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**REACH**

RESOURCES  
FOR CHILD  
HEALTH

# **ASSESSMENT OF PRIMARY HEALTH CARE IN HODEIDA GOVERNORATE**

**29 June - 31 August, 1991**

**Yemen**



John Snow, Inc., 1616 N. Fort Myer Drive, Suite 1100, Arlington, Virginia 22209 USA  
Tel: (703) 528-7474 Fax: (703) 528-7480 Tlx: 272896 JSI WUR

The Resources for Child Health (REACH) Project  
1616 North Fort Myer Drive, Eleventh Floor  
Arlington, Virginia 22209

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**Assessment of Primary Health Care  
in Hodeida Governorate**

**29th June-31st August 1991**

**Assessment Team:**

**Ahmed Ahmed Wahban  
Alam Mohammed Saleh  
Asia Sharaf Mohammed Shaibani  
Fatima Mohammed Abdul Wahab  
Hassan Mansoud  
Mohammed Omar Ibbi Sagan  
Rachel Feilden**

**Report prepared by**

**Rachel Feilden**

**Consultant to ACCS/REACH**

**7th November 1991**

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## Acronyms and Glossary

|             |  |
|-------------|--|
| Aakil       | local official   |
| ACCS        | Accelerated Cooperation for Child Survival                                   |
| ANC         | Antenatal Care   |
| Arba'een    | the first forty days after birth   |
| BCCD        | British Organization for Community Development                               |
| CBR         | Crude Birth Rate   |
| DPT         | Diphtheria, Pertussis and Tetanus vaccine                                    |
| FP          | Family Planning  |
| HC          | Health Centre  |
| HMI         | Health Manpower Institute  |
| HMP         | Health Manpower Projection   |
| HUP         | Hodeida Urban Project  |
| IMR         | Infant Mortality Rate  |
| IUD         | Intra-Uterine Device (loop)  |
| Jidda       | traditional birth attendant  |
| Jiddaat     | plural of Jidda  |
| LBA         | Local Birth Attendant (1 year training); daiya                               |
| LCCD        | Local Council for Cooperation and Development                                |
| MCH         | Maternal and Child Care  |
| MD          | Medical Doctor   |
| Menarche    | the first time a girl menstruates  |
| MOPH        | Ministry of Public Health  |
| Muqtaribeen | Returnees  |
| Murshid     | Male Health Facilitator  |
| Murshida    | Female Health Facilitator  |
| Murshidaat  | plural of Murshida   |
| Murshideen  | plural of Murshid  |
| Nahia       | administrative unit; smaller than a Qada                                     |
| Nahiaat     | plural of Nahia  |
| OPV         | Oral Polio Vaccine   |
| ORS         | Oral Rehydration Salts   |
| ORT         | Oral Rehydration Therapy   |
| PHC         | Primary Health Care  |
| PHCW        | Primary Health Care Worker, now<br>Health Facilitator (Murshid and Murshida) |
| PNC         | Postnatal Care   |
| Qada        | administrative unit; smaller than a Governorate                              |
| REACH       | Resources for Child Health   |
| ROY         | Republic of Yemen  |
| Suq         | market   |
| TBA         | Traditional Birth Attendant  |
| THC         | Training Health Centre<br>(eg Tahreer, Zaidia, Zabid)                        |
| Tihama      | coastal plain between the mountains and<br>the Red Sea                       |
| TPHCP       | Tihama Primary Health Care Project   |
| TT          | Tetanus Toxoid   |
| T/S         | Trainer/Supervisor   |
| YAR         | Yemen Arab Republic  |

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Rachel Feilden

## Executive Summary

The assessment of primary health care in Hodeida Governorate was carried out during ten weeks in the summer of 1991 as part of the Accelerated Cooperation for Child Survival Project (ACCS), funded by USAID through the REACH Project, John Snow Inc. The purpose of the assessment was to identify how the governorate can best provide the desired level of primary health care (PHC) within existing resources and constraints, and to recommend priority areas for future donor support for sustaining the PHC system. The assessment was to identify lessons learned from the rapid expansion of basic health services under the Tihama PHC Project.

The methodological approach was to assess whether the necessary resources (inputs) for health services were available, and to find out whether these resources were being used properly. Resources included personnel, their skills and time, medical supplies, stationery, transport and buildings. Assessment of how resources were used included direct observation and analysis of reported activities through on-site examination of registers and reports, and review of the data in the Health Office Statistics Department's computer files. The dynamic processes needed to support and manage PHC were also assessed; these included supervision, the information system, and logistics. This assessment did not measure coverage of PHC services or their impact upon health status, although indicators of coverage that should be used for monitoring service coverage were analysed.

Questionnaires were developed to cover all aspects of PHC staff's work. The plan was to start by interviewing at PHC Units, then to interview the supervisors (T/Ss) responsible for those Units, and finally to follow up our findings with staff at the Health Office. The objective was for the Assessment Team to visit each of the seven rural PHC supervisory areas in the governorate, and Hodeida city. We completed interviews with PHC staff and their T/Ss from five rural supervisory areas, Zaidia THC, and two facilities in Hodeida city (see Appendix C).

The first task was to compile a complete list of all the health facilities in the governorate, according to their function and staffing. This involved visiting Zabid (which until this year was outside the Health Office's jurisdiction) and a search of the Health Office Manpower Department's records to identify staff posted to Curative Units. Section 4 of this report gives the lists of facilities, and shows that population per facility varies considerably between the 22 nahiaat, with Bait al Faqih and Hajaila having almost three times more population per facility than the average. Section 4 also presents data on the availability of female staff trained in maternal and child care;

great progress has been made in training Murshidaat, but there are still nine nahiaat without MCH staff at health centre level. The plans to train more Murshidaat are therefore very timely.

The lists of PHC Units provided the sampling frame from which the places to visit were selected. Interviews usually took 3 hours, plus an extra hour if both male and female staff were present.

A review of community based data on morbidity and mortality showed that poor nutritional status, diarrhoeal disease, fever and respiratory infections are the commonest reported illnesses in the Tihama. Section 5 presents the findings about PHC activities.

► The assessment found children being weighed only at the Training Health Centres and the Hodeida Urban Project clinics. None of the rural PHC Units are now monitoring growth although this was an established activity in the past. Constraints included absence of Road to Health cards, broken scales and lack of transport to cover rural catchment areas, but the main reason was what one T/S described as "the Chain of Carelessness;" the coordinated effort required from the Health Office to the village level had come undone and had not been repaired. Growth monitoring needs to be recognized as a central element of PHC and should now be reestablished.

► Packets of ORS for treating diarrhoeal disease were available. Staff who were considered to be average or below average regularly see children with life-threatening dehydration caused by severe diarrhoea, and are referring them as they have been taught. However, the best PHC staff no longer have many cases of dehydration as they have successfully conveyed to their communities the importance of early treatment. A qualitative improvement is needed in the way most PHC staff communicate with parents.

► Malaria is reported twice as often as any other illness from PHC Units and health centres, yet the PHC essential drugs kit did not contain antimalarials - either syrup for children or tablets. This shortcoming was due to inadequate communication between the MOPH and the Health Office and steps were taken during the assessment to correct the omission. This report suggests that use of bed-nets dipped in the insecticide permethrin could be developed as a special scheme to control malaria in areas where the communities are ready to cooperate.

► The drug stocks for treating respiratory infections among children were sufficient for two to three weeks; the drug kit supplies are supposed to last for four times that long. The report proposes a review of the contents and quantities supplied in the essential drugs kit, and recommends reestablishing the use of stock records so that safety stocks can be monitored and resupply can be obtained before essential drugs go out of stock.

This recommendation is especially important for the stock management of oral contraceptives.

► Immunizable diseases were reported to be the cause of 14% of deaths in a household survey in 1985, and immunization was the main PHC activity last year, because of the worldwide campaign to reach the target of 80% coverage for child immunization by the end of 1990. Although many doses were administered, the campaign did not equip PHC staff with the skills they need to identify and monitor coverage of their own eligible populations; it promoted a vertical approach to EPI. Numerous discussions during the assessment emphasized the necessity of integrating EPI activities with the other aspects of PHC; this will involve making the technical staff at governorate level full members of the Health Office team: resident in the governorate, with salary and administrative supervision from the Health Office, and technical supervision continuing to be from MOPH. Some staff consider that shortages of resources for transport (vehicles and fuel) are the main constraint upon immunization activity. The analysis presented in this report shows many serious problems with the present quality of EPI services; these problems must be addressed in a proper operational plan that is designed to be integrated with the other elements of PHC. For example by using supervising health centres as supply points - as T/Ss used to do - 900 km of travel per month can be cut from the EPI Supervisors' delivery schedule. Adopting a tiered delivery structure would leave these staff free to address the problems observed during the assessment with handling and administering vaccine, and recording doses, stocks and temperatures.

Section 6 reports on resource inputs. The permanent PHC Unit is by far the most expensive of the resources devoted to PHC. The assessment found much evidence that the official design is unsatisfactory for busy clinics, and unused by women because of its lack of privacy. This report gives several criteria which should be met in the design of such facilities.

Recommendations are also made for reviewing the equipment list in light of the assessment's findings, and for planning to repair essential equipment and replace it when its useful life is over.

The assessment collected information on all stationery available (and out of stock) at PHC Units, and observed how recording and reporting were done. The report contains many detailed recommendations for making the PHC information system more suited to the functions and level of competence of PHCWs and Murshidaat. In particular, several crucial indicators of maternal health services are absent from the official reporting system. It is proposed that a Working Group be set up by the MOPH to undertake a detailed review of the PHC information system, and to develop and field test revised formats.

The last section of the report covers the support systems needed to manage an efficient, effective PHC system. One of the most noticeable findings is that the control mechanisms for use of the vehicle fleet that were established within the Tihama PHC Project have been discarded. Thus there is now no system for ensuring regular preventive maintenance and for monitoring the use of these essential and expensive resources. It is recommended that a vehicle use policy be adopted.

The report ends with some examples of how the planning cycle can become a means for increasing the efficiency and effectiveness of resource use through planning what is feasible within existing resources, and monitoring the progress of PHC activities. It is proposed that a workshop could be held to establish the next steps.

**ASSESSMENT OF PRIMARY HEALTH CARE IN HODEIDA GOVERNORATE**  
**29th June - 31st August 1991**

**1 Introduction**

The assessment of primary health care in Hodeida Governorate was carried out as the main component of a ten-week consultancy (26th June-1st September) for the Accelerated Cooperation for Child Survival Project (ACCS), funded by USAID through the REACH Project, John Snow Inc. The purpose of the assessment was to identify how the governorate can best provide the desired level of primary health care (PHC) within existing resources and constraints, and to recommend priority areas for future donor support (including technical assistance) for sustaining the PHC system. The assessment was to be conducted in consultation with members of the Health Manpower Projection Technical Committee. It was also to identify lessons learned from the rapid expansion of basic health services under the Tihama PHC Project. Terms of Reference are attached in Appendix A.

The second activity for this consultancy was to assist in the preparation of a workshop for trainer/supervisors from the three governorates where ACCS is currently supporting PHCW training (Hajja, Mareb and Sa'ada). The workshop was planned with staff from the Health Manpower Institute and the Dhamar Rural Health Project, and with ACCS's Training consultant, Dr. Madeleine Taha, who completed the mid-term assessment of male and female trainees during this consultancy (see her report). The workshop was held in Sana'a from 10th-19th August. It was conducted by staff from HMI and the MOPH, with contributions from staff with experience of supporting and supervising PHCWs in Hodeida governorate. The workshop participants drew up several recommendations to present to the MOPH.

The remainder of this report presents the findings and recommendations arising from the assessment of PHC in Hodeida Governorate. After giving an outline of the development of primary health care in the Governorate, the approach used for this assessment is described. The findings and recommendations are presented in four chapters: facilities and staff; primary health care activities; resources (manpower, buildings, equipment, vehicles and transportation, supplies, and finance); and processes for supervision, support, monitoring and management, including suggestions for increasing the efficiency of resource use.

## 2 Background

### 2.1 Development of Primary Health Care in Hodeida Governorate

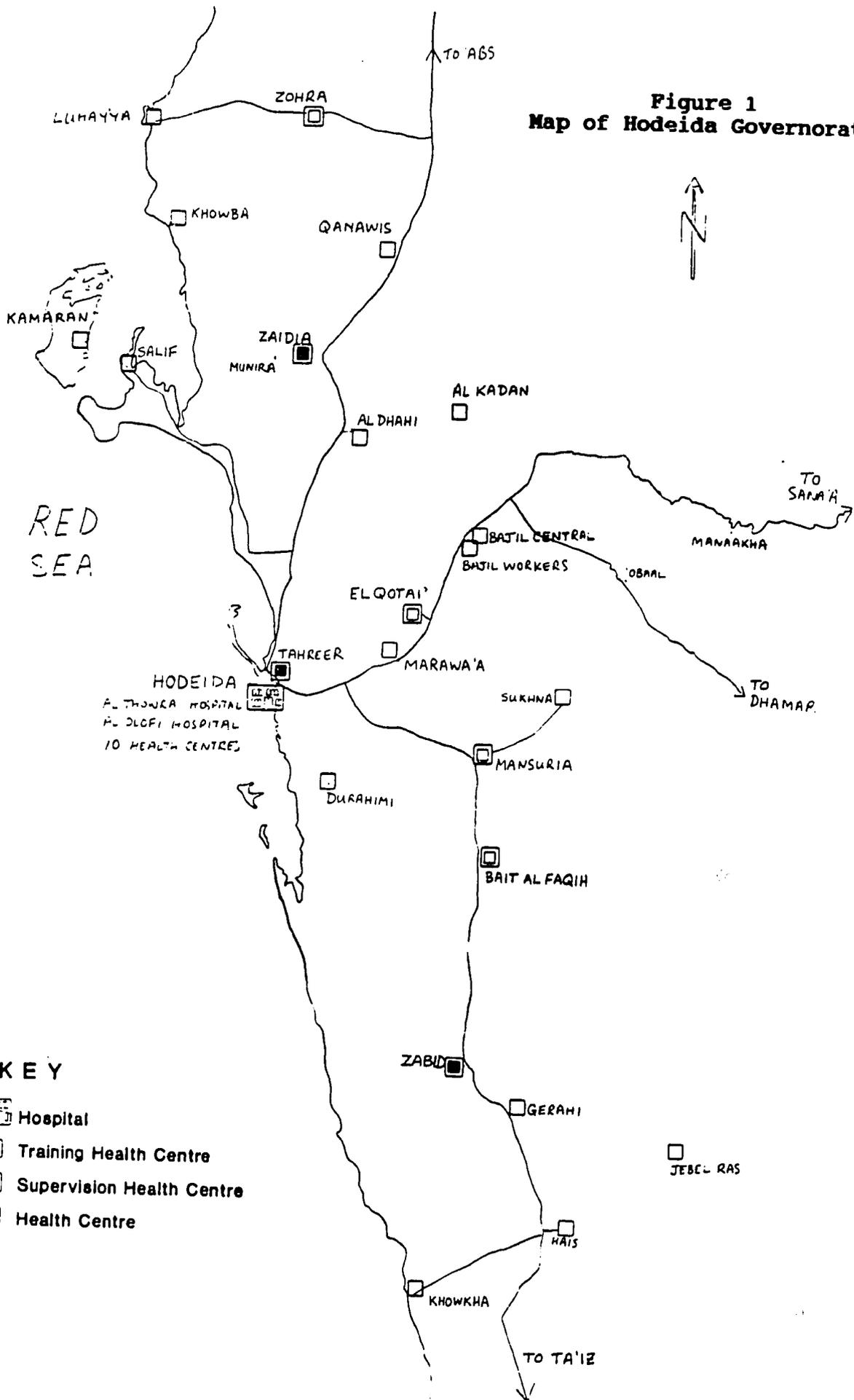
In 1980, the first group of Trainer/Supervisors (T/Ss) completed their six-week training at HMI in Sana'a. This cadre of staff were to train men and women selected from their communities to be primary health care workers (PHCWs) and local birth attendants (LBAs) respectively. PHCWs had to have a minimum of six years' basic education, but most of the LBAs were not literate when they began their course. After the one year training, the PHCWs and LBAs started providing health services in their villages, based at temporary or permanent PHC Units, and were supervised by a T/S and/or a midwife. At that time there were at least a dozen PHC projects in the YAR; although each was run within the MOPH's guidelines, the emphasis of each was slightly different.

In Hodeida governorate, PHC in rural areas has been developed under two separate projects. The northern part, from Zohra to Mansuria and later to Bait al Faqih (see Figure 1), was the area designated for the activities of the Tihama PHC Project, supported by USAID, with technical assistance from Catholic Relief Services (1980-1982) then from Management Sciences for Health (1983-1989). The southern part (from Bait al Faqih to Khowka) was covered by Zabid Yemeni Swedish Clinic with support from Rädä Barnen (Swedish Save the Children) from the 1970s until the end of 1991; the last resident advisor left Zabid in 1984 but technical assistance from staff based in Taiz has continued. The Tihama south of Khowka is in Taiz Governorate which trained at least seven PHCWs in this area, and there were other PHC activities based in Mokha. North of Zohra (in Hajja Governorate) there was training for PHCWs, LBAs and TBAs based in 'Abs. Thus the area covered by the Tihama PHC Project was only part of the entire coastal plain referred to as the Tihama.

Different approaches for developing PHC services were adopted in these two areas, and the effect is evident in the data from the assessment. The Tihama PHC Project put more emphasis on community health activities, with PHCWs conducting surveys of their catchment areas, reporting monthly on field visits for environmental sanitation, and working intensively on selected topics such as growth monitoring, oral rehydration, malaria control and immunization. Detailed systems were developed for child health services, drug supply logistics, recording and reporting, supervision, vehicle maintenance and training of PHCWs, and manuals were prepared describing how each system should work. (These manuals are listed in Appendix E and are on file in Hodeida Health Office and at USAID, under Project 279-0065.)

In Zabid, the focus of attention has been on developing the clinic, training candidates from Zabid town to cover the workload of curative outpatients, and providing trained midwives for deliveries at the clinic. Child nutrition initially received considerable attention from researchers but their findings do not appear to have been incorporated into the work of rural PHC staff. Systems for regular reporting and supervision at the PHC Units are relatively undeveloped.

**Figure 1**  
**Map of Hodeida Governorate**



**KEY**

-  Hospital
-  Training Health Centre
-  Supervision Health Centre
-  Health Centre

Urban PHC services in Hodeida city were developed at Tahreer MCH Centre with input from CRS's nutrition programme in the late 1970's, and from the Tihama PHC Project as Tahreer was a training centre for PHCWs and LBAs. In 1985 the Hodeida Urban Project, supported by the Dutch Government, began working in Ghuleil Centre, and is developing a model for urban PHC based on home visits and clinic services provided by Murshidaat (female health workers). Since 1983-4, the Local Council for Cooperation and Development (LCCD, or the Ta'un) has established three clinics which provide curative services for modest fees; two of these clinics offer immunization (without charge). Following the influx of returnees during the Gulf Crisis (see next section), the decision was taken to build two new health facilities in Hodeida city, in Rabassa and Salkhana; female staff are being trained to work in these neighbourhoods, supported by the British Organization for Community Development (BOCD).

The title of Primary Health Care Worker ('Amil al Ra'iya al Awalia as Sahi) has been changed to Health Facilitator; a male facilitator is a Murshid (pl. Murshideen) and a female facilitator is a Murshida (pl. Murshidaat). The previous female cadre of Local Birth Attendant (LBA) who is typically not literate, was trained until early 1985, when the MOPH directed that no more candidates for LBA training should be recruited. The new cadre of female PHC staff must have the same basic education (six years) as the male staff. In the remainder of this report the following terminology will be used for health workers at the periphery:

|              |   |
|--------------|---|
| PHCW         | PHC Worker, male Health Facilitator           |
| Murshida     | Female Health Facilitator (6 years of school) |
| LBA (daiya)  | Local Birth Attendant (no formal education)   |
| TBA (jidida) | Traditional Birth Attendant                   |

The number of Yemeni doctors and nurses has increased considerably over the last decade, reducing the need to depend upon foreigners to staff health facilities. Perhaps the greatest impact upon primary health care will come from the increased number of Yemeni midwives; the HMI in Hodeida graduated its third cohort in July 1991. Their training has been supported by Pathfinder.

Many other organizations and donors have contributed to the development of PHC; for example, WHO had a resident parasitologist in the malaria control project for several years. Projects in other areas, such as Rayma (Sana'a Governorate) and 'Abs (Hajja Governorate), shared their experiences, particularly of training non-literate women in maternal care. OXFAM has supported health education, and the establishment of the new facility in Rabassa. UNICEF's long-standing material support, providing buildings, equipment, immunization supplies and essential drugs, has made a substantial contribution to PHC.

UNICEF's global target of 80% coverage for immunization in 1990 has had a considerable effect on primary health care services. In Yemen, a campaign strategy was chosen, and this necessitated dedicating staff and vehicles to immunization activities. In Hodeida Governorate the campaign ran over the summer of 1990 (June to September) so that schools and students could be used. The effects of this campaign became rather clear during the assessment of PHC, and are discussed in the findings and recommendations.

## 2.2 Recent Political, Social and Economic Developments

In the last decade, development of Yemen's physical infrastructure (water supply, roads, schools, telephone communications) has proceeded at a rapid pace, and this has affected primary health services. For example, the pool of candidates who are qualified for training as health professionals is now much larger due to the wider availability of education. In the mid-1980's, high quality oil was found in Mareb, and gas has also been discovered; these resources are attracting foreign investment.

In the last 18 months, Yemen has experienced two events which have affected all aspects of life. First, on 22nd May 1990, the Yemen Arab Republic and the People's Democratic Republic of Yemen united to become the Republic of Yemen. Among other challenges, this has involved reorganizing government ministries and budgets, and reviewing and modifying social sector policies. For example, the Ministry of Public Health is currently revising its definition of basic health services, and is considering whether the southern governorates' model for peripheral health care - the volunteer village health guide with a few weeks of training - is to be adopted in the northern governorates, where the most peripheral health staff have one year of training. The period following Unity has required considerable adjustment; for example, the 1991 budget for Hodeida Health Office was in two parts, each covering six months, and budgets are still relatively centralized. It has recently been announced that 1992 will also be a transitional year; in future, the governorates will be given greater responsibility for financial planning, as part of the general policy of decentralization, and will be preparing their own annual plans of activity.

Less than three months after Unity, on 2nd August 1990, Iraq invaded Kuwait and annexed the territory. Yemen condemned the invasion but abstained or voted against most of the twelve United Nations resolutions. International responses to the Gulf Crisis resulted in more than 800,000 Yemenis who had been living and working in Saudi Arabia and the Gulf States being forced to return to Yemen. Many thousands of these muqtaribeen (returnees) arrived in the Tihama, and set up temporary shelters on the outskirts of towns and villages (such as Zaidia, Ma'arufia, Hodeida and Bajil) and in open spaces unconnected with any village (eg on the way to Raskatib). The local authorities had to make immediate provision for water and sanitation for these overnight shanty towns, which seriously taxed the available resources. Many of the muqtaribeen had their families with them, and some did not have an extended family in Yemen with whom they could stay. Although many families have now moved, an uncounted number of people are still living in temporary shelters.

The remittances earned by Yemenis working outside the country are estimated to have accounted for \$600,000,000 (about 50% of foreign exchange earnings) before the Crisis. Loss of earnings by the muqtaribeen and their need to find alternative employment has created economic and social stress. The economic situation was also affected by some donors' decisions to curtail their funding. Most expatriate staff from donor agencies were evacuated during the Crisis, and started returning to Yemen in April and May 1991.

### 2.3 Demographic and Socio-Economic Statistics

The most recent census in the North (1986) estimated that the population was 9.2 million, with 1.2 million resident in neighbouring countries. The total fertility rate was 8.8, with the population growing at a rate of 3.3% per year. The latest official statistics show the infant mortality rate as 136/1000 live births and falling, and maternal mortality as 10/1000 births (i.e. one woman dies every 100 deliveries) and not declining. Life expectancy at birth was 46 years for males and 49 years for females. About 90% of the population lived in rural areas, and GNP per capita was estimated to be \$450 per year.

These basic demographic and socio-economic indicators have been greatly affected by the events described in the preceding section. With Unity in May 1990, the population of Yemen became 12 million, and the geographic area of the Republic is now three times bigger than that of the eleven northern governorates alone. After the return of Yemenis who had been resident in Saudi Arabia and the Gulf, the population data for the areas where the muqtaribeen settled have been fluctuating considerably. This makes it difficult to estimate the target population for primary health care activities. For example, EPI targets for Hodeida Governorate in 1991 are 5.16% higher than last year, but this multiplier has been applied uniformly to all nahiaat (districts) without taking into account the actual variations in the population increases.

The effect upon the economy of the sudden loss of remittances and the increase in people needing work has been mentioned above. During the last decade, the value of the Yemeni Rial in terms of US dollars has fallen from 5 Rials/\$ to 30 Rials/\$ in the unofficial market. The official rate is 12 Rials/\$. Since May 1990, the Republic has had two currencies, with the Dinar used mainly in the southern governorates. Inflation is eroding the real wages of government employees, whose salaries are not increasing at the same rate. However, some staple foods (eg bread) have not changed in price over the last six years, and petrol is relatively inexpensive at 6.05 Rials (\$0.20) per litre.

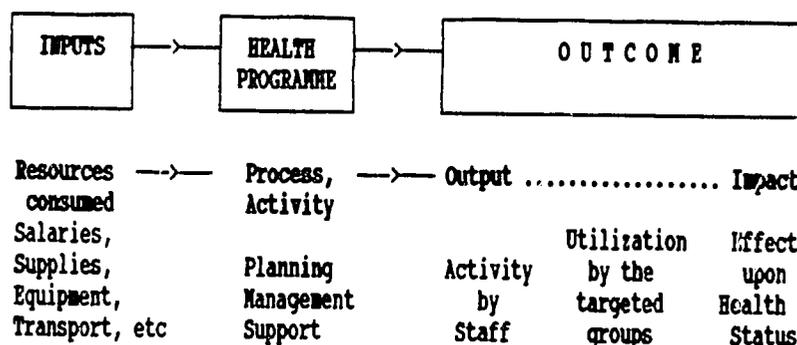
Several surveys have provided health status indicators which refer specifically to the Tihama. The National Nutrition Survey (1979) found that although the percentage of Tihama children with normal weight-for-height and height-for-age (37%) was above the national rural average of 33%, one-quarter of Tihama children aged 3-59 months were acutely undernourished (i.e. weight-for-height more than 2 standard deviations below the reference mean). A 1985 survey in the Tihama PHC Project area also found poor nutritional status among young children. In this survey more than half of morbidity reported by household members was due to three sets of symptoms: diarrhoea and/or vomiting, fever, and respiratory tract infections. These broadly correspond to the three illnesses which are reported most frequently by health staff: malaria, respiratory infections, and diarrhoea. Twice as much malaria was reported as any other disease or symptom in 1990 (see Figure 15 and Appendix D.5).

### 3 Approach Chosen for the Assessment

#### 3.1 Framework and Methodology

The basis for the methodology used in this assessment is the concept that certain inputs (resources, activities) are necessary in order to provide PHC services. If these inputs are lacking, then the desired outcome - PHC services of acceptable quality - cannot be provided.

The diagram below characterizes the relationships between the necessary inputs and the desired outcome in terms of resources, activities by staff, action by the community, and the long term effect on health status:



This assessment has not attempted to measure any impact upon health status, nor has community-based utilization (coverage) been measured. However we have collected data on the volume of services provided and linked this with the size of the catchment population; this permits the calculation of simple indicators that PHCWs and their supervisors can use on a monthly basis to monitor their own level of activity.

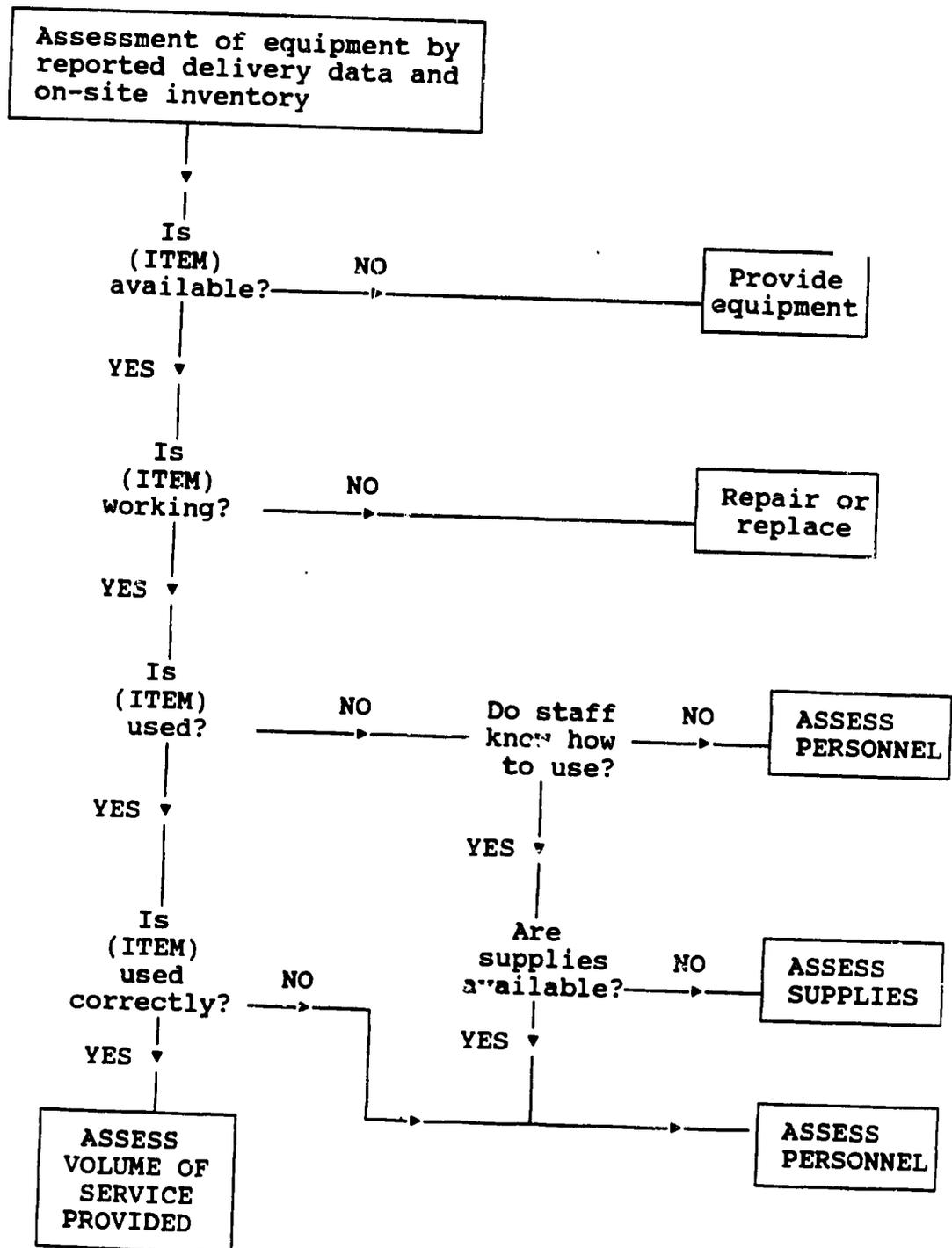
The strategy was to start the assessment at the periphery (PHC Unit), and follow up the information obtained there with the supervisor who is responsible for the surveyed Units. At the same time some aspects of the supervisor's Health Centre were assessed. Finally points arising from these field visits were followed up at the Health Office, and with the Ministry of Public Health and donors.

#### 3.2 Questionnaires

Structured questionnaires were developed for interviews with male and female health workers, their supervisors, and Health Centre directors. The PHC Unit questionnaire was designed to capture the main elements of the PHCW's and Murshida's job description (see Appendix D.2), especially the emphasis on identifying cases at risk. It covered the resources required to run a satisfactory service (equipment, stationery, supplies), some indicators of quality (how the PHCW would deal with standard presenting conditions, and correct use of equipment), and indicators of the volume of services provided. Most of the questions on volume of activity were designed to reflect the information required in the

Monthly Report of Activity; this meant that the data were easier to extract, and that the accuracy of reporting could be verified on site from the registers. The basic design of questions on resources follows the pattern shown in Figure 2, for equipment.

Figure 2 Flowchart for Assessing Equipment Inputs



For questions on knowledge and practices (eg vaccine handling, treatment of diarrhoea), the format of the questionnaire allows us to distinguish whether the answer was given spontaneously or after a probe. As the same core team conducted all the interviews, consistency was assured.

The Supervisor's questionnaire followed up on all aspects of the information from the PHC Unit. The Health Centre questionnaire covers the range and volume of services offered (especially maternal health and immunization), and the reporting practices for assembling the monthly reports. These three questionnaires were pretested and revised, and are attached in Appendix F. It must be emphasized that these questionnaires are designed for use by senior staff who know how the PHC system is supposed to work, and can follow up on unexpected or curious information as the interview proceeds.

The systematic detail about most aspects of a PHCW's work provided several checks of internal consistency. In practice, it was virtually impossible for a PHCW to misrepresent his activities. For example, on Page 3 he is asked the reason for his last visit to each village in the catchment area, then on Page 5 he is asked whether certain registers are kept, the date of the last entry, and the total reported last month. In one memorable interview, the PHCW said that five village visits were for registering births, but these infants were not in the Birth Register, so the questionnaire caused the fabrications to become unravelled. This level of detail combined with on-site examination of equipment, registers, records and drug stocks mean that the data are reliable. The PHC Unit interviews took about three hours, plus an hour if there was a Murshida or LBA.

### 3.3 Sampling Strategy

The sampling strategy was to develop a complete list of PHC Units functioning now (see Section 4), to group together all units supervised from the same Health Centre, and to assign a score on a seven-point scale (-3 to +3, with "average" being 0). In the Tihama PHC Project area, the score was based on the Training Director's 1990 assessment report after visiting all units, and in Zabid the score was based on the Clinic Director's assessment. The plan was to visit at least two units from each of the six supervision areas, then to interview the supervisor and complete the health centre questionnaire. One of the best units in each area should be visited, and one average or below average unit. In choosing these units, priority was given to those with female staff. The reason for choosing this strategy was to find out how well PHC Units could function within existing constraints, and to gather as much information as possible about rural MCH services.

This plan was followed for the areas supervised from Tahreer/ El Qotai', Mansuria, Bait al Faqih and Zabid, but for Zaidia and Zohra, there was not enough time to visit PHC Units. Following the supervisor's strategy for supervision visits, the visits were unannounced in all but two cases. Altogether 20 rural PHC Units were visited and interviews were completed at 14 sites. In addition, seven HCs were visited including two in Hodeida. The complete list of facilities visited is given in Appendix C.

## FINDINGS AND RECOMMENDATIONS

### 4 Facilities and Staff

This section presents the types of facilities currently offering health services in Hodeida Governorate, the cadres of staff, and estimates of population per facility and per staff member with special attention to maternal and child health services. Movement and attrition of PHCWs, LBAs and Murshidaat since they qualified is also discussed.

#### 4.1 Types of Facilities and their Staffing Patterns

The definitions of each type of facility were outlined in the memorandum on Health Manpower Projection (HMP) from the MOPH's Planning and Development Sector (June 1991), as follows:

Health Units  
Health Centres (20-30 beds)  
Rural Hospitals (40-60 beds)  
Governorate Hospitals (60+ beds)  
Teaching Hospitals

The precise definitions will be clarified by the HMP Technical Committee after their nationwide survey, being planned and developed during the latter half of August 1991 (see Peter Shipp's consultancy report). In the mean time we have discussed how to describe the variety of public facilities which are providing health services in Hodeida Governorate, and have grouped them into four broad categories:

#### Health Units

- Primary Health Care Units, staffed by PHCW and/or Murshida and/or Local Birth Attendant; is supervised on site and submits reports on a monthly basis.
- Curative Units, staffed by a nurse (often foreign) working from a temporary location; typically does not submit monthly reports to the Health Office, and is not supervised at the place of work.

#### Health Centres

- Health Centre with a doctor and supporting staff who may include midwife, lab technician, x-ray technician; note that some Health Centres do not yet have MCH services.
- Supervising Health Centre: as above, but also has a T/S who supervises the PHC Units in the area, and supplies them with drugs and vaccine.
- Training Health Centre, used for practical training of PHCWs and Murshidaat; usually also has responsibility for the supervision and resupply of PHC Units in the area.
- MCH Health Centre specializes in antenatal care, family planning and child health clinics (growth monitoring and immunization); no curative service for adult males.
- Sub-centres staffed by one or two nurses in a permanent facility.

### Hospitals

- Governorate hospitals in Hodeida city (al Olofi, al Thowra); both institutions are used for some practical training for nurses, midwives, PHCWs and Murshidaat/LBAs.
- Rural hospitals with space for 20-30 beds
- Other facilities with inpatients (eg the psychiatric hospital in Hodeida)

### Specialized clinics

- Tuberculosis and leprosy clinics in Hodeida city.

In addition there is a range of services (medical, diagnostic, pharmaceutical) available in the private sector.

**PHC Units.** The full list of PHC Units that have been established in Hodeida Governorate is shown in Table 1. These Units are arranged according to their Supervising Health Centre, by nahia and by the date the first PHCW qualified. Out of 105 sites where PHC Units have been established,

- 99 PHC Units are said to be functioning at present;
- 2 (Jebel al Milh and Maibelia) offer only immunization services on an outreach basis (the PHCWs work at a Health Centre);
- 2 PHC Units are closed at present (Kidf Zumeila, Dayr al Qumaat) and their PHCWs are working at a Health Centre;
- 2 PHC Units (Dayr al Wali and Mahal Mohammed Saeed) never opened after the PHCWs finished their training, but remain on the data base for the monthly reports.

