters' personnel
(e) A swift editing process prior to data entry, and
(f) The use of interactive data entry software to keep key errors to a minimum.

Nevertheless, there is still a need to investigate content errors such as misreporting of ages, ignorance of dates of birth, and other recall problems.

Table C.1 shows the distribution of the household population by single years of age. There is rather a substantial heaping of ages ending in 0 and 5 throughout the distribution, and it is slightly more pronounced for males than for females. The heaping occurs more evidently in latter ages of 30 years and over (30, 35, 40, 45, etc.).

In the next table of this appendix, Table C.2, errors are particularly notable in the age reporting of females around the border of eligibility for the individual questionnaire, i.e., ages 15 and 49. When crosschecked against the previous table, there is an evident deficit of women at ages 15-17 years and a corresponding surplus at ages 12-14. At the other extreme, many women of ages 45-49 have been classified as being 50-54 years old. Little difference can be seen between the age distribution of women recorded in the household schedule and those interviewed with the individual questionnaire, indicating that response rates vary little across the age of respondents (Table C.2). The only exception would be for women at ages 15-19 whose percentage decreased by 0.8 percent. One can only speculate that this could be due to the mobility at such age, nil births leading to individual questionnaire neglect, etc.

Information on the completeness of reporting in connection with a set of important variables is provided in Table C.3. It is alarmingly evident that, though most variables have low percentage of missing information, the month of birth for both "births in the past 15 years" and "all respondents" have very high percentage missing information.

Table C.4 shows the distribution of births by calendar year by various characteristics. According to this table, information on month and year of birth is available for 66 percent of all children included in the birth history; the figure for living children is 70 percent, and for dead children is only 36 percent. However, reporting is much better for recent births. For children born since 1992, complete dates are given for 86 percent; the figure reaches 88 percent for living children, but falls to 59 percent for dead children.

This table also shows that the overall sex ratio at birth is 110; from year to year there are random fluctuations around this value without any indication of a trend. The sex ratio for dead children (126) is much higher than for surviving children (108), indicating higher mortality among male children.

The overall sex ratio of 110 is higher than for most countries, where it is generally in the range of 104-106. This may indicate a small but persistent omission of female births from the birth history.

From Table C.4 and the accompanying graph, a small amount of displacement of births from 1994 and 1993 into 1992 is evident. This is probably due to a temptation among interviewers to lessen their interviewing load by pushing births back to 1992, thereby not having to ask the long Section D of the questionnaire, which applied only to births since January, 1993.

C.1 Household Age Distribution

Single Year Age Distribution of the Household Population by Sex

	Males		Females			Males		Females	
Age	Number	Percentage	Number	Percentage	Age	Number	Percentage	Number	Percentage
0	369	2.9	326	2.7	36	175	1.4	158	1.3
1	409	3.2	346	2.9	37	94	0.7	106	0.9
2	369	2.9	342	2.9	38	165	1.3	151	1.3
3	399	3.1	347	2.9	39	101	0.8	119	1.0
4	407	3.2	384	3.2	40	252	2.0	184	1.5
5	410	3.2	359	3.0	41	52	0.4	75	0.6
6	405	3.2	384	3.2	42	134	1.1	103	0.9
7	381	3.0	379	3.2	43	81	0.6	67	0.6
8	358	2.8	382	3.2	44	80	0.6	74	0.6
9	360	2.8	341	2.9	45	161	1.3	100	0.8
10	398	3.1	340	2.9	46	80	0.6	91	0.8
11	296	2.3	292	2.5	47	59	0.5	51	0.4
12	389	3.1	346	2.9	48	105	0.8	114	1.0
13	299	2.4	314	2.6	49	71	0.6	100	0.8
14	342	2.7	305	2.6	50	163	1.3	15	0.1
15	276	2.2	172	1.4	51	46	0.4	110	0.9
16	270	2.1	232	2.0	52	68	0.5	155	1.3
17	225	1.8	212	1.8	53	37	0.3	65	0.5
18	258	2.0	207	1.7	54	97	0.8	115	1.0
19	212	1.7	212	1.8	55	100	0.8	90	0.8
20	264	2.1	250	2.1	56	77	0.6	102	0.9
21	182	1.4	176	1.5	57	37	0.3	36	0.3
22	195	1.5	209	1.8	58	67	0.5	64	0.5
23	143	1.1	170	1.4	59	47	0.4	38	0.3
24	240	1.9	223	1.9	60	128	1.0	107	0.9
25	239	1.9	230	1.9	61	27	0.2	13	0.1
26	202	1.6	230	1.9	62	40	0.3	24	0.2
27	176	1.4	172	1.4	63	22	0.2	17	0.1
28	224	1.8	219	1.8	64	22	0.2	18	0.2
29	112	0.9	149	1.3	65	58	0.5	33	0.3
30	291	2.3	246	2.1	66	14	0.1	16	0.1
31	105	0.8	136	1.1	67	13	0.1	8	0.1
32	208	1.6	175	1.5	68	22	0.2	14	0.1
33	120	0.9	118	1.0	69	18	0.1	13	0.1
34	154	1.2	156	1.3	70+	110	0.9	84	0.7
35	197	1.5	162	1.4					
					DK.				
					Missing	7	0.1	3	0.0
					Totals	12,714	100	11,874	100

C.2 Age Distribution of Eligible and Interviewed Women

Percent distribution in five-year age groups of the household population of women aged 10-54 and of interviewed women aged 15-49, and percentage of eligible women who were interviewed

Age	Household population		Interviewed women aged 15-49		Percent interviewed
	Number	Percent	Number	Percent	
10-14	1597	-	-	-	-
15-19	1035	18.7	882	17.9	85.2
20-24	1028	18.5	905	18.4	88.0
25-29	1000	18.0	892	18.1	89.2
30-34	831	15.0	758	15.4	91.2
25-39	696	12.5	623	12.7	89.5
40-44	503	9.1	447	9.1	88.9
45-49	456	8.2	410	8.3	89.9
50-54	460	-	-	-	-
15-49	5549	-	4917	-	88.6

C.3 Completeness of Reporting

Percentage of observations missing information for selected demographic and health questions

Subject	Reference group	Percent missing information	Number of cases
Month of birth	Births in past 15 years	28.4	9589
Both month and year	Births in past 15 years	0.4	9589
Month of birth	All respondents	70.2	4917
Both month and year	All respondents	1.1	4917
Educational level	All respondents	0.4	4917
Diarrhoea in last 2 weeks	Living children < 36 mon	1.3	1968

C.4 Births by Calender Year of Birth

Distribution of births by calender year of birth for living (L), dead (D), all (T) children, according to reporting completeness, sex ratio at birth, and ratio of births by calender year.

	Number of births			Percentage with complete birth date1			Sex ratio at birth2			Calender ratio3			Male			Female		
Year	L	D	T	L	D	T	L	D	T	L	D	T	L	D	T	L	D	T
96	481	10	491	96.3	50.0	95.3	111.9	42.9	109.8	-	-	-	254	3	257	227	7	234
95	744	62	806	93.8	82.3	92.9	113.2	121.4	113.8	136.5	203.3	140.1	395	34	429	349	28	377
94	609	51	660	88.8	51.0	85.9	111.5	112.5	111.5	88.5	92.7	88.8	321	27	348	288	24	312
93	633	48	681	86.6	64.6	85.0	111.0	152.8	113.5	98.0	86.2	94.8	333	29	362	300	19	319
92	683	94	777	78.5	44.7	74.4	108.9	176.5	115.2	108.0	172.5	113.1	356	60	416	327	34	361
91	632	61	693	78.6	42.6	75.5	107.9	177.3	112.6	94.2	66.3	90.8	328	39	367	304	22	326
90	659	90	749	72.8	34.4	68.2	106.6	87.5	104.1	109.1	142.9	112.3	340	42	382	319	48	367
89	576	65	641	70.3	32.3	66.5	100.0	109.7	100.9	92.8	81.8	91.5	288	34	322	288	31	319
88	583	69	652	66.4	31.9	62.7	88.1	137.9	92.3	104.7	92.6	103.2	273	40	313	310	29	339
87	538	84	622	66.0	38.9	62.1	104.6	133.3	108.0	-	-	-	275	48	323	263	36	299
92-96	3150	265	3415	88.4	58.5	86.1	111.3	136.6	113.0	-	-	-	1659	153	1812	1491	112	1603
87-91	2988	369	3357	71.1	35.5	67.2	101.3	122.3	103.5	-	-	-	1504	203	1707	1484	166	1650
82-86	2441	289	2730	63.2	29.8	59.7	104.1	135.0	107.0	-	-	-	1245	166	1411	1196	123	1319
77-81	1608	228	1836	59.1	25.3	55.0	113.8	107.3	113.0	-	-	-	856	118	974	752	110	862
< 77	1423	253	1676	50.1	26.5	46.5	115.9	130.0	117.9	-	-	-	764	143	907	659	110	769
All	**11610**	**1404**	**13014**	**69.9**	**35.5**	**66.2**	**108.0**	**126.1**	**109.8**	-	-	-	**6028**	**783**	**6811**	**5582**	**621**	**6203**

