Papua New Guinea Institute of Medical Research

Partnership in Health Project Progress Report: Women's Health

(Reporting period: July - December 2015)

Goroka, March 2016

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Note: The list was updated as of 30th December 2015.

Tribute message from the PiHP

It is with great sadness to include this message in this report. Over this reporting period, we are sorry to inform our stakeholders of the loss of our two valuable staff:

Mr Albert Sie, Senior Research Nurse died of tuberculosis on 12th November 2015 aged 40.

Dr Regina Wangnapi, a Medical Doctor and Senior Clinical Research Officer, died of breast cancer on 10th February 2016, aged 34.

The PNG Institute of Medical Research acknowledges the research and intellectual contributions that both staff provided to the development of the PiHP. They both were an invaluable part of the PiHP Study Design Team, writing scientific reports for the Exxon Mobil (PNG LNG project) which is an extremely huge contribution they have given to the project. They left the PiHP so soon, leaving us a big gap.

At a country wide level, Late Albert and Late Regina have contributed through past PNG IMR research and current research work to PNG addressing the health needs of Papua New Guineans. It takes real people who are passionate to do good health research and make a difference in other peoples' lives. You could see it in both Albert and Dr Regina, they were full of energy, were passionate researchers making a different in the lives of Papua New Guineans. We take our caps off and salute both of them for being true Papua New Guineans in addressing the health needs of Papua New Guineans.

We take this time to thank the families and Health Workers (Doctors, HEOs, Nurses, CHWs) who tried their best to save the lives of our two staff.

We also take time to thank the PNG IMR families in Goroka and other IMR sites who have supported our staff and their families both during official and unofficial hours sorting out funeral arrangements, logistics and ensuring the bodies of our colleagues were taken to their respective homes to be laid to rest.

Thank you all once again.

Prof. Peter Siba

Director

PNG Institute of Medical Research

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College of Public Health, Medical & Veterinary Sciences, James Cook University, Townsville

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The authors would like to thank the respective community leaders, councillors and church leaders in each of the study sites for their support of the PiHP. A special thank you is extended to the community members who participated in the various studies presented in this report. Many thanks to the Provincial Health divisions in Central Province, Hela Province, Eastern Highland Province and Madang Province for their enthusiastic supports to the PiHP and approvals for our iHDSS team to access the health facilities and medical records. We are grateful to our partners: Salvation Army, ECPNG, Lutheran Health Service and Catholic Health Services for their support for our field work. We also thank the ISAB (Independent Scientific Advisory Board) and collaborators of the PiHP for their scientific guidance as well as NewFields for their review and comment on the report. Lastly, we would like to acknowledge our donors, ExxonMobil PNG Ltd, for their great support to PNG IMR and the PiHP in particular.

Abbreviations

ACD	Active Case Detection
AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal care
BCG	Bacillus Calmette-Guérin
BMI	Body Mass Index
CI	Confidence Interval
CHW	Commune Health Worker
CPR	Contraceptive Prevalent Rate
COPD	Chronic Obstructive Pulmonary Disease
CU5MR	Children Under 5 Morality Rate
CVD	Cardiovascular Disease
DENV	Dengue virus
DNA	Deoxyribonucleic acid
DOTS	Directly Observed Therapy - Short Course
DSS	Demographic Surveillance Survey
DST	Drug Sensitivity Test
DTP	Diphtheria, Tetanus and Pertussis
DWU	Divine World University
EHP	Eastern Highland Province
EM PNG	ExxonMobil PNG Ltd.
EPI	the Expanded Program on Immunization
EPTB	Extra Pulmonary Tuberculosis
GDP	Gross Domestic Product
GIS	Geographic Information System
GPS	Global Positioning System
HepB	Hepatitis B
Hib	Haemophilus influenza type B
HIV	Human Immunodeficiency Virus
HP	Hela Province
HPV	Human Papilloma Virus
HRV	Human rhinovirus
HSV-2	Herpes simplex type-2
IEC	Information, education and communication
iHDSS	Integrated Health and Demographic Surveillance System
IMR	Infant Mortality Rate
IRB	Internal Review Board
LAM	Lactational amenorrhoea method
LAMP	Loop-mediated isothermal amplification
LBW	Low birth weight

LLG	Local Level Government
LNG	Liquefied Natural Gas
MCH	Maternal and Child Health
MDGs	Millennium Development Goals
MDR/TB	Multi-drug resistant tuberculosis
MMR	Maternal mortality rate
MRAC	Medical Research Advisory Committee
MTB	Mycobacterium Tuberculosis
N/A	Not applicable
NCD	Non-Communicable Diseases
NDoH	National Department of Health
NMR	Neonatal mortality rate
OPV	Oral Polio Vaccine
ORS	Oral rehydration salts
PCD	Passive Case Detection
PCR	Polymerase chain reaction
PICT	Provider-initiated HIV counselling and testing
PiHP	Partnership in Health Project
PNG	Papua New Guinea
PNG Med J	Papua New Guinea Medical Journal
PNG IMR	Papua New Guinea Institute of Medical Research
PNG LNG	Papua New Guinea Liquefied Natural Gas
POM	Port Moresby
PPAQ	Papua New Guinea Physical Activity Questionnaire
PSI	Population Services International
PTB	Pulmonary Tuberculosis
QMLR	Queensland Mycobacterial Reference Laboratory
SOP	Standard Operating Procedures
STI	Sexually Transmitted Infections
TB	Tuberculosis
TBA	Traditional Birth Attendant
UNs	The United Nations
UNSW	The University of New South Wales
UQ	The University of Queensland
VA	Verbal Autopsy
VHW	Village Health Worker
VCT	Voluntary counselling and testing
VDS	Vaginal discharge syndrome
WASH	Water, Sanitation and Hygiene
WHO	World Health Organisation

EXECUTIVE SUMMARY

As part of the Partnership in Health Programme (PiHP), the PNG Institute of Medical Research (PNG IMR) develops and submits two (2) progress reports per year. This report covers and updates new data and findings since the last submission in September 2015. The work presented in this report includes new data and results covering the six-month period, from July to December 2015.

As an interim deliverable of the PiHP, the March 2016 Report assumes a basic understanding of the overall effort and does not fully reiterate well-known background information of either the PNG LNG Project or the PiHP. Whenever possible the focus is on new results developed since the September 2015 Report. The PiHP is a longitudinal effort. Therefore, the presentation of certain types of time sequence information is critical.

Health and demographic indicators and socio-cultural determinants do not change rapidly. Rather, they evolve over a period of several years. This is the power of the integrated Health and Demographic Surveillance System (iHDSS) i.e. revealing trends so that appropriate actions can be considered and taken by concerned stakeholders, authorities and individuals.

The March 2016 Report, a new update of Women of Reproductive Age, 15-49 data, has been completed in four surveillance sites, including morbidity data. A total of 6,540 women were included in this data collection round. Their data were extracted from the iHDSS database for the reporting period, July-December 2015. This report presents major findings and observations of the iHDSS in interlinked chapters. The findings were presented for all iHDSS sites and also for each iHDSS site: Asaro, Hides, Hiri, and Karkar for comparison purposes. Whenever possible, new findings and observations are emphasized in particular iHDSS sites. Below is the summary of major findings and observations of the women health data.

Data Quality

The data collection process continues to improve. All interviews were completed within the reporting period July-December 2015. Ninety-two percent (92%) of the interviews with women were completed at all four surveillance sites. Intervention sites, Hiri and Hides had a greater than 99% completion rate. Completion rate at the comparison sites, Asaro and Karkar was approximately 85%. The refusal rate was very low, less than 1% of the total interviews across all four sites. All the data were entered into the database from September - December 2015. While the age of women was consistently reported across all four sites, 72.3% of women in Hides responded as 'Don't Know' to this question of age, reflecting respondent reality as opposed to a data quality issue.

Socio-Economic Demographic Characteristics

Hiri recorded the highest number of women, 2,295 and accounted for 35.1% of the total women interviewed, followed by Asaro with 2,178 women (33.3%), Karkar with 1,410 women (21.6%), and Hides, 657 women (10.0%).

Hides had the highest proportion of women in the youngest age group of 15-19, (37.3%), but reported the lowest proportion of single women, (21.1%), compared to other three sites. At the other sites, women were 20% in 15-19 age group with 22% of this group single.

More than 60% of women in the four iHDSS sites reported having ever given birth during their lives and less than 40% of the women reported giving birth in the last two years. Significantly, more than 50% of women in Hides reported having birth in the last two years, a much higher percentage than the Asaro comparison site (33%). Hiri and Karkar reported similar proportions of women (38%) having given birth in the last two years.

WOMEN'S EDUCATION

80% of women reported ever attending school, with the highest percentages in Hiri (97%) and Karkar (96%). Asaro women reported a 64% attendance attainment, compared to only 30% in Hides. These data confirm the longstanding and well documented educational "attendance gap" in Hides versus a Highlands comparison location (Asaro).

Among women reported ever attending school, 92% reached the lower secondary education as the highest attainment, while only 5% completed upper secondary school. Only 3% of women completed tertiary education across all four sites.

Hiri reported better education level among women aged 15-49 than the other three sites, with more than 50% completing the lower secondary education and more than 7% attending upper secondary education; however, only 4% completed the tertiary education level. The majority of women completed the primary education, i.e. more than 70% in Asaro, 76% in Karkar, and approximately 80% in Hiri, compared to only one third in Hides.

For the first time, an assessment of the ability to read in English was conducted among aged 15-49 study participants. There was a large gap between school attendance status and ability to read. Although 80% of women reported as having ever *attended* school, 33% could not read at all, 32% could read only part of the paragraph, and only 31% could read the entire reading test paragraph. Women in Hiri performed significantly better than the other site, i.e. only 8% of Hiri women could not read at all, compared to 18% in Karkar, 44% in Asaro and 68% in Hides.

POLYGAMY

For the first time, the iHDSS collected data on polygamy. These data potentially provide insights into how polygamy could affect the health of PNG women. About 16% of the surveyed women reported their husband/partner had an additional wife/partner. On average, men had 1.72 wife/partners. Polygamy rates were highest in Hides (2.1) compared to 1.4 in Asaro; the Hiri rate (2.0) was higher than its Karkar comparison site (1.3). These data indicate that impact sites had higher rates of polygamy versus comparison locations. Further investigation of this observation may be required to provide further insights, particularly regarding the impact of traditional cultural attitudes/practices; however, the impact of higher incomes/wages associated with the LNG construction period cannot be completely discounted as a potential explanatory variable, particularly in Hides.

In terms of first marriage age or living in-union with a man, about one third of women reported getting married/ living in union for the first time between the ages of 15-19 while only 2% reported marriage/union before the age of 15. However, more than 85% of Hides women and more than one third of Asaro women could not tell their age at first marriage. These data are consistent with the low levels of female educational attainment and literacy observed in Hides and Asaro.

Sexual Behaviour

The overwhelming majority of women reported having their first sexual intercourse by ages 15-19. Approximately 4% of women reported having their first sexual intercourse before the age of 15. The majority (90%) of women reported having never used a condom with their first sexual intercourse. There were no significant differences observed across the four sites.

More than half of women reported having had sex during the two weeks prior to the study interview. More than 90% reported that they did not use a condom, a proportion that was similar across the four surveillance sites. The majority of women (80%) had the reported having the last sex with their husbands, 11% with boyfriend and 6% with a casual partner. Women were asked if they were with more than one sexual partner in the last 12 months. Asaro women reported the highest number (3.7 partners), followed by Hides (3.1 partners), with Hiri and Karkar both reporting the same number, 2.0 partners.

Domestic Violence (DV)

Perceptions regarding DV are complex and do not represent a "traditional western perspective." A quarter of women across the four sites believed a man was justified to hit or beat his wife/ sexual partner if she refused to have sex with him. Almost 50% of the women had experienced verbal abuse in the last 12 months. Nearly 20% reported being physically beaten. Five percent (5%) reported being threatened with a knife or gun while 2.4% reported being attacked with a knife or gun.

The Highlands women (Asaro and Hides), reported a higher level of DV experience in the past 12 months than those women in the coastal areas i.e. Hiri and Karkar. Nearly 8% of women in Asaro and 9.0% of women in Hides reported being threatened with a knife, compared to 2.0% of women in Hiri and less than 6% of women in Karkar.

Husbands were reported by 30.5% of female study respondents as the most common perpetrators across all sites. Nearly one third of women were verbally threatened to have sex, with the highest proportion being reported in the Highlands, i.e., 40% in Hides and Asaro, compared to 20% in Karkar and Hiri. Furthermore, one fifth of women reported being physically forced to have sex by their husband/ sexual partner in the last 12 months.

Alcohol consumption appears as a high risk factor associated with DV. Seventy percent (70%) of women who had experienced of DV reported that the action was in association with their husbands or sexual partners drinking.

CHILD MORTALITY

In this report, infant mortality rate (IMR) and Children Under 5 Mortality Rate (CU5MR) were calculated using the indirect estimation method. In this method, IMR and CU5MR were estimated based on the average of proportions of children that died among women in three age groups, i.e., 20-24, 25–29 and 30–34. The results showed IMR at 64 per thousand live births and CU5MR around 96.5 per thousand live births.

Compared to child mortalities reported in the March 2015 Report using the direct estimation method, the results show that IMR estimates are similar, 60 versus 64 per thousand live births, but CU5MR is lower, 96.5 versus 150 per thousand live births. The lower value of CU5MR based on the indirect estimation method used in this report suggest that women could have under reported the number of children dead when they recalled their birth history.

ANTENATAL CARE

The data showed that 701 out of 1,418 (49%) women aged 15-49, who gave birth in the last two years, reported attending four visits or more for antenatal care services while 1,098 out of 1,418 women (77%) received at least once antenatal care visit by skilled health workers such as doctor, HEO, Nurse/CHW, and Midwife during their last pregnancy. 118 out of 1418 women, accounted for eight percent (8%) reported having no antenatal care services during the last pregnancy in the past two years. In terms of content of antenatal care, 75% of women reported having their blood pressure measured; 48% had a blood sample taken and 27% had a urine sample taken. Only 25% of women reported having used all three services.

The data showed 31.5% of respondents receiving assistance from skilled birth attendants compared to 13% assisted by unskilled birth attendants. Seventeen (17) Caesarean sections were reported.

About two thirds delivered at public health facilities while one third of women delivered at home. Five reported birth deliveries at private health facilities and two in other places.

NEWBORN HEALTH

Ninety percent (90%) of mothers/ caretakers across all four sites said their babies were weighed at birth. The majority of babies were within the average weight category/range of 2,800-3,200 grams. Approximately15% of newborn babies weighted less than 2,200 grams while 8% were larger than 4,000 grams. These findings are based on birth weight records from health record books.

Breastfeeding of newborn was widely practiced, with 90% of the babies across all sites being breastfed. More than half of the babies were breastfed within the first hour after the birth. Only 10% of mothers across all sites reported giving their newborns other fluids such as plain water, infant formula, or sugar/glucose water in the first three days after birth. Findings were similar across the four surveillance sites.

UNMET NEED FOR CONTRACEPTION

For the first time, contraceptive use and unmet need of contraception was calculated for women aged 15-49 who gave births in the last two years. Approximately 31% of respondents reported currently using contraceptive methods, i.e., 29% using modern contraceptives with 2% using traditional contraception methods such as periodic abstinence, rhythm and withdrawal. Some traditional herbs given to women after having sex are also believed effective.

Contraceptive Prevalent Rate (CPR) shows the share of contraceptives as follows: (i) implants 11.5%, (ii) injectables 9.0%, (iii) oral pills 2.9%, (iv) male condoms 2.2%, (v) female sterilisation 2.1%, and (vi) other modern contraceptive methods 0.1% of all women. Implant was most prevalent in Karkar, (26%), followed by Hiri, (12.6%). Injectable use was also highest in Karkar (14.5%), followed by Hiri and Hides (8%), with the lowest level in Asaro at 6%.

The analysis of Modern Contraceptive Method Mix showed Implant 40%, Injectable 31%, Oral Pill 10%, Male condom 8%, Female Sterilisation 7%, and Female condom 4% for all modern contraceptive users across all four surveillance sites. Unlike the CPR indicating the prevalence of contraceptive use among all women of reproductive age, 15-49, the Modern Contraceptive Mix presents the share of each modern contraceptive method among all contraceptive users.

The unmet need of contraception was calculated to be 34.2%, meaning that slightly more than one third of these women had no access to modern contraception to delay or avoid a pregnancy.

MORBIDITY SURVEILLANCE

Clinic data review demonstrated an increase, versus previous reporting periods, in the total number of caseload records as well as the morbidity tallies in the health facilities across all sites. This change in patient volume was due to the increased number of children visiting health facilities during the special supplementary immunization programme which was conducted in the sites in November 2015.

Respiratory diseases accounted for one third of the total caseloads across the four surveillance sites, i.e. 28% in Asaro, 24% in Hides, 33% in Hiri and 31% in Karkar, followed by skin infections and diarrhoeal diseases.

A number of TB cases were reported over the period: 2 in Asaro, none in Hides, 15 in Hiri, and 49 in Karkar. “Suspect malaria cases” were also reported with 67 in Asaro, 31 in Hides, 22 in Hiri, and 577 in Karkar. A suspect malaria case is based on clinical presentation; however, a confirmed malaria case requires an objective laboratory test, i.e., rapid diagnostic or microscopic slide. Suspect/clinical malaria cases are not always laboratory confirmed; hence the true burden of laboratory proven malaria is typically much lower than when based on only clinical presentation.

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1.0 INTRODUCTION

Papua New Guinea Institute of Medical Research (PNG IMR) has established and operated an *integrated Health and Demographic Surveillance System* (iHDSS) under the Partnership in Health Programme (PiHP) since 2011. The programme was financially supported by ExxonMobil PNG Ltd, with technical assistance from the University of Queensland, Australia. The iHDSS database is updated twice a year with new information on health and demographic changes in life-cycle events such as birth, education, employment, marriage, migration, and death.

This report provides up-to-date information on health and demography of the surveillance population, with a focus on women's reproductive health, (aged 15-49 years old) living in the four surveillance sites during the reporting period of July – December 2015.

1.1 THE iHDSS SITES

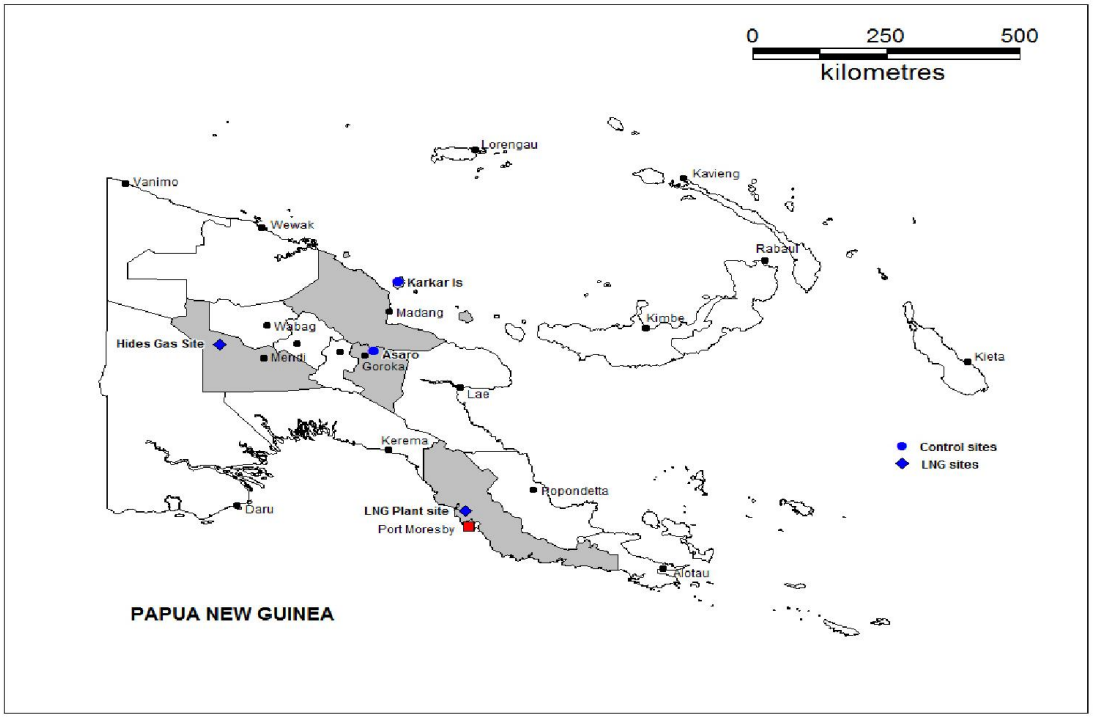

Figure 1-1. PNG IMR's iHDSS sites: Asaro vs. Hides and Karkar vs. Hiri sites, 2016

Figure 1-1 shows the four iHDSS sites, including Asaro, Hiri, Hides and Karkar. These sites were selected based on thorough discussions and consultations with key national and international stakeholders and previous PNG IMR experience in the surveillance of communicable diseases. These sites are matched in pairs of intervention-comparison sites, i.e., Hides vs. Asaro and Hiri vs. Karkar. Asaro and Hides sites are mountainous areas while Hiri and Karkar sites are both coastal areas. The intervention sites are places where the PNG LNG project had active construction and current ongoing production. The iHDSS is designed to provide longitudinal monitoring so that potential impacts, positive and/or negative can be captured in a timely manner.

1.2 ASARO

The Asaro iHDSS was re-established by the PiHP in 2011 and is located approximately 40-45km northeast of Goroka. Asaro is primarily a farming and agricultural production area with a total population of approximately ten thousand (10,000). Coffee is the main cash crop. Major languages spoken by people living in Asaro are *Tokples, Gahuku, Siane* and *Dano/Tokano*, apart from *Pidgin* that is also regularly spoken. There are four health facilities where local people can access to basic health services i.e. *Goroka Provincial Hospital*, *Asaro health clinic, Urioka health clinic and Tafeto health clinic.* Asaro has more than 10 public and private schools where local children attend at the primary and secondary educational levels. During the reporting period, 25 data reporters worked at the Asaro site.

1.3 HIDES

Hides iHDSS is an identified impact site for the PiHP. The Hides IHDSS is located in the Hela Province and has a total population of approximately 13,000. Geographically, the Hides iHDSS site is very remote and difficult to access. Tribal cultural norms and practices are an integral part of the local people' lives and have created a complex society. People live in clans and sub-clans, and maintain a traditional tribal lifestyle. Most of the houses are built using bush materials and there are very few semi-permanent buildings. The main *Tokples* language spoken is *Huli*, which is also the common name given to people from that region. Other languages include *Pidgin* and a small number of English speakers. Hides iHDSS site is also home to the Komo Airfield, which was a major PNG LNG logistical hub during construction. The two main health facilities are Mananda Health Centre and Para Clinic, both of which are run by the Evangelical Church of PNG (ECPNG). There are elementary and primary schools, but no evidence of a functioning high school for the area.

Based on discussions between ExxonMobil and PNG IMR and with agreement from the external Independent Science Advisory Board (ISAB), during the post-construction period, only Division 3 of Hides (known as *Gigiria)* is under active iHDSS surveillance. The other two divisions, Haliago (Division 1), and *Hibiria* (Division 2) are not actively covered by the Hides iHDSS. This decision was primarily based on changes in work activities in the Hides areas i.e. Komo airport construction ended combined with logistics, safety, security and financial considerations. During the construction period, in/out migration was carefully monitored and these data have previously been presented in earlier PNG IMR reports. As previously noted, during construction in-migration was documented; however, post construction the population is beginning to re-equilibrate i.e. an out migration of job-seeking young men. Only data for Division 3 is presented in this report.

1.4 HIRI

The Hiri iHDSS is located approximately 30-40 km west of Port Moresby, the National Capital of PNG. The iHDSS covers four coastal villages i.e. *Porebada, Boera, Papa* and *Lealea* with a total population of approximately 12,000. Most inhabitants are either *Motu* or *Koitabu* speakers. Hiri iHDSS can be reached by road and is less than one hour driving distance from Port Moresby.