Another six Units (Ruqaab, 'Obaal, Hussainia, Shujeera, Mowshej, Qataaba) have closed for at least one year from the time they first opened, but are now functioning with new staff. In three cases, the PHC Unit has moved from one village to another (see Ghazaala/Shab, al Mahal/Kilo 16, Ruqaab/Magreba). The Health Office has plans to upgrade two PHC Units (Munira and 'Obaal) to Health Centres. (The PHC Unit at el Qotai' had a PHCW in 1981 and was upgraded to a HC in 1987-8). Another two functioning units (both in Jebel Ras) have extra staff (a doctor and lab technician at Qahara, and two nurses at Dhohra) and should really be counted as Health Centres or Sub-Centres.

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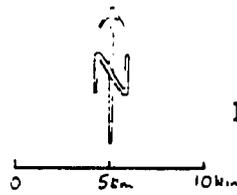
### Notes to Table 1 (pages 13-17)

Code of Unit is the code used by the Health Office Director of Training (1 to 77). Codes 98 and 99 have been assigned to Units north of Zabid which had no code. For Units in the Zabid area without a code, the numbering runs from 901 to 927. The system used for assigning codes is approximately by date of qualification, then by geographic area. (Code 3 was assigned to el Qotai' when it was a Unit.) Recommendations address the need to establish numeric codes for identifying Units in the information system.

- \* **Type of building:** Temp=temporary (rented or free of charge);  
Perma=permanent unit built in the official UNICEF design;  
Other=permanent structure, other design;  
B=Built by PHCW or Murshida.

**KEY**

- Training Health Centre
- ▢ Supervision Health Centre
- Health Centre
- △ PHC Unit
- Curative Unit, Sub-Centre
- ⋈ 500 metre contour line



**Figure 3**

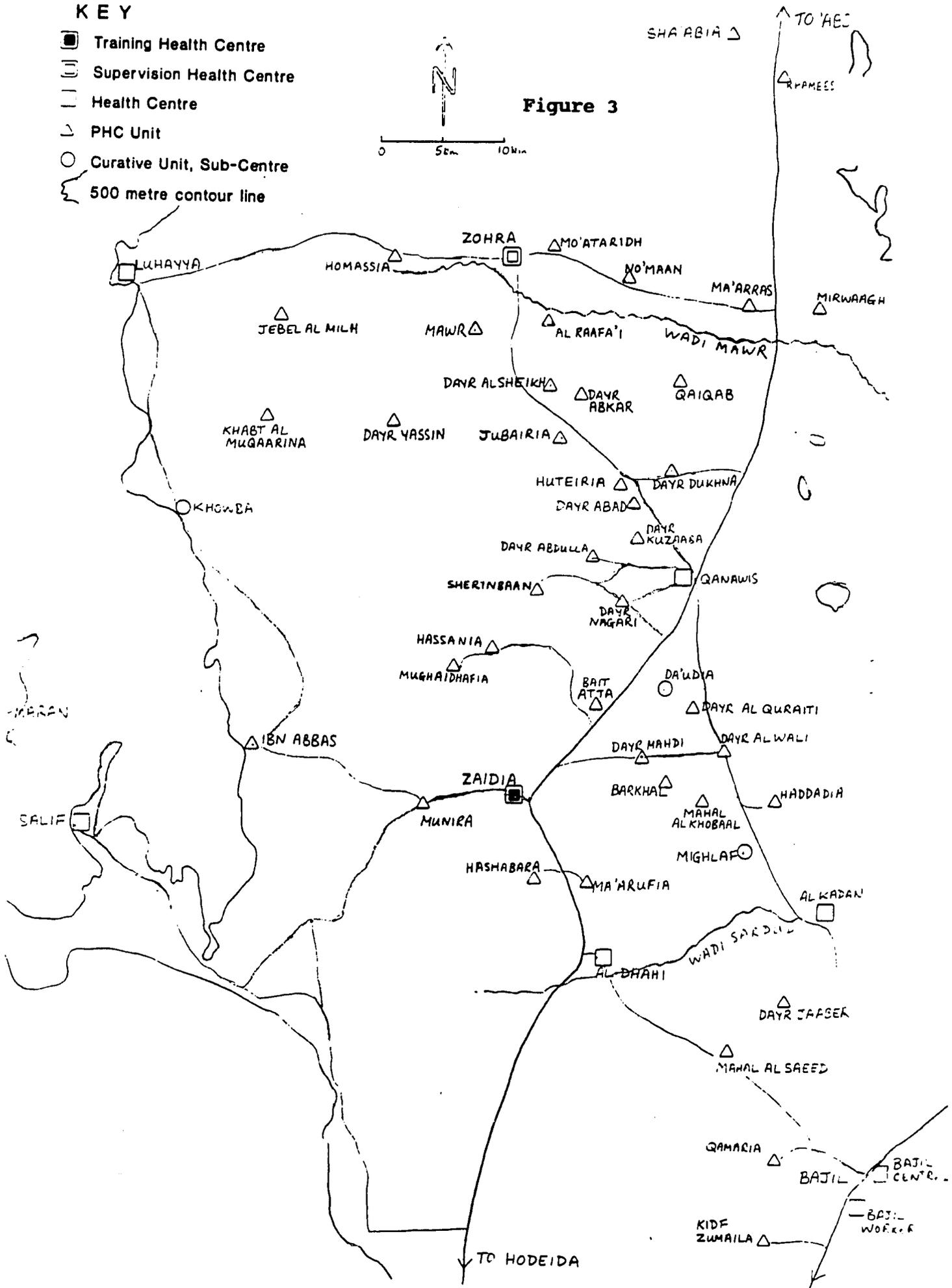


Table 1.1 PHC Units grouped by their Supervising Health Centre

| Primary Health Care Unit<br>Code Name | Nahia     | Type of<br>Build-<br>ing* | Date Qualified |        | Current<br>Staff<br>of Unit |
|---------------------------------------|-----------|---------------------------|----------------|--------|-----------------------------|
|                                       |           |                           | Male           | Female |                             |
| <u>Supervised from Zohra HC</u>       |           |                           |                |        |                             |
| 5 al Mirwagh                          | Zohra     | Temp                      | Dec-82         | Jan-84 | M                           |
| 6 al Khamees                          | Zohra     | Temp                      | Dec-82         |        | M                           |
| 8 Mawr                                | Luhayya   | Temp                      | Dec-82         |        | M                           |
| 24 al Raafa'i                         | Zohra     | Temp                      | Dec-83         |        | M                           |
| 26 No'maan                            | Zohra     | Temp                      | Dec-83         |        | M                           |
| 27 al Jubeiria                        | Luhayya   | Temp                      | Dec-83         |        | M                           |
| 29 al Ma'ras                          | Zohra     | Temp                      | Dec-83         |        | M                           |
| 30 al Mo'taradh                       | Zohra     | Perma                     | Dec-83         |        | M                           |
| 42 Dayr al Sheikh                     | Luhayya   | Temp                      | Jul-86         | Feb-90 | M                           |
| 45 Dayr Abkar                         | Luhayya   | Temp                      | Jul-86         |        | M                           |
| 52 Dayr Yaaseen                       | Luhayya   | Temp                      | Oct-86         |        | M                           |
| 57 al Homaasia                        | Luhayya   | Temp                      | Oct-86         |        | M                           |
| 66 Khabt al Muqaarina                 | Luhayya   | Temp                      | Sep-87         |        | M                           |
| 67 Jebel al Milh                      | Luhayya   | Temp                      | Sep-87         |        | M                           |
| 70 al Sha'abia                        | Zohra     | Temp                      | Sep-87         |        | EPI<br>M                    |
| <u>Supervised from Zaidia THC</u>     |           |                           |                |        |                             |
| 1 al Munira                           | Munira    | Perma                     | Dec-81         |        | M                           |
| 2 Bait 'Atta                          | Zaidiya   | Temp                      | Dec-81         |        | M                           |
| 7 Dayr Mahdi                          | Mighlaf B | Home                      | Dec-82         |        | M                           |
| 16 Dayr 'Abdalla                      | Qanawis   | Perma                     | Dec-83         |        | M                           |
| 17 Mahal al Khobaal                   | Zaidiya   | Perma                     | Dec-83         |        | M                           |
| 20 al Mughaidafia                     | Munira    | Other                     | Dec-83         |        | M                           |
| 21 al Hashaabara                      | Zaidiya B | Home                      | Dec-83         |        | M                           |
| 22 al Ma'arufia                       | Zaidiya   | Other                     | Dec-83         |        | M                           |
| 25 al Hassania                        | Munira B  | Home                      | Dec-83         |        | M                           |
| 31 Dayr Dukhna                        | Luhayya   | Home                      | Dec-85         |        | M                           |
| 32 Dayr Kuzaaba                       | Qanawis   | Temp                      | Dec-85         |        | M                           |
| 33 al Huteiria                        | Luhayya   | Perma                     | Dec-85         |        | M                           |
| 34 Dayr al Quraiti                    | Zaidiya   | Other                     | Dec-85         | Feb-90 | M+F                         |
| 49 al Qaiqab                          | Luhayya   | Other                     | Oct-86         |        | M                           |
| 50 Ibn 'Abbas                         | Munira    | Home                      | Oct-86         |        | M                           |
| 61 Dayr al Najaari                    | Qanawis   | Home                      | Sep-87         |        | M                           |
| 68 al Sherinbaan                      | Munira B  | Other                     | Sep-87         |        | M                           |
| 69 Barkhal                            | Zaidiya   | Other                     | Sep-87         |        | M                           |
| 77 Dayr 'Abad                         | Luhayya   | Temp                      | Sep-87         |        | M                           |
| 98 Dayr al Wali                       | Zaidiya   | No Unit                   | Dec-86         |        | Closed                      |

Notes to Table 1.1

- 1 Munira PHC Unit will be upgraded to a Health Centre.
- 5 LBA works at Zaidiya THC because of problem in Mirwagh.
- 20 Building for Mughaidhafia Unit was built by PHCW according to himself, or by the LCCD according to his father.
- 30 Murshida works at Zohra HC because Mo'ataradh PHC Unit is in the suq so women won't use it.
- 32 Dayr Kuzaaba's temporary Unit is in the school.
- 34 PHCW and two Murshidaat all work at the unit in Dayr al Quraiti, in a building provided by the LCCD.
- 49 Qaiqab's permanent building was provided by the LCCD.
- 67 Does EPI only. Not employed so doesn't work as a PHCW.
- 98 Unit closed. PHCW never worked after finishing training.

Table 1.2 PHC Units grouped by their Supervising Health Centre

| Primary Health Care Unit Code   | Name                  | Nahia     | Type of Building | Date Qualified |        | Current Staff of Unit |
|---|-----------------------|-----------|------------------|----------------|--------|-----------------------|
|   |                       |           |                  | Male           | Female |                       |
| <u>Formerly Supervised from El Ootai', presently from Tahreer THC</u> |                       |           |                  |                |        |                       |
| 9   | al Qamaria            | Bajil     | Perma            | Dec-82         | Jan-84 | M                     |
| 10  | Kidf Zumeila          | Bajil     | Perma            | Dec-82         |        | Closed                |
| 11  | al Behaah             | Bajil     | Perma            | Dec-82         |        | M                     |
| 28  | al Jaran              | Bura'     | Temp             | Dec-83         | Jan-84 | M+F                   |
| 43  | al Hajaila            | Hajaila   | Temp             | Jul-86         | Jan-84 | M+F                   |
| 46  | 'Obaal                | Hajaila   | Perma+           | Dec-83         |        | M                     |
| 54  | Dayr Jaaber           | Bajil     | Temp             | Oct-86         |        | M                     |
| 56  | al Shaawer            | Bura'     | Temp             | Oct-86         |        | M                     |
| 62  | Mahal Mohammed Sa'eed | Bajil     | Temp             | Sep-87         |        | Closed                |
| 63  | Ghazaala/Shah'ba      | Bajil     | Temp             | Sep-87         |        | M                     |
| 64  | 'Ofeidar              | Bajil     | Temp             | Sep-87         |        | M                     |
| 99  | Gheileen              | Bura'     | Temp             | Ibb            |        | M                     |
| <u>Supervised from Tahreer THC</u>                                    |                       |           |                  |                |        |                       |
| 12  | al Mahaal/Kilo 16     | Duraihimi | Temp             | Dec-82         |        | M                     |
| 18  | Mahal al Saeed        | Dhahi     | Temp             | Dec-83         |        | M                     |
| 60  | al Mukaimania         | Duraihimi | Temp             | Dec-82         |        | M                     |
| 76  | Shujeera              | Duraihimi | Temp             | Sep-87         |        | M                     |
| <u>Supervised from Mansuria HC</u>                                    |                       |           |                  |                |        |                       |
| 13  | Dayr Daud             | Sukhna    | Temp             | Dec-82         | Jan-84 | M+F                   |
| 14  | al Midman             | Sukhna    | Temp             | Dec-82         |        | M                     |
| 15  | al Hosaya             | Mansuria  | Home             | Dec-82         |        | M                     |
| 19  | al Daamegh            | Sukhna    | Perma            | Dec-83         |        | M                     |
| 23  | Ruqaab/Magreba        | Bura'     | Temp             | Dec-83         | Jan-84 | M                     |
| 35  | Biyut al Buta         | Sukhna    | Temp             | Dec-85         |        | M                     |
| 36  | Shujaina              | Sukhna    | Temp             | Dec-85         |        | M                     |
| 37  | Manwab                | Bura'     | Temp             | Dec-85         | Jan-84 | M+F                   |
| 39  | Dayr al Tubain        | Sukhna    | Temp             | Jul-86         |        | M                     |
| 40  | 'Awaaja               | Sukhna    | Temp             | Jul-86         |        | M                     |
| 44  | al Maibelia           | Mansuria  | No Unit          | Jul-86         |        | EPI                   |
| 47  | Dayr al Qamaat        | Sukhna    | Temp             | Jul-86         |        | Closed                |
| 48  | al Radhia             | Mansuria  | Temp             | Oct-86         |        | M                     |
| <u>Supervised from Bait al Faqih HC</u>                               |                       |           |                  |                |        |                       |
| 4   | al Laawia             | Duraihimi | Temp             | Dec-81         | Sep-82 | M+F                   |
| 38  | al Mahwa              | Mansuria  | Temp             | Jul-86         |        | M                     |
| 41  | al Lijaam             | Mansuria  | Temp             | Jul-86         |        | M                     |
| 51  | Munqum                | Duraihimi | Temp             | Oct-86         |        | M                     |
| 53  | al 'Omaria            | Duraihimi | Temp             | Oct-86         |        | M                     |
| 55  | Hajab                 | Mansuria  | Temp             | Oct-86         |        | M                     |
| 58  | al Ghuzia             | Bait al F | Temp             | Sep-87         |        | M                     |
| 59  | al 'Abassi            | Bait al F | Temp             | Sep-87         |        | M                     |
| 71  | Hussainia             | Bait al F | Perma            | Nov-81         |        | M                     |
| 72  | Jurbishia             | Bait al F | Perma            | Nov-81         |        | M                     |
| 73  | Nafhaan               | Bait al F | Temp             | Nov-81         |        | M                     |
| 74  | al Jaah               | Bait al F | Temp             | Nov-81         |        | M                     |
| 75  | Asa'eed               | Bait al F | Temp             | Nov-81         |        | M                     |

## Notes to Table 1.2

- \* Type of building: Temp=temporary (rented or free of charge);  
Perma=permanent unit built in the official UNICEF design;  
Other=permanent structure, other design; B=Built by PHCW.
- 9 LBA died.
- 10 Kidf Zumeila is closed, reportedly due to problems between the LCCD and the PHCW, who works at el Qotai' HC.
- 12 Al Mahal's PHCW lives at Kilo 16; he worked at Mukaimania from January 1983 until Dec 1987, then moved to al Mahal.
- 23 Two PHCWs from Ruqaab were trained in 1983; many problems and the unit was closed. One PHCW is now in prison for shooting someone. A third PHCW from Ruqaab trained at Ibb and works in Magreba. The LBA from Ruqaab never worked after qualifying.
- 37 Manwab's LBA trained in Jan 1984. One PHCW from Ruqaab moved here (see note for 23) until a local candidate was trained.
- 43 Bajaila's LBA trained Jan-84 and worked alone for two and a half years, when PHCW joined her. Murshida was trained Feb-90. All three work out of a one-room temporary building.
- 44 Maibelia is closed except for EPI; PHCW works in Mansuria HC.
- 46 'Obaal Unit (UNICEF design) is being enlarged as this facility will be upgraded to a health centre. Ground floor has been extended by 45 sq m, and a second storey added above this for doctor's living quarters (living room, kitchen, bathroom).  
First PHCW trained in Dec-83 left in 1985 to work with LCCD Majlis al Mahali, as Director of Finance. Replacement PHCW started work in January 1987.
- 47 Dayr al Qumaat is reportedly closed (no-one was found on a visit during this assessment), but sent monthly report for May '91. PHCW works in Sukhna HC; after he left, Sudanese nurse was posted to the Unit.
- 60 First PHCW who worked at Mukhaimania was from Kilo 16 (see notes for 12, al Mahal). A local candidate from Mukaimania was trained in December 1987.
- 62 Unit at Mahal Mohammed Sa'eed never opened. Not known where PHCW is. One report was in the computer in error for Jan-June 1991; it was probably for Mahal al Saeed (code 18).
- 63 Unit moved from Ghazaala to Sha'aba because the people of Ghazaala would not provide a building for a temporary Unit.
- 71 Hussainia's first PHCW trained at Zabid in 1981; he left after one year to train as a nurse. Replaced by a second PHCW in December 1988. Both run private practices now; not clear whether this Unit should be considered to be functioning.
- 72 Supervised from Bait al Faqih, trained in Zabid.
- 73 Supervised from Bait al Faqih, trained in Zabid.
- 74 Two PHCWs, both trained in 1981 at Zabid; now supervised from Bait al Faqih.
- 75 Supervised from Bait al Faqih, trained in Zabid.
- 76 Shujeera Unit was closed for 15 months; PHCW was replaced by a nurse with a course in PHC.
- 99 PHCW was trained at Ibb (date unknown) and employed in May 91.

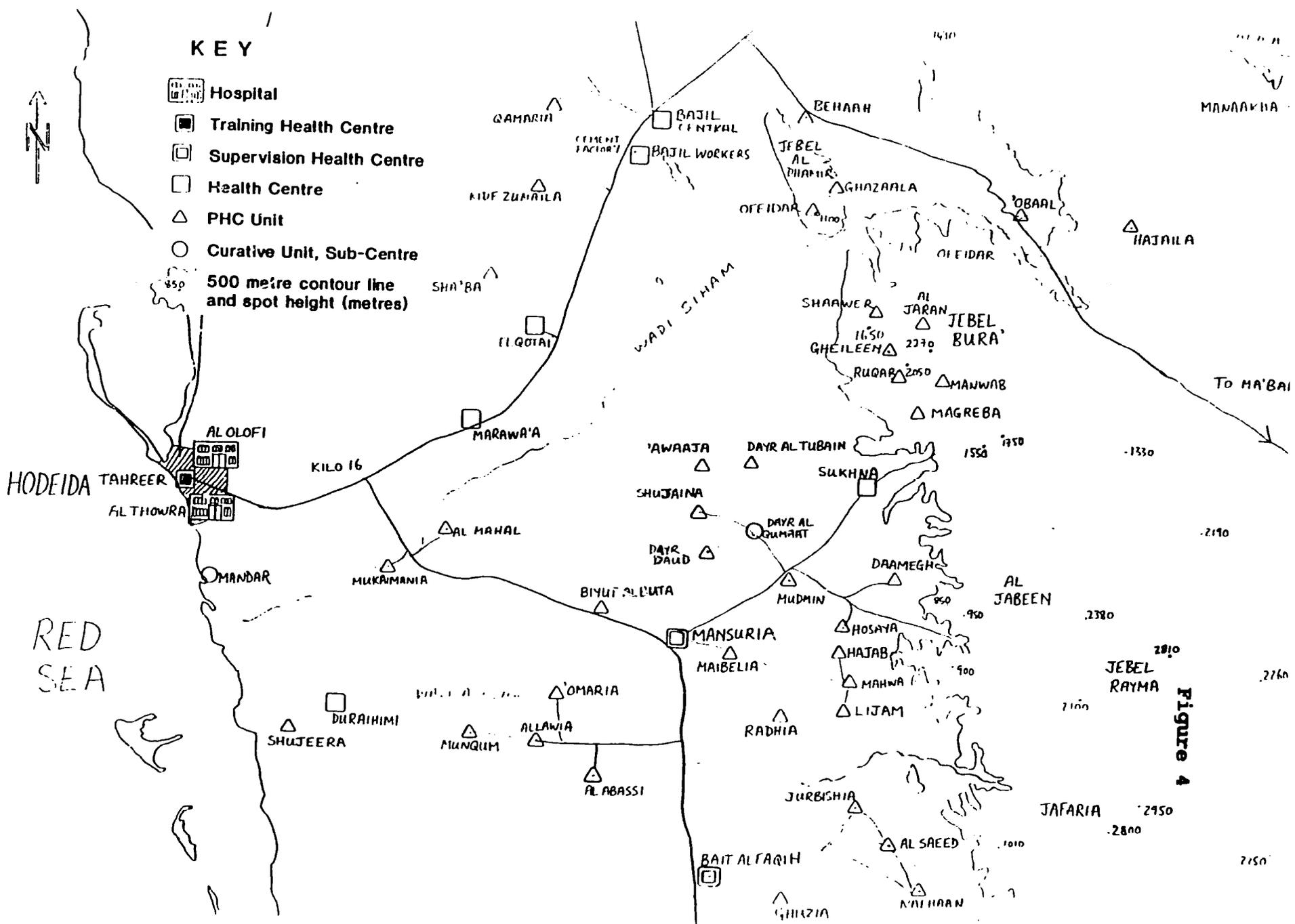
Table 1.3 PHC Units grouped by their Supervising Health Centre

| Primary Health Care Unit Code    | Name                | Nahia     | Type of Building | Date Qualified |        | Current Staff of Unit |
|----------------------------------|---------------------|-----------|------------------|----------------|--------|-----------------------|
|                                  |                     |           |                  | Male           | Female |                       |
| <u>Supervised from Zabid THC</u> |                     |           |                  |                |        |                       |
| 901                              | Madan               | Zabid     | Perma            | Nov-81         | Sep-85 | M+F                   |
| 902                              | Mowqer              | Zabid     | Perma            | Nov-81         |        | M                     |
| 903                              | Tuhaita             | Zabid     | Perma            | Nov-81         |        | M                     |
| 904                              | Turaiba             | Zabid     | Perma            | Nov-81         | Sep-85 | M+F                   |
| 905                              | Zareeba             | Zabid     | Perma            | Nov-81         | Aug-89 | M+F                   |
| 914                              | Toweela             | Zabid     | Perma            |                | Sep-85 | F                     |
| 915                              | Bait al Sheikh Omar | Zabid     | Home             |                | Jul-86 | F                     |
| 65                               | Maghrass            | Zabid     | Temp             | Sep-87         |        | M                     |
| 916                              | Musallab            | Zabid     | Temp             | Dec-88         | Aug-89 | M+F                   |
| 917                              | Jirba               | Zabid     | Temp             | Dec-88         | Aug-89 | M+F                   |
| 918                              | Mahal al Sheikh     | Zabid     | Temp             | Dec-88         |        | M                     |
| 919                              | Majailis            | Zabid     | Temp             | Dec-88         |        | M                     |
| 920                              | Mudaman             | Zabid     | Temp             | Dec-88         |        | M                     |
| 921                              | Radaadia            | Zabid     | Other            | Dec-88         |        | M                     |
| 926                              | Mahat               | Zabid     | Home*            |                | Aug-89 | F                     |
| 927                              | Bedwa               | Zabid     | Home B           |                | Aug-89 | F                     |
| 906                              | Qahara              | Jebel Ras | Perma            | Nov-81         |        | HC                    |
| 922                              | Dhohra              | Jebel Ras | Temp             | Dec-88         |        | SubC                  |
| 907                              | al Fash             | Hais      | Perma            | Nov-81         |        | M                     |
| 908                              | Asurad              | Hais      | Temp             | Nov-81         |        | M                     |
| 909                              | Mahal al Rabi'      | Hais      | Perma            | Nov-81         |        | M                     |
| 910                              | Qulma               | Hais      | Perma            | Nov-81         | Aug-89 | M                     |
| 911                              | Thami               | Hais      | Perma            | Nov-81         | Sep-85 | M+F                   |
| 912                              | Mowshej             | Khowkha   | Perma            | Nov-81         |        | M                     |
| 913                              | Qataaba             | Khowkha   | Perma            | Nov-81         |        | M                     |
| 923                              | Abu Zahr            | Khowkha   | Temp             | Dec-88         |        | M                     |
| 924                              | Dar al Khubaish     | Khowkha   | Temp             | Dec-88         |        | M                     |
| 925                              | Dar Naaji           | Khowkha   | Temp             | Dec-88         |        | M                     |

### Notes to Table 1.3

- \* Type of building: Temp=temporary (rented or free of charge);
- Perma=permanent unit built in the official UNICEF design;
- Other=permanent structure, other design; B=Built by PHCW.

- 65 Maqhrass PHCW was trained under Tihama PHC Project.
- 901 Two LBAs were trained in 1985; one has gone to Hodeida.
- 904 Two female staff at Turaiba are sisters: LBA 1985 and Murshida 1989. They work from home as permanent Unit is used by PHCW.
- 905 Two PHCWs (1981 and 1988) and two Murshidaat (1989) who are sisters. Permanent Unit is beside the school so female staff work at home.
- 906 PHCW lives in Mabraz, 20 minutes from Qahara; has his own building, and private practice? He was not found either at the Unit or at home when we visited Qahara. Egyptian MD works in the permanent Unit and the Lab Tech works in his own building (constructed at his own expense) next door. There are plans to establish a health centre in Jebel Ras and this is a possible site.
- 907 PHCW lives in Hais, commutes to al Fash.
- 908 PHCW lives in Hais, commutes to Asurad.
- 909 PHCW lives in Hais, commutes to Mahal al Rabi' which is sometimes listed as Beni Zoheir.
- 910 Murshida from Qulma works at Hais HC, not at the Unit.
- 911 Thani is sometimes listed as Daaina Thani.
- 912 PHCW from Khokha qualified in 1981 and left for Saudi Arabia after one year. Was replaced in 1988 by a PHCW from Mowshej.
- 913 PHCW trained for Qataaba in 1981 was recruited by the LCCD from Khokha, where he now works at the Health Centre. Replaced in 1988 by a candidate from Qataaba.
- 914 Toweela has two females: LBA 1985 and Murshida 1989. Male trainee failed to qualify in 1988, is now repeating the course.
- 915 Female at Bait al Sheikh Omar is a nurse trained at HMI in Hodeida; does deliveries, EPI and curative. Submits the same reports as a Murshida. Plans to train as a doctor.
- 916 PHCW and Murshida at Musallab are cousins.
- 918 Mahal al Sheikh was sometimes listed as Bait al Sheikh Omar (see 915) which is a separate unit with one female nurse.
- 922 PHCW from Dhohra was trained in 1988; not clear whether he works at the unit, as two Yemeni nurses are also posted there.
- 926 Mahat has two Murshidaat (sisters), both trained in 1989 and working from home. There is also a Curative Unit referred to as Mahat, in a village called Makheirif, with EPI fridge, but the male Yemeni nurse who works there does not coordinate with Murshidaat for EPI.
- 927 Two Murshidaat, both trained in 1989, are listed for Bedwa; they live in separate villages and each run services from their homes. One has built her own room to use for PHC, but is still negotiating for an official Unit; the Sheikh (her father) has offered to donate the land for it.



**KEY**

-  Hospital
-  Training Health Centre
-  Supervision Health Centre
-  Health Centre
-  PHC Unit
-  Curative Unit, Sub-Centre
-  500 metre contour line and spot height (metres)

**Figure 4**

18

HODEIDA

RED SEA

MANAKHA

TO MA'BAI

2750

2810

2710

1550

2270

1100

1410

JEBEL RAYMA

JAFARIA

AL JABEEN

JEBEL BURA

BEHAAR

JEBEL AL PHARIR

MANSURIA

WADI SIMAM

BAJIL CENTRAL  
BAJIL WORKERS

QAMARIA

KUDF ZUMAILA

SHA'BA

EL QOTAI

MARAWA'A

KILO 16

ALOLOFI

TAHREER  
ALTHOWRA

MANDAR

MUKAIMANIA

AL MAHAL

BIYUT AL'UTA

SHUJAINA

DAYR DAUD

DAYR AL TUBAIN

SUKHNA

SHAARER  
GHEILEEN

RUQAA

MANWAB

MAGREBA

DAAMEGH

MUDMIN

HOSAYA

HAJAB

MAHWA

LIJAM

MAIBELIA

RADHIA

OMARIA

ALLAWIA

AL ABASSI

MUNQUM

SHUJEERA

DURAIHIMI

JURBISHIA

BAIT ALTAQH

GHIZIA

N'NIHAN

AL SAEED

950

1550

1750

2270

1100

1410

2380

2100

2750

2800

2380

950

1550

1750

2270

1100

1410

2810

2710

1550

2270

1100

1410

2810

2710

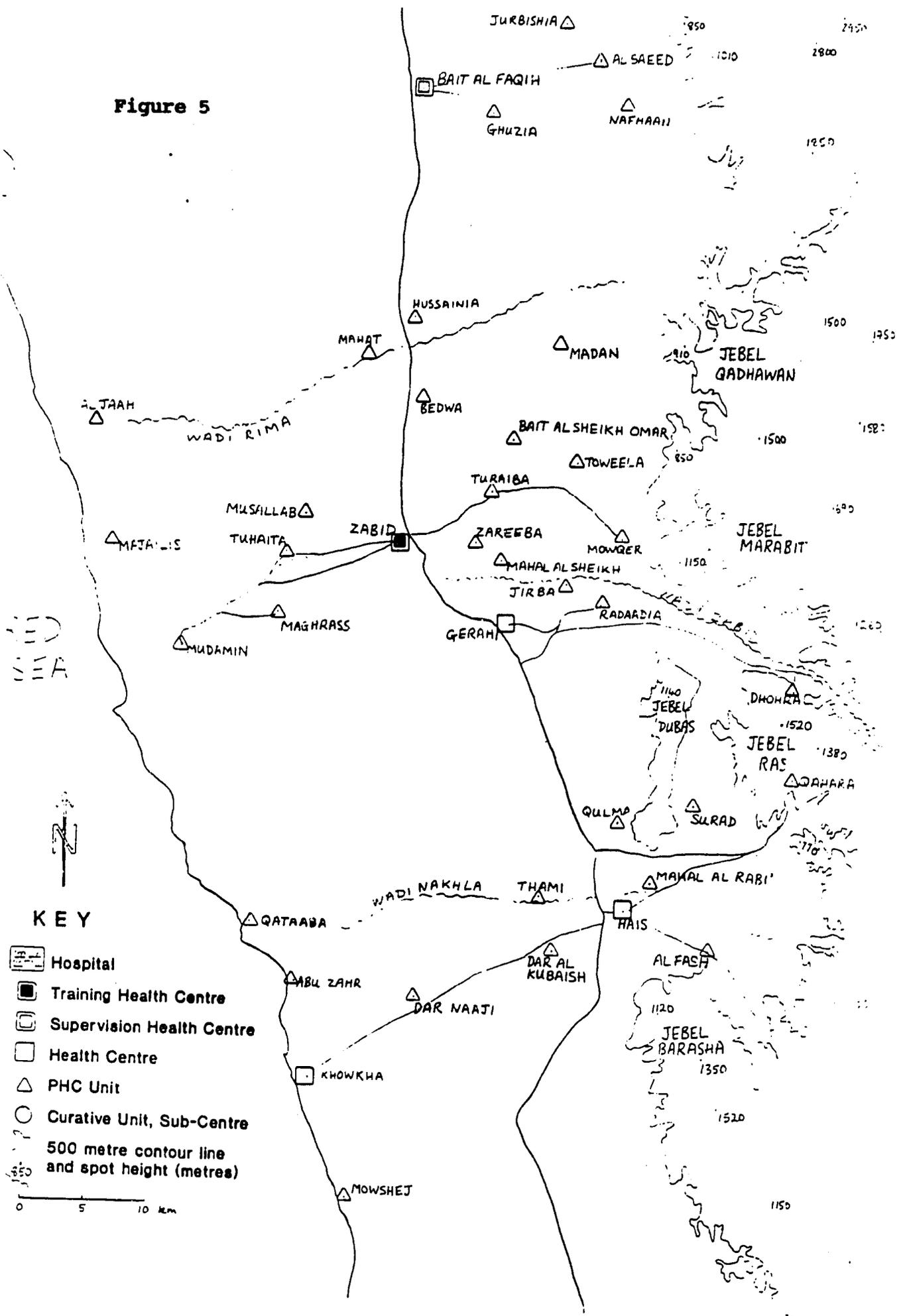
1550

2270

1100

1410

Figure 5



The staffing pattern for a PHC Unit is ideally one male PHCW and one female worker (Murshida or LBA). In practice, the 99 PHC Units functioning at present have the following staff:

|                    | Zohra to<br>Bait al Faqih | Zabid to<br>Khowkha | Hodeida<br>Governorate |
|--------------------|---------------------------|---------------------|------------------------|
| Male and Female    | 6                         | 6                   | 12                     |
| Male alone         | 65                        | 16                  | 81                     |
| Female(s) alone    | 0                         | 4                   | 4                      |
| Male plus Curative | 0                         | 2                   | 2                      |
| Total              | <u>71</u>                 | <u>28</u>           | <u>99</u>              |

However, the following variations are found:

- 4 PHC Units with male and female staff have two females; (Hajaila and Turaiba have an LBA and a Murshida; Dayr al Quraiti and Zareeba have two Murshidaat)
- 2 PHC Units have two PHCWs (al Jaah, Zareeba)
- 3 PHC Units have male staff who are not PHCWs (Shujeera, Qahara and Dhohra, and Dayr al Qumaat until May 1991)
- 3 PHC Units with only female staff have two females (Toweela - LBA & Murshida; Mahat and Bedwa - two Murshidaat).

Thus it is clear that the status of PHC Units changes over time, and that there are considerable variations in Units' staffing patterns. The lists given here will need to be updated again when the new cohort of male students now training in Zabid qualify as PHCWs in September-October 1991.

**Curative Units.** This term is used to describe sites in rural areas to which a nurse or a doctor has been posted, when the site has no permanent facility (Mandar is the exception). Curative Units may be in the school or a building rented by local leaders, or in the medical staff's house. The list of such units is shown in Table 2. It was assembled using information from the payroll for May 1991, and updated using the EPI Supervisor's plan of August 1991.

Several points about this list should be noted. First, the list, which now contains 33 Curative Units, is incomplete. It can be completed using the database assembled by the Statistics Department from the May payroll, when the place of work of all staff in the Governorate is known.

Second, all but one of the staff are male, so access to health care for women is restricted. Third, most of these units do not submit regular reports of their activities to the Statistics Department, and are not included in the Health Office's information system. This makes it difficult to include Curative Units in annual plans and supervision schedules. In particular, the exact location of the units is not readily available (the data on Nahia needs to be checked).

Table 2 Curative Units in Hodeida Governorate (May 1991)

| Curative Units       | Nahia     | Staff                   | Other Facilities |
|----------------------|-----------|-------------------------|------------------|
| Qanama               | Zohra     | 2 nurses                |                  |
| Daudia               | Qanawis   | 2 nurses <sup>a</sup>   |                  |
| Qanawis              | Qanawis   | 1 nurse                 | H Centre         |
| Haddadia             | Qanawis   | 1 nurse                 |                  |
| village not known    | Qanawis   | 1 nurse                 |                  |
| Mighlaf              | Mighlaf   | 1 nurse                 |                  |
| Mehagam              | Mighlaf   | 1 nurse                 |                  |
| Mighlaf              | Mighlaf   | 1 nurse                 |                  |
| Dayr Da'an           | Mighlaf   | 1 nurse                 |                  |
| Maqazala             | Mighlaf   | 1 nurse                 |                  |
| Menaber              | Mighlaf   | 1 nurse                 |                  |
| Menwab               | Mighlaf   | 1 nurse                 |                  |
| Maslouba             | Mighlaf   | 1 nurse                 |                  |
| 'Ursh                | Zaidia    | 1 nurse                 |                  |
| Dayr Jelala          | Zaidia    | 1 nurse                 |                  |
| Dayr al Rubeidi      | Zaidia    | 1 nurse                 |                  |
| Dayr al Bahri        | Zaidia    | 1 nurse                 |                  |
| Dayr al Wali         | Zaidia    | 1 nurse                 |                  |
| Harounia             | Munira    | 1 nurse                 | closed PHCU      |
| Ibn Abbas            | Munira    | 1 nurse                 | PHC Unit         |
| Ja'alia              | Munira    | 1 nurse                 |                  |
| 'Urj                 | Bajil     | 1 nurse                 |                  |
| Mazra al Da'ud Saeed | al Dhahi  | 1 doctor                |                  |
| Hail al Saeed Farm   | al Dhahi  | ? <sup>b</sup>          |                  |
| Mandar <sup>c</sup>  | Hodeida   | 1 nurse <sup>d</sup>    |                  |
| 'Obaal               | Hajeila   | 1 nurse                 | PHC Unit         |
| al Shaama            | Bura'     | ? <sup>b</sup>          |                  |
| Mahat/Mukheirif      | Zabid     | 1 nurse <sup>d</sup>    |                  |
| Muntawfia 'Ulia      | Jebel Ras | 1 med.asst <sup>d</sup> |                  |
| Fouaha               | Jebel Ras | 1 nurse <sup>d</sup>    |                  |
| Dubas                | Jebel Ras | 2 nurses <sup>d</sup>   |                  |
| Mujeireen            | Jebel Ras | 1 nurse                 |                  |
| Asha'ira             | Jebel Ras | 1 nurse                 |                  |

Notes

- One of these nurses is female.
- Name of this unit came from EPI Supervisors' Plan; staff not yet known.
- Mandar used to be a Sub-Centre, and the building is permanent.
- Staff are Yemeni.