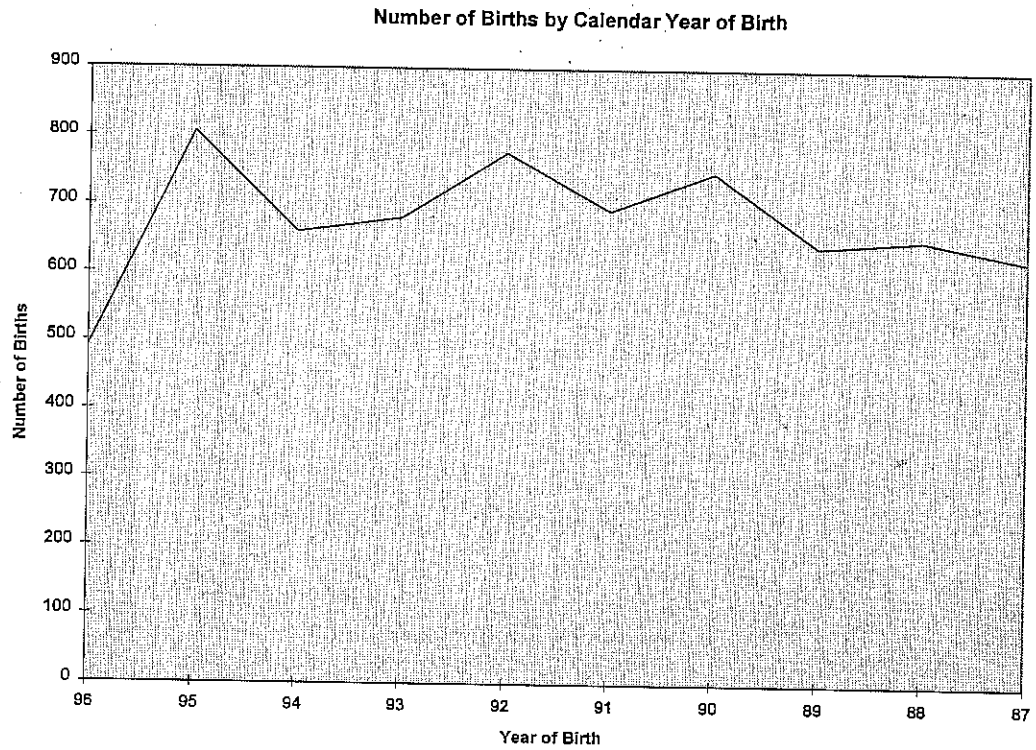
- Not applicable

1Both year and month of birth given

*2(Bm/Bf)*100, where Bm and Bf are the numbers of male and female births, respectively*

*3[2Bx/(Bx-1+Bx+1)]*100, where Bx is the number of births in a calender year x*

Figure C.1 Number of births by calender year of birth



APPENDIX D

WORLD SUMMIT FOR CHILDREN INDICATORS

APPENDIX D

WORLD SUMMIT FOR CHILDREN INDICATORS

Basic Goals		
Goal	**Indicator**	**Value**
Infant Mortality	Infant Mortality Rate (0-9 years before survey)	77
	Under -Five Mortality Rate (0-9 years before survey)	100
Maternal Mortality	Maternal Mortality Ratio	370
Clean Water Supply	Percent of Households within 15 minutes of a safe water supply [3]	27.4
Sanitary Excreta Disposal	Percent of Households with Flush Toilets or VIP Latrines	13.4
Basic Education	Percent of Women 15-49 with Completed Primary Education	42.2
	Percent of Men 15-49 with Completed Primary Education	55.2
	Percent of Girls 6-12 Attending school	40.2
	Percent of Boys 6-12 Attending School	40.0
	Percent of Women 15-49 who are Literate	56.1
Children in an Especially Difficult Situation	Percent of Children under 5 years of Age who Do Not Live with their Natural Mother	3.3
	Percent of Children 5-9 years of Age who Do Not Live with their Natural Mothers	6.8

[3] Includes tap water, well water, communal tank and tanker truck; excludes spring, river/stream, pond/lake/dam, rainwater, and others.

Supporting Goals:		
Goal	**Indicator**	**Value**
Women's Health		
Birth Spacing	Percent of Births Within 24 Months of a Previous Birth	25.1
Safe Motherhood	Percent of Births with Medical Prenatal Care	77.5
	Percent of Births with Medical Assistance at Delivery	53.2
	Percent of Births in a Medical Facility	51.0
	Percent of Births at High Risk.[4]	55.4
Family Planning	Contraceptive Prevalence Rate (all women)	19.8
	Percent of Currently Married Women with an Unmet Demand for Family Planning.[5]	45.9
Child Health		
Vaccinations	Percent of Children whose Mothers received Tetanus Toxoid Vaccination During Pregnancy	68.8
	Percent of Children 12-23 months with Measles Vaccination	75.6
	Percent of Children 12-23 months Fully Vaccinated	38.7
Diarrhoea Control	Percent of Children with Diarrhoea in Preceding 2 weeks who Received Oral Rehydration Therapy	16.7
Acute Respiratory Infection	Percent of Children with Acute Respiratory Infection in Preceding 2 weeks who were Seen by Medical Personnel	74.9

[4] See Chapter 7 for the definition of a high-risk birth.

[5] Off all currently married women, those who say they want no more children, or are unsure, but are not using any method of contraception.

APPENDIX E

QUESTIONNAIRES

NATIONAL STATISTICAL OFFICE

1996 DEMOGRAPHIC AND HEALTH SURVEY

Household Form B: Without Fertility Questions

Form	2
Cluster	
Province	
District	
CD no.	
CU no.	
Dwelling no.	
Household no.	

Address of dwelling /Name of H/H Head

INTERVIEWER VISITS

	1	2	3	Final visit
Date				Day / Month / Year
Result *				Result
Interviewer's name				
Next visit: Date				Total number of visits
Time				

*Result codes:
1 Completed
2 No household member/No competent respondent at home
3 Entire household absent for extended period
4 Postponed
5 Refused
6 Dwelling vacant/Address not a dwelling
7 Dwelling destroyed
8 Dwelling not found
9 Other (*Specify*) _____

Total persons in H/H

Total women age 15 to 50

Person No. of resp. to H/H form

TERVIEWER	FIELD EDITOR	OFFICE EDITOR	KEYER

SECTION A: HOUSEHOLD FORM

Person No.	A1. NAME WHAT ARE THE NAMES OF ALL THE PEOPLE WHO STAYED HERE LAST NIGHT? *Start with the HEAD of the household. If a baby has no name yet, enter as "BABY".*	A2. RELATIONSHIP WHAT IS *(Name)* RELATIONSHIP TO THE HEAD OF THIS HOUSEHOLD? 01=Head 02=Wife/husband 03=Own son /daughter 04=Son/daughter in-law 05=Grandchild 06=Parent 07=Parent-in-law 08=Brother/sister 09=Other relative 10=Adopted/foster /step child 11=Not related	A3. SEX WHAT IS *(Name)'s* SEX? 1=Male 2=Female	A4. AGE WHAT WAS *(Name)*'s AGE LAST BIRTHDAY? *Please estimate age if exact age is not known.* 00=Less than 1	A5. MAR. STATUS WHAT IS *(Name)*'s MARITAL STATUS? *If child is less than 15 years, then code 1* 1=Never married 2=Married 3=Divorced 4=Separated 5=Widowed	A6. MOTHER ALIVE IS *(Name)*'s OWN MOTHER STILL ALIVE? 1=Yes 2=No → *A8* 8=Don't know → *A8*	A7. MOTHER ALIVE ***If A6=1*** DOES *(Name)*'s NATURAL MOTHER LIVE IN THIS HOUSE-HOLD? *If Yes, record mother's person number.* *If No, enter "00".*	A8. FATHER IS *(Name)*'s OWN FATHER STILL ALIVE? 1=Yes 2=No 8=Don't know
01								
02								
03								
04								
05								
06								
07								
08								
09								
10								
11								
12								
13								
14								

A1A. ARE THERE ANY OTHER PEOPLE SUCH AS SMALL CHILDREN OR INFANTS OR ANY FRIENDS OR VISITORS WHO STAYED IN YOUR HOUSEHOLD LAST NIGHT?

