

SECTION III

SURVEY RESULTS - HEALTH SECTION

1. HEALTH SERVICES

1.1 SUB-DISTRICT & VILLAGE LEVEL HEALTH SERVICES IN IRIAN JAYA

1.1.1 COMMUNITY HEALTH CENTRE (PUSKESMAS)

Since the 1970s health care in Indonesia has revolved around the *puskesmas*, an integrated rural health centre. At the beginning of the project there were a total of 13 government run *puskesmas* and 9 mission run *puskesmas* operating in Jayawijaya. The *puskesmas* is a large centre that offers both preventative and curative services and also supports and supervises a range of other village level health clinics and community based programs. The *puskesmas* should be staffed by at least one doctor, a number of paramedics or nursing aides and nurses and at least one midwife. Officially the *puskesmas* should offer a range of services such as community awareness and education programs about prevailing health problems, local epidemic disease prevention and control, an expanded immunisation program, maternal and child health and family planning, provision of essential drugs, nutrition and food production, and the treatment of common diseases and injuries. However in remote areas in particular, these ideals are rarely realised.

1.1.2 INTEGRATED SERVICES POST (*POSYANDU*)

In 1985 the health post in the village became an integrated health post locally known as *posyandu*. These posts are owned by the community and run by *puskesmas* staff with assistance from community *Posyandu cadres*, almost always women, organised through the auspices of the national family welfare (PKK) program. *Posyandu* clinics generally open once a month and offer five basic health services: maternal and child health monitoring, nutrition, family planning, immunisation, and diarrheal disease control for women and children.

In conducting infant and maternal health monitoring activities the staff follow a five-step service procedure. First there is registration, second comes the weighing of children under five, the third is the filling in of growth record charts (Kartu menuju sehat - *KMS*), the fourth is individual health and nutrition education, and the fifth procedure is providing professional health services by the paramedical staff for family planning. It has been noted that even in the more developed parts of Indonesia, most of the poorer members of rural communities only reluctantly participate in the maternal and infant health clinics. This has been related to the fact that people do not want other community members to know if their children are not meeting growth norms. Furthermore, even if the *posyandu* can detect a problem they can offer little or no support or clinical services.

The immunisation programs conducted through the *posyandu* aim to immunise all children aim to provide coverage against: tuberculosis (one injection of Bacillus Calmetted-Guerin –BCG vaccine at 1 – 7 days old), diphtheria, pertussis and tetanus (three DPT injections between 6 and 14 weeks), polio (four injections between 6 and 24 weeks) measles (one injection after the age of nine months) and hepatitis B. Two injections of tetanus toxoid vaccine are also provided to pregnant women. Immunisation is probably the most popular and successful of the programs conducted through the *posyandu* but in Jayawijaya problems including poor supply of vaccines, break downs in the cold chain and the tyrannies of distance means that this program still has quite limited outreach.

1.1.3 SUB-HEALTH CENTRE (PUSTU)

The sub health centre is similar to the *puskesmas* but with less staff, less facilities and in a less central location. What is lessened varies from region to region. During the course of the project several sub-health centres were upgraded to the status of *puskesmas* even though their facilities were not necessarily upgraded to *puskesmas* standard. In 1998 there were a total of 74 Pustu operating in Jayawijaya.

1.1.4 POLYCLINICS (BALAI PENGOBATAN – BP)

The Polyclinics (BPs) were established during the 1960s – 1980s by the former mission administered health service. The government is in the process of closing the BPs and replacing them with the village medicine posts described below. However, in many parts of Irian Jaya, including Kembu-Mamit Sub-district, the BPs remain the principal providers of health services and pharmaceuticals at the village level.

1.1.5 VILLAGE MEDICINE POST (POD)

The DOH is currently in the process of establishing Village Medicine Posts at the *Desa* level across Irian Jaya. These facilities are owned by the government but are also staffed by community *cadres* with assistance from mantris. The idea of establishing the *PODs* was, at least in part, to relieve the need for the establishment of BPs. The village medicine posts are a community-based service operated by *cadres* and mantris. *Cadres* are trained in basic diagnosis and referral, and can prescribe and distribute certain pharmaceuticals. In theory *cadres* should derive income from selling government subsidised drugs at a higher rate.

1.1.6 VILLAGE BIRTHING HUT (POLINDES)

In 1995 the Government of Indonesia established the *Bidan di Desa* or village midwife program in an attempt to reduce the infant mortality rate across the nation. This program aimed to place a midwife and to construct a *polindes* or village birthing hut in each *Desa*. The Government of Indonesia (GOI) intended to pay each midwife a comparatively large salary for a period of three years minimum and up to six years maximum depending on local needs. It was intended that part of the wage be saved so that at the end of the period of government funding midwives would have sufficient capital to go on operating as professional village midwives

in the private sector. Unfortunately the model applied by the central government was of little relevance to the situation in Jayawijaya and the program is unlikely to be sustainable in the absence of external support.

1.1.7 DUKUN BERSALIN/ TRADITIONAL BIRTH ATTENDANTS

A TBA program was established in recognition of the fact that many women in rural areas rely on traditional birthing attendants. It offers to train TBAs in simple techniques to improve the outcomes of their work and to distribute TBA kits. Since the *bidan di Desa* program the government has expected midwives to be responsible for supervising and educating village TBAs. TBAs are expected to gather statistics for the government but in reality many never do, as they are mostly illiterate and not on the government payroll.

1.2 HEALTH FACILITIES & HEALTH WORKERS IN THE TARGET AREAS

1.2.1 KANGGIME SUB-DISTRICT²²

Kanggime Sub-district is serviced by a network of health facilities as outlined below:

- 1 Puskesmas or community health center which is staffed by 16 formal health workers including one graduate from the Diploma of Nursing College in Jayapura, one class A midwife and a total of 14 medical aides who are graduates from the Wamena Nursing School (SPK).
- 3 Puskesmas Pembantu (Pustu) or sub-health centers, each of which are each staffed by a nursing aid with either SPK or Dikswa (mission health worker correspondence bridging training) qualification.
- 25 *Pos Obat Desa (POD)* or village medicine posts which are staffed by around 39 volunteers, all but one of whom are male;
- 4 church run Balai Pengobatan (BP) or polyclinics which are staffed by 4 BP *cadres*, all of whom are male, who have been educated by through the former church administered health services;
- 11 *Polindes* or village birthing huts which are each attended by a midwife with class C qualifications, except for one which is attended by a class A midwife; and
- 39 *posyandu* clinics staffed by around 89 community volunteers, all but one of whom are women.

The total number of formal health workers in the sub-district is 34 including 13 men and 21 women whereas the total number of non-formal health workers or *cadres* is 122 including 50 men and 72 women.

22 For a complete breakdown of data on health workers in Kanggime Sub-District refer to Annexe I.

TABLE 13.
NUMBER OF FORMAL AND NON-FORMAL HEALTH WORKERS IN KANGGIME SUB-DISTRICT
& THEIR RATIO AGAINST THE TOTAL POPULATION OF 16,062 INHABITANTS

	HEALTH WORKERS / HEALTH CADRES POSITION / EDUCATION	TOTAL	MALE	FEMALE	RATIO PER POPULATION
1.	FORMAL HEALTH WORKERS				
1.1	Doctor	0	-	-	
1.2	Diploma of Nursing	1	1	-	1 : 16,062
1.3	Nursing School (SPK)	7	7	-	1 : 2,294.57
1.4	Nursing School (SPK) Level 1	12	12	-	1 : 1,338.5
1.5	Midwife - Class A	2	-	2	1 : 8,031
1.6	Midwife - Class C	11	-	11	1 : 1,460.18
1.7	Dikswa (Former Mission trained health workers)	1	1	-	1 : 16,062
	Total Number of Formal Health Workers	34	21	13	1 : 472.4
2.	Non-Formal Health Workers				
2.1	Balai Pengobatan (BP) <i>Cadres</i>	4	4	-	1 : 4,015.5
2.2	<i>POD Cadres</i>	39	38	1	1 : 411.85
2.3	<i>Posyandu Cadres</i>	89	1	88	1 : 180.47
2.4	Traditional Birth Attendants	Data collectors for Kanggime did not differentiate between normal posyandu cadres and TBAs.			
	Total Number of Non-Formal Health Workers	132	43	89	1 : 121.68
	Total Number of Health Workers	166	64	102	1 : 96.76

TABLE 14.
HEALTH FACILITIES IN KANGGIME SUB-DISTRICT

	HEALTH SERVICE	NUMBER	RATIO PER POPULATION	RATIO TO AREA
1	Puskesmas	1	1 : 16,062 people	1 : 550 km ²
2	Pustu	3	1 : 5,354 people	1 : 137.5 km ²
3	Balai Pengobatan (BP)	4	1 : 4,015.5 people	1 : 50 km ²
4	<i>Pos Obat Desa (POD)</i>	25	1 : 642.5 people	1 : 22 km ²
5	<i>Polindes</i>	13	1 : 1,235 people	1 : 42.5 km ²
6	<i>Posyandu</i>	38	1 : 422.7 people	1 : 14.5 km ²

Data Source : Health Centre Records

1.2.2 HEALTH FACILITIES & HEALTH WORKERS IN KEMBU-MAMIT SUB-DISTRICT²³

Kembu-Mamit Sub-district is serviced by a network of health facilities as outlined below:

- 1 Puskesmas or community health center which is staffed by 12 formal health workers including two class A midwives and a total of 10 medical aides who have qualifications from either the Wamena Nursing School (SPK) or the Dikswa correspondence bridging training for former mission health workers.
- 2 Puskesmas Pembantu (Pustu) or sub-health centers, which are staffed by a nursing aid with either SPK qualification and six community *cadres*.
- 9 *Pos Obat Desa (POD)* or village medicine posts which are staffed by 9 volunteers, all of whom are male;
- 22 church run Balai Pengobatan (BP) or polyclinics which are staffed by a total of 30 BP *cadres* who have been educated by through the former church administered health services;
- 12 *Polindes* or village birthing huts which are each attended by a midwife with class C qualifications, except for one *polindes* located in the *Desa* Telengeme, which is attended by a class A midwife; and
- 41 *posyandu* clinics staffed by 20 *posyandu cadres* and 34 traditional birth attendants, some of whom have already been trained by WATCH.. All of the *posyandu cadres* and TBAs are women.

The total number of formal health workers in the sub-district is 34 including 15 men and 19 women, whereas the total number of non-formal health workers or *cadres* is 99 including 45 men and 54 women.

By comparing the data in tables 13 – 16 we can see that, whilst the numbers of qualified health workers fall well below national standards, the situation in Kembu-Mamit is considerably worse than in Kanggime. Village level health services Kembu-Mamit Sub-district remain largely reliant on the old system of village polyclinics, with only 9 of the new village medicine posts (*POD*) having been established there. This compares to 25 *PODs* in Kanggime. Furthermore, whilst the ratios of health workers to population are roughly comparable between the two sub-districts, if we consider health coverage in terms of ratio of facilities or personnel to the sub-districts area we can see that the people in Kembu-Mamit must suffer from considerably worse access to health services than their neighbours in Kanggime. This picture looks even worse if we consider that the community health center is located at Mamit, at the southernmost apex of the sub-district, and many of the other health facilities are also concentrated in this area. This means that for some in the remote communities in the northern two thirds of Kembu-Mamit Sub-district, a trip to the nearest health facility may require several hours of travel by foot whilst a visit to the community health center may involve walking for several days each way. It is not surprising that many people might feel that such an arduous trip is often not worth the effort especially since many health workers only treat patients on a somewhat sporadic basis and that the quality of service they do receive is poor.

On the other hand, this data can be read as a higher level of community participation occurring since the community has established a relatively large number of *posyandu* clinics and such clinics rely a lot on community participation.

23 For a complete breakdown of data on health workers in Kembu-Mamit Sub-District refer to Annexe II.

TABLE 15.

**NUMBER OF FORMAL AND NON-FORMAL HEALTH WORKERS IN MAMIT SUB-DISTRICT
& THEIR RATIO AGAINST THE TOTAL POPULATION OF 11,613 INHABITANTS**

	HEALTH WORKERS / HEALTH CADRES POSITION / EDUCATION	TOTAL	MALE	FEMALE	RATIO PER POPULATION
1.	FORMAL HEALTH WORKERS				
1.1	Doctor	0	-	-	
1.2	Diploma of Nursing	0	-	-	
1.3	Nursing School (SPK)	2	2	-	1 : 5,806.5
1.4	Nursing School (SPK) Level 1	14	12	2	1 : 829.5
1.5	Midwife - Class A	3	-	3	1 : 3,871
1.6	Midwife - Class C	12	-	12	1 : 967.75
1.7	Dikswa (Former Mission trained health workers)	3	1	2	1 : 3,871
	Total Number of Formal Health Workers	34	15	19	1 : 341.56
2.	Non-Formal Health Workers				
2.1	Pustu <i>Cadres</i>	6	5	1	1 : 1,935.5
2.2	Balai Pengobatan (BP) <i>Cadres</i>	30	30	0	1 : 387.1
2.3	<i>POD Cadres</i>	9	9	0	1 : 1,290.33
2.4	<i>Posyandu Cadres</i>	20	0	20	1 : 580.65
2.5	Traditional Birth Attendants	34	0	34	1 : 341.56
	Total Number of Non-Formal Health Workers	99	45	54	1 : 117.3
	Total Number of Health Workers	133	60	73	1 : 87.32

TABLE 16.

HEALTH FACILITIES IN KEMBU / MAMIT SUB-DISTRICT

	HEALTH SERVICE	NUMBER	RATIO PER POPULATION	RATIO TO AREA
1	Puskesmas	1	1 : 11,613 people	1 : 3,400 km ²
2	Pustu	2	1 : 5,806 people	1 : 1,700 km ²
3	Balai Pengobatan (BP)	22	1 : 527.9 people	1 : 154.5 km ²
4	<i>Pos Obat Desa (POD)</i>	9	1 : 1,290.3 people	1 : 377.8 km ²
5	<i>Polindes</i>	12	1 : 967.8 people	1 : 283.3 km ²
6	<i>Posyandu</i>	41	1 : 283.2 people	1 : 82.9 km ²

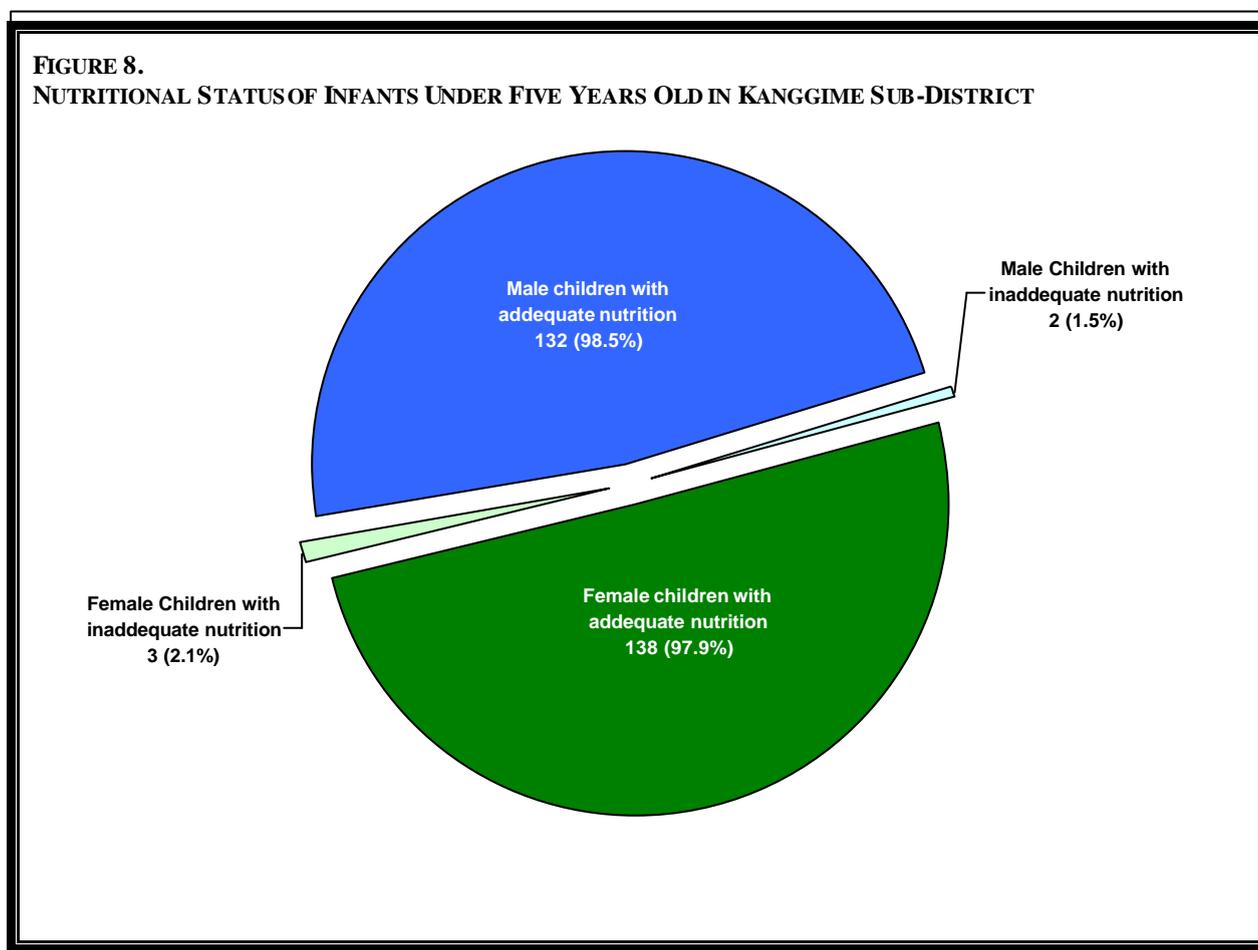
Data Source : Health Centre Records

2. HEALTH CONDITIONS EXPERIENCED BY THE TARGET COMMUNITY

2.1 COMMUNITY NUTRITIONAL STATUS

2.1.1 NUTRITIONAL STATUS

According to the results of the anthropometric survey, of the 275 respondents from 10 villages in Mamit and Kanggime, the nutritional status of almost all babies and infants (under-fives) was adequate. The sufficiency of energy (calorie) of both mothers and children in Mamit and Kanggime had almost reached 100%. This indicates that when extreme environmental or social disturbances to normal production activities are absent, people in the target areas are generally able to meet their standard calorie requirements. The finding that the calorie sufficiency of children under-fives reached more than 135% dramatically supports this point. Figure 1 also suggests that there is little difference between the calorific adequacy of the diets of male and female children as just 1.5% of males and 2.1% of females fall below the cut off points.



Reaching only 57.58%, it appears that the calorie sufficiency of babies aged 0-12 month was much poorer. This score, however, is dubious when we consider that it falls far below the percentage of breastfeeding mothers who are recorded as having inadequate nutrition. Considering that breastfeeding mothers occupy the lowest nutritional rank amongst Jayawijayan communities it seems unlikely that the 0-12 month old demographic group could suffer even poorer standards of nutrition. It is more likely that this discrepancy was created by

inaccuracies in the nutrition surveys, or that extraordinary factors had caused an occurrence of widespread under-nutrition of babies in the target areas during the last 12 months. Possibly the effects of the famines and disease epidemics associated with the 1997-1998 ENSO related drought had affected some of the children measured. As many children tested would have been born well after the drought had ended, these effects would probably manifest as disease or dietary inadequacy suffered by their mothers during pregnancy.

The results of the 24-hour recall survey suggested that the dietary diversity of the target communities has increased with many respondents reporting that they had consumed various introduced/non-traditional foodstuffs such as cooking oil, instant noodle, and/or peanuts, within the preceding 24 hours.

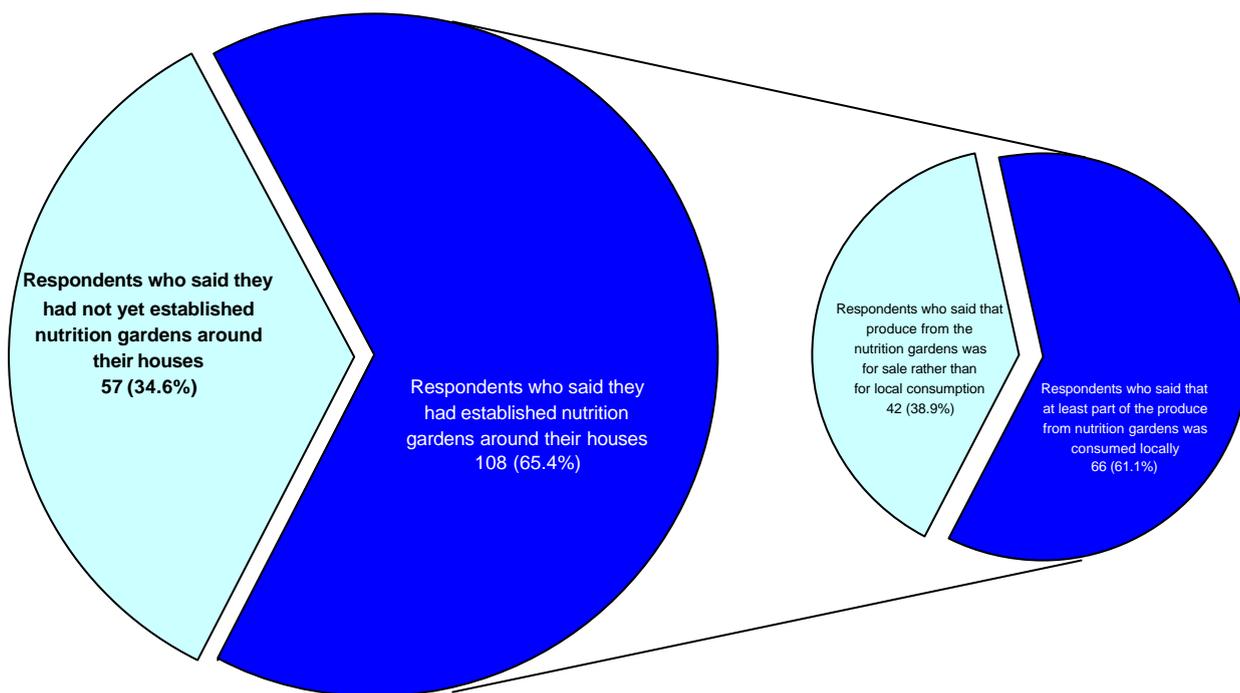
2.1.2 NUTRITION GARDENS

The majority of survey respondents from both Kanggime and Kembu / Mamit Sub-Districts said that they had already made use of the yards around their house compounds (*silimo*) to plant nutrition gardens. The survey teams were able to verify this by directly observing that nutrition gardens had been planted in the villages. Throughout the course of the survey, team members observed that new food plants such as leaf vegetables, corn, cassava and legumes had been inter-cropped with plants traditionally grown in housing compound gardens (e.g. sweet potatoes, tobacco, mountain pit-pit and ginger).