Fourth, there is a considerable concentration of these units in certain nahiaat (Qanawis, Mighlaf, Zaidia, Munira, Jebel Ras). The absence of planning their location is highlighted by the finding that two nurses are running Curative Units in villages which have a PHC Unit (Ibn Abbas and 'Obaal) and one is in Qanawis, which has a Health Centre.

Finally, the large number of foreign staff (at least 28 out of 34) who mostly work alone means that there should be a clear system for orientating them to how they are expected to contribute to the Health Office's activities. For example, what are the reporting requirements? What part will they play in providing immunization services? At present, most staff posted to these Curative Units

seem to function more or less independently of the government's health service system. The notable exception found during the assessment was the Medical Assistant responsible for supervising the units in Jebel Ras.

**Health Centres.** The Health Centres are shown in Table 3. They are arranged by nahia, from north to south, with the exception of Hodeida urban centres which are listed last. Excluding the two PHC Units with extra staff in Jebel Ras (Qahara and Dhohra), and excluding the Jebel Ras HC which in reality is a curative unit (see footnote), there are 34 Health Centres in the governorate. Thirteen of these ambulatory facilities are in Hodeida city (including the three LCCD clinics). (Table 3 also shows Salkhana and Rabassa which are not yet open.) The MCH Clinics at the two hospitals also provide ambulatory PHC services.

It can be seen that facilities described as "health centres" are not a homogeneous group in terms of services provided, which are determined largely by the staff available. For example not all health centres have female staff to provide maternal care. Of the 21 rural health centres,

- 7 have a female MD or a qualified midwife;
- 7 have Murshidaat for providing MCH services;
- 7 have no female staff to provide MCH services.

In Hodeida City, three facilities concentrate on maternal and child care: Tahreer, Muqtaribeen and Ghuleil. The availability of MCH at some of the urban clinics is unclear as some female staff "float" between facilities. The provision of MCH services is discussed further in Section 4.3.

Ancillary services available at health centres also vary considerably; some have an x-ray department and laboratory, others must refer all patients needing diagnostic tests. The assessment recorded the types of services provided at the facilities visited, but a complete inventory of services offered at each health centre is still needed.

The lists of facilities were compiled in a Lotus spreadsheet, starting with the Health Office map and using lists from the Departments of Training, Statistics, Finance/Manpower, and the EPI Supervisors. None of these lists was identical. The spreadsheet was revised and updated over many days, and a copy of the diskette was given to the Planning Department before leaving Hodeida. Many aspects of the data are subject to change; for example when the Supervisor from el Qotai' was posted to be Director of Bajil Central Health Centre (formerly the Kuwait Hospital), all units supervised from el Qotai' were assigned to the Supervisor at Tahreer. The version of the spreadsheet left in Hodeida already needs updating, to incorporate the units identified in the EPI Supervisors' plan and in the payroll database. The Health Office must have mechanisms for updating and circulating its information about the status of all health facilities; suggestions for developing this capability are given in the recommendations.

**Table 3 Health Centres and Sub-Centres in Hodeida Governorate**

| Health Centres    | Type of Services            | Nahia         |
|-------------------|-----------------------------|---------------|
| 1 Zohra           | HC+Supervision; murshidaat  | Zohra         |
| 2 Luhayya         | HC ?MCH?                    | Luhayya       |
| 3 Khowba          | SubCentre, no MCH           | Luhayya       |
| 4 Qanawis         | HC with midwife             | Qanawis       |
| 5 Zaidia          | THC+Supervision; murshidaat | Zaidia        |
| 6 al Dhahi        | HC with midwife             | al Dhani      |
| 7 Kadan           | HC with murshidaat          | al Dhahi      |
| 8 Kamaran         | HC with murshidaat          | Kamaran       |
| 9 Salif           | HC with murshidaat          | Salif         |
| 10 el Qotai'      | HC with murshidaat          | Marawa'a      |
| 11 Marawa'a       | HC with female doctor       | Marawa'a      |
| 12 Bajil Central  | HC, no MCH                  | Bajil         |
| 13 Bajil Workers  | HC with female doctor       | Bajil         |
| 14 Mansuria       | HC+Supervision; murshidaat  | Mansuria      |
| 15 Duraihimi      | SubCentre, no MCH           | Duraihimi     |
| 16 Sukhna         | HC ?MCH?                    | Sukhna        |
| 17 Bait al Faqih  | HC+Supervision; murshidaat  | Bait al Faqih |
| 18 Zabid          | THC+Supervision; midwives   | Zabid         |
| 19 Gerahi         | HC ?MCH?                    | Zabid         |
| [20 Jebel Ras     | Curative Unit, no MCH       | Jebel Ras]    |
| 21 Hais           | HC with murshida            | Hais          |
| 22 Khowkha        | HC ?MCH?                    | Khowkha       |
| H01 Muqtaribeen   | MHC only                    | Hodeida Urban |
| H02 'Omaal        | HC ?MCH?                    | Hodeida Urban |
| H03 Haali         | HC with female MD           | Hodeida Urban |
| H04 AlQala'a      | HC ?MCH?                    | Hodeida Urban |
| H05 Sadeeqiya     | HC ?MCH?                    | Hodeida Urban |
| H06 Shahariya     | HC ?MCH?                    | Hodeida Urban |
| H07 Howak         | HC ?MCH?                    | Hodeida Urban |
| H08 Tahreer       | THC (MCH)+Supervision       | Hodeida Urban |
| H09 Yemen         | HC ?MCH?                    | Hodeida Urban |
| H10 Ghuleil       | MHC only                    | Hodeida Urban |
| H11 Salkhana      | not yet open?               | Hodeida Urban |
| H12 Rabassa       | not yet open                | Hodeida Urban |
| H13 LCCD Clinic 1 | Curative+EPI                | Hodeida Urban |
| H14 LCCD Clinic 2 | Curative+EPI                | Hodeida Urban |
| H15 LCCD Clinic 3 | Curative                    | Hodeida Urban |
| al Thowra         | MCH Clinic at hospital      | Hodeida Urban |
| al Olofi          | MCH Clinic at hospital      | Hodeida Urban |

**Notes**

- 1 Zohra's building is that for a 20-bed rural hospital.
- 3,15 Khowba Sub-Centre and Duraihimi Sub-Centre are listed as Health Centres both by the Statistics Department and by the Finance Department, although they could be regarded as Curative Units.
- 11 Bajil Central is in the building which used to be called the Kuwait Hospital (30 beds), which has not had inpatients since 1978.
- 12 Marawa'a is designated to become a training centre for Murshidaat.
- 17 Bait al Faqih's building is for a 20-bed rural hospital. A team of 5 Russian doctors including a female OB/GYN is due to start working there.
- 20 "Jebel Ras" is listed as a Health Centre both by the Statistics Department and by the Finance Department, but it is not clear precisely which of the staff or units in Jebel Ras is the Health Centre. The PHC Unit at Qabara (with MD and lab technician) may be upgraded.
- 21 Hais's building is for a 20-bed rural hospital; it is designated to become a training centre.
- H11 The EPI Supervisors' Plan (August 1991) treats Salkhana as a fully functional facility.

## Recommendations

A system of numeric codes is needed to identify each Unit and Health Centre in the Governorate. This is especially important for the Statistics Department, which compiles monthly reports on a computerized system, for three reasons:

- Several Units have very similar names (eg Mahal Mohammed Saeed and Mahal al Saeed) and have been confused with each other in data entry of monthly reports.
- The Statistics Department is using software in English, so Arabic names have to be transliterated. There is a great variety of feasible spellings for one place (eg Zeidiya, Zaidia, Zaydiya) and this hampers the "sort, search and match" operations which computers are designed to do. Numeric codes will provide unambiguous identification.
- Numeric identification will make it much easier to update the data base as new units open and the status of existing units changes (eg upgrading to a Health Centre, closing a curative unit).

A scheme for assigning numeric codes was developed during the Tihama Project; the memorandum describing this system is attached in Appendix D.1. That scheme needs to be updated, using nahia codes which are compatible with other sources (eg the Census). Then all health information systems (eg PHC, EPI) should use the same codes, attached to the facility name, to identify each facility and its nahia.

The data bases containing information about the present status of Units and other facilities must be kept up to date on a regular basis. This should be carried out by the Planning Department in close coordination with the departments of Public Health and Manpower.

Software for converting the Statistics Department's computer system into Arabic (al Musa'id) is available from the computer agent in Hodeida. This should be obtained as soon as possible so that formats and reports can be produced in Arabic.

In Zabid area, the EPI Supervisor identifies some Units by different names than those used by the PHC Supervisors. A standard list of names needs to be established for all PHC activities, and posted prominently for easy reference.

Printed lists (in Arabic) of the Units and Health Centres currently active in the data base should be distributed to Supervisors so that they can use the same sequence of facilities for verifying receipt of reports and estimating resupply. The numeric codes should be shown on the lists.

The Health Office map now needs to be updated to show all the PHC Units and Curative Units in their proper location. Health Centres and Supervising Health Centres should also be identified. Updating should be done at least once per year, preferably before annual plans are prepared. The database and maps prepared during this assessment can be used, but these need to be checked against the detailed Nahia maps.

#### 4.2 Basic Health Services in relation to the Population

The 1991 population figures used by the EPI programme are available for each of the 22 nahiaat in Hodeida governorate. In Table 4, these data have been arranged from the least populous nahia to the most populous. The average population per facility (HCs, PHC Units and Curative Units) is about 7,300. However, health centres cover a larger population than units; in Table 4 we have assumed that health centres can serve five times more people than PHC Units or Curative Units. This gives a weighted average of 3,953 people per facility. Hajaila and Bait al Faqih stand out as having substantially more people per facility than the average.

**Table 4 Population per Facility, by Nahia**

| Code | Nahia               | Total Population 1991 <sup>a</sup> | Health Centres | PHC Units       | Curative | Weighted Population per facility <sup>b</sup> |
|------|---------------------|------------------------------------|----------------|-----------------|----------|---|
| 8    | Kamaran             | 2,436                              | 1              |                 |          | 487   |
| 9    | Salif               | 4,350                              | 1              |                 |          | 870   |
| 4    | Mighlaf             | 22,282                             |                | 1               | 9        | 2,228   |
| 6    | Munira              | 22,933                             |                | 5               | 3        | 2,867   |
| 20   | Jebel Ras           | 28,314                             |                | 2               | 5        | 4,045   |
| 15   | Mansuria            | 28,836                             | 1              | 5               |          | 2,884   |
| 7    | al Dhahi            | 29,443                             | 2              | 1               | 2        | 2,265   |
| 16   | Duraihimi           | 30,623                             | 1              | 6               |          | 2,784   |
| 13   | Hajaila             | 30,670                             |                | 2               | 1        | 10,223  |
| 21   | Hais                | 32,527                             | 1              | 5               |          | 3,253   |
| 12   | Bura'               | 36,556                             |                | 5               | 1        | 6,093   |
| 3    | Qanawis             | 39,375                             | 1              | 3               | 3        | 3,580   |
| 2    | Luhayya             | 40,081                             | 2              | 11              |          | 1,909   |
| 17   | Sukhna              | 41,449                             | 1              | 7               |          | 3,454   |
| 22   | Khowkha             | 49,848                             | 1              | 5               |          | 4,985   |
| 14   | Bajil               | 59,588                             | 2              | 5               | 1        | 3,724   |
| 11   | Marawa'a            | 74,505                             | 2              |                 |          | 7,451   |
| 5    | Zaidia              | 84,497                             | 1              | 6               | 5        | 5,281   |
| 1    | Zohra               | 95,303                             | 1              | 7               | 1        | 7,331   |
| 18   | Bait al Faqih       | 132,890                            | 1              | 7               |          | 11,074  |
| 10   | Hodeida             | 162,195                            | 15             |                 | 1        | 2,134   |
| 19   | Zabid               | 184,278                            | 2              | 16              | 1        | 6,825   |
|      | Hodeida Governorate | 1,232,979                          | 36             | 99 <sup>c</sup> | 33       | 3,953   |

#### Notes

- Population data are EPI figures for 1991.
- Health centres are assumed to cover 5 times more people than units.
- Excludes 2 Units only open for EPI (Jebel al Milh, Maibelia).

- Luhayya: Jebel al Milh is open only for monthly EPI.
- Zaidia: Dayr al Wali is closed, but has a Curative nurse.
- Hodeida: excludes Salkhana and Rabassa, includes the two hospital MCH clinics at al Thowra and al Olofi.
- Bura': Ruqaab is closed, shifted to Magreba.
- Bajil: Mahal Mohammed Saeed and Kidf Zumeila are closed.
- Mansuria: Maibelia PHCU is open only for monthly EPI.
- Sukhna: Dayr al Qumaat is closed; had a Curative nurse in May.

With large numbers of returnees arriving in the Tihama last year, the population figures from the Census became out of date. Many muqtaribeen have now dispersed but some towns still have large numbers of extra people. The EPI figures for 1991 are 5.16% higher than the 1990 figures in every nahiaat, so the concentrations of muqtaribeen in certain areas are not reflected in Table 4.

### **Recommendations**

The assignment of staff to curative units should take into account the presence of existing facilities. In particular, the concentrations of curative units in Mighlaf, Jebel Ras, Munira and Qanawis deserve attention.

Curative staff should not be posted to villages with a PHCW or Murshida (see Ibn Abbas and 'Obaal).

The nurses and doctors posted to rural areas should be required to provide the Health Office with regular reports on their activities. They should be given an orientation to the PHC system, what role they will be expected to play (eg providing immunization), and with whom they must coordinate their PHC activities.

Special efforts are still needed with community leaders in the nahiaat with more curative units than PHC Units. Visits have to be made by relatively senior Health Office staff to encourage a better understanding of primary health care and the contribution that preventive measures and maternal care will make to the public health. Assistance might be sought from local leaders who have demonstrated support for primary health care in their own area (eg the Sheikh of Mahat).

A more selective adjustment to the population data needs to be made, to take account of the muqtaribeen in specific areas of the governorate.

### **4.3 MCH Services in relation to the Population**

Services for children are provided by male PHC staff, and most say that they can visit homes very soon after deliveries to register births. For maternal care (antenatal check-ups, attendance during delivery, postnatal care and advice about family planning), women typically do without these services unless a female health worker is available. Table 5 shows that trained female staff (doctors, midwives, Murshidaat and LBAs) are available at 36 of the governorate's 168 facilities, i.e. one facility in five has a female staff member trained in maternal care.

**Table 5 Female Staff at Health Centres and PHC Units, by Nahia**

| Code | Nahia                  | Population<br>1991* | H.Centres with: PHC       |                                    |                                     | Female<br>Staff <sup>a</sup> |     |
|------|------------------------|---------------------|---------------------------|------------------------------------|-------------------------------------|------------------------------|-----|
|      |                        |                     | No. of<br>Facil-<br>ities | Female<br>MD or<br>Midwife<br>only | Mursh-<br>ida<br>LBA or<br>Murshida |                              |     |
| 8    | Kamaran                | 2,436               | 1                         |                                    |                                     | X                            |     |
| 9    | Salif                  | 4,350               | 1                         |                                    | 1                                   | X                            |     |
| 4    | Mighlaf                | 22,282              | 10                        |                                    |                                     | XXX                          |     |
| 6    | Munira                 | 22,933              | 8                         |                                    |                                     | XXX                          |     |
| 20   | Jebel Ras              | 28,314              | 7                         |                                    |                                     | XXX                          |     |
| 15   | Mansuria               | 28,836              | 6                         |                                    | 1                                   | X                            |     |
| 7    | al Dhahi               | 29,443              | 5                         | 1                                  | 1                                   |                              |     |
| 16   | Duraihimi              | 30,623              | 7                         |                                    |                                     | 1                            | XX  |
| 13   | Hajaila                | 30,670              | 3                         |                                    |                                     | 1                            | XX  |
| 21   | Hais                   | 32,527              | 6                         |                                    | 1                                   | 1                            | X   |
| 12   | Bura'                  | 36,556              | 6                         |                                    |                                     | 2                            | XX  |
| 3    | Qanawis                | 39,375              | 7                         | 1                                  |                                     |                              |     |
| 2    | Luhayya                | 40,081              | 13                        |                                    |                                     |                              | XXX |
| 17   | Sukhna                 | 41,449              | 8                         |                                    |                                     | 1                            | XX  |
| 22   | Khowkha                | 49,848              | 6                         |                                    |                                     |                              | XXX |
| 14   | Bajil                  | 59,588              | 8                         |                                    | 1                                   |                              | X   |
| 11   | Marawa'a               | 74,505              | 2                         | 1                                  | 1                                   |                              |     |
| 5    | Zaidia                 | 84,497              | 12                        | 1                                  |                                     | 1                            |     |
| 1    | Zohra                  | 95,303              | 9                         | 1                                  |                                     |                              |     |
| 18   | Bait al Faqih          | 132,890             | 8                         | 1                                  |                                     |                              |     |
| 10   | Hodeida                | 162,195             | 16                        | 6                                  |                                     |                              |     |
| 19   | Zabid                  | 184,278             | 19                        | 1                                  |                                     | 9                            |     |
|      | Hodeida<br>Governorate | 1,232,979           | 168                       | 13                                 | 7                                   | 16 <sup>b</sup>              |     |

- a. X means no midwife or female MD is available in the nahia, but the health centre has a Murshida.  
 XX means no midwife, female MD or Murshida at health centres; the only female staff are at PHC Units.  
 XXX means there are no female PHC staff in the nahia, either at health centres or at PHC Units.

- b. Seven of these Units have more than one female worker; this reflects two aspects of the difficulty of recruiting women for training. First, a community that was willing to support a woman to train as a LBA (from 1982 to 1985) was also willing for a Murshida (1987 onwards) to be trained (Hajaila, Turaiba, Toweela). Second, it is easier to get permission for two young women to leave home for the one-year training than for one to go alone (Dayr al Quraiti, Zareeba, Mahat, Bedwa).

Of the 99 PHC Units, 16 have female staff (Murshida or LBA). The shortage of female staff at village level reflects the fact that most community decision makers give lower priority to maternal care than to ambulatory curative services. Communities were more prepared to nominate and support PHCWs than LBAs. The shortage of these female staff is also partly the result of a hiatus in MOPH policy in the mid-1980s. The Tihama PHC Project was informed by the Ministry in 1985 that no more LBAs would be employed, so the training of the third cohort of recruits was cancelled. When training of Murshidaat was introduced, candidates had to have six years of primary education, and this greatly limited the number of sites which could nominate any young women who met the selection criteria. Recruitment of Murshidaat began in 1986, and for three years all the trainees were from towns or Hodeida city. The first

rural women completed Murshida training in Zabid in August 1989. A new group is currently being recruited, to be trained with assistance from the ACCS project.

The decision to train women from rural towns, to work in health centres rather than in PHC Units, has made a significant contribution to the availability of maternal health services. Of the 21 rural health centres, one-third (7) rely on Murshidaat to provide maternal care (Kamran, Salif, al Kadan, Bajil Workers, el Qotai', Mansuria and Hais). Six of the 7 rural health centres with a midwife or female doctor are dependent upon foreign staff; only Zabid has Yemeni women with this level of training. The two health centres which have been proposed as new MCH training centres (Marawa'a and Hais) and Bajil Central, which should become a supervising HC, do not yet have a well established provision for maternal care by female staff. Even in Hodeida city, where it is easier to recruit and post qualified women, every facility does not have female staff for maternal care.

Table 5 shows that there are

- 8 nahiaat with at least one midwife or female doctor
- 5 nahiaat where the most qualified female staff at the health centres are Murshidaat (1 year of training)
- 4 nahiaat with no female staff at health centres but some villages have Murshidaat or LBAs
- 5 nahiaat with no female MCH staff at all.

It is estimated that the average number of women (15-44) per female staff member who provides MCH is between 4,000 and 5,000. As we have seen, some areas have no female staff at all, and there are numerous constraints which discourage women from travelling to the nearest MCH clinic for routine antenatal or family planning services. The 1985 survey in the Tihama PHC Project area found that only 13% of women had any antenatal care during their last pregnancy in sites with no female staff, compared with 33% in the site with an LBA (who had only started work 18 months before). Thus rural women's access to MCH is still severely limited by the absence of female PHC staff in their own community.

In Hodeida city there are many public and private facilities which provide maternal care, and physical access is much easier than in rural areas. However, surveys by the Hodeida Urban Project have shown that there are still social and economic factors which discourage or prevent women, especially those from poorer, less educated families, from using the available services.

Most births in rural areas (95% in the 1985 survey) take place at home; of these, only 10% were attended by someone who had been trained in safe delivery techniques. In an effort to improve care during delivery, traditional birth attendants (jiddaat) have been trained: at least 62 were trained at five sites in the north and in Ghuleil, and a number were trained in the Zabid area. At present the jiddaat in rural areas have no formal connection with the health system, unless they are attached to a health centre (eg at Hais). The jiddaat trained during the Hodeida Urban Project have a monthly meeting with health centre staff.

## Recommendations

The recruitment of female candidates for training as Mursnidaat should pay attention to the future effect upon the availability of MCH services. Some candidates should be recruited from under-served areas with high population density, such as Marawa'a, Bajil and Bait al Faqih. The most effective way to improve the provision of MCH care in these areas may be to develop urban PHC, drawing on the experience of the Hodeida Urban PHC project.

Rural areas with fewer than average female staff are Mighlaf, Munira, Jebel Ras, Duraihim, Hajaila, Qanawis, Luhayya, Sukhna, Khawkha, Bajil, Zaidia and Bait al Faqih (see Table 5). Recruitment should take into consideration both the communities' support of candidates for Murshida training, and their geographic distribution.

It would be preferable to train only one woman per PHC Unit, making exceptions only where the catchment population is much larger than 3,000 or where access is especially difficult.

Suggestions for strengthening links with jiddaat are given in Section 5.4, Providing Maternal Health Care.

### 4.4 Attrition of PHC Staff since they Qualified

Since 1981, there have been 16 basic training courses for male PHCWs, LBAs and Murshidaat from rural areas of the governorate, and five courses for Murshidaat from Hodeida city. Details of the dates, number of candidates who qualified, and where they now work are given in Appendix D.3. Altogether, 184 staff have completed the one-year training (this figure excludes 43 women who attended the Urban Project's first three courses but did not become government employees). Table 6 shows the number of staff trained for each cadre, the number still working in PHC Units or health centres, and the percentage of those who qualified who are still in post. The available information about jidda training is also shown.

With 9 PHCWs and 6 female health workers not in their intended posts, the rate of attrition is 8% for male staff and 7% for female staff. Reasons why qualified staff are not working now are given in the notes to Table 1, and are summarized below:

|   | Male | Female |
|---|------|--------|
| Never worked after qualifying                         | 2    | 2      |
| Not employed so stopped working                       | 1    |        |
| Left for fulltime private practice                    | 1    | 1      |
| Left for other reasons (moved, took another job, etc) | 5    | 1      |
| Died  |      | 2      |

**Table 6 Number of PHC Staff Trained in Hodeida Governorate between 1981 and August 1991**

| Cadre of Staff | Number of Courses | Trainees Qualified | Now working at: |     | Percent in post |
|----------------|-------------------|--------------------|-----------------|-----|-----------------|
|                |                   |                    | Units           | HCS |                 |
| Male PHCW      | 9                 | 108 <sup>a</sup>   | 94 <sup>a</sup> | 5   | 92%             |
| LBA            | 3                 | 15                 | 10              | 1   | 73%             |
| Murshida       | 9                 | 72 <sup>b</sup>    | 14              | 56  | 97%             |
| Jidda          | 6 <sup>c</sup>    | 64 <sup>d</sup>    |                 | DK  |                 |

**Notes**

- a. Total PHCWs trained and working exclude two PHCWs trained at Ibb; the number working at PHC Units in the governorate is 96.
- b. For Murshidaat trained by the Hodeida Urban Project, only 5 from the first three cohorts (48 trainees) were employed (see HUP's 1990 Annual Report, page 3).
- c. Number of training sessions for jiddaat run from Zabid is not known, so this figure is a minimum.
- d. Number of jiddaat includes 2 met at Hais HC, but does not include others trained in the Zabid area.

The number of PHC staff who left the government health service is relatively small, but it should be recalled that several more were trained to work in their communities but are not working there now (see Section 4.1). In the first group of 19 PHCWs trained in Zabid area, six PHCWs did not live in the villages where they were supposed to work. Two left their assigned units which were then empty until replacement PHCWs were trained seven years later. During this period, extensive damage was done to the permanent building at Qataaba and its equipment. Out of the four units whose PHCWs commute to work, two were visited during the assessment. The state of services at these two were among the worst encountered, and the fact that the PHCW was not a resident appeared to be a significant factor. These examples serve to emphasize the importance of selecting candidates for training who are members of the community in which they will work.

**Recommendation**

Recruitment of good candidates is essential as their training and placement is a lifetime investment, both for their community and for the Health Office. The established criteria for selecting candidates for PHC training should be followed.

The Training Department can use its past assessments and the experience of T/Ss to identify additional factors which have positive and negative effects upon the effectiveness of PHC staff. These factors can also be taken into consideration when recruiting candidates.

## 5 Primary Health Care Activities

At the Director-Generals' workshop in June 1991, the job description for male and female health facilitators was reviewed. It addresses a broad range of preventive and curative activities, including environmental sanitation, cooperation with other health staff (eg the malaria team) and school teachers, advising parents about health, providing immunization and family planning services, identifying families and children at risk, as well as treating common health problems and first aid (see Appendix D.2). The workshop for planning the programme for training PHCWs and Murshidaat in Sa'ada, Hajja, Hodeida and Mareb, held in June 1990, also examined the job description, and participants prepared a detailed set of tasks for which PHC staff would be responsible. (see Workshop Report, ACCS, 1990). Health centres' primary health care activities tend to be confined to the facility, and staff do not involve themselves with community participation and environmental sanitation. The exceptions are the Hodeida Urban Project health centres (and, when they open, Rabassa and Salkhana) in Hodeida city, and PHC staff at el Qotai' who hold meetings for women in the afternoons. El Qotai' staff also visit the school twice per month.

Among the 121 PHC staff now working at their units, there is a wide range in the quality of performance. The Health Office's assessment in 1990 included 68 of the northern units and found that 13 (19%) were functioning well above average, but performance at 4 units (6%) was so poor that the PHCW could barely be considered to be functioning at all. At least 3 PHCWs in the Zabid area also fall into this category. In Section 5, we describe the services offered at PHC Units and health centres, and we examine some indicators of quality for selected activities: growth monitoring, immunization, maternal care, pregnancy spacing, and curative services. We also describe the public health activities of PHCWs and Murshidaat and their relationships with the community.

### 5.1 A Profile of PHC Activities and Services

Data on PHC Units' activities from January to April 1991 were extracted from the Health Office's automated information system. The database follows the format of the MOPH's Monthly Activity Report for PHC Units. The spreadsheet was developed during the Tihama PHC Project and contains 71 units from Zohra to Bait al Faqih; the five units staffed by PHCWs trained in Zabid (Hussainia, Jurbishia, Nafhaan, al Jaah and Asa'eed) and Gheileen (trained in Ibb) are missing. All of the Zabid area units (see Table 1.3) are absent from this database, and the assessment found that they had never used the MOPH's Monthly Activity Report.

Out of the 71 PHC Units in the Statistics Department's spreadsheet, six were closed, four did not submit any reports, and 61 sent at least one report during the first four months of 1991. Out of a possible total of 244 reports (61x4), 229 (94%) had been received and processed. This information gives a profile of the average monthly activity reported by PHC Units in the northern part of Hodeida Governorate, shown in Table 7.

**Table 7 Profile of PHC Units' Average Monthly Activity calculated from 229 reports for January-June 1991<sup>a</sup>**

|   | Patients<br>per month | Minimum | Maximum       |                  |
|---|-----------------------|---------|---------------|------------------|
| Attendance for treatment                        | 102                   | 7       | 226           | Manwab           |
| Antenatal visits: at Unit                       | 2                     | 0       | 11            | Hashaab-<br>ara  |
| at home   | 7                     | 0       | 54            | "                |
| Deliveries                                      | not on the form       |         |               |                  |
| Postnatal visits                                | not on the form       |         |               |                  |
| Family planning/<br>pregnancy spacing           | 0.1                   | 0       | 4             | Biyut al<br>Buta |
| EPI: Doses of TT                                | 0.05                  | 0       | 2             | Mo'ataradh       |
| FPI: Doses to Children Under 3                  | 4.2 <sup>b</sup>      | 0       | not available |                  |
| Growth monitoring                               | not on the form       |         |               |                  |
| Home visits                                     | not on the form       |         |               |                  |
| Field visits (environmental<br>sanitation, etc) | 4.5                   | 0       | 22            | Lijaam           |

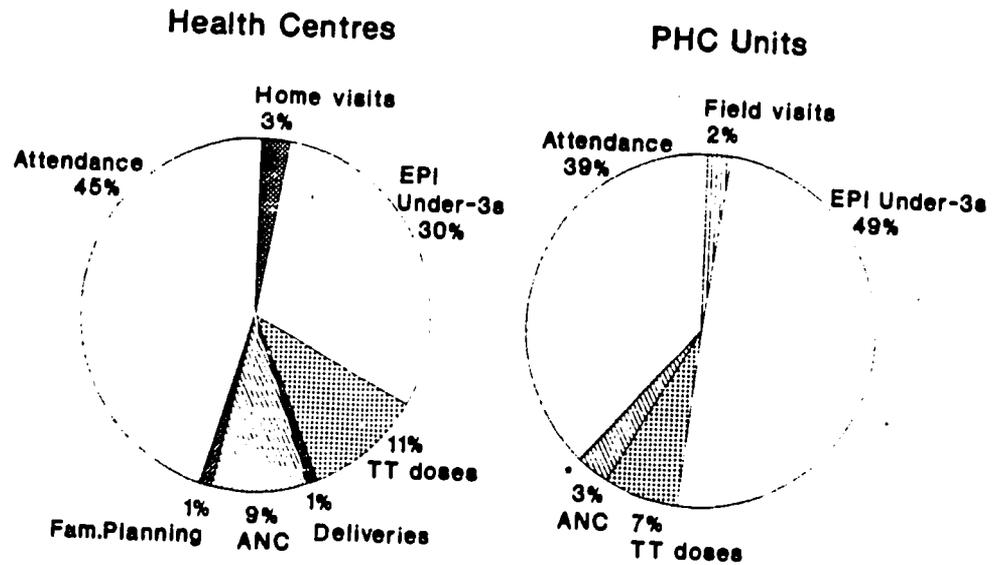
a. Immunization data on the Monthly Activity Report are not processed. The EPI Monthly Summary forms for the 71 Units in the Activity Report database shows a total of 1,191 doses to under-3s for this 4-month period.

Several points about these numbers should be emphasized:

- The PHC Units' Monthly Activity Report does not give space for reporting some activities (eg growth monitoring, deliveries, and home visits other than for antenatal care).
- Reporting is incomplete; some units which sent in reports left several items blank.
- The activities of female staff are sometimes not reported by the male PHCW; for example, Dayr al Quraiti shows no antenatal visits but it is known that the two Murshidaat there are active.

Section 7.3 examines the information system and reporting practices in greater detail. Bearing these points in mind, we have summarized the reported activities of health centres and PHC Units during 1990, in Figure 6. We have made the simplifying assumption that each activity is of equal weight in the facility's workload. This means that a dose of TT has been given the same importance as a curative visit or a home visit. The exception is children's EPI, for which it has been assumed that 2 doses are given at each visit. (These assumptions can be adjusted by using estimates of the time taken to carry out each type of task.)

Figure 6 Primary Health Care Activities in 1990 a



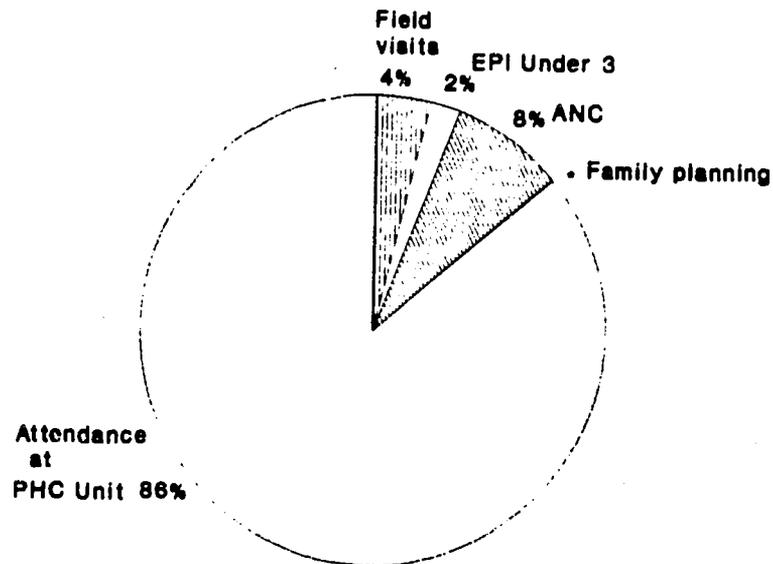
Notes:

- PHC Units' family planning visits are less than 0.1%.
- a. Data have been taken from the Monthly Activity Reports.
- The Monthly Activity Report for Health Centres does not give space for reporting Home Antenatal Visits or Field Visits.
- PHC Unit's Monthly Activity Report does not give space for reporting deliveries attended, or Home Visits other than antenatal care.
- Well child care (growth monitoring) has not been reported since the new MOPE format was issued in 1990.

Attendance for curative care and EPI comprise the great majority of activity both at health centres and at PHC Units. The share of effort devoted to immunization was higher than usual during 1990 because of the national campaign.

Wide variations in the level of activity at individual PHC Units are shown by the minimum and maximum values in Table 7. The Monthly Reports do not cover some of the female staff's work, and the profile of activity at Units with LBAs or Murshidaat differs from that derived from the information system (Table 7 and Figure 7). There are similar variations among the health centres; for example, Bajil Central and Luhayya report more than 3,700 curative attendances per month, whereas at facilities specializing in MCH this figure is lower: 900 curative patients at Tahreer (May) and 160 at Ghuleil (July). However these health centres have a high volume of well child, antenatal care and family planning clients: about 1,000 cases per month at Tahreer and 2,000 at Ghuleil. El Qotai' and Hais see one-tenth of the number of children seen at Zabid and the busy Hodeida centres. Seasonal variations in curative attendance are shown in Appendix D.4.

Figure 7 Activities at PHC Units in 1991<sup>a</sup>



- Family planning visits amount to less than 0.1%.
- a. Data are from 229 monthly reports for January-April 1991, from 61 PHC Units in the northern part of Hodeida Governorate. Only 12 doses of TT were reported for the period and these did not show up on the chart.

Data for the first four months of 1991 are shown in Figure 7; they indicate that the profile of activity at PHC Units has changed considerably since last year. After the new format of Monthly Activity Report was introduced in 1990, the information system no longer contains data about growth monitoring, and important aspects of maternal care have never been integrated into the PHC reporting system. The assessment provided an opportunity to collect information about these activities, to compare them with the expected allocation of time, and to look at the reliability of reporting and the quality of care.

- All of the 14 PHC Units visited were providing curative care, in spite of shortages of most essential drugs (notably chloroquine tablets and syrup, and eye ointment). Drugs are discussed in Section 5.6 and Section 6.5, and logistics in Section 7.2.
- None of the Units was monitoring children's nutritional status.
- All of the Units immunized children, but only 6 had provided this service in the month preceding our visit. Three Units had not been supplied with any vaccine since the end of the 1990 campaign.
- TT for women had been offered at 4 Units during the previous month; 3 of these Units only had male staff. Six Units (including 4 with female staff) had not been supplied with TT since the campaign.

- Eight of the 14 Units had provided antenatal care; two of these 8 did not have female staff. The information system indicates that 93% of the Units without female staff reported antenatal visits, but it seems likely that these visits are for curative care to women who are pregnant, rather than antenatal care.
- In only two places was any antenatal care provided at the Unit itself (Dayr Daud and Hajaila). Problems over women's access to facilities and the layout of the building are discussed in Section 6.2.
- All of the LBAs and Murshidaat interviewed (10 staff at six Units) had attended deliveries during the previous month. However in no case was their cord tape sterile, and their procedures for disinfecting equipment gave some cause for concern.
- The number of times female staff usually visited a woman after delivery varied from once to 40 times (daily for 40 days). The mode was 3-4 visits if the woman's house was not too far away.
- All but one of the PHCWs trained under the Tihama PHC Project made one or more postnatal visits, mainly to register the birth.
- Four Units did not keep a Register of Births, and at two Units that did, the number of births registered was far below the number expected in the catchment population identified by the PHCW (eg 1 birth registered in Mowqer from a population of 28,000). The staff at these 6 units had been trained in Zabid.
- None of the PHC staff provided family planning supplies; one said he referred people to the nearest health centre but they did not go. Three Units with LBAs used to identify family planning clients who were then seen by a midwife when she made regular supervision visits, but this system had ceased some years before. Two LBAs still had a small supply of condoms but said people want pills or Neosampoon (foaming tablets).
- The Units established under the Tihama PHC Project give more attention to public health activities in the community; on average, they made 5 visits per month for water supply, garbage disposal, schools, mosques and food shops, and met once or twice per week with community leaders, often on Fridays. In the Zabid area, only one PHCW said he met regularly with community leaders (one Murshida did also as her father is the Sheikh). Field visits for environmental sanitation and health education were mentioned at three Zabid area Units but are not regularly scheduled. There is no other information about these activities as the Zabid area does not use the Monthly Activity Report.
- Murshidaat are less involved in meetings with local leaders and field visits for public health activities; Units with no male staff said that they did not do these things. This is an important consideration if PHC manpower policy favours a greater role for female staff.