Yes *(Enter each in table)* ☐

No ☐

A8. FATHER							
IS *(Name)*'s OWN FATHER STILL ALIVE?							
1=Yes 2=No 8=Don't know							
Y							

If 5 years of age or over			*If 15 years of age or over*			
A9.	A10.	A11.	A12.	A13.	A14.	A15.
EDUCATION			ECONOMIC ACTIVITY			
HAS *(Name)* EVER BEEN TO SCHOOL? 1=Yes 2=No → A12 8=Don't know → A12	IS *(Name)* ATTENDING A SCHOOL NOW? 1=Yes 2=No 8=Don't know	WHAT IS *(Name's)* HIGHEST EDUCATIONAL LEVEL COMPLETED/ ATTENDED? 00=No grade completed 01-12=School years 13=Trade certificate 14=Other certificate 15=Diploma 16=Bachelor's degree 17=Postgraduate 98=Don't know	DID *(Name)* DO ANY WORK LAST WEEK FOR SALARY OR WAGES OR PROFIT? 1=Yes → *A14* 2=No	DID *(Name)* DO ANY WORK LAST WEEK TO GROW FOOD OR CATCH FISH OR MAKE ARTICLES FOR OWN USE OR FOR SALE? 1=Yes 2=No → A15	*If A12/13=1* WHAT KIND OF WORK DID *(Name)* DO MOST OF THE TIME LAST WEEK? *Interviewer:* *Describe the kind of work.*	*If A13=2* WHAT DID *(Name)* DO MOST OF THE TIME LAST WEEK? 1=Full time student 2=Home duties 3=Looking for work 4=No work available 5=Too old/sick/ handicapped 6=Other 8=Don't know

Please circle the person number of all women aged 15 to 50 years.
Complete an Individual Questionnaire for each of these women.

HOUSEHOLD AMENITIES AND SERVICES

A24. WHAT IS THE MAIN SOURCE OF DRINKING WATER YOUR HOUSEHOLD USES?

Piped water:

- 01. piped into household/yard → *A27* ..... ☐ 1
- 02. piped into neighbourhood (communal) ..... ☐ 2

Well water:

- 03. well in yard → *A27* .... ☐ 3
- 04. public well ..... ☐ 4

Surface water:

- 05. spring ..... ☐ 5
- 06. river/stream ..... ☐ 6
- 07. pond/lake/dam ..... ☐ 7

Other:

- 08. communal tank ..... ☐ 8
- 09. rain water → *A27* ..... ☐ 9
- 10. tanker truck → *A27* .... ☐ 10
- 11. other (*Specify*) ..... ☐ 96

.....

A25. HOW LONG DOES IT TAKE TO GO THERE, GET WATER AND COME BACK?

Minutes ..... ☐☐☐

On premises ..... ☐ 996

A26. WHO <u>USUALLY</u> FETCHES WATER?

<u>Interviewer:</u>

Classify as follow:

- Female child ..... ☐ 1
- Other female ..... ☐ 2
- Male child ..... ☐ 3
- Other male ..... ☐ 4

A27. WHAT KIND OF TOILET FACILITY DOES YOUR HOUSEHOLD HAVE?

Flush toilet

- own flush toilet ..... ☐ 1
- shared flush toilet ..... ☐ 2

Pit/latrine toilet

- traditional pit latrine ..... ☐ 3
- improved latrine ..... ☐ 4

Other

- bucket system ..... ☐ 5
- closet over sea/river ..... ☐ 6

No facility/bush/seashore ..... ☐ 7

A28 DOES YOUE HOUSEHOLD HAVE:

A. Electricity

Yes ..... ☐ 1

No ..... ☐ 2

B. Radio

Yes ..... ☐ 1

No ..... ☐ 2

C. Television

Yes ..... ☐ 1

No ..... ☐ 2

D. Refrigerator

Yes ..... ☐ 1

No ..... ☐ 2

E. Motor vehicle

Yes ..... ☐ 1

No ..... ☐ 2

F. Telephone

Yes ..... ☐ 1

No ..... ☐ 2

A29. HOW MANY ROOMS IN YOUR HOUSEHOLD ARE USED FOR SLEEPING?

Number of rooms ..... ☐☐

A30. WHAT TYPE OF FUEL DOES YOUR HOUSEHOLD <u>MAINLY</u> USE FOR COOKING?

Electricity..... ☐ 1

Gas ..... ☐ 2

Kerosene ..... ☐ 3

Charcoal..... ☐ 4

Firewood ..... ☐ 5

Other (*Specify*)..... ☐ 6

.....

A31. WHAT IS THE <u>MAIN</u> SOURCE OF LIGHTING YOUR HOUSEHOLD USES?

Electricity..... ☐ 1

Pressure lamp (Coleman)..... ☐ 2

Kerosene lamp ..... ☐ 3

Candles..... ☐ 4

Open fire ..... ☐ 5

Other (*Specify*)..... ☐ 6

.....

A32. <u>MAIN</u> MATERIAL OF FLOOR?

<u>Interviewer</u>:

Record observation

Natural floor

Earth floor ..... ☐ 11

Sand..... ☐ 12

Rudimentary floor

Wood planks ..... ☐ 21

Palm/bamboo ..... ☐ 22

Finished floor

Polished wood ..... ☐ 31

Vinyl/asphalt strips..... ☐ 32

Ceramic tiles..... ☐ 33

Cement ..... ☐ 34

Carpet..... ☐ 35

Other (*Specify*)..... ☐ 96

.....

NATIONAL STATISTICAL OFFICE

1996 DEMOGRAPHIC AND HEALTH SURVEY

Individual Questionnaire

Cluster	
Province	
District	
CD no.	
CU no.	
Dwelling no.	
Household no.	
Person no.	

Address of dwelling /Name of H/H Head

Respondent's Name _____

INTERVIEWER VISITS

	1	2	3	Final visit
Date				Day / Month / Year
Result *				Result
Interviewer's name				
Next visit: Date				Total number of visits
Time				

*Result codes:

1 Completed
2 Not at home
3 Postponed
4 Refused
5 Partly completed
6 Incapacitated
7 Other (*Specify*) _____

INTERVIEWER	FIELD EDITOR	OFFICE EDITOR	KEYER

INDIVIDUAL QUESTIONNAIRE

This questionnaire is ONLY for women aged 15 to 50 years old.

THE FOLLOWING QUESTIONS ARE ABOUT WOMEN 'S AND CHILDREN'S HEALTH. THE INFORMATION WILL BE USED TO HELP REDUCE ILLNESS AND PREVENT PREMATURE DEATH AMONG PNG WOMEN AND CHILDREN.

SECTION B: RESPONDENT'S BACKGROUND

B1. IN WHAT MONTH AND YEAR WERE YOU BORN?

Month..... ☐☐

Don't know..... ☐ 98

Year..... ☐☐☐☐

Don't know..... ☐ 98

B2. HOW OLD WERE YOU AT YOUR LAST BIRTHDAY?

Age in completed years..... ☐☐

Interviewer

Compare and correct B1 and/or B2 if inconsistent.

B3. HAVE YOU EVER BEEN MARRIED OR LIVED WITH A MAN?

Yes..... ☐ 1

No → *B11*..... ☐ 2

B4. ARE YOU NOW MARRIED OR LIVING WITH A MAN, OR ARE YOU NOW WIDOWED, DIVORCED, OR NO LONGER LIVING TOGETHER?

Married..... ☐ 1

Informal union..... ☐ 2

Divorced → *B9*..... ☐ 3

Separated → *B9*..... ☐ 4

Widowed → *B9*..... ☐ 5

B5. IS YOUR HUSBAND/PARTNER LIVING WITH YOU NOW OR IS HE STAYING ELSEWHERE?