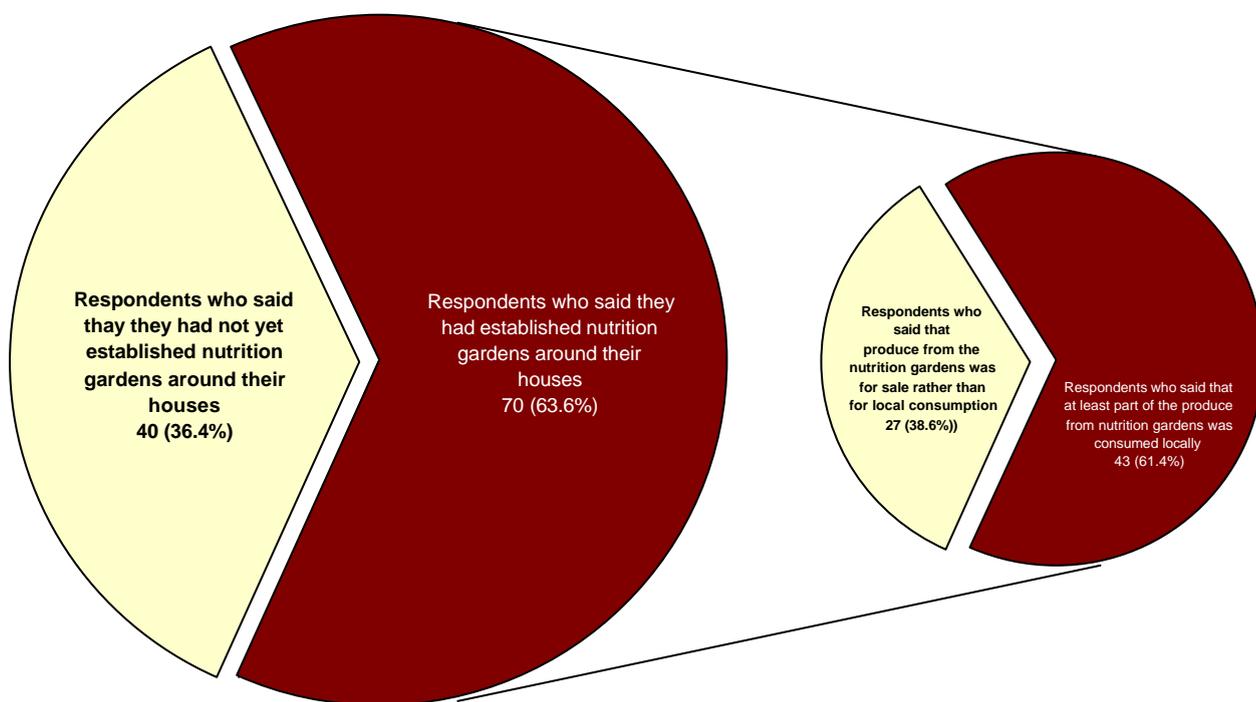
Most of the respondents from Kanggime and Kembu / Mamit said that part of the harvest from their nutrition plot was used for daily meals and that another part had been sold in order to raise additional income for their families. The survey team was not able to verify whether or not people were consuming produce from the nutrition gardens through field observations. Despite the diversity and abundance of food crops in many nutrition gardens now, there is no clear indication as to whether or not dietary changes, the goal of WATCH's promotion of nutrition garden, have been adopted by the target groups. Therefore, there is still a concern that the great majority of the produce from nutrition gardens may actually be being sold rather than consumed. If this was the case it could be assumed that the survey respondents reported a higher level of consumption of foods from these gardens than was actually the case because they believe this is what the project personnel and the survey team wish to hear.

If it is true that the majority of the produce from nutrition gardens may be being sold rather than being consumed by group members, this does not necessarily mean that these activities are not helping to raise the nutrition status of group members. The cash income generated through the sale of produce from nutrition gardens could still influence levels of nutrition levels if that cash is used to purchase other foodstuffs, or even more indirectly, if the cash raised from the sales is invested in education or entrepreneurial activities.

FIGURE 9.
ESTABLISHMENT AND UTILIZATION OF NUTRITION GARDENS IN THE RESPONDENTS YARDS



KANGGIME SUB-DISTRICT



KEMBU – MAMIT SUB-DISTRICT

2.2 MATERNAL AND INFANT HEALTH

2.2.1 ANTENATAL CARE (ANC)

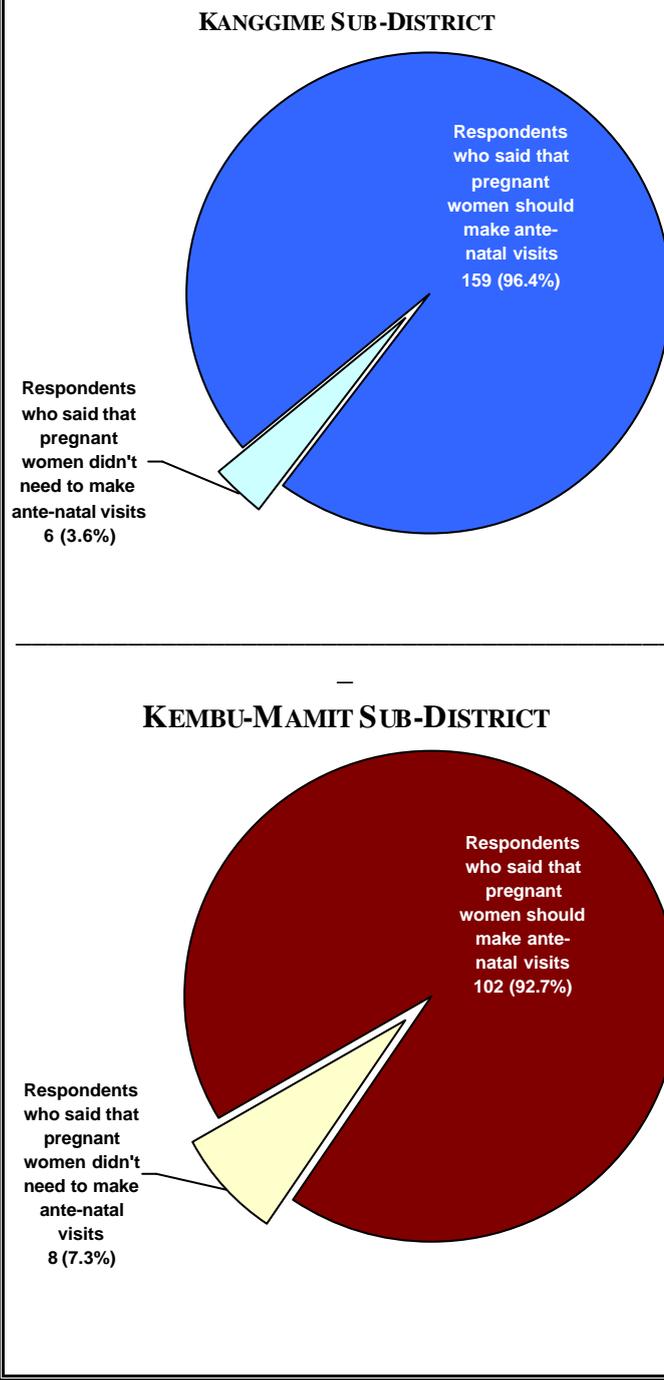
According to the target levels of service provision of the Indonesian Health Care System, all women should receive a minimum of four antenatal checks during their pregnancy. Each of these visits, designated K1 through to K4, should occur at different stages throughout pregnancy. The K1 visit should take place during the first trimester of pregnancy, the K2 visit during the second trimester and the K3 and K4 visits should both occur during the third trimester. During each of these visits pregnant women should receive a minimum level of antenatal services according to the 5T system. The five Ts are as follows:

1. **Timbang dan Tinggi:** Weight, height and middle upper arm circumference measurements (MUAC) should be taken for growth monitoring and the detection of nutrition problems.
2. **Tekanan Darah:** Blood pressure should be checked.
2. **Tinggi Fundus Uteri:** Womb expansion should be measured
4. **Tetanus Toxoid Vaccination:** Tetanus vaccinations should be given
5. **Tablet Tambah Darah:** Iron and sodium tablets should be provided to aid red blood cell production.

In Jayawijaya the DHO / DHS has also been attempting to implement the disbursement of malaria prophylaxis (chloroquine) and worming tablets (Pyrantel Pamoat) to pregnant women through the ANC examinations. This program seeks to reduce the effect of these diseases upon the incidence of fetal malnutrition and low birth weights. The health service in Jayawijaya has experienced difficulties in applying these service standards and for a range of reasons has not been able to achieve these target levels of service provision.

One of the main reasons for the low attendance rates of the K1 antenatal examinations relates to local beliefs about conception and pregnancy. Throughout the highland region in New Guinea, local people believe that a woman cannot be pregnant until the baby begins to move about noticeably in the womb. This usually occurs at about the 12th to 14th week of pregnancy, well into the second trimester. It is extremely difficult to convince a woman from Jayawijaya to make a K1 visit during the first trimester when she and most other people in her community do not consider her to be with child. Therefore, the first visit to the health workers by most women in Jayawijaya is made at a time when they are expected to make their K2 visit. Local understandings of their own biology has led to quite low K1 antenatal examination coverage (see Section III / 3.3.1 and Figure 38). And as the *puskesmas* level record keepers were often unsure whether the first visit should be recorded as K1 or K2, local beliefs have led to considerable confusion in the ANC visitation records for the health information system (HIS).

FIGURE 10.
RESPONDENTS' ATTITUDES TOWARDS ANTE-NATAL EXAMINATIONS



In order to gauge community attitudes towards the ANC examinations the survey team questioned the survey respondents as to whether they felt that it was good to make ANC visits to the village midwives or *puskesmas* and whether they felt that the services provided were beneficial and/or efficacious. The results of this line of questioning (see Figure 10) showed that the overwhelming majority expressed a positive attitude towards the ANC visits/examinations. In fact only 3.7% of respondents in Kanggime and 7.7% of respondents in Kembu / Mamit expressed the view that antenatal checks were not important or beneficial in ensuring safe births and healthy children.

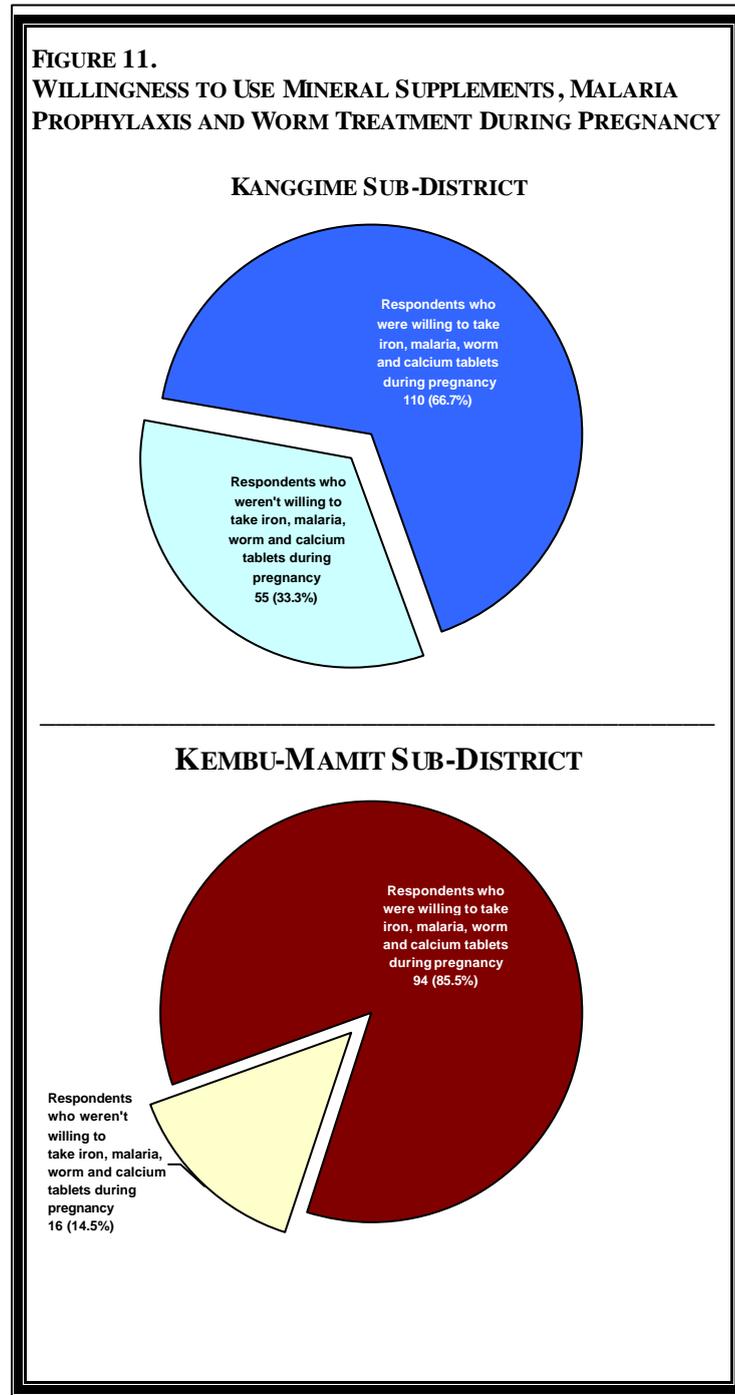
These figures are surprisingly positive as they indicate that the communities in Kanggime and Kembu / Mamit have developed a high degree of faith in village midwives and are highly aware of the importance of antenatal care.

Whilst most women from both sub-districts would be willing to participate in the ANC program, the data about ANC coverage in Figure 38 suggests that K1 coverage in both sub-districts was quite low and K4 coverage was seemingly excellent in Kanggime but was very poor in Kembu-Mamit. The discrepancy between the sub-districts suggests that other factors may be leading to rates of ANC coverage. Perhaps the poorer quality and

accessibility of service experienced by women in Kembu-Mamit is related to stronger faith in local ideas of biology described above.

2.2.2 COMMUNITY ATTITUDES TOWARDS MINERAL SUPPLEMENTS, MALARIA PROPHYLAXIS AND WORM TREATMENT DURING PREGNANCY

When questioned regarding their willingness to take iron supplements, chloroquine (malaria prophylaxis) and Pyrantel Pamoat (worm tablets) throughout the course of their pregnancy, 66.7% of female respondents in Kanggime and 85% of women in Kembu / Mamit stated that they were willing to take these medications if they were available and affordable. The remainder, or one third of women in Kanggime and 15% in Kembu / Mamit were not interested in using these medications during pregnancy.



WATCH personnel have observed that in general, members of the target communities have different levels of faith in the efficacy of these different drugs. In particular people have expressed doubts as to the efficacy of the worming treatment Pyrantel Pamoat. Unlike other worming treatments where the respondents had directly observed the expulsion of worms in their stools, people claim that after taking Pyrantel Pamoat there were no worms visible in their stools. Thus the targeted groups assumed that this medication does not work properly. As a suggestion, future surveys should examine community perceptions to each of these pharmaceuticals separately. It may well be that some people who are currently unwilling to take any of these drugs might be induced to use some of them if they were not being packaged with other drugs about which they have concerns regarding their efficacy or safety.

2.2.3 UNDERSTANDING OF THE ADVANTAGE OF TETANUS TOXOID IMMUNISATION FOR PREGNANT WOMEN

To protect unborn babies against tetanus neonatrum, the DOH conducts a Tetanus Toxoid (TT) immunisation program that aims to provide all women with two doses of the TT vaccine during pregnancy. In order to establish a picture of the target community's awareness of the purpose and advantages of the TT immunisation program, the survey team questioned respondents regarding their understanding of the purpose and benefits of the TT immunizations. As figure 12 suggests, an overwhelming majority of respondents had no understanding of the purpose or benefits of TT immunisation for pregnant women.

At first this result appears concerning because an extremely poor understanding of the TT immunization program, it can be assumed, would contribute to a poor realisation of the TT immunisation coverage targets. However, when we look at the results for the TT immunisation coverage (shown in Section III / 3.3.2 and Figure 39), this concern seems misguided. In Kanggime Sub-district (where 3.7% of the survey respondents showed some understanding of the TT immunisation program) only 66 women (or 16.0% of the years TT immunisation coverage target of 413 pregnant women) received a full course of TT immunisations. On the other hand, in Kembu-Mamit Sub-district where no respondents could display an understanding of the TT immunisations, a much larger percentage of pregnant women (103 or 34.5% of the years target of 299 women) received a full course of TT immunisations. This data suggests that the realisation of immunisation coverage targets has less to do with the communities understanding of the TT immunisations than it has to do with other factors that would influence a community's willingness to participate in such programs, regardless of their understanding of the purpose or benefits, and the capacity of the DHO/DHS, local midwives and other local health workers to extend these programs into the villages.

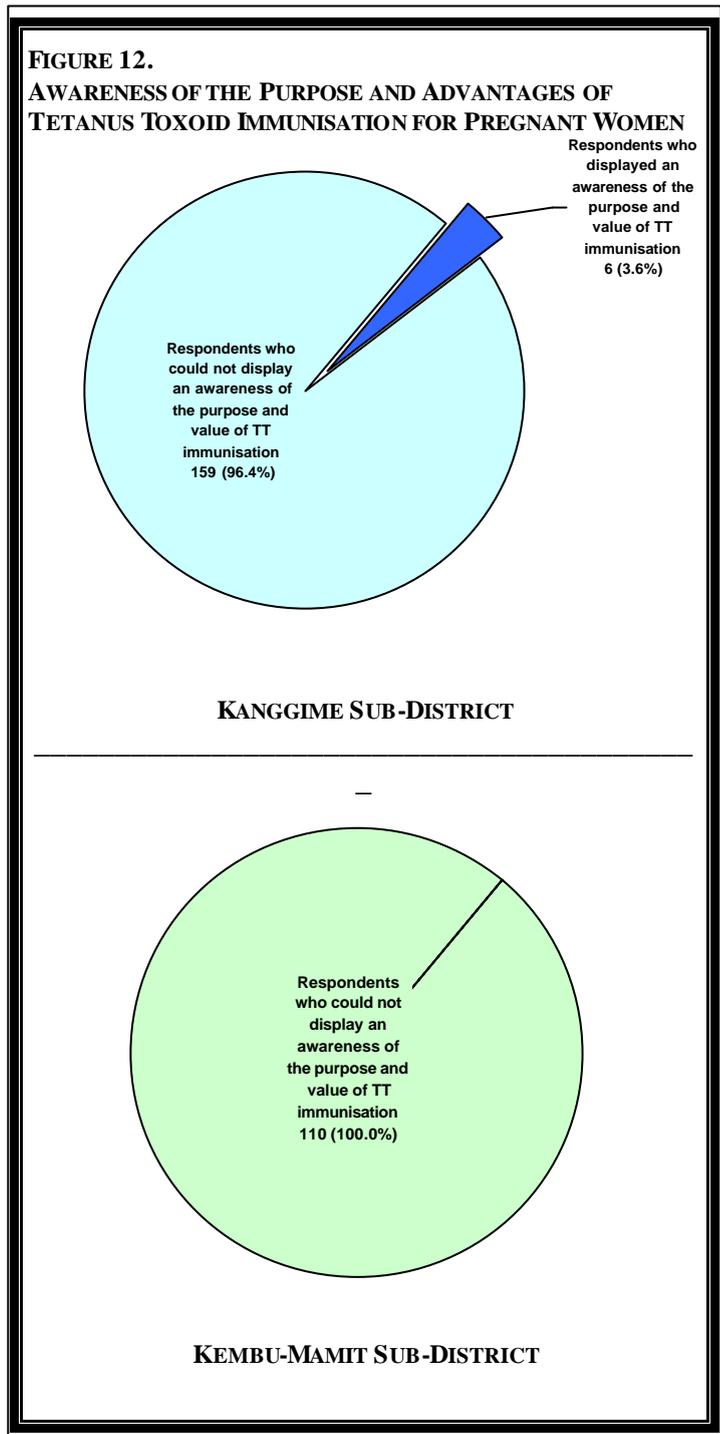
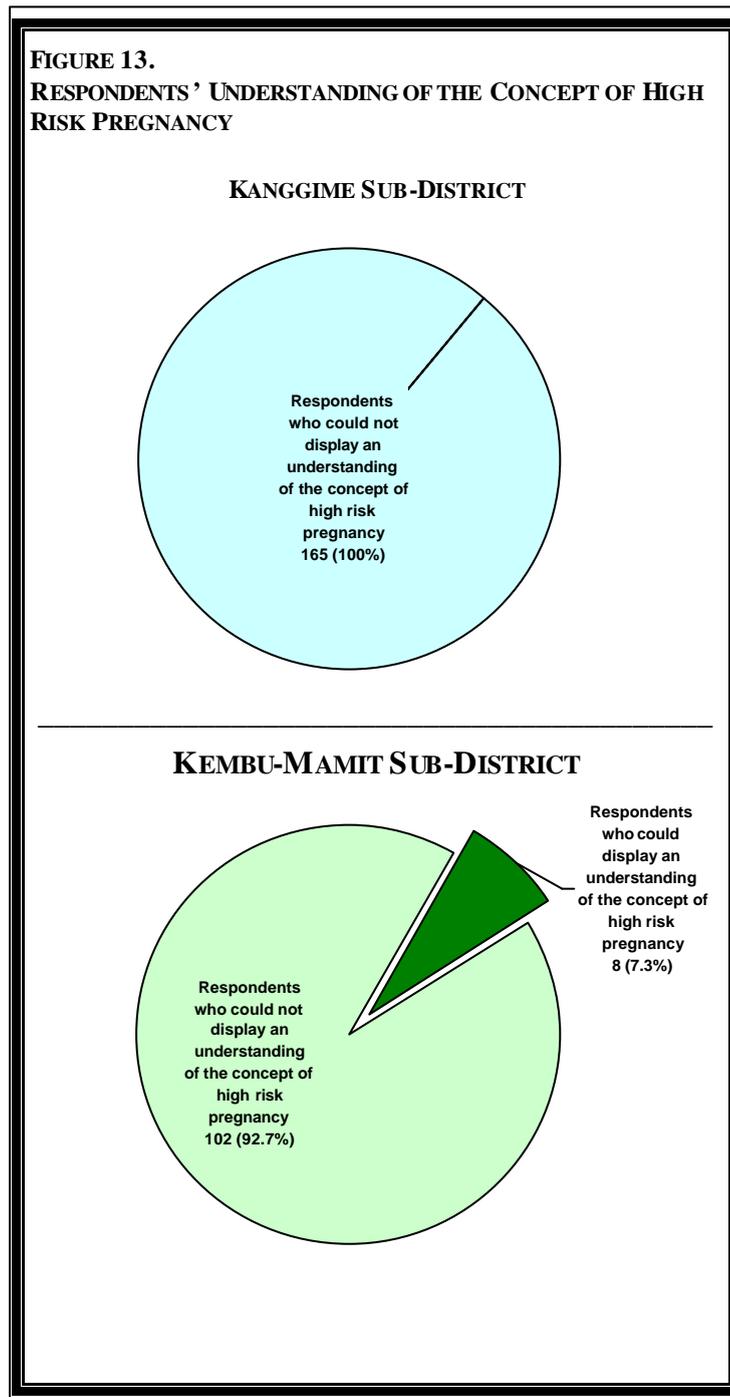