1.5 KARKAR

Karkar district is a volcanic island located 30km off of the PNG coast in the Bismarck Sea and is part of Madang Province. The iHDSS covers a population of approximately 18,500 (the total population of Karkar is about 60,000). The island's soil is known for its fertility and the large plantations produce the island's main exports of cocoa and coconut and provide a large amount of the local employment opportunities. Inhabitants of the island come from one of two language groups: *Waskia* in the North half of the island and *Taskia* in the South. Most inhabitants are either Lutheran or Catholic.

One main road follows the coast of the island and provides access to the three available health facilities. Gaubin Hospital is the largest of the facilities and is a Lutheran run institution. Karkar has been unaffected by the extensive and intensive mining activity that has occurred in Madang; hence, Karkar is considered as an appropriate location for comparison with the coastal villages in Hiri.

2.0 METHOD AND MATERIALS

This Chapter provides details of the data collection tools, data collection methods, data entry and management processes as well as quality assurance/quality check (QA/QC) procedures which are currently applied to the data collection, data processing and data analysis across the iHDSS sites.

2.1 QUALITY ASSURANCE AND QUALITY CONTROL MEASURES OF THE PNG IMR'S IHDSS

Figure 2-1 describes the QA/QC procedures currently applied to the data collection, recording and processing of the iHDSS. This QA/QC procedure is divided into three stages, corresponding to three steps of data processing process:

(i) Data collection;

(ii) Data entry and management;

(iii) Data cleaning and generation.

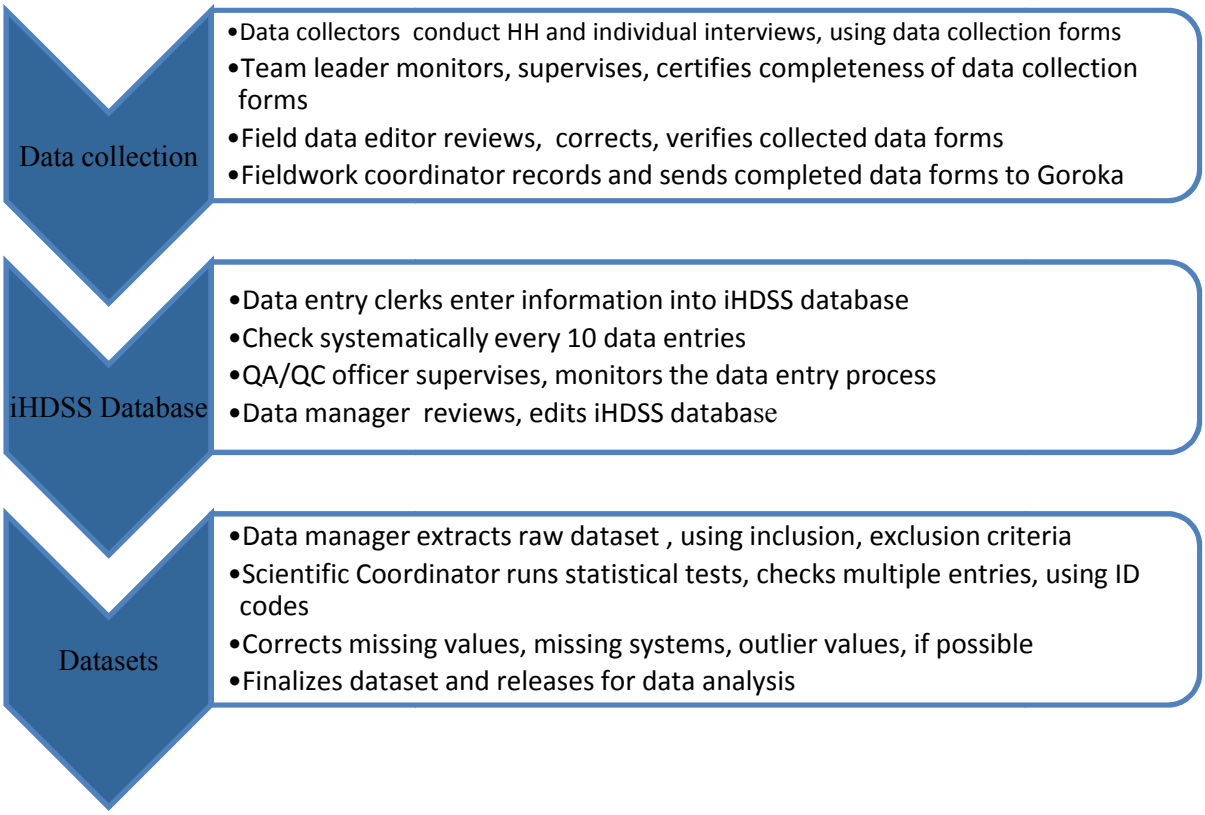

Figure 2-1. QA/QC measures of the PNG IMR's iHDSS, 2016

Data Collection

Data collectors visited households (HH) and conducted individual interviews with women of reproductive age, using the iHDSS Women of Reproductive Age 15-49 Questionnaire. Every ten data collectors have one team leader, who monitors and supervises the data collection process. Each iHDSS site has one or two fieldwork data editors who are responsible for review of the collected information and make corrections if needed. All the data forms were quality checked by data editors, who were also field-based.

A fieldwork coordinator oversees the efforts to ensure activities are planned and implemented in a coordinated manner so that deadlines are met. The fieldwork coordinator verifies the data collection forms before sending them all to site manager for endorsement. Identified mistakes were cross-checked with the fieldwork coordinators for any needed clarifications and/or corrections.

Data Entry and Management

According to the new QA/QC procedures, data entry work was shifted from the data manager, who is based at the iHDSS sites, to the data management team, based in the PNG IMR main office in Goroka. This change was made in order to standardize data entry processes and thereby improve the overall quality of the iHDSS database.

Data entry clerks are assigned as focal point for each iHDSS site. He/she is responsible for entering the information of his/ her iHDSS site into the database. Data entry clerks have systematically checked every batch of 10 entries. The data management team has a QA/QC officer who supervises and monitors the data entry processes and provides technical assistance to the data entry clerks. About ten percent of the total responses were randomly cross-checked by the QA/QC officer as the second round of quality control of the overall data processing process.

The data manager is responsible for developing the data entry template on the basis of MySQL process maker. The data manager maintains and edits the iHDSS database to make sure all the data modules of HH data components are linked via the HH unique ID code. The data manager generates the HH dataset by extracting data from the database. Raw datasets are sent the study design team for data analysis.

Data Cleaning

The scientific coordinator performs the final check of the HH dataset which includes a variety of statistical tests and assessment of missing values. The internal consistency within the dataset was also cross-checked and corrected. Outlier values were recorded for further examination in order to identify their potential contribution to a change in the results. The final dataset was then released to the study design team for data analysis and report writing.

2.2 WOMEN OF REPRODUCTIVE AGE, 15-49 QUESTIONNAIRE

Data used in this report are primarily from the women's health data set contained within the iHDSS database. This data was collected over the reporting period of July – December 2015, using the Women of Reproductive Age, 15-49 Questionnaire. This questionnaire is designed for collecting socio-economic, demographic and health data of women, who live in the iHDSS sites. The Women of Reproductive Age 15-49 Questionnaire comprises eight data modules:

(i) Household identification information, including geographic positioning system (GPS);
(ii) Women's Background;
(iii) Marriage and Family;
(iv) Sexual Behaviour;
(v) Domestic Violence;
(vi) Child Mortality;
(vii) Unmet need for contraception; and
(viii) Maternal and newborn health.

This individual questionnaire has been developed and adapted from available data collection tools currently in use across the INDEPTH Network's country members as well as other international organisations such as the UNICEF Multi-Indicator Cluster Survey (MICS).

2.3 TRAINING AND NATIONAL CAPACITY BUILDING

A training of the trainers (TOT) workshop was conducted by the scientific coordinator for core staff of PiHP including site managers, fieldwork coordinators, and scientific officers of the four iHDSS sites in May 2015. The training focused on the design of this questionnaire. The training included sections on pre-test and post-test of the questionnaire with local people. A post-training evaluation was also conducted with a standard evaluation tool for a training course, adopted from the University of Queensland. The Women of Reproductive Health 15-49 Questionnaire was also translated back into *Tok-Pisin* by national scientific officers in order to facilitate the interviews with local women.

The TOT training was then followed up by refresher training in June 2015. These sessions were conducted by site managers in collaboration with the fieldwork coordinators and provide in depth knowledge of the questionnaire as well as the necessary skills for conducting interviews with women at the household level.

2.4 FIELD WORK AND DATA COLLECTION

Field work and data collection were conducted over the July – December 2015, using the new Women 15-49 Questionnaire. Data reporters collected household data on a daily basis. Data reporters are based in the targeted villages. Field work was organised by data collection team Leaders and closely supervised by the fieldwork coordinators. A total of 6,540 women were approached for interviews, of which 6,196 women agreed to participate, i.e., 94.7% of the total surveillance population approached agreed to

participate in this data collection round. The overall refusal rate was 5.3%; however, there were marked variations across the four sites. Asaro had the highest refusal rate of 13.1% (see **Table 2-1**).

Asaro site had a higher refusal rate than other three surveillance sites because all Asaro data reporters are males. Social and cultural sensitive issues have been identified and reported during the field work i.e. questions about sexual behaviour of women are particularly sensitive in the highlands region. Male data reporters felt uncomfortable asking sensitive questions to young women who in turn were reluctant to respond. This interaction partially explains the high refusal rate observed in Asaro site during this data collection round.

Although data collection team in Hides site faced similar problem, the issue was generally solved due to the assistance of Hiri female staff, who were mobilised to the Hides site in order to assist male reporters with their interviews. This strategy was developed based on the Asaro experience.

Table 2-1. Permission given to Women 15-49 interviews, PNG IMR's iHDSS, 2016

Permission given to interview		iHDSS site				
		Hiri	**Asaro**	**Karkar**	**Hides**	**All sites**
Yes	N	2,285	1,893	1,363	655	6,196
	%	99.6%	86.9%	96.7%	99.7%	94.7%
No	N	10	285	47	2	344
	%	.4%	13.1%	3.3%	.3%	5.3%
Total	**N**	**2,295**	**2,178**	**1,410**	**657**	**6,540**
	%	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Error! Not a valid bookmark self-reference. shows that the majority of interviews were completed in July and August, i.e., 40.6% and 28.3%, respectively. However, the peak varied from site to site i.e. July was the peak in Hiri and Karkar, where 81.6% and 49.6% of the interviews was conducted. In contrast, August was the peak time in Asaro and Karkar, where 44.4% and 59.1% of the interviews were organised. The data collection process was largely complete by the end of September; however, there were a number of interviews (5.4%) that were revisited in Asaro in November 2015. Karkar had a highest proportion of missing information during the month of interviews, at 10.5%.

'Missing information' is different from 'Don't Know' response. 'Missing information' is defined as mistake made by data collectors during the data collection process when they forget or skip a question. As a result, no response/information is recorded in the questionnaire i.e. the month of interview. By contrast, 'don't know' means the question was asked by the data reporter, but participant responds clearly as 'I don't know'. Therefore, the 'don't know' option is selected in the questionnaire. Any information that is not specifically asked for in the questionnaire is not included in the data analysis or reporting.

Table 2-2. Month of interviews of women aged 15-49 interviews, PNG IMR's iHDSS, 2016

Month of interview		iHDSS site				All sites
		Hiri	Asaro	Karkar	Hides	
June	N	392	23	17	9	441
	%	17.1%	1.1%	1.2%	1.4%	6.7%
July	N	1873	83	699	3	2658
	%	81.6%	3.8%	49.6%	.5%	40.6%
August	N	30	966	465	388	1849
	%	1.3%	44.4%	33.0%	59.1%	28.3%
September	N	0	988	38	252	1278
	%	0.0%	45.4%	2.7%	38.4%	19.5%
November	N	0	118	43	2	163
	%	0.0%	5.4%	3.0%	.3%	2.5%
Missing	N	0	0	148	3	148
	%	0.0%	0.0%	10.5%	.5%	2.3%
Total	**N**	**2295**	**2178**	**1410**	**657**	**6540**
	%	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 2-3. Outcome of Women 15-49 interviews by iHDSS site, 2016

Outcome of interviews		iHDSS site				
		Hiri	Asaro	Karkar	Hides	All sites
Completed	N	2273	1832	1251	655	6011
	%	99.0%	84.1%	88.7%	99.7%	91.9%
Partially completed	N	10	17	58	2	87
	%	.4%	.8%	4.1%	.3%	1.3%
Refused to participate	N	3	19	23	0	45
	%	.1%	.9%	1.6%	0.0%	.7%
Not at home	N	4	48	61	0	113
	%	.2%	2.2%	4.3%	0.0%	1.7%
Incapacitated	N	2	11	4	0	17
	%	.1%	.5%	.3%	0.0%	.3%
Other	N	3	251	13	0	267
	%	.1%	11.5%	.9%	0.0%	4.1%
Total	**N**	**2295**	**2178**	**1410**	**657**	**6540**
	%	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 2-3 shows the outcome of interviews with women of reproductive ages 15-49. More than 90% of interviews were completed, with the highest proportion in Hiri, 99%. The lowest proportion of completed interviews was observed in Asaro, 84.1%. Interviewers noted that 11.5% of women in Asaro were reported to have moved out of the site prior to the interview.

2.5 DATA ENTRY AND MANAGEMENT

Women 15-49 information was entered into the iHDSS database using a standard data entry template which was developed by the data manager using on the My SQL/Process Maker. The data quality control officer monitored the data entry progress and provided technical assistance to data entry clerks as required.

Data collection forms were sent to the PNG IMR main office in Goroka for data entry into the iHDSS database. The data management team has eight data entry clerks. The distribution of data entries by entry clerk is shown in **Table 2.4.** Data entry clerks #7 and #8 performed quite well and entered 22.2% and 21.0% of the total data forms into the system. These data entry clerks are newly recruited, younger and had a higher education than other members of the team.

Table 2-4 Distribution of data entries by data entry clerk, PNG IMR's iHDSS, 2016

Data entry clerk #		Hiri	Asaro	Karkar	Hides	All sites
Data entry clerk #1	N	236	102	24	60	422
	%	10.3%	4.6%	1.7%	9.1%	6.4%
Data entry clerk #2	N	222	252	193	81	748
	%	9.7%	11.6%	13.7%	12.3%	11.4%
Data entry clerk #3	N	12	158	150	40	360
	%	.5%	7.3%	10.6%	6.1%	5.5%
Data entry clerk #4	N	242	223	81	53	599
	%	10.5%	10.2%	5.7%	8.1%	9.2%
Data entry clerk #5	N	385	184	67	44	680
	%	16.8%	8.4%	4.8%	6.7%	10.4%
Data entry clerk #6	N	303	268	248	84	903
	%	13.2%	12.3%	17.6%	12.8%	13.8%
Data entry clerk #7	N	450	532	308	164	1454
	%	19.6%	24.4%	21.8%	25.0%	22.2%
Data entry clerk #8	N	445	459	339	131	1374
	%	19.4%	21.1%	24.0%	19.9%	21.0%
Total	**N**	**2295**	**2178**	**1410**	**657**	**6540**
	%	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 2-5. Month of data entries by iHDSS site, PNG IMR's iHDSS, 2016

Data entry clerk #		Hiri	Asaro	Karkar	Hides	All sites
September	N	1691	0	0	0	1816
	%	79.1%	0.0%	0.0%	0.0%	27.8%
October	N	479	368	1240	657	2744
	%	20.9%	16.9%	87.9%	100.0%	42.0%
November	N	0	746	170	0	916
	%	0.0%	34.3%	12.1%	0.0%	14.0%
December	N	0	1064	0	0	1064
	%	0.0%	48.9%	0.0%	0.0%	16.3%
Total	**N**	**2295**	**2178**	**1410**	**657**	**6540**
	%	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Table 2-5 shows the month of the data being entered into the system. Hiri data entry was completed in September and October; however, it took three months, October-December to complete the data entry for Asaro. By contrast, the data entry team spent only two months, October-November in order to enter all the data for Karkar and only one month for entering data from Hides.

2.6 ASSESSMENT OF THE DATA QUALITY

Table 2-6 show the completeness of age information recorded in the iHDSS database. Age of women is one of the most important variables for cross-table analysis of the surveillance population.

Table 2-6. Completeness of age variable by iHDSS site, PNG IMR's iHDSS, 2016

		iHDSS site				
Age		**Hiri**	**Asaro**	**Karkar**	**Hides**	**All sites**
15	N	127	87	60	25	299
	%	5.6%	4.8%	4.6%	3.9%	5.0%
16	N	89	73	70	12	244
	%	3.9%	4.0%	5.3%	1.9%	4.1%
17	N	78	53	75	18	224
	%	3.4%	2.9%	5.7%	2.8%	3.7%
18	N	83	73	53	10	219
	%	3.7%	4.0%	4.0%	1.6%	3.6%
19	N	78	57	55	1	191
	%	3.4%	3.2%	4.2%	.2%	3.2%
20	N	79	44	46	3	172
	%	3.5%	2.4%	3.5%	.5%	2.9%
21	N	99	65	61	11	236

Age		iHDSS site				All sites
		Hiri	Asaro	Karkar	Hides	
	%	4.4%	3.6%	4.7%	1.7%	3.9%
22	N	77	47	38	3	165
	%	3.4%	2.6%	2.9%	.5%	2.7%
23	N	75	56	52	4	187
	%	3.3%	3.1%	4.0%	.6%	3.1%
24	N	77	50	38	4	169
	%	3.4%	2.8%	2.9%	.6%	2.8%
25	N	96	41	43	9	189
	%	4.2%	2.3%	3.3%	1.4%	3.1%
26	N	80	58	36	11	185
	%	3.5%	3.2%	2.8%	1.7%	3.1%
27	N	73	48	39	3	163
	%	3.2%	2.7%	3.0%	.5%	2.7%
28	N	65	63	32	6	166
	%	2.9%	3.5%	2.4%	.9%	2.8%
29	N	73	56	43	3	175
	%	3.2%	3.1%	3.3%	.5%	2.9%
30	N	75	53	36	5	169
	%	3.3%	2.9%	2.8%	.8%	2.8%
31	N	62	44	37	7	150
	%	2.7%	2.4%	2.8%	1.1%	2.5%
32	N	61	65	45	4	175
	%	2.7%	3.6%	3.4%	.6%	2.9%
33	N	42	44	29	7	122
	%	1.9%	2.4%	2.2%	1.1%	2.0%
34	N	67	83	30	0	180
	%	3.0%	4.6%	2.3%	0.0%	3.0%
35	N	61	39	40	6	146
	%	2.7%	2.2%	3.1%	.9%	2.4%
36	N	56	49	33	0	138
	%	2.5%	2.7%	2.5%	0.0%	2.3%
37	N	48	25	31	1	105
	%	2.1%	1.4%	2.4%	.2%	1.7%
38	N	50	37	30	2	119
	%	2.2%	2.0%	2.3%	.3%	2.0%
39	N	72	44	35	0	151
	%	3.2%	2.4%	2.7%	0.0%	2.5%
40	N	52	64	23	3	142
	%	2.3%	3.5%	1.8%	.5%	2.4%
41	N	56	53	42	4	155
	%	2.5%	2.9%	3.2%	.6%	2.6%
42	N	53	56	29	0	138
	%	2.3%	3.1%	2.2%	0.0%	2.3%
43	N	50	59	32	6	147
	%	2.2%	3.3%	2.4%	.9%	2.4%
44	N	35	53	13	2	103
	%	1.5%	2.9%	1.0%	.3%	1.7%
45	N	43	33	19	0	95

Age		iHDSS site				All sites
		Hiri	Asaro	Karkar	Hides	
	%	1.9%	1.8%	1.5%	0.0%	1.6%
46	N	46	41	23	2	112
	%	2.0%	2.3%	1.8%	.3%	1.9%
47	N	29	29	13	1	72
	%	1.3%	1.6%	1.0%	.2%	1.2%
48	N	32	20	12	4	68
	%	1.4%	1.1%	.9%	.6%	1.1%
49	N	24	44	15	0	83
	%	1.1%	2.4%	1.1%	0.0%	1.4%
DK	N	1	3	1	463	468
	%	.0%	.2%	.1%	72.3%	7.8%
Missing	N	1	0	0	0	1
	%	.0%	0.0%	0.0%	0.0%	.0%
Total	N	2265	1809	1309	640	6023
	%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 2-6 shows the completeness of the variable on 'age of woman'. The data analysis revealed very few numbers of 'missing' and 'don't know' responses in Asaro, Hiri and Karkar. In contrast, 72.3% of responses were 'don't know' in Hides. It is noted that the response of 'I don't know' means that participant was asked the question of 'How old are you now?' and the respondents replied as 'I don't know' to the question. It is different than a 'missing' response where the participant was not asked the question of age by the data reporter.

2.7 DATA ANALYSIS AND REPORT WRITING

A four-day training workshop on data analysis and report writing was held by the scientific coordinator in first week of March 2016 for a core group of national scientific officers in order to develop the March 2016 Report. The data manager edited the database and extracted raw datasets, using scripts. The HH dataset and sub-data sets were converted from excel spreadsheet and entered into the Statistical Package for Social Studies (SPSS) for use in the training and subsequent data analysis. This process generated the tables and graphs for this report.

3.0 WOMEN'S DEMOGRAPHIC CHARATERISTICS

3.1 ABSTRACT

This Chapter reports key findings and observations on demographic characteristics of the surveillance population living in four iHDSS sites, i.e., Asaro, Hiri, Hides and Karkar. A total of 6,540 women of reproductive ages 15-49 living in 4,202 dwellings, were recorded in the iHDSS Database by the end of March 2016.

Hiri and Asaro recorded the highest numbers of women, 35% and 33% of the total women surveyed, respectively, followed by Karkar, 22% and Hides, 10%.

The data analysis focuses on key demographic characteristics of these populations. There were 21.2% of women in the lowest age group of 15-19, but only 7.7% recorded in the highest age group of 45-49. Sixty-two percent (62%) of the women reported being married compared to 29.3% of single. 63.3% of women reported having ever given birth while 38.1% of the women reported giving birth in the last two years.

3.2 DISTRIBUTION OF WOMEN AGED 15-49

Table 3-1. Household and women 15-49 distribution by iHDSS site, PNG IMR's iHDSS, 2016

iHDSS sites		Number of dwellings	Number of Women 15-49
Asaro	N	1559	2178
	%	37.1%	33.3%
Hides	N	460	657
	%	10.9%	10.0%
Hiri	N	1215	2295
	%	28.9%	35.1%
Karkar	N	968	1410
	%	23.0%	21.6%
All Sites	N	4,202	6,540
	%	100.0%	100.0%

Table 3-1 shows the overall population and household distribution by iHDSS sites as of June 2015. A total of **4,202** dwellings were included in the GPS database, with the population coverage of **6,540** women of reproductive age 15-49. The data analysis reveals that Hiri recorded the highest number of women of reproductive age, (2,295) and accounted for 35.1% of the total women. Asaro recorded 2,178

women and accounted for 33.3% of the total surveyed women across all four sites). Karkar recorded 1,410 women or 21.6% of the total women and Hides recorded the lowest proportion (10.0% or 657 women). As previously noted, the Hides 2015 data collection was only conducted in Hides Division 3 only.

3.3 WOMEN DEMOGRAPHIC CHARACTERISTICS

The results from the motherhood status demonstrated that 63.3% of women across all four iHDSS sites reported having ever given birth during their lives. Asaro site had the lowest proportion of women reported having given birth, (57.2 %), compared to 69.5% reported in Hides.

38.1% of the women across all four sites reported giving birth in the last two years; however, more than 50% of women in Hides reported having given birth. Further data analysis of this finding is ongoing.