Living with her..... ☐ 1

Staying elsewhere..... ☐ 2

B6. DOES YOUR HUSBAND/PARTNER HAVE ANY OTHER WIVES BESIDES YOURSELF?

Yes..... ☐ 1

No → *B9*..... ☐ 2

Don't know → *B9*..... ☐ 8

B7. HOW MANY OTHER WIVES DOES HE HAVE?

Number..... ☐☐

Don't know → *B9*..... ☐ 98

B8. ARE YOU FIRST, SECOND,...WIFE?

Rank..... ☐☐

B9. HAVE YOU BEEN MARRIED OR LIVED WITH A MAN ONLY ONCE, OR MORE THAN ONCE?

Once..... ☐ 1

More than once..... ☐ 2

B10. HOW OLD WERE YOU WHEN YOU STARTED LIVING WITH YOUR (FIRST) HUSBAND/PARTNER?

Age ☐☐

B11. CAN YOU READ AND UNDERSTAND A LETTER OR NEWS PAPER EASILY, WITH DIFFICULTY, OR NOT AT ALL IN ANY LANGUAGE?

- Easily ☐ 1
- With difficulty ☐ 2
- Not at all → *B13* ☐ 3

B12 DO YOU USUALLY READ A NEWSPAPER OR MAGAZINE AT LEAST ONCE A WEEK?

- Yes ☐ 1
- No ☐ 2

B13. DO YOU USUALLY LISTEN TO A RADIO AT LEAST ONCE A WEEK?

- Yes ☐ 1
- No ☐ 2

B14. DO YOU USUALLY WATCH TELEVISION AT LEAST ONCE A WEEK?

- Yes ☐ 1
- No ☐ 2

B15. WHAT IS YOUR RELIGIOUS DENOMINATION (PREFERENCE)?

Christian

- Anglican ☐ 01
- Evangelical Alliance ☐ 02
- Pentecostal ☐ 03
- Evangelical Lutheran ☐ 04
- Roman Catholic ☐ 05
- Salvation Army ☐ 06
- Seventh Day Adventist ☐ 07
- United Church ☐ 08
- Other Christian Church ☐ 09

Non-christian (*Specify*) ☐ 10

.....

No religion ☐ 20

B16. HAVE YOU USED A HEALTH SERVICE IN THE LAST TWO YEARS?

- Yes ☐ 1
- No → *C1* ☐ 2

B17. WHY DID YOU GO TO THE SERVICE THE LAST TIME YOU WENT?

- Antenatal care ☐ 01
- Delivery ☐ 02
- Postnatal care ☐ 03
- Illness ☐ 04
- Accident/trauma ☐ 05
- Health check up ☐ 06
- Other (*Specify*) ☐ 96

.....

B18. WHERE DID YOU GO TO RECEIVE THE SERVICE?

Public sector

- Gov't. hospital/clinic..... ☐ 01
- Gov't. health center..... ☐ 02
- Gov't. aid post..... ☐ 03
- Mobile clinic..... ☐ 04
- Comm. health worker..... ☐ 05

Private medical sector

- Church hospital..... ☐ 06
- Church health center..... ☐ 07
- Church aid post..... ☐ 08
- Other private hospital..... ☐ 09
- Chemist/drug store..... ☐ 10
- Private clinic..... ☐ 11

Other private sector

- Traditional practitioner..... ☐ 12

Other (*Specify*)..... ☐ 96

.....

B19. HOW DID YOU GET THERE?

- On foot..... ☐ 1
- PMV..... ☐ 2
- Car/truck..... ☐ 3
- Boat/canoe..... ☐ 4
- Airplane..... ☐ 5
- Other (*Specify*)..... ☐ 6

.....

B20. HOW LONG DID IT TAKE TO GET THERE?

- *Minutes*..... ☐☐☐
- Don't know..... ☐ 998

SECTION C: REPRODUCTION

C1. HAVE YOU EVER HAD A BABY?

- Yes..... ☐ 1
- No → *C6*..... ☐ 2

C2. **I WOULD NOW LIKE TO ASK YOU ABOUT ALL THE TIMES YOU HAVE GIVEN BIRTH DURING YOUR LIFE.**

DO YOU HAVE ANY SONS OR DAUGHTERS THAT YOU HAVE GIVEN BIRTH TO WHO ARE NOW LIVING WITH YOU?

- Yes..... ☐ 1
- No → *C4*..... ☐ 2

C3. HOW MANY OF YOUR OWN SONS AND DAUGHTERS LIVE WITH YOU?

- *Sons at home*..... *a* ☐☐
- Nil..... ☐ 00
- *Daughters at home*..... *b* ☐☐
- Nil..... ☐ 00

C4. DO YOU HAVE ANY SONS OR DAUGHTERS TO WHOM YOU HAVE GIVEN BIRTH WHO ARE ALIVE BUT DO NOT LIVE WITH YOU?

- Yes..... ☐ 1
- No → *C6*..... ☐ 2

C5. HOW MANY SONS AND HOW MANY DAUGHTERS THAT YOU HAVE GIVEN BIRTH TO ARE ALIVE BUT DO NOT LIVE WITH YOU?

- *Sons elsewhere*..... *a* ☐☐
- Nil..... ☐ 00
- *Daughters elsewhere*..... *b* ☐☐
- Nil..... ☐ 00

C6. HAVE YOU EVER GIVEN BIRTH TO ANY SONS OR DAUGHTERS WHO WERE BORN ALIVE BUT LATER DIED?

Yes ..... ☐ 1

No → *C8* ..... ☐ 2

If No,
Probe: Any baby who cried or showed signs of life but lived only a few minutes/hours/days.

C7. HOW MANY SONS OR DAUGHTERS THAT YOU GAVE BIRTH TO HAVE DIED?

Sons .....

Nil ..... *a* ☐☐ 00

Daughters .....

Nil ..... *b* ☐☐ 00

C8. *Interviewer:*

Sum the responses for C.3, C.5, C.7 .

Total number of births ..... ☐☐

C9. IN TOTAL YOU HAVE HAD *(number in C.8)* BIRTHS DURING YOUR LIFE, IS THAT CORRECT?

Interviewer:

If not correct, probe and correct answers above.

Yes ..... ☐ 1

No ..... ☐ 2

C10. *Sequence guide*

One or more births → C11.

No births → Enter "0" in C22 then ask C23.

C11. NOW I WOULD LIKE US TO TALK ABOUT ALL OF YOUR BIRTHS, WHETHER STILL ALIVE OR NOT, STARTING WITH THE FIRST ONE YOU HAD.

Record names of all births . Record twins and triplets on separate lines. Then ask questions C14-C20 about each child in turn, and circle or record responses.

C12.	C13.	C14.	C15.	C16.	C17.	C18.	C19.	C20.
					If alive			*If dead*
WHAT NAME WAS GIVEN TO YOUR (FIRST, NEXT) CHILD?	*Record single or multiple birth status.* Single=1 Mult.=2	WAS (*Name*) A MALE OR A FEMALE? Male =1 Female =2	IN WHAT MONTH AND YEAR WAS (*Name*) BORN? *Probe: What is his/her birthday?* Month Year	IS (*Name*) STILL ALIVE? Yes=1 No=2 (*Go to C20*)	HOW OLD WAS (*Name*) AT HIS/HER LAST BIRTHDAY? *Record age in completed years.* 00=less than 1 year	IS (*Name*) LIVING WITH YOU? Yes=1 (*Go to next birth*) No=2	WITH WHOM DOES (*Name*) LIVE? Father=1 Relative=2 Someone else=3 Alone=4 (*Go to next birth*)	HOW OLD WAS (*Name*) WHEN HE/SHE DIED? ***If "1 year" probe: How many months old was (Name)?*** Days = 1 Months = 2 Years = 3
01	1 2	1 2		1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
02	1 2	1 2		1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
03	1 2	1 2		1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
04	1 2	1 2		1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
05	1 2	1 2		1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
06	1 2	1 2		1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
07	1 2	1 2		1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
08	1 2	1 2		1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3