FIGURE 13.
RESPONDENTS' UNDERSTANDING OF THE CONCEPT OF HIGH RISK PREGNANCY



All of the respondents in the Kanggime Sub-District and over 90% of the respondents from Kambu / Mamit displayed a lack of understanding of the concept of high-risk pregnancy. This finding is a major concern because it has been found that the poor identification, referral and treatment of high-risk pregnancies is closely linked to extremely high maternal and infant mortality rates.

It is most plausible that the difficulties involved in conveying the concept of high-risk pregnancies to Lani and other highland Papuan people are related to conflicting concepts about conception, gestation and childbirth processes. According to O'Brien (1969) Lani conceptions of conception, gestation and childbirth, problems during pregnancy have more to do with social factors and supernatural interventions than physiological causes. Therefore any complications during pregnancy or childbirth is more likely to be based upon factors such as the behavior of the parents and other close clan members, the correct fulfillment of exchange and ritual obligations, outstanding disputes or grievances which might draw witchcraft attacks etc. In this kind of conceptual

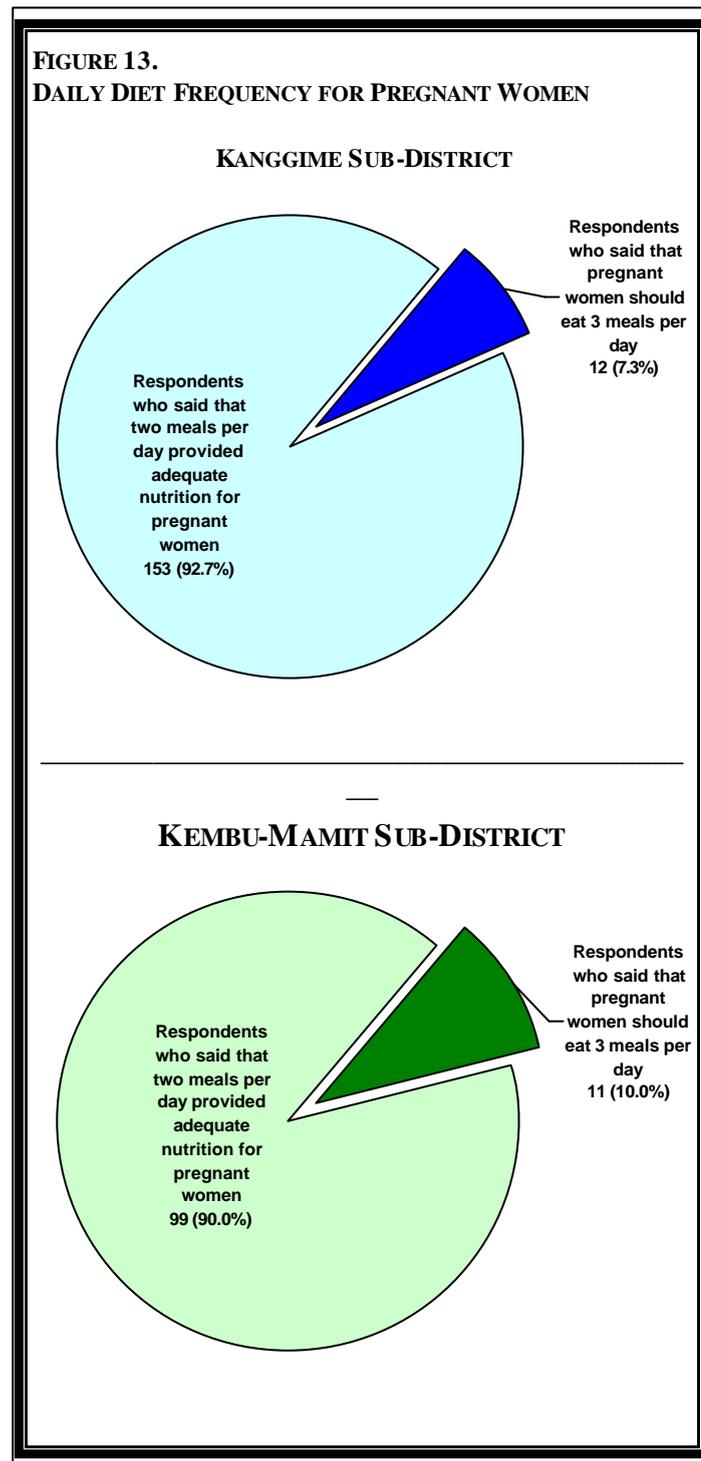
paradigm it is easier to accommodate and incorporate more physical and tangible health interventions (such as immunization programs and disease treatments) than it is to find community acceptance of conceptual and intangible interventions. This is because the former kind may be incorporated as new rituals or forms of semi-supernatural intervention whereas the latter requires a greater understanding and acceptance of the western notion of biomedicine.

2.2.5 DAILY DIET FREQUENCY OF PREGNANT WOMEN

When questioned regarding the number of meals eaten by pregnant women each day approximately 90% of respondents in both Kanggime and Kembu-Mamit Sub-Districts said that women continue to consume an average of two meals per day throughout their pregnancy. These meals were consumed in the morning before women went out to work, and in the early evening. Only 7.5% of pregnant women in Kanggime and 10.3% of pregnant women in Kembu / Mamit appear to be consuming a third meal in the middle of the day. These responses indicate that local knowledge about the importance of adequate energy intake for pregnant women (through increasing the frequency and size of their meals) remains poor.

This finding is not surprising when we consider that when working in the gardens women find it difficult to consume food as there are no adequate facilities for washing and cooking food. However there have been others, including the author, who have observed people in these regions consume uncooked bananas, sweet potatoes etc. during the day as well as eating two main meals. Leslie Butt (1998) notes how women often eat a “100 rupiah cake (about \$0.02 US) when at the market,

or...give their growing girl child an extra second or two of nibbling at crumbs or small potatoes before bundling up food in banana leaves for her to take to the men” (1998, p. 177). As such additional feeding is usually done in secret or else is not considered to be an additional meal it is unlikely to be recorded in a questionnaire-style nutrition survey.



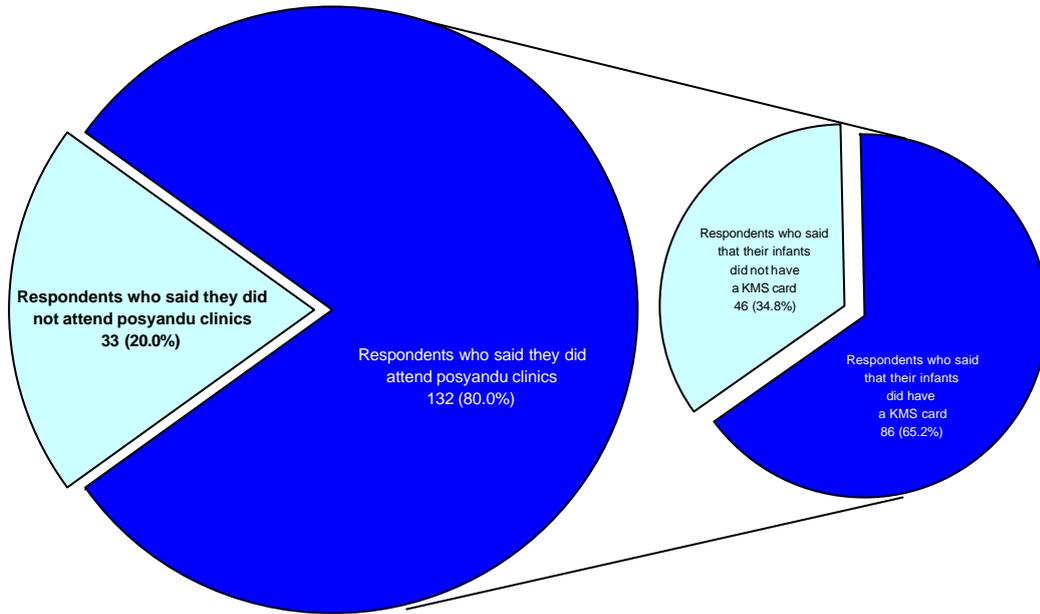
WATCH should have investigated to what extent top up feeding is occurring and not being reported. However, this poses a serious challenge, as even in the best of times it is difficult to verify the eating habits of people. To directly observe the behaviour of a large sample of informants over a reasonable period of time is labour intensive as well as behaviour-distorting. That is, it requires a lot of person-hours as well as influencing the behaviour of the informant by the very presence of the observer. The latter is of more concern because it increases the likelihood of causing biased or unrealistic results²⁴.

2.2.6 THE COMMUNITY'S UTILISATION OF POSYANDU SERVICES AND POSSESSION OF INFANT HEALTH RECORD CARDS (KMS)

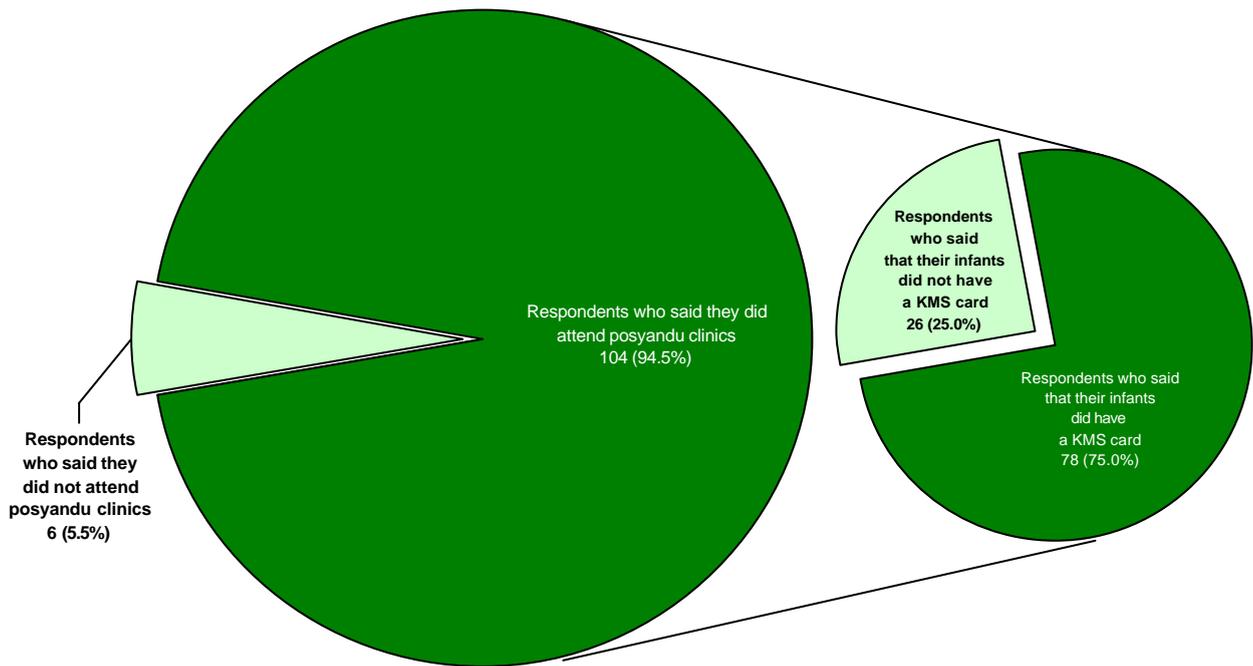
From the data displayed in Figure 14 we can see that a large percentage of women in both sub-districts claim to take their children to the monthly *posyandu* infant health clinics. Unfortunately there is no easy means to check the validity of these claims. We may, however, show some apprehension considering that although most women claimed to attend the clinics the percentage who claimed to be in possession of a *KMS* infant growth monitoring card was somewhat lower. In Kanggime only 65.2% of the respondents who said they attended the *posyandu* (or 52.0% of the entire sample) said that they had *KMS* infant growth monitoring record cards whereas in Kembu-Mamit 75.0% of the respondents who said they attended the *posyandu* (or 70.9% of the entire sample) said that they had *KMS* infant growth monitoring record cards. Once again it was not possible to cross check the validity of these findings by actually inspecting their *KMS* cards because most respondents had not been aware that they were required to bring the *KMS* cards to the survey location. It was definitely not practical for the survey team to personally visit individual homes in order to examine cards. Despite this, it is likely that data about the possession of *KMS* cards is likely to be overstated.

24 For an example of the difficulties involved in conducting detailed nutrition surveys in New Guinea see Hornabrook (1977), for a discussion of the validity of dietary recall methods see Gersovitz, Madden & Smiciklas-Wright (1978) and for a broader discussion of the limitations of nutritional survey methods see Marr (1971).

FIGURE 14.
RESPONDENTS' PARTICIPATION IN POSYANDU CLINICS
& POSSESSION OF INFANT GROWTH RECORD CARDS (KMS)



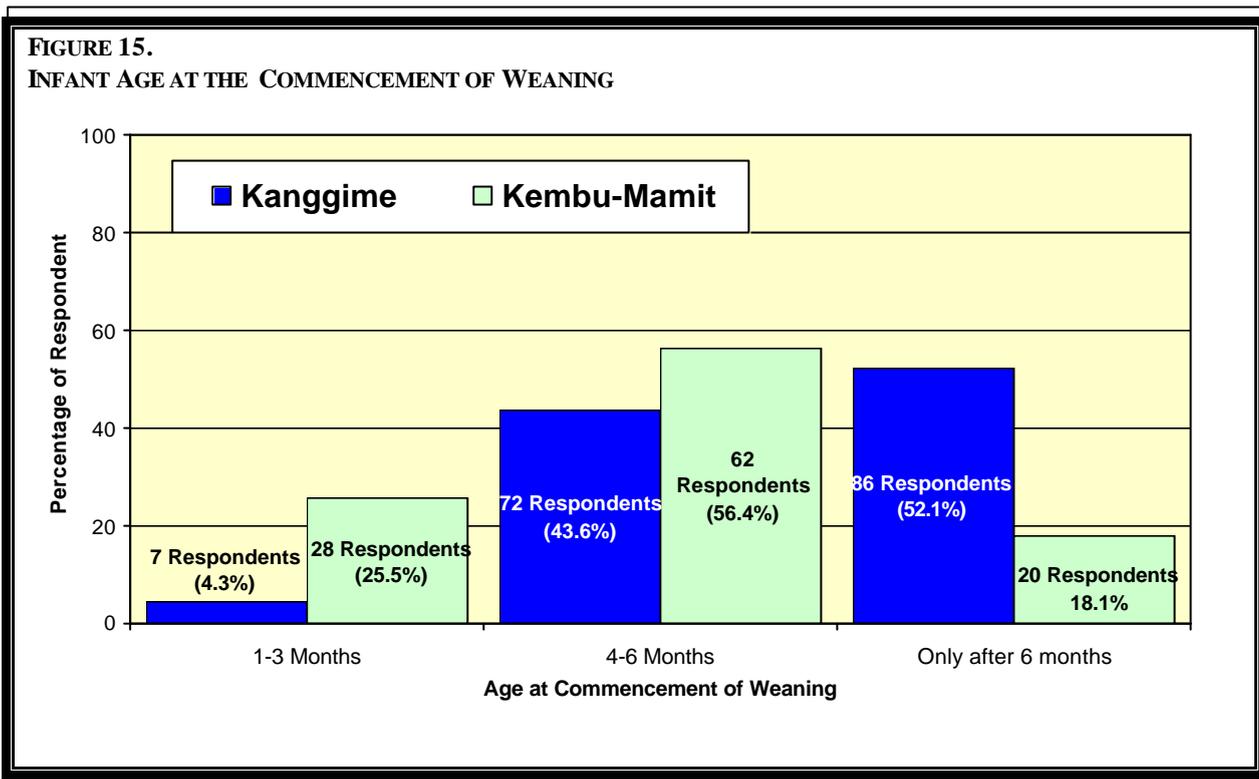
KANGGIME SUB-DISTRICT



KEMBU – MAMIT SUB-DISTRICT

2.2.7 INFANT AGE AT COMMENCEMENT OF WEANING

The data displayed in Figure 15 shows the breakdown of answers given by respondents when questioned about the age in which they began to wean their infants. It appears that women from Kembu-Mamit tend to wean their infants earlier than those from Kanggime. Indeed the data suggests that a considerable minority (over 25%) of women in Kembu-Mamit appear to be commencing weaning before their children reach the age of four to six months (according to health officials in Indonesia this is optimal age range in which to commence weaning). In Kanggime, on the other hand, a slight majority of women may delay weaning beyond the age range that is considered optimal.



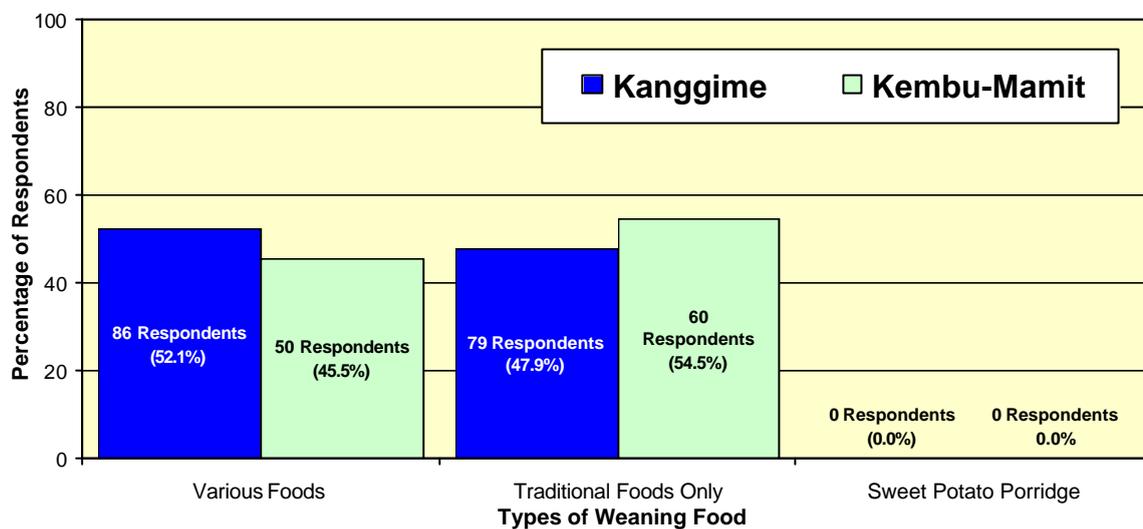
When considering this data it is useful to realize that most respondents have a very limited grasp of numeracy. However, if both groups provided answers that were numerically inaccurate we can assume that the trends within the data are more accurate than the actual months weaning was said to have begun. These statistics tell us nothing about the reasons why weaning takes place at different times across the two sub-districts however by looking at secondary data sources we can speculate about these reasons. It is possible that the harsher environment in Kembu-Mamit may motivate women to wean earlier. After all energy and nutrition levels, of which a lot is required to work the more inhospitable land in this region, are reduced by the act of breastfeeding. The perspective of WATCH personnel regarding the optimal time to wean is in contrasted with certain local viewpoints. As far as WATCH and other bio-medically oriented institutions are concerned, the weaning practices of Lani women in Kembu-Mamit are agreeable however, for Lani and Dani who live in more accommodating environments, their earlier weaning practices may appear pitiful.