Table 3-2 shows the main demographic characteristics of women of reproductive age, 15-49 year old across the four surveillance sites. As noted in previous PNG IMR reports, Hiri, due to its proximity to Port Moresby, is generally transitioning from rural to peri-urban status in many respects. In contrast, the other locations are rural settings.

The results from the table indicate a higher proportion of the women of reproductive age in the lower age group. In other words, the proportion of women decreased from the lower age group to the higher age group i.e. 21.2% of women in age group of 15-19, but only 7.7% of women recorded in age group of 45-49. Generally, the proportion of women of reproductive age decreases as the age group increases. This finding reflects the overall age structure of the surveillance population as well as the overall PNG population.

With regard to marital status, the data demonstrates that 62% of the women reported that they are married while 29.3% reported a single status. Only a few reported as widowed, divorced or separated, totalling up 8.4% of the total women aged 15-49. Hides had the highest proportion of women aged 15-49, (37.3%), and the lowest proportion of single women, 21.1%. The subsequent chapter on “Marriage and Living” presents additional information on these findings.

The results from the motherhood status demonstrated that 63.3% of women across all four iHDSS sites reported having ever given birth during their lives. Asaro site had the lowest proportion of women reported having given birth, (57.2 %), compared to 69.5% reported in Hides.

38.1% of the women across all four sites reported giving birth in the last two years; however, more than 50% of women in Hides reported having given birth. Further data analysis of this finding is ongoing.

Table 3-2. Demographic characteristics of women aged 15-49, PNG IMR's iHDSS, 2016

			iHDSS Sites				
			Asaro	Hides	Hiri	Karkar	All sites
Rural-Urban sector	Rural area	N	2178	657	2295	1410	6540
		%	100.0%	100.0%	100.0%	100.0%	100.0%
	Urban area	N	0	0	0	0	0
		%	0.0%	0.0%	0.0%	0.0%	0.0%
	Total	N	2178	657	2295	1410	6540
		%	100.00%	100.00%	100.00%	100.00%	100.00%
Age of Women	15-19	N	343	66	455	313	1177
		%	19.0%	37.3%	20.1%	23.9%	21.2%
	20-24	N	262	25	407	235	929
		%	14.5%	14.1%	18.0%	18.0%	16.7%
	25-29	N	266	32	387	193	878
		%	14.7%	18.1%	17.1%	14.8%	15.8%
	30-34	N	289	23	307	177	796
		%	16.0%	13.0%	13.6%	13.5%	14.3%
	35-39	N	194	9	287	169	659
		%	10.7%	5.1%	12.7%	12.9%	11.9%
	40-44	N	285	15	246	139	685
		%	15.8%	8.5%	10.9%	10.6%	12.3%
	45-49	N	167	7	174	82	430
		%	9.2%	4.0%	7.7%	6.3%	7.7%
	Total	N	1806	177	2263	1308	5554
		%	100.0%	100.0%	100.0%	100.0%	100.0%
Marital status	Single	N	421	141	747	482	1791
		%	22.6%	21.1%	33.0%	36.6%	29.3%
	Married	N	1217	475	1383	726	3801
		%	65.5%	71.1%	61.1%	55.1%	62.2%
	Widowed	N	43	14	40	30	127
		%	2.3%	2.1%	1.8%	2.3%	2.1%
	Divorced	N	60	4	27	22	113
		%	3.2%	0.6%	1.2%	1.7%	1.8%
	Separated	N	118	34	67	58	277
		%	6.3%	5.1%	3.0%	4.4%	4.5%
	Total	N	1859	668	2264	1318	6109
		%	100.0%	100.0%	100.0%	100.0%	100.0%
Motherhood status	Ever gave birth	N	1026	421	1503	807	3757
		%	57.2%	69.5%	67.5%	63.2%	63.6%
	Never gave birth	N	767	185	725	469	2146
		%	42.8%	30.5%	32.5%	36.8%	36.4%
	Total	N	1793	606	2228	1276	5903
		%	100.0%	100.0%	100.0%	100.0%	100.0%
Gave birth in the last 2 years	Yes	N	326	225	587	296	1434
		%	32.6%	50.7%	38.7%	36.7%	38.1%
	No	N	674	219	928	510	2331
		%	67.4%	49.3%	61.3%	63.3%	61.9%
	Total	N	1000	444	1515	806	3765
		%	100.0%	100.0%	100.0%	100.0%	100.0%

4.0 WOMEN'S EDUCATION

4.1 ABSTRACT

This Chapter describes the educational status of women of reproductive ages, 15-49 in the four surveillance sites in order to explore the relationship between education and women's health status.

Of the women who have never attended school, 90% (1,108 out of 1,211 women) were women in Asaro and Hides, the two sites in the highlands region. The remaining 10% were women in the Hiri and Karkar coastal sites.

Among women who reported attending school, many did not make it through the upper secondary school. 4,458 women reached grade 10 and below, i.e., 92% of the total of women who ever attended school. 387 women (5%) made it through the upper secondary school while only 3% made it through to tertiary education.

The data show the large gap between school attendance status and ability to read among women aged 15-49. The proportion of women with ability to read is actually lower than the proportion of women who have ever attended school. This finding raises a question of how to retain the general ability to read among adult women.

4.2 SCHOOL ATTENDANCE

Table 4-1. School attendance among women aged 15-49, PNG IMR's iHDSS, 2016

		Hiri	Asaro	Karkar	Hides	All sites
Ever attended school	N	2145	1153	1230	195	4723
	%	97.5%	63.8%	96.2%	30.1%	79.6%
Never attended school	N	55	655	48	453	1211
	%	2.5%	36.2%	3.8%	69.9%	20.4%
Total	N	2200	1808	1278	648	5934
	%	100.0%	100.0%	100.0%	100.0%	100.0%

According to **Table 4-1**, the highlands region had the highest number of women who did not attend school at anytime during their life. The Asaro site (655 women), accounted for about one third of the total number of women who had not ever attended school. Hides had the largest number of women (453) who reported having never attended school, i.e., almost 70% of the number of women at this site.

In contrast, women from the two coastal sites reported having better access to education with 97.5% of women in Hiri and 96.2% of women in Karkar having attended school. These data stand in sharp contrast to the highlands sites where 63.8% of women in Asaro and only 30.1% of women in Hides reported having ever attending school.

4.3 HIGHEST SCHOOL GRADE COMPLETION

Across all four sites, very few women reached Grade 11 and Grade 12, 1.1% and 5.1%, respectively. Less than one third of women reported completing Grade 10, with the highest proportion, 45% (1,003) in Hiri.

In Asaro and Karkar, the highest grade that the largest proportion of women reported completing was Grade 6, i.e., 273 (23.8%) and 334 (26.8%), respectively. The majority of women (95%) in these two sites reported completing Grade 1 to Grade 10. Less than 5% of these highland women completed Grade 11 and Grade 12. In Hides, 92.1% attended Grade 8 and below. The lowest proportion of women completed Grade 10 was reported in Hides, at 4.1%.

Table 4-2. Highest school grade completed among women aged 15-49, iHDSS, 2016

School grade completed	Hiri		Asaro		Karkar		Hides		All sites	
	N	%	N	%	N	%	N	%	N	%
Grade 1	17	0.8	16	1.4	17	1.4	7	3.6	57	1.2
Grade 2	5	0.2	36	3.1	22	1.8	20	10.2	83	1.7
Grade 3	15	0.7	86	7.5	54	4.3	43	21.8	198	4.1
Grade 4	24	1.1	129	11.2	91	7.3	33	16.8	277	5.7
Grade 5	32	1.4	122	10.6	93	7.5	23	11.7	270	5.6
Grade 6	278	12.5	273	23.8	334	26.8	37	18.8	922	19.1
Grade 7	78	3.5	80	7.0	105	8.4	8	4.1	271	5.6
Grade 8	361	16.2	127	11.1	279	22.4	8	4.1	775	16.1
Grade 9	151	6.8	51	4.4	40	3.2	4	2.0	246	5.1
Grade 10	1003	45.0	153	13.3	152	12.2	8	4.1	1316	27.3
Grade 11	30	1.3	15	1.3	6	0.5	0	0.0	51	1.1
Grade 12	178	8.0	32	2.8	36	2.9	2	1.0	248	5.1
DK	1	0.0	0	0.0	0	0.0	0	0.0	1	0.0
Total	**2229**	**100.0**	**1149**	**100.0**	**1245**	**100.0**	**197**	**100.0**	**4820**	**100.0**

4.4 EDUCATIONAL LEVEL ATTAINMENT

Table 4-3. Educational level attained among women aged 15-49, iHDSS, 2016

Educational Level	Hiri		Asaro		Karkar		Hides		All sites	
	N	%	N	%	N	%	N	%	N	%
Preschool	4	0.2	26	2.2	13	1.0	0	0.0	43	.9
Elementary (grade 1 to 2)	11	0.5	42	3.6	34	2.7	21	11.6	108	2.2
Primary (grade 3 to 8)	814	36.4	818	70.7	965	76.0	144	79.6	2741	56.6
Lower Secondary (grade 9 to 10)	1151	51.4	209	18.1	192	15.1	14	7.7	1566	32.3
Upper Secondary (grade 11 to 12)	166	7.4	38	3.3	32	2.5	2	1.1	238	4.9
Vocational/Professional training	45	2.0	11	1.0	10	0.8	0	0.0	66	1.4
College/University Graduate	45	2.0	12	1.0	23	1.8	0	0.0	80	1.7
Post graduate	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
DK	2	0.1	1	0.1	0	0.0	0	0.0	3	0.1
Total	2,238	100.0	1,157	100.0	1,269	100.0	181	100.0	4,845	100.0

Table 4-3 shows the highest educational level attained by the total of 4,845 respondents from the four surveillance sites. More than half of the women (56.6%) reported attaining primary education level (from grade 3 to grade 8). About one third of women reported attaining lower secondary education level (grades 9-10). Very few women reported attainment of either vocational/ professional training (1.4%) or college/university level (1.7%).

Hiri reported better education level among women aged 15-49 than other sites. More than one third attained primary education (grades 3-8) while approximately 50% of Hiri women completed lower secondary education (grades 9-10). Approximately 4% of Hiri women attained vocational training or tertiary education.

In Asaro, Karkar and Hides, the majority of women attained primary education: more than 70% in Asaro, 76% in Karkar, and about 80% in Hides. However, few women in Hides completed lower

secondary and no women reported having attained tertiary education level in the surveillance population.

4.5 ABILITY TO READ

In this survey effort, an assessment of the ability to read was included in the Women aged 15-49 Questionnaire. The objectively demonstrated ability to read can be different from the self-reported educational status. English was used to test the ability to read among the participants since English is official language being taught at primary education level upward in PNG. Participants were asked to read an English paragraph consisting of 5 sentences. These sentences which are written in simple, plain English were part of the consent form.

Table 4-4. Ability to read among women aged 15-49, iHDSS, 2016

	Hiri		Asaro		Karkar		Hides		All sites	
	N	%	N	%	N	%	N	%	N	%
Cannot read at all	72	8.3	692	43.8	199	17.8	430	67.7	1,393	33.2
Be able to read only parts of statement	444	51.2	378	23.9	420	37.7	94	14.8	1,336	31.8
Be able to read whole sentence	343	39.5	478	30.3	478	42.9	7	1.1	1,306	31.1
Required other language rather than Tok-Pisin or English	5	0.6	30	1.9	14	1.3	104	16.4	153	3.6
Blind/mute, visually/speech impaired	4	0.5	2	0.1	4	0.4	0	0.0	10	0.2
Total	868	100.0	1,580	100.0	1,115	100.0	635	100.0	4,198	100.0

Table 4-4 shows the ability to read among 4,198 women of reproductive age 15-49, who responded to the assessment of ability to read English. The data demonstrates there is a marked difference between reported school attendance and the actual ability read. For example, in Hiri only 2.5% of women reported having never ever attended school; however, 8.3% could not read at all, while 51.2% could read only parts of the assigned paragraph. Similarly, in Karkar only 3.8% of women reported as having never attended any school; however, 17.8% of women could not read and 37.7% could read only parts on the paragraph. The same pattern occurred at Asaro where the same mismatch between school attendance (43.8%) and reading ability (36.2) was observed. In contrast, the Hides data showed a similarity between the proportion of women reported never attending school and the inability to read, 67.7% compared to 69.9%, respectively. The data clearly demonstrate that the proportion of women with the ability to read is substantially lower than the proportion of women who reported having ever attended school. This means that although some women did attend school, they were unable to retain their ability to read after they completed school.

5.0 MARRIAGE AND LIVING IN UNION

5.1 ABSTRACT

This Chapter presents the marriage and living in union status of the women of reproductive age 15-49 across the four iHDSS sites (Asaro, Hides, Hiri and Karkar). From 6,044 women who responded to the questions on their marriage/ living in union status, half of them (3,005) reported currently living in marriage and 13.2% living in-union. Among 2,222 women, who are currently not married or living in union, 248 women reported being formerly married while 183 women reported formerly living with a man in the past. There were 1,791 women having never married or lived with a man in the surveillance population.

With regard to polygamy, 15.9% of women reported their husband/partner having an additional wife/ partner. Men are reported to have 1.72 wife/ partners on average in addition to their "primary" wife/partner. More than 20% of women reported getting married more than once with 31.7% of women, reported first marriage/ living in union between the ages of 15-19. The polygamy phenomenon is more likely common in the highlands than in the coastal areas.

The result from the survey indicates that 51% of women from Hides and 20% from Asaro practices polygamy while Hiri and Karkar reported less than 10% of women whose husbands/partners have other wives.

Asaro reported almost half of the women who Don't Know (DK) their age at first marriage or age of their partners/husbands while Hides reported very high proportion, compared to Hiri and Karkar which reported very low proportion of DK in terms of giving age. This clearly indicates that Asaro and Hides have more un-educated/illiterate women than Hiri and Karkar.

5.2 MARRIAGE AND LIVING IN UNION

Table 5-1 shows the current marriage or living in union status among the women of reproductive aged 15-49. The results indicate that approximately half of the women (49.7%) across all iHDSS sites are currently married, 13.2% reported living in union and 37.1% reported that they were not currently living in union. Comparing the data between the sites, Hides had the highest number of women reported as currently married, (72%). The married percent was much higher than the other sites, i.e. 44.6% in Hiri, 50% in Asaro and 46% in Karkar. In contrast, very few Hides women (0.6%) reported as currently living in union, a substantially lower percentage than the other three sites e.g. 16% in Hiri, 16% in Asaro and 9.4% in Karkar. Formal marriage, either in traditional or modern systems, is more common in Hides than across the other sites.

Table 5-1. Current marriage/living in union among women aged 15-49, PNG IMR's iHDSS, 2016

		Hiri	Asaro	Karkar	Hides	All sites
Currently married	N	1,010	921	603	471	3,005
	%	44.6%	50.7%	46.1%	72.0%	49.7%
Currently living in union	N	373	296	123	4	796
	%	16.5%	16.3%	9.4%	0.6%	13.2%
Currently not in union	N	884	599	581	179	2,243
	%	39.0%	33.0%	44.5%	27.4%	37.1%
Total	N	2,267	1,816	1,307	654	6,044
	%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 5-2. Age of current husband/ partner of women aged 15-49, PNG IMR's iHDSS, 2016

Age group		iHDSS site				All sites
		Hiri	Asaro	Karkar	Hides	
15-19	N	12	5	3	0	20
	%	0.9	0.4	0.4	0.0	0.5
20-24	N	120	30	52	2	204
	%	8.9	2.5	7.4	0.4	5.5
25-29	N	215	62	83	7	367
	%	15.9	5.2	11.9	1.6	9.9
30-34	N	224	119	138	5	486
	%	16.5	10.0	19.7	1.1	13.2
35-39	N	250	127	126	4	507
	%	18.5	10.7	18.0	0.9	13.7
40-44	N	241	107	123	1	472
	%	17.8	9.0	17.6	0.2	12.8
45-49	N	165	77	80	2	324
	%	12.2	6.5	11.4	0.4	8.8
50-54	N	73	56	40	1	170
	%	5.4	4.7	5.7	0.2	4.6
55-59	N	9	28	12	2	51
	%	0.7	2.4	1.7	0.4	1.4
60-64	N	6	9	1	0	16
	%	0.4	0.8	0.1	0.0	0.4
65-81	N	5	25	1	40	71
	%	0.4	2.1	0.1	9.0	1.9
DK	N	35	546	41	381	1,003
	%	2.6	45.8	5.9	85.6	27.2
Total	**N**	**1,355**	**1,191**	**700**	**445**	**3,691**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0%**

Table 5-2 shows the age of the current husband or sexual partner for women aged 15-49 across the four iHDSS sites. A total of **3,691** women responded to the question regarding the age of their current husband/partner. The results showed that most of the current husbands/partners were in the age groups of 30-44. This observation was consistent across Hiri and Asaro. However, nearly half of the women (45.8%) in Karkar and 85% of women in Hides reported for don't know' the age of their partner.

When comparing the age group distribution of women aged 15-49 (Table 3.2) with that of their husbands/ sexual partner (Table 5.2), the data show a mismatch between the two age group distributions.

5.3 POLYGAMY

Polygamy is a common phenomenon in many traditional societies, including PNG, where it is common for a man to simultaneously have multiple wives. The current survey effort systematically collected polygamy data for the first time during any of the iHDSS household surveys. In order to explore this phenomenon, a set of questions were included in the Questionnaire for Women of Reproductive age, 15-49: (i) whether or not their current husband/partner has additional sexual partners/wives) rather than herself; (ii) how many other wives)/ partner(s) her husband/ partner currently has; and (iii) how many times the female respondent has got married or lived with a man. The results from this survey effort are presented in **Table 5-3.**

Table 5-3. Current husband/partner currently having additional partner(s) other than wife, PNG IMR's iHDSS, 2016

		Hiri	Asaro	Karkar	Hides	All sites
Yes	N	56	238	64	239	597
	%	4.1%	19.8%	8.9%	51.2%	15.9%
No	N	1304	963	654	228	3149
	%	95.9%	80.2%	91.1%	48.8%	84.1%
Total	**N**	**1360**	**1201**	**718**	**467**	**3746**
	%	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

More than 15% of women across the four surveillance sites reported their husbands/ partners currently having additional wives or sexual partner(s). There was a marked difference between coastal and highland sites and between impact and matched comparison sites. The level of polygamy was substantial in Hides, even in comparison to Asaro (51% versus almost 20%). Polygamy levels were far less in both coastal location illustrating clear cultural differences.

Table 5-4. Number of other wives/partners of husbands, PNG IMR's iHDSS, 2016

Number of other wives/partners		Hiri	Asaro	Karkar	Hides	All sites
1	N	29	156	42	92	319
	%	55.8	69.6	68.9	39.7	56.1
2	N	14	51	19	95	179
	%	26.9	22.8	31.1	40.9	31.5
3	N	3	11	0	25	39
	%	5.8	4.9	0.0	10.8	6.9
4	N	2	6	0	6	14
	%	3.8	2.7	0.0	2.6	2.5
5	N	1	0	0	6	7
	%	1.9	0.0	0.0	2.6	1.2
6	N	0	0	0	1	1
	%	0.0	0.0	0.0	.4	.2
7	N	0	0	0	1	1
	%	0.0	0.0	0.0	.4	.2
8	N	3	0	0	1	4
	%	5.8	0.0	0.0	.4	.7
9	N	0	0	0	3	3
	%	0.0	0.0	0.0	1.3	.5
10	N	0	0	0	2	2
	%	0.0	0.0	0.0	.9	.4
Total	**N**	**52**	**224**	**61**	**232**	**569**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Mean		**1.98**	**1.41**	**1.31**	**2.06**	**1.72**

Table 5-4 shows the responses of 569 women aged 15-49 to the question of how many other wives/partners that their current husband/ partner currently has. As previously noted, the number of second and third wives is substantial in the highlands sites versus the coastal areas. The percentage comparisons should be cautiously made as the absolute numbers of second and third wives is small in the coastal sites in comparison to the highlands. Generally, across the four iHDSS sites, women who were currently married or living in union reported that on average, their current husband/ partner had 1.72 additional wives/partners apart from themselves. This figure was highest in Hides, where women reported a man had additional 2.06 wives on average, compared to 1.98 in Hiri, 1.41 in Asaro and 1.31 in Karkar.

Aside from the current marriage/ live in union, another aspect of polygamy can be examined by gathering data on past history of marriage/ living in union. Questions regarding former marriage and living in-union were included in the questionnaire. The results are shown in **Table 5-5**.

Table 5-5. Formerly married or lived with a man among women 15-49, PNG IMR's iHDSS, 2016

		Hiri	Asaro	Karkar	Hides	All sites
Formerly married with a man	N	76	97	42	33	248
	%	8.7	16.3	7.3	18.4	11.2
Formerly lived with a man	N	49	77	52	5	183
	%	5.6	12.9	9.0	2.8	8.2
Never married or lived with a man	N	747	421	482	141	1791
	%	85.7	70.8	83.7	78.8	80.6
Total	**N**	**872**	**595**	**576**	**179**	**2,222**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 5-5 shows the number and proportion of women (ages15-49), who reported having had married or lived with a man in the past. Among 2,222 women who currently not married/ or living in union, (and responded to the question in the four iHDSS sites), 11.2% reported that they had previously been married while another 8.2% reported that they had previously lived with a man in union. Thus, there were another 432 women who had previously been married or lived in union.

Table 5-6 shows the number and percentages of surveyed women as a function of number of times married or living in union. Across all sites, more than 20% of women reported getting married or living in union more than once. This figure varied across all sites with the highest level in Asaro, (33%) and lowest in Hiri 9%. There are likely cultural and potentially economic differences for these findings.

Table 5-6. Number of marriage or living in union among women 15-49, iHDSS, 2016

		Hiri	Asaro	Karkar	Hides	All sites
Once only	N	1,325	828	562	316	3,031
	%	90.8	66.9	73.5	85.2	79.1
More than once	N	134	409	203	55	801
	%	9.2	33.1	26.5	14.8	20.9
Total	**N**	**1,459**	**1,237**	**765**	**371**	**3,832**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Age of first marriage reflects another aspect of polygamy because men tend to look for younger women. Early (arranged) marriages could be a potentially significant issue. Table 5-7 shows age at first marriage or living in union with a man among the survey population. The data indicate that only a small proportion of women (2.1%) reported getting married/ living in union for the first time below 15 years old with approximately one third married between the ages of 15-19. This data must be carefully compared across sites as the majority of women in Hides (87%) and significant numbers in Asaro (38%) did not know their age at first marriage/ living in union. This suggests that the actual proportion of child marriage could be higher in the highland locations. The interaction between polygamy and child marriage is uncertain and potentially requires further investigation and analysis.

Table 5-7. Age at the first time getting marriage or living in union with a man among women aged 15-49, PNG IMR's iHDSS, 2016

		Hiri	Asaro	Karkar	Hides	All sites
<15	N	4	51	22	2	79
	%	.3	4.1	2.9	.5	2.1
15-19	N	485	434	292	12	1,223
	%	33.2	34.7	38.2	3.2	31.7
20-24	N	675	222	318	25	1,240
	%	46.2	17.8	41.6	6.6	32.2
25-29	N	174	45	90	7	316
	%	11.9	3.6	11.8	1.9	8.2
30-34	N	53	7	20	1	81
	%	3.6	0.6	2.6	0.3	2.1
35-40	N	20	1	1	0	21
	%	1.4	0.1	0.1	0.0	0.5
DK	N	50	479	18	329	876
	%	3.4	38.3	2.4	87.5	22.7
Missing	N	1	11	3	0	15
	%	.1	.9	.4	0.0	.4
Total	**N**	**1,462**	**1,250**	**764**	**376**	**3,852**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

6.0 SEXUAL BEHAVIOUR

6.1 ABSTRACT

This Chapter explores sexual behaviour of women of reproductive age, 15-49 across the four iHDSS sites, Asaro, Hides, Hiri and Karkar. The study was conducted in the reporting period of July- December 2015. A total of 5,976 women responded to the questions of this data module,

When asked about their age at first sexual intercourse, most women reported having their first sexual intercourse by ages 16-18, but about 4% reported having their first sexual intercourse at less than 15 years of age. The majority (90%) of women reported having never had a partner use a condom during their first sexual intercourse.