C12.	C13.	C14.	C15.		C16.	C17.	C18.	C19.	C20.
							If alive		*If dead*
WHAT NAME WAS GIVEN TO YOUR (FIRST, NEXT) CHILD?	*Record single or multiple birth status.* Single=1 Mult.=2	WAS (*Name*) A MALE OR A FEMALE? Male =1 Female =2	IN WHAT MONTH AND YEAR WAS (*Name*) BORN? *Probe: what is his/her birth day* Month	Year	IS (*Name*) STILL ALIVE? Yes= 1 No=2 (*Go to C20*)	HOW OLD WAS (*Name*) AT HIS/HER LAST BIRTHDAY? *Record age in completed years.* 00=less than 1 year	IS (*Name*) LIVING WITH YOU? Yes= 1 (*Go to next birth*) No=2	WITH WHOM DOES (*Name*) LIVE? Father=1 Relative=2 Someone else=3 Alone=4 (*Go to next birth*)	HOW OLD WAS (*Name*) WHEN HE/SHE DIED? ***If "1 year" probe: How many months old was (Name)?*** Days =1 Months =2 Years =3
09	1 2	1 2			1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
10	1 2	1 2			1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
11	1 2	1 2			1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
12	1 2	1 2			1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3
13	1 2	1 2			1 2		1 2	1 2 3 4	Days 1 Months 2 Years 3

C21. *Interviewer:*
Compare C8 with number of births in history above and mark:
Numbers are same ☐
Check:
For each birth: year of birth is recorded. ☐
For each living child: Current age is recorded. ☐
For each dead child: Age at death is recorded. ☐
For age at death 12 months: probe to determine exact number of months. ☐

Numbers are different (*Probe and reconcile*). ☐

C22. *Interviewer:*
Check C15 and enter the number of births since January, 1993 If none, record 0. ☐

C23. ARE YOU PREGNANT NOW?

Yes	☐ 1
No → *C26*	☐ 2
Unsure → *C26*	☐ 3

C24. HOW MANY MONTHS PREGNANT ARE YOU?

Months	☐☐
Don't know	☐ 98

C25. AT THE TIME YOU BECAME PREGNANT, DID YOU WANT TO BECOME PREGNANT <u>THEN</u>, DID YOU WANT TO WAIT UNTIL <u>LATER</u>, OR DID YOU <u>NOT WANT</u> TO HAVE ANY MORE CHILDREN AT ALL?

Then	☐ 1
Later	☐ 2
No more	☐ 3
Indifferent	☐ 4

C26. HAVE YOU EVER HAD A PREGNANCY THAT MISCARRIED, WAS ABORTED, OR ENDED IN A STILLBIRTH?

Yes	☐ 1
No → *C28*	☐ 2
Don't know → *C28*	☐ 8

C27. HOW MANY TIMES DID THIS HAPPEN TO YOU?

Number	☐☐
Don't know	☐ 98

C28. *<u>Interviewer</u>*

Check C22.

One or more births since January 1993 → D1	☐ 1
No births since January 1993 → E1	☐ 2

SECTION D: MATERNAL AND CHILD HEALTH

D1. *Interviewer:*

Enter the line number , name and survival status of each birth since January 1993 in the table. Ask the questions about all of these births. Begin with the last birth. If there are more than two births, use additional forms or the space at the right.

NOW I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT THE HEALTH OF ALL OF YOUR CHILDREN BORN IN THE PAST THREE YEARS. (We will talk about one child at a time).

	Last birth	*Next-to-last birth*
Interviewer: *Copy line number from C12.*	☐☐	☐☐
Interviewer: *Copy name from C12 and survival status from C16.*	*Name* ..... Alive ☐ 1 Dead ☐ 2	*Name* ..... Alive ☐ 1 Dead ☐ 2
D2. AT THE TIME YOU BECAME PREGNANT WITH (*Name*), DID YOU WANT TO BECOME PREGNANT THEN, DID YOU WANT TO WAIT UNTIL LATER, OR DID YOU WANT NO (MORE) CHILDREN AT ALL?	Then ☐ 1 Later ☐ 2 No more ☐ 3 Indifferent ☐ 4	Then ☐ 1 Later ☐ 2 No more ☐ 3 Indifferent ☐ 4
D3. WHEN YOU WERE PREGNANT WITH (*Name*), DID YOU SEE ANYONE FOR ANTENATAL CARE FOR THIS PREGNANCY? If yes: WHOM DID YOU SEE? ANYONE ELSE? *Probe for all type of person and record all persons seen.* *If No, go to D5*	Doctor ☐ A Nurse/Midwife ☐ B Auxiliary (village) midwife ☐ C Traditional birth attendant ☐ D Other (*Specify*): ☐ X ..... No one ⟹ *D5* ☐ Y	Doctor ☐ A Nurse/Midwife ☐ B Auxiliary (village) midwife ☐ C Traditional birth attendant ☐ D Other (*Specify*): ☐ X ..... No one ⟹ *D5* ☐ Y
D4. HOW MANY TIMES DID YOU RECEIVE ANTENATAL CARE DURING THIS PREGNANCY?	No. of times ☐☐ Don't know ☐ 98	No. of times ☐☐ Don't know ☐ 98
D5. WHEN YOU WERE PREGNANT WITH (*Name*), WERE YOU GIVEN AN INJECTION IN THE ARM TO PREVENT THE BABY FROM GETTING TETANUS, THAT IS, CONVULSIONS OR FITS AFTER BIRTH?	Yes ☐ 1 No ☐ 2 Don't know ☐ 8	Yes ☐ 1 No ☐ 2 Don't know ☐ 8
D6. WHERE DID YOU GIVE BIRTH TO (*Name*)?	Your home ☐ 11 Other home ☐ 12 Gov't. hospital ☐ 21 Gov't. health center ☐ 22 Gov't. aid post ☐ 23 Other government ☐ 26 Church hospital ☐ 31 Church health center ☐ 32 Church aid post ☐ 33 Other private medical ☐ 41 Other (*Specify*) ☐ 96	Your home ☐ 11 Other home ☐ 12 Gov't. hospital ☐ 21 Gov't. health center ☐ 22 Gov't. aid post ☐ 23 Other government ☐ 26 Church hospital ☐ 31 Church health center ☐ 32 Church aid post ☐ 33 Other private medical ☐ 41 Other (*Specify*) ☐ 96 .....

	Name	*Name* .....
D14. WHY DID YOU STOP BREASTFEEDING (*Name*)?	Mother ill/weak ☐ 01 Child ill/weak ☐ 02 Child died ☐ 03 Nipple/breast problem ☐ 04 Not enough milk ☐ 05 Mother working ☐ 06 Child refused ☐ 07 Weaning age/age to stop ☐ 08 Became pregnant ☐ 09 Started contraception ☐ 10 Other (*Specify*) ☐ 96	Mother ill/weak ☐ 01 Child ill/weak ☐ 02 Child died ☐ 03 Nipple/breast problem ☐ 04 Not enough milk ☐ 05 Mother working ☐ 06 Child refused ☐ 07 Weaning age/age to stop ☐ 08 Became pregnant ☐ 09 Started contraception ☐ 10 Other (*Specify*) ☐ 96 .....
D15. *Interviewer:* *Check D1.* *Child alive?*	Alive ☐ 1 Dead ⇒ *next column or, if no more births go to E1.* ☐ 2	Alive ☐ 1 Dead ⇒ *next column or, if no more births go to E1.* ☐ 2
D16. DO YOU HAVE A CARD WHERE (*Name's*) VACCINATIONS ARE WRITTEN DOWN? If yes: MAY I SEE IT PLEASE?	Yes, seen ⇒ *D18* ☐ 1 Yes, not seen ⇒ *D19* ☐ 2 No card ☐ 3	Yes, seen ⇒ *D18* ☐ 1 Yes, not seen ⇒ *D19* ☐ 2 No card ☐ 3
D17. DID YOU EVER HAVE A VACCINATION CARD FOR (*Name*)?	Yes ⇒ *D19* ☐ 1 No ⇒ *D19* ☐ 2	Yes ⇒ *D19* ☐ 1 No ⇒ *D19* ☐ 2
D18. *Interviewer:* **Copy informatiom from the vaccination card, then skip to D20**	*Received* / *Not received*	*Received* / *Not received*
BCG	BCG ☐ 1 ☐ 2	BCG ☐ 1 ☐ 2
Polio 1/DPT1 (Sabin/T.A)	P1/D1 ☐ 1 ☐ 2	P1/D1 ☐ 1 ☐ 2
Polio 2 /DPT2	P2/D2 ☐ 1 ☐ 2	P2/D2 ☐ 1 ☐ 2
Polio 3/DPT3	P3/D3 ☐ 1 ☐ 2	P3/D3 ☐ 1 ☐ 2
Hepatitis B1	HB1 ☐ 1 ☐ 2	HB1 ☐ 1 ☐ 2
Hepatitis B2	HB2 ☐ 1 ☐ 2	HB2 ☐ 1 ☐ 2
Hepatitis B3	HB3 ☐ 1 ☐ 2	HB3 ☐ 1 ☐ 2
Measles	MEA ☐ 1 ☐ 2	MEA ☐ 1 ☐ 2
	Skip to D20	*Skip to D20*