2.2.8 TYPES OF FOODS USED FOR WEANING INFANTS

Sweet potato, greens, and fruits are usually given to babies as weaning food. It is very common for mothers to feed their babies mashed sweet potato or a handful of sweet potato. The data displayed in figure 16 indicates that whilst the number of mother who use an increased variety of foods when weaning is increasing, feeding infants porridge made from sweet potato flour, a major promotion by the WATCH project, is not at all the norm. None of the respondents from either sub-district claimed to use sweet potato porridge as a weaning food. Despite the social constraints or lack of perceived need or benefit for sweet potato porridge amongst the target communities, the WATCH staff maintain that weaning infants with porridge made from sweet potato flour is an important strategy for overcoming infant malnutrition. Local resistance to sweet potato porridge suggests that either the promotion of sweet potato flour porridge be abandoned, that the technique for its production be further simplified to make its production less labour intensive, or that the approach applied in promoting it must be radically revised.

FIGURE 16.

TYPES OF WEANING FOODS GIVEN TO INFANTS



2.2.9 DAILY INFANT (UNDER-FIVES) FEEDING FREQUENCY

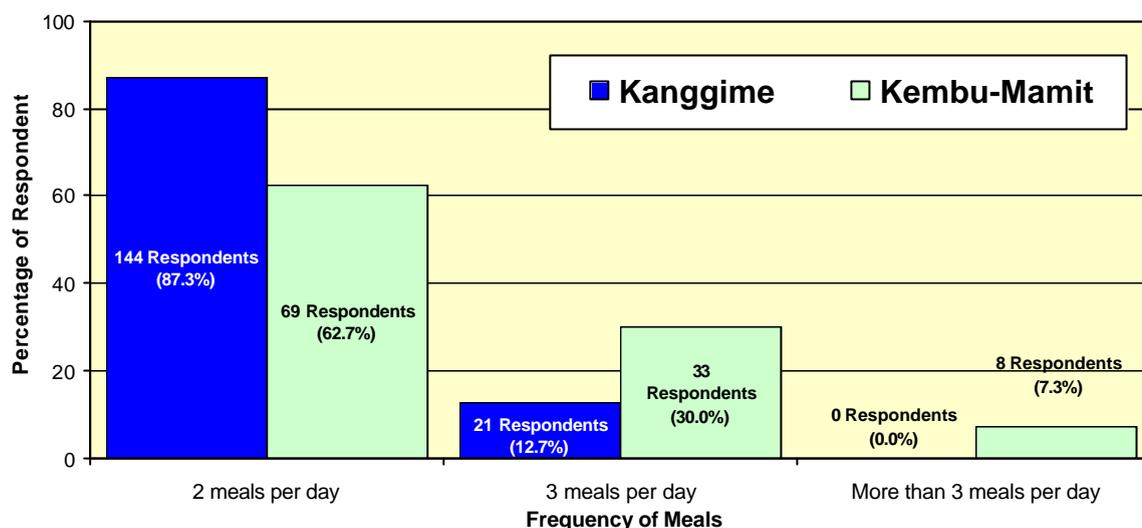
As we can see from the data displayed in Figure 17, when questioned regarding how frequently they fed their infants each day, the majority of respondents (87.3% in Kanggime and 69% in Kembu-Mamit) said they only fed the child two meals a day, once in the morning and once in the early evening. Only 12.7% of respondents from Kanggime and 30.0% from Kembu-Mamit said that they provided their children with an average of three meals per day and 7% from Kembu-Mamit said they fed their infants more than three meals per day.

It is likely that the reported calorie intake of underfives per day is quite low because the high bulk and high water content of sweet potatoes makes it difficult for an infant to consume sufficient calories in two sittings per day. As mentioned before, it is likely that there is a degree of under-reporting of infant feeding as children do snack on cooked or uncooked sweet potatoes, other garden produce or small animals caught or collected

throughout the day. However, such additional sources of nutrition are not generally considered to make a significant contribution to Highland Papuan diets.

FIGURE 17.

DAILY FREQUENCY OF INFANT FEEDING



2.3 THE COMMUNITY’S UNDERSTANDING OF THE THREE MAIN DISEASES : DIARRHEA, PNEUMONIA AND MALARIA

Diarrhea, pneumonia and malaria remain the three most significant preventable diseases and the main causes of death in underfives in the target areas as well as across both Jayawijaya and Irian Jaya as a whole. The prevalence of these three diseases amongst infants is considered to be significantly influenced by chronic, but generally not severe, malnutrition. However, the relationship between these diseases and rates of malnutrition is quite complex as exposure to these diseases, especially malaria, can also contribute to malnutrition problems.

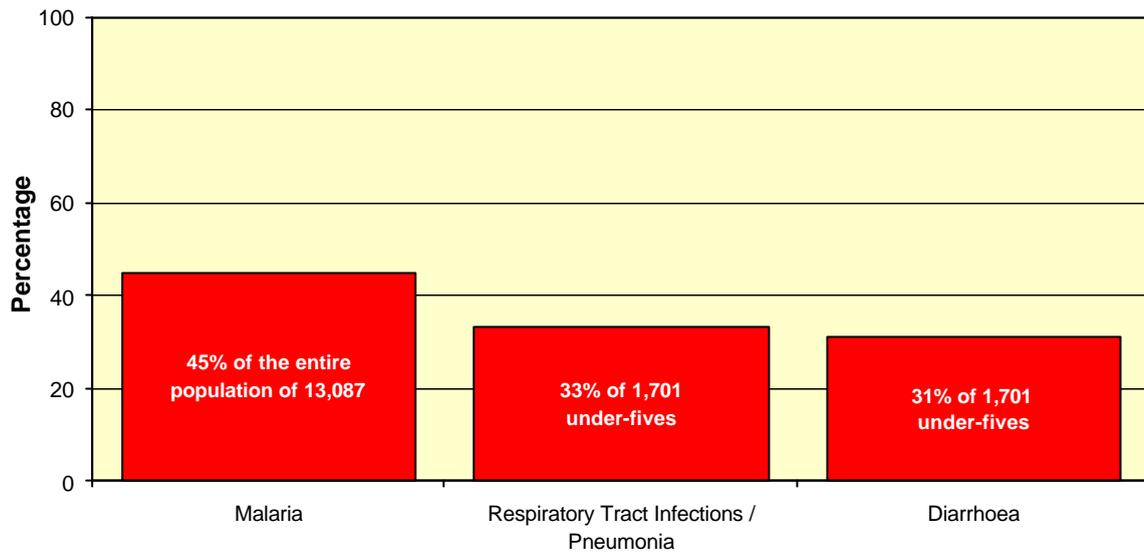
Whilst it remains difficult to get a clear and directly comparable picture of the current prevalence of the three diseases in the target areas, based on the January-December 1996 disease report (LB1 report) at the Mamit *Puskesmas* we can get some idea of their prevalence.

From the data displayed in Figure 18 we can see that malaria was the most prevalent disease in Kembu-Mamit Sub-district effecting 45% of the entire population (N = 13,087 people). Based on a DHO report for 1996, the Sub-district of Kembu-Mamit is categorized as a hyper-endemic malaria area where AMI levels over the year reached more than 100% and the parasite rate was 86.3%. Figure 12 also highlights that the number of upper respiratory tract infections and pneumonia cases amongst the underfives in Kembu-Mamit was 33% (N = 1,701) whilst the number of diarrhea cases amongst underfives in Kembu-Mamit was 31% (N= 1,701).

In light of the fact that Kanggime lies at a higher altitudes than Kembu-Mamit and that people in Kanggime have fewer opportunities or reasons to travel to lowland areas, it can be predicted that in Kanggime pneumonia would be the most prevalent disease followed by malaria and diarrhea. Whilst data from the Kanggime *Puskesmas* was not available to test this prediction, field observations, daily records from the *puskesmas* and

other health facilities as well as data from other similar sub-districts strongly supports this prediction.

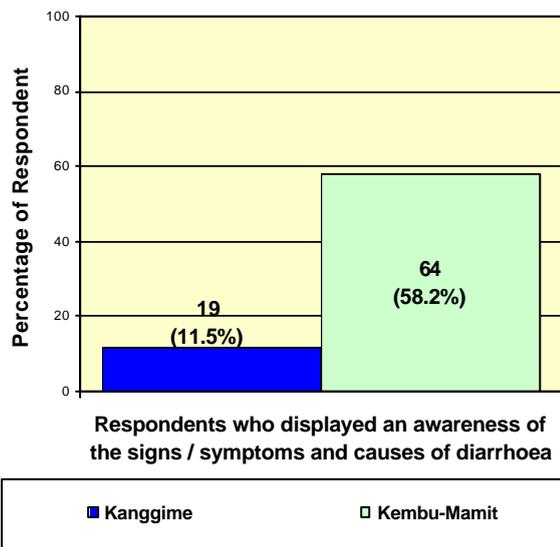
FIGURE 18.
PREVALENCE OF THE THREE MAJOR DISEASES IN KEMBU-MAMIT SUB-DISTRICT



Notes: The data in this graph is based upon the results of a 1996 epidemiological survey conducted by the DHO statistics for 1996

2.3.1 THE COMMUNITY'S AWARENESS OF THE CAUSES AND SYMPTOMS OF DIARRHEA

FIGURE 19.
RESPONDENTS AWARENESS OF THE SIGNS / SYMPTOMS & CAUSES OF DIARRHOEA



When questioned regarding their understanding of the causes and symptoms of diarrhea the great majority (98%) of respondents from Kanggime Sub-District displayed a poor understanding. On the other hand, a slight majority (58.1%) of respondents from Kembu / Mamit Sub-district displayed a good understanding of the causes and symptoms of diarrhea.

The main symptom identified by respondents was loose or watery stools that, they explained, resulted in the loss of large amounts of fluids from the body. Those in the know also explained that diarrhea is contracted by drinking unboiled water, eating unhygienic food or by eating with dirty hands.

The considerable disparity between the two sub-districts suggest that health education programs, at least in regard to diarrhea, have been much more effective in the Kembu / Mamit Sub-district. Possible reasons for this include that the health workers in Kembu / Mamit have been more active in health education activities and/or the

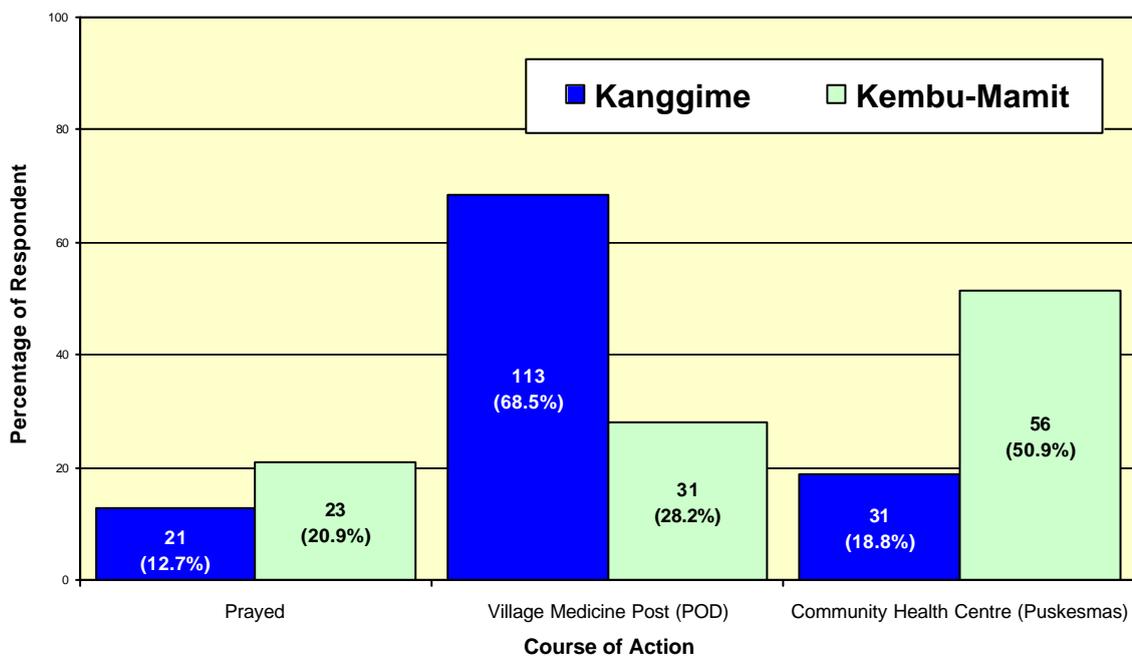
community itself has been more receptive to health education programs. The possibility of Kembu-Mamit communities being more receptive to diarrhea education campaigns or messages seems quite likely when we consider that many people in Kembu-Mamit live further down the Toli watershed and thus have to deal with higher levels of contamination of water sources. In contrast to the headwater communities in Kanggime, uncontaminated streams running of the main mountain peaks are much more easily accessible. Presuming that there is a variance in the degree of receptiveness to new ideas between the communities in Kanggime and Kembu / Mamit it would be a worthwhile exercise to try to determine what social, environmental or historical factors cause this variance.

The fact that some community members were able to understand the causes and symptoms of diarrhea suggests that these health concepts are relatively comprehensible and acceptable to Lani people. Local beliefs about the two spirits Liimbu and Meelemu (see discussion of Hayward and Larson’s research on Lani cosmology in section II / 4.1.6 and Annexe IV of this report) certainly provide a framework for assimilating the biomedical idea that preparing food in or drinking stagnant water can be a source of disease.

2.3.2 THE COMMUNITY’S INITIAL COURSES OF ACTION IN CASES OF DIARRHEA

When questioned regarding what kind of aid / treatment they would resort to in cases of diarrhea, the majority (68.8%) of respondents from Kanggime referred to the Village Medicine Post *POD* as being the best place to seek treatment. The percentage of respondents who said that they would seek assistance at the *Puskesmas* was fairly low (18.8%) while those who said they would seek supernatural intervention through prayer (there was no category for more traditional spiritual practices or *adat*) in the first instance was even less (12.5%).

FIGURE 20.
COURSES OF ACTION TAKEN IN CASES OF DIARRHOEA



By comparison the majority (51.3%) of respondents from Kembu / Mamit Sub-district referred to the *Puskesmas* as the best place to seek assistance for diarrhea. Only 28.1% said they would go to the *POD* and 20.6% said they would pray or seek other supernatural intervention.

The disparity in preference for the *Puskesmas* and *POD* between respondents in Kanggime and those in Kembu / Mamit would be related to the fact that there are, as yet, only a very limited number of *PODs* established in Kembu-Mamit. Many communities in this region are still serviced by the *BPs* (Polyclinics) a mission-based village level clinic which the government is attempting to replace with community based *PODs*. Therefore people in Kembu-Mamit must still rely on the *BPs* and the *puskesmas* and/or *pustu* for medical assistance.

It is interesting that a greater number of respondents from Kembu-Mamit said they would pray before seeking medical assistance. It is possible that a belief in spiritual causes of illness is stronger in Kembu-Mamit or at least more prevalent or openly espoused. Whatever the reason it is likely that in both regions the amount of prayer or use of adat to treat illness would be underrepresented since that people are aware that these actions are considered “backward” by the team of “modern” health surveyors. Moreover it is likely that a high percentage of people who volunteered to participate in this health survey would strongly ascribe to ideas of modernity and therefore the results would be skewed away from groups within the target communities who more openly ascribe to traditionalist views.

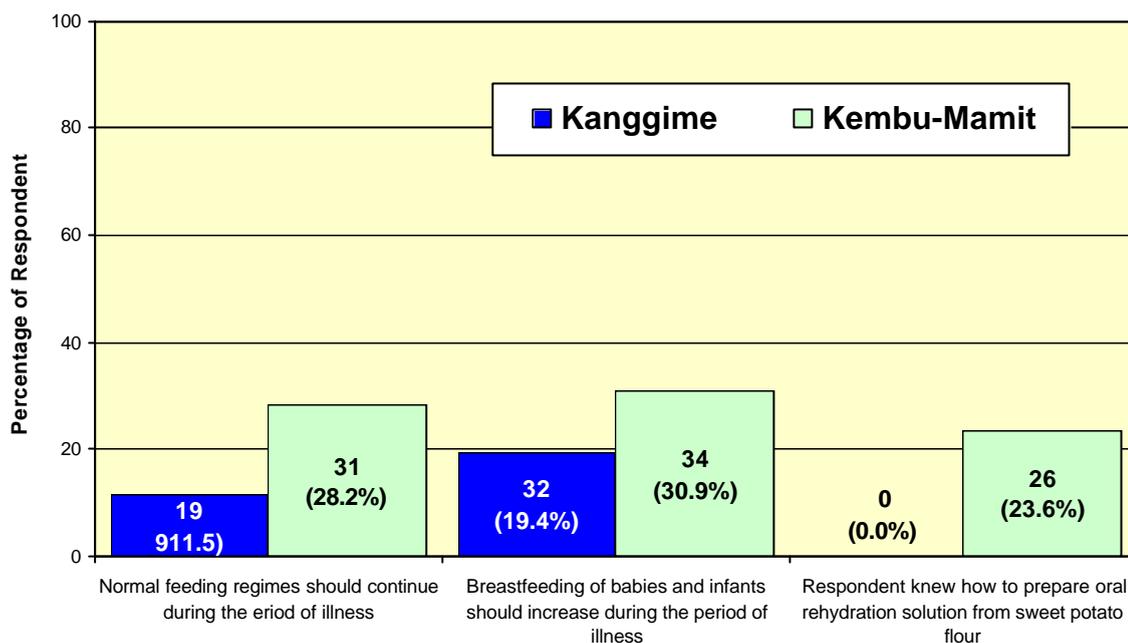
2.3.3 FEEDING PRACTICES FOR BABIES & INFANTS SUFFERING FROM DIARRHEA

When questioned regarding what they would feed their babies or infants if they were suffering from diarrhoea, most respondents replied that treating diarrhoea involved giving oral rehydration solution and excess water from a pot of boiled sweet potato to the infected person as well as taking them to the health centre in order to seek medication or other advanced treatment.

However, as we can see in Figure 21, the majority of respondents in both sub-districts seemed unaware that the frequency of breastfeeding should be increased when a baby suffered diarrhea. Also, none of the respondents from Kanggime and only 23.6% of respondents from Kembu-Mamit knew how to prepare oral rehydration solution from sweet potatoes, another major intervention promoted by the WATCH staff.

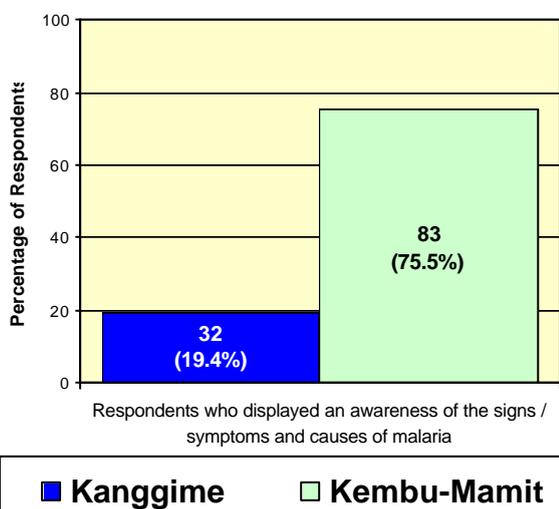
Consistent with the results about awareness of the symptoms and causes of diarrhea, women in the Kembu-Mamit Sub-district were more concerned about the health risks involved with diarrhea than women in Kanggime. Again, this is not surprising considering that in Kanggime clean water from mountain streams is in greater abundance and fewer stagnant or slow moving water bodies are encountered.

FIGURE 21.
FEEDING PRACTICES FOR BABIES AND INFANTS SUFFERING FROM DIARRHEA



2.3.4 UNDERSTANDING OF THE CAUSES AND SYMPTOMS OF MALARIA

FIGURE 22.
RESPONDENTS AWARENESS OF THE SIGNS / SYMPTOMS & CAUSES OF MALARIA



When respondents were questioned regarding the causes and symptoms of malaria, it was found that most respondents from Kembu-Mamit (over 75%) could display a reasonable understanding of the causes and symptoms of malaria but only a minority of respondents from Kanggime (under 20%) could do so.