More than half of women reported having the last sex act during two weeks prior to the interview. More than 90% reported no use of a condom by their husband/partner. The majority of women (80%) performed the last sex with their husbands, 11% with boyfriend and 6% with a casual partner. Very few women responded to the question of the age of sexual partners in the last sex; hence this was not further analysed.

Responding to the question of whether or not women had sex with any other persons rather than husband or regular sexual partner in the last 12 months, 94% of respondents said 'No' while only 6% responded 'Yes'. Contradictorily, when women were asked about the number of sexual partners they had in the last 12 months, only 15% reported having one while more than three quarters reported having 2 or more different partners, i.e., 36% having 2, 16% having 3, 9% having 4, and 15% having 5+). Further questioning revealed that more than half of respondents reported having only one sexual partner (56%) during their lifetime. Clearly, the reporting of sexual behaviour is complex and fraught with over and under reporting issues.

6.2 AGE AT FIRST SEX

Table 6.1 shows the age of first sexual intercourse among women aged 15-49 across the four sites. The data analysis showed 79% of all women interviewed responded "yes" to having sexual intercourse. When asked about the age at first sexual intercourse, most women reported having their first sexual intercourse by ages 16 to 18. The data for Hides is compromised by the high percentage of respondents who could not specify an age range. Data appear to be more accurately reported across Hiri, Karkar and Asaro. A very small percentage (4%) of the total women interviewed reported having their first sexual intercourse by ages 9 to 14, of which Asaro had the highest proportion (9.8%).

Table 6-1. Age of first sexual intercourse among women aged 15-49, PNG IMR's iHDSS, 2016

		Asaro	Hides	Hiri	Karkar	All Sites
Never had sex	N	310	106	493	357	1266
	%	17.3	16.9	21.9	27.3	21.2
<15	N	176	1	27	45	249
	%	9.8	0.2	1.2	3.4	4.2
15	N	140	4	79	71	294
	%	7.8	0.6	3.5	5.4	4.9
16	N	201	4	141	110	456
	%	11.2	0.6	6.3	8.4	7.6
17	N	168	3	171	100	442
	%	9.4	0.5	7.6	7.7	7.4
18	N	158	16	284	122	580
	%	8.8	2.6	12.6	9.3	9.7
19	N	84	4	225	151	464
	%	4.7	0.6	10.0	11.6	7.8
20+	N	243	37	825	347	1452
	%	13.5	5.9	36.7	26.6	24.3
DK	N	310	451	4	3	768
	%	17.3	72.0	0.2	0.2	12.9
Missing	N	4	0	1	0	5
	%	0.2	0.0	0.0	0.0	0.1
Total	**N**	**1794**	**626**	**2250**	**1306**	**5976**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

6.3 CONDOM USE AT FIRST SEXUAL INTERCOURSE

Table 6-2. Condom use at first sexual intercourse among women aged 15-49, PNG IMR's iHDSS, 2016

	Asaro		Hide		Hiri		Karkar		All Sites	
	N	%	N	%	N	%	N	%	N	%
Yes	121	8.4	9	1.7	146	8.4	61	6.6	337	7.3
No	1259	87.3	373	71.3	1588	91.4	857	92.5	4077	88.1
DK	62	4.3	141	27.0	3	0.2	8	0.9	214	4.6
Total	**1442**	**100.0**	**523**	**100.0**	**1737**	**100.0**	**926**	**100.0**	**4628**	**100.0**

Table 6.2 shows condom usage at first sexual intercourse among women aged 15-49 across the four sites. Analysis indicates that less than 10% of all women reported a husband/partner using a condom at first sexual intercourse while 5% reported "don't know". When moving across all sites Asaro and Hiri reported higher usage. Although Karkar and Hides reported lower condom usage at first sexual intercourse, this is proportional to the number of women who responded to this question. In summary, the data showed that condom usage was relatively rare (<10%) for the respondents at their first sexual intercourse.

6.4 LAST SEXUAL INTERCOURSE

Table 6.3 shows the last sexual intercourse performed by women aged 15-49 across all four sites. The data analysis showed more than 50% of all women reporting having their last sex between 1-14 days prior to being interviewed (28% had last sex less than 7 days ago and 25% had last sex 1-2 weeks ago respectively). In summary data showed that 50% of the women are sexually active as most had their last sexual intercourse between 1-14 days prior to being interviewed.

Table 6-3. Last sex among women aged 15-49, PNG IMR's iHDSS, 2016

		Asaro	Hide	Hiri	Karkar	All Sites
Less 1 week ago	N	312	150	611	265	1338
	%	21.0	28.6	35.0	27.7	28.4
1-2 weeks ago	N	340	204	444	182	1170
	%	22.9	38.9	25.4	19.0	24.8
3-4 weeks ago	N	90	13	61	41	205
	%	6.1	2.5	3.5	4.3	4.3
1-2 months ago	N	242	76	210	132	660
	%	16.3	14.5	12.0	13.8	14.0
3-6 months ago	N	172	22	107	78	379
	%	11.6	4.2	6.1	8.2	8.0
7-12 months ago	N	48	1	42	36	127
	%	3.2	0.2	2.4	3.8	2.7
More than 1 year ago	N	269	58	270	212	809
	%	18.1	11.1	15.5	22.2	17.2
DK	N	14	0	1	10	25
	%	0.9	0.0	0.1	1.0	0.5
Total	**N**	**1487**	**524**	**1746**	**956**	**4713**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 6-4. Condom use in the last sex among women aged 15-49, PNG IMR's iHDSS, 2016

		Asaro	Hide	Hiri	Karkar	All Sites
Yes	N	167	6	105	36	314
	%	13.9	1.3	7.2	4.8	8.1
No	N	1031	446	1356	715	3548
	%	86.1	98.7	92.8	95.2	91.9
Total	**N**	**1198**	**452**	**1461**	**751**	**3862**
	%	**100**	**100**	**100**	**100**	**100**

Table 6-4 shows condom use during the last sex by women aged 15-49 across four sites. The data analysis reveals that about 92% of all women reported "no condom use" during the last sex while only 8% of women reported that a husband/partner used a condom. When comparing across sites, Asaro had the highest condom use during the last sex. The survey data reveals that more than 90% of women did not use a condom during their last reported sex act.

Table 6-5. Relationship in the last sex among women aged 15-49, PNG IMR's iHDSS, 2016

		Asaro	Hide	Hiri	Karkar	All Sites
Husband	N	855	446	1302	607	3210
	%	69.9	95.9	85.8	79.1	80.8
Cohabiting partner	N	168	0	38	33	239
	%	13.7	0.0	2.5	4.3	6.0
Boyfriend	N	170	3	156	111	440
	%	13.9	0.6	10.3	14.5	11.1
Casual acquaintance	N	29	16	21	13	79
	%	2.4	3.4	1.4	1.7	2.0
Other	N	2	0	1	3	6
	%	0.2	0.0	0.1	0.4	0.2
Total	**N**	**1224**	**465**	**1518**	**767**	**3974**
	%	**100**	**100**	**100**	**100**	**100**

Table 6.5 shows the relationship of the sexual partner in the last sex performed among women 15-49 across the four sites. The data analysis reveals that about 81% of all women performed the last sex with their husbands, 11% with boyfriend and 6% with a casual acquaintance.

Table 6.6 shows the age of the sexual partner in the last sex act performed by women aged 15-49 across the four sites. The data analysis reveals that about 13% of all women reported that the age of their sexual partner at last sex was between ages 30-34. This observation is true for Hides and Hiri; however, for Karkar the male partner age group was between 40-44. Asaro reported a higher proportion of women reporting their last sex with men who were 50 years and older. In conclusion, the data do not provide a clear trend regarding the age of last sexual partner within the respondent group.

Table 6-6. Age of sexual partner in the last sex among women aged 15-49, PNG IMR's iHDSS, 2016

Age		Asaro	Hide	Hiri	Karkar	All site
15-19	N	2	0	1	3	6
	%	4.8	0.0	10.0	6.8	6.0
20-24	N	2	0	0	4	6
	%	4.8	0.0	0.0	9.1	6.0
25-29	N	3	0	0	4	7
	%	7.1	0.0	0.0	9.1	7.0
30-34	N	1	1	4	7	13
	%	2.4	25.0	40.0	15.9	13.0
35-39	N	3	0	1	7	11
	%	7.1	0.0	10.0	15.9	11.0
40-44	N	1	0	1	8	10
	%	2.4	0.0	10.0	18.2	10.0
45-49	N	0	0	1	1	2
	%	0.0	0.0	10.0	2.3	2.0
50+	N	4	0	0	0	4
	%	9.5	0.0	0.0	0.0	4.0
DK	N	26	3	2	10	41
	%	61.9	75.0	20.0	22.7	41.0
Total	**N**	**42**	**4**	**10**	**44**	**100**
	%	**100**	**100**	**100**	**100**	**100**

6.5 NUMBER OF SEXUAL PARTNER

Table 6-7. Having sex with any other person rather than husband/ regular sexual partner in the last 12 months among women aged 15-49, PNG IMR's iHDSS, 2016

		Asaro	Hides	Hiri	Karkar	All site
Yes	N	140	12	36	66	254
	%	11.5	2.6	2.4	8.7	6.5
No	N	1076	449	1455	695	3675
	%	88.5	97.4	97.6	91.3	93.5
Total	**N**	**1216**	**461**	**1491**	**761**	**3929**
	%	**100**	**100**	**100**	**100**	**100**

Table 6.7 shows whether or not a woman had sex with any other persons rather than husband or regular sexual partner in the last 12 months across four sites. This question was asked to all participants and there were 3,929 women responded to the question. 94% of the women responded 'No", while 6% responded 'Yes'. Asaro had the highest level of 'Yes' at 11%, followed by Karkar with 9%; however, these results are directly proportional to the number of women that participated in this question per site. Overall, more than 90% of all women did not have sex with any other person in the last 12 months. These findings are likely due to strong cultural values that perceive extra marital affairs as an unacceptable practice which would lead to loss of respect and value.

Table 6-8. Number of sexual partners in the last 12 months among women aged 15-49, PNG IMR's iHDSS, 2016

		Asaro	Hides	Hiri	Karkar	All Site
1	N	7	0	10	24	41
	%	4.9	0.0	27.0	34.8	15.6
2	N	45	2	20	28	95
	%	31.3	16.7	54.1	40.6	36.3
3	N	28	3	3	9	43
	%	19.4	25.0	8.1	13.0	16.4
4	N	17	1	1	4	23
	%	11.8	8.3	2.7	5.8	8.8
5+	N	37	1	0	3	41
	%	25.7	8.3	0.0	4.3	15.6
DK	N	10	5	3	1	19
	%	6.9	41.7	8.1	1.4	7.3
Total	**N**	**144**	**12**	**37**	**69**	**262**
	%	**100**	**100**	**100**	**100**	**100**
Min-Max		**1-11**	**2-5**	**1-4**	**1-5**	**1-11**
Mean		**3.75**	**3.14**	**1.85**	**2.03**	**2.98**

Further analysis of number of sexual partner among 254 women, who reported having sex with other persons rather than their husband or regular partner in the last 12 months provides further insight into their sexual behaviour.

Table 6.8 shows the number of sexual partners in the last 12 months among women aged 15-49 across the four sites. A total of 262 women were included in this analysis, slightly higher than the figure shown in Table 6.7 (254 women). When asked about the number of sex partners they had in the last 12 months, the majority of these women reported having at least 2 sexual partners in the last 12 months (52%), followed by 3 and 4 sexual partners; 16% and 9% respectively. The overall all site mean was three sexual partners in the last 12 months. Asaro and Hides women reported having more than three partners, while Hiri and Karkar had two partners on average. Interestingly, there were 37 women, accounting for about 25% of the women interviewed in Asaro, who reported having 5 or more sexual partners in the last 12 months.

Table 6-9. Number of sexual partners in the lifetime among women aged 15-49, PNG IMR's iHDSS, 2016

		Hiri	Asaro	Karkar	Hides	All Sites
1	N	1215	420	549	416	2600
	%	69.6	28.3	58.2	81.1	55.5
2	N	366	218	200	74	858
	%	21.0	14.7	21.2	14.4	18.3
3	N	81	172	90	14	357
	%	4.6	11.6	9.5	2.7	7.6
4	N	34	119	46	0	199
	%	1.9	8.0	4.9	0.0	4.2
5+	N	21	393	49	4	467
	%	1.2	26.5	5.2	0.8	10.0
DK	N	28	160	10	5	203
	%	1.6	10.8	1.1	1.0	4.3
Total	**N**	**1745**	**1482**	**944**	**513**	**4684**
	%	**100**	**100**	**100**	**100**	**100**
Min-Max		**1-14**	**1-29**	**1-12**	**1-14**	**1-29**
Mean		**1.47**	**3.94**	**1.48**	**1.56**	**2.25**

Table 6.9 shows the number of sexual partners in the lifetime among women aged 15-49 across the four sites. This table presents data on all women who participated in the interviews. When asked about the number of sex partners they had in a lifetime, a total of 4,684 women responded to the question and most women reported having only 1 sexual partner (56%), followed by 2 (18%). On average, each woman reported having 2.2 sexual partners in their lifetime. The highest mean number of sexual partners was recorded in Asaro, 3.9, compared to 1.5 in Hides. Hiri and Karkar women reported having similar number of 1.5 sexual partners in their life time.

7.0 DOMESTIC VIOLENCE

7.1 ABSTRACT

This chapter reports key findings and observations on domestic violence (DV) reported by women aged 15-49 in the four iHDSS Sites, i.e., Asaro, Hiri, Hides and Karkar. The report considers a number of key areas of DV including: (i) perception of DV; (ii) experience of DV; (iii) perpetrators of DV; (iv) experiences of DV with sexual partner/s; and (v) alcohol consumption prior to DV of sexual partners.

More than 43% (2,574 women) of the respondents perceived that her husband or sexual partner was justified for beating or hitting her when she went out without informing her husband or sexual partner. A quarter of women perceived that it was justified for a man to hit or beat his wife/ sexual partner if she refused to have sex with him.

Almost 50% of the women had experienced verbal abuse including being shouted at. Less than three percent of husbands and/or sexual partners were reported to attack a women with a knife or gun, with the highest record been in Hides (4.6%).

Husbands were reportedly the most common perpetrators of DV in the last 12 months, with the highest reported percent among Hides women (46.2%).

Nearly one third of women were verbally threatened by their male sexual partners to have sex. One fifth of women reported being physically forced to have sex in the last 12 months.

Alcohol consumption appears as a high risk factor associated with DV with 70% of women reporting an episode of alcohol fuelled DV.

7.2 PERCEPTION ON DOMESTIC VIOLENCE

Understanding women's perceptions of DV is vital as it provides an opportunity to deepen the knowledge of DV in PNG. Participants were asked to speak about what they believe causes DV by their sexual partners in a variety of situations, including: if she goes out without telling him; if she neglects the children; if she does not do the house work; if she argues with him/husband; if she refuses to have sex with him; or if she burns the food.

Table 7-1 demonstrates findings on the perception of DV among women 15-49 across the four iHDSS sites. A total of 5,883 women responded to questions for this data module. The results demonstrate a striking difference across sites; however, there were general similarities between impact and comparison locations, i.e., Hiri/Karkar and Hides/Asaro.

The most commonly mentioned perception justifying why men hit or beat his wife/sexual partner was 'when she goes out without telling him'. More than 43% (2,574 women) of the respondents perceived that her husband or sexual partner was justified for beating or hitting her when she went out without informing her husband or sexual partner. The data showed the highest percentage in Karkar site (51.7%), followed by Hiri, Asaro, and Hides.

'Neglecting children' and 'Don't do the housework' were also common perceptions of women justifying DV, i.e., more than 40% of women across the four sites. Women in Hides reported the lowest response levels compared to other three sites.

A quarter of women perceived that it was justified for a man to hit or beat his wife/ sexual partner if she refused to have sex with him. This perception was highest in Hiri, (33%) and lowest in Hides, where less than one fifth of women had had that perception.

'Burning of food' had the lowest (17.5%) of justification for DV. However, there were marked differences in the responses of women across the different sites e.g. 25% of women in Hiri compared to only 1.4% of women in Hides.

Table 7-1. Perception of domestic violence among women 15-49, PNG IMR's iHDSS, 2016

Man is justified in hitting or beating his wife/sexual partner in the following situations:			IHDSS Site				All Sites
			Hiri	Asaro	Karkar	Hides	
If she goes out without telling him	Yes	N	1040	662	634	238	2574
		%	46.6	37.2	51.7	36.8	43.8
	No	N	1146	1092	512	371	3121
		%	51.3	61.4	41.8	57.4	53.1
	DK	N	47	24	80	37	188
		%	2.1	1.3	6.5	5.7	3.2
	Total	N	2233	1778	1226	646	5883
		%	100.0	100.0	100.0	100.0	100.0
If she neglects the children	Yes	N	958	721	522	206	2407
		%	43.0	40.6	42.4	31.9	40.9
	No	N	1220	1026	612	402	3260
		%	54.7	57.7	49.8	62.2	55.4
	DK	N	51	30	96	38	215
		%	2.3	1.7	7.8	5.9	3.7
	Total	N	2229	1777	1230	646	5882
		%	100.0	100.0	100.0	100.0	100.0
If she does not do the house work	Yes	N	923	726	618	123	2390
		%	41.4	40.9	49.8	19.0	40.6
	No	N	1251	1024	555	478	3308
		%	56.0	57.7	44.8	74.0	56.1

Man is justified in hitting or beating his wife/sexual partner in the following situations:			IHDSS Site				All Sites
			Hiri	Asaro	Karkar	Hides	
	DK	N	58	25	67	45	195
		%	2.6	1.4	5.4	7.0	3.3
	Total	N	2232	1775	1240	646	5893
		%	100.0	100.0	100.0	100.0	100.0
If she argues with him/ elder in the family	Yes	N	764	400	423	166	1753
		%	34.2	22.6	34.2	25.7	29.8
	No	N	1401	1305	723	442	3871
		%	62.8	73.8	58.4	68.4	65.8
	DK	N	67	63	92	38	260
		%	3.0	3.6	7.4	5.9	4.4
	Total	N	2232	1768	1238	646	5884
		%	100.0	100.0	100.0	100.0	100.0
If she refuses to have sex with him	Yes	N	744	375	267	125	1511
		%	33.3	21.2	21.3	19.3	25.6
	No	N	1395	1346	846	458	4045
		%	62.4	76.0	67.4	70.8	68.5
	DK	N	95	50	143	64	352
		%	4.3	2.8	11.4	9.9	6.0
	Total	N	2234	1771	1256	647	5908
		%	100.0	100.0	100.0	100.0	100.0
If she buns the food	Yes	N	568	269	185	9	1031
		%	25.5	15.2	14.8	1.4	17.5
	No	N	1593	1443	968	579	4583
		%	71.5	81.8	77.7	90.0	77.9
	DK	N	67	53	93	55	268
		%	3.0	3.0	7.5	8.6	4.6
	Total	N	2228	1765	1246	643	5882
		%	100.0	100.0	100.0	100.0	100.0

7.3 EXPERIENCE OF DOMESTIC VIOLENCE

Understanding women's experiences regarding DV is vital in order to explore innovative ways to respond to this societal concern. **Table 7-2** shows the experience of DV reported by women aged 15-49. A total of 5,965 women were asked if they had experienced DV in the last 12 months for any of seven DV categories, including verbal abuse; threaten with a knife or gun; pushed, pulled, slapped; beaten with something; kicked, dragged; strangled, burnt; or attacked with a knife or gun.

Table 7-2. Experience of domestic violence in the last 12 months among women 15-49, PNG IMR's iHDSS, 2016

			iHDSS Site				All Sites
			Hiri	Asaro	Karkar	Hides	
Verbally abused or shouted at you	Yes	N	1019	688	730	375	2812
		%	45.1	38.5	57.3	58.0	47.1
	No	N	1235	1092	537	272	3136
		%	54.7	61.1	42.2	42.0	52.6
	DK	N	5	6	6	0	17
		%	.2	.3	.5	0.0	.3
	Total	N	2259	1786	1273	647	5965
		%	100.0	100.0	100.0	100.0	100.0
Threaten you with a knife or gun	Yes	N	44	135	70	57	306
		%	2.0	7.6	5.6	9.0	5.2
	No	N	2198	1642	1170	573	5583
		%	97.6	92.0	93.5	91.0	94.3
	DK	N	10	7	12	0	29
		%	.4	.4	1.0	0.0	.5
	Total	N	2252	1784	1252	630	5918
		%	100.0	100.0	100.0	100.0	100.0
Push, pull, slap or hold you down	Yes	N	304	317	226	226	1073
		%	13.5	17.8	18.0	35.3	18.1
	No	N	1938	1460	1024	414	4836
		%	85.9	81.8	81.5	64.7	81.5
	DK	N	13	7	7	0	27
		%	.6	.4	.6	0.0	.5
	Total	N	2255	1784	1257	640	5936
		%	100.0	100.0	100.0	100.0	100.0
Beat you with something	Yes	N	215	409	370	170	1164
		%	9.5	22.9	29.1	26.6	19.6
	No	N	2026	1369	898	469	4762
		%	89.9	76.7	70.6	73.4	80.0
	DK	N	12	8	4	0	24
		%	.5	.4	.3	0.0	.4
	Total	N	2253	1786	1272	639	5950
		%	100.0	100.0	100.0	100.0	100.0
Kick or drag you	Yes	N	98	197	108	117	520
		%	4.3	11.1	8.6	18.4	8.8
	No	N	2142	1575	1146	518	5381
		%	95.1	88.5	91.0	81.6	90.8

			iHDSS Site				All Sites
			Hiri	**Asaro**	**Karkar**	**Hides**	
	DK	N	13	8	6	0	27
		%	.6	.4	.5	0.0	.5
	Total	N	2253	1780	1260	635	5928
		%	100.0	100.0	100.0	100.0	100.0
Try to strangle or burn you	Yes	N	14	64	36	29	143
		%	.6	3.6	2.9	4.6	2.4
	No	N	2227	1707	1219	606	5759
		%	98.9	96.0	96.6	95.4	97.2
	DK	N	11	7	7	0	25
		%	.5	.4	.6	0.0	.4
	Total	N	2252	1778	1262	635	5927
		%	100.0	100.0	100.0	100.0	100.0
Attack you with a knife or gun	Yes	N	16	65	33	29	143
		%	.7	3.7	2.6	4.6	2.4
	No	N	2220	1700	1218	606	5744
		%	98.8	95.9	96.8	95.4	97.1
	DK	N	12	7	7	0	26
		%	.5	.4	.6	0.0	.4
	Total	N	2248	1772	1258	635	5913
		%	100.0	100.0	100.0	100.0	100.0

Table 7-2 shows the most commonly experienced type of situation was 'verbally abused', in which 47.1% of the women reported this experience in the last 12 months across the four sites. The highest proportion was reported in Hides where 58% of women reported having been verbally abused or shouted at by their husbands/sexual partners. The lowest proportion of women, 38% reported such experience in Karkar.

More than 5% of women reported being threatened with a knife or gun, with the highest proportion reported in Hides, (9%) and lowest in Hiri, (2%). Asaro and Karkar women reported (7.6%) and (5.6%), respectively.

Being pushed, slapped and held down by husbands/sexual partners in the last 12 months was reported by 18.1% of women across the four sites. Again, the highest prevalence was observed in Hides, (35.8%) and lowest in Hiri, (13.5%). Similar proportion of women in Asaro and Karkar reported experiencing this DV, (17.8%) and (18%), respectively.