	Name	Name .....
D19. PLEASE TELL ME IF (*Name*) HAS RECEIVED ANY OF THE FOLLOWING VACCINATIONS:		
D19A. A BCG VACCINATION AGAINST TUBERCULOSIS, THAT IS, AN INJECTION IN THE LEFT ARM THAT CAUSED A SCAR?	Yes ☐ 1 No ☐ 2 Don't know ☐ 8	Yes ☐ 1 No ☐ 2 Don't know ☐ 8
D19B. POLIO VACCINE, THAT IS, DROPS IN THE MOUTH AND DPT VACCINATION, THAT IS, AN INJECTION GIVEN AT THE SAME TIME?	Yes ☐ 1 No ⇒ D19D ☐ 2 Don't know ⇒ D19D ☐ 8	Yes ☐ 1 No ⇒ D19D ☐ 2 Don't know ⇒ D19D ☐ 8
D19C. HOW MANY TIMES?	Number of times ⇒ ☐	Number of times ⇒ ☐
D19D. HEPATITIS VACCINATION, THAT IS, AN INJECTION USUALLY GIVEN IN THE BUTTOCK?	Yes ☐ 1 No ⇒ D19F ☐ 2 Don't know ⇒ D19F ☐ 8	Yes ☐ 1 No ⇒ D19F ☐ 2 Don't know ⇒ D19F ☐ 8
D19E. HOW MANY TIMES?	Number of times ⇒ ☐	Number of times ⇒ ☐
D19F. AN INJECTION TO PREVENT MEASLES?	Yes ☐ 1 No ☐ 2 Don't know ☐ 8	Yes ☐ 1 No ☐ 2 Don't know ☐ 8
D20. HAS (*Name*) BEEN ILL WITH A FEVER AT ANY TIME IN THE LAST 2 WEEKS ?	Yes ☐ 1 No ☐ 2 Don't know ☐ 8	Yes ☐ 1 No ☐ 2 Don't know ☐ 8
D21. HAS (*Name*) BEEN ILL WITH A COUGH AT ANY TIME IN THE LAST 2 WEEKS ?	Yes ☐ 1 No ⇒ D27 ☐ 2 Don't know ⇒ D27 ☐ 8	Yes ☐ 1 No ⇒ D27 ☐ 2 Don't know ⇒ D27 ☐ 8
D22. WHEN (*Name*) WAS ILL WITH A COUGH, DID HE/SHE BREATHE FASTER THAN USUAL WITH SHORT, FAST BREATHS?	Yes ☐ 1 No ☐ 2 Don't know ☐ 8	Yes ☐ 1 No ☐ 2 Don't know ☐ 8
D23. WAS ANYTHING GIVEN TO TREAT THE COUGH?	Yes ☐ 1 No ⇒ D25 ☐ 2 Don't know ⇒ D25 ☐ 8	Yes ☐ 1 No ⇒ D25 ☐ 2 Don't know ⇒ D25 ☐ 8

	Name	Name .....
D24. WHAT WAS GIVEN TO TREAT THE COUGH? *Probe*: ANYTHING ELSE? *Record all mentioned*	Injection ☐ A Antibiotic (pill/syrup) ☐ B Antimalaria (pill/syrup) ☐ C Cough syrup ☐ D Other pill/syrup ☐ E Unknown pill/syrup ☐ F Home remedy/herbs ☐ G Other (*Specify*): ☐ X	Injection ☐ A Antibiotic (pill/syrup) ☐ B Antimalaria (pill/syrup) ☐ C Cough syrup ☐ D Other pill/syrup ☐ E Unknown pill/syrup ☐ F Home remedy/herbs ☐ G Other (*Specify*): ☐ X .....
D25. DID YOU SEEK ADVICE OR TREATMENT FOR THE COUGH?	Yes ☐ 1 No ⇒ D27 ☐ 2 Don't know ⇒ D27 ☐ 8	Yes ☐ 1 No ⇒ D27 ☐ 2 Don't know ⇒ D27 ☐ 8
D26. WHERE DID YOU SEEK ADVICE OR TREATMENT? *Probe*: ANYWHERE ELSE? *Record all mentioned.*	PUBLIC SECTOR Govt. hospital/clinic ☐ A Govt. health center ☐ B Govt. aid post ☐ C Mobile clinic ☐ D Comm. health worker ☐ E PRIVATE MEDICAL SECTOR Church hospital ☐ F Church health center ☐ G Church aid post ☐ H Other private hospital ☐ I Chemist/drug store ☐ J Private doctor/clinic ☐ K Traditional practitioner ☐ L OTHER (*Specify*) ☐ X	PUBLIC SECTOR Govt. hospital/clinic ☐ A Govt. health center ☐ B Govt. aid post ☐ C Mobile clinic ☐ D Comm. health worker ☐ E PRIVATE MEDICAL SECTOR Church hospital ☐ F Church health center ☐ G Church aid post ☐ H Other private hospital ☐ I Chemist/drug store ☐ J Private doctor/clinic ☐ K Traditional practitioner ☐ L OTHER (*Specify*) ☐ X .....
D27. HAS (*Name*) HAD DIARRHOEA IN THE LAST TWO WEEKS?	Yes ☐ 1 No ⇒ *next column or, if no more births go to E1* ☐ 2 Don't know ⇒ *next column or, if no more births go to E1* ☐ 8	Yes ☐ 1 No ⇒ *next column or, if no more births go to E1* ☐ 2 Don't know ⇒ *next column or, if no more births go to E1* ☐ 8
D28. HAS (*Name*) HAD DIARRHOEA IN THE LAST 24 HOURS?	Yes ☐ 1 No ☐ 2 Don't know ☐ 8	Yes ☐ 1 No ☐ 2 Don't know ☐ 8
D29. FOR HOW MANY DAYS (HAS THE DIARRHOEA LASTED/DID THE DIARRHOEA LAST)? ***If less than 1 day, record 00***	Days ☐☐	Days ☐☐

	Name	Name .....
D30. WAS THERE ANY BLOOD IN THE STOOLS?	Yes ☐ 1 No ☐ 2 Don't know ☐ 8	Yes ☐ 1 No ☐ 2 Don't know ☐ 8
D31. WAS ANYTHING GIVEN TO TREAT THE DIARRHOEA?	Yes ☐ 1 No ⟹ D33 ☐ 2 Don't know ⟹ D33 ☐ 8	Yes ☐ 1 No ⟹ D33 ☐ 2 Don't know ⟹ D33 ☐ 8
D32. WHAT WAS GIVEN TO TREAT THE DIARRHOEA? *Probe*: ANYTHING ELSE? *Record all mentioned.*	Fluid from ORS packet ☐ A Recommended home fluid ☐ B Pill or syrup ☐ C Injection ☐ D Intravenous (I.V) ☐ E Home remedies/herbs ☐ F Other (*Specify*) ☐ X	Fluid from ORS packet ☐ A Recommended home fluid ☐ B Pill or syrup ☐ C Injection ☐ D Intravenous (I.V) ☐ E Home remedies/herbs ☐ F Other (*Specify*) ☐ X .....
D33. DID YOU SEEK ADVICE OR TREATMENT FOR DIARRHOEA?	Yes ☐ 1 No ⟹ *next column or, if no more births go to E1* ☐ 2 Don't know ⟹ *next column or, if no more births go to E1* ☐ 8	Yes ☐ 1 No ⟹ *next column or, if no more births go to E1* ☐ 2 Don't know ⟹ *next column or, if no more births go to E1* ☐ 8
D34. WHERE DID YOU SEEK ADVICE OR TREATMENT? *Probe*: ANYWHERE ELSE? *Record all mentioned*	PUBLIC SECTOR Govt. hospital/clinic ☐ A Govt. health center ☐ B Govt. aid post ☐ C Mobile clinic ☐ D Comm. health worker ☐ E PRIVATE MEDICAL SECTOR Church hospital ☐ F Church health center ☐ G Church aid post ☐ H Other private hospital ☐ I Chemist/drug store ☐ J Private doctor/clinic ☐ K OTHER PRIVATE SECTOR Traditional practitioner ☐ L OTHER (*Specify*) ..... ☐ X	PUBLIC SECTOR Govt. hospital/clinic ☐ A Govt. health center ☐ B Govt. aid post ☐ C Mobile clinic ☐ D Comm. health worker ☐ E PRIVATE MEDICAL SECTOR Church hospital ☐ F Church health center ☐ G Church aid post ☐ H Other private hospital ☐ I Chemist/drug store ☐ J Private doctor/clinic ☐ K OTHER PRIVATE SECTOR Traditional practitioner ☐ L OTHER (*Specify*) ..... ☐ X