- The preparation of monthly reports took 1.5 days per month on average. Half of the staff interviewed took one day. One PHCW who spent 3 days per month on this task asked if the Disease Report (with 250 items) could be simplified.
- Monthly meetings with T/Ss at the Unit were reported only by the staff supervised from Bait al Faqih. Murshidaat supervised from Zabid spend one day per month at the Health Centre with their supervisors, but are not visited on site. The breakdown of the supervision system for the northern units and the steps needed to reestablish it throughout the governorate are discussed in Section 7.1.
- All staff spent at least one day per month travelling outside their catchment area on health business, usually to pick up their salaries and to meet people at their supervising health centre or the Health Office.

### **Recommendations**

The activity timetable for PHC Units should be reactivated. In addition to helping staff to plan and use their time effectively, it also gives the community (and the T/S) a schedule which states where the PHC staff will be and when, making it easier for patients to use the available services.

Suggestions for revising the contents of the Monthly Activity Report are given in Section 7.3.

The following sections discuss the activities which should comprise the major components of the PHC staff's workload, given the profile of health status in Tihama communities.

## 5.2 Monitoring Children's Nutritional Status

The National Nutrition Survey of the northern governorates in 1979 found that undernutrition in young children was widespread. Among the rural sample, the Tihama had the largest percentage of surveyed children with normal weight and height, but this area also had the highest prevalence of children with acute undernutrition (wasting). Many researchers have devoted considerable energy to studying and publicising the determinants of childhood malnutrition in Yemen, which include infant feeding practices, bottle-feeding, and late introduction of weaning foods. (See Food Habit Survey among Under Fives: Al Lawia (1981). For a detailed recent study, see the Dhamar Rural Health Project's health systems research, Childhood Malnutrition in Rural Dhamar and Mortality Survey, 1988, which also gives many useful references.) In Hodeida Governorate, donor assistance from Catholic Relief Services focussed on nutrition for some years before the primary health care project started.

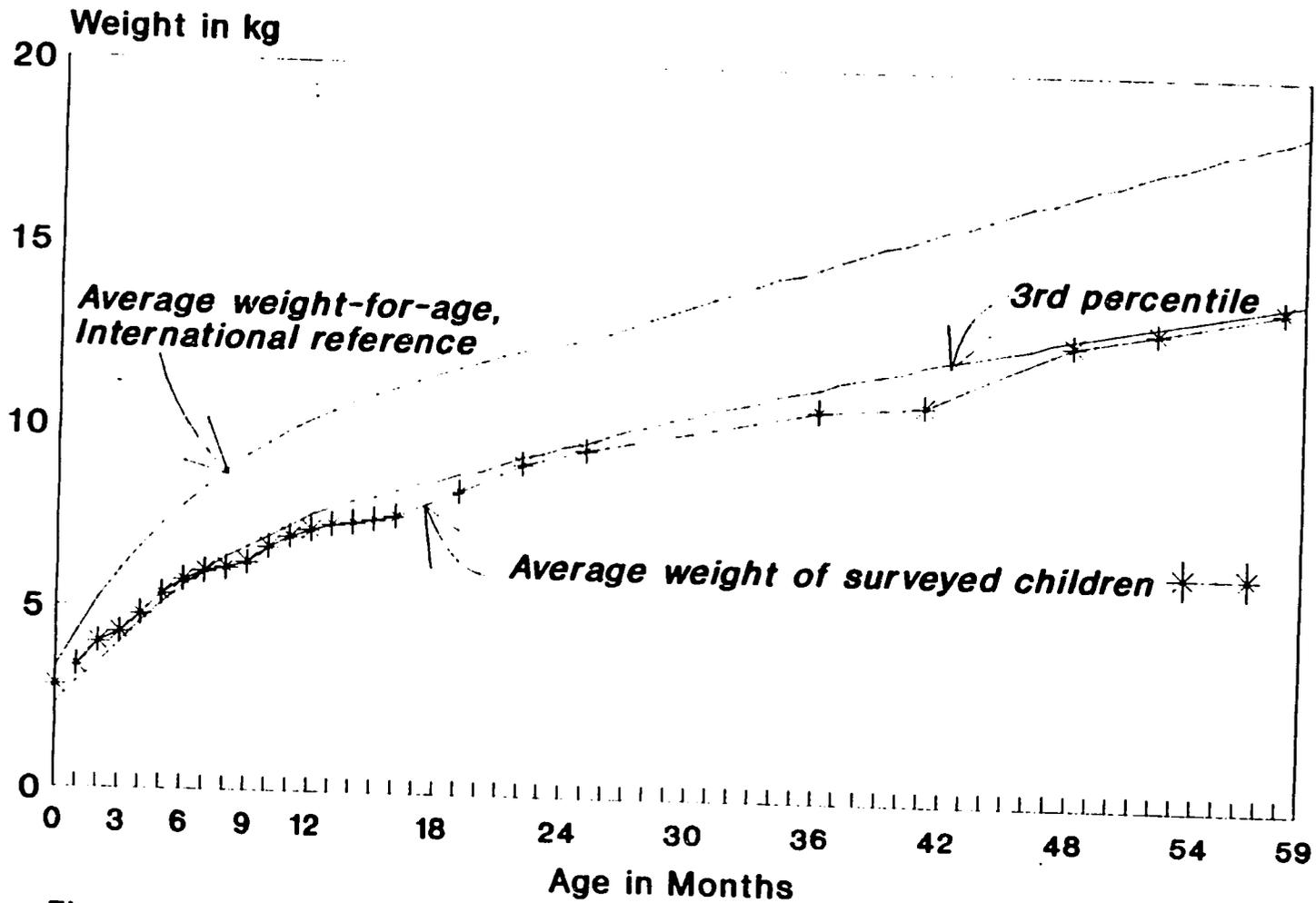
Data from the 1985 survey in the Tihama PHC Project area show that the average weight of rural children from birth up to 6 months was within the normal band of weight-for-age on the Road to Health chart (see Figure 8). However, from 7 months onwards the average weight of the sample fell below the lower line and remained there. (This lower line on the Road to Health chart is the 3rd percentile of the reference population, whose average weight - in this case the 50th percentile - is traced by the upper line.) Thus having gained weight at the normal rate for the first three to four months, the rate of weight gain begins to lag behind the norm on the Road to Health chart and nutritional status deteriorates.

Figure 9 shows the percentage of the sample who fell below the lower line on the Road-to-Health chart. Figure 10 shows that severe under-nutrition (children whose weight-for-age was more than 3 standard deviations below the reference population's mean) was found in 5% of children under 6 months old, and that this percentage increased for each age group under 48 months old. The decline to 13% for the 48-59 month age group is assumed to reflect the likelihood that the most severely malnourished cases had died and thus were not in the sample. (These data are from Tawfik and Bastian (1986), Chapter V; there were 636 under-5s in the sample.)

The interactions between nutritional status and morbidity mean that poorly nourished children succumb more easily to infections, which then drain their strength to the point where a relatively minor illness can become life-threatening. Advocates of primary health care promote growth monitoring as a means of identifying whether a child is growing at a normal rate. PHC staff's tools for monitoring growth are scales, Road-to-Health charts for recording weight month by month, and a register of children to be weighed.

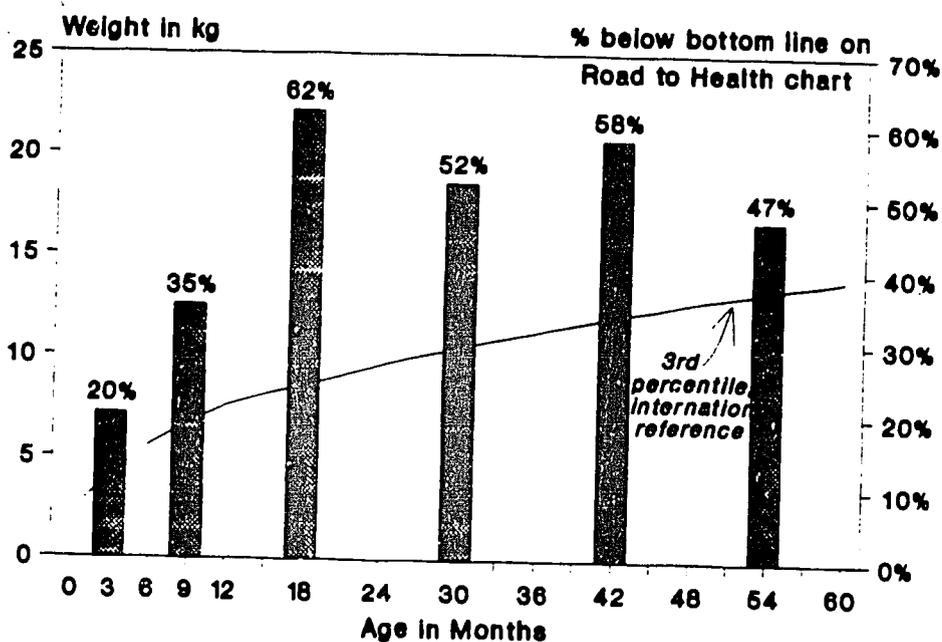
The revised Monthly Activity Report introduced in 1990 does not ask PHC Units to give any information about growth monitoring. The assessment found that none of the 14 units visited was weighing children and monitoring their growth from month to month. Units established during the Tihama PHC Project had instituted intensive growth monitoring (see Child Health Manual 1987) but this activity has come to a halt for several reasons:

**Figure 8 Average Weight of Children Under 5 in the Tihama, 1985**



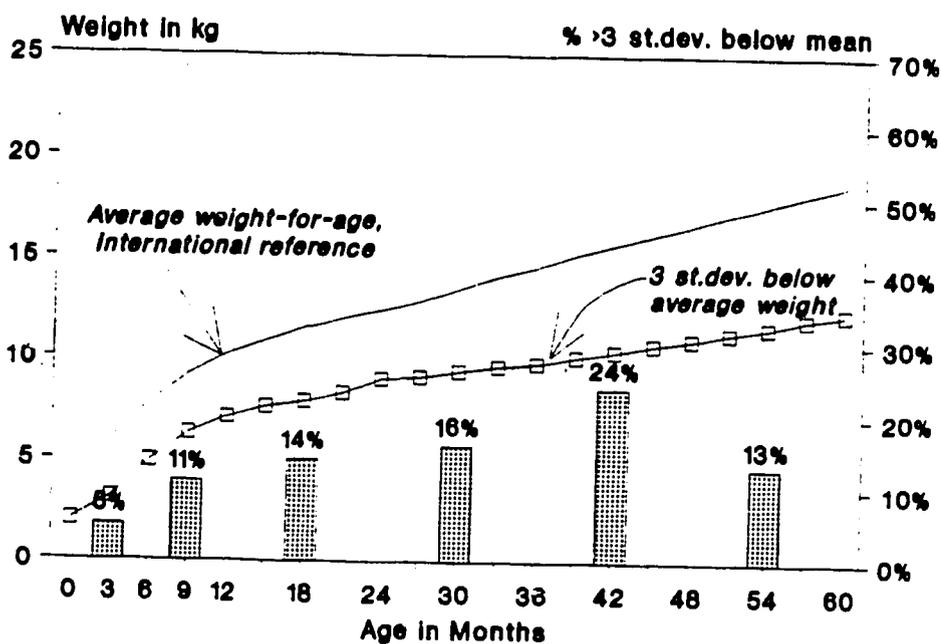
The average weight-for-age and 3rd percentile are the upper and lower lines on the Road to Health chart used in Yemen until 1990. The survey sample was 636 under-5s.

**Figure 9 Under-Nutrition among Under-5s  
in the Tihama, 1985**



The 3rd percentile is the bottom line on the Road to Health chart.

**Figure 10 Severe Malnutrition among Under-5s  
in the Tihama, 1985**



The line for 3 standard deviations below average weight is below the line in Figure 9.

- Road to Health cards were out of stock at 5 of the 7 northern units; in one case the stock of cards was used up 4-5 years ago. The Zabid area units have not used these cards since training.
- A Children's Register (showing date of birth, immunizations and monthly weights) was found at only one of the 7 northern units. Zabid area units have never had a Children's Register.
- The Monthly Activity Report does not mention growth monitoring.
- Four units had no infant table scales.
- Six units had scales but did not use them. At the other four units, the staff said they used their scales and when tested, knew how to weigh correctly; these four were all trained under the Tihama PHC Project.
- The six units established during TPHCP also had portable scales (clockface model) for weighing children up to 20kg. However most of the PHCWs (and some of the T/Ss) thought that these scales could only be used for weighing children who could sit up, giving this as a reason why they did not weigh newborns.
- The disruption to supervisors' monthly meetings caused by the EPI campaign, the subsequent failure to reinstate these meetings, and difficulties with transport have all contributed to what one T/S called "the chain of carelessness" (silsila min al laamunaala) whereby supervisors identified a special topic to receive special attention for two months (see Supervisor's Manual, 1987). Growth monitoring was one of these topics.

In addition to some shortages of necessary inputs (especially stationery) and supervision, one T/S said that the PHCWs still need training in how to move beyond weighing children and plotting the growth curve to counselling parents effectively about child nutrition, and instituting an improvement in feeding practices. The T/S's opinion is borne out by observation of how some PHCWs responded to seriously underweight infants, and by answers to Questions 8.4 and 8.5 in the interviews:

- All but one of the PHCWs and Murshidaat interviewed said that if they saw an underweight child they would give advice about nutrition, but only two said (without our probe) that they would consider a child who was not gaining weight to be at risk.
- Only one PHCW mentioned older siblings being underweight as a sign that this child might be at risk.
- Five PHC staff said that low birthweight put a child at risk, but opinions about low birthweight varied, and were given to the nearest kilogram, suggesting insufficient awareness of birthweight as an indicator of the child's risk status.

Some of the Murshidaat, who have portable Salter scales in their midwifery kits, are not weighing the babies they deliver, so the vital first indicator for monitoring growth is lost. As babies normally lose weight for the first few days, a first weight taken during this period will put the starting point too low on that child's Road to Health card.

The situation at the four training health centres visited was more positive in that they were all weighing children as part of a routine child visit. However, Road to Health cards were out of stock at all except Ghuleil, where cards have been printed by the Hodeida Urban Project.

## Recommendations

The contribution of nutritional status to child health needs to be taken more seriously at all levels of primary health care.

The PHC Unit's Monthly Activity Report should be revised to provide space for reporting on growth monitoring. The new indicators need to be chosen with great care. If the PHC Units are asked to report how many children were weighed and how many have gained weight, this will encourage staff to focus on the growth curve of each child, and avoids the debate about what is "normal" weight-for-age of Yemeni children.

The Child Health Register needs to be reactivated. It should show the child's name, date of birth, space for recording the date of every antigen and every dose of immunization, and space for recording the child's birthweight and monthly weight (to the nearest 100gm) for at least 18 months (i.e. well into the weaning period).

The new stock of Road to Health cards should be distributed. A safety stock system should be introduced at all levels to avoid stock-outs in the future, as the absence of this card sends a clear message that growth monitoring is not regarded as important.

Any spare scales should be redistributed to Units without scales (eg the Units staffed by Murshidaat alone). In the longer term, provision needs to be made in the Health Office budget for replacing or repairing broken equipment.

All staff with portable scales and their T/Ss need in-service training in how to make a sling (out of a scarf or sheet) in which a small baby can be weighed. A special harness is not necessary. The ease of using these scales may be increased by adding a rope to the top hook so that the equipment can be hung up, rather than hand-held by the person who is trying to read the weight.

Weighing of newborns immediately after delivery should be emphasized, along with the targets that the baby should regain its birthweight within a week, and should have double its birthweight by 4 months of age.

The involvement of rural Murshidaat in monitoring growth after the first 40 days needs to be emphasized and encouraged.

In-service training to reactivate growth monitoring throughout the governorate should address the technical issues of accurate measurement and recording, and the systems for regular follow-up of eligibles. It should also convey the interpersonal skills needed for effective communication with parents. The highly experienced female T/Ss at Tahreer, who initially specialized in nutrition education, are valuable resource people whose skills would be well used in all aspects of training on growth monitoring.

### 5.3 Providing a Regular Immunization Service

**Background.** The strategy for child health services which was developed during the Tihama PHC Project used immunization as an entry point to primary health care, as the community demonstrated considerable demand for this service. Plans for providing immunization through PHCWs were tested, implemented and modified over time (see Review of Immunization Activities in the Geographical Area of the Tihama Primary Health Care Project, by Anthony Battersby: March 1985). Newborns were to be registered in advance in a child health register, the T/S brought monthly supplies in a seven-day cold box (al isboo'i, usually the RCW25), worked with the PHCW on that day and left him to finish up immunizing the eligibles over the next few days. Assistance from neighbouring PHCWs and community volunteers might be arranged, and no-shows and drop-outs were to be followed up using the register. Recording and reporting were made faster and more accurate with the Daily List of Attendees, which allowed the PHCW to update the child health register after each day's work, and enabled the T/S to verify and summarize the session's activity onto the standard EPI monthly report form. The strategy was chosen to fit the resources available, and depended upon a regular (monthly) supply of vaccine, needles and syringes; with a regular monthly service, the PHCW could immunize all eligible children in his catchment population (approximately the number of newborns per month multiplied by 5) without the assistance of mobile team vaccinators. The mobile teams were phased out, and the vaccinators were assigned to health centres offering a daily service in rural towns and in Hodeida itself. The availability of these static services has increased substantially since 1985.

The assessment found that the basic elements of this strategy were still in place in the area covered by the Tihama PHC Project, but that the continuous, sustainable service had been greatly disrupted by the temporary but total change to a campaign strategy in 1990, the lack of transport since the end of last year, shortages of vaccine, insufficient supply of needles and syringes, and shortages of Butagas for ensuring that sufficient frozen icepacks were available.

In the Zabid area, three different strategies for immunization by PHCWs and Murshidaat were in operation:

11 PHC Units have been equipped with refrigerators: 7 with an RCW42 and 4 with a fridge+freezer (2 Sibir and 2 Electrolux);

13 PHC Units were reported to be supplied with a daily vaccine carrier (al yeomi; most are Chinese Model II, some are King Seely/Thermos) which can be used for one day of immunization per month;

4 PHC Units were reportedly not supplied at all (at least one because it was an hour's travel from the supplying point).

The assessment found that these figures were not accurate; for example two units that in theory were supplied by vaccine carrier had not done any immunizations since the campaign, and did not coordinate with a curative unit in their area who had been issued

with an RCW42. When asked why the seven day cold box was not used (except for transporting vaccine to Units with refrigerators), the team was told that the staff in Zabid did not think that this equipment was suitable for local conditions; ten brand new seven day cold boxes were stored in the EPI Supervisor's room (along with three new icepack freezers).

Some of the current problems with planning, shortages and transport are to some extent a legacy of the National EPI Project, which functioned as an independent vertical programme. The national level staff have now been integrated with the MOPH; they continue to provide technical supervision for EPI, but daily supervision of staff at governorate level is now the responsibility of the Health Office. However, some of these staff, who worked on the EPI Project for ten years, are still receiving their salaries and allowances from outside Hodeida Governorate, and regard themselves as somewhat independent of the Health Office's administrative procedures, supervision and discipline. This issue was still being discussed at the end of this consultancy.

The remainder of this section discusses the present level of immunization activity, equipment, supplies, knowledge and practices, and planning. The assessment's findings suggest that much planning and activity is needed in order to establish immunization services as an integral component of PHC; recommendations for how to proceed are given at the end of this section.

**Present Activity and Coverage Indicators.** Of the 14 PHC Units surveyed, four had not had any immunization service since the campaign. Two of these four units had refrigerators ('Obaal and Qahara). Some of the best performing units had not been supplied for three or four months (al Daamegh, Dayr Daud), and their statistics reflect the late completions (i.e. the immunization schedule is not completed before first birthday) and high drop-out rates which are inevitably found with a discontinuous service. For example, al Daamegh gave one dose of DPT3 under 1 at the last monthly session, whereas the target is 11 per month; with no service from April to June there would have been 44 under-1s eligible for DPT3 in July. The situation in al Lawia was similar, with only 11% of eligibles receiving DPT3.

Coverage is being constrained by shortages of supplies. Some Units were not given all antigens; TT was usually not supplied, and OPV and Measles vaccine were sometimes not available at the most recent session. The PHCWs and T/Ss complained that the policy of only providing needles and syringes for 70% of the doses of vaccine supplied was preventing some children from getting their immunizations. This could not be confirmed by comparing actual vaccine wastage rates at PHC Units with the assumed rate of 30% wastage, because records of vaccine issued and vials used are not kept.

The strong community demand for immunization was clearly demonstrated to the assessment team; in three villages, the local leaders and parents asked if we had brought vaccines. Three PHCWs also reported going to their supervisor's health centre, asking

for vaccine and offering to provide their own transport, but being told there were no supplies for them.

**Equipment.** The diversity of equipment found both at PHC Units and at the Supervising Health Centres (from which vaccine is supplied to PHC Units) demonstrates a serious lack of planning and an inappropriate allocation of the available resources. For each monthly session, a PHC Unit needs a seven-day cold box for the vaccines, packed with 24 frozen icepacks, a daily vaccine carrier with four icepacks, and another seven-day cold box packed with 24 frozen icepacks of which 4 will be used each day in the vaccine carrier. To supply five PHC Units in one week, the T/S needs 10 seven-day cold boxes, 5 vaccine carriers and 260 icepacks. Only two of the supervising health centres had this number of cold boxes, but they were not being used for supplying PHC Units (Mansuria had 2 in use and 8 in storage, and Zabid had 16, 10 still in their original shipping cartons). Some T/Ss were using the Coleman cold box in preference to the heavier but better insulated RCW25. The T/S at Bait al Faqih reported that the icepack freezer had been removed by the EPI Supervisor after the campaign. The icepack freezer at el Qotai' Health Centre was not in use because this facility no longer supplies vaccine to PHC Units (its T/S became director of Bajil Centre HC), and because it takes at least one week to get the spare Butagas cylinder refilled. The icepack freezer at Mansuria Supervising HC was switched off because it used too much Butagas; the director of this health centre is one of the five rural HC directors who never claim their quarterly budget (6,000 Rials) which is intended to cover such expenses. In Zabid, one of the two Hurre cold rooms, which has sufficient storage capacity for several governorates, contained only 11,000 doses of vaccine (DPT and TT). The second Hurre was a freezer, but its compressor failed during a holiday period; the recording thermometer showed that the vaccine had been exposed to unacceptable temperatures so the stock was discarded. The same problem was experienced with the Hurre freezer in Hodeida (al Thowra store). The loss of vaccine could have been avoided if alarm systems and twice daily checkups were part of the cold chain management system. At present, both Zabid and al Thowra store are using ice-liners (TCW 1151) on their freezer setting for antigens which are stored below 0°; this equipment has ample space for each store's current vaccine requirements.

**Vaccine, Needles, Syringes and Registers.** Until now, the amount of vaccine supplied has depended on the number of eligible children. Most PHC Units have a catchment population of about 3,000, but the number of villages and hamlets in the catchment area varies from 1 to 15. Just as the density of the population varies, so the number of days needed to cover the target group also varies - between one day and six days according to the PHCWs, many of whom now have no transport. Once a vial has been opened, it should not be kept for use the next day; the safe life of reconstituted BCG vaccine is about 3 hours, if it is kept below +8°C. Thus the factor which determines the number of doses supplied should not be the number of eligibles, but the number of days required to reach all the eligibles; at least one vial of vaccine is needed for each day worked. The calculations in Table 8 show the difference in quantities of vaccine needed using these two different approaches (eligibles, and days worked).

The method shown to EPI Supervisors at the workshop in Abiyan (24th-29th August) also concentrates upon the number of vials needed; the worksheets show four categories of population size. Using this method, all PHC Units with a population of 3,000 (the next category is 10,000) would get one 20-dose vial of vaccine. Data from the assessment shows that if this system is adopted in Hodeida governorate, only one of the 14 PHC Units surveyed would be able to complete their monthly immunization activities, and several would reach less than 20% of their eligible population.

At present, most health centres are offering a daily immunization service. In the busy centres (eg Ghuleil, Tahreer) this is clearly appropriate. However, some of the rural health centres have such a low level of activity (eg fewer than 12 doses per working day at el Qotai') that their vaccine wastage rates are above 80% for all antigens. (Note that no facility had complete and reliable records of vials used, and most kept no record at all, so these data were calculated by counting the number of doses of each antigen administered per day, assuming that partly used vials were discarded at the end of the day.)

Where there are such high wastage rates for vaccine, there should be a surplus of needles and syringes, since these are supplied on the assumption that 30% of doses will be wasted. However, the expected surpluses were not found. In one case, the syringes are being kept in the doctor's room so staff have to leave the EPI room to get a fresh needle and syringe. There are spaces on the daily tally sheet and the EPI Monthly Summary for recording the number of syringes and needles used, but in most health centres this information is not recorded.

The policy recommended by WHO and UNICEF is one syringe, one needle, one dose (see Appendix D.6). The use of the Omega syringe for 10 doses of BCG, changing only the needle between doses, does not comply with this policy. One-dose, disposable BCG syringes are now available. If the possibility of shifting to the use of sterilizable syringes were contemplated, extensive training of all cadres of staff would be needed, as the assessment revealed significant gaps in staff's knowledge about disinfecting and sterilizing their instruments and equipment (see Section 5.6).

The blue EPI register combines children and women. With a total fertility rate over 8, there are many more children needing immunization than the number of women eligible for TT. The Campaign target included children under 3, and every other page has the 12-35 month age group printed at the top; the target group is now under 1s, and only a few staff cross out the printed age group to make use of the empty pages. Thus the design of this register results in enormous wastage of paper. It is also faulty because it does not give space for recording DPT and OPV separately; when one or the other vaccine is not available, some staff said that they would not give DPT or OPV on its own. The format of the register encourages this mistake. The Register shows the youngest age group as being "from 40 days to 11 months" which suggests incorrectly that no dose should be given during the "Arba'een," i.e. the first 40 days. The majority of staff do give BCG to babies under 40 days old, but the special box for recording this information on the EPI monthly report is seldom used.

**Knowledge and Practices.** The EPI campaign, which finished less than one year ago, was preceded by workshops to reinforce health staff's knowledge of how to use the specially printed registers, how to look after vaccine (and refrigerators if one had been issued to them), the national schedule (age at which to give each dose and antigen), and correct immunization technique. The assessment found that:

- 31% of staff interviewed mentioned a workshop or refresher training in EPI since they qualified (see also Figure 16); two-thirds of the courses mentioned were attended before 1989.
- 44% of facilities (units and health centres) had an EPI Register (large with blue covers), but only three facilities (Tahreer, Ghuleil and Mowqer) were using it correctly. Most staff use it as a daily record of attendance.
- 84% of facilities had EPI cards for children, but some were in the old format which treats DPT and OPV as a single antigen.
- 69% of facilities had TT cards for women; only half the PHC Units had these cards, and one had three different formats.
- All but one (a PHCW) gave BCG to babies under 40 days, but very few staff used the special box on the Monthly Summary Form to indicate the number of such cases.
- Most staff (65%) said that a woman should have four or five doses of TT in her whole life, and knew the correct intervals between doses, but in practice staff said that they had no way of following up women beyond the second dose.
- 26% mentioned the six essential points of how to look after vaccines in the daily carrier. <sup>1</sup>
- 69% of those who used the seven day cold box mentioned the two essential points for maintaining the cold chain. <sup>2</sup>
- None of the facilities with refrigerators was adhering to correct cold chain procedures. No-one kept stock records, and only two places (Tahreer and Ghuleil) kept temperature records. Many of the fridges were not cold enough, showing temperatures between +12°C and +20°C during the morning clinics.

1. Carrier is kept in the shade; unused vials are kept in the carrier; opened vials are in the icepack; icepack is between 0°C and +8°C; partly used vials are discarded at the end of the session; unused vials are discarded if there is no seven-day cold box or fridge. (See Appendix F, Question 10.20).

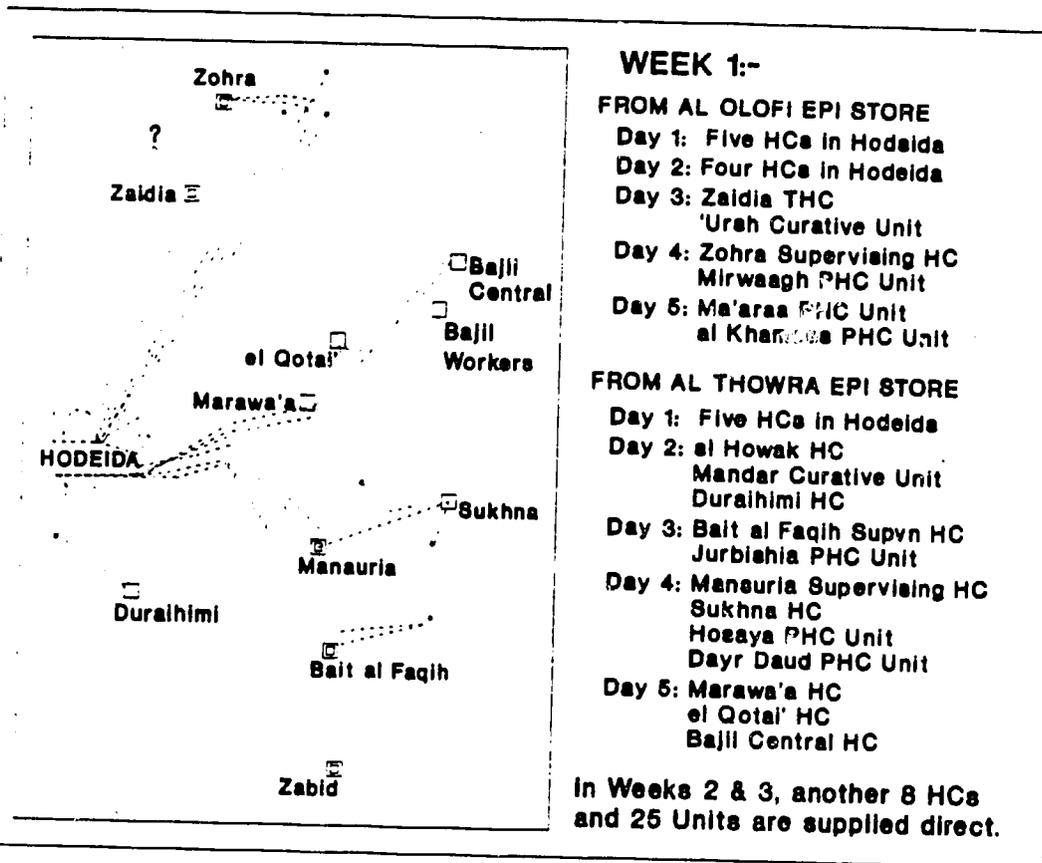
2. Coldbox is kept in the shade; coldbox is opened only twice daily, to remove vaccine, and to return any unopened vials at the end of the session. (See Appendix F, Question 10.21)

- The absence of alarm systems at the main stores, the failure to inspect refrigerators and freezers during weekends and holidays, combined with the lack of temperature records mean that vaccine storage conditions are not properly monitored. At least two facilities (Zabid and Hais) experienced a total cold chain failure within the last few months, and had to discard the damaged vaccine. The Hurre freezer in the governorate store at al Thowra Hospital broke for the second time in 1990, and has not been mended.

Many other problems were observed. For example, one PHCW administered DPT in the thigh to one child and in the buttock to the next. Multidose syringes are still being supplied for administering BCG; this is contrary to WHO recommendations. Random checks for BCG scars indicate that the scar failure rate is high; this may be due to incorrect technique, underdosing, missing children completely in a busy but poorly organized session, or problems with vaccine potency due to poor vaccine handling (before or after reconstituting the vaccine). We found that diluent was kept cool, ready for use, but some staff do not discard reconstituted vaccine after the recommended interval; two vials of reconstituted Measles vaccine were found in the freezer at one health centre. TT was found in the freezer at a supervising health centre, and partly used vials of DPT and TT were found lying in water at the bottom of a warm RCW42 in a PHC Unit. One member of staff (at a Training Centre) explained that the fourth space for OPV (on the EPI card) was in case it was given when the child went to school; no-one is giving OPV0 at birth, and there is no space to record OPV0 on the Monthly Summary. Recording was so chaotic at some facilities that the basic indicators of immunization activity could not be verified from the registers or records; nurses and vaccinators at health centres are not more accurate than the average PHCW or Murshida. Disposable needles and syringes were generally disposed of by burning them, but the assessment team collected much photographic evidence that the manner in which burning is carried out does not dispose of either syringes or needles. Only one facility (Zabid) was using a needle destructor. Given the reported levels of hepatitis, the presence of used needles lying around both inside and outside health facilities is a serious risk to health.

**Planning.** If these problems are recognized as such by the EPI Supervisors, there is no evidence that they are taking appropriate measures to solve them. The latest plan (August 1991) reflects an intensely vertical approach (the first of three weeks' deliveries are mapped in Figure 11). This plan retains the geographical division of the governorate into three areas: the north (Zohra to Hodeida), the south (Hodeida to Bait al Faqih), and Zabid qada (four nahiaat), and each EPI Supervisor has his own vaccine store (the north and south Supervisors' stores are at separate locations in Hodeida city). The plan was prepared in Hodeida, and does not cover Zabid, which has 24% of the governorate's population. The plan lays out a hectic monthly schedule for delivering vaccine and supplies direct from the governorate stores to 47 rural facilities, i.e. all of the health centres, 26 PHC Units and 5 Curative Units. It does not make any provision for supplying the remaining 47 PHC Units and 21 Curative Units between Zohra and Bait al Faqih.

**Figure 11 The Supply Strategy in the EPI Supervisor's Plan of August 1991**



The plan fails to acknowledge the present system of using Supervising Health Centres as intermediate supply points; of the 18 planned days of EPI Supervisors' travel outside the city (excluding Jebel Bura') it is estimated that 14 days are unnecessary, because vaccine could be supplied to rural Units more effectively by the T/Ss. These extra 14 days add about 900 km per month to the distance that would be travelled if Supervising Health Centres were used as the PHC Units' and Curative Units' supply points. The plan also indicates that 16 PHC Units and 4 Curative Units will have refrigerators. The assessment found serious problems with the use of refrigerators both at PHC Units (in the Zabid area, where 11 out of 28 units are so equipped) and at health centres. A case can be made for equipping selected sites with refrigerators so that they can supply surrounding units with vaccine and icepacks, but the August 1991 plan does not take into account either the accessibility of the Unit or the competence of the PHCW; for example why should Mawr and Ma'aras be given a fridge? Nor does the plan address the logistical and financial problems of refilling Butagas cylinders.

Senior Health Office staff have come to the conclusion that many of the problems and constraints identified above cannot be solved unless the EPI Supervisors become fully integrated into the governorate administrative and supervisory systems. The following recommendations support this conclusion, and outline an integrated approach to planning and implementation of immunization services.

## Recommendations

The place of EPI in the Health Office's organizational chart needs to be settled; will EPI be part of Primary Health Care, or a separate component within the Public Health Department? The main consideration is to choose an organizational relationship which will encourage the best outcome for primary health care services including immunization.

EPI Supervisors posted to Hodeida Governorate should become regular members of the Health Office staff, receiving their salaries from Hodeida and subject to the same scale of allowances and benefits as other governorate staff. Administrative supervision (including all financial matters) should be from the Health Office. Technical supervision will continue to be from EPI in the MOPH, Sana'a.

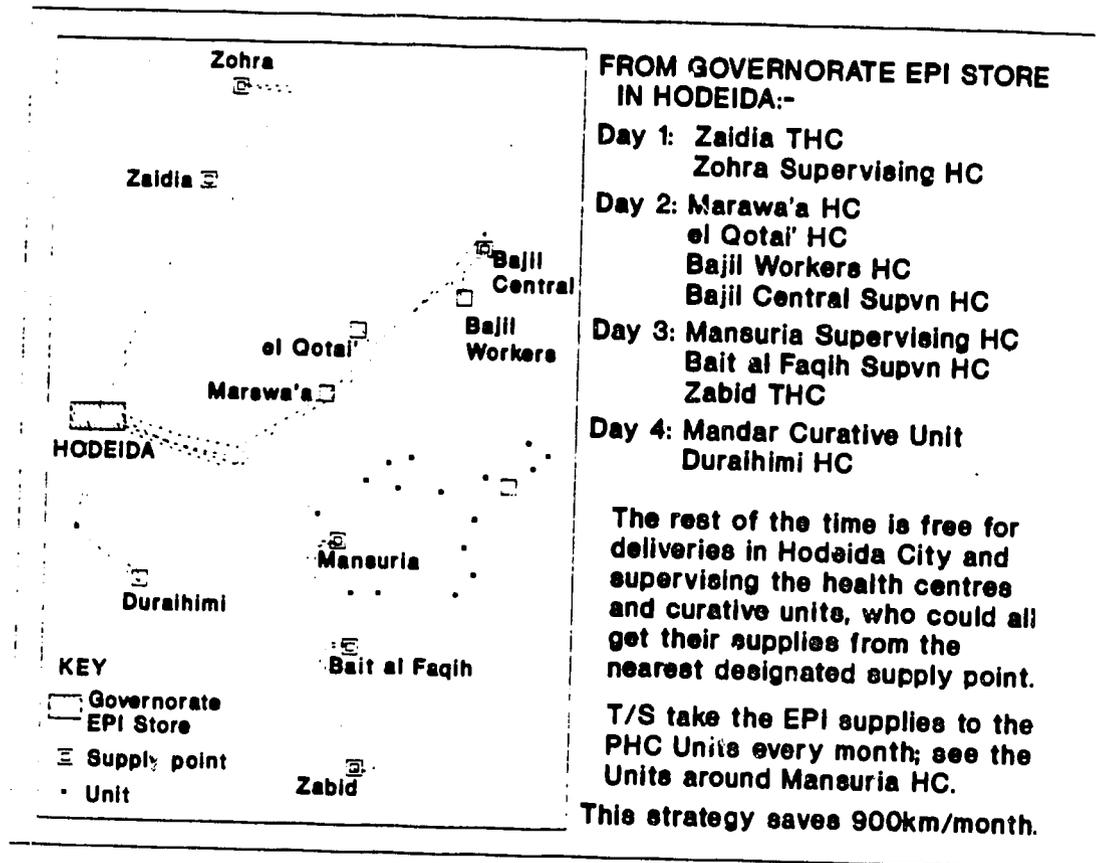
Hodeida Governorate should have one EPI Store in the city (see Figure 12). The desirability of providing air conditioning in this store should be assessed by a cold chain technician. Now that the campaign is over, it is unlikely that the Hurre cold room or freezer will be needed; the available ice-liners probably have adequate capacity for the governorate's needs. The Hurre cold room and freezer in Zabid are not needed there.