Almost one fifth of women in the four surveillance sites reported being beaten by their husband/partner with something in the last 12 months. The highest proportion was recorded in Karkar and Hides, (29% and 27%,) followed by Asaro, (23%) and Hiri, (10%).

Other forms of DV such as being kicked or dragged and being strangled or burnt by husband or sexual partners were also experienced by women across the surveillance sites (overall 10%). Hides women experienced this type of violence more than the other sites. Attacks by the husband/partner with knife or gun were also reported, 2.4% (n=143) of women across all four sites. The highest proportion was reported in Hides, where (4.6%) of women experienced this type of DV.

7.4 PERPETRATOR OF DOMESTIC VIOLENCE

More than 6,530 women responded to the questions regarding perpetrators of DV. Table 7-3 showed that "Husbands" were the most common perpetrators of DV across all sites, reported by (30.5%) of the women surveyed. Hides site reported the highest percentage (46.2% or 303 women) followed by Karkar (34.9%). Women reported similar proportions in Hiri (27.4%) and Asaro (26.2%).

Table 7-3. Perpetrator of domestic violence in the last 12 months among women 15-49, PNG IMR's iHDSS, 2016

			iHDSS Site				
			Hiri	Asaro	Karkar	Hides	All Sites
Husband	No	N	1665	1602	917	353	4537
		%	72.6	73.8	65.1	53.8	69.5
	Yes	N	628	570	492	303	1993
		%	27.4	26.2	34.9	46.2	30.5
	Total	N	2293	2172	1409	656	6530
		%	100.0	100.0	100.0	100.0	100.0
Other sexual partner	No	N	2282	2079	1383	654	6398
		%	99.5	95.7	98.2	99.7	98.0
	Yes	N	11	93	26	2	132
		%	.5	4.3	1.8	.3	2.0
	Total	N	2293	2172	1409	656	6530
		%	100.0	100.0	100.0	100.0	100.0
Parents	No	N	1934	2016	1062	602	5614
		%	84.3	92.8	75.4	91.8	86.0
	Yes	N	359	156	347	54	916
		%	15.7	7.2	24.6	8.2	14.0
	Total	N	2293	2172	1409	656	6530
		%	100.0	100.0	100.0	100.0	100.0

			iHDSS Site				
			Hiri	**Asaro**	**Karkar**	**Hides**	**All Sites**
Siblings	No	N	2176	2080	1212	651	6119
		%	94.9	95.8	86.0	99.2	93.7
	Yes	N	117	92	197	5	411
		%	5.1	4.2	14.0	.8	6.3
	Total	N	2293	2172	1409	656	6530
		%	100.0	100.0	100.0	100.0	100.0
Other relatives	No	N	2235	2102	1320	642	6299
		%	97.5	96.8	93.7	97.9	96.5
	Yes	N	58	70	89	14	231
		%	2.5	3.2	6.3	2.1	3.5
	Total	N	2293	2172	1409	656	6530
		%	100.0	100.0	100.0	100.0	100.0

Other sexual partners (not husbands) were also reported as perpetrators by a small number of women (2%) across the four sites. However, other household/family members were reported as significant perpetrators, e.g., parents (14%), brother/sister (6.3%), and other relatives (93.5%).

7.5 EXPERIENCE OF DOMESTIC VIOLENCE WITH SEXUAL PARTNER

Table 7-4 shows the experience of DV with 'sexual partner' in the last 12 months. The women participants were asked to respond to the question if she had experienced DV from any of her sexual partners in the past 12 months. Three situations were outlined for the survey women's response: (i) verbally threaten to have sex; (ii) physically forced to have sex; and (iii) forced to perform sexual acts that she does not want. More than 1,900 women responded to these questions.

Table 7-4 showed that 29.7% of women stated that they were verbally threatened by their sexual partners to have sex. The highest proportion was reported in Hides, (45.6%), followed by Asaro, (37%), Karkar (28%) and Hiri (16%).

Comparing by iHDSS site, the data showed that significant numbers of women were physically forced to have sex, i.e., Asaro (31.7%), Karkar (21.2%), Hiri (20.1%) and Hides (19.3%). Asaro also recorded the highest rate for women 'forced to perform sexual acts she did not want' (12.4%), followed by Karkar (6.6%), Hiri (2.7%) and Hides (0.3%).

Table 7-4. Experience of domestic violence with sexual partner in the last 12 months among women 15-49, PNG IMR's iHDSS, 2016

In the past 12 months, has any of your sex partners done the following situation:			iHDSS Site				All Sites
			Hiri	Asaro	Karkar	Hides	
Verbally threaten you to have sex	Yes	N	101	236	114	140	591
		%	15.8	37.2	28.1	45.6	29.7
	No	N	516	397	287	167	1367
		%	80.6	62.5	70.7	54.4	68.8
	DK	N	23	2	5	0	30
		%	3.6	.3	1.2	0.0	1.5
	Total	N	640	635	406	307	1988
		%	100.0	100.0	100.0	100.0	100.0
Physically forced you to have sex	Yes	N	128	202	84	58	472
		%	20.1	31.7	21.2	19.3	24.0
	No	N	481	433	307	243	1464
		%	75.6	68.0	77.5	80.7	74.3
	DK	N	27	2	5	0	34
		%	4.2	.3	1.3	0.0	1.7
	Total	N	636	637	396	301	1970
		%	100.0	100.0	100.0	100.0	100.0
Forced you to perform other sexual acts you did not want to	Yes	N	17	79	25	1	122
		%	2.7	12.4	6.6	.3	6.3
	No	N	592	554	349	298	1793
		%	93.2	87.2	91.8	99.7	92.0
	DK	N	26	2	6	0	34
		%	4.1	.3	1.6	0.0	1.7
	Total	N	635	635	380	299	1949
		%	100.0	100.0	100.0	100.0	100.0

7.6 ALCOHOL CONSUMPTION PRIOR TO DOMESTIC VIOLENCE

Alcohol consumption is known to be a high risk factor for domestic violence. **Table 7-5** presents the findings on alcohol consumption prior to domestic violence across the four iHDSS sites. A total of 946 women, who had experienced domestic violence with a sexual partner in the last 12 months, responded to a question of "when your sexual partner used force, how often had he consumed alcohol?" Only 30% of the respondents reported their sexual partners as 'never consumed alcohol' prior to domestic violence. This implies that nearly 70% of the women surveyed reported some form of alcohol consumption prior to DV.

Substantial percentages of women (typically more than 50%) with the exception of Karkar reported their husbands/sexual partners sometimes consumed alcohol before committing DV acts. This proportion was reported highest in Hiri, 66% followed by Asaro, 60%, Hides, 53% and Karkar 40%.

Table 7-5. Alcohol consumption prior to domestic violence of sexual partner among women 15-49, PNG IMR's iHDSS, 2016

When your sexual partner used force, how often had he consumed alcohol?		iHDSS				All Sites
		Hiri	Asaro	Karkar	Hides	
Never	N	45	84	96	61	286
	%	19.3	23.2	50.0	38.4	30.2
Occasionally	N	25	43	16	8	92
	%	10.7	11.9	8.3	5.0	9.7
Sometimes	N	155	220	77	85	537
	%	66.5	60.8	40.1	53.5	56.8
Frequently	N	8	15	3	5	31
	%	3.4	4.1	1.6	3.1	3.3
Total	**N**	**233**	**362**	**192**	**159**	**946**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

8.0 CHILD MORTALITY

8.1 ABSTRACT

The health of children has been an important global health issue and includes efforts at reducing Infant Mortality Rate and Children Under 5 Mortality Rate (Sustainable Development Goal #3 Good Health and Well-Being).

This chapter presents child mortality estimates, including Infant Mortality Rate and Children under 5 Mortality Rate, based on the birth history data of 5,554 women aged 15-49 in four iHDSS sites, namely Asaro, Hides, Hiri and Karkar, using indirect estimation method.

The IMR and CU5MR of women in the four iHDSS sites were estimated at 64 and 96.5 per thousand live births. These estimates are comparable to the estimates, based on direct estimation methods, reported previously by PNG IMR.

One of the overarching goals of the longstanding Millennium Development Goals (MDGs) [now known as the "Sustainable Development Goals (SDGs)" or Global Goals] is the reduction of infant and children under-five mortality. The Sustainable Development Goals build on the MDGs eight anti-poverty targets. The MDGs, adopted in 2000 (with a target completion by 2015), aimed at an array of issues that included slashing poverty, hunger, disease, gender inequality, and access to water and sanitation. The new SDGs, and the broader sustainability agenda, go much further than the MDGs, addressing the root causes of poverty and the universal need for development that works for all people (http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda.html). In terms of health outcomes, there are many "carry overs" between the MDGs and the new SDGs. Specifically, MDG 4 calls for the reduction in under-five mortality by two-thirds between 1990 and 2015. The new post-2015 SDGs carry on this effort. Monitoring and reporting the country progress towards this goal is an important, but challenging objective.

8.2 LIVE BIRTH, CHILD SURVIVING AND PROPORTION OF DEAD

Total number of live births is measured by the sum of total number of sons and the total number of daughters, including those who were born alive and currently live with or live away from their mothers, and those who were born alive, but died later. Live births do not include the number of still births.

Table 8-1 illustrates the process of calculating the mean numbers of live births and children surviving, and estimated numbers of live births and children surviving in each age group of women aged 15-49. Number of children born alive but died later was calculated, then the proportion of children dead was calculated for each age group of women aged 15-49 in all four iHDSS sites.

Table 8-1. Mean and total numbers of live birth, child surviving and proportion of child dead by mother's age, PNG IMR's iHDSS, 2015

		Live births		Child surviving		Children born alive but later died	
Women age group	**No. of women**	**Mean**	**Total**	**Mean**	**Total**	**N**	**Proportion of dead**
15-19	1177	1.36	1,601	1.32	1,554	47	29.4
20-24	929	1.68	1,561	1.58	1,468	93	59.5
25-29	878	2.36	2,072	2.2	1,932	140	67.8
30-34	796	3.51	2,794	3.07	2,444	350	125.4
35-39	659	3.84	2,531	3.51	2,313	217	85.9
40-44	685	4.27	2,925	3.77	2,582	343	117.1
45-49	430	4.48	1,926	3.87	1,664	262	136.2
All age groups	**5,554**	**3.16**	**17,551**	**2.92**	**16,218**	**1,333**	**75.9**

Table 8.1 shows the mean, total numbers of live births, child surviving and proportion of child dead by mother's age groups in all the iHDSS sites. A total of 5,554 women aged 15 – 49 responded to the questions of child mortality module. As expected, the highest mean of live births belonged to the women of the highest age group (45-49), 4.48 children per woman on average.

8.3 CHILD MORTALITY

Child mortality as measured and discussed in this chapter includes Infant Mortality Rate (IMR) and Children Under-five Mortality Rate (CU5MR). IMR is the probability of dying before the first birthday. CU5MR is the probability of dying before the fifth birthday.

There are a number of methods available for measuring child mortality. Direct estimation questions involve information which can be collected from questions like "Has anyone in this household died in the last year?" This direct measure of child mortality is time consuming, more expensive, and requires greater attention to training, supervision and data collection.[1] Alternatively, indirect estimation methods for measuring child mortality can produce robust estimates that are comparable with the ones obtained from other sources. Indirect methods minimize the pitfalls of memory lapses, inexact or misinterpreted definitions, and poor interviewing techniques.

In this Chapter, IMR and CU5MR were calculated, using the indirect estimation technique known as the Brass method. The data used in the estimation are included:

- The mean number of children ever born for the five-year age groups of women aged 15-49;
- The proportion of children dead after birth among these five-year age groups of women.

[1] Direct estimations of IMR and CU5MR was used in the PNG IMR PiHP March 2015 Report

The technique converts the proportions of dead among children of women in each age group into probabilities of dying by taking into account the approximate length of exposure of children to the risk of dying, assuming a particular model age pattern of mortality.[2]

Table 8-1 provides the proportion of child dead obtained from women age groups of 20-24, 25–29 and 30–34, which were 60, 68, and 125 per thousand live births, respectively. These figures were used to estimate child mortality by averaging the proportions of child dead among those women age groups. The IMR was estimated at 64 per thousand live births and CU5MR was estimated around 96.5 per thousand live births, referred to mid-2015.

The current data available from the iHDSS do not allow estimate IMR and CU5MR by rural-urban sector, iHDSS site, women's education, household wealth index.

The IMR and CU5MR of women in the four iHDSS sites were estimated at 64 and 96.5 per thousand live births for the year 2015, based on the indirect estimation method, using the birth history data of women of reproductive age, 15-49. These estimates are comparable to the estimates, based on direct estimation methods, using birth and death records of households as reported previously by PNG IMR: IMR at 60 and CU5MR at 150 per thousand live births for the year 2014.

However, this report revealed higher child mortality rates at the sub-national level, compared to the national level, which was reported for IMR at 48 and CU5MR at 63 by the National Statistics Office in 2012.

Chapter 13 (Discussion Chapter) will further analyze and compare the two estimation methods and child mortality estimates. An in-depth analysis of child mortality in PNG using data available from the iHDSS will be presented in a separate research paper.

[2] United Nations (1983). Indirect Techniques for Demographic Estimation. Population Studies No. 81; United Nations (1990) Step-by-step guide to the estimation of Child Mortality; United Nations (1990) United Nations programme for child mortality estimation: a microcomputer programme to accompany the step-by-step guide to the estimation of child mortality. Population Studies No. 107.

9.0 CHAPTER 9 MATERNAL HEALTH

9.1 ABSTRACT

This Chapter reports the access and utilisation of antenatal care services among 1,418 women aged 25-49, who gave birth in the last two years and responded to the questions of this data module across the four surveillance sites. Of which, 1,372 women (97%) reported receiving at least once, antenatal care by a skilled health worker such as a doctor, HEO, Nurse/Commune Health Worker, and Midwife during the last pregnancy.

With regard to the number of antenatal care visits, there were 701 women (49%) reported attending four visits or more for antenatal care services. Still 118 women (8%) reported having no visit for antenatal care services.

In term of content of antenatal care, 1065 women (75%) reported having their blood pressure measured; 386 women (27%) having urine sample taken; and 689 women (48.5%) having blood sample taken. However, there were only 337 women reporting have used all three services, accounted for about 25% of the total respondents.

452 women reported having assistance from skilled birth attendants (such as doctors (73), HEO (42), Nurse/ Commune Health Worker (222) and Midwife (115)), accounted for 31.5% of women giving birth in the last two years. A total of 185 women reported receiving birth assistance from unskilled birth attendants, including Traditional Birth Attendant (39), Village Health Worker (21), relative/ friend (114), and other persons (11), accounted for 13% of the total women surveyed. Only two women reported delivering birth by themselves without assistance from any person. There were 17 Caesarean sections reported by the women surveyed.

For place of birth delivery, the analysis of data from 435 respondents showed that about one third of women delivered births at home and two third delivered at public health facilities; only five reported birth deliveries at private health facilities and two in other places.

9.2 ANTENATAL CARE

Table 9-1. Access and utilisation of antenatal care services among women aged 15–49, who gave birth in the last two years, PNG IMR's iHDSS, 2016

			No. of women	Doctor	HEO	Nurse/ CHW	Midwife	TBA	VHW	Others	At least once by skilled personal
iHDSS site	Hiri	N	587	67	107	409	40	2	25	0	556
		%	41.4	39.2	61.1	41.3	46.5	20.0	73.5	0.0	40.5
	Asaro	N	327	75	51	209	21	6	8	0	291
		%	23.1	43.9	29.1	21.1	24.4	60.0	23.5	0.0	21.2
	Karkar	N	284	28	16	198	22	2	1	5	337
		%	20.0	16.4	9.1	20.0	25.6	20.0	2.9	100.0	24.6
	Hides	N	220	1	1	174	3	0	0	0	188
		%	15.5	.6	.6	17.6	3.5	0.0	0.0	0.0	13.7
	Total	N	1418	171	175	990	86	10	34	5	1372
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Urban rural	Urban	N	0	0	0	0	0	0	0	0	0
		%	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	Rural	N	1418	171	175	990	86	10	34	5	1372
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Total	N	1418	171	175	990	86	10	34	5	1372
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Education attendance	Yes	N	1115	147	157	777	76	6	29	5	1106
		%	79.5	86.5	90.8	79.2	88.4	60.0	85.3	100.0	82.0
	No	N	288	23	16	204	10	4	5	0	243
		%	20.5	13.5	9.2	20.8	11.6	40.0	14.7	0.0	18.0
	Total	N	1403	170	173	981	86	10	34	5	1349
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Highest Education	Preschool	N	11	1	1	6	0	0	0	0	11
		%	1.0	.7	.6	.8	0.0	0.0	0.0	0.0	1.0
	Elementary	N	24	0	2	19	2	0	0	0	27
		%	2.2	0.0	1.3	2.5	2.7	0.0	0.0	0.0	2.4
	Primary	N	607	78	80	413	31	6	15	4	631
		%	54.7	53.1	51.3	53.3	41.3	100.0	51.7	80.0	55.5
	Lower Secondary	N	377	56	64	273	30	0	10	0	384
		%	34.0	38.1	41.0	35.2	40.0	0.0	34.5	0.0	33.8
	Upper Secondary	N	63	4	4	47	5	0	4	1	56
		%	5.7	2.7	2.6	6.1	6.7	0.0	13.8	20.0	4.9
	Vocational	N	9	4	2	5	2	0	0	0	10
		%	.8	2.7	1.3	.6	2.7	0.0	0.0	0.0	.9
	Graduate	N	18	4	3	12	5	0	0	0	17
		%	1.6	2.7	1.9	1.5	6.7	0.0	0.0	0.0	1.5
	Total	N	1109	147	156	775	75	6	29	5	1137
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 9-1 shows the access and utilization of antenatal care services during the last pregnancy among a total of 1,418 women, aged 15-49, who gave birth in the two years preceding the survey in the four surveillance sites. The data analysis revealed that Nurse/Community Health Worker (CHW) was most commonly seen for antenatal care (990), followed by HEO (175) or doctor (171), and mid-wives (86).

Few women reported visiting traditional birth attendants (TBA) (10) and village health workers (VHW) (34).

Women in Hiri site appeared to have the best access to antenatal care compared to other sites as Hiri women accounted for the highest proportion of visits to all types of antenatal care providers e.g. 39% of visits to a doctor, 61% of visits to a HEO, 41.3% of visits to a Nurse/CHW, and 46% to a midwife.

With regard to the association between education and utilization of antenatal care, the data analysis also revealed that women, who reported having ever attended school, were more likely than those who did not attend school to visit a doctor or a HEO or a midwife during the last pregnancy for antenatal care. In contrast, there was no significant difference between school attendance and the choice of visiting CHW or TBA for antenatal care.

Women with school attendance appeared more likely to visit a skilled health worker for at least one time for antenatal care. In contrast, women without school attendance were more likely having no access to antenatal care services in the last pregnancy.

Among 1,109 women, who reported having gone to school, it is reported that women with the highest education level completed being primary and lower secondary, had the highest proportion that visited someone for antenatal care. The data showed a trend between antenatal care attendance and the level of a women's education.

Table 9-2. Number of antenatal care visits in the last pregnancy among women aged 25-49 who had a live birth in the last two years, PNG IMR's iHDSS, 2016

			No. of women	None antenatal care	One visit	Two visits	Three visits	Four+ visits
iHDSS site	Hiri	N	587	17	8	20	87	381
		%	41.4	14.4	25.0	18.3	34.0	54.4
	Asaro	N	327	46	4	25	49	145
		%	23.1	39.0	12.5	22.9	19.1	20.7
	Karkar	N	284	28	17	30	51	118
		%	20.0	23.7	53.1	27.5	19.9	16.8
	Hides	N	220	27	3	34	69	57
		%	15.5	22.9	9.4	31.2	27.0	8.1
	Total	N	1418	118	32	109	256	701
		%	100.0	100.0	100.0	100.0	100.0	100.0
Urban rural	Urban	N	0	0	0	0	0	0
		%	0	0	0	0	0	0
	Rural	N	1418	118	32	109	256	701
		%	100.0	100.0	100.0	100.0	100.0	100.0
	Total	N	1418	118	32	109	256	701
		%	100.0	100.0	100.0	100.0	100.0	100.0
Education attendance	Yes	N	1115	74	29	72	184	606
		%	79.5	62.7	90.6	67.3	72.2	87.3
	No	N	288	44	3	35	71	88
		%	20.5	37.3	9.4	32.7	27.8	12.7
	Total	N	1403	118	32	107	255	694
		%	100.0	100.0	100.0	100.0	100.0	100.0
Highest Education	Preschool	N	15	5	0	0	5	4
		%	1.3	6.9	0.0	0.0	2.7	.7
	Elementary	N	24	1	3	3	5	10
		%	2.1	1.4	10.3	4.1	2.7	1.6
	Primary	N	618	50	19	54	102	309
		%	54.7	69.4	65.5	73.0	54.5	50.2
	Lower Secondary	N	380	15	3	13	63	231
		%	33.7	20.8	10.3	17.6	33.7	37.6
	Upper Secondary	N	63	1	3	2	7	43
		%	5.6	1.4	10.3	2.7	3.7	7.0
	Vocational	N	9	0	0	0	1	8
		%	.8	0.0	0.0	0.0	.5	1.3
	Graduate	N	19	0	1	2	4	9
		%	1.7	0.0	3.4	2.7	2.1	1.5
	DK	N	1	0	0	0	0	1
		%	.1	0.0	0.0	0.0	0.0	.2
	Total	N	1129	72	29	74	187	615
		%	100.0	100.0	100.0	100.0	100.0	100.0
Age group	15-19	N	88	9	1	5	11	52
		%	7.1	10.0	3.4	5.4	5.5	8.0
	20-24	N	290	18	7	17	49	171
		%	23.4	20.0	24.1	18.3	24.4	26.3
	25-29	N	357	22	10	23	63	191
		%	28.8	24.4	34.5	24.7	31.3	29.3
	30-34	N	264	18	9	24	50	124
		%	21.3	20.0	31.0	25.8	24.9	19.0
	35-39	N	138	11	2	13	19	72
		%	11.1	12.2	6.9	14.0	9.5	11.1
	40-44	N	84	10	0	9	7	37
		%	6.8	11.1	0.0	9.7	3.5	5.7
	45-49	N	19	2	0	2	2	4
		%	1.5	2.2	0.0	2.2	1.0	.6
	Total	N	1240	90	29	93	201	651
		%	100.0	100.0	100.0	100.0	100.0	100.0

Table 9-2 shows the number of antenatal care visits during the last pregnancy among 1,418 women aged 15-49 who gave a birth in two years preceding the survey. The data analysis revealed that about half of women (701/1418) reported having had four or more antenatal care visits across all four iHDSS sites. Among those who reported having four or more antenatal care visits, women in Hiri site accounted for the highest proportion of women (54.4%), followed by Asaro (20%) and Karkar (17%), and Hides (8%).

118 women among the 1,418 respondents (8%) reported receiving no antenatal care, with Asaro reporting the highest number, (39 women, 28%), while Hiri had the lowest number, (17 women. 14%).

The data analysis also revealed that a woman's education was strongly associated with access and utilization of antenatal care. Women who reported school attendance were less likely to have no access to antenatal care, and by contrast, they were more likely to use the services, as reflected in the higher number of antenatal care visits, compared to women who had no education attendance and lower antenatal care visits.

Further analysis of the association between the highest education attainment and the use of antenatal care showed that more than 50% of women, who reported having four or more antenatal care visits, attained primary education level. The data showed a trend of increased access and utilization of antenatal care in accordance with the women education attainment.

The data analysis further revealed that among 651 women who reported four or more antenatal care visits, women in age group 25-29 accounted for the largest proportion, (29%), followed by women of age group 20-24, (26%) and women of age group 30-34, (19%). This distribution was comparable to the age group distribution, meaning that there was no significant association between age group of women and the number of visit for antenatal care.