SKIP INSTRUCTION: ***At this point, go back to D1 and ask the series of questions for the birth in the next column. If there are no other births, proceed to Section E.***

SECTION E: FAMILY PLANNING

E1. THERE ARE A NUMBER OF THINGS PEOPLE CAN DO TO DELAY OR AVOID HAVING CHILDREN. THE FOLLOWING QUESTIONS ASK YOU ABOUT FAMILY PLANNING METHODS. WHICH WAYS OR METHODS HAVE YOU HEARD ABOUT?

Circle code 1 in E2 for each method mentioned spontaneously.
Then proceed down the column, reading the name and description of each method not mentioned spontaneously. Circle code 2 if method is recognised, and code 3 if not recognised. ***Then for each method with a 1 or 2 circled in E2, ask E3 and E4.***

	METHODS	E2. HAVE YOU EVER HEARD OF (METHOD)? Yes/spont = 1, Yes/probed = 2, No = 3	E3. HAVE YOU AND YOUR PARTNER EVER USED (METHOD)? Yes = 1, No = 2	E4. DO YOU KNOW WHERE A PERSON COULD GO TO GET (METHOD)? Yes = 1, No = 2
01	**PILL** Women can take a pill every day.	1 2 3 ⇩	1 2	1 2
02	**IUD** Women can have a loop or coil placed inside them by a doctor or a nurse.	1 2 3 ⇩	1 2	1 2
03	**INJECTIONS** Women can have an injection by a doctor or a nurse which stops them from becoming pregnant for several months.	1 2 3 ⇩	1 2	1 2
04	**DIAPHRAGM/FOAM/JELLY** Women can place a sponge, diaphragm, jelly or cream inside them before intercourse.	1 2 3 ⇩	1 2	1 2
05	**CONDOM** Men can use a rubber sheath during sexual intercourse.	1 2 3 ⇩	1 2	1 2
06	**FEMALE STERILISATION** Women can have an operation to stop having any more children.	1 2 3 ⇩	Have you ever had an operation like this? 1 2	1 2
07	**MALE STERILISATION** Men can have an operation to stop having any more children.	1 2 3 ⇩	Has your husband ever had an operation like this? 1 2	1 2
08	**PERIODIC ABSTINENCE** Couples can avoid having sexual intercourse on certain days of the month when the woman is more likely to become pregnant.	1 2 3 ⇩	1 2	Do you know where a person can obtain advice on how to use periodic abstinence? 1 2
09	**WITHDRAWAL** Men can be careful and pull out before climax.	1 2 3 ⇩	1 2	
10	**OTHERS** Have you heard of any other ways or methods that women and men can use to avoid pregnancy. 1. ..... (*Specify*) 2. ..... (*Specify*) 3 ..... (*Specify*)	1 3	1 2 1 2 1 2	

E5. *Interviewer*

Check E3.

Woman sterilised → ***E7 and tick 06*** ..... ☐ 1

Woman not sterilised ..... ☐ 2

E6. ARE YOU CURRENTLY DOING SOMETHING OR USING ANY METHOD TO DELAY OR AVOID GETTING PREGNANT?

Yes ..... ☐ 1

No → *E9* ..... ☐ 2

E7. WHICH METHOD ARE YOU USING?

Pill ..... ☐ 01

IUD (Loop) ..... ☐ 02

Injection ..... ☐ 03

Diaphragm/Foam/Jelly ..... ☐ 04

Condom ..... ☐ 05

Female Steril. → *E8b* ..... ☐ 06

Male Steril. → *E8b* ..... ☐ 07

Periodic abstinence/Rhythm .... ☐ 08

→ *Section F*

Withdrawal → *Section F.* . ☐ 09

Other (*Specify*) → *Section F* ..... ☐ 96

.....

.....

E8a. WHERE DID YOU OBTAIN (*Method*) THE LAST TIME?

FPA Clinic → *F1* ..... ☐ 01

Aid Post → *F1* ..... ☐ 02

Health Sub Centre → *F1* ... ☐ 03

Health Centre → *F1* ..... ☐ 04

MCH Clinic → *F1* ..... ☐ 05

Hospital → *F1* ..... ☐ 06

Private doctor → *F1* ..... ☐ 07

Comm. based distributor → *F1* ..... ☐ 08

Pharmacy / chemist → *F1* ..... ☐ 09

Shop → *F1* ..... ☐ 10

Relative or friend → *F1* ... ☐ 11

Other (*Specify*) → *F1* ..... ☐ 96

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.....

E8b. WHERE DID THE STERILISATION TAKE PLACE?

Health Sub Centre → *F1* ... ☐ 03

Health Centre → *F1* ..... ☐ 04

Hospital → *F1* ..... ☐ 06

Private doctor → *F1* ..... ☐ 07

Other (*Specify*) → *F1* ..... ☐ 96

.....

.....

E9. *Interviewer:*

Check E3

Ever user ..... ☐ 1

Never user → *E11* ..... ☐ 2

E10 WHY AREN'T YOU CURRENTLY USING ANY METHOD TO DELAY OR AVOID PREGNANCY?

Pregnant	☐ 01
Wants children	☐ 02
Partner opposed	☐ 03
Costs too much	☐ 04
Side effect/health concern	☐ 05
Hard to get methods	☐ 06
Religion	☐ 07
Menopausal/had hysterectomy → *Section F*	☐ 08
Not married	☐ 09
Other *(Specify)*	☐ 96
.....	
.....	

E11. DO YOU INTEND TO USE A METHOD TO DELAY OR AVOID PREGNANCY AT ANY TIME IN THE FUTURE?

Yes → *E13.*	☐ 1
No	☐ 2
Don't know → *F1*	☐ 8

E12. WHY DON'T YOU INTEND TO USE A METHOD?

Lack of knowledge → *F1*	☐ 01
Wants children → *F1*	☐ 02
Partner opposed → *F1*	☐ 03
Costs too much → *F1*	☐ 04
Side effect/health concern → *F1*	☐ 05
Hard to get methods → *F1*	☐ 06
Religion → *F1*	☐ 07
Fatalistic → *F1*	☐ 08
Menopausal/had hysterectomy → *F1*	☐ 09
Not married → *F1*	☐ 10
Other *(Specify)* → *F1*	☐ 96
.....	
Don't know → *F1*	☐ 98

E13. WHAT METHOD DO YOU INTEND TO USE?

Pill	☐ 01
IUD (Loop)	☐ 02
Injection	☐ 03
Diaphragm/Foam/Jelly	☐ 04
Condom	☐ 05
Female Sterilisation	☐ 06
Male Sterilisation	☐ 07
Periodic abstinence/Rhythm	☐ 08
Withdrawal	☐ 09
Other *(Specify)*	☐ 96
.....	
Don't know	☐ 98

SECTION F: FERTILITY PREFERENCES

F1. ***Sequence guide***

Check E7.

If male or female sterilisation used → *F9* ..... ☐ 1

Check B3.

If never married → *F9* ..... ☐ 2

Otherwise → *F2* ..... ☐ 3

F2. ***Sequence guide***

Check C23.

If currently pregnant → *F3* ..... ☐ 1

If not pregnant → *F4* ..... ☐ 2

F3. AFTER THE CHILD YOU ARE EXPECTING, WOULD YOU LIKE ANOTHER OR WOULD YOU PREFER NOT TO HAVE ANY MORE CHILDREN?