The basic strategy for providing a monthly immunization service that was developed during the Tihama PHC Project is still appropriate and feasible. The strategy should be based on the use of seven day cold boxes, reserving refrigerators for a few carefully chosen sites which will supply other units in their area (eg Jebel Bura' and Jebel Ras). These sites will need equipment for storing vaccine (at 0°C to +8°C) and for freezing icepacks. The details of the strategy are described in the Tihama PHC Project Child Health Manual (1987), and provide a robust, manageable system for immunization services within PHC. These details need to be revived (eg the Daily Attendance Sheet) and shared with the EPI Supervisors, and extended to the Zabid area.

The extent to which Curative Units should be involved in EPI needs to be clearly specified; this will require close coordination with the Manpower Department (which has details of who is on the payroll) and the Planning Department. A method for assessing the EPI skills of foreign staff must be developed, along with a scheme for orientating them to the details of Yemen's national EPI policy and for supervising their performance.

The role of Health Centres as intermediate supply points should be updated when their supervisory function changes (eg el Qotai' and Bajil Central). The equipment needed for them to carry out their supply functions (eg sufficient cold boxes, vaccine carriers, icepacks and icepack freezers) should be put in place promptly. Unused equipment should be returned to the governorate EPI store.

**Figure 12 Proposed Supply Strategy for EPI in Hodeida Governorate**



**Recommendations (continued)**

The process of planning immunization activities must involve all of the people concerned with implementing the plans. PHCWs and Murshidaat should identify their catchment populations and work out how many days it will take them to cover the target population (under 1s and women); the number of days will determine the number of vials of vaccine they must have each month. T/Ss should prepare a schedule of visits which allows time for proper supervision at each site. From this information the Planning Department can use its computers to estimate the monthly requirements of each antigen, needles and syringes, Butagas, and fuel for vehicles. Worksheets which cover these steps (one for facilities which supply others and one for facilities which do not) have been discussed. They are attached in Figure 13 and Figure 14. Table 8 is an example showing the calculations for the facilities supplied by Mansuria Health Centre.

The quantity of vaccine supplied should be estimated from operational considerations (eg the number of days needed to cover the area) as well as the size of the eligible group. Facilities should be supplied with the larger number resulting from these two methods of estimation, to encourage safe handling of vaccine and to ensure that services are not constrained by shortage of vaccine.

## Recommendations (continued)

Vials of vaccine, needles and syringes supplied to PHC Units should be recorded in their Duplicate Books to provide a means for Health Office supervisors to check that adequate quantities are being delivered on schedule.

The quantity of needles and syringes supplied should be based on the expected number of injections to be given, and not on an assumed wastage rate.

All staff should report the supplies used in the spaces provided on the EPI report formats (daily tally and monthly summary).

Current practices for disposing of used needles and syringes do not fulfil the assurance of safe disposal required by UNICEF Headquarters, New York, before procurements of disposables are approved (UNICEF document from UCI, New York in 1983 or 1984). If disposables continue to be used,

- either (a) used needles must be recapped with the one-handed technique, then the syringe and needle are dropped into a container which can be burned;
- or (b) used needles and syringes must be dropped into a needle-proof container (metal, glass or rigid plastic), which is then emptied into the incinerator.

The PHC staff who have used the disposables should be responsible for making sure (observing) that they are burned at the end of each session.

The policy recommended by WHO, to use a sterile syringe and a sterile needle for each dose, should be followed for BCG as for all other antigens. Single dose disposable syringes which are suitable for administering BCG are available from Saniplas in Italy. (There are two companies with the same name; the EPI Unit at WHO in Geneva or UNICEF Copenhagen have the details.)

BCG scars should be checked when the child comes for the Measles dose at 9 months. If there is no scar, the BCG dose should be repeated. Those staff whose technique results in a scar failure should be identified and retrained. In health centres where more than one person administers this antigen, or THCs where staff learn how to give BCG, a method of identifying who gave the dose will have to be introduced (eg an identification on the card or register).

No injections should be given in the buttocks. There are clear medical reasons for this policy, and all EPI Supervisors and T/Ss should be able to explain these reasons to the staff whom they supervise. The National EPI Manager can provide the supervisors with reference materials.

Policy regarding OPV at birth should be clarified. If it is part of the national schedule, then the EPI register and monthly report forms should give space for this dose. If it is not official policy, then it should not appear on the EPI card.

## Recommendations (continued)

The clarity of records at PHC Units where the Daily Attendance Form (6/84) was still in use suggests that this form should be reprinted for use at PHC Units and Curative Units throughout the governorate. It should be used in conjunction with an improved EPI Register: pages of a more manageable size, space for recording every dose of each antigen (i.e. DPT and OPV shown separately), space for child's date of birth, and a separate register for women's TT. Staff who use the Register as a list of children attending per day should be trained in the use of the Daily Attendance Form, then trained and supervised in correct use of the Register. Drop-outs can then be identified and followed up.

The EPI reporting formats should be modified to show the youngest age group from birth to 11 months. If information on doses under 40 days is required, this can be collected from the Daily Attendance Form.

The greatest contribution to increasing the coverage of EPI comes from community participation. Local leaders and volunteers should be encouraged to help by identifying newborns, publicising immunization days, and encouraging high utilization of the service. Thus EPI should be closely linked to antenatal care, the registration of births, and postnatal care.

The forms for recording temperatures twice daily, which are available in the EPI Stores, should be supplied to all facilities with a refrigerator and/or freezer. Records should be kept for each piece of equipment and each compartment (above zero and below zero). Faulty equipment should be reported to the EPI Supervisors.

PHC Units and Curative Units with refrigerators should be assessed by the EPI Supervisors to determine if the staff are maintaining the cold chain and handling vaccine correctly. Action must be taken with those who do not follow established cold chain management practices. Staff who continue to ignore correct practices should be supplied using the seven day cold box, and the refrigerators returned to the EPI Store.

Close supervision is required at some of the health centres surveyed. EPI Supervisors need to schedule more time to check on all aspects of EPI - cold chain management, technique, recording and reporting, interaction with clients - when they take supplies to these facilities. Supervisory action should be coordinated with the Director of the Health Centre and the Health Office, as problems in the immunization room often reflect a wider range of problems in the facility.

The daily workload at some health centres does not justify the number of staff in the EPI room. On those days of the week when fewer people use the health centre, these staff should be redeployed to follow up drop-outs and to contact no-shows house-to-house in the community. The experience of the Hodeida Urban Project will be useful in developing a strategy for community outreach and follow up.

**Conclusion.** Shortages of supplies and transport are regarded as the major constraints by most T/Ss, and senior Health Office staff have felt that problems with supplies and transport cannot be satisfactorily solved until the EPI Supervisors are fully integrated into the Health Office. Once this has been achieved, the key EPI staff together with the T/Ss and the Planning Department can build up a sustainable, appropriate strategy along the lines proposed above. The calculation of each input required is quite transparent, and provides clear supporting documentation of the level of material and financial resources required. This should be of benefit during the preparation of the governorate's next annual health plan and budget. With all of the staff involved participating in the planning and realizing the implications of their input and their subsequent responsibilities, there should be greater efficiency and fewer shortages constraining immunization activities in the future.

The EPI Supervisors' 1991 plan assumes that a health centre will give 10 times more immunizations than a PHC Unit. We have used this figure to estimate the average monthly workload of under 1s (newborns per month times five visits for 100% coverage). If all health centres, PHC Units and Curative Units are active in EPI, the governorate's 1991 target group of 50,670 under 1s would be fully immunized if each of the 37 health centres saw 450 children per month (17 children per working day), and if each of the 144 PHC Units and Curative Units saw 45 children per month (15 per day for 3 days). These workloads are quite feasible. The problem is that the population per facility varies greatly between nahiaat. The health centres' workloads range from 45 children per month in Kamaran to 1,400 in Bait al Faqih. For Units, the range is from 20 per month in Luhayya to 180 in Hajaila. These wide ranges demonstrate the importance of distributing facilities and staff efficiently, as discussed in Section 4.



**Figure 14 Worksheet for Facilities which Store EPI Supplies for Other Facilities**

1 Name of Health Facility \_\_\_\_\_ Nahia \_\_\_\_\_

2 Type of Facility: Health Centre Training HC Rural Hospital

3 Population of the town \_\_\_\_\_

4 Number of other facilities supplied \_\_\_\_\_

5 Frequency of sessions here: Daily \_\_\_\_\_ days/week Other \_\_\_\_\_

6 Staff who will administer vaccines \_\_\_\_\_

7 Which Store (or HC) will supply vaccines and needles/syringes?

8a Kilometres (one way) from Supply point to this facility: \_\_\_\_\_

8b Total kilometres per month to deliver EPI supplies to dependent Units and HCs: \_\_\_\_\_

9 What is the supply interval? Weekly Monthly Quarterly

10 Supply strategy? Collected by this facility's staff  
Delivered by Health Office staff  
Other (specify) \_\_\_\_\_

11 Cold Chain equipment: Butagas  
Cylinders

|                            |                      |       |
|----------------------------|----------------------|-------|
| Vaccine Carriers _____     | Refrigerator _____   |       |
| Colemans _____             | Fridge/Freezer _____ | _____ |
| Seven-day cold boxes _____ | Freezer _____        | _____ |

12a If equipment uses Butagas: cylinders needed per month \_\_\_\_\_

12b Strategy for refilling Butagas cylinders \_\_\_\_\_

12c When packing Colemans or Seven-day Cold Boxes: Maximum number of icepacks needed at one time \_\_\_\_\_

13 FROM STATISTICS DEPARTMENT:  
Expected number of newborns per month for this facility \_\_\_\_\_

|               | Here                | Others | Total |                     | Here   | Others | Total |
|---------------|---------------------|--------|-------|---------------------|--------|--------|-------|
| Syringes: 1ml | _____               | _____  | _____ | 2ml                 | _____  | _____  | _____ |
| Needles: BCG  | _____               | _____  | _____ | 24g                 | _____  | _____  | _____ |
| Vaccine       | -----V I A L S----- |        |       | -----D O S E S----- |        |        |       |
|               | Here                | Others | Total | Here                | Others | Total  |       |
| BCG           | _____               | _____  | _____ | _____               | _____  | _____  |       |
| OPV           | _____               | _____  | _____ | _____               | _____  | _____  |       |
| DPT           | _____               | _____  | _____ | _____               | _____  | _____  |       |
| Measles       | _____               | _____  | _____ | _____               | _____  | _____  |       |
| TT            | _____               | _____  | _____ | _____               | _____  | _____  |       |

Items 3 and 5 are added to the computer spreadsheet in Table 8.

Table 8 Printout of a Worksheet for Planning the Quantity of EPI Supplies

For each PHC Unit, Curative Unit and Health Centre, put into the spreadsheet (a) the most recent population estimate, and  
(b) the number of days needed to cover the catchment area.

| Facility        | Mahia    | ASSUMPTIONS:                    |                   | Doses administered per vial: |                              |           |           |           | (b)<br>Days<br>needed | Minimum vials needed        |           |           |           |           | DPT*3<br>Measles<br>TT*2 |              | SYRINGES   |              |     |
|-----------------|----------|---------------------------------|-------------------|------------------------------|------------------------------|-----------|-----------|-----------|-----------------------|-----------------------------|-----------|-----------|-----------|-----------|--------------------------|--------------|------------|--------------|-----|
|                 |          | (a)<br>Total<br>Popul-<br>ation | Crude Birth Rate: |                              | Vials calculated from births |           |           |           |                       | calculated from days worked |           |           |           |           | NEEDLES                  |              |            |              |     |
|                 |          |                                 | Year              | Month                        | BCG                          | DPT       | OPV       | Measles   |                       | TT                          | BCG       | DPT       | OPV       | Measles   | TT                       | BCG          | 24g        | BCG          | 2ml |
| <b>MANSURIA</b> |          |                                 |                   |                              |                              |           |           |           |                       |                             |           |           |           |           |                          |              |            |              |     |
| al Daamegh      |          | 2,800                           | 115               | 10                           | 1                            | 2         | 2         | 1         | 2                     | 3                           | 3         | 3         | 3         | 3         | 10                       | 60           | 10         | 60           |     |
| Hosaya          |          | 3,700                           | 152               | 13                           | 1                            | 3         | 3         | 2         | 2                     | 4                           | 4         | 4         | 4         | 4         | 13                       | 78           | 13         | 78           |     |
| Dayr Daud       |          | 3,230                           | 133               | 12                           | 1                            | 2         | 3         | 2         | 2                     | 3                           | 3         | 3         | 3         | 3         | 12                       | 72           | 12         | 72           |     |
| Shujaina        |          | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 3                           | 3         | 3         | 3         | 3         | 11                       | 66           | 11         | 66           |     |
| 'Awaaja         |          | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 3                           | 3         | 3         | 3         | 3         | 11                       | 66           | 11         | 66           |     |
| Dayr al Tubain  |          | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 4                           | 4         | 4         | 4         | 4         | 11                       | 66           | 11         | 66           |     |
| Dayr al Quraat  | closed   |                                 | 0                 | 0                            | 0                            | 0         | 0         | 0         | 0                     | 0                           | 0         | 0         | 0         | 0         | 0                        | 0            | 0          | 0            |     |
| Mudman          |          | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 3                           | 3         | 3         | 3         | 3         | 11                       | 66           | 11         | 66           |     |
| Maibelia        | EPI only | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 2                           | 2         | 2         | 2         | 2         | 11                       | 66           | 11         | 66           |     |
| Radhia          |          | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 3                           | 3         | 3         | 3         | 3         | 11                       | 66           | 11         | 66           |     |
| Mahwa           |          | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 3                           | 3         | 3         | 3         | 3         | 11                       | 66           | 11         | 66           |     |
| Rajab           |          | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 5                           | 5         | 5         | 5         | 5         | 11                       | 66           | 11         | 66           |     |
| Lijam           |          | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 3                           | 3         | 3         | 3         | 3         | 11                       | 66           | 11         | 66           |     |
| Biyut al Buta   |          | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 3                           | 3         | 3         | 3         | 3         | 11                       | 66           | 11         | 66           |     |
| Manwab          |          | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 3                           | 3         | 3         | 3         | 3         | 11                       | 66           | 11         | 66           |     |
| al Magreba      |          | 4,500                           | 185               | 16                           | 1                            | 3         | 3         | 2         | 2                     | 4                           | 4         | 4         | 4         | 4         | 16                       | 96           | 16         | 96           |     |
| Ruqaab          | EPI only | 3,000                           | 123               | 11                           | 1                            | 2         | 2         | 2         | 2                     | 3                           | 3         | 3         | 3         | 3         | 11                       | 66           | 11         | 66           |     |
| Sukhna HC       |          | 15,000                          | 615               | 52                           | 4                            | 9         | 10        | 6         | 6                     | 12                          | 12        | 12        | 12        | 12        | 52                       | 312          | 52         | 312          |     |
| Mansuria HC     |          | 30,000                          | 1,230             | 103                          | 7                            | 18        | 19        | 11        | 12                    | 26                          | 26        | 26        | 26        | 26        | 103                      | 618          | 103        | 618          |     |
| <b>Total</b>    |          | <b>95,230</b>                   | <b>3,906</b>      | <b>338</b>                   | <b>27</b>                    | <b>61</b> | <b>64</b> | <b>48</b> | <b>50</b>             | <b>90</b>                   | <b>90</b> | <b>90</b> | <b>90</b> | <b>90</b> | <b>338</b>               | <b>2,028</b> | <b>338</b> | <b>2,028</b> |     |

#### 5.4 Providing Maternal Health Care

The need to provide maternal care is clearly demonstrated by the findings from the 1979 National Fertility Survey and the 1985 survey of rural Tihama communities:

- Between 16% and 20% of married women aged 15-44 are pregnant at any one time.
- 84% of women who had delivered within the last five years did not have any antenatal care during their last delivery.
- 95% of deliveries in the last five years were at home, and only 5% of home deliveries were attended by someone with training (such as an LBA).
- In 73% of home deliveries, the mother was attended by a family member, neighbour or friend (or no-one: 2%), that is someone without special expertise in deliveries.
- Traditional birth attendants (jiddaat) were at 22% of home deliveries, but only one of the villages surveyed showed widespread use of jiddaat; in this village three-quarters of reported deliveries were attended by a jidda, whereas in the remainder of the sample, jiddaat only attended one delivery out of ten.
- Two-thirds of the women aged 15-19 reported that their last delivery had been breech.
- Out of all the reported pregnancies (n=2,457), 4.7% ended in miscarriage and 2.6% in a stillbirth.
- Infant deaths in the first three days after delivery accounted for 27% of infant mortality (IMR was 136.1/1000).

The average age of first marriage in the rural Tihama is 14.7 years; 45% of the sample (497 ever-married women aged 15-44) were younger than 15 years old when they were married, and 40% interviewed said that they had started living with their husbands before menarche. Pregnancy in a barely mature girl is risky both for her and for the baby. The risks of pregnancy and childbirth are aggravated by under-nutrition and malnutrition during childhood, which leads to pelvic disproportion. The very high figure of 10 maternal deaths per 1000 live births reflects the risk of complications arising from pregnancy and delivery.

Data from monthly reports in the information system showed that PHC Units report about half of the expected number of births in their catchment populations; there is a wide range in the completeness of reporting between health workers. Stillbirths represent:

- 1.2% of deliveries at health centres,
- 4.6% of deliveries at home attended by health centre staff,
- 6.9% of births (live births plus stillbirths) reported by PHC Units. There are nine units, mostly around Zohra and Zaidia, where stillbirths are 18% of all reported births.

Two sample months of data from al Thowra hospital showed that stillbirths were reported to be 22% of all deliveries; the Statistics Department was finding out whether these figures were the result of faulty reporting.

Routine antenatal care, including screening for risk factors, is most easily accepted when provided by female staff. As we have seen in Sections 4.1 and 4.3, there are shortages of female staff

at some health centres and at most PHC Units. Training of more Murshidaat will address part of this problem.

Most of the LBAs and Murshidaat who were interviewed during the assessment showed an impressive level of competence and commitment. They know the medical and obstetric conditions which help to identify pregnant women at risk, although there is some variation in their views about age and parity risk factors (for example their definitions of "high parity" ranged from 4 children to 15 children). Their knowledge of whether to refer (see Questions 9.7 to 9.9) was satisfactory, and rural staff usually accompany the women they have referred to hospital, thus helping to overcome one of the barriers to care. They expect to see a pregnant woman for the first time during the second or third month of pregnancy, and then see her 7 times on average before she delivers (ranging from 4 to 12 times). If this visit schedule was achieved, the monthly reports would show about 14% of antenatal visits as new patients, but these reports show that most women who get antenatal care only attend once; 49% of ANC visits at health centres and 67% of ANC visits reported from PHC Units are described as new patients. However, these data (from the information system) do not represent the work of the average Murshida or LBA, because their activities are not fully reported; some PHCWs do not include female staff's work on the monthly activity report, and the Zabid area units have never used this reporting form.

The female staff who were interviewed said that they visited the mother and baby between 3 times and 40 times (daily for six weeks) after the delivery; they gave advice about breastfeeding and family planning, and when the baby was 3 to 4 months old advised about weaning foods. Postnatal visits are not included on the monthly activity report, so it is not possible to monitor these activities through the information system.

The quality of maternal care is being affected by shortages of essential drugs (eg ergometrine), and by inadequate basic training in how to disinfect and sterilize equipment. From what we were told, deliveries attended by Murshidaat and LBAs are not aseptic because the scissors are not boiled for long enough. Cord tape is supplied on a large reel from which lengths are cut, then boiled or dipped in antiseptic. Several staff said they had been told during training to use surgical spirit "if they did not have time for boiling."

The non-literate LBAs have now been working for 5-7 years and their level of activity (attending deliveries every two or three days, identifying and referring problem cases) demonstrates the contribution they have made to maternal health in their villages. Both they and the less experienced Murshidaat need on-site supervision, a structured recording and reporting system, and focussed continuing education to strengthen their work still further.

When the female staff were asked about their relationship with the community, several said that the jiddaat (TBAs) would not cooperate with them, or actively sought to discredit them because of their youth or unmarried status. Some jiddaat were reported to

be using dangerous techniques. Studies in the rural Tihama have shown that the presence of jiddaat varies considerably between individual villages (see Mary Hébert, 1984; Youssef Tawfik, 1986). If there is no jidda, maternal care is provided by members of the household or neighbours. The task of identifying the leaders of female opinion and providing appropriate information about maternal care is much more complex than running a training programme for jiddaat. Even where jidda training has been held (see Appendix D.3), the PHC system has not maintained contact with the trainees, except in Hodeida city through the Urban Project.

### Recommendations

The training of more Murshidaat under the ACCS Project will help improve the availability and quality of maternal health care in rural areas. (See Recommendations under Section 4.3.)

Initiatives to improve the community's information about appropriate maternal health care are still needed. These could use the proposals in Hébert (1985) for establishing an exchange of ideas with female opinion leaders, the work of BOCD with rural women, and the Hodeida Urban Project's experience. Training of more jiddaat would address part of the objective, but only in villages where jiddaat provide maternal care. The introduction of Disposable Delivery Kits might provide a vehicle for improving knowledge of safe maternal care (see below).

Support from male family members needs to be obtained to enable women to seek routine antenatal care and to go to a higher level of care when referred, thus reducing the number of preventable emergencies. The issue of age of marriage, and the effect of pregnancy on very young brides' health, needs to be addressed as part of the PHC message to communities.

Community support in registering all births needs further encouragement. Accuracy and consistency of reported data need to be followed up by the T/S on site, and by the Statistics Department. Health staff's interest in the circumstances surrounding stillbirths and neonatal deaths would provide a starting point for Health Office supervisors to identify whether interventions during labour and delivery were appropriate. In cases where staff have intervened inappropriately, supervisors should follow up (eg through case conferences). (This recommendation also applies to stillbirths and neonatal deaths in the hospitals.)

The initial contact established with jiddaat through the training programmes needs to be maintained and strengthened as they will continue to influence maternal care for many years. Meetings could focus on discussion of their cases, using pictorial records (which would need to be developed and field-tested - see LBA's pictorial ANC card in Appendix D.9). Jiddaat could be instrumental in promoting the use of Disposable Delivery Kits (see below). The experience from places with positive relationships between health staff and jiddaat (eg Hais HC, Hodeida Urban Project) provides a good starting point for developing a strategy for coordinating with jiddaat.

LBAs and Murshidaat need regular, supportive supervision on site. Female T/Ss should reinforce correct practices, check equipment and supplies, review records and reports, respond to technical queries, and see cases identified by the LBA or Murshida. (See also Section 7.1.)

The PHC Department's recent move to reestablish visits by female supervisors is welcomed. The cadre of female supervisory staff needs to be expanded in preparation for the increased number of Murshidaat next year. Midwives and nurses appointed to become supervisors will need orientation to the wider public health role of the Murshida, especially her relationship with the community and child health activities (eg growth monitoring). The involvement of female T/Ss in recruiting the new Murshidaat will help to establish links with the community.

In-service training for female PHC staff needs to be planned and implemented. Maternal health topics identified during this assessment include correct procedures for sterilizing equipment, modifying formats for recording and reporting (see Section 7.3), and how to follow up eligible women after the second dose of TT. Most staff are interested in knowing more about difficult deliveries, but their training should continue to emphasize how to identify cases that they can manage safely and competently, and cases that must be referred.

The possibility of introducing Disposable Delivery Kits should be considered. Each kit (one per delivery) is in a heat-sealed plastic bag which typically contains a tiny bar of soap, a sterile razor blade (one-sided), two sterile cord ties, antiseptic lotion, several cotton swabs (for eyes and nose) and a 30cm x 30cm piece of plastic (on which to keep the supplies clean). The cost is minimal (less than 10 Rials, based on other countries' experience). The family can purchase a kit before the woman's due date, so if a relative, friend or jidda attends the delivery, the cord can be cut and tied with clean supplies. The kit thus also provides an opportunity to introduce and explain safe delivery techniques. Production of the Disposable Delivery Kits could be undertaken as an income-generating scheme for women, with supervision from MOPH to ensure that the supplies were sterile.

PHC staff should have a supply of Disposable Delivery Kits in their midwifery kits; this would remove the difficulty (reported by Murshidaat) of having insufficient time to sterilize equipment between deliveries (eg with twins).

Other MCH supplies such as ergometrine tablets need to be reestablished as part of the essential drug list and supplied to female PHC staff. (Note that injectable ergometrine must be stored between +4°C and +8°C so is not practical for Murshidaat who do not have a fridge.)

The Monthly Activity Report for PHC Units should be revised to show the number of deliveries attended by trained staff, and the number of postnatal visits. (See Section 7.3.)

## 5.5 Pregnancy Spacing Care

The likelihood that mother and child will survive in good health is improved if there is an adequate interval between each pregnancy. The 1985 survey in the rural Tihama found that

- 61% of the women (aged 15-44) surveyed said they did not want any more children (ranging from 30% of those with 1-2 children to 98% of those with 7 or more children);
- 27% of these women had heard of family planning methods (mostly the pill); in villages with PHC staff, 33% had heard of FP compared with 15% in villages with no PHC staff. Knowledge was most widespread (41%) where there was a LBA.
- Only 7% of the women in the sample said that they were interested in using a family planning method; these women had larger than average families (5 children, compared with the average of 3.4 for the whole sample).

In an average PHC Unit catchment population we estimate that in 1985 there would have been about 36 married women interested in using family planning services. In 1991 the PHCWs' reports show that on average, one FP client visits the PHC Unit every 10 months (see Table 7). Only 10% of units reported seeing anyone for this service, and neither PHCWs nor Murshidaat receive contraceptive supplies. Units with LBAs used to have family planning clients when a midwife made regular supervision visits, screened the potential users, and coordinated with the LBAs over resupplying pills; this system ended some years ago. The list of essential drugs supplied to PHC Units does not include contraceptives.

Health centres see a few clients for family planning (Figure 6), but they are constrained by shortage of supplies. Total stock-outs occurred during this assessment; for example, Tahreer THC had to refer family planning clients to Ghuleil HC which was known to have stock. Such supply failures make it more difficult and expensive for clients to obtain this health service, and undermine the reliability and continuity of care which are essential for users of contraceptive pills. Supplies can be obtained from private pharmacies and drug stores, but the great variety in the composition of oral contraceptives makes it likely that brands obtained privately will differ from the pills supplied through the government health service.

The Health Office's supply comes from two sources in Sana'a: the MOPH's MCH Department, and the Yemen Family Care Association. Two different formats of family planning registers were seen during the assessment. Health centres charge for contraceptives: 3 Rials per cycle of Neogynon and Microgynon; 5 Rials for a cycle of Micronol, 3 Rials for Neosampoon, and 25 Rials for an IUD (loop). However some staff charge higher prices.

### Recommendations

A positive strategy for responding to the population's interest in family planning and for promoting the spacing of pregnancies should be developed and implemented. A possible model is for PHC staff (Murshidaat, LBAs and PHCWs) to identify clients who are interested in contraception, and arrange an appointment with

the T/S or midwife on scheduled supervision visits (or if there is a health centre near by, refer them there). Each case would be counselled about methods and supplied (or referred to someone qualified to insert IUDs). The local PHC staff would then be responsible for following up users to check on any side-effects, and resupplying pills, condoms and spermicide, or referring anyone who had developed danger signs.

This strategy will require that staff knowledge and practices are effectively monitored and upgraded, through use of a printed checklist of contraindications and early warning danger signs, regular on-site supervision and periodic workshops. For a list of possible contraindications and early signs of danger, see Contraceptive Technology 1990-1992 (1990), pp.247, 293, 322.

The strategy will also require improving the ordering of supplies and stock control, and the regular distribution of sufficient supplies to meet demand. The present fragmented, ad hoc logistics practices should be revised; in particular,

- a stock book should be kept showing the balance of stock remaining in the Hodeida store;
- a safety stock level should be established based on the rate at which supplies are used and the length of time needed to obtain new supplies;
- replacement stock should be obtained as soon as stock levels have fallen to the safety stock level.

The present approach to stock management found at the central level, of restricting supply on the basis of past activity reports, will clearly need to be revised if there is to be any expansion in family planning services.

The strategy should be introduced in phases, starting with PHC Units with female staff and those with male workers whose performance is above average (refer to the Health Office supervisors' assessment). After several months the level of demand and the supplies required can be analysed, and plans made for obtaining the supplies needed for expanding services to more units.

Consideration should be given to treating family planning supplies as essential drugs, at least from the Health Office down to the peripheral facilities. This would enable economies to be made in managing, storing and distributing supplies.

Sometimes a husband is given oral contraceptives for his wife without the health staff seeing the woman herself. This makes it especially important that information about the pills, contraindications and possible danger signs are properly understood. The use of printed check lists by all staff providing family planning services will ensure that the relevant points have been covered.

If set prices are to be charged for family planning supplies, these should be prominently posted in health facilities (as the fee schedule in LCCD Clinics) and proper mechanisms should be established for accounting for the money collected.

## 5.6 Curative Services

Figures 6 and 7 show that in numerical terms, most of PHC staff's activity is treating curative patients. The target groups for PHC are women of reproductive age and children under 5. The Tihama PHC Project made an effort to increase the numbers of women and small children receiving treatment, and set targets for PHCWs which were monitored through the information system, using data on the age and sex of patients attending units. In this section we discuss present utilization by the target groups. Then we analyze the profile of reported symptoms and diseases to see how far it corresponds to the priorities of PHC. Finally we present several indicators used during the assessment to evaluate the quality of care provided.

**Utilization by target groups.** Children under 5 accounted for almost half (48%) of the cases of illness reported in the 1985 household survey in rural communities, and for 84% of deaths during the last year. Data from the PHC Units' Monthly Disease Reports show that only 22% of illness reported in 1990 was in patients under 5.

In the 1985 survey, 40% of reported morbidity was among women aged 15-44, and almost all of the adults reported to be ill were women (these figures may be biased high as women were the main respondents). Data collected during the assessment showed that:

- Some male PHCWs see as many women as men (eg al Daamegh, Hosaya); this is achieved by making home visits to sick women who would not come to the PHC Unit.
- In the Zabid area, Units staffed by PHCWs alone had very low proportions of women patients. The records were clear enough to check at two of these units and showed that the percentage of adult patients who were women was 19% (most of his activity was house-to-house) and 11%.
- Units staffed entirely by Murshidaat or LBAs reported that 90% of their caseload was women; they concentrate on maternal care.
- The presence of female staff does not guarantee higher utilization by female curative patients; at Hajaila (with an LBA and a Murshida) one-third of adult patients were women, and at al Lawia (LBA) only one-fifth were women.
- Information on the travel time to villages in the PHC Unit's catchment area indicates that 60% of villages are too far from the Unit to be readily accessible without transport (eg more than half an hour's walk from the village to the Unit).

These findings indicate that the most important factors in making curative services available to women are not the health worker's sex, but (1) the orientation of the staff, and (2) staff mobility. It appears that the effort to make staff sensitive to the age/sex composition of their caseload has had a positive effect in the northern part of the governorate. However their capacity to hold outreach clinics and to visit outlying areas is constrained by transportation (see Section 6.4). This constraint is more severe for female staff, none of whom have motorcycles or cars.

The health staff's time would be used more efficiently if patients came to them at the unit. In several places, female staff cannot work at the unit because of its location (in the suq, or next to the school), or because its layout makes it impossible to assure women of privacy. The location and design of PHC Units is discussed in Section 6.2.

The data show that where the PHC system has employed a strategy for improving utilization by the target groups, the initially low utilization by women and small children has been raised. However, further efforts are needed to overcome the physical and social constraints which discourage women from attending themselves and from bringing their small children when they need curative care.

**Profile of reported morbidity.** More than half of illness reported by household members during the 1985 survey was accounted for by three sets of symptoms:

|                              |     |
|------------------------------|-----|
| Diarrhoea and/or vomiting    | 19% |
| Fever                        | 19% |
| Respiratory tract infections | 18% |

Malnutrition (thinness and weakness) is notably absent from parents' reports of illness. Analysis of symptoms in those who had died during the last year indicated that

|   |
|---|
| 45% of those who died had diarrhoea                           |
| 14% died from diseases which can be prevented by immunization |
| 6% were reported to have died from malaria                    |

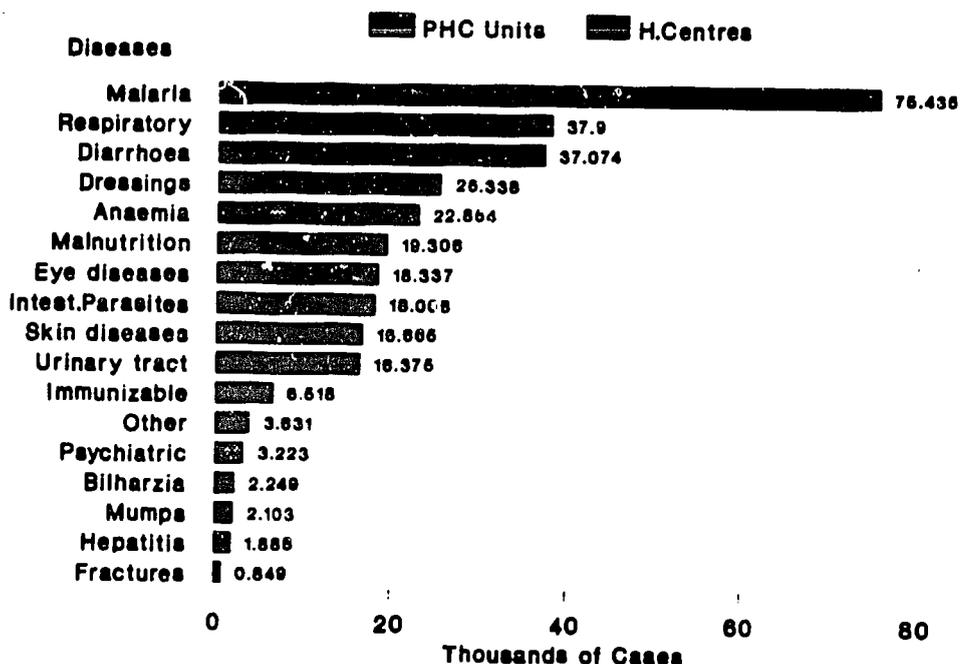
The Monthly Disease Reports reflect both the patients' decisions about whether to seek treatment and the health staff's diagnosis. In 1990, malaria was reported more than twice as often as any other illness (see Figure 15), and accounted for 24% of cases reported by PHC Units and health centres. (Appendix D.5 shows the 1990 data in a table.) The three illnesses which are reported most often are malaria, respiratory tract infections and diarrhoea; these account for 49% of cases, and correspond to the three commonest symptoms in the household survey.

However, the disease reports should not be treated as a perfect reflection of morbidity in the community. For example the 1985 household survey found that 14% of children under 5 were severely malnourished,<sup>1</sup> but the number of malnourished children reported by the health system is barely one-tenth of the number expected for the 71 units in the database. This reflects the absence of growth monitoring discussed in Section 5.2.

Health staff's diagnostic practices and the clerical accuracy of the monthly reports are discussed in Section 7.3.

1. More than 3 standard deviations below the mean weight-for-age.

**Figure 15 Symptoms and Diseases reported by PHC Units and Health Centres in 1990**



**Quality of Curative Care.** Three indicators of quality were used: the adequacy of essential drugs, procedures for disinfecting instruments, and the profile of cases referred from PHC Units.

**Adequacy of essential drugs:** The stock levels of drugs for treating five common illnesses were compared with the number of cases reported and registered (some PHCWs do not report cases for whom they had no drug treatment). If drug resupply was regular and at adequate levels, the information should be analysed to show how many months the Unit could treat patients with the current stock. However, this approach could not always be followed:

**Malaria.** Data for June-July showed an average of 33 cases of malaria per month at the PHC Units visited. None of them had any antimalarials, either syrup for children or tablets. Most had been stocked out of chloroquine for two years; one had been supplied tablets a year ago through the malaria project.

**Acute Respiratory Tract Infections.** There were adequate stocks of antibiotic tablets at all units. However only one had any stock of antibiotic syrup for children; this unit had received its quarterly resupply a few days before our visit and its stock would last another week. The stock-out dates from other units indicate that the amount of antibiotic syrup supplied is sufficient for two or three weeks.

**Diarrhoea.** All units had ORS in stock, although three had less than one month's supply based on the number of cases last month.

**Anaemia.** All units had antianaemics in stock, although there were at least three different forms (some for children, others suitable for pregnant women). If iron+folic acid were provided to all pregnant women, the stock levels might not be adequate.

**Eye diseases.** On average there were 8 cases per unit per month; each case should be given a tube of antibiotic eye ointment. Only two units had stock and they had just been resupplied. The length of time since this item was last in stock varied from one month to two years.