Symptoms of malaria which were most regularly cited by respondents included fever, headache, and bodily pain. Many were also aware of the relationship between mosquito bites and malaria transmission and seemed to understand that malaria is a communicable disease. Some respondents were also conscious of the connection between the immune system and disease, although

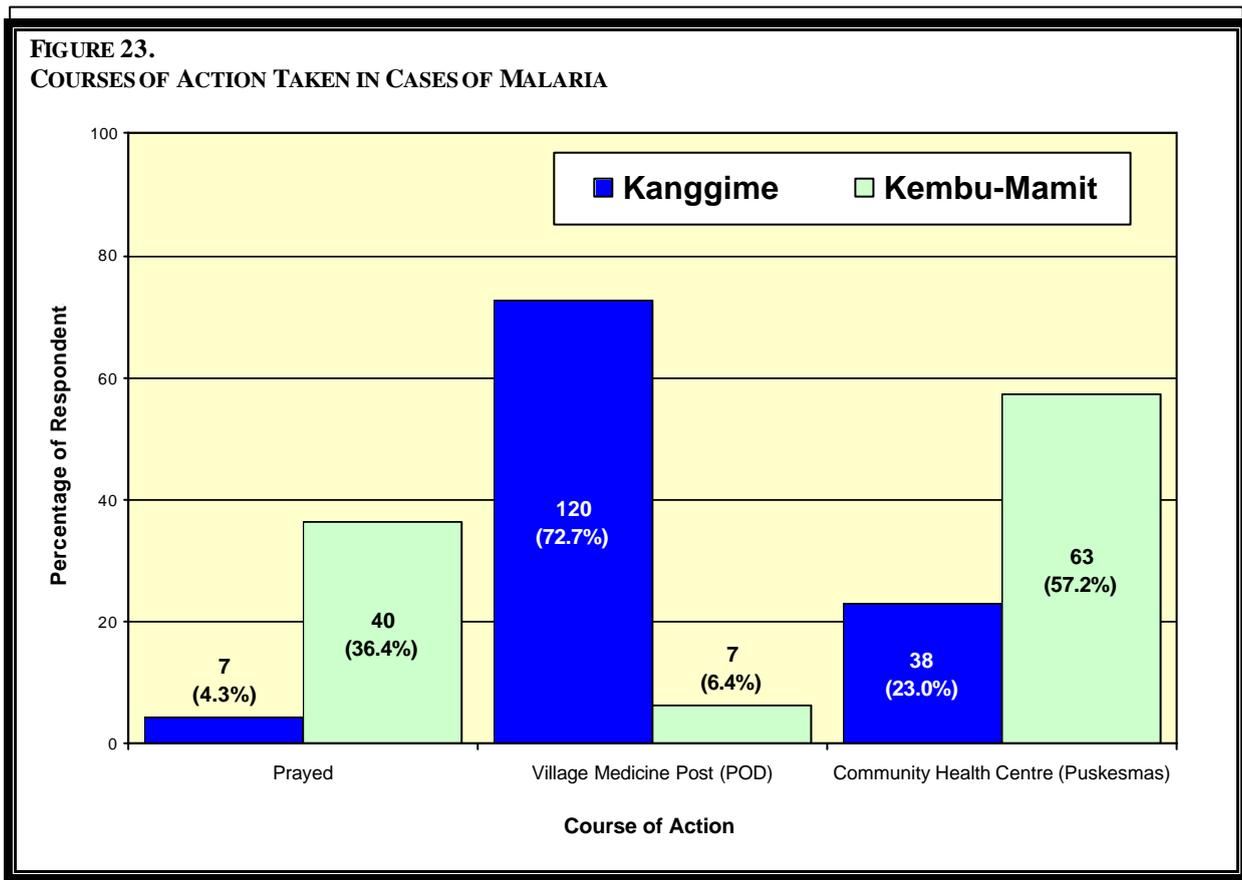
it was articulated along the lines of 'if people work particularly hard, such as to open a new garden, they would be tired, their stamina would decrease and they would be more likely to become infected with malaria'. In regards to what they would do if they thought they had malaria, some respondents said that they would go to the health center and also drink teas made from boiled pawpaw leaves or *koperingu* root.

The clear discrepancy between the levels of understanding about the symptoms and causes of malaria is not altogether surprising when we consider that malaria is a much greater problem in Kembu-Mamit than is the case in Kanggime. Even though the levels of malaria in Kembu-Mamit are much higher, malaria education campaigns in Kanggime need much greater emphasis.

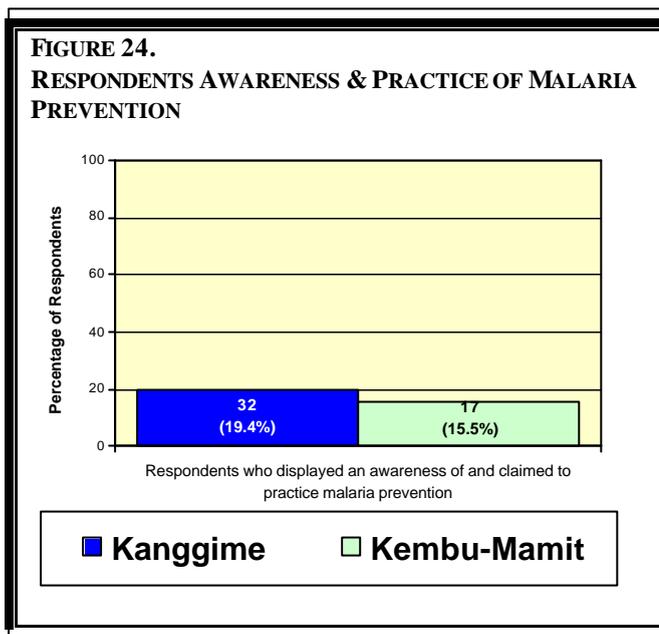
2.3.5 INITIAL COURSES OF ACTION IN CASES OF MALARIA

As with Figure 23, which highlights the preferred treatment for diarrhea, Figure 17 illustrates that in Kanggime Sub-district the Village Medicine Posts (*POD*) were clearly the preferred place to seek treatment in cases of malaria. In Kembu-Mamit on the other hand, most respondents (57.2%) said they would go to the *puskesmas* with only 6.4% going to the *POD*. The main reason why respondents from Kembu-Mamit are more likely to go to the *puskesmas* than the *POD* is because, as yet only a small number of *PODs* have been established.

As was also the case when respondents were questioned regarding their initial courses of action in cases of diarrhea, a significant minority of respondents from Kembu-Mamit (36.4%) stated that their first response would be to pray.



2.3.6 UNDERSTANDING AND PRACTICE OF MALARIA PREVENTION



Greater community participation in the prevention of malaria is considered vital if malaria morbidity and mortality rates in the target areas are to be sustainably reduced. In particular, communities need to clean up their neighbourhoods and remove mosquito breeding environments, use bed nets when sleeping, drink the water from boiled papaya leaves, and take chloroquine once a week during pregnancy.

From the data displayed in Figure 24 it is clear that the levels of community awareness about malaria prevention is very poor with less than 20% of respondents in both sub-district displaying a satisfactory understanding.

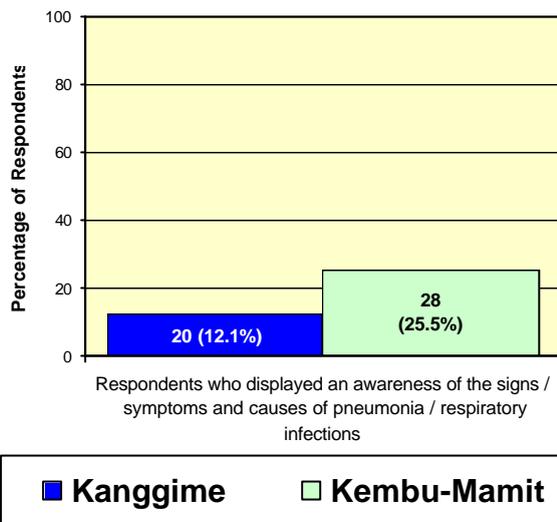
It is therefore considered important that the promotion of greater community awareness and participation malaria prevention activities be prioritised. Malaria awareness and prevention campaigns should be run through the *posyandu* and *POD*, particularly in the villages that are far away from health centres and sub-health centres. The health workers in health centres and sub-health centers also need to be continuously trained and supervised in malaria prevention, diagnosis and treatment so that they will be better able to implement both preventative and curative approaches to this problem. This especially important in Kembu-Mamit Sub-district where the malaria problem is considered hyper-endemic.

2.3.7 UNDERSTANDING OF THE CAUSES AND SYMPTOMS OF PNEUMONIA AND OTHER UPPER RESPIRATORY TRACT INFECTIONS

As can be seen from the data displayed in Figure 17 responses to questions about the causes and symptoms of upper respiratory tract infections (including pneumonia) indicate that less than 25% of the target communities have a basic understanding of these diseases. The term >pneumonia = appeared to be foreign to almost all respondents. The meaning of the term >pneumonia= was only grasped after the survey team described the symptoms (i.e. coughing with mucus, high body temperature, constricted breathing and chest pain).

From these results it is apparent that the idea of pneumonia is much harder for Lani people to comprehend than either malaria or diarrhea.

FIGURE 25.
RESPONDENTS AWARENESS OF THE SIGNS / SYMPTOMS
& CAUSES OF PNEUMONIA / RESPIRATORY TRACT
INFECTIONS



Although the disparity of results between the two groups is not great, community awareness about pneumonia is higher in Kembu-Mamit. This result is surprising and runs counter to the logic used before to explain why understandings about diarrhea and malaria are higher in Kembu-Mamit. Clearly there are other factors mediating people’s understanding about a disease other than motivation to reduce the prevalence of a disease. After all, most communities in Kanggime live at higher altitudes they are thus likely to suffer from more indoor air pollution from heating fires, a major cause of acute respiratory infections. Yet the people in Kanggime have lower understandings about the causes and symptoms of respiratory illnesses and pneumonia, diseases that effect more people

there than in Kembu-Mamit. Therefore, we can infer that the most likely factor that influenced the results were differences in the effectiveness of the pneumonia education campaigns conducted by the health workers in the different regions. It is also quite possible that the community in Kembu-Mamit may generally be more receptive to new ideas than the community in Kanggime. This possibility is supported by many other survey findings and is also consistent with Anton Ploeg’s (1969) notion of societal intensification as a function of environmental stress (see section II / 4.1.5).

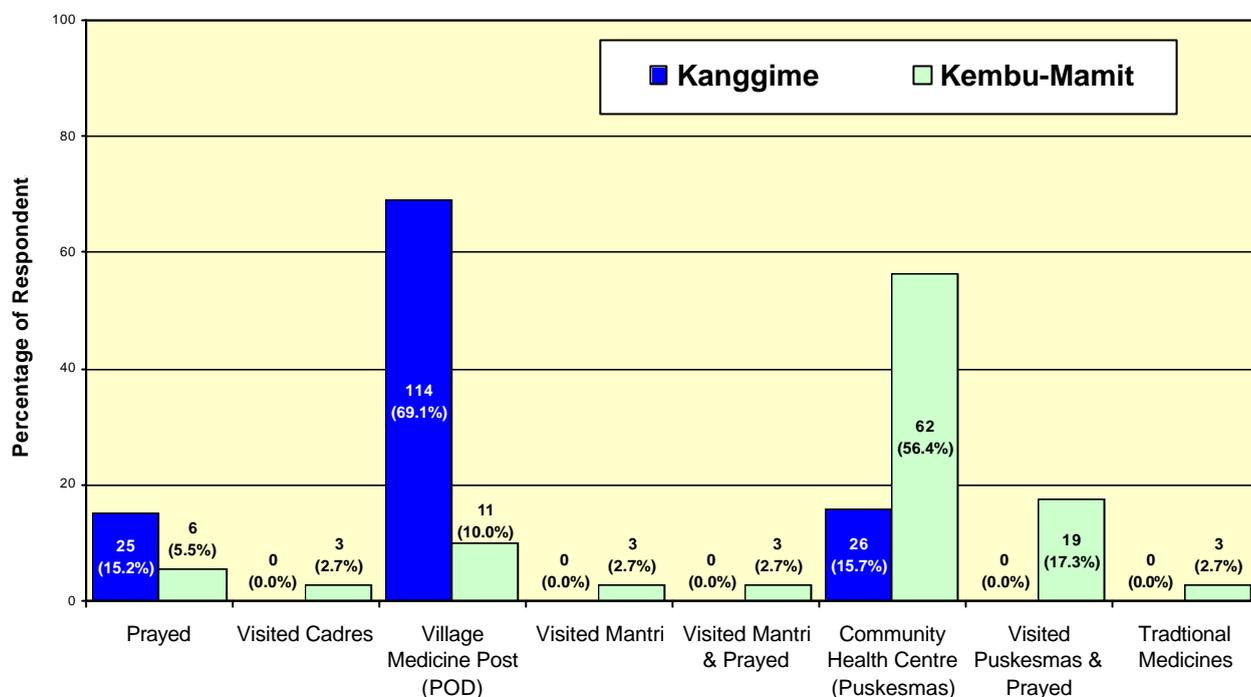
2.3.8 INITIAL COURSES OF ACTION IN CASES OF PNEUMONIA

The data displayed in Figure 26 suggests that most people (69.1%) in Kanggime are likely to seek first aid from the community health volunteers in the Village Medicine Post when they are suffering from pneumonia. Only 15.7% of respondents from Kanggime stated that the community health center or sub-health center would be their first option for treating pneumonia whilst 15.4% said that they would pray at first. In Kembu, most people (56.4%) said they would go to health center to get help if they got pneumonia whilst the remaining respondents said they would go to the *POD* (10%), directly approach the *cadres* (2.7%) or *mantris* (2.7%) or take traditional medicines (2.7%).

It is interesting to note that many respondents from Kembu-Mamit objected to the either/or nature of the categories used in the survey. In particular they rejected the category “prayed.” They wished to make it clear that whilst they considered praying to be an important or even essential part of the healing process, they still respected the efficacy of biomedical approaches and would avail themselves of formal health services and pray simultaneously.

The results indicate that people from both sub-districts are more likely to pray when afflicted with pneumonia than when they had either malaria or diarrhea. Presumably this relates to the community's poorer understanding of pneumonia. This result is also possibly related to local beliefs that seem to regard influenza and respiratory illness as being associated with the powerful Ap Endak and Kwe Wa'nakwe spirits (see Annexe IV).

FIGURE 26.
COURSES OF ACTION TAKEN IN CASES OF PNEUMONIA / RESPIRATORY TRACT INFECTIONS



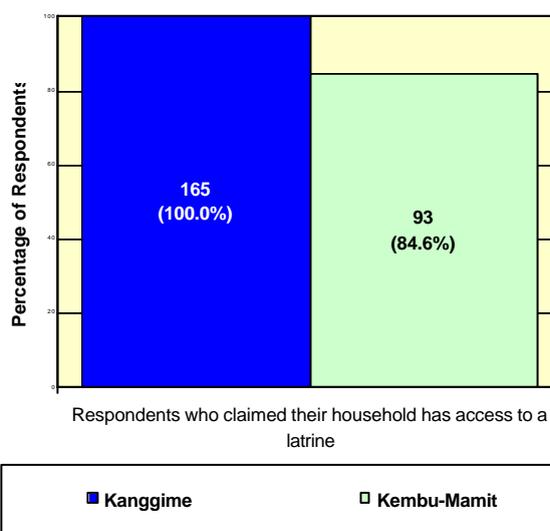
2.4 SANITATION AND LATRINE UTILITY

2.4.1 COMMUNITY ACCESS TO LATRINES

From the data displayed in Figure 27 we can see that all of the respondents from Kanggime and a considerable majority (84.6%) of those from Kembu-Mamit claimed to have access to latrines.

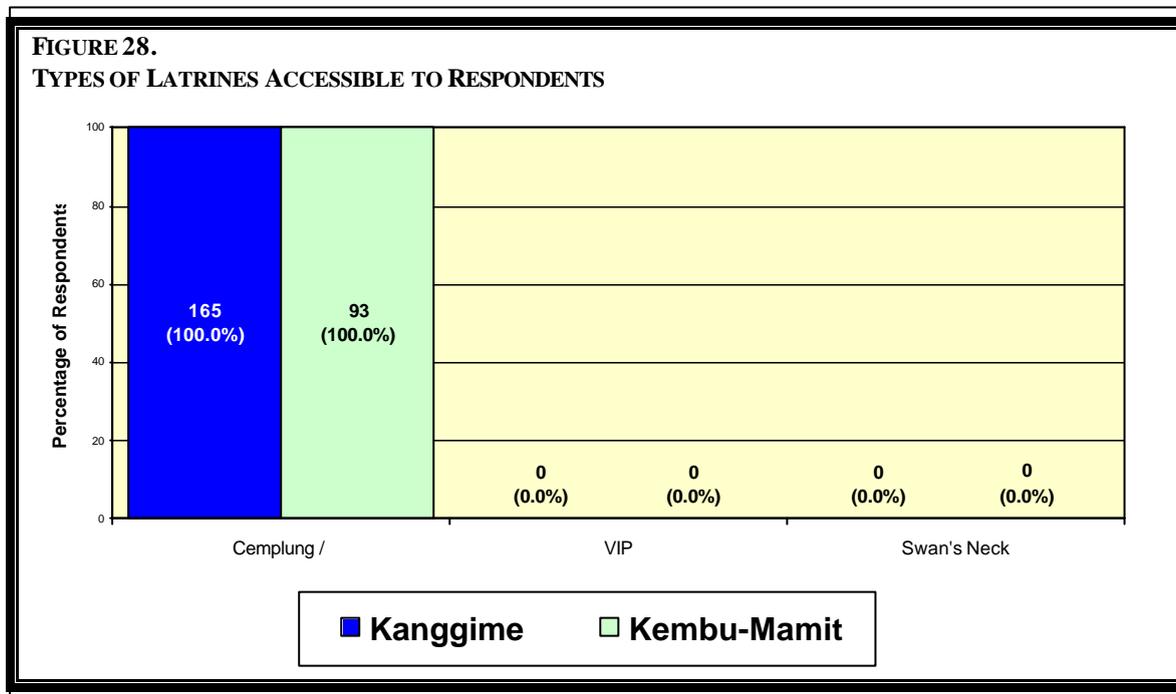
As it is not practical to visit all or most of the respondents' hamlets we cannot be sure of the validity of these results. However we can presume that a considerable percentage of the target communities have at least some access to and understanding of latrines.

FIGURE 27.
HOUSEHOLD ACCESS TO LATRINES



2.4.2 TYPES OF LATRINES USED IN KANGGIME AND KEMBU-MAMIT SUB-DISTRICTS

Across Jayawijaya WATCH has promoted the installation and use of three different types of latrines. These are the cemplung (the standard Indonesian squat toilet), the VIP (Ventilated Pit Latrine), and the swan's neck latrine. The results of the surveyed suggest that the cemplung type latrine is the only model that has been installed in the target areas.

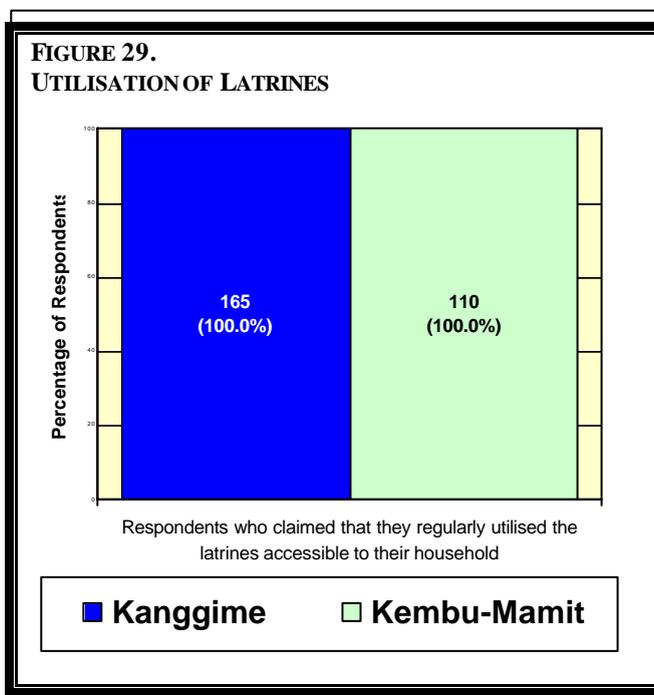


2.4.3 UTILISATION OF LATRINES

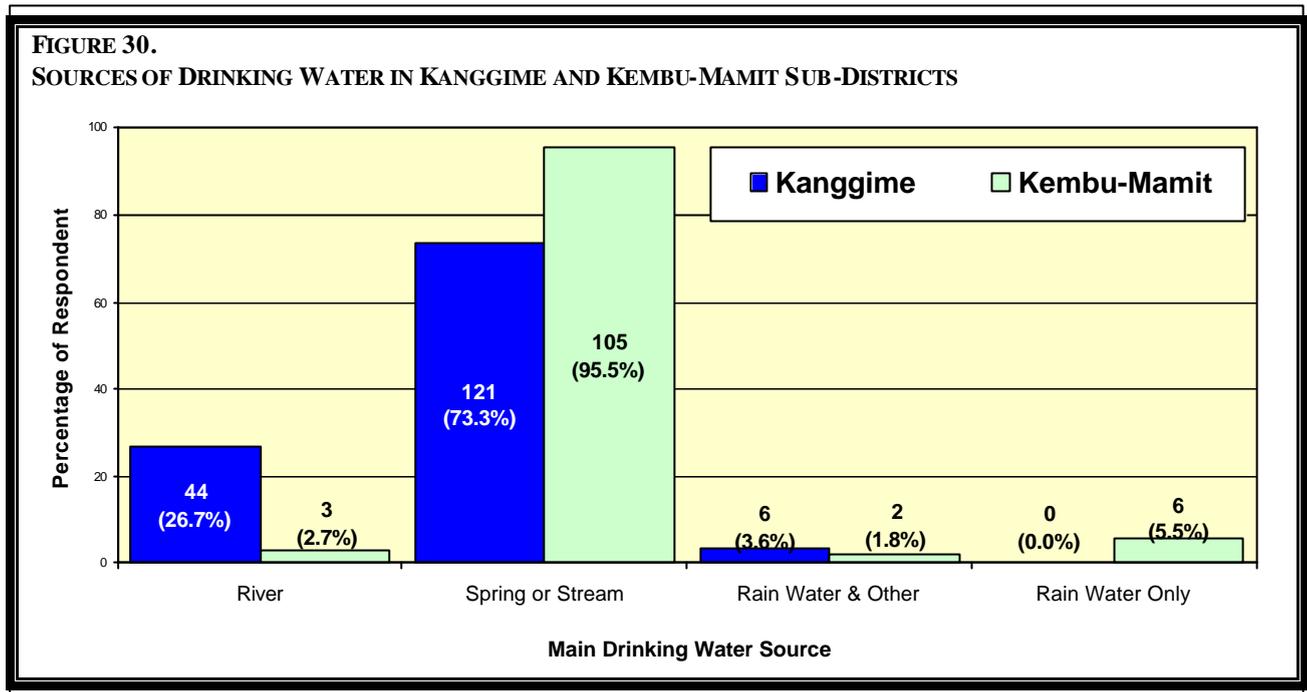
When questioned about the utilization of village latrines all of the respondents claimed that the latrines are used on a regular basis. A result of 100% is dubious and it is possible that respondents are simply answering in a manner that they feel would be pleasing to the survey team.