Have another child → *F6* ..... ☐ 1

No (more) children → *F7* ..... ☐ 2

Not up to me to decide/Not sure → *F8* ..... ☐ 3

Don't know → *F9* ..... ☐ 8

F4. WOULD YOU LIKE TO HAVE A (ANOTHER) CHILD OR WOULD YOU PREFER NOT TO HAVE ANY (MORE) CHILDREN?

Have (another) child ..... ☐ 1

No (more) children → *F7* ..... ☐ 2

Not up to me to decide/Not sure → *F8* ..... ☐ 3

Don't know → *F9* ..... ☐ 8

F5. WOULD YOU LIKE TO HAVE A BOY OR A GIRL?

A boy ..... ☐ 1

A girl ..... ☐ 2

No preference ..... ☐ 3

F6. WHAT IS THE MAIN REASON YOU WOULD LIKE ANOTHER CHILD (AFTER THE ONE YOU ARE EXPECTING) ?

Love for children → *F9* .... ☐ 1

Family wish → *F9* ..... ☐ 2

Husband's wish → *F9* ..... ☐ 3

Old age security → *F9* ..... ☐ 4

Recent child death → *F9* .. ☐ 5

Other (*Specify*) → *F9* ..... ☐ 6

.....

Don't know → *F9* ..... ☐ 8

F7. WHAT IS THE MAIN REASON WHY YOU WOULD NOT LIKE ANOTHER CHILD ?

Medical reasons → *F9* ..... ☐ 1

Financial reasons → *F9* ... ☐ 2

Have enough children → *F9* ..... ☐ 3

For career reasons → *F9* ... ☐ 4

Single parent → *F9* ..... ☐ 5

Other *(Specify)* → *F9* ..... ☐ 6

.....

F8. WHO WILL DECIDE HOW MANY CHILDREN YOU HAVE ?

Husband	☐ 1
Husband's clan	☐ 2
My clan	☐ 3
My mother	☐ 4
God	☐ 5
Other (*Specify*)	☐ 6
.....	

F9. *Sequence guide*

Check C16.

Has living children → *F10*	☐ 1
No living children → *F11*	☐ 2

F10. IF YOU COULD GO BACK TO THE TIME YOU DID NOT HAVE ANY CHILDREN AND COULD CHOOSE EXACTLY THE NUMBER OF CHILDREN TO HAVE IN YOUR WHOLE LIFE, HOW MANY WOULD THAT BE?

Number → *Section G*	☐☐
Other (*Specify*) → *Section G*	☐ 96
.....	

F11. IF YOU COULD CHOOSE EXACTLY THE NUMBER OF CHILDREN TO HAVE IN YOUR WHOLE LIFE, HOW MANY WOULD THAT BE?

Number	☐☐
Other (*Specify*)	☐ 96
.....	

SECTION G: AIDS

NOW I WOULD LIKE TO TALK TO YOU ABOUT SOMETHING ELSE.

G1. HAVE YOU EVER HEARD OF AN ILLNESS CALLED AIDS?

Yes	☐ 1
No → *Section H*	☐ 2

G2. FROM WHICH SOURCES OF INFORMATION HAVE YOU LEARNED MOST ABOUT AIDS?

Probe: ANY OTHER SOURCES?

Record all mentioned.

Radio	☐ A
TV	☐ B
Newspapers/magazines	☐ C
Pamphlets/posters	☐ D
Health workers	☐ E
Churches	☐ F
Schools/teachers	☐ G
Community meetings	☐ H
Friends/relatives	☐ I
Workplace	☐ J
Other (*Specify*)	☐ X
.....	
.....	

G3. IS THERE ANYTHING A PERSON CAN DO TO AVOID GETTING AIDS OR THE VIRUS THAT CAUSES AIDS?

Yes	☐ 1
No → G7	☐ 2
Don't know → G7	☐ 8

G4. WHAT CAN A PERSON DO?

Probe: ANY OTHER WAYS?

Record all mentioned

Safe sex	A
Abstain from sex	B
Use condoms	C
Have only one sex partner	D
Avoid sex with prostitutes	E
Avoid sex with homosexuals	F
Avoid blood transfusions	G
Avoid injections	H
Avoid kissing	I
Avoid mosquito bites	J
Seek protection from traditional healer	K
Other (*Specify*)	X
Don't know	Z

G5. *Sequence guide:*

Check G4

Mentioned safe sex → *G6.*
Did not mention safe sex → *G7.*

G6. WHAT DOES SAFE SEX MEAN TO YOU?

Probe: ANY OTHER WAYS?

Record all mentioned

Abstain from sex	B
Use condoms	C
Have only one sex partner	D
Avoid sex with prostitutes	E
Avoid sex with homosexuals	F
Other (*Specify*)	X
Don't know	Z

G7. IS IT POSSIBLE FOR A HEALTHY-LOOKING PERSON TO HAVE THE AIDS VIRUS?

Yes	1
No	2
Don't know	8

G8. DO YOU THINK THAT PERSONS WITH AIDS ALMOST NEVER DIE FROM THE DISEASE, SOMETIMES DIE, OR ALMOST ALWAYS DIE FROM THE DISEASE?

Almost never	1
Sometimes	2
Almost always	3
Don't know	8

G9. DO YOU THINK YOUR CHANCE OF GETTING AIDS IS SMALL, MODERATE, GREAT, OR NO RISK AT ALL?

Small	1
Moderate	2
Great	3
No risk at all	4
Has AIDS	5

G10. HAS YOUR KNOWLEDGE OF AIDS INFLUENCED OR CHANGED YOUR SEXUAL BEHAVIOUR?

Yes..... ☐ 1

No ⟶ *G12*..... ☐ 2

G11 IN WHAT WAY HAS IT INFLUENCED OR CHANGED YOUR BEHAVIOUR?

Record all mentioned

Did not start sex..... ☐ A

Stopped all sex..... ☐ B

Started using condoms..... ☐ C

Restricted sex to one partner.... ☐ D

Reduced number of partners..... ☐ E

Other (*Specify*)..... ☐ X

.....

Don't know..... ☐ Z

G12. HAVE YOU HEARD OF OTHER DISEASES APART FROM AIDS WHICH COULD BE TRANSMITTED THROUGH SEXUAL CONTACT?

Yes..... ☐ 1

No ⟶ *Section H*..... ☐ 2

G13. COULD YOU NAME THE DISEASES?

Probe: ANY OTHER?

Record all mentioned

Gonorrhoea..... ☐ A

Syphilis..... ☐ B

Herpes..... ☐ C

Hepatitis..... ☐ D

Other (*Specify*)..... ☐ X

.....

SECTION H: MATERNAL MORTALITY

I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT ALL YOUR SISTERS BORN TO YOUR NATURAL MOTHER.

H1. HOW MANY SISTERS DID YOU EVER HAVE, INCLUDING THOSE WHO ARE NOW DEAD?

Sisters..... ☐☐

If 00, End of interview.

H2. HOW MANY OF YOUR SISTERS EVER REACHED AGE 12?

Reached age 12..... ☐☐

If 00 End of interview.

H3. HOW MANY OF YOUR SISTERS WHO REACHED AGE 12 ARE ALIVE NOW?

Alive..... ☐☐

H4. HOW MANY OF YOUR SISTERS WHO REACHED AGE 12 ARE DEAD?

Dead..... ☐☐

H5. *Interviewer:*

Check that sum of *H3* and *H4* is equal to *H2*. *IF H4 equals 00, end of interview.*

H6. HOW MANY OF THESE DEAD SISTERS DIED DURING PREGNANCY?

During pregnancy..... ☐☐

H7. HOW MANY OF THESE DEAD SISTERS DIED DURING CHILDBIRTH? During childbirth.....	☐☐		
H8. HOW MANY OF THESE DEAD SISTERS DIED DURING THE SIX WEEKS AFTER THE END OF A PREGNANCY? After pregnancy.....	☐☐		
H9. *Interviewer:* *Sum answers to H6, H7 and H8* *Sum maternal deaths*	☐☐		

INTERVIEWER'S OBSERVATIONS

(To be filled in after completing interview)

Comments About Respondent: _____

_____

_____

_____

_____

Comments on Specific Questions: _____

_____

_____

_____

_____

SUPERVISOR'S OBSERVATIONS

_____

_____

_____

_____

_____

_____

Name of Supervisor: _____ **Date:** _____