When essential drugs are out of stock, the PHCWs and Murshidaat write prescriptions, which patients must fill by travelling to the nearest town with a drug store. Rural towns usually have a health centre and private clinics, so patients might not bother going to the PHC Unit at all if it does not have the necessary drugs.

Stocks at health centres were not counted so thoroughly. Zaidia Training Health Centre was stocked out of all the items above except for antianaemics, and there was no stock book. At Ghuleil, stock records were kept and all items were in stock; children's syrups (antibiotic and antimalarial) had been purchased from pharmacies. Drug logistics are discussed in Sections 6.5 and 7.2.

**Procedures for disinfecting instruments:** Figure 15 shows that dressings and minor surgery are the second most frequently reported treatment at PHC Units, representing a far larger part of their workload than at health centres. We assessed the equipment and procedures for disinfecting scissors and forceps:

- One of the 14 PHC Units visited had all the equipment on our checklist: scissors, forceps, disinfectant, stove and Butagas. Another four would have been adequately equipped if they had Butagas; some had no cylinder, others could not get their empty cylinder refilled.
- At ten units, the staff said they would clean their scissors, then boil them then remove them with sterile forceps, but only one said that they would boil the instruments for 20 minutes or more.
- When the answers about procedure are linked with the information about equipment, only one unit could have been disinfecting instruments correctly at the unit. Another seven could do so by using their own stoves, kerosene, saucepans, etc.
- Two units had water on tap, but these lacked equipment or did not follow correct procedures.
- Several units were using antiseptic and/or surgical spirit because they could not boil their instruments. One T/S said he preferred using antiseptic and surgical spirit.

At the health centres most Murshidaat described correct procedures for disinfecting MCH instruments, but these practices were not always in evidence in the dressings room (staffed by nurses). In particular, the procedures used at Zaidia Training Health Centre do not provide a suitable role model for trainees to follow.

**Profile of cases referred from PHC Units:** During the field work PHCWs and Murshidaat were asked when they had last referred a child, and for what reason. We identified a pattern which connected the cases which the PHCW or Murshida had referred and evidence of the staff's impact upon primary health care in the community.

- Staff whose performance was rated as far above average had recently referred children, and the reasons for the referral were diverse (eg suspected TB, suspected diabetes, skin disease).
- All but one of the other staff who had referred said the reason was severe diarrhoea and dehydration, sometimes with malnutrition (eg a 10-month old weighing 2.5kg). Two of these referred children had died.
- One PHCW had not referred any children in the last 8 months; another said he had never referred a child.

The pattern is that effective PHCWs and Murshidaat have succeeded in educating their communities to recognise and treat the commonest illness among children before it becomes life-threatening. The less effective staff are still facing preventable emergencies. Some are not aware of their own professional limitations.

Referrals are reported on the Monthly Activity Report; 3-4% of patients seen for curative care at PHC Units are referred and 1-2% are referred from health centres. There is a well designed referral form for use by PHCWs but this stationery is out of stock at some units. Follow-up of referrals is facilitated by the T/S, who is based at the nearest supervising health centre. The health centres themselves seem to be less well equipped with stationery and systems for following up referred patients, complaining about lack of written communication from hospital doctors. The follow-up of TB patients and their continuity of care was not studied.

**Curative Units.** There are at least 33 of these units providing treatment in the governorate (see Table 2). They do not use the Monthly Disease Report showing patients by diagnoses or symptom, age group and sex. They are supposed to report the number of cases seen, male and female, new and old patients, but this information is not part of the Statistics Department database. Little is known of the contribution made by these staff to primary health care.

### **Recommendations**

PHC staff's awareness of their caseload's profile needs to be reactivated in the northern units and introduced in the Zabid area. The Health Office can draw on the experience of PHCWs and Murshidaat who have succeeded in gaining access to groups which did not initially come for care. Then supervisors can help rural staff to develop strategies for gaining access to underserved target groups. T/Ss should monitor progress in reaching the target groups, and discuss with the PHCWs and Murshidaat how they could improve their strategy.

Given continuing difficulties of patients' access to the Unit and health staff's transport, it would be worth considering a strategy of establishing outreach points in the catchment area where the staff can hold clinics for people who live in that neighbourhood. This strategy has several advantages: it requires community participation in the provision of a room; it makes PHC more accessible to people who do not live in the village where the Unit has been established; it does not raise unrealistic expectations that the health worker can always visit people in their homes; and it allows the health worker to see more people than is possible going house to house.

Curative care is an entry point to primary health care. Greater effort is needed to ensure a reliable supply of essential drugs (see Sections 6.5 and 7.2). The composition of the drug kit needs to be revised to provide children's treatments in syrup form and to include essential drugs such as chloroquine. The quantities supplied should also be reviewed, as some items are consumed within days while others are hardly used. Review of the appropriateness of the quantities is made more complex by the complete absence of stock books, and by the change in the format of patient registers, dropping the columns showing treatments given (and quantities). Thus it is now impossible for T/Ss to monitor drug use from the attendance register. The content of this register needs to be revised (see Section 7.3).

The quality of care can be improved if all T/Ss do what some are already doing: discuss referred cases with the PHCW or Murshida, follow up the cases, give the staff feedback on the cases, and visit the patients at home afterwards.

Some PHCWs and Murshidaat need retraining in management of diarrhoeal disease; the ORS module in the Child Health Manual could be used for this. This retraining should go beyond the mixing and administration of ORS and should draw on the experience of staff who have succeeded in convincing their community to treat diarrhoea early with ORS. The objective should be to give other staff an effective strategy for changing parents' behaviour. A review of causes of death among under-5s and cases referred could be used to identify which staff should attend this training.

Both T/Ss and the Health Office should react to any report of an immunizable disease, to find out if it has been correctly diagnosed, if it is an isolated case, whether the patient had been immunized, and if so when and where. Such response to reported information is the essence of epidemiological surveillance. See Carl Hasselblad's ACCS consultancy report (September-October 1991) on this topic.

Retraining in correct procedures for disinfecting instruments is needed for PHCWs, LBAs, Murshidaat and trainers, and staff who work in the dressings and injection room at health centres. Retraining should cover the points in Appendix D.6. After the inventory of equipment has been completed, a plan for replacing or repairing missing or broken equipment can be prepared. A strategy - including logistics, persons responsible and budget - should be prepared for resupplying Butagas for the stoves.

## 5.7 Public Health Activities

One of the main differences between PHC staff and those trained for curative and hospital work is the involvement of PHCWs and Murshidaat in public health activities, which reduce morbidity by attacking the environmental causes (eg of diarrhoeal disease and malaria). Activities include field visits to water sources, schools, mosques and food shops, promotion of better environmental sanitation including drainage, latrines and disposal of garbage, lectures on health education covering these topics, and meetings with local leaders to generate support for improvements in public health. PHC staff also register births and deaths, and should actively promote preventive services, following up eligibles and defaulters. These activities require the PHCWs and Murshidaat to spend time out of the unit moving around their catchment area.

Field visits and health education lectures are reported on the summary of monthly activity. Data for 1991 show that:

- PHC Units report between 4 and 5 field visits per month on average, which is one field visit per week.
- More field visits for water and environmental sanitation (30%) are reported than for any of the other three categories.
- Between 12 and 13 health education lectures are reported per month, with an average of 3-4 people at each lecture.

The assessment found that field visits are a regular part of PHCWs' work in the governorate north of Zabid, with frequency ranging from "monthly" to 2 per week. This contrasted with PHCWs in the Zabid area, who visited much less regularly; the most competent PHCW made his last visit five months before. The Murshidaat working without male staff said they never made field visits; this finding has important implications if there are plans to extend the number of PHC Units without male staff.

Similar differences between the two areas of the governorate were found when we asked about the frequency of health education lectures. These differences are partly due to the effect of filling out the Monthly Activity Report, which reminds PHCWs that they should be doing these activities; the Zabid PHC Units do not use this report. The differences are also due to the different approaches for establishing the PHC staff's role in the community.

In the PHC Units from Zohra to Bait al Faqih, T/Ss and Tihama PHC Project staff placed considerable emphasis on public health. During training, PHCWs and Murshidaat did surveys of their catchment areas, asking about health problems and marking the water sources, school, mosque, shops and houses on simple maps which were later posted in their units. The villages in the catchment area were identified and their populations listed on specially developed forms; both the T/Ss and the Health Office thus had information on each PHC Unit's catchment population. At the start of establishing regular immunization services provided by PHCWs, all eligibles were registered by house-to-house visiting. The Hodeida Urban Project used a much more detailed mapping exercise to define the catchment population for their health centres, but the mapping was too complex for the Murshidaat to complete without assistance.

The long term results of the initial survey and listing of village populations were apparent during the assessment.

- In the northern units, staff named the villages for which they were responsible; the average was 6, ranging from 4 to 9. All but one told us the population, usually for each village. The one exception had replaced the original PHCW and had not repeated the exercise of mapping and registering eligibles.
- In the units around Zabid, all but one named the villages in the catchment population; the average was 11 villages, and the catchment population was twice the northern units' average (see Table 9). The two units staffed by Murshidaat did not know the size of their catchment population, and one PHCW, a replacement for the original person, gave data only for his own village.
- Population data came from house-to-house surveys, the akil, or were the PHCW's best guess. Four PHCWs had updated the population figures since they were first prepared. Several staff told us of villages which were added to their catchment area for the immunization campaign in 1990, but they did not regard these extra villages as their permanent responsibility.
- Hodeida Urban Project made a detailed assessment of population movement into and out of Ghuleil during their survey last year.

PHC staff were asked how many births per month they expected in their catchment population; this should be the basis for monitoring their immunization coverage.

- In the northern units, the PHCWs' estimates were slightly low; two were correct but on average they would miss 15% of newborns (based on the figure projected from their population data).
- In the Zabid area, three places (including two staffed by Murshidaat) could not answer the question. The others' estimates were far too low; they thought there would be 5-10 births per month in a population of 5,000, and on average would miss 60% of newborns in their main village.

**Table 9 Knowledge of PHC Unit's Catchment Population**

|                              | Tihama PHCP      | Zabid area        |
|------------------------------|------------------|-------------------|
| Survey ever carried out      | all <sup>a</sup> | none              |
| Villages in catchment area   | 6                | 11                |
| Range                        | 4 to 9           | 1 to 15           |
| Population in catchment area | 4,200            | 8,400             |
| Range                        | 2,800 to 5,950   | 5,000 to 28,000   |
| Number of births per month:  |                  |                   |
| projected from pop.data      | 15.8             | 18.8 <sup>b</sup> |
| PHCW's estimate              | 13.5             | 7.5               |

a. All staff trained under TPHEP; one PHCW trained in Zabid and now supervised from Bait al Faqih had never done a survey himself.

b. PHCWs could not estimate for their whole catchment population so they were asked to estimate births per month in a population of 5,000.

The difference between the two areas in being able to project this vital target figure seems to be due to T/Ss and their supervisors making sure that the PHCWs mapped and counted the population in their catchment areas right at the beginning of their work. Even though the immunization campaign involved all PHC staff, it did not equip them with the knowledge of how they should identify and monitor their own continuing target of newborns per month.

When we asked PHCWs and Murshidaat what were their biggest problems with their work, three described public health problems: stagnant water, garbage, a dirty environment, and poor knowledge about health among the people. Staff who reported constructive support from their T/S frequently mentioned that the T/S had met community leaders to solve an environmental health problem.

### Recommendations

For primary health care to produce lasting improvements in health status, the public health perspective must be strongly promoted among all PHC staff, trainers and supervisors. For staff to be effective in promoting public health improvements, the PHCWs and Murshidaat must know their catchment population, and environmental health must receive proper attention in activity planning and monthly reports.

Knowledge of the catchment population is the basis for all preventive and promotive work. Trainees should carry out a survey of their communities; the Training Department has experience of this exercise. A list of the villages in each catchment area should be kept both at the PHC Unit and at the Health Office, with a copy for the Planning Department. The format used during the Tihama PHC Project had space for village name, distance or travel time on foot from the unit, population, and target population for child health; this form should be reactivated. The most useful number for maternal and child health is the number of under-1s (approximated as births per year) because it gives PHC staff their target for finding the highest priority groups: pregnant women, deliveries, postnatal care, birth registration, immunization and growth monitoring. Information on the distribution and size of the catchment population should then be used to plan activities (including outreach clinics and field visits) and to monitor coverage of the target groups.

The Health Office will need to train and assist the Zabid area trainers and supervisors to introduce these activities in their area. The new batch of PHCW trainees should complete their surveys as soon as possible.

Greater emphasis on environmental health can be attained by the T/S following up on these activities when the PHCW and Murshidaat plan their use of time and when they review the Monthly Activity Report (which should now be used in the Zabid area). The T/Ss should be encouraged to spend time and energy supporting interventions to improve environmental health. Role models from units which have had success should be identified and shared, to encourage those who are unsure where and how to start.

If Murshidaat work without male staff, special attention will need to be given to the Murshidaat carrying out surveys of their communities and planning activities to improve environmental sanitation, as these aspects seem to have received less emphasis in their training and orientation. One possibility would be to develop community volunteers who would undertake the organization of garbage clearance, meetings to find solutions to problems such as stagnant water, and other community wide topics.

In some areas where prevalence of malaria is very high, it may be appropriate to introduce bed-nets treated with the insecticide Permethrin. Pilot projects in the Gambia and Kenya are reporting positive effects of this innovative scheme upon health status (see references in Appendix E). There are many details which must be addressed before attempting to implement such an activity, which requires families to obtain bed-nets and training for the people (eg PHCWs) who will organize dipping the bed-nets every 6 months in a carefully prepared Permethrin solution. Assistance with procurement of supplies (eg bulk purchase of bed-nets which could be sold at cost-plus rates) could be sought from UNICEF, who has supported the scheme in Kenya. Expert technical support from a parasitologist could be sought in coordination with the Malaria Project. If such a scheme were developed, it should be pilot tested in communities which express a strong interest in controlling malaria.

### 5.8 Relationship with the Community

The health services need community participation to bring about changes in behaviour and improvements in health. PHC staff's contact with the community is not only through direct provision of care, health education and field visits, but also through discussion at meetings to gain civic support for health-related activities.

The selection of potential candidates begins with meetings between the LCCD and the Health Office. The LCCD provides half of the trainee's financial support during training, and is responsible for providing either the land for a permanent PHC Unit or a temporary building. At least three units have been built entirely by the LCCD.

During the Tihama PHC Project one resident advisor and his counterpart spent much of their time visiting LCCD members and other local leaders. Some of the staff losses in Zabid and damage to buildings and equipment have been attributed to the community having an imperfect understanding of the PHCW's role. Failure to convey accurately what the community should expect from primary health care has led, in a few notable instances, to having to retrain replacement staff and reequip the unit.

Changes in the elected officials and alterations in the status of health staff themselves make it likely that the local relationship between community and PHC staff will change over time. Two units

(Kidf Zumeila and Ghazaala) are presently closed due to a breakdown in relations. In the assessment, most of the staff interviewed said that their relationship with the community was excellent. Where problems existed they had been caused by disagreement between the sheikh and the LCCD over rent for a temporary unit, and uncooperative behaviour by the jiddaat. To keep local leaders and officials involved in improving community health, regular contact would seem to be desirable.

Regular meetings were reported by six of the units visited, and took place once or twice per week (usually on Fridays). Five of these were in the northern part of the governorate. The only Murshida who had such meetings discussed PHC with the local sheikh, who is her father. Most PHCWs in the north said they had approached the LCCD about repairs to their motorcycles or to the unit. This contrasts with units in the Zabid area, where two staff specifically mentioned that they were not allowed to approach the LCCD directly about building repairs.

A specific type of problem with the community is caused by private practitioners, who respond to their clients' demand for injections, drips and drugs. Their conspicuous style of curative medicine undermines the PHCWs and Murshidaat, who are trained to promote public health measures, give ORS for diarrhoea, and do not use oxytocin and glucose drips during deliveries. Only four of the units visited said that there were no private clinics in their village. Private practitioners included unemployed hospital nurses, trainee nurses, and hospital staff who came to their home village on their days off. Most PHC staff recognize that the problem is that the community values drug treatments without knowing whether the drugs are appropriate or safe. It is hard to see how this situation can be changed unless all health providers support a massive health education effort, and fundamentally alter their prescribing habits.

## Recommendations

The Health Office has an influential role to play in establishing the community's expectations concerning primary health care. More active community involvement in PHC activities - for example in registering all births, bringing all eligibles for growth monitoring and immunization, and proper disposal of rubbish - would make an enormous contribution to the PHCW's and Murshida's capacity to do their work effectively.

Now that there are so many PHC Units under the Health Office's supervision, and given the number of trainee Murshidaat to be recruited, it seems appropriate to give a member of the Health Office staff specific responsibility for coordinating with local leaders. This person's tasks would include negotiations about sites for PHC Units (temporary and permanent), and giving community leaders a proper orientation to primary health care and the contribution of public health interventions. The community's positive involvement should be stressed.

## Recommendations (continued)

In the past, village women have scarcely been involved in this process, yet many of the PHC interventions depend on their active cooperation. A strategy for identifying leaders of women's opinion, canvassing them and involving them in initiatives to improve health should be developed. The experience of the LBAs and Murshidaat should be sought out when developing the strategy.

An important part of this strategy should be contact and communication with the jiddaat. As some of these traditional midwives are very experienced, the staff who meet them for discussions will need to be accepted as knowledgeable and wise by the village women.

The difficult issue of identifying practitioners who have given dangerous treatments will require community cooperation. This will require a better understanding of what treatments are appropriate. The "Problem Drugs" kit designed by Health Action International is available in Arabic and could provide a way of increasing community awareness of inappropriate drugs (see Appendix E for the reference).

The PHCWs' and Murshidaat's promotion of PHC should continue to be backed up by health education information on TV, and videos in the clinics which have the equipment. One topic which needs better knowledge is safe practices for delivering a baby. PHC staff and their supervisors can identify others and propose them to the health education unit.

## 6 Resources for Primary Health Care

Resources include staff, buildings, equipment, vehicles, and supplies of consumables. Some resources are long term investments which require periodic expenditure to maintain their quality and usefulness; staff need refresher training, buildings and vehicles need maintenance. Consumable supplies such as fuel, stationery and drugs are usually obtained annually; they may be purchased using the recurrent budget, or supplied through donors. The assessment did not complete a thorough economic analysis of costs and effectiveness, but found many areas where effectiveness could be improved. These findings are presented in this section.

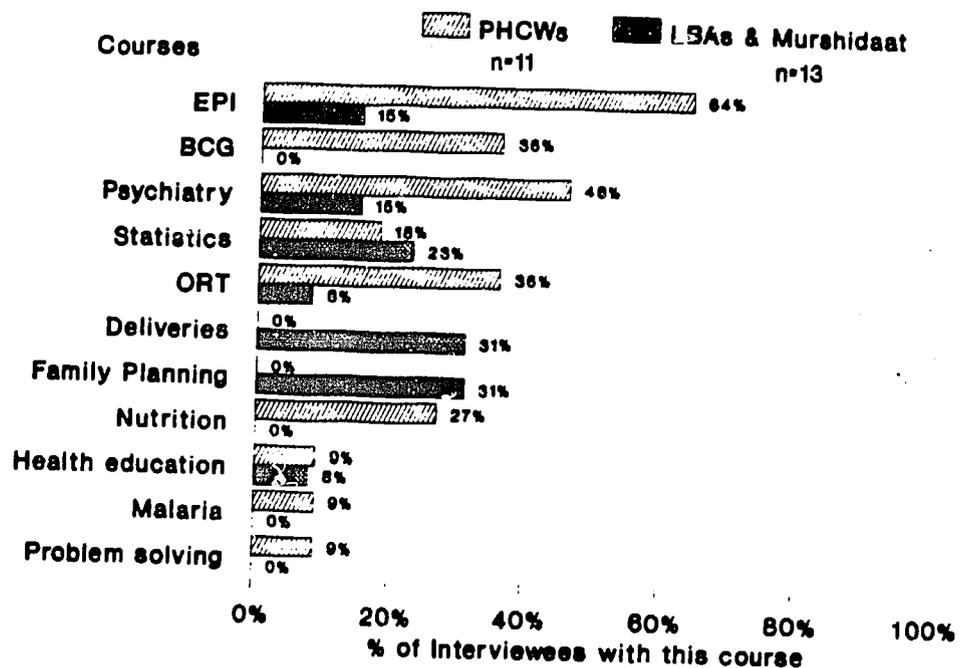
### 6.1 Manpower: PHC Staff and their Skills

The numbers of PHC staff, their geographic distribution and the average population per staff in each nahia have been discussed in Section 4. The main conclusions were that there are substantial variations in the availability of staff in different nahiaat (see Table 4), and there are not yet enough female staff. Fourteen nahiaat have neither a qualified midwife nor a female doctor, and five of these nahiaat have no trained female MCH staff at all (see Table 5). The plans to train more Murshidaat with support from the ACCS project are therefore very appropriate.

**PHCWs, Murshidaat and LBAs:** There are several findings from the assessment which should be fed into the new Murshida training courses; these have been identified in Section 5, and are summarized in the recommendations below. For male and female staff who have completed their basic training, refresher training is needed in specific areas, such as disinfecting instruments, registering and reporting, planning their use of time for home visiting and field visits, injection technique for administering vaccines, how to weigh children and monitor their growth, how to communicate sympathetically and effectively with parents. Some of these topics can best be covered by the T/S during one-to-one supervision visits. Other topics can be addressed through meetings or courses for groups of staff.

The need for refresher training varies considerably between individuals, whose knowledge, skills and performance range from praiseworthy to inadequate. The T/Ss are responsible for redressing any deficiencies of staff's basic knowledge and skill during their supervision visits. Staff skills have also been extended through in-service training and workshops, often supported by donors. PHC staff's recall of the sessions they had attended presents a wide variety of exposure to refresher training and continuing education. The subjects covered and the number of times they were mentioned during the assessment are shown in Figure 16. The average exposure to continuing education for PHCWs, LBAs and Murshidaat was two sessions (ranging from one day to one week) since they qualified. Taking into account the number of years worked, these PHC staff have attended one training session every three years since they qualified. Table 10 is based on the people interviewed during the assessment, and indicates that the staff trained during the Tihama and Hodeida Urban PHC Projects recalled twice as much continuing education as staff trained in Zabid.

Figure 16 Continuing Education for PHCWs, Murshidaat and LBAs



The staff's own list of topics on which they would like more training includes MCH (mentioned 5 times), difficult deliveries (4 female staff), family planning (2 male staff), diseases and their drug treatments (2), and a general refresher (mentioned by four Murshidaat who qualified last year). Nutrition education, health education and communication skills, statistics and a new approach for public health were each mentioned once.

Table 10 In-Service Training and Workshops attended since Qualifying, by Cadre and Location

|                   | Number of Staff | Courses per Person | Courses/ year worked | TPHCP and HUP |                            | Zabid |                            |
|-------------------|-----------------|--------------------|----------------------|---------------|----------------------------|-------|----------------------------|
|                   |                 |                    |                      | Staff         | Courses/ year <sup>a</sup> | Staff | Courses/ year <sup>a</sup> |
| PHCWs             | 11              | 2.8                | 0.36                 | 6             | 0.48                       | 5     | 0.24                       |
| LBAs & Murshidaat | 13              | 1.3                | 0.33                 | 7             | 0.42 <sup>b</sup>          | 6     | 0.13 <sup>c</sup>          |
| Total             | 24              | 2.0                | 0.35                 | 13            | 0.45                       | 11    | 0.21                       |

- Courses attended per person per year worked since qualifying.
- Murshidaat in the Hodeida Urban Project have attended considerably more courses than rural based Murshidaat and LBAs.
- Five Murshidaat who qualified 2 years ago had not attended any course, but meet their T/Ss at Zabid Health Centre every month.

**Trainers and Supervisors:** All T/Ss have attended the HMI's six week course in Sana'a, which was first held in 1981. The male T/Ss worked as nurses before they attended this course, and female T/Ss in Hodeida Governorate include midwives and community nurses. Since the initial HMI course, the T/Ss have attended a wide variety of workshops, short courses and study tours, some of which have been in other countries. Their exposure to continuing education as trainers and supervisors depends upon the length of time they have been working in the governorate, and the project which covered (or still covers) their area.

From the interviews conducted with T/Ss it was clear that this cadre's knowledge and performance varies considerably. Those with the best grasp of PHC concepts came from a background in paediatrics and community health. The extensive supplementary training (eg an extra nine weeks on management and supervision of PHC, and statistics) indicates that the initial six week training did not give T/Ss sufficient skills to carry out their responsibilities. We also found that some foreign trainers had not been sufficiently orientated to the Yemeni environment nor integrated with the PHC system.

**Curative Staff at Curative Units:** Very little is known about the contribution of these nurses and doctors to primary health care, as the systems for reporting, supervision and monitoring are relatively undeveloped. From payroll data we have calculated that the average salary cost of one foreign staff member at a curative unit is 5,160 Rials per month (net of tax), which is three times more than the salary cost of a PHCW or Murshida.

**Health Centre staff:** Both the number and the cadres of staff at health centres vary considerably; some HC directors are physicians, others are T/Ss or nurses. The Health Manpower Projection Technical Committee will be enumerating these facilities in detail.

The knowledge and skills of some of the PHCWs and Murshidaat posted to health centres compare favourably with the way some nurses were handling vaccine, record keeping and disinfecting their instruments.

**Reference Materials:** PHC staff and T/Ss were asked what reference manuals or books they had, whether they used them, and what additional references they would like. We expected that everyone would have the PHCWs' Reference Manual and "Where there is no Doctor".

- Almost half of the literate staff (8/17) did not have "Where there is no Doctor"; 3 copies had been lost, stolen or taken back by the Health Office. Of the 9 who had a copy, all but one said they used it and it was useful.
- 5 staff had the PHCW/Murshida manual, but only 2 said it was useful.
- 6 staff had an EPI booklet (blue); several said they knew everything in it so they no longer used it, but we found later in the interview that some who had the booklet did not know correct procedures for handling vaccine or the schedule for TT.

- Five other reference materials were each mentioned once: "The Art of Delivery," "Child to Child," ORT, health education, and a PHC booklet from Sudan.
- The T/Ss who were interviewed all had "Where there is no Doctor" and found it useful. Two had "Teaching for Better Learning" but only one found it useful. One had the PHCW manual and did not find it useful. All the T/Ss said that PHCWs needed "Where there is no Doctor."
- One foreign midwife who has been training LBAs, jiddaat and Murshidaat in Yemen for eight years said that she was originally given the PHCW manual but its coverage of maternal health was too thin to use as a trainer's guide. Therefore she has been using her own reference materials.

The additional references wanted by PHCWs and Murshidaat included the whole range of topics that they are supposed to learn during training. Subjects included guidelines for diarrhoea, how to protect the child from diseases, MCH, malnutrition and nutrition education, epidemic diseases (including pertussis and measles), and first aid. This list suggests that some PHCWs and Murshidaat feel the need for more knowledge to carry out their basic responsibilities properly.

The topic requested most often was some kind of manual on drugs: pharmaceutical treatments for specific diseases, cures for infectious diseases, and a drug reference. Some PHCWs said that people who have got drugs from a private practitioner ask the PHCW to explain how they should take the drugs, which may be brand names with multiple ingredients.

### Recommendations

Basic training provides the opportunity for preparing PHCWs and Murshidaat to carry out their work competently. Ineffectual trainers waste this precious opportunity, and poorly prepared trainers misinform their students. Some of the best trainers have been promoted to positions of administrative responsibility which leaves them little time for classroom contact. Their routine administrative chores should be delegated to clerical staff, to allow the Health Office to gain the greatest advantage from its best trainers.

Selection of trainers should take into consideration prior work experience. The six-week course for T/S candidates needs to be reviewed and updated; it is proposed that a working group be formed to carry out the review and recommend modifications. The group should include T/Ss, from several governorates, with field experience of implementing the training and supervision of PHC.

The PHCW Manual was prepared in 1980-81 and needs updating, to take account of new PHC guidelines (eg WHO's recommendations on sterilizing equipment) and developments in Yemen's PHC policies (eg the immunization schedule). The section on maternal care needs to be updated to cater for the cadre of literate female health facilitators. It is proposed that a working group of experienced practitioners with field experience should be involved in this task, and that drafts of the revised manual be

## Recommendations (continued)

field tested on trainees and experienced PHC field staff. Sufficient copies of the revised manual should be distributed for every T/S, trainee, PHCW and Murshida to have one.

All staff should also have "Where there is No Doctor," thus allowing the PHCW Manual to concentrate on aspects of PHC which are specific to Yemen. After the first copy is distributed free, arrangements should be made for staff to replace lost copies at their own expense; the constraint is not the money (they buy drug references already) but the difficulty of finding the book in a private bookshop.

Reference materials on drugs are needed as PHC staff are asked to advise people who have bought treatments prescribed by private practitioners. The Problem Drugs kit available from the Arab Resource Collective should be reviewed to assess whether it is suitable for use by PHC staff.

The general consensus on the quality of Murshida training is that more emphasis should be given to practical training, to reinforce students' theoretical knowledge. There is an understandable tendency to concentrate on maternal health; but if Murshidaat are to function solo in villages, then they must be fully trained in growth monitoring and public health tasks, as well as curative care. The skill of effective communication with parents also needs to be acquired; role models could be found among the experienced PHC staff (male and female), in both rural and urban areas.

The plan is to establish MCH training centres at Marawa'a and Hais. The volume of MCH services at these health centres is very low at present, so a strategy must be developed to encourage more women and young children to use these facilities and provide enough patients on whom the trainees can practice. The experience from the Hodeida Urban Project (eg house-to-house visiting and referring eligibles to the clinic) could be used in developing this strategy for Marawa'a and Hais, and extended to other large rural towns.

The female T/Ss trained under the Tihama PHC project in nutrition and child care are underutilized at present. In August, plans were drawn up for reactivating their supervision of rural Murshidaat and LBAs. If they could also assist with supervision of the Urban Project's field visits, this would create a good foundation for developing the strategy for urban PHC in the large towns of the governorate. These staff's skills and experience should be fully utilized in the forthcoming training of Murshidaat. If this requires them to relocate temporarily to the new training centres, appropriate allowances for housing and transport should be made. Donor support of local qualified staff is recommended, as it will contribute more to establishing a permanent female training and supervision capability than hiring temporary trainers who have no continuity in the PHC system.

It is recommended that the training cohorts be kept small, and rotated through different sites. Thus after the initial period of theoretical work in the classroom, students could rotate through a busy MCH centre (Tahreer), see house-to-house visiting (from Ghuleil and Muqtaribeen), and gain experience of normal deliveries at Zabid. If each group is small, the trainees will cause less disruption and have greater exposure to practical activities, so the quality of their training will be better. The Tihama PHC Project used a schedule of staggered training, in which a new group of 6-8 trainees started the course every three months. This reduces the bottlenecks of activity which strain the available resources.

A well defined career path for female staff who have trained as Murshidaat needs to be established. Those with good work experience but less formal schooling should not be excluded from further training to upgrade their skills (eg in midwifery and supervision).

Refresher training to review and remind staff of what they should already know, and continuing education covering new material should help to improve the quality of care. The Health Office needs an Information System to keep track of the dates and subjects of courses, participants and trainers. The 1990 assessment, this assessment, the T/Ss' observations and the Statistics Department's analysis of monthly reports should all be used for identifying the topics on which in-service training is needed, and which individuals need to improve their skills in particular areas. Staff at the Health Office can determine their training priorities and can decide the most effective and efficient strategy for each topic: T/S one-to-one with the PHC staff at the Unit, or a meeting at the Supervising HC, or a more formal session at the Training Health Centre or Health Office.

Ideally all staff should have the opportunity for in-service training on a regular basis (eg one session per year), but this must be governed by the resources available. It is important not to neglect staff whose skills are already satisfactory, whose motivation would be boosted by continuing education.

When in-service training sessions which introduce new material or new procedures are held, reference materials and hand-outs should be prepared in advance so that the participants can take accurate information away with them. There should be enough copies of reference materials for every participant.

A systematic record (with signatures and dates) of material that has been distributed needs to be kept, as we found that most of the manuals prepared under the Tihama PHC Project and reportedly delivered to PHC Units had disappeared without trace.

A strategy needs to be developed for orientating curative staff at health centres and all foreign staff to PHC priorities and policies in Yemen. These staff's training is usually in facility based curative care, and they need an understanding of the contribution of environmental factors and prevention so that their advice and treatments complement and support the work of PHCWs and Murshidaat, especially when treating diarrhoea.

## 6.2 Buildings

A great variety of buildings are used as PHC facilities. Health centre buildings include the old 5-room design (eg Mansuria), the new design with 8 rooms (Marawa'a and el Qotai'), the 12-room layout around a central corridor (found at Tahreer and Zabid), the 20-bed rural hospital building (Zohra, Bait al Faqih and Hais), and buildings designed around a central courtyard (eg Ghuleil and Zaidia). For PHC Units there has been a standard design since 1980-1981 (see Figure 18); 25% of units have been built in this layout, and another 6% have permanent buildings, mostly constructed by the LCCD. Seven out of ten units are in temporary buildings, either rented or free of charge; 10% are run entirely from the health worker's home. This figure understates the level of home-based PHC, as we know of six places where the female staff work from home rather than at the official PHC Unit.

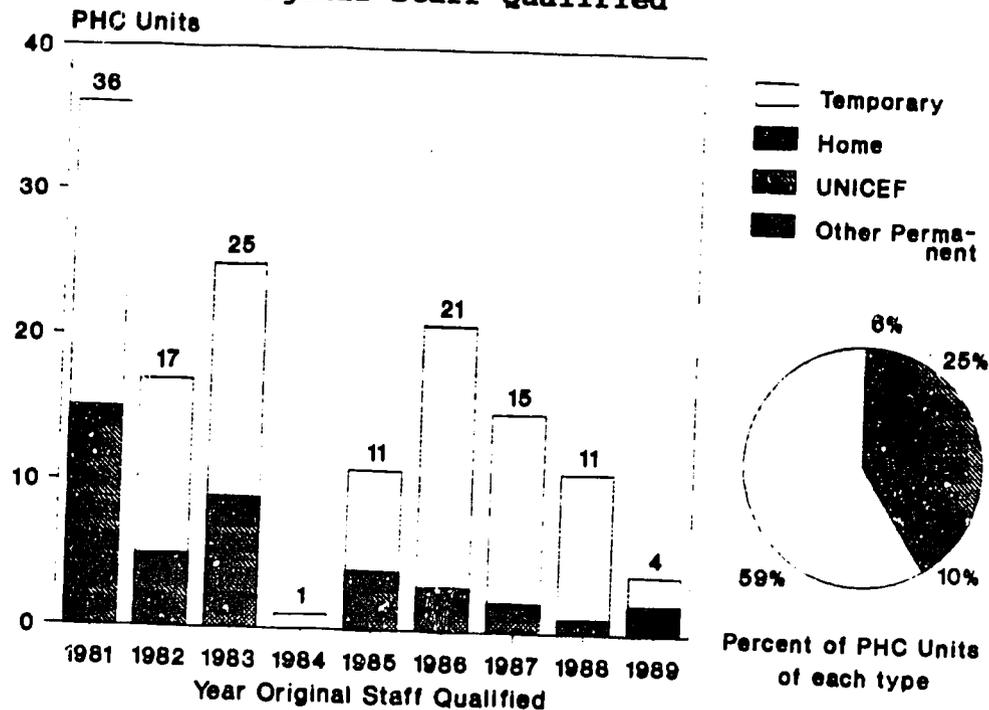
Geographic equity in the distribution of construction resources has been considered by calculating the population per permanent structure. Using three different weighting factors for health centres (1, 5 and 10) and counting PHC Units only if their construction used government funds, there are eleven nahiaat with fewer permanent facilities per population than the average. Bura' and Mighlaf have no permanent HCs or PHC Units, and there are fewer than the average in Hajaila, Jebel Ras, Munira, Bait al Faqih, Zohra, Zaidia, Zabid, Marawa'a and Sukhna. The Health Office's plans to convert the PHC Units to health centres in 'Obaal (Hajaila) and Munira, and possibly Qahara (Jebel Ras), will increase equity in the distribution of construction resources.

All of the permanent PHC Units in the official design (known as the UNICEF design) are in villages where the original staff qualified before 1985. Self-help and community-funded construction began with the cohort which qualified in 1983 (see Figure 17).

Recent data on actual construction costs of the UNICEF design for a PHC Unit are thus not available. Suppose that in the early 1980s one building (48½ square metres) cost about 150,000 Rials, exclusive of the land which was donated by the community. To estimate an annualized cost this amount should be amortized over its useful life (say 25 years) at a positive rate of interest (12% is the rate now recommended by the World Bank). The amortization formula gives an figure of 19,125 Rials per year. Thus the permanent PHC Units represent a very large share of PHC resources.

To keep this investment in good working order, preventive maintenance and repairs are needed. Eight of the units visited were the UNICEF design; one FHCW had spent 300 Rials to mend the door handle and lock, another spent 350 Rials to repair a window and shutters smashed by thieves (who took the generator). But these figures understate the amount that should be spent on maintenance; six of these eight permanent units needed repairs, mostly to doors and windows, and only one had running water on the day of our visit. Several PHCWs no longer spend money to get their units repaired because they were not reimbursed for past repairs. They had contacted the Health Office, the LCCD, and/or their supervisor, and it was not clear who should pay.