2.4.4 DRINKING WATER SUPPLY

The data displayed in figure 30 indicates that almost all (95.5%) of the respondents from Kembu-Mamit relied on springs or mountain streams for their water supply whilst only 2.7% used river water and 7.3% relied either fully or partially on rain water. In Kanggime 73.3% reported to rely on springs or streams whilst 26.7% said they drew water from the river. Only 3.6% said that they were partially reliant on rainwater.



Choice of water supply depends on environmental factors. It is not surprising that the people of Kembu-Mamit are wary of drinking water from the Toli River given that by the time it reaches them it has already collected considerable amounts of run-off from humans and swine.



2.4.5 PASTEURISATION OF DRINKING WATER

The survey showed that very few people in either sub-district are in the habit of boiling their drinking water in order to kill off any pathogens. Whilst this behaviour may not represent a considerable health risk in times when there is enough rain to keep surface streams and springs flowing, in times of drought failure to properly pasteurize drinking water is likely to be a significant factor contributing to epidemics of diarrhea, cholera and other water borne illnesses.

2.5 WILLINGNESS AND ABILITY TO PAY HEALTH SERVICE FEES

The survey results highlight that most respondents (95.2 % in Kanggime and 90.9 % in Kembu-Mamit) use cash to pay for treatment and medicines in the health centers, sub-health centers, polyclinics (*BP*) and village medicine posts (*POD*). Of the respondents from Kembu-Mamit sub-district, 4.5% claimed that their community had already established an “Askes” health insurance fund, which they used to help them cover the cost of treatment and medicines when required.

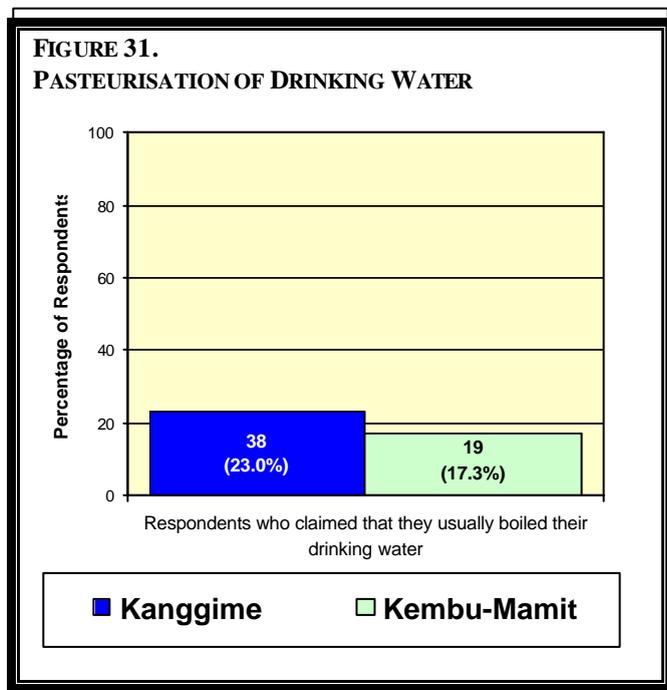


FIGURE 32.
MEANS OF PAYMENT FOR HEALTH SERVICES

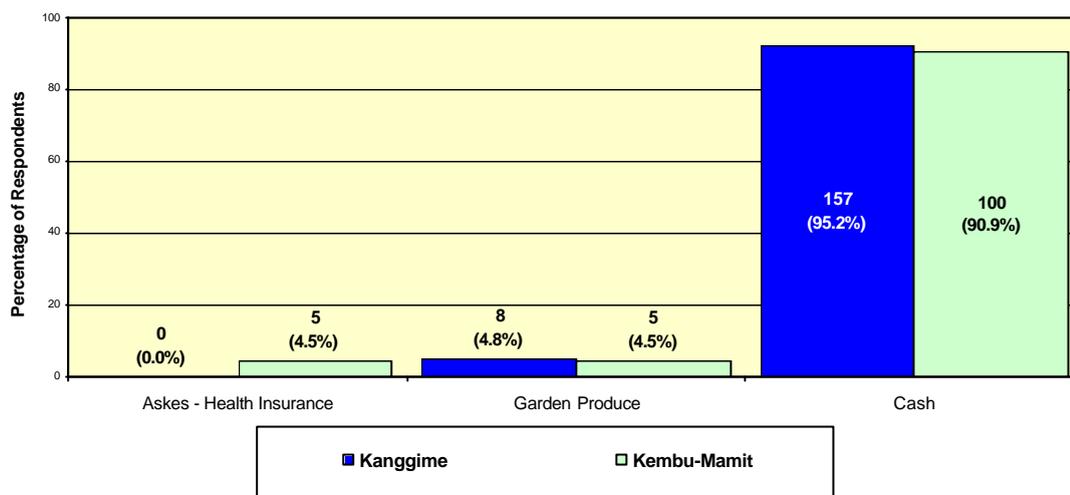
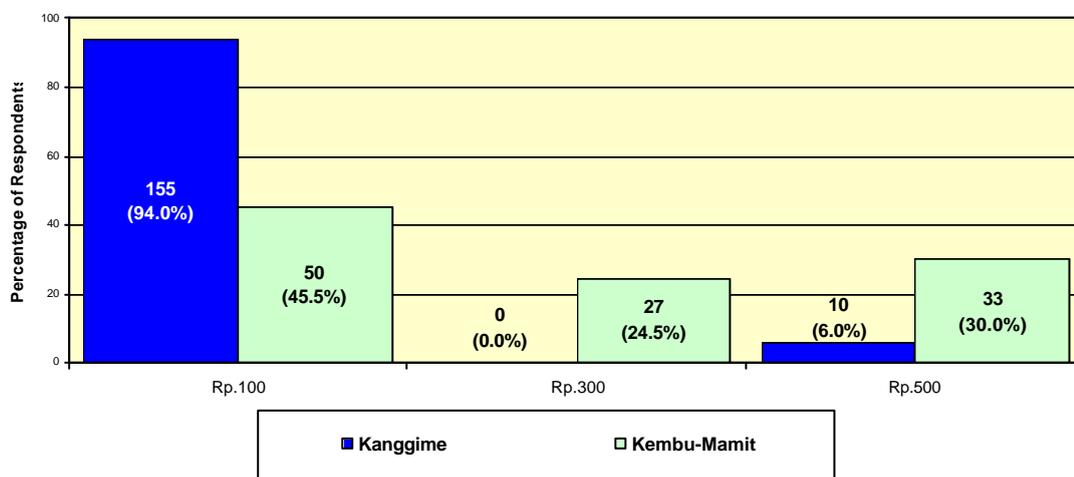


Figure 33 shows that of the survey respondents, most demonstrated an understanding that they were required to pay a small fee when seeking treatment or medication at the health centers, sub-health canthers, polyclinics (*BP*) and village medicine posts (*POD*) although the rate of payment varied.

FIGURE 33.
RESPONDENTS AWARENESS OF THE PRICE OF MEDICATION



3. HEALTH SERVICES

3.1 IMMUNISATION

The child immunisation program is conducted through the integrated services posts (*posyandu*) by community health centre (*puskesmas*) staff with assistance from *posyandu cadres*. The program aims to immunise all children through providing five different vaccines to protect against seven diseases. These vaccines are: the Bacillus Calmetted-Guerin (BCG) vaccine for Tuberculosis; the DPT vaccine, which provides protection against diphtheria, pertusis and tetanus; the polio vaccine; the measles vaccine and; the Hib (Haemophilus influenzae type b) vaccine for Hepatitis B. Full immunisation with these vaccines requires that children receive a total of twelve doses during the first 11 – 12 months of their lives according to the following timetable.

TABLE 17. RECOMMENDED TIMETABLE FOR CHILD IMMUNISATION IN INDONESIA

Tuberculosis (BCG) Vaccine	Diphtheris / Pertusis / Tetanus (DPT) Vaccine			Oral Polio Vaccine				Measles	Hepatitis B. Vaccine		
	I	II	III	I	II	III	IV		I	II	III
1 – 7 days	2 months	4 months	6 months	2 months	4 months	6 months	10 months	> 11 months	2 months	4 months	10 months

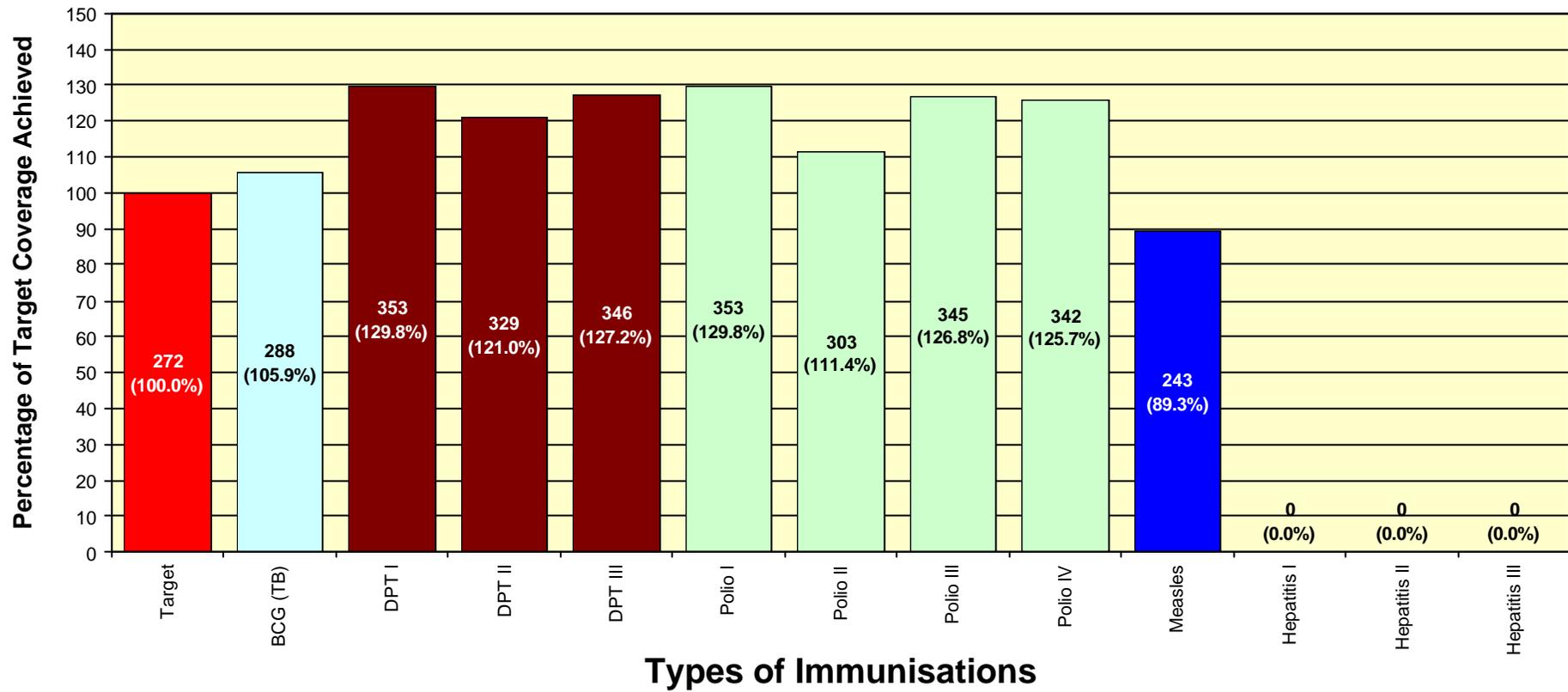
As one of the key indicators for the project extension period, WATCH set a target of 376 children in Kanggime Sub-district and 272 children²⁵ in Kembu-Mamit to be fully immunised in each year of the project extension. Figure 34 shows the results of this immunisation program in Kembu-Mamit Sub-District during 1998. Results from Kanggime are not displayed because, based on interviews with health workers and volunteers, community members and missionaries, WATCH determined that no immunisation activities had been conducted by the Kanggime *Puskesmas* between January 1998 and December 1998. Two factors appear to have led to this cessation of immunisation activities in Kanggime Sub-District. Firstly, the only vaccine refrigerator in the sub-district (at the Kanggime *Puskesmas*) was out of order. Secondly, a dispute broke out between the *Puskesmas* staff and the DHS / DHO over the distribution of operational funds for the immunisation campaigns.

Figure 34 shows that in Kembu-Mamit Sub-District the target of 272 fully immunised children was exceeded for every vaccine except the measles and hepatitis vaccines and even then the measles immunisation fell only slightly short of the target.

The Hepatitis B immunisation program had not commenced in Kembu-Mamit because as it has only relatively recently been introduced into the national child immunisation program, the *puskesmas* staff were largely unaware that it was now considered necessary. The DHS / DHO have not yet put in place adequate health worker training and logistical support to get the Hepatitis B immunisation program up and running in remote locations like Kembu-Mamit.

25 These figures are based on a calculation of 2.3% of then census population for each sub-district.

FIGURE 34.
REALISATION OF IMMUNISATION TARGETS IN KEMBU-MAMIT SUB-DISTRICT



3.2 HEALTH INFORMATION SYSTEM (RECORDING & REPORTING)

3.2.1 MORTALITY

A. *Infant Mortality Rate (IMR)*

In order to obtain data regarding the causes and rates of infant mortality the survey team interviewed mothers of deceased babies, village midwives, traditional birth attendants and in some cases other community members who attended the births in order to completed an “infant mortality questionnaire” for each known case of infant mortality in the target areas.

These methods resulted in the total number of infant mortalities during a 12-month period (from August 1997 to August 1998) being calculated as 27 for Kanggime Sub-district and 16 for Kembu-Mamit. The causes of infant mortality in the target areas included severe pneumonic infection, severe malaria, premature birth, low birth weight, severe diarrhea and dehydration, septicemia and obstructed birth.

It should be remembered that the period this data covers coincides with the ENSO related drought of 1997-1998. Even though the effects of this drought were not severe in the sub-districts of Kanggime and Kembu-Mamit, they are still likely to have affected Infant Mortality Rates in several ways. For example food shortages experienced during the drought would presumably have contributed to ante-natal malnutrition and low birth weights; reduced rainfall levels are likely to have caused an increase in the incidence of water borne diseases such as diarrhea, dysentery and cholera; lower night time temperatures caused by less cloud would most likely have compelled people to light more fires which would lead to higher levels of indoor air pollution. This in turn would result in higher rates of respiratory infections.

TABLE 18.
INFANT MORTALITY CASES IN KANGGIME SUB-DISTRICT BETWEEN AUGUST 1997 AUGUST 1998.

AGE AT DEATH	NUMBER OF CASES	CAUSE OF DEATH	TREATMENT / CASE HANDLING
Died at or before birth	1	Twin with low birth weight.	Delivery assisted by a class C Midwife.
< 24 hours	3	Prematurity and asphyxiation	Delivery assisted by family members.
		Prematurity and asphyxiation	Delivery assisted by family members.
		Prematurity and asphyxiation	Delivery assisted by family members.
4 days	2	Severe pneumonia	Case handled by the class A midwife.
		Twin with low birth weight	Case handled by the class A midwife.
7 days	2	Premature with severe pneumonia	Case handled by the class C midwife.
		Severe pneumonia	Case not treated.
1 month	4	Severe pneumonia	Case handled by the local <i>POD cadres</i>
		Severe pneumonia	Case handled by the local <i>POD cadres</i>
		Severe pneumonia	Case not treated.
		Severe pneumonia	Case not treated.
2 month	1	Severe pneumonia	Case handled by the class C midwife.
3 month	3	Severe pneumonia	Case not treated.
		Severe pneumonia	Case not treated.
		Severe malaria	Case handled by the class C midwife.
4 month	4	Severe pneumonia	Case handled by the class C midwife.
		Severe pneumonia	Case handled by the class C midwife.
		Severe pneumonia	Case not treated.
		Severe pneumonia	Case not treated.
5 month	1	Severe pneumonia	Case handled by the class C midwife.
6 month	3	Severe pneumonia	Case handled by the Mantri in the <i>BP</i>
		Severe pneumonia	Case handled by the class C midwife.
		Severe pneumonia	Case handled by the class C midwife.
8 month	2	Severe pneumonia	Case handled by the Mantri
		Severe pneumonia	Case not treated.
11 month	1	Severe pneumonia	Case handled by the local <i>POD cadres</i>
Total	27		

TABLE 19.
INFANT MORTALITY CASES IN KEMBU-MAMIT SUB-DISTRICT BETWEEN AUGUST 1997 AUGUST 1998.

AGE AT DEATH	NUMBER OF CASES	CAUSE OF DEATH	NOTES
Died at or before birth	3	Prematurity and obstructed birth.	Delivery assisted by a class C Midwife.
		Prematurity and obstructed birth.	Delivery assisted by a class C Midwife.
		Twins and obstructed birth	Delivery assisted by a class C Midwife.
< 24 hours	3	Severe asphyxiation	Delivery assisted by a class C Midwife.
		Severe asphyxiation	Delivery assisted by a class C Midwife.
		Prematurity and severe asphyxiation	Delivery assisted by family members.
2 weeks	1	Sudden death due to undiagnosed causes	Case not treated.
1 month	1	Severe Pneumonia	Case handled by the Mantri in the local BP.
5 weeks	1	Septicaemia caused by infection of the umbilical cord.	Case handled by a class C Midwife
2 months	2	Severe pneumonia	Case handled by the Mantri in the Puskesmas
		Severe pneumonia	Case not treated.
3 months	3	Severe pneumonia	Case not treated.
		Severe pneumonia	Case not treated.
		Severe malaria	Case handled by the class A midwife.
4 Months	1	Diarrhoea and severe dehydration	Case handled by the local POD cadres
11 Months	1	Severe malaria	Case handled by the Mantri in the Puskesmas
Total	16		

FIGURE 35.
PROVIDERS OF MEDICAL ASSISTANCE FOR INFANT MORTALITY CASES IN KANGGIME & KEMBU-MAMIT SUB-DISTRICTS OCCURRING BETWEEN AUGUST 1997 AND AUGUST 1998

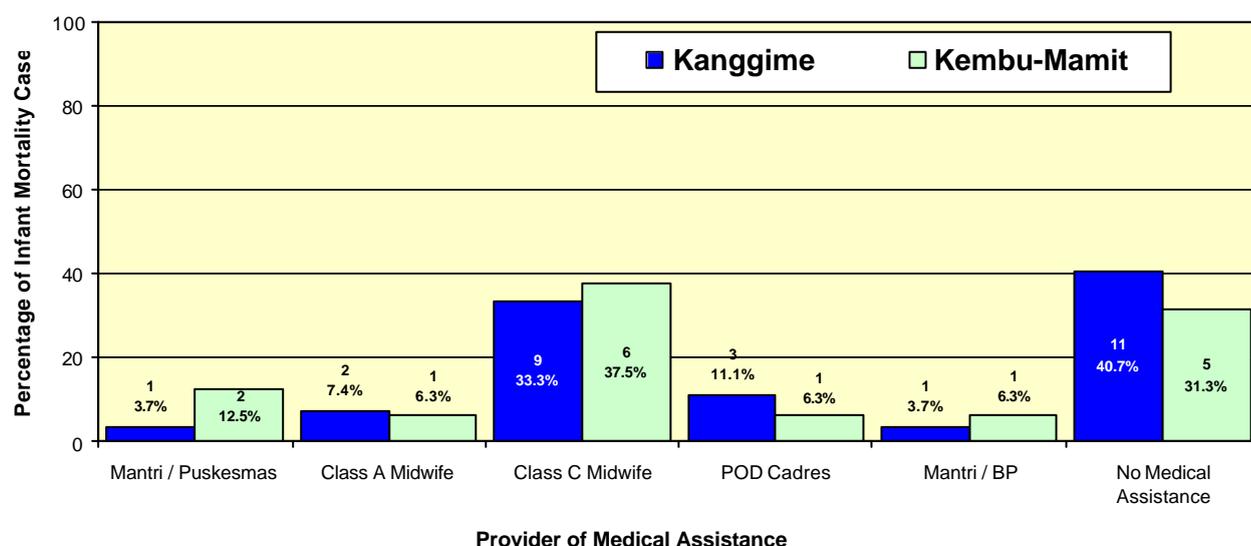
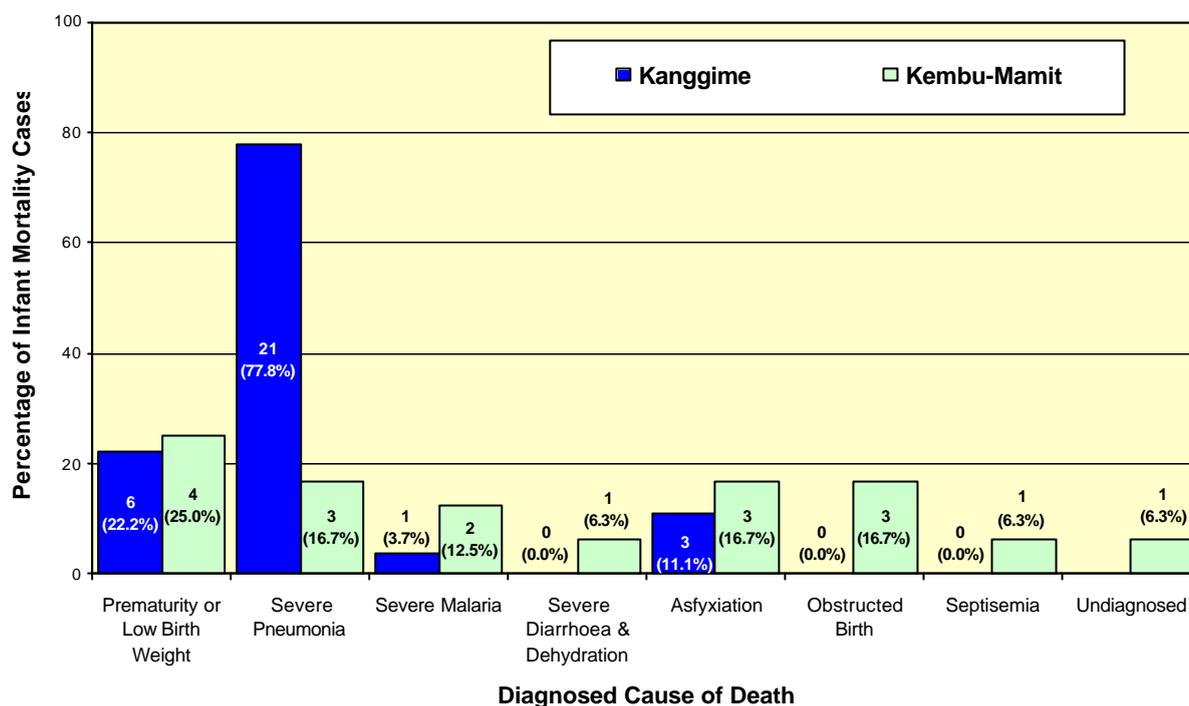


FIGURE 36.