9.3 CONTENT OF ANTENATAL CARE

Table 9-3. Women 15–49 reported having blood pressure measured, urine sample and blood sample taken as part of antenatal care during the last pregnancy, PNG IMR's iHDSS, 2016

			No. of women	Blood pressure measured	Urine sample taken	Blood sample taken	All three services used
iHDSS site	Hiri	N	587	500	209	269	194
		%	41.4	46.9	54.1	39.0	57.6
	Asaro	N	327	204	92	162	81
		%	23.1	19.2	23.8	23.5	24.0
	Karkar	N	284	189	79	132	58
		%	20.0	17.7	20.5	19.2	17.2
	Hides	N	220	172	6	126	4
		%	15.5	16.2	1.6	18.3	1.2
	Total	N	1418	1065	386	689	337
		%	100.0	100.0	100.0	100.0	100.0
		N					
Urban rural	Urban	%	0	0	0	0	0
	Rural	N	1418	1065	386	689	337
		%	100.0	100.0	100.0	100.0	100.0
	Total	N	1418	1065	386	689	337
		%	100.0	100.0	100.0	100.0	100.0
School attendance	Yes	N	1115	857	343	531	303
		%	79.5	81.3	90.0	78.0	91.0
	No	N	288	197	38	150	30
		%	20.5	18.7	10.0	22.0	9.0
	Total	N	1403	1054	381	681	333
		%	100.0	100.0	100.0	100.0	100.0
Education level	Preschool	N	15	9	2	6	1
		%	1.3	1.0	.6	1.1	.3
	Elementary	N	24	18	4	11	3
		%	2.1	2.1	1.2	2.0	1.0
	Primary	N	618	446	176	289	147
		%	54.7	51.3	50.9	53.5	48.2
	Lower Secondary	N	380	315	130	183	122
		%	33.7	36.2	37.6	33.9	40.0
	Upper Secondary	N	63	55	20	30	18
		%	5.6	6.3	5.8	5.6	5.9
	Vocational training	N	9	9	7	8	7
		%	.8	1.0	2.0	1.5	2.3
	Graduate	N	19	17	7	13	7
		%	1.7	2.0	2.0	2.4	2.3
	DK	N	1	1	0	0	0
		%	.1	.1	0.0	0.0	0.0
	Total	N	1129	870	346	540	305
		%	100.0	100.0	100.0	100.0	100.0
Age group	15-19	N	88	54	31	41	23
		%	7.1	5.8	8.1	7.1	6.9
	20-24	N	290	227	101	153	91
		%	23.4	24.3	26.5	26.4	27.2
	25-29	N	357	285	109	169	97
		%	28.8	30.5	28.6	29.2	29.0
	30-34	N	264	196	71	119	61
		%	21.3	21.0	18.6	20.6	18.3
	35-39	N	138	108	41	57	37
		%	11.1	11.6	10.8	9.8	11.1
	40-44	N	84	56	25	34	23
		%	6.8	6.0	6.6	5.9	6.9
	45-49	N	19	9	3	6	2
		%	1.5	1.0	.8	1.0	.6
	Total	N	1240	935	381	579	334
		%	100.0	100.0	100.0	100.0	100.0

Table 9-3 shows the proportion of women aged 15-49 years, who reported having their blood pressure measured, urine sample taken, and blood sample taken as part of antenatal care. The data analysis of 1418 respondents revealed that 1065 women reported having their blood pressure measured; 386 women having urine sample taken; and 689 women having blood sample taken. However, there were only 337 women reporting have used all three services, accounted for about 25% of the total respondents.

Among the four sites, Hiri had the highest proportion of respondents, (41%); hence, this site reported the highest proportion of who had one of the three services, ranging from 39% to 54%. By contrast, Hides site reported only six women having had blood pressure measured and only four women received all three services. Further study on availability and accessibility of antenatal care services in the iHDSS sites would provide further insights into the observation.

The data analysis also revealed that women with school attendance were more likely to have access to and utilization of antenatal care services e.g. among 1054 women having blood pressure measured, 81% of women reported having school attendance compared to 19% of those having never attended school. Among the 333 women reported using all three antenatal services, 91 women have attended school, accounted for 91%.

Among women who reported having their blood pressure measured, urine and blood samples taken, the number of women who attained primary education accounted for more than 50%. For those women who used all three antenatal services, women with primary education also accounted for nearly a half, (48%), followed by women with lower secondary education, (40%).

There was no significant difference between age groups of the mothers and the utilization of each antenatal service. For those women (334), who reported using all three types of services provided in the antenatal care, the age distribution was similar to that of the total respondents (1,240).

9.4 ASSISTANCE AT BIRTH DELIVERY

Table 9-4. Assistance at birth delivery among women aged 15–49 who gave birth in the last two years, PNG IMR's iHDSS, 2016

			No. of women	Skilled birth attendant				Unskilled birth attendant				No attendant	Any skilled attendant	Caesarean section
				Doctor	HEO	Nurse/ CHW	Midwife	TBA	VHW	Relative/ friend	Others			
iHDSS site	Hiri	N	587	48	29	110	74	12	17	68	0	0	164	5
		%	40.9	65.8	69.0	49.5	64.3	30.8	81.0	59.6	0.0	0.0	54.1	29.4
	Asaro	N	326	14	7	44	23	5	2	11	3	1	62	3
		%	22.7	19.2	16.7	19.8	20.0	12.8	9.5	9.6	27.3	50.0	20.5	17.6
	Karkar	N	296	9	6	41	9	18	2	27	8	0	48	6
		%	20.6	12.3	14.3	18.5	7.8	46.2	9.5	23.7	72.7	0.0	15.8	35.3
	Hides	N	225	2	0	27	9	4	0	8	0	1	29	3
		%	15.7	2.7	0.0	12.2	7.8	10.3	0.0	7.0	0.0	50.0	9.6	17.6
	Total	N	1434	73	42	222	115	39	21	114	11	2	303	17
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Urban rural		N	0	0	0	0	0	0	0	0	0	0	0	0
	Urban	%	0	0	0	0	0	0	0	0	0	0	0	0
	Rural	N	1434	73	42	222	115	39	21	114	11	2	303	17
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Total	N	1434	73	42	222	115	39	21	114	11	2	303	17
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
School attendance	Yes	N	1121	68	39	181	99	33	18	100	11	1	254	13
		%	79.2	94.4	92.9	82.6	86.8	86.8	90.0	90.1	100.0	50.0	84.7	86.7
	No	N	294	4	3	38	15	5	2	11	0	1	46	2
		%	20.8	5.6	7.1	17.4	13.2	13.2	10.0	9.9	0.0	50.0	15.3	13.3
	Total	N	1415	72	42	219	114	38	20	111	11	2	300	15
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Education level	Preschool	N	17	0	0	0	0	0	0	0	0	0	3	0
		%	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
	Elementary	N	28	1	1	5	4	0	0	1	0	0	8	1
		%	2.5	1.5	2.6	2.8	4.0	0.0	0.0	1.0	0.0	0.0	3.1	7.1
	Primary	N	620	26	11	80	35	25	8	57	9	1	104	8
		%	54.3	38.2	28.2	44.2	35.4	78.1	44.4	57.6	81.8	100.0	40.0	57.1
	Lower Secondary	N	388	35	27	80	50	4	7	34	2	0	124	5
		%	34.0	51.5	69.2	44.2	50.5	12.5	38.9	34.3	18.2	0.0	47.7	35.7
	Upper Secondary	N	61	2	0	10	7	2	3	6	0	0	13	0
		%	5.3	2.9	0.0	5.5	7.1	6.3	16.7	6.1	0.0	0.0	5.0	0.0
	Vocational training	N	10	1	0	2	0	0	0	1	0	0	2	0

			No. of women	Skilled birth attendant				Unskilled birth attendant				No attendant	Any skilled attendant	Caesarean section
				Doctor	HEO	Nurse/ CHW	Midwife	TBA	VHW	Relative/ friend	Others			
		%	.9	1.5	0.0	1.1	0.0	0.0	0.0	1.0	0.0	0.0	.8	0.0
	Graduate	N	17	3	0	4	3	1	0	0	0	0	6	0
		%	1.5	4.4	0.0	2.2	3.0	3.1	0.0	0.0	0.0	0.0	2.3	0.0
	Total	N	1141	68	39	181	99	32	18	99	11	1	260	14
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age group	15-19	N	90	6	2	13	7	1	1	4	0	0	18	2
		%	7.2	8.3	4.8	6.4	6.5	2.6	4.8	3.8	0.0	0.0	6.3	13.3
	20-24	N	308	15	12	44	32	9	5	23	4	1	66	4
		%	24.6	20.8	28.6	21.6	29.6	23.1	23.8	21.9	36.4	100.0	23.2	26.7
	25-29	N	356	15	8	60	23	12	8	33	2	0	76	4
		%	28.5	20.8	19.0	29.4	21.3	30.8	38.1	31.4	18.2	0.0	26.8	26.7
	30-34	N	265	16	8	49	29	9	4	24	3	0	67	2
		%	21.2	22.2	19.0	24.0	26.9	23.1	19.0	22.9	27.3	0.0	23.6	13.3
	35-39	N	140	11	9	21	10	4	2	13	2	0	34	2
		%	11.2	15.3	21.4	10.3	9.3	10.3	9.5	12.4	18.2	0.0	12.0	13.3
	40-44	N	76	8	2	14	5	3	0	8	0	0	20	1
		%	6.1	11.1	4.8	6.9	4.6	7.7	0.0	7.6	0.0	0.0	7.0	6.7
	45-49	N	16	1	1	3	2	1	1	0	0	0	3	0
		%	1.3	1.4	2.4	1.5	1.9	2.6	4.8	0.0	0.0	0.0	1.1	0.0
	Total	N	1251	72	42	204	108	39	21	105	11	1	284	15
		%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 9-4 shows assistance at delivery among women, aged 15-49 who gave birth in the last two years. Among 1,434 women reported having delivered births in the last two years, a total of 452 women reported having assistance from skilled birth attendants, including a doctor (73), HEO (42), Nurse/CHW (222) and Midwife (115). A total of 185 women reported receiving birth assistance from unskilled birth attendants, including TBA (39), VHW (21), relative/ friend (114), and other persons (11). Only two women reported delivering birth by themselves without assistance from any person. There were 17 Caesarean sections reported in the surveyed cohort.

Comparing data on assisted birth attendance across the four surveillance sites, women in Hiri had better access to antenatal care than other sites. Among 303 women, who reported receiving assistance from any skilled birth attendants, 164 women from Hiri accounted for 54%, followed by Asaro site, 20%, Karkar, 16%, while women from Hides accounted for only 10%.

Comparing the utilization of antenatal care service providers between the two groups: 620 of women, who had primary education (54%) and 388 women who attained lower secondary education (34%), the primary educated women were more likely to receive assistance from unskilled birth attendants, ranging from 44% to 82% across the sites. The secondary school educated women were more likely to use the services provided by skilled attendants, ranged from 44% to 69% across sites.

There was no significant association between the mother age groups and the utilisation of antenatal care service providers.

Karkar site reported the highest number of women (six out of 17) delivered babies through caesarean section. Women with school attendance were more likely than those who did not attend school to have births delivered through caesarean section, 13 cases compared to 2 cases, respectively. These findings should be cautiously interpreted as the case numbers are very small.

In term of place of birth delivery, the majority of births (70%) in the four surveillance sites were reported being delivered at other health facilities, i.e., health clinics operated by religious organisations.

9.5 PLACE OF DELIVERY

Table 9-5. Place of birth delivery among women aged 15–49, PNG IMR's iHDSS, 2016

			Number of women	Home	Public health	Private health	Other
iHDSS site	Hiri	N	587	55	152	4	1
		%	40.9	39.0	53.0	80.0	50.0
	Asaro	N	326	19	60	1	1
		%	22.7	13.5	20.9	20.0	50.0
	Karkar	N	296	53	45	0	0
		%	20.6	37.6	15.7	0.0	0.0
	Hides	N	225	14	30	0	0
		%	15.7	9.9	10.5	0.0	0.0
	Total	N	1434	141	287	5	2
		%	100.0	100.0	100.0	100.0	100.0
Urban rural	Urban	N	0	0	0	0	0
		%	0	0	0	0	0
	Rural	N	1434	141	287	5	2
		%	100.0	100.0	100.0	100.0	100.0
	Total	N	1434	141	287	5	2
		%	100.0	100.0	100.0	100.0	100.0
Education attendance	Yes	N	1121	118	239	5	2
		%	79.2	84.9	84.5	100.0	100.0
	No	N	294	21	44	0	0
		%	20.8	15.1	15.5	0.0	0.0
	Total	N	1415	139	283	5	2
		%	100.0	100.0	100.0	100.0	100.0
Education level	Preschool	N	12	0	0	0	0
		%	1.1	0.0	0.0	0.0	0.0
	Elementary	N	28	2	6	0	0
		%	2.5	1.7	2.5	0.0	0.0
	Primary	N	607	82	97	1	1
		%	54.4	70.1	40.6	20.0	50.0
	Lower Secondary	N	381	24	119	3	1
		%	34.1	20.5	49.8	60.0	50.0
	Upper Secondary	N	61	8	11	0	0
		%	5.5	6.8	4.6	0.0	0.0
	Vocational training	N	10	0	1	1	0
		%	.9	0.0	.4	20.0	0.0
	University Graduate	N	17	1	5	0	0
		%	1.5	.9	2.1	0.0	0.0
	Total	N	1116	117	239	5	2
		%	100.0	100.0	100.0	100.0	100.0
Age	15-19	N	90	2	19	0	0
		%	7.2	1.6	7.1	0.0	0.0
	20-24	N	308	29	62	0	2
		%	24.6	22.5	23.1	0.0	100.0
	25-29	N	356	42	71	3	0
		%	28.5	32.6	26.5	60.0	0.0
	30-34	N	265	32	64	1	0
		%	21.2	24.8	23.9	20.0	0.0
	35-39	N	140	13	32	1	0
		%	11.2	10.1	11.9	20.0	0.0
	40-44	N	76	10	17	0	0
		%	6.1	7.8	6.3	0.0	0.0
	45-49	N	16	1	3	0	0
		%	1.3	.8	1.1	0.0	0.0
	Total	N	1251	129	268	5	2

			Number of women	Home	Public health	Private health	Other
		%	100.0	100.0	100.0	100.0	100.0
Number of antenatal care visits	None	N	122	16	11	0	0
		%	8.7	11.5	3.9	0.0	0.0
	1-3	N	413	45	72	1	0
		%	36.0	39.8	29.1	20.0	0.0
	4+	N	735	68	175	4	1
		%	64.0	60.2	70.9	80.0	100.0
	Total	N	1148	113	247	5	1
		100.0	100.0	100.0	100.0	100.0	100.0

Table 9-5 shows further analysis of place of birth delivery among women aged 15–49 who gave birth in the last two years. The analysis of data from 435 respondents showed that about one third of women delivered births at home and two third delivered at public health facilities; only five reported birth deliveries at private health facilities with two in other places.

Hiri women were more likely than other three sites to deliver births at public health facilities. The same trend was also observed among women with school attendance. The majority of women 70%, who delivered births at home, attained primary education level, compared to 20% who obtained lower secondary education. By contrast, more women with a higher education (lower secondary education) tended to deliver births at public health facilities rather than women with lower education (primary education).

There was no significant difference in the choice of place for birth delivery among women in different age groups.

Among 113 women who delivered at home, 60% reported having four visits or more for antenatal care. Of the 247 women who delivered at public health facilities, more than 70% reported four visits or more for antenatal care.

10.0 NEWBORN HEALTH

10.1 ABSTRACT

This Chapter presents major findings from the newborn health data module. 77.1% of mothers perceived size/weight of their babies born in their last births as average. Around 90% across all sites said their babies were weighed at birth. The weight records from health record books were actually lower than that from mothers'/caretakers' recall e.g. 27% of newborn babies weighed between 2800-3200 grams from health record book compared to 43% from care takers' recalls.

90% of the babies across all sites were breastfed and over half of the babies were breastfed within the first hour after the birth. Almost all women (90%) reported never giving any liquids other than breast milk to the newborn in the first three days after birth. Only 10% of mothers reported giving their newborns other liquids in the first three days.

10.2 PERCEPTION OF MOTHERS ABOUT SIZE/ BIRTH WEIGHT OF THEIR NEWBORN BABIES

Table 10-1 is an analysis of the perceptions of mothers about birth weights of their newborn babies from their last birth event. The data analysis revealed that most mothers across all the study sites, (77.1%) perceived the size/weight of their newborn babies from their last birth as average. 16% perceived their newborns to be larger than average, and 7% considered their newborns smaller than the average.

Table 10-1. Perception of mother about the birth weight of newborns, PNG IMR's iHDSS, 2016

Perception of mother about birth weight of newborn		iHDSS Sites				
		Hiri	Asaro	Karkar	Hides	All sites
Very Large	N	6	6	6	1	19
	%	3.5	8.8	8.7	3.1	5.6
Larger than Average	N	15	5	6	6	32
	%	8.7	7.4	8.7	18.8	9.4
Average	N	138	51	49	25	263
	%	80.2	75	71	78.1	77.1
Smaller than Average	N	12	5	6	0	23
	%	7	7.4	8.7	0	6.7
Very Small	N	0	0	1	0	1
	%	0	0	1.4	0	0.3
DK	N	1	1	1	0	3
	%	0.6	1.5	1.4	0	0.9
Total	**N**	**172**	**68**	**69**	**32**	**341**
	%	**100**	**100**	**100**	**100**	**100**

Table 10.2 shows whether or not the last newborn baby is weighed at birth. Most mothers, (around 90% across all sites), said their babies were weighed at birth. Almost 10% of the caregivers said either their babies were not weighed at birth or they didn't know. Hiri has the highest proportion of birth mothers (95%) who said their last born babies were weighed at birth, followed by Asaro (86%), and Hides (86%). Karkar recorded the lowest proportion with 79% of mothers reporting that their last newborn was weighted at birth.

Table 10-2. The Newborn Baby Weighed at Birth, PNG IMR's iHDSS, 2016

		iHDSS Sites				
New Born Baby Weighed at Birth		**Hiri**	**Asaro**	**Karkar**	**Hides**	**All Sites**
Yes	N	135	56	49	19	259
	%	95.7	86.2	79.0	86.4	89.3
No	N	5	3	9	1	18
	%	3.5	4.6	14.5	4.5	6.2
DK	N	1	6	4	2	13
	%	0.7	9.2	6.5	9.1	4.5
Total	**N**	**141**	**65**	**62**	**22**	**290**
	%	**100**	**100**	**100**	**100**	**100**

10.3 BIRTH WEIGHT OF NEWBORNS

Table 10-3. Birth Weight of the Last Newborn Baby (Child) from Handbook and Recall PNG IMR's iHDSS, 2016

Newborn's Birth Weight			**iHDSS Sites**				
	Birth Weights (g)		Hiri	Goroka	Karkar	Hides	All Sites
Birth Weight from Handbook	<1500	N	1	0	3	0	4
		%	0.8	0	2.8	0	1.3
	1500-1800	N	0	1	0	0	1
		%	0	1.4	0	0	0.3
	1800-2200	N	8	23	7	0	38
		%	6.7	32.9	6.4	0	12.6
	2200-2800	N	34	11	29	1	75
		%	28.6	15.7	26.6	33.3	24.9
	2800-3200	N	42	20	21	1	84
		%	35.3	28.6	19.3	33.3	27.9
	3200-3600	N	24	10	11	1	46
		%	20.2	14.3	10.1	33.3	15.3
	3600-4000	N	8	3	19	0	30
		%	6.7	4.3	17.4	0	10
	>4000	N	2	2	19	0	23
		%	1.7	2.9	17.4	0	7.6
	Total	N	119	70	109	3	301
		%	100	100	100	100	100

Newborn's Birth Weight			iHDSS Sites				
Birth Weight from Recall	<1500	N	2	0	7	0	9
		%	0.5	0	4.6	0	1.3
	1500-1800	N	0	2	1	0	3
		%	0	2.5	0.7	0	0.4
	1800-2200	N	15	4	38	0	57
		%	3.9	5.1	25.2	0	8.4
	2200-2800	N	94	11	45	5	155
		%	24.7	13.9	29.8	7.4	22.8
	2800-3200	N	184	36	35	36	291
		%	48.3	45.6	23.2	52.9	42.9
	3200-3600	N	60	14	8	13	95
		%	15.7	17.7	5.3	19.1	14
	3600-4000	N	20	3	9	6	38
		%	5.2	3.8	6	8.8	5.6
	>4000	N	6	9	8	8	31
		%	1.6	11.4	5.3	11.8	4.6
	Total	N	381	79	151	68	679
		%	100	100	100	100	100

Table 10.3 shows the last newborn babies' birth weights recorded either from the handbook or from the caregiver's recall. The results show that the birth weights of 301 newborns were recorded in their Handbooks and the birth weights of 679 newborns were from recall of their mothers/caretakers.

The results across all sites indicates that in both cases either the birth records taken from Handbooks or recalled from caretakers, the birth weights of the last newborns fall within the average birth weight. Hiri and Karkar had the highest proportion of births and weight records both from the handbook and recall compared to that of the other two sites.

Data analysis also indicates that actual number of weight records from health record books was lower than number of birth weights from mothers'/caretakers' recall. Hides recorded the lowest number of birth weight records from health record books.

10.4 BREASTFEEDING

Table 10-4. Breastfeeding of the last newborn baby, PNG IMR's iHDSS, 2016

Breastfeeding of the New Born Baby			iHDSS Sites				All Sites
			Hiri	Asaro	Karkar	Hides	
Newborn baby ever breastfed	Yes	N	577	308	340	216	1441
		%	95.2	87.7	91.9	98.2	93.1
	No	N	29	43	30	4	106
		%	4.8	12.3	8.1	1.8	6.9
	Total	N	606	351	370	220	1547
		%	100	100	100	100	100
Newborn baby breastfed first time after birth	Within 1st hour	N	295	134	167	202	798
		%	50.4	42.3	47.4	93.1	54.2
	Between 1st – 24hs	N	244	154	165	14	577
		%	41.7	48.6	46.9	6.5	39.2
	After 24 hours	N	42	16	19	1	78
		%	7.2	5	5.4	0.5	5.3
	DK	N	4	13	1	0	18
		%	0.7	4.1	0.3	0	1.2
	Total	N	585	317	352	217	1471
		%	100	100	100	100	100

Table 10-4 shows breastfeeding history for the last newborn baby as reported by the mothers/caregivers. The results indicate that more than 90% of the babies across all sites were breastfed and that over half of the babies were breastfed within the first hour after the birth. The results also showed that only a small percentage of the babies were not breastfed. In comparison to the other three sites, mothers in Hides had the best breastfeeding practices, i.e., only four babies weren't breastfed while only 15 babies were breastfed between first to after 24 hours after the birth. In contrast, mothers at the Asaro site reported 12.3% of newborns having never breastfed and 42% were breastfed between the first and 24 hours.