Figure 17 Type of PHC Unit Building, according to the Year when the Original Staff Qualified

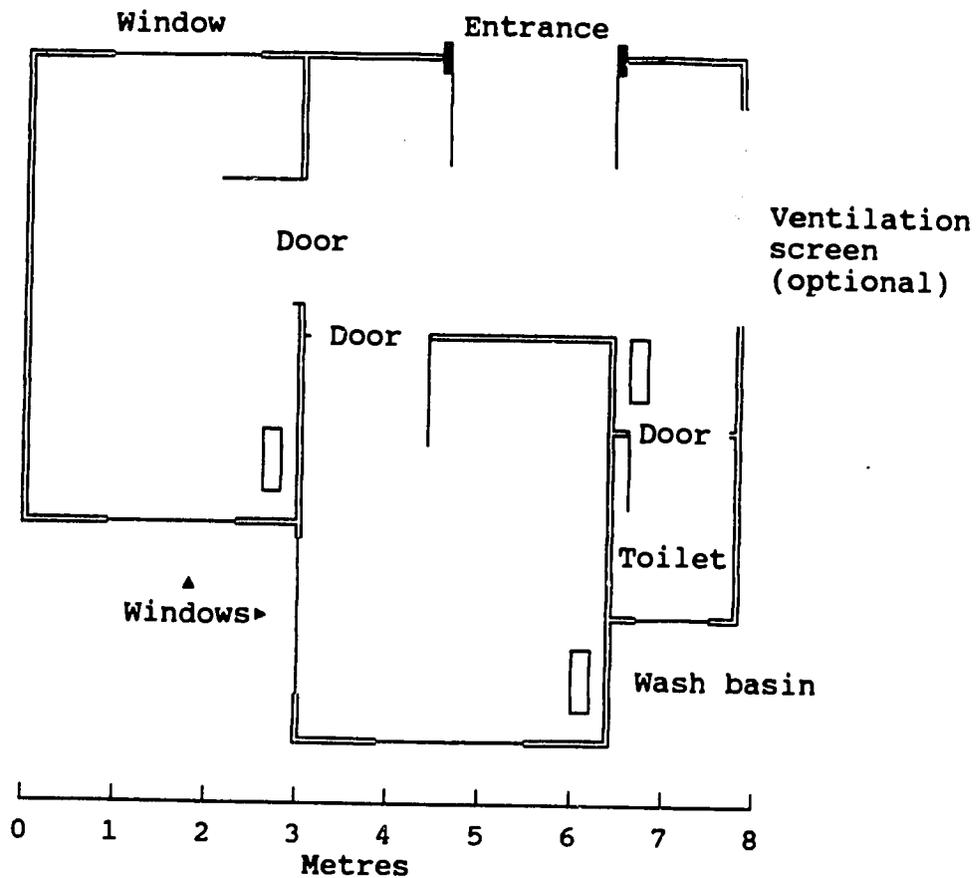


Maintenance expenditure on the temporary units appears to be higher, partly because if the staff had moved buildings, they sometimes had to install water and electricity and paint the rooms. (At two of the six temporary units in our sample, staff were in their third building since starting work.) Another reason why more may be spent to maintain a rented building (or a room at home) is that the landlord is obliged to pay for repairs, and the owner has an interest in keeping the property in good order.

Construction costs for health centres were not examined but must vary enormously, according to the size of the building and quality of the materials. Recently all of the wooden doors in Hais health centre had to be replaced as the termites had destroyed them. Minor repairs at these facilities are covered from the quarterly running costs (see Section 6.6). The design of health centres is quite good, but the use of space in some (eg el Qotai') needs to be changed to improve patient flow and privacy for women.

Use of facilities is greatly influenced by whether people find them accessible. Units located in the suq or next to the school are inaccessible even to the female health workers (eg Mo'ataradh, al Lawia, Zareeba). Where location is not a problem, female staff do not use the official building because its layout does not give their clients enough privacy. The design shown in Figure 18 has been criticised since it was adopted, and in 1982-3 the UNICEF Representative asked an architect and health planner who had been a member of the 1982 EPP Review Team (Anthony Battersby) to propose a more suitable design, but no action has been taken. The problems with the layout are summarized below.

Figure 18. Layout of the Permanent PHC Unit (approx 50 sq.m)



- Poor flow: those waiting to be seen and those leaving all have to cross the same space. At busy immunization sessions it has been observed that children are sometimes registered but they do not receive all the doses recorded on their card.
- Waiting area is not user-friendly: the outside door is locked so if the health staff are delayed, there is no shaded area where the people can sit and wait. We have not seen any fences around the unit to provide a windbreak and to discourage dogs.
- Inadequate protection from sun, wind and dust: the natural lighting is good but the windows are too wide and too low with no overhanging lintel to provide shade. It was observed that a vaccine carrier used during an immunization session was placed in direct sunlight coming through the window. We sometimes had to close the shutters against sand blowing into the room.
- No privacy: neither women nor some female health staff feel comfortable using this unit as the arrangement of the waiting area and rooms affords them no privacy. Windows are large and at hip height, and people outside can easily look in.
- Lack of storage space: the unused equipment (eg the stretcher, delivery bed, bassinet and generator) are typically stored in one of the rooms (sometimes locked and never used for patients) or in the toilet (usually unused because there is no water).
- Bad layout: construction is made more costly by the building's unnecessarily complex design. The two corners (lower left and lower right of Figure 18) were being used as public lavatories in three of the sites visited; one aakil was very upset about this and brought it to the attention of the assessment team.

The recommendations contain a check list of objectives that should be met in the design of a PHC Unit. For the 75% of staff without a permanent facility, the lack of an official unit is frequently named as their biggest problem (eg by four out of five in the assessment). However, given the construction cost of permanent units, many will continue to be rented, and some will be built by the LCCD or by the health worker himself or herself. At present there is no checklist of points for health staff to consider when discussing sites and designs of rented or self-constructed units.

### Recommendations

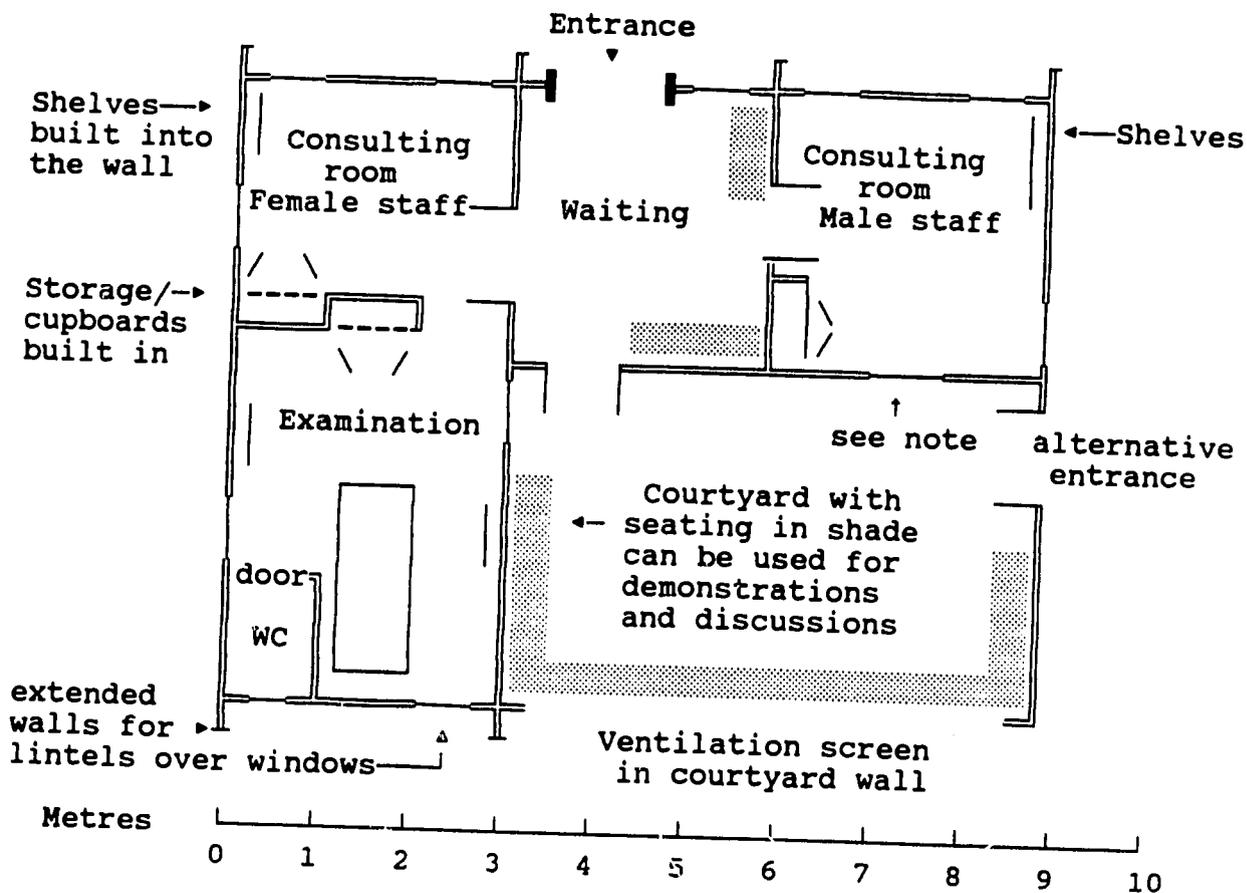
A new design for the permanent PHC Unit should be developed, meeting the following requirements:

- a shaded waiting area which is accessible when the rooms are locked
  - good patient flow, especially for MCH (women and children) who will come in large numbers for monthly clinics (such as immunization)
  - two consultation rooms, and one examination room with toilet
  - privacy for women, achieved by separating male and female entrance/exit, waiting areas and consulting rooms, giving access to the toilet from the examination room, and placing windows high enough in the wall (making curtains unnecessary)
  - cross ventilation and natural lighting through several smaller windows (which are also cheaper to build)
  - minimizing heat, glare and dust through smaller windows shaded by overhanging lintels and/or the thickness of the walls
  - appropriate orientation of the building to minimize solar gain through windows (which should therefore face north and south) and to utilize prevailing winds for ventilation
  - adequate storage space, including built in shelves in the rooms and seating in the waiting area (as in Zabid)
  - a design which enables the building to function effectively without electricity, as power supply is often not available
  - a design which lends itself to utilizing local building technology and traditional building skill
  - a building which blends naturally with its surroundings by respecting local traditions (eg materials, roof style)
- Costs will be reduced by using a grid system (simpler to construct), by optimizing use of common walls, and smaller windows. (Two floor plans are shown in Figures 19 and 20.)

Much greater emphasis should be given to providing a reliable water supply at permanent health facilities. In some countries these buildings have a handpump or other water source in their compound thus emphasizing the place of safe water in public health. The need for water should be a prime consideration when choosing a site for new construction and rental buildings.

Health facilities must be accessible to the target groups for primary health care, namely women and small children. This point must be emphasized in discussions with the people who choose sites for PHC Units or health centres. Members of the community should not expect that women will always be visited at home by health staff. Women should be the most frequent users of the PHC Unit, so their views about accessibility must be sought.

**Figure 19 Floor Plan of Sub-Health Centre for Madhya Pradesh, India (approx. 50 sq.m. including courtyard)**



Note: Putting a door here would improve the flow of patients.

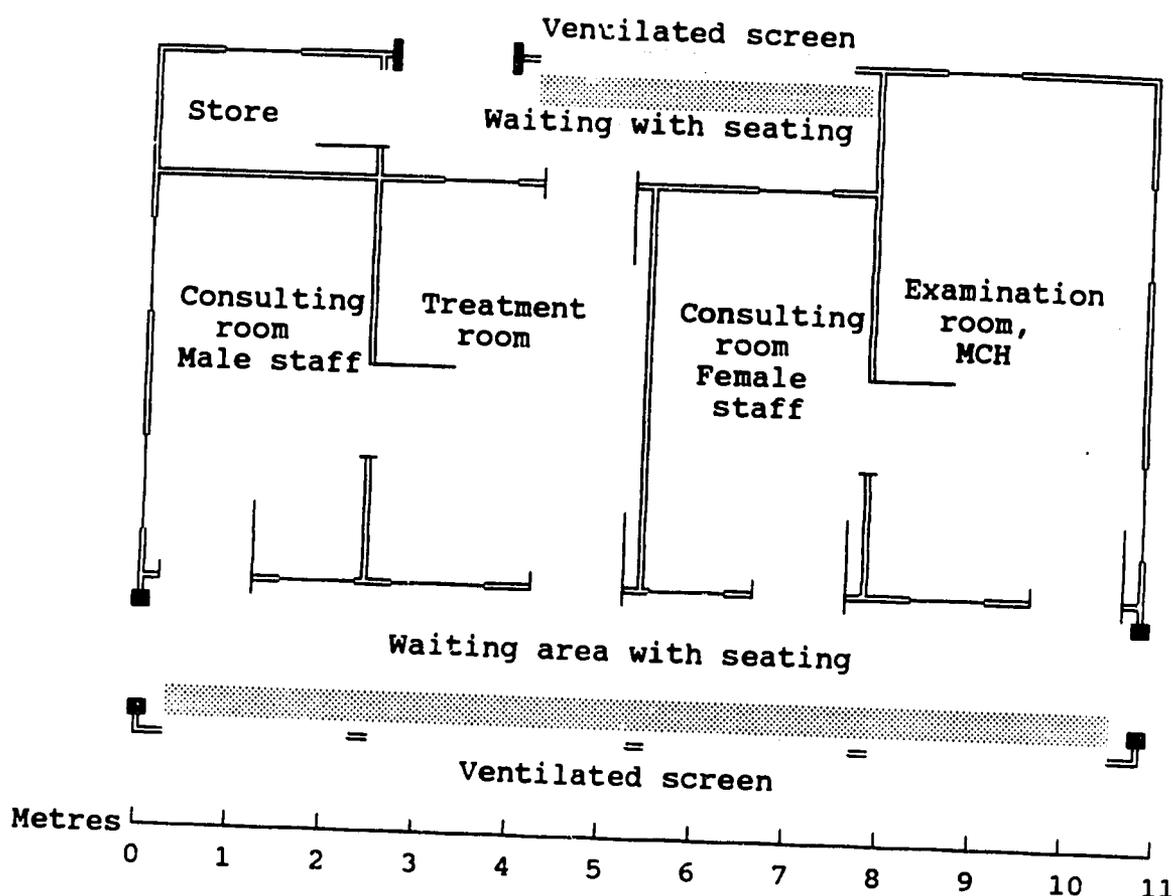
From Participatory Planning for Rural Health Facilities.  
Danida, New Delhi: 1985.

### Recommendations (continued)

As 70% of PHC Units are in "temporary" buildings, there should be clear guidelines summarizing the requirements of the units (eg accessibility for target groups, water). We do not suggest that these guidelines become rigid however, as one of the most active PHC Units visited in the assessment was a single rented room in the middle of the village used by both male and female staff, with a screened examination couch.

The establishment of PHC Units in the homes of health staff may be the best solution in some circumstances, but needs to be monitored, with the help of community leaders, to ensure that no-one feels excluded from access to care by this arrangement.

Figure 20 Floor Plan of Rural Dispensary in Mbinga, Tanzania (approx. 80 sq.m.)



Note: This layout is much larger than the present PHC Unit; if the treatment room were removed and the male staff's consulting room were slightly bigger, the size would be about 60 sq m. A toilet could be fitted into the MCH examination room.

From Tanzania EPI Joint Review Report, MOH and Danida, 1987.

#### Recommendations (continued)

The environment surrounding all health facilities should provide a model for health promotion. Drainage systems for toilets must work, waste water must be properly disposed of (eg into a nutrition garden or shade trees), and a perimeter fence would cut down on dust and create a more sheltered and welcoming impression (all houses and most schools in the Tihama have fences or walls around them).

An incinerator should be placed at a suitable point inside the compound of every facility, making sure that its smoke will not blow into the building. Used syringes and dressings can then be properly disposed of. Judging by our visits, this aspect of environmental sanitation is low on most Health Centre Directors' list of priorities, so it may be necessary to make available suitable incinerators (eg 40 gallon oil drums with holes punched in the bottom) and supervise their installation and use.

The responsibility for maintenance of buildings needs to be clarified. Clear guidelines for Health Centre Directors are needed specifying the extent to which they should use their quarterly running costs for repairs and maintenance. Some Health Centre Directors whose buildings need repair (eg the door off its hinges at Mansuria) never collect this money from the Health Office. If PHC Units' building maintenance is a community responsibility, it will require a sensitive approach as some communities may consider that they have already contributed enough to PHC. If the Health Office is responsible, then resources must be budgeted to cover repairs and preventive maintenance, which should be carried out on a regular schedule.

The use of space at some health centres (eg el Qotai') needs to be changed to improve patient flow, reduce confusion and provide more privacy for women patients. Health Office supervisors should instigate these changes.

### 6.3 Equipment

PHC Units' first set of medical equipment is procured through UNICEF, and most of the furniture (cupboards, shelves, benches, some examining couches) are procured locally. EPI equipment (cold boxes, vaccine carriers, refrigerators) has been supplied separately through the national EPI programme.

The 1990 list of equipment from UNICEF is shown in Appendix D.7; it contains 69 items and cost \$1,091.88 per unit. This list differs slightly from one prepared by Hodeida Health Office (see the notes in Appendix D.7). Some items which were supplied to units in the past (eg baby bassinet) are not on either of these lists. The revision of the standard list to items used by male workers will avoid wastage of resources; we saw several sets of equipment for maternal care that had not been used in the ten years since they were issued to a PHC Unit staffed by a male worker.

The Health Office list shows three items that only female staff would be likely to use (breast pump, nipple shield and obstetric sutures). Most of the equipment for antenatal care and deliveries is supplied separately in the Murshida's kit, which includes a binaural stethoscope and 2ml syringes plus needles, and looks like the professional midwife kit in the 1990 UNICEF Warehouse Catalogue (see Appendix 5 for reference). The LBA's equipment is less extensive but includes a test kit for albumen, an irrigator and catheters, making it much more sophisticated than a TBA kit.

The UNICEF equipment list has some peculiarities; for example the disinfectant is so long (430mm) that it is virtually impossible to balance it on the single-burner kerosene stove for disinfecting instruments. The Health Office list includes a three-burner butane stove, which is wide enough to support the disinfectant safely. The infant scales in the UNICEF list are a non-portable table-top model which are only suitable for babies before they can walk, or ages up to 12-15 months. If these were the only scales

provided to PHC staff, it would not be possible to monitor children's growth through the weaning period. The Health Office list specifies a portable scale which goes up to 25kg, which is more than adequate for monitoring growth of children up to 5 years of age (see the upper line in Figure 8).

Health office staff have encountered considerable difficulties when they wanted to reassign equipment from one facility to another. For example a refrigerator or microscope is regarded as a status symbol for the facility and staff or community leaders have sometimes been unwilling to release equipment even though there is no-one technically qualified to use it at that facility.

The useful lifetime of equipment varies from item to item. During the assessment we found some equipment was not working because a part needed to be replaced (eg the pipe on the butane stove), and other items had broken during 10 years of use (eg forceps for dressings). PHC staff report when their equipment cannot be used but as yet there is no reliable system for repairing or replacing broken items.

### Recommendations

The equipment list for PHC Units should be reviewed, identifying any items which should be provided for units with a female health worker in addition to her midwifery kit. This should be done with reference to the health workers' tasks (eg weighing children from birth to 3 years, disinfecting equipment) to make sure that the combination of selected models makes sense for the PHC strategy. Specifications and catalogue numbers can be checked and revised more easily if the equipment list is put into a computer spreadsheet (in Arabic).

If PHC policy requires instruments to be sterilized, rather than simply disinfected (see Appendix D.6), then new equipment will be needed (eg steam sterilizers). The models should be chosen with reference to PHC tasks (eg the number of people attending a clinic).

T/Ss or the staff responsible for repairing medical equipment should be issued with an equipment check list (see Figure 2) on which they can mark (one sheet per facility) whether items are:

- not available
- available but not working and beyond economic repair
- available, not working but repairable (specifying replacement parts needed)
- available and in working order (checking at the same time if the health staff know how to use it correctly).

This list will allow the Health Office to identify surplus equipment (eg delivery beds where there are no female staff) which could be moved to facilities which need it. It will also provide the basis for estimating the cost of repairing or replacing equipment. It may be necessary to set priorities determining which items will be replaced first within the budget constraints. This could be done on the basis of PHC priorities, or cost.

A clear procedure for reporting, repairing and replacing broken equipment needs to be drawn up, circulated to supervisors and staff, and implemented. Reports of breakages or losses should always be recorded in the Duplicate Book at the PHC Unit and noted and followed up in the Health Office. This would increase the staff's morale by demonstrating a response to their needs.

As part of this procedure, guidelines for reallocating assigned equipment should be established so that unused items can be moved to facilities where they can be properly used.

The aluminium box provided for the Murshida kit is too small to hold the contents conveniently (i.e. for quick access during a home delivery). Repacking the kit is like doing a three-dimensional jigsaw puzzle. Consideration should be given to supplying an additional canvas bag with internal pouches for holding the items which the Murshida uses during deliveries.

#### 6.4 Vehicles and Transportation

Staff from the Health Office, Training Health Centres and Supervising Health Centres all require 4-wheel drive transport to enable supervisors and supplies to move around the governorate. The vehicle fleet is mixed, and includes Toyotas (3 models), Nissan Patrols, Daihatsus and Suzukis. Some of these have been provided as part of donor support for PHC projects, and others came from the National EPI Project, funded by UNICEF. Other health centres use personal or public transport for visiting the Health Office on official business.

The assessment did not undertake a complete inventory of vehicles, but we were made aware of the present difficulties constraining staff movements:

- Some vehicles procured for use by PHC projects are no longer available for use by the Hodeida Health Office; the newest models are reported to have been requisitioned for use in Sana'a.
- Some of the vehicles in Hodeida have been requisitioned for the sole use of senior staff.
- The vehicles available for supervision and resupply have mostly outlived their expected useful life. For example the Toyota Saloon used by the assessment team was seven years old and had 190,000 km on the clock, and required large expenditures on replacements (tyres, battery) and repairs to make it roadworthy.
- Vehicles at facilities which supervise and supply PHC Units were in several cases even older, and in need of repairs and tyres.

The inventory being conducted by the ACCS Project will provide a full list of vehicles and their condition (beyond economic repair, or repairable, with estimated cost of repairs).

The difficulty of keeping the vehicle fleet in roadworthy condition is partly due to budgetary constraints; there has not been sufficient funding to purchase fast moving spare parts and to

pay for essential repairs. However the cost of repairs is almost certainly higher than it would be if regular preventive maintenance had been carried out. The maintenance system established at the outset of the Tihama PHC Project was never incorporated into the Health Office's policies for vehicle use, and came to an end when the local hire staff in charge of transport left the health system at the end of that project.

All of the vehicles assigned to projects with resident expatriate staff have travel logs which must be filled out by the driver every time the vehicle is used. Date, starting point and destination, time of departure and arrival, and fuel or oil are recorded in the log. If there is a gap in the record (i.e. the present odometer reading does not match the last entry in the log), the new driver must make a note of the fact. The vehicles in the Health Office fleet do not have these travel logs.

At the time of the assessment, none of the Health Office vehicles was insured. Considering (a) the shaky condition of the vehicles, (b) the lack of controls over vehicle use (especially out of working hours), and (c) poor driving skills among the general public, insurance would seem to be essential rather than discretionary.

PHCWs were issued with motorbikes (150cc) but many of these are no longer working. Of the units visited during the assessment,

- one quarter had working motorbikes
- one quarter had motorbikes which were not working
- one quarter had sent their broken motorbikes back to the Health Office or nearest repair shop
- one quarter had never had transport; these were two units with female staff and one unit where the present PHCW had replaced the original person.

Lack of transport was given as one of the biggest problems with their work by the all the staff who had never had transport. At least two of the staff interviewed had their own vehicles which they used for visiting other villages in their catchment areas.

The motorbike's useful life was 4½ years for four that had stopped working and 7 years for three that were still running. The distance travelled per month could not be checked from the odometers because they had stopped working, but kilometrage was reported to be about 300km per month. Running costs were reported to be 300 Rials to 500 Rials per month, but one PHCW who commuted from his home town to his catchment area said that his monthly running costs were 1,200 Rials. Six PHCWs told us what had been spent on repairing their machines (often for the last repair rather than total expenditure since they first got the motorbike) and the average was 2,450 Rials. Sometimes the LCCD had paid for repairs, but usually the PHCW paid himself.

Female staff have not been given any means of transportation (except for an LBA in Hajaila who unsuccessfully tried using a donkey to reach her clients).

## Recommendations

A policy for procurement and replacement of vehicles and motorbikes should be developed. In some health systems, cars are expected to run for 7 years of hard but careful use after which they will be replaced. Alternatively they can be run for a shorter time (say 5 years) and sold locally, the proceeds being used towards the purchase of replacement vehicles. This policy avoids the problem of having to spend ever increasing amounts of precious resources on patching up vehicles which have exceeded their useful life (ie they are beyond economic repair).

Both of these systems depend upon regular preventive maintenance to keep vehicles roadworthy and to identify problems before they become more expensive to repair. It is recommended that the procedures established during the Tihama PHC Project for daily and periodic maintenance be reactivated. They are described in the Reference Manual for the Vehicle Maintenance System of the TPHCP, March 1987, which is available in the files at USAID under Project 279-0065, Section 1.

An integral part of the maintenance system is the policy for use of vehicles, which should be followed by everyone who uses Health Office vehicles. A copy of the TPHCP vehicle use policy is shown in Appendix D.8. In particular, users must fill out the travel logs which are the basis for monitoring the distance travelled, which has immediate cost implications for fuel consumption and long term implications for the vehicle's useful life. For example if half of the mileage consists of personal use, the useful life of the vehicle is effectively halved, which means that the cost of fleet replacement is doubled. The travel log also provides the basic documentation for scheduling and monitoring preventive maintenance such as changing the oil and rotating and replacing tyres.

The recommendations for planning T/S visits to PHC Units for supervision and delivering supplies (including vaccine) depend upon establishing and keeping managerial control of vehicle use. In some health systems (eg EPI in Tanzania) staff lose the vehicle assigned to them if they abuse this precious resource (eg by exceeding the mileage they have submitted in their plans - see Figures 13 and 14), and have to travel by other means.

If the Health Office wishes PHCWs and Murshidaat to cover their entire catchment areas, strategies for their transportation should be developed. Issues to be resolved include:

- Is the motorbike an essential item of PHC Unit equipment?
  - If so, who will pay for regular replacements?
  - who will pay for running costs and repairs?
- If staff provide their own means of transport, what is the Health Office view about how this transport is paid for?
- How can communities contribute to transportation costs? For example if the people attend clinics or outreach points, the need for travel by PHC staff is reduced.
- How are female staff expected to move around their catchment area?

## 6.5 Supplies of Consumables

Consumables include drugs, vaccines, dressings and other medical supplies, Butagas, cleaning materials and stationery. In this section we discuss the quantities of consumables found during the assessment, and the systems for supplying them and monitoring their use.

**Drugs.** During the Tihama PHC Project the PHCWs' drug list contained 47 items, all generic. The present essential drugs kit contains about 20 items, including some branded products. Current drug stocks for selected items were counted at the PHC Units visited during the assessment, and supply dates noted (see page 16 of the PHC Unit Questionnaire). If a drug was stocked out, we asked when it had gone out of stock. By comparing the last delivery date, stock-out dates, current stock levels and number of patients for selected diseases, we assessed the adequacy of drug supplies. Section 5.6 presented a comparison of the drugs available at the PHC Unit with the number of patients treated for five diseases (malaria, acute respiratory tract infections, diarrhoea, anaemia and eye diseases) in the last month. The assessment found that the present kit is inadequate for the PHC staff's caseload, both in the quantity of drugs supplied (eg antibiotic eye ointment, antibiotic syrup) and in the choice of drugs in the kit (eg absence of antimalarials and ergometrine). The shortages of drugs for small children (in syrup form) were particularly noted, and PHC staff mentioned that the supply of antibiotic syrup and eye ointment was used within two or three weeks of the kit's arrival. PHC staff write prescriptions for out-of-stock items, but if it is a drug which will be needed in an emergency (eg ergometrine), the staff keep it in stock by buying it themselves.

The procurement of branded products (eg Ospen) causes confusion among PHC staff who were originally trained in the use of generic drugs. (This may partly explain their interest in drug reference material.) Branded products are also more expensive. "There is no longer any question that generic drugs are significantly less expensive than their brand-name equivalents. ...not only are generic drugs significantly cheaper than equivalent brand-name drugs, but they make for good medical practice." (Financing Essential Drugs: Report of a WHO Workshop, p.7.)

The process of expanding the PHC Unit kit began during the assessment, when it was discovered that the MOPH had antimalarials (chloroquine). However no-one had been informed that chloroquine could be requested as an optional extra for kits going to areas where malaria is endemic.

It was not possible to compare our own count of the current stock with the records because stock registers are no longer kept. This lack of documentation means that there are no records indicating how long each supply of drugs lasts, thus discouraging a periodic review of whether the quantities in the kit are adequate.

During the drug inventory some staff told us that their kits had been opened before they got them. Some did not know what items and quantities they were supposed to get. Others knew that their kits had less than the designated quantities. These comments were

made in the Zabid area units, none of which had the Stock Request/ Stock Issue forms (white, with yellow duplicate page) which were found in the northern part of the governorate.

The kit is intended to last for 3 months. The most recent drug deliveries were made after an interval of 7 months, and the average interval between deliveries is more than 5 months. (We did not determine whether the binding constraint was a shortage of drugs or problems with transportation to distribute the kits.) When the stock of drugs in the kit is exhausted, patients have to travel to fill their prescriptions. Only one of the PHC Units visited had a drug store in the village ('Obaal). For the other places visited, the average round trip cost of transport to the nearest drug store is 28 Rials, ranging from 10 Rials to 90 Rials.

The T/Ss and Health Office supervisors used to be able to monitor whether the PHC staff were using drugs appropriately, by comparing the PHCW's record of each patient's symptoms and his diagnosis with the treatment chosen, all of which were written in the patient register. This type of monitoring is no longer possible because the new register does not provide a column for treatments.

**Vaccines.** The supply has been so infrequent and irregular since the end of the campaign (September 1990) that there has been very little immunization activity, and coverage levels are back to around 10%. The quantity of needles and syringes supplied is based on an assumed wastage rate for vaccine (30%) which is higher than the wastage at PHC Units' monthly immunization sessions, so PHC staff have been constrained by shortages of needles and syringes. Section 5.3 makes recommendations for improving the basis for estimating quantities required, and for making adequate budgetary provision for the complementary supplies needed (eg petrol, Butagas); see Figures 12, 13 and 14, and Table 8.

**Cleaning Materials.** In the last quarterly budget 26,180 Rials was spent on cleaning materials (soap, Chlorox, brooms, etc) which are distributed from the Health Office warehouse. Assuming that a health centre needs five times more cleaning materials than a unit (PHC or curative), the average resources for cleaning materials were 420 Rials per quarter for health centres and 84 Rials for units.

**Butagas.** This fuel is needed for the 3-burner butane stove on which the disinfectant (430mmx250mmx180mm) must be boiled. It is also needed at facilities which do not have 24-hour electricity and have refrigerators and/or freezers. An icepack freezer consumes one cylinder of Butagas every 12 days. The number of cylinders needed by facilities which supply vaccine to PHC units (in cold boxes) could be halved by concentrating all EPI deliveries into two weeks of the month. This strategy would depend upon the EPI supply system making deliveries on schedule to the supplying facility (see Figure 12).

The health centres and units visited for the assessment described their logistical difficulties in refilling the Butagas cylinders:

- El Qotai' is a town of 15,000 about 1 km from the main road, but the empty cylinders have to be taken to the depot, from where they are collected a week later. Transport for the cylinder has to be paid in each direction.
- The PHCW at Hajaila took his cylinder to Bajil (75 minutes travel time in a vehicle) and queued for two hours to get it refilled, without success. He left it with a friend in the drug store in 1989 and has not yet picked it up.

The cost of refilling a cylinder from el Qotai' is 50 Rials plus transport; Hajaila's transport to and from Bajil costs 40 Rials. Cylinders cannot be carried safely on motorbikes.

**Stationery.** The questionnaires covered two types of stationery: registers, which last for several months (eg attendance) or years (eg births and deaths) and stay at the facility; and patients' cards and reporting forms. We found a variety of stationery in use, both different printed formats for the same purpose, and notebooks and pieces of paper being used in place of stocked-out items or complete gaps (essential stationery that was never in stock). Table 11 summarizes the assessment's findings.

At PHC Units there are serious shortages of all forms except curative attendance registers and the Monthly Disease Reports. This reflects the health system's tendency to give greater attention to treatment rather than to MCH. For example none of the rural Murshidaat have a printed ANC register but have to draw up their own in notebooks, and the pictorial ANC card used by non-literate LBAs during the Tihama PHC Project has not been supplied for several years.

The assessment found that the new combined register for patients, births, deaths and field visits is resulting in enormous wastage of paper. First, mixing the functions of curative and well child health within one format (the new attendance register) requires a double page whereas in the past, the separation of these registers meant that all the necessary patient information could fit on a single page, thus enabling twice as many patients to be registered for the same quantity of printed pages. Second, the combined register has to make assumptions about the ratio of curative patients compared with births, deaths and field visits; these assumptions can be identified by referring to the number of pages allotted for each section of the register:

- for every birth (20 pages) there will be 2½ curative patients (50 pages);
- the number of field visits (20 pages) will be equal to the number of births;
- the number of deaths (10 pages) will be half the number of births.

These assumptions do not correspond to PHCWs' experience; in two units which had filled up the curative section of their combined registers we found that the empty pages for births, deaths and field visits amounted to wastage of 41% and 44% of the register. Resources would be far better used by reverting to the original concept of separate registers.

**Table 1.1 PHC Stationery found at Facilities**

|                                 | Number of Printed Formats | Health Centres (n=4) | PHC Units (n=14) |
|---------------------------------|---------------------------|----------------------|------------------|
| <b>Registers</b>                |                           |                      |                  |
| Register of Curative Attendance | (6) <sup>a</sup>          | 4                    | 14               |
| Antenatal register              | (3)                       | 4                    | 2                |
| Register of Deliveries          | ?                         | ?                    | 6                |
| Family planning register        | (2)                       | 4                    | none             |
| Child Health Register           | (2)                       | 4                    | none             |
| EPI Register                    | (1)                       | 4                    | 4 <sup>b</sup>   |
| Birth Register                  | (2) <sup>a</sup>          | 4                    | 10 <sup>c</sup>  |
| Death Register                  | (3) <sup>a</sup>          | 3                    | 9                |
| Stock Book                      | (2)                       | 1                    | 2 <sup>d</sup>   |
| Duplicate Book/Visitor's Book   | (2)                       | ?                    | 2                |
| <b>Cards and Report Forms</b>   |                           |                      |                  |
| Referral forms                  | (2)                       | 2                    | 3                |
| Antenatal cards                 | (4)                       | 3                    | 2                |
| TT cards (women)                | (3)                       | 4                    | 2                |
| Family planning cards           | ?                         | 2                    | none             |
| Road to Health cards            | (1)                       | 1                    | 2 <sup>e</sup>   |
| EPI cards (children)            | (3)                       | 4                    | 9                |
| EPI Daily Attendance (84/6)     | (1)                       | n.a.                 | 2                |
| EPI Summary of Monthly Activity | (2) <sup>f</sup>          | 4                    | 2                |
| Monthly Activity Report forms   | (1)                       | 4                    | 6 <sup>g</sup>   |
| Monthly Disease Report forms    | (1)                       | 4                    | 13               |

- a. One format combines the Curative Register, Birth Register, Death Register and Field Visit Register in one book.
- b. Two of these 4 EPI Registers were not being used.
- c. Two of these 10 Birth Registers were never used.
- d. Both of these had been given out for use as curative registers.
- e. Neither Unit was using the Road to Health cards.
- f. One format is for a rough or daily tally, the other is for the final fair copy.
- g. None of the staff trained in Zabid had this form.

Shortages combined with inappropriate formats make it harder for staff, especially at the PHC Units, to keep their records properly and to fill out their monthly reports accurately. These findings demonstrate the need for a comprehensive review of the information system (see Section 7.3). Once that review has identified the essential stationery for PHC, then the supply system will be responsible for keeping facilities stocked with registers, records and forms.

During the last quarter the Health Office expenditure for stationery (in addition to printed registers and forms from MOPH) was 30,280 Rials.

## Recommendations

The composition of the drug kit needs to be revised:-

- to include essential drugs indicated by Hodeida Governorate's profile of morbidity (eg chloroquine for treating malaria);
- to include MCH drugs (including family planning supplies) where there are staff trained to use them;
- to provide children's treatments in syrup form (especially antimalarials).

Procurement of brand-name products should be avoided; until the existing stock of brand-name products is consumed, each drug kit should contain clear identification of the generic name for every brand-name product in the kit.

The quantities supplied should be reviewed, as some items are consumed within days while others are hardly used. Larger quantities of children's treatments and eye ointment are particularly needed.

Systems for documenting the issue, receipt and use of drugs should be reestablished. Each delivery of drugs should be accompanied by an accurate list detailing the items and quantities delivered. The person receiving the delivery should record discrepancies between the issue list and the physical count. A simple stock register which shows the date of supply and the date of stock-out would provide firm information to use during a periodic review of quantities supplied.

As the planned supply interval for drugs is now three times longer than it used to be, it is especially important that deliveries are made on schedule. The logistical planning should be integrated with the T/Ss' schedule, rather than running as a separate vertical activity (see Figure 11 and Figure 12).

Procedures for obtaining drugs from the MOPH in Sana'a need to be made more transparent. The lack of communication concerning antimalarials and the absence of documentation for some supplies picked up from the MOPH by the assessment team indicate that much staff time (and fuel) could be saved if clear procedures were furnished to governorate level and followed both at the central level and by governorate staff.

The curative register should give space for recording the treatment given so that the use of drugs and the quality of care can be monitored by supervisors.

A strategy for refilling Butagas cylinders should be developed. Without this fuel the instruments used for dressings and minor surgery cannot be disinfected properly. Butagas is also essential for running many of the refrigerators and freezers for immunization activities. The strategy should cover logistics and funds for refills and transport.