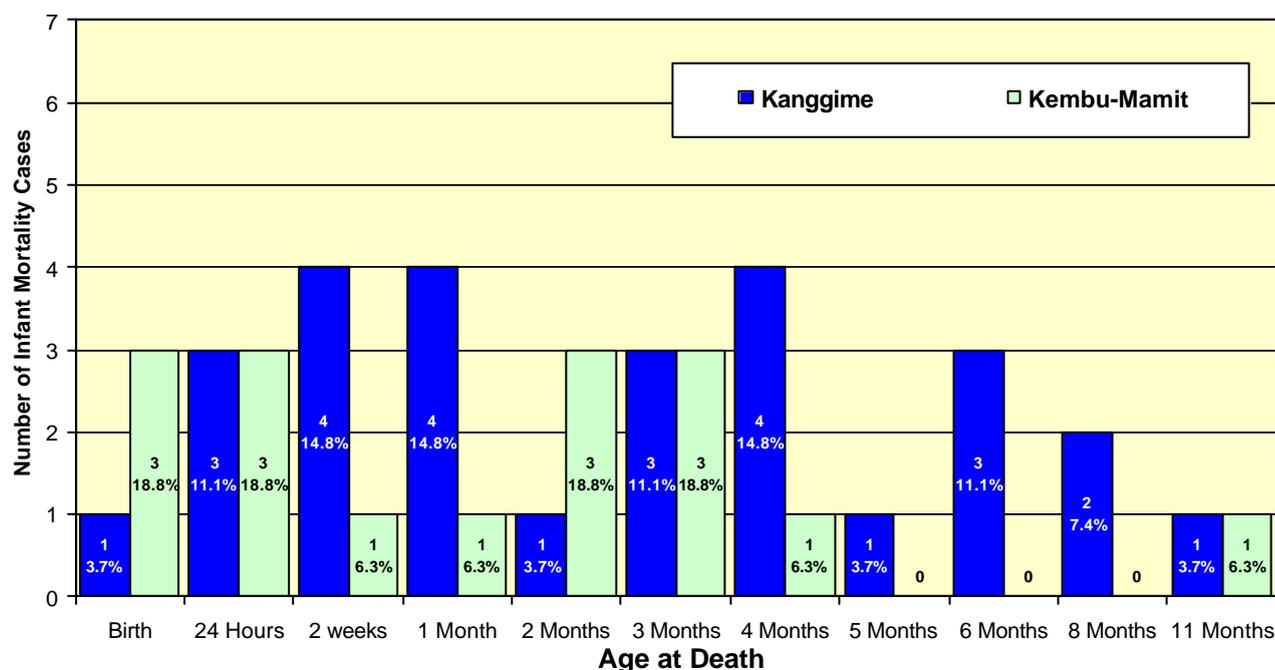
DIAGNOSED CAUSES OF INFANT MORTALITY IN KANGGIME & KEMBU-MAMIT SUB-DISTRICTS FOR THE 12 MONTHS BETWEEN AUGUST 1997 & AUGUST 1998



Notes: In some cases more than one cause of death was diagnosed. The percentages shown in this graph refer to the percentage of recorded infant mortality cases (27 in Kanggime & 16 in Kembu-Mamit) where each cause was diagnosed rather than the percentage of all diagnosed causes.

FIGURE 37.

AGES OF DEATH FOR INFANT MORTALITY CASES IN KANGGIME & KEMBU-MAMIT SUB-DISTRICTS FOR THE 12 MONTHS BETWEEN AUGUST 1997 & AUGUST 1998



Notes: The percentages shown in this graph refer to the percentage of cases which occurred during each time period against the total number of infant mortality cases for each sub-district.

B. Maternal Mortality Rate (MMR)

In order to update and verify HIS data regarding the frequency causes and treatment/case handling of maternal mortality in Kanggime and Kembu-Mamit Sub-districts the survey team interviewed midwives, TBAs and other community members and completed maternal mortality questionnaires for each case that was detected.

The results of the maternal mortality questioners (as displayed in tables 20 & 21) showed that there were a total of 3 known cases occurring in the two sub-districts during the period between August 1997 and August 1998. These included two cases in Kanggime as a result of post-partum infection and ante-partum infection combined with severe malaria and one case in Kembu-Mamit as a result of post-partum hemorrhaging caused by retention of the placenta.

TABLE 20.
MATERNAL MORTALITY CASES IN KANGGIME SUB-DISTRICT OCCURRING BETWEEN AUGUST 1997 AND AUGUST 1998.

NUMBER OF CASES	DIAGNOSED CAUSE OF DEATH	TREATMENT / CASE HANDLING
1	Post-partum infection	Case handled by a class C Midwife
1	Antepartum infection & severe malaria	Case not treated

TABLE 21.
MATERNAL MORTALITY CASES IN KEMBU-MAMIT SUB-DISTRICT OCCURRING BETWEEN AUGUST 1997 AND AUGUST 1998.

NUMBER OF CASES	DIAGNOSED CAUSE OF DEATH	TREATMENT / CASE HANDLING
1	Post-partum haemorrhaging due to retention of the placenta	Case handled by a class C Midwife

3.2.2 DELIVERIES ASSISTED BY HEALTH WORKERS (MIDWIVES & TBAS)

The total number of trained midwives stationed in Kanggime Sub-district during 1998 was 13 including 2 class A midwives who work out of the community health centre (*puskesmas*) and 11 class C midwives who work out of the *Desa* based village birthing huts (*polindes*). Of the 13 *Desa* in Kanggime only 11 currently have village midwives stationed in them.

The total number of trained midwives in Kembu-Mamit Sub-district during 1998 was 14 including 2 class A midwives who work out of the community health centre (*puskesmas*) and 11 class C midwives who work out of the *Desa* based village birthing huts (*polindes*). Of the 14 *Desa* in Kanggime only 12 currently have village midwives stationed in them.

Through the deployment of class C midwives at the *Desa* level it is hoped that the District Health Service's ability to extend health coverage, and especially women and children's health services, will be greatly increased. In order to realise this goal, a number of problems, which are currently limiting the effectiveness of the village midwife program, must be resolved. In particular, the quality of services provided by the village midwives is generally quite poor. The DHS / DHO needs to address this problem through ongoing training and supervision of the midwives.

It also appears to be the case that many women still prefer to seek assistance during childbirth from traditional women healers / traditional birth attendants (TBAs). This is probably in large part due to the community awareness that at present there is little difference in the quality of services offered by the village midwives and the TBAs. This problem should be alleviated as the skills of the village midwives improve.

However, a range of other factors may be affecting community preferences towards TBAs. For example, whilst most people seem to be aware of the positive benefits of biomedical treatment in case of illness, it is quite likely that many people still perceive pregnancy and childbirth as being principally a social and spiritual condition rather than a biological or biomedical condition. If this is the case, then people may wish to seek what they see as the more holistic services of their local healers than those of the village midwives. It is also possible that many women feel more comfortable giving birth in the presence of people they know better and/or that it is considered important for the delivery to be assisted by close relatives or affines to ensure that clan obligations are satisfied. It should also be remembered that, as various anthropologists have pointed out²⁶, it is generally considered taboo for women to leave their home or the place where they gave birth for a period of several days or weeks after the birth. If such taboos are still widely adhered to in Kanggime and Kembu-Mamit it is likely that some women may wish to avoid giving birth in the village birthing huts for fear that they will be isolated there for a considerable period of time. In order to overcome these problems, the DHS needs both to seek better approaches to ensure the communities social concerns are being adequately addressed by the midwives and also to raise the communities awareness of the possible risks associated with pregnancy and childbirth and the positive role that village midwives can have.

Other possible factors of a more economic and demographic nature include: differences in the fees charges by the village midwives and TBAs; or the forms of payment they are willing to accept; and limitations on access to village midwives, including both limitations caused by remoteness from the woman's home from the midwives station and those caused by absenteeism on the part of midwives. In order to overcome these types of problems the DHS needs to closely supervise the activities of the village midwives to ensure that they are offering reliable services at affordable prices and also to encourage the midwives to make more home visits to patients who cannot easily come to the *polindes*.

26 Whilst Butt (1998 p.115-116) talks of Grand Valley Dani women being expected to remain indoors at the location where they gave birth for one or two weeks, so as to prevent spiritual pollution, O'Brien (1969 p.95) suggests amongst the Konda Valley this period is truncated to three or four days, presumably because the higher value placed on their labour overrides concerns of spiritual pollution.

3.3 ANTENATAL & PERINATAL SERVICES

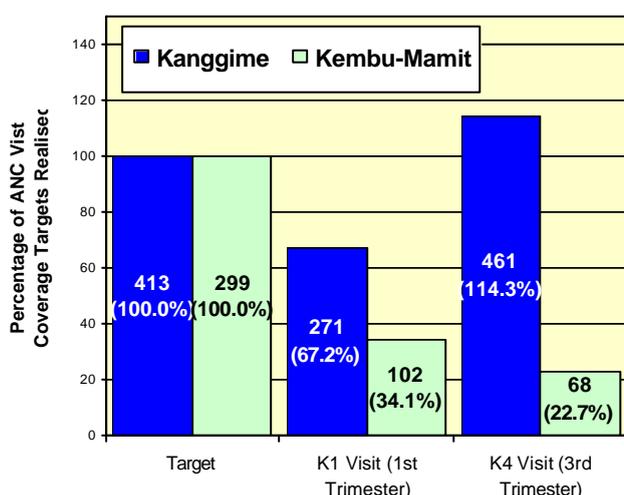
In Table 22 we can see the estimated numbers of babies, infants, pregnancies, deliveries and nursing mothers in Kanggime and Kembu-Mamit during 1998. These estimates are also used by the WATCH Project monitoring and evaluation system as the targets to measure the coverage achieved for various the antenatal and perinatal health services targeting these different demographic groups. As has been pointed out in the section II / 3.1.1, the reliability of the baseline population data used in generating these targets is unclear, so the measurement of health service coverage against these targets only provides a rough indication of the true situation in regards to extent of coverage.

TABLE 22.
ESTIMATED NUMBERS OF BABIES, INFANTS, PREGNANCIES, DELIVERIES AND BREASTFEEDING MOTHERS IN KANGGIME AND KEMBU-MAMIT SUB-DISTRICTS DURING 1998.

SUB-DISTRICT	TOTAL POPULATION	ESTIMATES / TARGETS				
		BABIES	INFANTS	PREGNANT WOMEN	LABOURS / DELIVERIES	NURSING MOTHERS
Kanggime	16,062	376 / 2.3%	2088 / 13%	413 / 2.6%	395 / 2.5%	752 / 4.8%
Mamit	11,613	272 / 2.3%	1509 / 13%	299 / 2.6%	286 / 2.5%	572 / 4.8%

3.3.1 REALISATION OF TARGETS FOR THE COVERAGE OF ANTENATAL EXAMINATIONS IN KANGGIME & KEMBU-MAMIT DURING 1998

FIGURE 38.
REALISATION OF TARGET COVERAGE FOR ANTENATAL EXAMINATIONS



Source: LII reports from the Kanggime & Kembu-Mamit community health centres

From the data displayed in Figure 38 it appears that most women in Kembu-Mamit (about 66% of the estimated number of pregnant women) and a large minority of women from Kanggime (32.8% of the estimated number of pregnancies) did not visit the midwives for an antenatal check during the first trimester of their pregnancy. During the fourth trimester it appears that almost all pregnant women in Kanggime must have made two antenatal visits with the coverage target for K4 visits actually being exceeded. In Kembu-Mamit on the other hand the coverage of antenatal checks during the third trimester is extremely low with the great majority of pregnant women (77.3% of the estimated

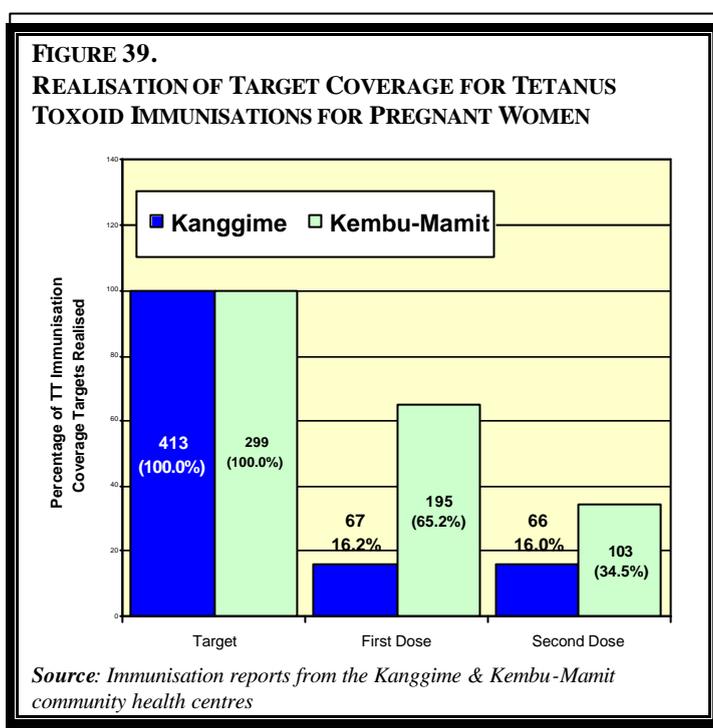
number of pregnancies) not making the K4 visit.

As was noted in section III / 2.2.1, there has been some confusion amongst the *Desa* and sub-district level health workers and HIS record keepers regarding the correct designation of K1 and K4 visits. For health

reporting procedures, the K1-K4 designations should be associated with the stage in the pregnancy during which they occur rather than the sequence in which visits occur. However because local people believe pregnancy begins when a baby begins to noticeably move around in the womb (in the second trimester) it is difficult to convince local women to make K1 visits during the first trimester. This seems to have caused considerable confusion in the recording of ANC visitation records as many health workers, whose numeracy skills are often very limited, being unsure whether these should be recorded as K1 or K2 visits. WATCH and the DHO have addressed this problem with the HIS by adopting a simpler sequential designation of K1-K4 visits. This system is less useful for health monitoring but easier for health workers to comprehend. As the data displayed in figure 35 was generated prior to these changes, it is therefore quite likely that what appeared as a K1 visit in figure 35 is actually a mixture of K1 and K2 visits.

3.3.2 REALISATION OF COVERAGE TARGETS FOR TETANUS TOXOID IMMUNISATION OF PREGNANT WOMEN IN KANGGIME & KEMBU-MAMIT DURING 1998

From the data displayed in figure 39 we can see that realisation of tetanus toxoid vaccination for pregnant women in Kanggime was very poor with only just over 16% of the estimated number of pregnant women in the sub-district receiving both doses of the TT vaccine. In Kembu-Mamit the coverage was better, however, it appears as if many women in Kembu-Mamit are receiving the first dose of the vaccine but not the second. This may reflect a number of things, such as a high rate of miscarriage, a high rate of loss of interest in the antenatal services or difficulties involved in attending the *polindes* to receive the second dose during the later stages of pregnancy.



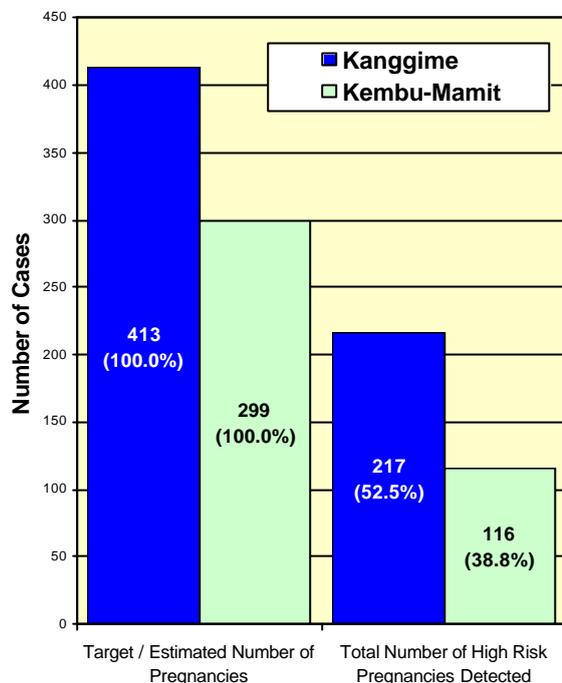
However, it may also be the result of a sudden increase in the number of women being immunized during the period covered by this data with many new women coming into the program and receiving their initial dose during the data recording period and their second shortly after the end of that recording period.

3.3.3 DETECTION OF HIGH RISK PREGNANCIES

From the data displayed in figure 40 we can see that a very high number (217 or 52.5% of the estimated number of pregnancies) of high-risk pregnancies were identified in Kanggime whereas in Kembu-Mamit a total of 116 (or 38.8% of the estimated number of pregnancies) were identified as being high risk. Whilst these figures appear to be quite high, when we consider the extent of the disease risks in Kanggime and Kembu-Mamit, and also the fact that, at least in Kanggime, the number of actual pregnancies appears to have been

higher than the original estimates, then these figures do not appear to be so extraordinary.

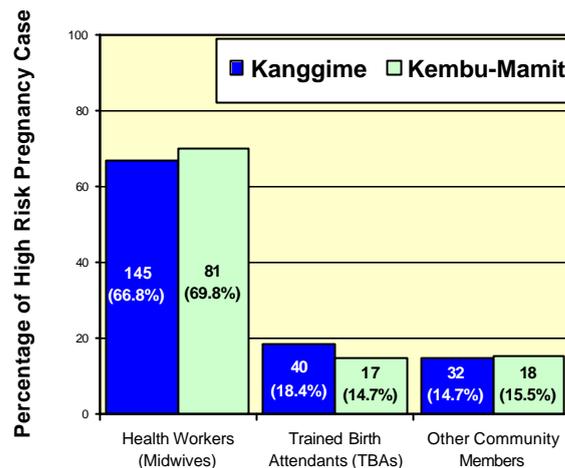
FIGURE 40.
NUMBER OF PREGNANCIES IN KANGGIME & KEMBU-MAMIT WHICH WERE IDENTIFIED AS BEING HIGH RISK DURING 1998



Source: L11 reports from the Kanggime & Kembu-Mamit community health centres

From the data displayed in figure 41 we can see that the majority of high risk pregnancies were identified by the midwives with the TBAs and other community members being responsible for identification of around 15% of cases each in both sub-districts.