10.5 Drinks Given to the Newborn

Table 10-5. Other Drinks Given to the Newborn in the First Three Days, PNG IMR's iHDSS, 2016

Last New Born Baby Given Any Other Drinks			iHDSS Sites				All Sites
			Hiri	Asaro	Karkar	Hides	
First three days, newborn baby given other drinks	Yes	N	85	11	41	5	142
		%	14.9	3.6	12.1	2.4	10
	No	N	484	295	299	206	1284
		%	85.1	96.4	87.9	97.6	90
	Total	N	569	306	340	211	1,426
		%	100	100	100	100	100

List of Other Drinks Given

Last New Born Baby Given Any Other Drinks			iHDSS Sites				All Sites
			Hiri	Asaro	Karkar	Hides	
A. Milk (other than Breast Milk)	No	N	2233	2170	1367	655	6425
		%	97.4	100	97.1	100	98.5
	Yes	N	59	0	41	0	100
		%	2.6	0	2.9	0	1.5
	Total	N	2292	2170	1408	655	6525
			100	100	100	100	100
B. Plain Water	No	N	2250	2166	1391	655	6462
		%	98.2	99.8	98.8	100	99
	Yes	N	42	4	17	0	63
		%	1.8	0.2	1.2	0	1
	Total	N	2292	2170	1408	655	6525
		%	100	100	100	100	100
C. Sugar or Glucose Water	No	N	2292	2169	1398	653	6512
		%	100	100	99.3	99.7	99.8
	Yes	N	0	1	10	2	13
		%	0	0	0.7	0.3	0.2
	Total	N	2292	2170	1408	655	6525
		%	100	100	100	100	100
D. Grip Water	No	N	2292	2165	1403	655	6515
		%	100	99.8	99.6	100	99.8
	Yes	N	0	5	5	0	10
		%	0	0.2	0.4	0	0.2
	Total	N	2292	2170	1408	655	6525
		%	100	100	100	100	100
E. Sugar-Salt-Water Solution	No	N	2292	2170	1408	655	6525
		%	100	100	100	100	100
	Total	N	2292	2170	1408	655	6525
		%	100	100	100	100	100
F. Fruit Juice	No	N	2292	2168	1403	655	6518
		%	100	99.9	99.6	100	99.9
	Yes	N	0	2	5	0	7
		%	0	0.1	0.4	0	0.1
	Total	N	2292	2170	1408	655	6525
		%	100	100	100	100	100
G. Infant Formula	No	N	2286	2170	1401	655	6512
		%	99.7	100	99.5	100	99.8
	Yes	N	6	0	7	0	13
		%	0.3	0	0.5	0	0.2
	Total	N	2292	2170	1408	655	6525
		%	100	100	100	100	100
H. Tea/ Infusion	No	N	2292	2170	1406	655	6523
		%	100	100	99.9	100	100
	Yes	N	0	0	2	0	2
		%	0	0	0.1	0	0
	Total	N	2292	2170	1408	655	6525
		%	100	100	100	100	100

Last New Born Baby Given Any Other Drinks			iHDSS Sites				All Sites
			Hiri	Asaro	Karkar	Hides	
I. Honey	No	N	2292	2170	1407	655	6524
		%	100	100	99.9	100	100
	Yes	N	0	0	1	0	1
		%	0	0	0.1	0	0
	Total	N	2292	2170	1408	655	6525
		%	100	100	100	100	100
J. Rice Soup	No	N	2292	2170	1406	655	6523
		%	100	100	99.9	100	100
	Yes	N	0	0	2	0	2
		%	0	0	0.1	0	0
	Total	N	2292	2170	1408	655	6525
		%	100	100	100	100	100

Table 10-5 shows liquids other than breast milk given to the newborns in the first three days after the birth. The data also shows that almost all women never gave any liquids other than breast milk to the newborn within the first three days after birth. The data also indicates that milk other than mother's milk, plain water, infant formula and sugar or glucose water were rarely preferred by women. Only 10% of mothers across all sites reported giving their newborns other liquids. Among liquids given to the newborns, very few mothers gave formula milk, plain water, sugar water, grip water, fruit juice, or infant formula. No mother reported giving their newborns rice soup, sugar-salt-water solution, honey, or tea/infusion. Asaro and Hides sites had the lowest percentages of women who gave other liquids to their newborn compared to the other two sites.

11.0 UNMET NEED FOR CONTRACEPTION

11.1 ABSTRACT

This Chapter presents data regarding contraceptive practices among women of reproductive age, 15-49 across all four sites. The study focuses only on unmet need for contraception among women aged 15-49, who gave births in the last two years. The rationale for this approach is because these women need contraceptives in order to prevent a new pregnancy closely timed to their last delivery. Unwanted pregnancy or birth occurring within two years after the previous birth could have negative impacts on a woman's health. Quantifying the overall unmet need for comprehensive reproductive health services is beyond the scope of this report.

A total of 1,434 women aged 14-49, reported having delivering in the last two years. These women were utilized for the calculation of the (i) Contraceptive Prevalent Rate (CPR), (ii) Contraceptive Method Mix, and (iii) Unmet Need for Contraception. Approximately 31% of women, aged 15-49, gave birth in the last 2 years, and reported using a contraceptive method. From this group, only 29% used modern contraception methods while 2% used traditional contraception methods.

Analysis of CPR found: (i) implants-11.5%, (ii) injectables-9.0%, (iii) oral pills- 2.9%, (iv) male condom- 2.2%, and (v) female sterilisation- 2.1%. Other modern contraceptive methods accounted for 0.1%. Further analysis of CPR by iHDSS site revealed that implant was most prevalent in Karkar, 26%, followed by Hiri, 12.6%. Injectable use was also highest in Karkar, (14.5%), Hiri and Hides, (8%), and the lowest level in Asaro, (6%). Further analysis of modern contraceptive method mix showed implant (40%), injectable (31%), oral pills (10%), male condom (8%), female sterilisation (7%), and female condom (4%).

The unmet need of contraception among women aged 15-49, who reported giving birth in the last two years, was 34% for the last pregnancy, 36% for the current pregnancy, and 51% for future family planning. The overall unmet need of contraception is 34.2% for the total demand for contraception among women aged 15-49. Unmet need for spacing was also significant.

11.2 CONTRACEPTIVE PREVALENT RATE

Table 11-1. Contraceptive prevalent rate among women aged 15–49, who gave birth in the last 2 years, PNG IMR's iHDSS, 2016

	Contraception method	N	%
	Total of women observed	**1434**	**100**
Modern contraception methods	Female sterilization	30	2.1
	Male sterilization	2	0.1
	IUD	2	0.1
	Injectables	129	9.0
	Implants	165	11.5
	Oral pill	42	2.9
	Male condom	32	2.2
	Female condom	15	1.0
	Diaphragm	1	0.1
	Foam / Jelly	0	0
	LAM*	1	0.1
	Total	419	29.1
Traditional contraception method	Periodic abstinence / Rhythm	11	0.8
	Withdrawal	10	0.7
	Other	3	0.2
	Total	24	1.7
Contraceptive Prevalent Rate		443	30.9

* Lactational amenorrhoea method

A total of 1,434 women, who reported giving births in the last two years, responded to the questions of the data module on Unmet Need for Contraception. The data analysis in **Table 11-1** showed the 31% of women reported currently use any contraception methods, i.e., 29% reported use of modern contraception methods while only 1.7% reported use of traditional contraception methods.

Among modern contraception methods, the most popular methods were implants (11.5%), injectables (9.0%), oral pills (2.9%), male condoms (2.2%), and female sterilisation (2.1%). Very few women reported currently using other methods (0.1% or less).

Table 11-2. Current modern contraceptive use among women aged 15–49, who gave birth in the last 2 years by iHDSS site, PNG IMR's iHDSS, 2016

		Hiri	Asaro	Karkar	Hides	All sites
Total of women observed		**587**	**326**	**296**	**225**	**1434**
Implant	N	74	12	78	1	165
	%	12.6	3.7	26.4	.4	11.5
Injectable	N	47	20	43	19	129
	%	8.0	6.1	14.5	8.4	9.0
Oral pill	N	18	14	7	3	42
	%	3.1	4.3	2.4	1.3	2.9
Male condom	N	1	27	4	0	32
	%	.2	8.3	1.4	0.0	2.2

Table 11-2 shows the proportion of women aged 15-49, who gave birth(s) in the last two years, and reported using a modern contraceptive methods.

Implants were reported as the most frequently used modern contraceptive method by the women (11.5%). More than one quarter of women in Karkar reported using this method, followed by Hiri with 12.6%. Karkar women reported 14.5% for current use of injectables, compared to around 8% of women in Hiri and Hides. Asaro women reported the highest proportion (8.3%) currently using male condom. There was extremely limited us of male condoms at the other three sites. Further study on socio-cultural barriers to access and utilisation of contraceptives would be important.

11.3 Modern Contraceptive Method Mix

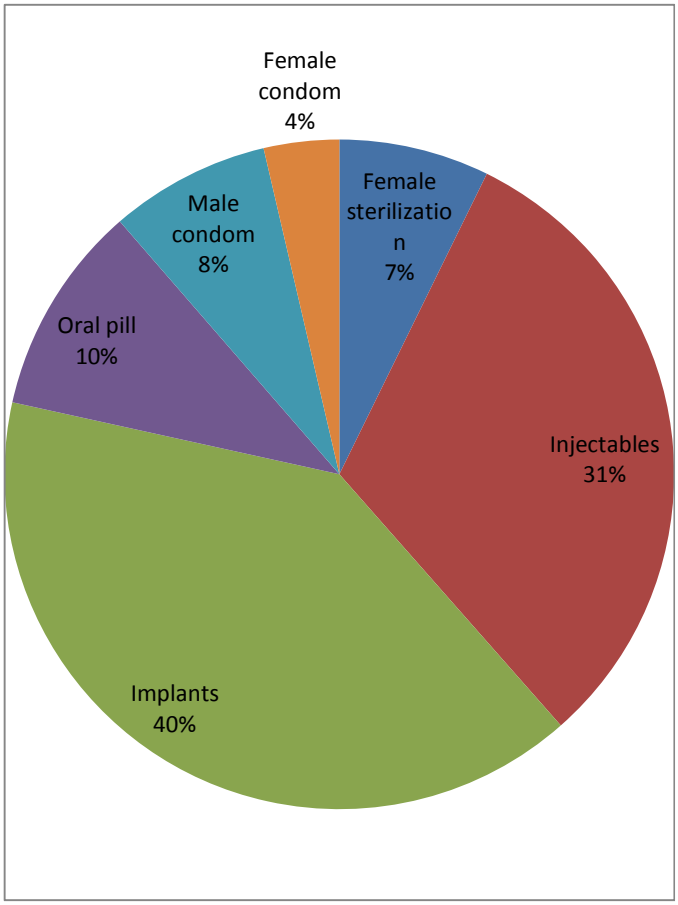

Figure 11-1. Contraceptive method mix of women aged 15-49, who gave birth in the last 2 years, PNG IMR's iHDSS, 2016

Figure 11-1 shows the modern contraceptive method mix among women aged 15-49, who gave births in the last two years across the four surveillance sites. Implants accounted for the largest proportion (40%), followed by injectables (31%), oral pills (10%), male condom (8%), female sterilisation (7%) and female condoms (4%).

11.4 UNMET NEED FOR CONTRACEPTION

Unmet need for contraception refers to fecund women who are not using any method of contraception, but who wish to postpone the birth timing (spacing) and/or who wish to stop childbearing (limiting). Unmet need is identified in the Women 15-49 Questionnaire by using a set of questions that elicit current behaviours and preferences pertaining to contraceptive use, fecundity, and fertility.

In this report, the unmet need was calculated only for the group of women aged 15-49, who reported giving birth(s) in the last two years, not for all women of reproductive age, 15-49 in general or among the women aged 15-49 who are sexually active, i.e., who are currently in married or living in union. This approach minimizes biases due to marital/living in union status; hence, the study provides a more accurate estimate of unmet need among the women aged 15-49. More importantly, women giving birth in the last two years are those who are most in need of contraceptives, either modern or traditional method and they are more likely to use contraceptives than other women groups in the reproductive age 15-49. Unmet need of contraception of these women is most likely lead to an unwanted pregnancy.

Unmet need for contraception was measured in three separate circumstances: (i) unmet need of contraception in the last pregnancy (resulted in a birth born in two years prior to the interview); (ii) unmet need of contraception in the current pregnancy if women are currently pregnant; and (iii) current unmet need of contraception if women want to have a child later or no more children, but currently not using any contraception method.

Unmet need for contraception is calculated for two forms: unmet need for spacing between births and unmet need for limiting number of children.

Unmet need for birth spacing includes: (i) women who reported giving birth in the last two years, but wanted to get pregnant later; (ii) women who are currently pregnant, but wanted to get pregnant later; and (iii) women who want to delay pregnancy (or want to have a child later), but who currently are not using any contraception method.

Unmet need for limiting number of children included: (i) women who gave birth in the last two year, but wanted no more child at that time; (ii) women who are currently pregnant, but do not want to have a child at the moment; (iii) women who want no more children in the future, but currently are not using any contraception method.

Total unmet need for contraception among those women is the sum of unmet need for spacing and unmet need for limiting.

Table 11-3. Unmet need of contraception in the last birth among women aged 15–49 years, who gave birth in the last 2 years, PNG IMR's iHDSS, 2016

		N	%
Gave birth in last 2 years	Yes	1434	21.9
	No	2331	35.6
	Total	3765	57.6
	Missing system	2775	42.4
	Total	6540	100.0
Singleton/ Multiple birth	Singleton birth	1376	96.0
	Twine birth	44	3.1
	Total	1420	99.0
	Missing system	14	1.0
	Total	1434	100.0
Wanted pregnancy	Yes	895	62.4
	No	488	34.0
	Total	1383	96.4
	Missing system	51	3.6
	Total	1434	100.0
Unmet need	Spacing	225	46.1
	Limiting	246	50.4
	Total	471	96.5
	Missing system	17	3.5
	Total	488	100.0

Table 11-3 shows the data on unmet need of contraception among women aged 15-49, who gave birth in the last 2 years across the four surveillance sites. Among the total of 6,540 women aged 15-49 reported in the system, there were 1,434 women who reported giving birth in the last two years, accounting for about 22% The proportion of missing data in the system is quite high, i.e., 42% of the total women aged 15-49). Single birth accounted for 96% of the total birth while only 3.1% of births were twins. No triplet births were reported.

Among 1,434 women giving births in the last two years, 488 women, (more than one third) reported unwanted births, reflecting the unmet need of contraception among these women. 46% of women reported they did not want to get pregnant (unmet need for spacing) and 54% reported that they did not want another child (unmet need for limiting).

Table 11-4. Unmet need of contraception in the current pregnancy among women aged 15–49 years, who gave birth in the last 2 years, PNG IMR's iHDSS, 2016

		N	%
	Total women observed	**1434**	**100.0**
Have current pregnancy	Yes	80	7.6
	No	977	92.3
	DK	1	.1
	Total	1058	100.0
Wanted pregnancy	Yes	47	61.0
	No	30	36.4
	DK	3	2.6
	Total	80	100.0
Unmet need	Spacing	20	66.7
	Limiting	10	33.3
	Total	30	100.0

Table 11-4 show data on unmet need of contraception for the current pregnancies among women aged 15-49, who gave births in the last two years. Among 1,434 women giving birth in the last two years, 1,058 women responded to the question if they were currently pregnant, i.e., 80 women reported being pregnant which accounted for 7.6% of respondents. Further analysis of unmet need among these women, indicated that 30 women reported that their pregnancies were unwanted, i.e., 36.4% of respondents. From this group of thirty, 20 women (66.7%) wanted to get pregnant later (unmet need of spacing) and 10 women wanted no more children (unmet need for limiting).

Table 11-5. Current unmet need of contraception among women aged 15–49 years, who gave birth in the last 2 years, PNG IMR's iHDSS, 2016

		N	%
Current use of contraceptive	Yes	374	26.1
	No	694	48.4
	Missing	366	25.5
	Total	1434	100.0
Family planning among women currently not using contraceptive	Want another child	36	5.2
	Want a child later	17	2.4
	No more child	21	3.0
	Missing	620	89.3
	Total	694	100.0
Unmet need of contraception	Spacing	17	44.7%
	Limiting	21	55.3%
	Total	38	100.0%

Table 11-5 shows the current unmet need of contraception among the total of 1,434 women aged 15-49, who gave birth in the last two years. 694 women reported currently not using any contraception method (48%.) Further investigation into future planning for children among those women, (who were not currently using a contraception method), was conducted; however, the majority (89%) did not respond. Among those women who did respond, 36 women wanted to have another child, i.e., a rationale for currently not using a contraceptive. Only 17 women wanted to have another child at a later date. These women are an "unmet need group" in term of birth spacing as they wished to delay pregnancy but currently not using any contraception method. There were 21 women who wanted no more children. Their need for limiting the number of children is considered to be" unmet" as they were currently not using any contraception method.

The unmet future need of contraception among women aged 15-49, (who gave birth in the last two years) is 51% (17+21/36+17+21). The unmet need for birth spacing was 45% while the unmet need for birth limiting was 55%.

Table 11-6. Total unmet need for contraception among women aged 15–49 years, who gave birth in the last two years, PNG IMR's iHDSS, 2016

		Last birth		Current pregnancy		Family planning		Total unmet need	
		N	%	N	%	N	%	N	%
Wanted pregnancy	Wanted	895	62.4	47	58.8	36	48.6	942	62.2
	Unwanted	488	34.0	30	37.5	38	51.4	518	34.2
	Missing	51	3.6	3	3.8	0	0	54	3.6
	Total	1434	100.0	80	100.0	74	100.0	1514	100.0
Unmet need	Spacing	225	47.8	20	66.7	17	44.7	262	47.1
	Limiting	246	52.2	10	33.3	21	55.3	277	49.8
	Missing	17	3.6	0	0.0	0	0	17	3.0
	Total	488	100.0	30	100.0	38	100.0	556	100.0

Table 11-6 shows the total unmet need of contraception among women aged 15-49, who gave births in the last two years in the four surveillance sites. These data show that the unmet need for their last birth was 34%; the unmet need for the current pregnancy is 37.5%; the unmet need for future family planning is 51.4%. The total unmet need of contraception among women aged 15-49 (who gave births in the last two year) was approximately 34.2%. The unmet need for birth spacing accounted is 47%, while the unmet need for limiting is 50%, missing data accounted for only 3%.

The current data do not allow further analysis of unmet need of contraception by iHDSS site, women's education or age group.

12.0 MORBIDITY SURVEILLANCE

12.1 ABSTRACT

This Chapter provides information on morbidity data collected from health facilities in the four iHDSS sites over the reporting period, July-December 2015. At each iHDSS site, health clinics are staffed by research nurses/ HEO, who provide the services to patients and collect morbidity data.

The main findings of the data revealed that there was an increase in the total number of caseload records as well as the morbidity tallies in the health facilities across all sites compared to the previous reporting period. There was also an increase in the total number of children immunized during the special supplementary immunization program which was conducted in the sites in November 2015.

Respiratory and skin diseases contributed most heavily to the caseloads across the four surveillance sites, 28% in Asaro, 24% in Hides, 33% in Hiri and 31% in Karkar. It was followed by skin infections and diarrhoeal diseases.

Among other infectious diseases, a few TB cases were reported over the period: 2 in Asaro, none in Hides, 15 in Hiri, and 49 in Karkar. Malaria suspected cases were also reported with 67 patients in Asaro, 31 in Hides, 22 in Hiri, and 577 in Karkar. Suspect cases do not have laboratory confirmation and are a clinical diagnosis.

AsaroTable 12-1 presents morbidity data collected from two clinics, *Asaro and Tafeto* health centres, at the Asaro iHDSS site. Data for *Kwongi* clinic was not included in this report due to the unavailability of a research nurse at the clinic over the reporting period.

Asaro Health centre recorded higher levels of caseloads than the Tafeto health centre, 6,566 compared to 1,610. Asaro health centre can be easily accessed by the patients as it is located along the main national highway while Tafeto is more remote. The high record of immunization in Asaro (7,292) is due to the supplementary immunization coverage activities conducted in September, 2015 by nurses in the surrounding villages.

Tafeto health centre does not provide family planning services, but limited sexual health consultations. Tafeto health centre further recorded low number of antenatal visits (n=325) during the reporting period compared to the previous report (n=2,151), as the figure is based on the regular antenatal visits to the health centre, rather than data from special antenatal awareness/campaign as was the case in the last report.

Table 12-1. Cases load and provision of health services, Asaro iHDSS, PNG IMR, 2016

	Asaro health centre	Tafeto health centre	Total
Case Load	6,566	1,610	8,176
Antenatal Visits	1015	325	1340
Family Planning	620	0	620
Immunisation	7,292	702	7,994
Accidents & Injuries	206	73	279

Table 12-2 shows the medical records of various diseases recorded in two health centres in Asaro site in the reporting period. The data showed a significant proportion of respiratory diseases, 24.6% in Asaro and 45% in Tafeto clinics. It was followed by skin infections (11%) and diarrhoeal diseases (8%), but very few malaria patients were recorded. Sexually transmitted infections were 6.7% of cases, with similar proportions in both health centres, 6.6% and 7.2%. Asaro has no records of tuberculosis (TB) during the reporting period, while Tafeto health centre recorded only two TB cases. However, Asaro recorded very high numbers of 'other infections', accounted for 34%, compared to 7.6% in Tafeto.

Table 12-2. Morbidity records on infectious diseases in Health Centres in Asaro iHDSS, 2016

	Asaro H/centre		Tafeto H/centre		Total	
	N	%	N	%	N	%
TB	0	0.0%	2	0.13	2	0.02
STIs	459	8.1%	113	7.24	572	6.75
Skin infections	561	9.9%	335	21.47	896	10.58
Respiratory Diseases	1706	30.0%	701	44.94	2407	28.42
Diarrhoea	532	9.4%	179	11.47	711	8.39
Malaria	62	1.1%	5	0.32	67	0.79
Other infections	2369	41.6%	119	7.63	2488	29.37
Total	**5,689**	**100.0%**	**1,454**	**100**	**7,143**	**100**

12.2 HIDES

Para clinic is the only operating clinic within Hides iHDSS. Morbidity data for Mananda health centre is included in this report, (although it is outside of the iHDSS study area), because Mananda is the only referral health facilities in Komo district, including patients from Para clinic. The IMR research officers are based in the church run premises, making it more convenient to collect data for comparison purposes and statistical analysis.

Table 12-3. Caseload recorded at health clinics in Hides iHDSS, 2016

	Mananda health centre	Para Clinic	TOTAL
Case Load	5,713	5,593	11,306
Antenatal Visits/	677	747	1,424
Family Planning			
Immunization	2,793	2,468	5,261
Accidents & Injuries	197	133	330

Table 12-3 showed the caseload recorded in Para Clinic in the Hides iHDSS catchment area and Mananda Health Centre in Division one of Komo urban LLG. Surprisingly, Para clinic recorded 5,593 cases, which is seven times higher than the figure reported in the last reporting period. Further verification of those data may be needed to ensure the accuracy of reporting figures.

Mananda health centre recorded 5,713 cases. This figure is not surprising because the health centre serves more than 20,000 populations in the surrounding villages and LLGs, including those people living in Hides area. The high record of immunization in both the facilities is due to the nationwide supplementary immunization conducted in November 2015, where more children were likely been immunized. There were a total of 1,424 antenatal and family planning services recorded in the two health facilities. This suggests more and more mothers went to the clinics to seek health services.

Table 12-4. Morbidity records on infectious diseases in Health Centres, Hides iHDSS, 2016

	Mananda health centre		Para Clinic		Total	
	N	%	N	%	N	%
TB	0	0.0%	0	0.0%	0	0.0%
STIs	75	1.6%	124	2.5%	199	2.1%
Skin infections	391	8.6%	296	6.1%	687	7.3%
Respiratory	1,003	22.0%	1,289	26.4%	2292	24.4%
Diseases						
Diarrhoea	516	11.3%	491	10.1%	1007	10.7%
Malaria	16	0.4%	15	1.0%	31	0.3%
Other infections	2,562	56.1%	2,625	53.8%	5,187	55.2%
Total	**4,563**	**100.0%**	**4,876**	**100.0%**	**9,403**	**100.0%**

Table 12-4 shows the morbidity records in Hides surveillance site. In Para clinic, respiratory disease accounted for the highest proportion, followed by diarrhoeal and skin infections, i.e., 26.4%, 10.1% and 6.1% respectively. A significant portion of the morbidity record was for sexually transmitted infections with a record of 124, accounting for 2.5%.

Similarly, the three leading causes of hospital visitation in Mananda health centre were respiratory, diarrhoeal and skin diseases, followed by STI and malaria. As expected, the morbidity cases for "other infections" accounted for more than 50% of all recorded cases.

12.3 HIRI

Table 12-5. Case load at health clinics, Hiri iHDSS, 2016

	Papa	Boera	Porebada	Total
Case Load	3,326	578	2,242	6,146
Antenatal Visits	343	28	192	563
Family Planning	88	02	52	142
Immunisation	1,279	0	555	1,834
Accidents & Injuries	134	12	200	346

Table 12-5 shows the caseload recorded in three health centres: Papa, Boera and Porebada in Hiri iHDSS site in the reporting period. Papa and Porebada clinics have relatively high caseloads compared to the Boera clinic. In addition, Papa clinic has high number of immunisation recorded while Boera clinic has no data recorded because the health worker was on leave. Reference to records of Boera on immunisations and family planning visits for the mothers and children are considered to be "vital visits/records" and require a health worker to be on duty if the responsible staff is otherwise on leave.

Table 12-6. Morbidity records on infectious diseases in Health Centres, Hiri iHDSS, 2016

	Papa		Boera		Porebada		Total	
	N	%	N	%	N	%	N	%
TB	13	0.5%	0	0.0%	2	0.1%	15	0.3%
STIs	7	0.3%	0	0.0%	7	0.3%	14	0.3%
Skin infections	411	14.7%	83	18.4%	441	19.4%	935	16.9%
Respiratory Disease	766	27.4%	167	36.9%	911	40.0%	1844	33.4%
Diarrhoea	367	13.1%	21	4.6%	265	11.6%	653	11.8%
Malaria	16	0.6%	0	0.0%	6	0.3%	22	0.4%
Other infections	1220	43.6%	181	40.0%	645	28.3%	2046	37.0%
Total	**2,800**	**100.0%**	**452**	**100.0%**	**2,277**	**100.0%**	**5,529**	**100.0%**

Table 12-6 shows the number and proportion of diseases recorded in Papa, Boera and Porebada Health centres in Hiri during the reporting period July-Dec 2015. As per the table, the highest proportions of morbidity were reported as "other infections", respiratory infections and skin

infections, 37%, 33%, 17%, respectively. Porebada recorded the highest for respiratory diseases, 40%, followed by "other infections", 28% and skin infections, 19%.

12.4 KARKAR

The Karkar iHDSS faced many challenging situations in collecting, compiling, and reporting the data as presented in the last report. Initial data are shown in Table 12-7 for the three reporting health facilities in the Karkar iHDSS.

	Miak health centre	Mapor health centre	Gaubin district health centre	TOTAL
Case Load	4,871	1,722	4,341	10,934
Antenatal Visits	469	468	1,084	2,021
Family Planning	167	268	432	867
Immunisation	1,580	779	3,873	6,232
Accidents/ Injuries	140	95	302	537

Data for Kulubob health centre were not recorded in this report because the clinic staff refused to provide data to the PNH IMR research nurse.

Table 12-7. Total number of cases load at health clinics, Karkar iHDSS, 2016

	Miak health centre	Mapor health centre	Gaubin district health centre	TOTAL
Case Load	4,871	1,722	4,341	10,934
Antenatal Visits	469	468	1,084	2,021
Family Planning	167	268	432	867
Immunisation	1,580	779	3,873	6,232
Accidents/ Injuries	140	95	302	537

Table 12-8 compares morbidity data on infectious disease collected among patients in three health facilities in Karkar from July - December 2015. Respiratory disease was the leading burden of disease reported in the previous report, followed by skin infections and malaria. However, this trend has changed with "antenatal care" (25.73%) as the leading reporting category, followed by respiratory diseases (20.7%) and "other infections (19.91%). "

It was observed that there was an increase on data recorded for different diseases in all the facilities compared to data in the previous reports. This is an indicative of improvement in data collection and recording processes in Karkar. However, it is also an indicative of more workload and strain on the nurses and the infrastructures at the health centres, which require attention from relevant authorities.

Table 12-8. Morbidity data on infectious diseases in Health Centres, Karkar iHDSS, 2016

	Miak health centre		Mapor health centre		Gaubin district health centre		TOTAL	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
TB	2	0.1%	8	0.7%	39	1.8%	49	0.9%
STIs	19	1.0%	12	1.0%	30	1.4%	61	1.2%
Skin infections	323	16.2%	196	17.0%	502	23.2%	1,021	19.3%
Respirations Disease	699	35.1%	441	38.3%	486	22.5%	1,626	30.7%
Diarrhoea	95	4.8%	53	4.6%	251	11.6%	399	7.5%
Malaria	179	9.0%	147	12.8%	257	11.9%	577	10.9%
Other infections	674	33.9%	295	25.6%	595	27.5%	1,564	29.5%
Total	**1991**	**100.0%**	**1152**	**100.0%**	**2160**	**100.0%**	**5297**	**100.0%**

13.0 DISCUSSION

Previous chapters of the report have presented major findings and observations from the surveillance dataset of 6,540 women of reproductive age, (15-49 years), extracted from the iHDSS database for the reporting period July-December 2015. The findings were presented for all iHDSS sites and also for each iHDSS site for comparison purposes. This chapter discusses major findings and observations from the data.

13.1 DATA QUALITY

The analysis of iHDSS data has once again reconfirmed the improvement of the data quality. This has been evident in three aspects of the iHDSS women health data.

The quality of data collection considerably improved and all interviews were completed within the reporting period July-December 2015. Missing information on 'Month of Interview' was very low, only 2.3% for all four sites. Hiri and Hides recorded 'none' and 0.5% of missing values, respectively (see Table 2.2).

The outcome of interviews with women was very good, with the completed rate at 92% for all four sites. Intervention sites, Hiri and Hides had more than 99% of the interviews completed, higher than that of comparison sites, Asaro and Karkar, around 85%. The refusal rate was also very low, less than 1% of the total interviews in all four sites, with no women refusing to participate in Hiri and Hides (see Table 2.3).

All the data were entered into the database from September- December 2015 (See Table 2.6). The age of women was consistently reported for all four sites; however, 72.3% of women in Hides responded as 'Don't Know' to the question of their age (See Table 2.6). This finding indicates that women in Hides do not know their age with any degree of certainty; however, this is not a data quality issue.

13.2 SOCIO-ECONOMIC DEMOGRAPHIC CHARACTERISTICS

Distribution of women aged 15-49 participated in the interviews showed that Hiri recorded the highest number of women, 2,295 and accounted for 35.1% of the total women. It was followed by Asaro with 2,178 women, accounted for 33.3% and Karkar with 1,410 women accounted for 21.6%. Hides recorded the lowest number, 657 women, accounted for 10.0% of the total women.

With regard the marital status, Hides had the highest proportion of women married aged 15-19, (37.3%), but it reported the lowest proportion of single women, (21.1%). In comparison, data in the other three sites showed about 20% in the age group 15-19 were married, which was balanced with around 22% of women indicating they were single.

More than 60% of women in the four iHDSS sites reported having ever given birth during their lives and less than 40% of the women reported giving birth in the last two years. It is striking that more than 50% of women in Hides reported having birth in the last two years, much higher than that of Asaro, 33%. Hiri and Karkar reported similar proportion of women 38% having given birth in the last two years, respectively.

13.3 WOMEN'S EDUCATION

Among women reported ever attending school, 92% attained the highest education level of lower secondary education or below, and 5% made it through the upper secondary school. Only 3% made it through to tertiary education in all four sites.

Hiri reported better education level among women aged 15-49 than other three sites, with more than one third attained the primary education, more than 50% attained the lower secondary education, and about 4% attained the tertiary education. By contrast, the majority of women in Asaro, Karkar and Hides reported attaining the primary education with more than 70% in Asaro, 76% in Karkar, and about 80% in Hides.

For the first time, the ability to read in English was tested among women aged 15-49 taking part in the study. There was a large gap between school attendance status and ability to read. The proportion of women with ability to read was much lower than the proportion of women who have ever attended school. Although 80% of women reported as having ever attended school, 33% could not read at all, 32% could read only part of the paragraph, and 31% could read entire the paragraph in the reading test. It seems that only those women, who attained lower secondary education level (about more than one third of the total women ever attending school), could actually read through the test.

Women in Hiri demonstrate a better ability to read than those in other three sites e.g. 8% of Hiri women could not read at all, compared to 18% in Karkar, 44% in Asaro and 68% in Hides.

As the majority of women aged 15-49 have left school, it raises a question of how to retain ability to read among adult population post- school attendance. If the adult population does not have access to reading materials for a long time, they may lose their reading skills. It is suggested that the Government should provide reading materials on regular basis to the community so that the adult population, including women aged 15-49 could have access to those materials in order to retain their ability to read.

13.4 POLYGAMY

For the first time, data on polygamy were collected, which allows some insights into this marital living arrangement and how it could affect PNG women's health. About 16% of the surveyed women reported their husband/partner had an additional wife/partner. Men were reported to have 1.72 wife/partners on average in the four sites. The average number of wives per man was 1.98 in Hiri compared to 1.3 in Karkar; and 2.1 in Hides compared to 1.4 in Asaro.

With regard the age of women at first time getting married or living in-union with a man, more than one third of Asaro women and more than 85% of Hides women reported as 'don't know', compared to 3% observed in Hiri and 2% in Karkar. However, about one third of women in the four surveillance sites reported getting married/ living in union for the first time at the age of 15-19, and about 2% reported before the age of 15 years old.

13.5 SEXUAL BEHAVIOUR

Most of all women reported having their first sexual intercourse by ages 16-18, and about 4% reported having their first sexual intercourse before the age of 15 years old. It is noticeable that more than 70% of women in Hides and 17% of women in Asaro reported as 'don't know' the age at first sex, while very few women reported as 'Don't know' in Hiri and Karkar sites. The majority (90%) of women reported never used condom in their first sexual intercourse and there was no significant difference among the four sites.

More than half of women in the four sites reported having their last sex act during two weeks prior to the interview time. More than 90% reported did not use a condom and this proportion was similar across the four surveillance sites. The majority of women (80%) had the last sex act with their husbands, 11% with boyfriend and 6% with a casual partner.

Regarding the number of sexual partners women had in the last 12 months, more than three quarters reported having 2 or more, including 36% having two, 16% having three, 9% having four, and 15% having 5 or more. Asaro women reported the highest number of partners (3.7), followed by Hides, (3.1). Hiri and Karkar had two partners on average in the last 12 months.

13.6 DOMESTIC VIOLENCE

Nearly half of women in the four surveillance sites reported approval of certain forms/types of situation/cause specific DV. For example, more than 40% agreed that their husband or sexual partner were justified for beating or hitting her when she went out without informing her husband or sexual partner This "approval" of DV was more prevalent among women in the coastal areas i.e. Hiri and Karkar, around 50% compared to 35% observed in the highlands i.e. Asaro and Hides. A quarter of women in the four sites believed man was justified to hit or beat his wife/sexual partner if she refused to have sex with him.

Almost 50% of the women had experience of verbal abuse in the last 12 months. 5% reported being threatened with a knife or gun. 2.4% reported being attacked with a knife or gun. Nearly 20% reported being physically beaten with something.

Contradictory to the apparent lower level of misperception on DV, women in the highlands i.e. Asaro and Hides reported a higher level of DV than those women in the coastal areas i.e. Hiri and Karkar. For example, nearly 8% of women in Asaro and 9.0% of women in Hides reported being threatened with a knife, compared to 2.0% of women in Hiri and less than 6% of women in Karkar.

Husbands were reported by 30.5% of the women surveyed, as the most common perpetrators of DV in the last 12 months across all sites. Hides women reported the highest number of DV events around 45%, followed by Karkar, around 35%. Women reported similar proportions of more than 25% in Hiri and Asaro.

Nearly one third of women were verbally threatened to have sex with their male sexual partners. The highest proportion was reported in the highlands i.e. about 40% in Hides and Asaro, and 20% in Karkar and Hiri. Furthermore, one fifth of women reported being physically forced to have sex in the last 12 months.

Alcohol consumption appears as a high risk factor associated with DV as it was reported by 70% of women, who had experience of DV caused by their husbands or sexual partners.

It is obvious from the research conducted by the PiHP at the four iHDSS sites that there are significant numbers of women who silently go through physical, emotional or psychological pain caused by their sexual partners or husbands as a result of DV. The lack of respect for women in PNG, typically attributed to tribal culture, does not match a western model perspective on relationships between men and women. Addressing this issue is complex and requires open and frank communication across communities, government agencies, law enforcement and households.

13.7 CHILD MORTALITY

IMR and CU5MR were calculated, using the indirect estimation technique known as the Brass method. In this method, the proportions of child dead obtained from women in three age groups of 20-24, 25–29 and 30–34 were calculated, and then IMR and CU5MR were estimated, based on the average of proportions of child dead among those age groups of women. The result showed IMR at 64 per thousand live births and CU5MR around 96.5 per thousand live births.

The direct estimation method, which was used in the March 2015, gave the estimates of IMR and CU5MR at 60 and 150 per thousand live births, respectively.

Comparing the results, the two estimation methods have provided similar estimates of IMR, which are of 60 and 64 per thousand live births, but direct method provided higher estimate of CU5MR than the indirect method, 150 vs. 96.5 per thousand live births, respectively. It may require further data to confirm the accuracy of these estimates.

Compared to the national data, the CU5MR was reported at 63 and IMR at 48 per 1,000 live births in 2012, this report revealed higher figures, reflecting considerable variations of child mortalities at the sub-national level that requires close monitoring.

13.8 ANTENATAL CARE

The antenatal period presents important opportunities for reaching pregnant women with a number of interventions that are vital to their health and well-being and that of their infants. The antenatal period has been used to inform women and families about the danger signs and symptoms as well as about the risks during labour and delivery. World Health Organisation recommends a minimum of four antenatal visits during the pregnancy.

The data showed that 49% of women reported attending four visits or more for antenatal care services, while 97% receiving at least once antenatal care by skilled health workers such as doctor, HEO, Nurse/CHW, and Midwife during the last pregnancy. Still 8% reported having no visit for antenatal care services.

WHO's guidelines are specific on the content of antenatal care visits, which should include four components:

- Blood pressure measurement
- Urine testing for bacteriuria and proteinuria

- Blood testing to detect syphilis and severe anemia
- Weight/height measurement (optional)

In term of content of antenatal care, the data showed 75% of women reported having their blood pressure measured; 27% had a urine sample taken; and 48% had a blood sample taken. However, about 25% of women reported having used all these three services.

The skilled birth attendance at delivery is an indicator used to track progress toward the Millennium Development Goal of reducing the maternal mortality rate (MMR) by three quarters between 1990 and 2015. The ultimate goal of any antenatal care programme is to ensure that women have ready and affordable access to skilled birth attendance assistance at delivery.

The current survey data showed 31.5% of respondents receiving assistance from skilled birth attendants compared to 13% assisted by unskilled birth attendants while giving birth in the last two years. There were 17 Caesarean sections reported.

Increasing the proportion of births that are delivered in health facilities is an important factor that has potential to reduce the health risks to both the mother and the baby. Proper medical attention and hygienic conditions during delivery can reduce the risks of complications and infection that can cause morbidity and mortality to either the mother or the baby.

The data indicated that about two thirds of mother's delivered at public health facilities and one third of mother's delivered births at home. Five reported birth deliveries at private health facilities and two in other places.

13.9 NEWBORN HEALTH

Although 90% of mothers/caretakers across all four sites said their babies were weighed at birth, not many provided evidence of weight records from health record books, e.g., only three health record books were seen in Hides. Comparing the actual birth weight recorded from health record books and those recalled from caretakers, the data showed the majority of babies were within the average weight category/range 2800-3200 grams. It is noticeable that about 15% of newborn babies weighted less than 2200 grams and about 8% of newborn babies from health record books were larger than 4000 grams.

Breastfeeding of newborn is still widely practiced right across the four sites, with 90% of the babies across all sites were breastfed and that more than half of the babies were breastfed within the first hour after the birth.

Almost all women reported having never given any liquids other than breast milk to the newborn in the first three days after birth. Only 10% of mothers across all sites reported to give their newborns other liquids such as plain water, infant formula and sugar or glucose water. There was no significant observation across the four surveillance sites.

13.10 UNMET NEED FOR CONTRACEPTION

Around 31% of women aged 15-49, who gave birth in the last 2 years, reported current use of contraceptive methods: (i) modern contraceptives (29%) and (ii) traditional contraceptives (2%).

The analysis of Contraceptive Prevalent Rate (CPR) found: (i) implants, 11.5%; (ii) injectables, 9.0%; (iii) oral pills, 2.9%; (iv) male condoms, 2.2%, (v) female sterilisation, 2.1%, and (vi) other modern contraceptive methods 0.1% for women aged 15-49 who gave birth in the last two years. Implant was most prevalent in Karkar, 26%, followed by Hiri, 12.6%. Injectable use was also highest in Karkar, (14.5%), Hiri and Hides, (8%), and Asaro, (6%).

Analysis of modern contraceptive method mix showed implant (40%), injectable (31%), oral pills (10%), male condoms (8%), female sterilisation (7%), and female condom (4%).

The unmet need of contraception was calculated among women aged 15-49, who had given birth in the last two years. The result indicated the total unmet need of contraception was 34.2%, meaning that more than one third of respondents had no access to modern contraception to delay or avoid a pregnancy.

13.11 MORBIDITY SURVEILLANCE

Although most of all clinics in the iHDSS sites were included in the report, results should be interpreted carefully as some clinics faced a shortage of staff for the collection and compilation of data. In addition, patients may have bypassed health clinics and sub-health clinics, and went directly to tertiary health facilities.

There was an increase in the total number of caseload records in the health facilities across all sites compared to the previous reporting period. This was due to the increased number of children visiting health facilities during the special supplementary immunization program which was conducted in the sites in November 2015. Para clinic recorded 5,593 cases, which is seven times higher than the figure reported in the last reporting period January-June 2015. There are many possible reasons for this increase in clinic visits: (i) local people's increased motivation and willingness to access services provided at the clinic when they are sick, (ii) improved record keeping in the health clinic and (iii) improved service delivery outcomes. In addition, the dry spell experienced throughout the country during the reporting period may have impacted the underlying disease burden.

Respiratory diseases contributed most heavily and accounted for one third of the total caseload across the four surveillance sites (28% in Asaro, 24% in Hides, 33% in Hiri and 31% in Karkar). Skin infections and diarrhoeal diseases were the second and third most common diagnoses. Diarrhoeal diseases dominated the morbidity data in Para Clinic in the previous reporting period. However, this trend has changed, with respiratory disease now accounting more than 25% of the reported caseload.

TB cases were reported over the period: 2 in Asaro, none in Hides, 15 in Hiri, and 49 in Karkar. Asaro health centre TB cases could be undercounted due to the absence of clinical staff/ research nurse over the reporting period. Malaria suspected cases were also reported with 67 in Asaro, 31 in Hides,

22 in Hiri, and 577 in Karkar. Suspect malaria cases may also be over reported as they lack objective laboratory confirmation.

In the LNG villages, Boera health centre (Hiri) recorded zero data for malaria and TB, while Papa also recorded few cases. The lack of diagnostic laboratory equipment in local health centre clinics is a major confounding factor.

14.0 CONCLUSIONS AND RECOMMENDATIONS

The restructuring process of the PiHP continued during the reporting period July-December 2015, i.e. strengthening new QA/QC measures of the iHDSS, from study design to data collection, database management and data analysis and dissemination. In the current reporting period, the iHDSS collected women health data, using the new Individual Questionnaire for Women of Reproductive age, 15-49. Data for these women have been incorporated into the iHDSS database. Training of trainer and refresh trainings have been continued, further strengthening research capacity of the national scientific officers in conducting data collection, data analysis and report writing. As a result, the efficacy and effectiveness of the iHDSS have been further improved and reflected in the improved quality of the data it produces as well as the timely submission of the March 2016 Report.

A total of 6,540 women of reproductive age, 15-49 have been interviewed. More than 60% of women in the four iHDSS sites have given birth during their lives and about 40% of the women gave birth in the last two years.

For the first time, an ability to read survey among an adult population was conducted. There was a large gap between school attendance status and ability to read among women surveyed. Although 80% of women reported as having ever attended school, only 65% could read the reading test partially or entirely. This finding questions the need to have access to reading materials among the adult population so that they can retain the ability to read after leaving school.

Polygamy is a common phenomenon in PNG. About 16% of the surveyed women reported that their husband/partner had an additional wife/partner.

PNG women get married quite early with one third reported getting married or living in union for the first time at the age of 15-19, and about 2% before the age of 15.

Most of all women reported having their first sexual intercourse by ages 15-19, and about 4% had first sex before 15 years of age. The majority (90%) of women reported never using a condom in either their first sex or the last sexual activity during the last two weeks. More than three quarters of women interviewed reported having two or more sexual partners in the last 12 months.

Domestic violence is also a common phenomenon in PNG, but for the first time the PiHP systematically collected data on this topic. Nearly half of women in the four surveillance sites believed a man was justified to hit or beat his wife/ sexual partner if she refused to have sex with him. Almost half of the women reported being verbally abused in the last 12 months and nearly one fifth reported being physically. Nearly one third of women were verbally threatened to have sex with their male sexual partners. Husbands were reported by one third of the surveyed women as perpetrators of DV in the last 12 months. Alcohol consumption appeared a high risk factor associated with DV as it was reported in 70% of DV cases.

The iHDSS is an important data source for monitoring and reporting child mortality. Unlike the direct estimations demonstrated in the March 2015 Report, child mortality was calculated using the indirect estimation method in this report. IMR and CU5MR were estimated at 96.5 per thousand live

births and 105.5 per thousand live births, respectively. However, further in-depth analysis of child mortality is required to confirm the accuracy of the two methods and these estimates.

With regard to antenatal care, nearly half of women of reproductive age, 15-49, who gave birth in the last two years, reported attending four visits or more. More than three quarters of women received at least one antenatal care visit by skilled health worker. About one forth reported having used these three services, including blood pressure measurement, urine and blood sample testing as recommended by WHO. About one third of respondents received assistance from skilled birth attendants. 17 Caesarean sections were reported. About two thirds of women delivered births at public health facilities and one third at home. These data suggest great efforts should be made to further improve the access and utilization of antenatal care services.

For newborn health, 90% of mothers/caretakers said their babies were weighed at birth although not many birth records were shown in the health record books. Data showed the majority of babies were within the average weight category/range 2800-3200 grams, but 15% weighted less than 2200 grams and about 8% weighted more than 4000 grams. Furthermore, 90% of the babies were breastfed by the mothers and more than half were breastfed within the first hour after the birth.

The analysis of Contraceptive Prevalent Rate among women of reproductive age, 15-49, who gave birth in the last two years, showed that only 31% are currently using a contraception method (29% of modern contraceptives and 2% of traditional contraceptives), including implants (11.5%), injectables (9.0%), oral pills (2.9%), male condoms (2.2%), female sterilisation (2.1%), and other modern contraceptive methods (0.1%). Modern Contraceptive Method Mix showed implant (40%,) injectable (31%), oral pills (10%), male condom ()8%, female sterilisation (7%), and female condom (4%) across all contraceptive users. The total unmet need of contraception among these women was about 35%.

The analysis of morbidity data collected from health facilities of the iHDSS showed significantly increased caseloads compared to the previous reporting period. Communicable diseases were still dominant in the morbidity data. Respiratory diseases contributed the most heavily, accounted for one third of the total caseloads, followed by skin infections and diarrhoeal diseases. The number of TB cases could have been undercounted due to the absence of appropriate clinical staff. Malaria diagnosis has heavily relied on clinical signs, rather than lab-test confirmation. The lack of rapid diagnostic test (RDTs) kits could be contributing to the misdiagnosis. Further strengthening the capacity of the iHDSS in term of clinical staff and lab equipment is needed for better morbidity monitoring and reporting at the community level.

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