FIGURE 41.
IDENTIFICATION OF HIGH RISK PREGNANCIES

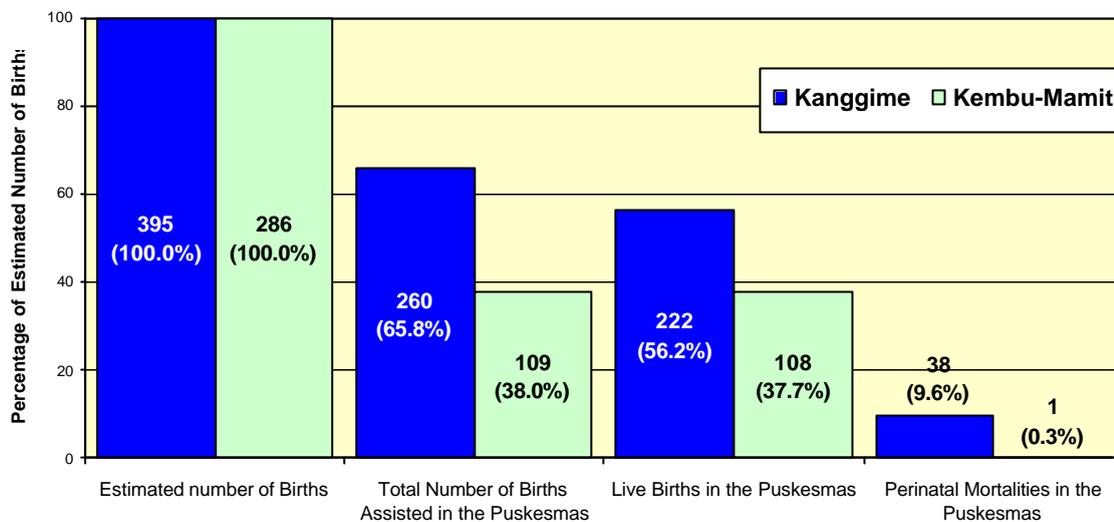


Source: Immunisation reports from the Kanggime & Kembu-Mamit community health centres

3.3.4 NUMBER OF DELIVERIES ASSISTED IN THE PUSKESMAS

Figure 42 suggests that a considerable percentage of births in Kanggime (65%) occurred in the community health center whilst in Kembu-Mamit people appear to be less likely to give birth in the community health center with only 38% of the estimated number of births in the sub-district occurring there. The table also suggests that the perinatal mortality rate in the Kanggime community health center was quite high with 14.6% of the 260 births recorded there ending in perinatal mortality. This result is probably a reflection of the diligence of health workers in Kanggime in detecting and referring high-risk pregnancies to the health center rather than any indication of poor services provided by the health center.

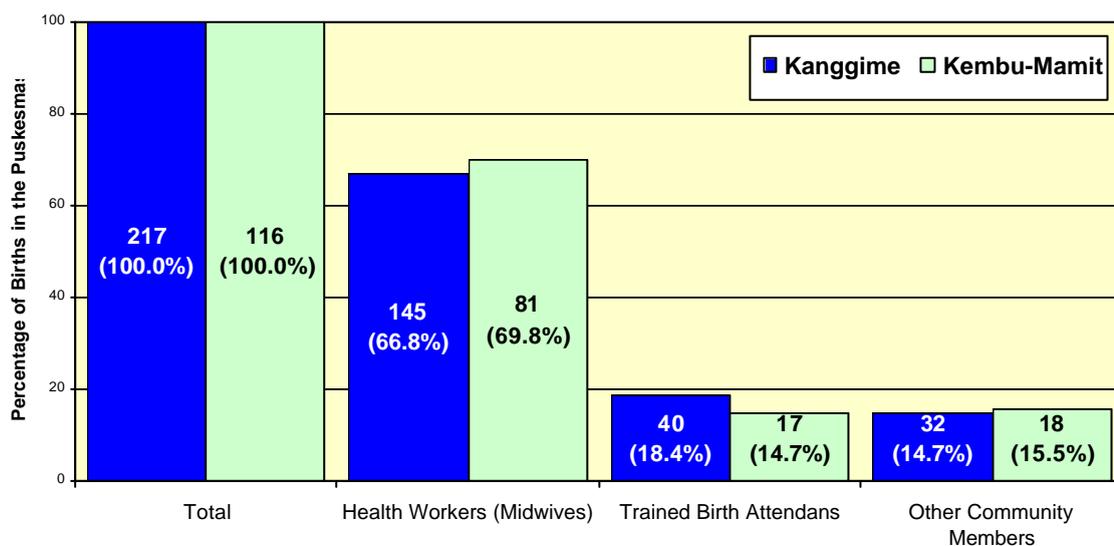
FIGURE 42.
DELIVERIES ASSISTED IN THE PUSKESMAS



Data source: HIS records from the Kanggime & Kembu-Mamit community health centres

From the data displayed in figure 43 we can see that of those births in the Kanggime and Kembu-Mamit community health centers for which we have adequate data, just short of 70% were attended by midwives or other qualified health workers, around 15% - 20% were attended by trained TBAs and around 15% were attended only by other community members with no specific training in how to assist women during childbirth.

FIGURE 43.
BREAKDOWN OF PEOPLE ASSISTING DELIVERIES IN THE KANGGIME & KEMBU-MAMIT PUSKESMAS



Source: LII reports from the Kanggime & Kembu-Mamit community health centres

4 CASE FINDINGS

4.1 MANAGEMENT OF THE KANGGIME AND MAMIT COMMUNITY HEALTH CENTRES (PUSKESMAS)

A variety of managerial problems at each *puskesmas* impacts upon the delivery of health services in both Kanggime and Kembu-Mamit Sub-districts. Perhaps the most significant problem is the chronic shortage of pharmaceuticals in the *puskesmas* and amongst the village based health workers and *cadres*. These shortages are caused by a number of factors including problems with the monitoring of pharmaceutical stocks, laxity in the re-ordering of pharmaceuticals, lengthy delays on the part of the DHS in restocking pharmaceuticals and further delays on the part of the *puskesmas* in restocking the village level health posts. These problems are further compounded by black marketeering of pharmaceuticals by health workers (and in some cases health *cadres*) and by the misuse of pharmaceuticals by some health workers in order to become inebriated. Although these activities occur on a small scale, the combined effect of various individuals misappropriating pharmaceutical stock represents a considerable drain on an already limited supply. There are many in the broader community who are well aware of this issue. The abuse of pharmaceuticals by certain health workers seems to impact negatively upon community perceptions of the local health services.

Another issue that impacts upon the quality of health services implemented at the *puskesmas* level is that of internal politics. This problem was most apparent in the Kanggime *Puskesmas* where staff were quite clearly polarised after one group attempted to oust the head of the *puskesmas*. This conflict seemed quite protracted and has all but paralysed many of the health outreach programs in Kanggime including child immunisation, the conduction of *posyandu* clinics and other support services for the *POD*, *BP*, *Pustu* and *Polindes*.

The community health centers should conduct training activities for *mantris*, midwives, *POD* and *Posyandu* volunteers and traditional birth attendants (TBAs) yet so far these training sessions have not been implemented in either sub-district. It is likely that the WATCH project Kanggime Extension itself was partially and indirectly the cause of this lack of training. Apparently the DHS and both the Kanggime and the Kembu-Mamit *Puskesmas* relied on the WATCH project to deliver training and supervisory services during the project period. To their credit the WATCH project has assisted the Kanggime and Kembu-Mamit community health centres by assisting with:

- The construction of 31 village medicine posts (*POD*);
- The construction of 42 integrated services posts (*Posyandu*);
- The provision of 42 sets of scales to the *posyandu*;
- The provision of 31 hand mills to the *POD*;
- The construction of a footbridge at Bogonuk village (Kanggime Sub-district) to improve access to the Kanggime *puskesmas*;
- The establishment of two community cooperatives with health insurance activities; and
- The training of *mantris*, midwives, *POD* and *posyandu* volunteers and traditional birth attendants

(TBAs).

Over the course of several visits to the Kanggime and Kembu-Mamit community health centres WATCH personnel did not find the heads of either *puskesmas* present. Nor did they find all of the *mantris* attending the *puskesmas* and due to extremely poor daily record keeping practices neither *puskesmas* was able to provide an adequate account of the occurrence of diseases, morbidity, mortality or the delivery of health services. The hours of opening at both health centers appeared quite limited with staff often closing the doors around mid-day. The average daily attendance of the *puskesmas* in Mamit appeared to be around 3-5 patients.

To date activities in the Kanggime and Kembu-Mamit *puskesmas* have been largely focused on the provision of curative services. As the *puskesmas* are the spearhead of the Indonesian health service, it is important both to improve the quality of curative services *and to back them up with much better diagnostic, promotional and preventative services* including immunisation, record keeping and reporting, planning and logistical support and community health education programs. To these ends WATCH was involved with implementing a range of initiatives including the development of case management protocols in the form of simple flow charts, the support and supervision of immunisation programs, the redesign and implementation of a health information system for Jayawijaya District and the development and distribution of new health information education and communication (IEC) materials. However, at the core the capacity of many *puskesmas*, including those in Kanggime and Kembu-Mamit Sub-districts, is severely limited by constraints outside the project staff's control. Such constraints include lack of human resources, an impoverished work environment and the lack of authority or ability to effect more appropriate support from the DHO, DHS and District Administration in general. In some parts of Jayawijaya the delivery of diverse health services at the village level has been facilitated through close cooperation with personnel from the sub-district and village level administrations. For example, WATCH personnel have observed that in the Sub-district of Ok Sibil the community based *posyandu* clinics was facilitated by the sub-district and village level authorities and this resulted in more effective organisation of the *posyandu*. Unfortunately, such close cooperation between sub-district and village level administrative officers and *puskesmas* health workers was not evident in Kanggime or Kembu-Mamit at the time of this baseline survey.

In many respects the health service in Kanggime and Kembu-Mamit retains a strong resemblance to the former church / mission based health system. This system emerged from the mission health centres and have only recently become government run *puskesmas*, and village based Polyclinics (*Balai Pengobatan / BP*). As the government has increasingly taken over responsibility for the provision of village level health services across Jayawijaya the church *BPs* have gradually been phased out and former mission health workers and volunteers have been being integrated by the DHS to work in the *puskesmas, pustu, polindes* or *POD*. In Kanggime and Kembu-Mamit the transition from a church based to a government based health service is as yet far from complete as is evidenced by the fact that 11 *BPs*, or 21% of the permanent health service points (excluding the *posyandus* which normally only operate for one day per month) continue to operate in Kanggime whilst 21, or 42% of the permanent health service points, in Kembu-Mamit. Much more work is therefore required to ensure that the system in place can adequately cater for the communities' health care needs.

4.2 THE QUALITY OF HEALTH WORKERS AND HEALTH CADRES

4.2.1 VILLAGE MIDWIVES

The village midwife program is a key element in WATCH's strategy for improving the quality and coverage of maternal and infant health services in the target areas. First introduced into Jayawijaya in 1995, the village midwife program has since been expanded to cover most *Desa* in the district. There are currently 12 village midwives working in Kanggime Sub-district and 13 in Kembu-Mamit.

The results of the surveys highlighted that 75% of the midwives in Kanggime and Kembu-Mamit possessed a poor understanding of the causes, symptoms and treatment of pneumonia, that 75% lacked the same knowledge about malaria, and that 75% didn't really understand basic information about diarrhea. The survey team also concluded that the level of knowledge of and skills in using the diagnostic flowchart for the three main diseases were inadequate. Furthermore, the midwives surveyed displayed limited understanding of the use of the obstetric diagnostic flowchart as well as the provision of ANC services including:

- (1) Physical diagnostic tests such as weight and height measurements, middle upper arm circumference (MUAC) measurements, blood pressure and anemia checks;
- (2) Obstetric diagnostic tests including the Leopold 1-4 test and fetal heart rate monitoring;
- (3) Hemoglobin tests using hemoglobin Sahli and Talquist;
- (4) The early detection of high risk pregnancies;
- (5) The scheduling of ANC examinations (K1, K4²⁷ visits); and
- (6) The minimum standard of antenatal care (5T).

Analysis of the results of the pre-tests for antenatal care indicated that the midwives = had a limited understanding and knowledge of most aspects of antenatal care including diagnostics, the detection of abnormal pregnancies and the provision of appropriate curative services. This was in spite of recently delivering new training materials to midwives that cover areas such as how to estimate a woman's date of delivery based on information about her identity, age and condition and by establishing the approximate stage of her pregnancy by calculating from the first day of her last period. It was also suggested that at start of ANC visits midwives should be trained to routinely question pregnant women regarding fetal movement and past obstetric experiences. The titles of other training materials that have recently been distributed to midwives include:

- (1) *Minimum Standard of "5T" Antenatal Care* (covering: weight, height and MUAC measurements, blood pressure, uterine expansion levels, Tetanus Toxoid Immunization and iron tablet distribution);
- (2) *The pregnant woman's visit* (K1, K4);
- (3) *Antenatal care coverage: K1 & K4 coverage*;
- (4) *High Risk Detection*

²⁷ K1: 1st visit, K4: 4th visit

The midwives were also generally unclear regarding the management of ANC services for their *Desa*. Effective antenatal care management on the part of village midwives is very important as it has direct effects on the quality and availability of maternal and infant health services in the *Desa*. Midwives need to improve the quality of their services and find better approaches for managing their work so that more pregnant women will be confident to use their services and have more regular antenatal checks when pregnant. The preparation of a work site map was considered an important aid in helping midwives organise their work. To this end WATCH provided each midwife with a large piece of cardboard on which to sketch a map of their *Desa*.

The midwives also need to improve their skills in forecasting coverage targets, as this would help them to schedule and monitor their future workload. In order to estimate targets for maternal and infant health coverage the midwives were taught to use the formula $2.34\% \times \text{the total of population in the target area}$ to estimate the number of babies born in the target area over the following year. Once an estimate has been established, the estimated number of pregnancies over the following year can also be calculated with the formula: $1.1 \times \text{no. of targeted babies}$. While this seems a good idea, these calculations are very difficult for many village midwives who have fairly limited numeracy skills.

The poor standard of maternal and infant health services is not only due to the midwives' poor knowledge and practice of diagnostic, clinical and management procedures. The poor standard of maternal and infant health services is also a function of the attitudes of midwives towards their work. Most midwives appear to lack motivation and dedication to their work and it was often found that the midwives were frequently absent from their work site. They preferred to stay in the sub-district centres or in Wamena itself.

The record keeping, registration and reporting activities that are part of a midwives' responsibility were also lacking in rigour. Part of the problem lies in the fact that activities such as filing birth and illness reports and maintaining *polindes* daily records have never been supervised or evaluated by the health centres. Consequently, health centre staff have little or no idea as to the performance and motivation levels of the midwives and the midwives themselves would feel undermined by this lack of direction and support. These issues need to be addressed if quality of maternal and infant health care services available at the village level in Jayawijaya is to be improved.

4.2.2 *POD* CADRES

One element of WATCH's strategy for improving the quality and coverage of health services at the village level in Jayawijaya has been to tap into and provide additional support for the governments community based Village Medicine Post (*Pos Obat Desa*) Program (see section III / 1.1.5). WATCH has therefore targeted much of its health worker training and supervisory activities at the community volunteers or cadres who run the *PODs*. In particular WATCH has attempted to improve the cadres skills in regards to the diagnosis of the three main: pneumonia, malaria, and diarrhoea and the correct procedures for the treatment or referral of diagnosed cases. Secondly, WATCH has tried to improve the cadres recording and reporting skills and to establish routine practices for the daily registration of illness and drug usage and monthly submission of reports to the community

health centre.

To ensure that all *POD* cadres have a reasonable grasp of numeracy, literacy and fluency in Bahasa Indonesia, the minimum requirement to become a *POD* cadre is junior high school. Even so, in Jayawijaya Indonesian language and numeracy skills are almost invariably very poor even though most *POD* cadres meet this formal requirement. As WATCH has been involved in the *POD* Program in Jayawijaya since the program's inception, almost all *POD* cadres in the target areas have already received some training (some have been trained on several occasions) from project personnel, particularly in the use of diagnostic flow charts for the three main diseases. It was also found that around 50% of cadres still retained their copies of the diagnostic flow chart distributed through the Karubaga health centre in 1996. In fact WATCH normally only distributes the flow charts to the mantris and midwives in the health centres, but in 1996 the Karubaga Health Centre, which at that time was still responsible for health services across the entire Toli Valley area, issued a policy that the flow charts should be distributed to all *POD* cadres in the sub-district.

Using a pre-test and post-test method, refresher training has been conducted many times. The result of these tests consistently indicate that whilst the majority of cadres have a reasonable understanding of malaria and diarrhoea, only around 30 % of the cadres had an adequate understanding of pneumonia. Also most cadres were not clear regarding correct reporting procedures for the diseases. It is worth noting that project staff consider this 'pre-test / post-test' method as quite rigid and does not allow cadres to display their actual skills and abilities. As an alternative method, WATCH personnel have recently trialled a kind of practical test that examines cadres' skills of disease prevention, diagnosis and reporting. The scores achieved by many cadres on these tests were considerably higher than the scores generated from the pre-test / post-test method.

4.2.3 POSYANDU CADRES

In the integrated service posts (*Posyandu*) in Kanggime and Kembu-Mamit, it was observed that the great majority of cadres had a limited ability to read and write. The illiteracy of cadres is a major obstacle to the implementation of *Posyandu* registration and reporting activities. One activity in the WATCH project was to simplify the forms used for reporting activities in the *Posyandu*. This activity meant that cadres only had to record the names of children attending the *Posyandu* clinic each month and the results of the weighing for that child. Surveys with *Posyandu* cadres indicated that most (67%) believed their role was to weigh children. Only 33.3% mentioned that the role of a *Posyandu* cadre included conducting health campaigns and home visits.

The level of *Posyandu* cadres = knowledge on kinds of immunization and its benefit for babies and children who were under five was generally poor. On the other hand, all cadres seemed to have a good understanding of nutritious foods and the benefits of good nutrition. The limited Indonesian language skills continues to be an obstacle in training *Posyandu* cadres and many misunderstanding seem to have occurred as a result of this. The survey team also learned that many *Posyandu* cadres miscalculated the weight of babies because they included the weight of the string bag (or *noken*) that the babies were in when weighed.

4.2.4 TBAS (TRADITIONAL BIRTH ATTENDANTS/ DUKUN BERSALIN)

The traditional birth attendants are not government employees or formal health workers. They are local women and ideally are already recognised within their communities as women's healers or birth attendants. They have been given limited training to improve their knowledge about labour processes, midwifery, nutrition and illness. Their training includes:

- Basic knowledge of the causes, symptoms and prevention of pneumonia, malaria, and diarrhoea;
- The provision of maternity care and *Posyandu* services;
- How to prepare nutritional foods for infant weaning using locally available materials,
- Extremely simple reporting and registration of deliveries / births,
- How to communicate health information to others.

TBAs are chosen by and are primarily responsible to the local community, but the DHO also expects them to report to the village midwives and to act within the parameters of the governments child health programs. As the DHO does not provide TBAs with a wage, many TBAs do not feel accountable to the DHO. Furthermore, many village midwives do not adequately supervise the TBAs in their *Desa* and so the community health centre and the DHO often have little idea of what the TBA is up to. Most TBAs have only been educated as far as primary school level and consequently their literacy, numeracy and spoken Indonesian skills are often very limited.

WATCH staff provided TBAs with TBA Kits that included, amongst other things, scissors or razor blades to cut umbilical cords. Through observation and tests, it appears that TBAs understand the importance of sanitation (i.e. washing their hands before assisting with the delivery) and of sterilising these tools by using boiling water.

All TBAs understood that the main signs of pregnancy are nausea, the cessation of menstruation, and swelling of the breasts. They claimed to conduct up to nine examinations on a woman during her pregnancy and most said that during these visits they would check the baby's position in the womb. Almost all said that they would try to visit each pregnant woman more often as their estimated delivery date approached. Most also understood that cases of excessive bleeding during labor should be quickly referred to the health center and that such bleeding was potentially fatal for the mother and baby. TBAs also understood that a newborn baby should be weighed immediately however there were TBAs who do not weigh babies because, they say, they do not have scales. Most did not know that a baby who weighs under two kilograms is categorized as a 'low birth weight baby' and should be referred to the health center immediately.

Most also appeared to understand that the Tetanus Toxoid (TT) immunization can protect the mother and her unborn child against illness and that pregnant women should get three shots of the TT immunization during pregnancy. They also understood that children must get BCG, DPT, Polio, and Measles immunization and that children who are suffering from other illnesses such as coughs, influenza or malaria shouldn't be immunised

until they recover.

The TBAs understanding of maternal and infant health care was considered adequate. It has been noted however that they are quite guarded with their knowledge, rarely sharing it with pregnant women, children or other TBAs.²⁸ The WATCH staff claim to have never seen a TBA give advice on nutritious foods and disease prevention or on the improvement of dietary frequency and diversity. On the other hand there are no people who come to health center due to malnutrition. A major issue here is that Lani people do not consider themselves to be sick unless the condition is directly affecting their daily activity and do not consider pregnancy to be a biological condition which predisposes the mother to other disease risks. It is therefore quite difficult for a TBA to fully understand the idea of preventative medicine, especially in relation to antenatal services. We should also realise that TBAs are local specialists who seek to augment their income with their knowledge and practice and so it is against their interests to disseminate their knowledge²⁹.

There is a concern that the government can select younger women who have not established a reputation as a healer in the eyes of the community. These new appointments cannot easily compete with local woman who are respected as traditional healers. However the government sponsored TBA usually operates side by side with the older female healer who continues with her traditional practice.

Despite the often sound advice of external bodies like the DHO or WATCH, women's lack of status combined with the paternalistic nature of Lani Society often means that a TBA cannot really exert much authority or advise mothers, for example, to reduce their workload during pregnancy or look after their babies rather than working in the garden.

²⁸ Not all local birth assistants receive training as TBAs from the DHO , consequently it is hoped that TBAs who have been trained will assist with transferring knowledge to the other TBAs who haven't been trained.

²⁹ Leslie Butt (1998) noted that mantris and other health workers in the Grand Valley area often guard their medical knowledge and attempt to mystify their work in order to cover up the fact that they could not really offer many curative services and keep their practice profitable. She describes the phenomena as the "Mantri's Secret".