When the information system is reviewed, a list of essential stationery will be specified. This must then be supplied to facilities. Other consumables such as staples and carbon paper should also be provided from the Health Office via the T/S.

## 6.6 Finance

Finance for PHC includes the funds to cover the physical resources discussed above, and other running costs, which are discussed here. In principle, the health centres have 6,000 Rials per quarter to cover incidental expenses (minor repairs, refilling Butagas); the assessment team did not make a detailed analysis of how these funds are used. However we did find considerable variation in the health centres' running costs:

- Five rural HCs and two urban HCs do not get any quarterly funds for running costs from the Health Office. The Finance Department said that their directors do not ask for these funds.
- The average amount received for running costs last quarter at 14 rural HCs was 3,690 Rials, ranging from 800 Rials to 7,110 Rials. This excludes Bajil Central (which used to be funded from Kuwait) and Zabid THC which for the past ten years has received, direct from MOPH, the same amount per quarter as al Thowra Hospital. (Zabid's money may also be used for three health centres which do not collect from the Health Office: Gerahi, Jebel Ras and Khowkha. However, Hais collects its allowance for running costs, so the administrative arrangements are unclear.)
- The average amount last quarter for urban HCs was 5,390 Rials. This is distributed in three line items: staff bonuses and incentives, petrol oil and lubricant, and other running costs. The actual distribution between the urban HCs is not known.

The assessment did not include a financial analysis of the PHC budget, or of the share of total health budget directed into PHC compared with inpatient services and special clinics. The increasing responsibility for financial management which will accompany decentralization provides the Health Office with the opportunity to introduce greater rationality and equity in the distribution of resources.

### Recommendation.

Preparation of budgets should be closely linked with the Health Office's strategic priorities and the operational plans for implementing these priority activities. The plans should be transparent so that the effect of changes in the plan's original assumptions can be identified (such as cutbacks in the number of roadworthy vehicles upon supervision and delivery schedules). The spreadsheet behind Table 8 gives an example of transparent planning which can be fed into cost analysis and budgeting.

## 7 Processes for Supervision, Support, Monitoring and Management

This section discusses the supervision system, the logistics system and the information system for primary health care. It also considers the processes for planning and monitoring, through which the Health Office and increase the effectiveness of resource use and of PHC activities.

### 7.1 The Supervision System and Supervisors' Activities

In Hodeida governorate the supervision system is in two layers. The first layer is the T/S who is responsible for staff at PHC Units in rural areas. The second layer is the Health Office, whose staff can supervise T/Ss and health centre directors as well as PHCWs and Murshidaat. There was an intermediate layer - the Training Health Centre Director - who was supposed to visit PHC Units occasionally, but pressure of time has removed this extra component from the supervisory structure.

A system for supervising PHCWs at PHC Units was developed, implemented, and documented in a manual (1987) during the Tihama PHC Project. This system was built on posting T/Ss to selected health centres, from where they would visit the PHC Units assigned to them twice per month: once for regular supervision and once for the immunization session to which they brought supplies. The frequency of visits had to be adjusted, depending on the number of units in the supervisor's area and the availability of transport. The system was further modified so that although immunization visits were scheduled, supervision visits were made without prior arrangement with the PHCW or Murshida. Regular supervision of the northern units was halted by the 1990 EPI campaign because staff time and vehicles were fully occupied with this one activity for four months. The practice of monthly meetings between T/Ss and other PHC staff at the Health Office has not been reestablished since that time.

In the area around Zabid, supervision of PHCWs has never been explicitly developed as a system with established protocols. All T/Ss are based centrally in the training health centre (THC). The female T/Ss have set up a regular monthly meeting for all Murshidaat and LBAs, who come to Zabid THC where they prepare their monthly reports, have their delivery kits checked, and discuss their work. Arrangements for on-site supervision of female staff were put in motion during the assessment.

For the Hodeida Urban Project there is close contact daily between Murshidaat and supervisors at the health centres, with a weekly planning meeting. The field visits are recorded in the patient records at the health centre, but on site supervision of Murshidaat during their house to house visiting is limited by a shortage of female supervisors.

Supervision by Health Office staff seems to rely on unscheduled visits. It includes PHC Units and health centres, and private clinics and drug stores may be visited to check on their practices.

For purposes of the assessment, we concentrated on supervision of PHC Units. We assumed that a T/S should be following the protocol approved by the PHC Department, which includes the following activities before, during and after a supervisory visit:

Before the visit, the T/S should:

- Review the last report for requests and plans
- Assemble supplies needed by the PHCW or Murshida
- Plan any special activity and discuss it with a colleague
- Arrange for transport (car/driver/fuel)

During the visit:

- Use the printed check list
- Discuss T/S's comments about the PHCW's or Murshida's work
- Write the comments in the Duplicate Book
- Check the registers
- Compare the registers with the Monthly Reports
- Check the drug stocks
- Deliver drugs
- Deliver other supplies (stationery, cleaning materials, etc.)
- Accompany the PHCW or Murshida on home visits
- Visit the school, water project, garbage disposal, etc.
- Meet community leaders
- Supervise the PHCW's or Murshida's activities on the spot
- Prepare a plan of action (eg with a timetable) for the PHCW or Murshida to follow until the next visit

Follow-up after the visit:

- Give the Monthly Reports and Duplicate Book note to the Health Office (PHC Department)
- Request any necessary supply of registers, forms, stationery
- Request drugs and other medical supplies

When we asked the PHCWs, LBAs and Murshidaat about the last time their T/S visited them, we were told that:

- the most recent visit had been to deliver vaccine or drugs;
- none had been supervised on site within the last 3 months;
- more than half had not been supervised on site within the last six months.

Data were analysed for 12 PHC Units; 2 had never been supervised on site. For the remaining 10 PHC Units, staff said (either spontaneously or after a probe) that their supervisors had:

- checked the Registers (7);
- compared Monthly Reports with the registers (6);
- discussed their comments with PHCWs (6);
- wrote them in the Duplicate Book (4);
- delivered the drug kit (4);
- checked drug stocks (3);
- used the printed checklist (3);
- accompanied them on a home visit (3);
- met community leaders (3);
- delivered non-medical supplies (1);
- accompanied PHCW on a field visit (1).

In the northern part of the governorate, PHCWs were generally appreciative of their T/S's support in answering technical questions and helping to solve problems (especially meetings about water projects). Some of the T/Ss' skills gave cause for concern (eg how they would disinfect instruments). Although the sample was small, the assessment team decided that T/Ss who came into their present job from a background related to PHC showed better understanding of PHC concepts. For example, paediatric nursing gives more relevant experience than the operating theatre.

Supervisors said that they planned to make two supervision visits per day, spending 2 hours at each PHC Unit. This is a tight schedule for completing all the tasks on the check list and giving time for quality discussion and follow-up of problem cases with the PHCW or Murshida. Time is undoubtedly lost by the practice of making unscheduled visits; the assessment team failed to make contact with 35% of the PHCWs whose villages we visited - they were neither at the unit nor at home. Several times we waited for a PHCW or Murshida to return from visiting a patient. So the T/S must also spend precious time looking and waiting for those they have come to supervise, failing to find them and wasting the fuel.

T/Ss said that their monitoring of PHC Units' monthly reports would improve if they were submitted at the supervising health centre. All of the northern PHCWs, LBAs and Murshidaat said they would prefer to collect their salary from the supervising health centre, rather than from the Health Office. Zabid area units already submit their reports and collect their salaries from the THC.

So far it has been difficult to integrate visits by male and female T/Ss. In Zabid the Murshidaat and LBAs come to their female supervisors, who have not been able to visit PHC Units due to the absence of a regular schedule of visits with transportation. For the northern units the number of female staff is so small that it has not been practical to post female T/Ss to the supervising health centres, and the Health Office has undertaken direct supervision. This will not be feasible when the new cohort of Murshidaat have qualified.

Since the T/S from el Qotai' left to become director at Bajil Central HC, the 10 functioning units in that area have been allocated to the Tahreer T/S. Bajil would make a better supervising health centre than el Qotai' or Marawa'a as it is closer to most of those units (see Table 1.2 and Figure 4), so time and fuel would be saved.

The community is supposed to play a role in monitoring the health staff's behaviour. We met four local leaders whose interest in improving PHC in their villages had not been positively received or encouraged by the health system above the PHCWs and Murshidaat. The T/S is the most accessible link with decision-makers in the Health Office.

## Recommendations

Regular meetings of T/Ss should be reactivated, to discuss plans, resource requirements, and to solve problems. The PHC Department should determine who will attend, and the frequency and location of these meetings.

Bajil Central HC should be established as the supervising health centre for the PHC Units formerly supervised from el Qotai'.

The supervision system is clear to the T/Ss who worked in the Tihama PHC Project area, but that system needs to be reviewed and updated to incorporate some fundamental changes (eg the change from monthly delivery of specifically requested drugs to a standard 3-monthly kit). The Arabic version of the draft supervision manual (1987) provides a good starting point for this review.

The supervision system in the Zabid area should be established using the guidelines (before, during and after the trip), checklists and activity planning methods known to the Health Office supervisors.

Supervision of female staff should be given equal priority as that for PHCWs, and transport provided so that they are visited on site.

A special strategy is still required for supervision of areas with difficult access (eg Jebel Bura' and Jebel Ras). The experience from other governorates with similar terrain and settlement patterns could be sought in developing this strategy.

The Health Office has already taken steps to involve the experienced female T/Ss based at Tahreer, but a larger cadre of female supervisors will eventually be needed, both for the rural PHC Units and for home visiting in Hodeida from four HCs. Special care should be taken to make sure that midwives who are selected to be trained as supervisors have enough experience to provide proper technical advice to Murshidaat and LBAs.

When male candidates are proposed for training as T/S, the relevance of their previous experience to PHC should be taken into consideration.

The theoretical content of supervision visits is known, and now an improvement in the quality of supervision is needed. For hard-working, reliable PHCWs and Murshidaat in rural areas, scheduled supervision visits should be considered, in order to reduce the large number of wasted journeys. It may also be more effective for the T/S to plan one thorough visit every 2 months, during which all the activities on the check list are covered. This visit should take 3-4 hours if reports and registers are checked, activity targets prepared, homes are visited and local leaders are met.

## Recommendations (continued)

T/Ss must take seriously their responsibility for delivering not only drugs and vaccines, but also stationery and cleaning materials. The lack of these items has a negative effect on morale at the units and hampers the work. The provision of lockable cupboards at the supervising health centres should be considered, to enable the T/S to store the stock of supplies which he should take with him on every visit.

The Duplicate Book is one of these items; it is both a record for the Unit and a link between the PHC Unit and the Health Office. PHCWs and Murshidaat should be given permission to use the Duplicate Book for letting the Health Office know if their T/S fails to fulfil his responsibilities.

Decentralizing the distribution of salaries from the Health Office to the supervising health centres, and linking salary to a qualitative review of monthly reports should be considered. It would not be feasible for one T/S to check all his units' reports in one morning, so peer review could be considered; this would improve consistency in reporting practices. (Monthly meetings would also provide opportunities for in-service training and feedback from the Health Office.)

### 7.2 The Logistics System

Logistics is the art of organizing supplies. It includes ordering and procurement, storage, and distribution, including transport. Primary health care needs a logistics system for drugs, vaccines and other supplies; the nature of the work means that distribution should be linked with assuring the quality of services, so the logistics system should be closely connected with supervision. Transport is also an essential component of logistics.

This is a vast area of PHC management which received constant attention during the Tihama PHC Project, with full-time staff managing medical stores at the warehouse, and running the vehicle fleet. Three substantial consultancies addressed these topics (Bates 1983; Bates 1984; Delienne 1985) and manuals were prepared covering Drug Supply Logistics and the Vehicle Maintenance System. The assessment could not cover these topics in such depth, and the situation has changed since the detailed work on logistics was done because a kit system for essential drugs has been introduced. The team made the following observations:

- The kit system lacks some features which are usually found in essential drugs kit systems. The kit is not sealed when it reaches its final destination; there is no documentation connecting its contents and their use (eg patient's symptom and treatment, date of stock-out); and supply is so late that the PHC staff are obliged to use their initiative when they run out of essential drugs.
- Documentation of medical supplies (drugs, vaccines, and other consumables) is lacking at all levels. Stock records were only found at the Hodeida Urban Project's health centre. It is impossible to manage and monitor logistics without stock

- records. For example without a record of quantities received and issued, showing the date of each stock movement, a safety stock level cannot be established; without a current balance staff do not know when they have reached the safety stock level and must reorder immediately to avoid a stock-out.
- Supplies for PHC Units and supplies for maternal health (eg ergometrine and family planning supplies) are procured, stored and distributed in isolation from each other. This involves duplication of effort in collecting and distributing supplies.

### **Recommendations**

The existing manuals, forms and reports on logistics should be reviewed as a preliminary step to strengthening the governorate's PHC logistics system, which should now include the Zabid area.

Essential supplies for PHC which are not in the standard kit should be integrated into PHC logistics at governorate level. (Immunization supplies must remain separate because of the cold chain.)

Donors should provide expert technical support if the governorate decides that specialist assistance would help in strengthening the PHC logistics system and introducing new management practices.

To ensure that the transport needed to run the logistics system is available, integrated planning of schedules and a vehicle use policy must be adopted (see Appendix D.8).

### **7.3 The Information System**

The information system includes the design of patient records, registers and reports, the processes of recording and reporting (manual and automated), and feedback and use of information. Both the Hodeida Urban Project and ACCS are actively involved in supporting the information system, HUP through training, equipment, detailed analysis of activities, and development of a family-based patient record system, and ACCS through the disease control and surveillance activities.

**Design and Content of Printed Materials.** The quality of printed formats for registers and report forms is impressive. Unfortunately shortages of the current official formats mean that old stock or personal notebooks have been substituted (see Table 11), and the previous formats do not contain the information needed in the new-format reports. For example, four of the surveyed units had the old-style Attendance Register which does not separate patients into "new" and "old", as required on the Monthly Activity Report, and does not separate adults into 15-44 and 45+ as required on the Monthly Disease Report. We estimate that one-third of the PHC Units in Hodeida Governorate cannot report these categories accurately because their registers' format is not consistent with the categories in the monthly report forms.

It is also unfortunate that the content of the new printed formats does not always correspond to the functions performed by PHCWs and Murshidaat, or to their level of expertise. The following problems were observed:

- The new register for attendance combines curative with preventive (immunization). An active PHC Unit sees 2,000 curative patients per year so the PHC staff would have to search through hundreds of entries to find an individual infant in order to record doses given during the second, third, fourth and fifth visits, and to identify drop-outs and no-shows. What is needed for child health activities is a child health register. A format is outlined in the recommendations.
- The wastage incurred by combining four types of register within one book is estimated to exceed 40% (see Section 6.5 under Stationery).
- The new EPI Register (large with blue covers) does not have a column for date of birth, and does not give space for recording OPV and DPT separately. Nor does it have space for OPV0 (OPV at birth), yet the child's EPI card has space for recording four doses of OPV. (However, OPV at birth is not mentioned in the pictorial schedule on the other side of this card.)
- The register used at health centres for monitoring children's weights has columns for ticking (✓) whether the child's weight is below normal, normal or above normal. We know from Figure 8 that the average weight-for-age of rural Tihama children is below the bottom line on the Road to Health chart; what do the health staff consider to be "normal"? The register should capture the vital points of growth monitoring:
  - (1) did this child gain weight?
  - (2) if so, did it gain enough weight?
- The Monthly Activity Report leaves out some items which are essential components of PHC (eg number of children weighed, children gaining weight; deliveries attended). If the activity report does not invite staff to record these activities, the implication is that the activities are not important.
- One-quarter of the space in the Monthly Activity Report is devoted to EPI doses for children under 3. This section duplicates the EPI Monthly Summary Form, but invites errors when the PHCWs and Murshidaat copy these data because the Activity Report shows the antigens in a different sequence, and transposes the matrix (i.e. antigens are down the side rather than across the top). The Statistics Department has found that EPI data on the Activity Reports are inaccurate, and relies on the EPI Monthly Summary for EPI data.
- The Monthly Disease Report asks for diagnoses rather than symptoms. We asked health staff how they would report three sets of symptoms which are not on the Disease Report: jaundice, vomiting with stomach pain, and fever without headache or chills.
  - Jaundice would be reported by all but two as hepatitis; not all jaundice is hepatitis, so this disease is over-reported.
  - Vomiting and stomach pain would be reported as intestinal parasites (3), malaria (2), other (3), or not reported if it was hyperacidity (not on the form).
  - Fever without headache or chills would be reported as malaria at four facilities and as "other" at the rest.

- The distinctions between the five categories of mental and psychiatric conditions on the Monthly Disease Report form were also discussed (see Appendix D.5). At all but two facilities the staff had seen mental or psychiatric cases, but after questioning it was clear that PHC staff and some physicians cannot make the diagnostic distinctions required by the form.

**Recording and Reporting Practices.** The clerical accuracy of the monthly reports was checked during the assessment. Comparing registers of patients with monthly summaries showed that half of the facilities visited had submitted accurate summaries of their curative work. Three were very inaccurate (more than 100% adrift), and at another three the registers were so poorly kept that we could not use them to verify the monthly reports (which therefore could not be accurate).

The monthly reports at health centres require coordinated input from several staff. We found that some HC directors at rural HCs had made errors in copying the data from other staff, and that attendance was sometimes double-counted; for example "attendance" may include the same curative cases recorded in "child attendance" in the HCs' monthly activities.

Health staff's practices for reporting three symptoms which do not appear on the Monthly Disease Report are discussed above, with our findings concerning the reporting of mental and psychiatric illness. We also wanted to find out whether the distinction between "new" and "old" patients was interpreted in the same way by all staff. We found that health centre staff and PHC Unit staff have different interpretations of these categories:

- HC staff at Ghuleil, Tahreer, Zabid, el Qotai' and one foreign MD at Zaidia count a patient as "new" if it is the person's first visit (eg if they already have a patient card).
- Two foreign doctors, the T/Ss and all but one of the PHCWs in the northern part of the governorate record a patient as "new" if his/her disease is different from the one at the last visit. If a patient comes with the same disease a month later, the patient is counted as "old".
- None of the 7 PHC staff trained in Zabid record whether patients are new or old, even though 3 had attendance registers with space for doing so. These staff do not fill out the Monthly Activity Report where the number of new and old patients are reported.

The Monthly Reports (Disease and Activity) are printed in triplicate. The green page stays at the facility, and the T/S or HC Director brings the yellow and white pages to the Health Office. The top copy (white) is for the Statistics Department, which processes the data on computers. There are delays in getting reports from the PHC Department to the Statistics Department. The list of facilities from which reports should be submitted is not up-to-date; none of the PHC Units in the Zabid area is on the PHC Unit spreadsheet, and no data from curative units are in the automated system.

**Analysis and Feedback.** The full extent of data analysis was not examined; for a recent report see Erik Heydelberg's Report on PHC Information Systems, Hodeida Governorate (October 1990). While looking at the monthly reports for 1991, it became clear that neither the T/Ss nor the Statistics Department do a quality control check of the data submitted. For example,

- at 27 out of 61 PHC Units which had submitted activity reports, the number of (live births plus still births) did not match the number of births; i.e. 44% of the units had inconsistent data.

Stillbirths reported from PHC Units represent 6% to 7% of all reported births; are these figures the result of PHC staff misunderstanding the definition of stillbirth? If so, retraining is needed. If not, and the data are accurate, the analysis suggests that PHC plans should include concerted interventions to improve care during pregnancy and childbirth.

A similar process of analysis, feedback, and identifying the appropriate action can be applied to reports of diseases which are preventable by immunization. In 1990 the PHC Units and health centres reported 139 cases of polio (shelal al atfaal, or child paralysis), which gives the very high incidence of 12 cases per 100,000 population. However, 9% of cases were reported to be adults over 45 years old. The age distribution of the 1,456 measles cases is also unlikely, with 12% of cases reported to be in patients over 15 years old. Follow-up with the people who submitted the reports may identify an epidemic, or it may lead to retraining in how to diagnose and how to fill in monthly reports. The ACCS consultancy on disease control and surveillance activities conducted during September and October 1991 has addressed these issues; see Carl Hasselblad's report for recommendations.

Planning and monitoring of targets depends upon identifying, registering and following up the highest priority groups (pregnant women and newborns). Section 5.7 discussed the staff's awareness of the size of their own target groups. We used the population data from the worksheet in Figure 13 to make the estimate of births in Table 8, which gives us the data for monitoring whether the PHC staff were keeping up with their eligibles (eg what was each PHC Unit's monthly coverage for Measles dose?). For the PHC Units in our sample who submitted activity reports and knew their catchment population, we have estimated births per year and per month, assuming that the crude birth rate is 41/1000 population. Our estimate of births per month is compared with the average number of births reported in the first four months of 1991, in Table 12. The relatively low proportion of expected births that are reported should prompt the T/S to find out first, if the report corresponds to the birth register (and delivery register if there are female staff), and if it does, how the PHCW and Murshida or LBA can identify a larger proportion of births.

**Table 12 Estimates of the Percentage of Births Reported by PHC Units in their Activity Reports**

|            | <u>Estimated births</u> |           | Births reported per month | Estimated % of births reported |
|------------|-------------------------|-----------|---------------------------|--------------------------------|
|            | per year                | per month |                           |                                |
| Hajaila*   | 176                     | 14.67     | 6.25                      | 43%                            |
| al Lawia*  | 205                     | 17.08     | 8.25                      | 48%                            |
| Dayr Daud* | 133                     | 11.08     | 6.25                      | 56%                            |
| al Daamegh | 115                     | 9.58      | 5.75                      | 60%                            |
| Hosaya     | 152                     | 12.67     | 9.25                      | 73%                            |

\* An LBA works with the PHCW. Hajaila also has a Murshida.

If the crude birth rate was higher, say 45/1000 population, then the percentage of births reported would fall to 39% in Hajaila and 67% in Hosaya. (These calculations are quick and easy using a spreadsheet.) Most of the PHCWs had not updated their population figures to account for natural increase or the muqtaribeen, so the actual percentage of births reported may be lower than our estimates.

Many of the monthly activity reports show blanks for certain items; for example 15% of the 61 PHC Units who submitted reports had not mentioned a single referred case during the first four months of 1991. This could indicate that they are not recognizing when cases are beyond their level of competence. Such blanks should prompt the T/S to address the issue during the next supervision visit. Similarly, units which fail to submit reports need follow-up to find out why; they may simply be out of stationery.

These are a few practical examples of how the data in the information system can be analysed and the results fed back into the PHCW's and Murshida's work, leading to better diagnosis, more accurate recording and reporting, closer links with the community (eg for birth registration), and activity planning to fill gaps in services.

### **Recommendations**

The essential stationery for PHC should be reviewed and modified. This is detailed work which requires consultation, observation of PHC functions in the field (task analysis), field testing of draft formats, revision, field testing of revisions, pilot testing of data entry and analysis, and so on, until the products are satisfactory. It is proposed that a Working Group be set up by the MOPH to undertake this review. Input from different PHC projects, experienced PHCWs and Murshidaat, both rural and urban, will be essential in this process.

The modified information system should keep registers separate according to their functions. The Curative Register (one line per visit) should be separate from registers of eligibles (eg Child Health, Antenatal Care/Postnatal followup) in which individuals (one line per person) are followed over many visits.

The contents of the Child Health Register and Antenatal Register should be designed with reference to printed and informal formats which have proved useful to PHC staff and their supervisors.

The Information Systems Manual prepared during the Tihama PHC Project is now out of date but both it and the Child Health Manual contain much useful material describing the use of each form: how it should be filled in, and how to interpret the information. The Working Group should use these manuals as reference documents.

The Curative Register should fit on a single page, and should show the treatment given so that its appropriateness can be monitored by supervisors. The reason for asking staff to identify "new" and "old" patients should be reviewed; for rural PHC we could find no practical utility in this distinction and the Working Group should consider dropping it. Much space could be gained by replacing the ten age/sex columns in the 1990 Curative Register with one column for sex and one for age; then staff should be reminded of the correct way to tally their monthly statistics: mark each patient into the appropriate place on the Monthly Disease Report, moving down the register one patient at a time. Curative staff at health centres and Curative Units should use a printed register rather than unformatted notebooks.

The Family Card being developed within the Hodeida Urban Project is thought to be too complex for use at rural PHC Units, but the Task Force should consider the option of a Family Card, bearing in mind the clerical time and cost of storage containers needed to use this system.

If parents keep their child's EPI card and the PHC staff keep the child's Road to Health card, the latter can be used in a "tickler file" organized by village and/or by date of birth; each time a child comes for immunization or growth monitoring, its Road to Health card is updated and replaced at the back of its section of the file, so the cards of children who fail to come for child health services move automatically to the front of the file. (A similar system has been used for following up TB patients.)

For immunization sessions at PHC Units and Curative Units, each child should be registered on the Daily Attendance Form (84/6). It was developed in 1984 after observing the work flow at rural PHC Units' monthly sessions. It can be filled out by a literate volunteer, is fast to use, provides a record from which the T/S can prepare or check the EPI Monthly Summary, and enables the PHC staff to update the Child Health Register carefully (without damaging the pages, as occurs during a busy session) after the session is over. PHCWs and T/Ss who have used this form regard it as very useful, and it should be reprinted.

The youngest age group on all EPI formats should be 0-11 months, i.e. from birth to 11 months, not from 40 days to 11 months.

The Monthly Activity Reports (PHC Units and Health Centres) should not duplicate the reporting of EPI data, which are better presented on the EPI Monthly Summary.

The PHC Unit's Monthly Activity Report should provide space for growth monitoring (eg number of children under 3 weighed; number who gained weight), home visits for curative care or follow-up (currently reported by some under Attendance, by others under Antenatal Home Visits), deliveries attended by trained staff, and postnatal visits (first and subsequent). Discussions with the MCH Department and female T/Ss, and review of the Health Office's draft form for Murshida's monthly reports, may lead to other items being proposed for inclusion on a combined (PHCW and Murshida) Monthly Activity Report form. For example, referred cases could be divided into antenatal referrals, emergency referrals during labour, and other (curative) referrals.

The Monthly Disease Report for PHC Units should be restricted to the level of diagnostic competence attained by PHCWs and Murshidaat at the end of their basic training. A report based on symptoms is regarded as more suitable by training experts. This report should be designed with reference to essential drugs used at this level of the health system. The five categories of mental and psychiatric illness are inappropriate for use by non-specialist staff and should be replaced by "mental health problem". The Working Group is referred to Programme for Identification and Management of Mental Health Problems, by B. Essex and H. Gosling (1982) who say that there is often disagreement about how to define each disease; they recommend a symptom based approach which avoids the danger of labelling people with a disease name (p.3).

While the essential stationery for PHC is being reviewed and pilot tested, the Working Group should draft a reference manual specifying how each piece of information is defined. For example does "TT doses" mean all doses, or only second dose, as most staff believe? The manual should be field tested during the Working Group's pilot phase. To be useful, this manual will need to go into greater detail than the existing booklet on the information system, and a copy should be distributed to all T/Ss, PHCWs and Murshidaat. Any refresher training in record keeping and reporting should be in small groups (eg all the units and health centres surrounding one supervising health centre) with plenty of practical exercises and feedback.

The minimum list of essential PHC stationery should be circulated to all levels of staff, and its use covered during practical sessions in basic training.

T/Ss and supervisors of health centres should encourage PHC staff to interpret the data and thus use the information system as a tool for planning activity and monitoring their own progress towards targets. Identifying pregnant women and registering newborns should be emphasized, because finding the eligibles is the key to effective promotion of PHC and preventive services.

The Health Office has tremendous potential for analysing the data and monitoring PHC activity, and could start to give more feedback by following up on inconsistencies and gaps (for example see the findings about inconsistencies in reporting births). This should result in better quality data which can support more rigorous analysis. As noted in the 1990 report, information is needed about which facilities have submitted reports, and how many each one submits in a year. The lists of facilities in Section 4 (see Tables 1, 2 and 3) provide the basis of a reporting checklist which will give the denominators (eg number of facilities or number of reports in the analysis) needed for doing further analysis.

The Statistics Department can support facilities in monitoring their progress towards higher coverage for priority services, but to do this reliably more accurate estimates of the catchment populations will be needed. It will be very important that discussions of coverage levels are constructive and focussed on overcoming any constraints and difficulties; if feedback ever becomes destructively critical, the targets will cause harmful distortions within PHC services.

Donor support for hardware, software or systems should take into consideration the technical configurations which will be most useful and flexible for the Health Office. For example if the Finance and Manpower Department computerizes its personnel and payroll lists, it would be easier for them if the systems are compatible (eg machines which use disks of the same density and the same operating system). Software for converting the Statistics Department's system into Arabic (al Musa'id) should be obtained as soon as possible. There is also a need for software to protect the system against viruses.

#### **7.4 Planning, Monitoring and Management**

In future the Health Office will have greater responsibility for planning how health services in Hodeida governorate will be provided. There are not enough resources to do everything, and priorities will have to be chosen. The selection of priorities will be determined by a combination of the government's policies for primary health care, the resources available to the Health Office, and an analysis of the current situation; the planners take these three elements together to decide what is feasible.

At governorate level, it is expected that all staff with any responsibility for implementing the plans and managing the systems should participate in the planning process. For example the T/Ss' knowledge of travel times and the level of skill at PHC Units are important for planning the number of visits, and hence time and fuel, needed to reestablish growth monitoring. The greater the extent of staff participation in the planning process, the greater must become their awareness of the strategic connections between their activities and the resources needed to carry out the plans. In this way every participant's awareness of responsibility should increase, both for using resources wisely and for meeting his or her commitments within the plan. This is why many PHC systems have established local teams for health planning and management.

It is important that the planners spell out their assumptions. For example when they plan to provide health services, do they assume that the eligible groups will turn up? Based on past experience what kind of activities will be needed to inform and motivate high utilization from these groups? How much preparation time will be needed? What supplies must be available for the next step of the plan to proceed? How long does it take to get those supplies through the pipeline? There are two major reasons for spelling out each step of the plan: first, if one part is not completed (eg qualified candidates cannot be found; supplies are not available), the missing component can be identified quickly, thus enabling managers to take appropriate action during the implementation. Second, when the next set of plans is being drawn up, the original assumptions must be reconsidered and this should help the planners to refine the new plan's activities (eg the amount of time allowed, the intensity of follow-up needed) to fit the more realistic assumptions.

Figure 21 shows the planning cycle, which includes managing and monitoring the implementation of planned activities.

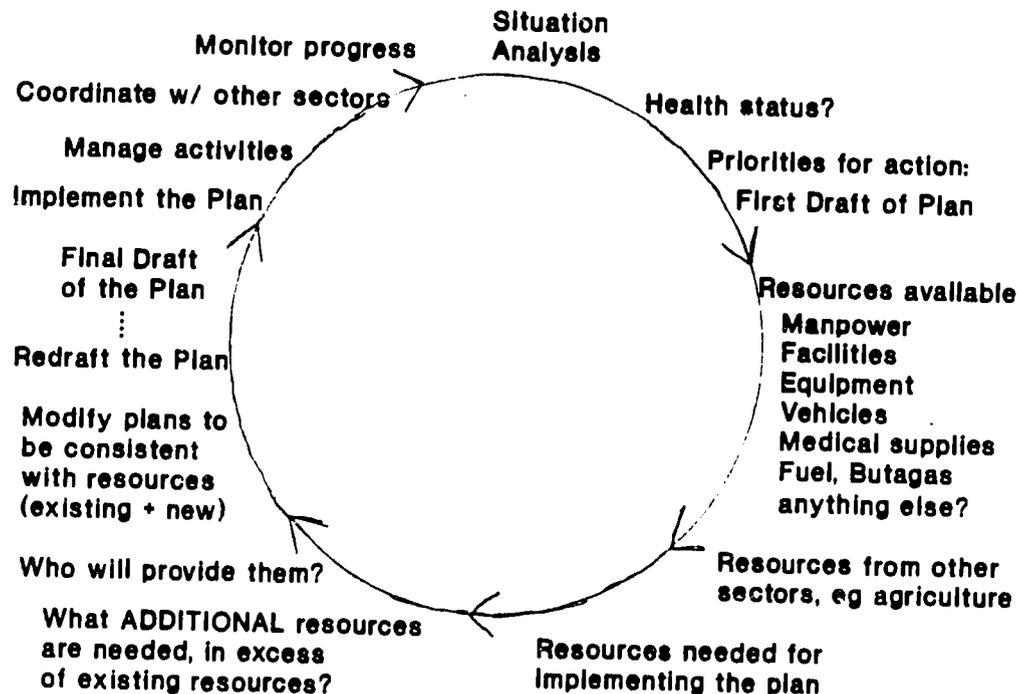
As primary health care activities increase in scope, there is greater need for good motivation and discipline by all staff in fulfilling their responsibilities within the plan. The assessment team found that the basic requirement of being at work on time was not always respected by health centre staff. This creates a vicious circle: the staff are not there so patients learn not to turn up before 8.45, so the staff see no reason to arrive any earlier. Qualitative problems were also observed at health centres - for example not disposing of reconstituted Measles vaccine at the end of the session; sloppy and inaccurate registration of patient's details; utterly inadequate procedures for disinfecting instruments - which were not due to resource constraints. At a health centre, the director is responsible for monitoring staff performance and promoting good discipline.

There are many positive effects that PHC staff can achieve even if they are short of their usual supplies; for example, two of the most serious health problems (poor infant feeding practices and episodes of diarrhoea) can be addressed using resources from the community - as long as the staff are motivated.

The issue of staff motivation and discipline was addressed for the Tihama PHC Project in 1985; see Peter Shipp's report, The Improvement of Quality of Work in the Tihama PHC Project by Improvements in Staff Motivation and Discipline.

Planning health services should not be restricted to the health sector. Traffic accidents place an enormous demand on hospital health services which then require a larger share of the health budget; primary health care frequently suffers. What can the authorities responsible for road safety contribute to reducing traffic accidents? How can water projects and agricultural projects be developed and implemented so that they do not increase morbidity from water-borne diseases and malaria? Coordinated planning is needed to avoid such problems, for example by providing proper drainage from the outset and health education.

Figure 21 The Planning Cycle



### Recommendations

The Health Office should establish the planning cycle: the team who will be responsible, the type of situation analysis required (eg statistics, field visits), input from Health Office departments on the status of their resources (eg manpower, facilities, vehicles, supplies), the timing so that participants can be ready with their contributions, intersectoral coordination with bodies responsible for agriculture, water, education, traffic.

The plan should identify the priorities to be addressed and give a strategy for addressing those priorities. Detailed operational plans should specify the assumptions upon which they depend, for example the number of vehicles, days of staff time, resources such as fuel and supplies. This will make it possible to assess whether the whole range of activities planned is feasible (eg will the resources required to mount a campaign preclude regular supervision and resupply?) or whether the fixed resources (eg staff) are overextended. The operational plans should also identify the resources - existing and additional - needed to implement the activities.

Choice of strategies should consider the cost-effectiveness of the alternatives. For example it is more cost-effective to prevent illness or accidents, to identify cases at risk and refer, to treat early rather than wait for an emergency. A PHCW

or Murshida should be far more cost-effective than a nurse at a Curative Unit, because public health interventions and MCH contribute far more to improving health status than curative treatments. Yet the Curative Unit's nurse costs three times more in salary than a PHCW or Murshida. Having a plan based on analysis and explicit choice of strategies would put the Health Office in a stronger position to resist random calls for curative staff to be posted to particular villages.

Staff who will be responsible for monitoring each activity in the plan should be identified. (They can delegate actual implementation to others, but they are the person in charge of the activity.) Regular meetings should be held during implementation to monitor progress towards distinct objectives or targets or milestones, which should be specified within the operational plan. For example, how many candidates for training should be recruited, by what date? When should all preparations for training (staff, accommodation, teaching materials, etc) be completed?

Health Office managers should develop ways of motivating and encouraging staff to fulfil their responsibilities, to use resources (including time) wisely, and to follow established policies (including everything from use of vehicles to safe disposal of syringes). Managers and supervisors should take appropriate disciplinary action when needed. Positive encouragement of good performance is as important as corrective action for inadequate performance or inappropriate behaviour. (Peter Shipp's 1985 report provides some suggestions for improving motivation and discipline.)

There are always resource constraints which put a limit on the activities and services that can be provided. So planners and managers must consider how to use the available resources to greater effect. The Health Office can gain more control of resource use and reduce the effort it now devotes to crisis management by introduce more structure and transparency to its planning and management. For example regular maintenance of vehicles (based on mileage logs filled out by each user) reduces the incidence of breakdowns and saves money and time. Proper stock management enables essential supplies to be procured before they go out of stock.

This assessment has provided many other examples of how the primary health care system can be strengthened. Now the Health Office should identify its priorities for action, within the MOPH's policies:

- what can be done immediately with existing resources,
- what can be done over a longer period,
- what additional resources are essential, and
- what other changes are needed to solve problems that are not principally caused by shortage of resources (eg motivation, discipline, lines of authority).

Operational plans should be prepared for implementing feasible, cost-effective strategies for addressing these priorities. The process could begin with a workshop to discuss the findings and suggestions contained in this report.

## APPENDICES

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**Appendix A Terms of Reference**

**(4 pages)**

# Resources for Child Health

REACH

JSI

## SCOPE OF WORK Management & Training Consultant ACCS/REACH/Yemen

1. A. Name: Rachel Feilden
- B. Consultancy: Management & Training
- C. Period: June 26-August 28, 1990
- D. Purpose: The consultancy will consist of two separate, but interrelated parts as follows:

PART I In collaboration with the MOPH and the Hodeidah Health Office, the consultant will conduct an assessment of the current operational status of the Hodeidah governorate PHC system for the support and delivery of basic health services as presently defined by the MOPH. This includes types of health services delivered and utilization rate by community; functional level of management/supervision; present level of fiscal and logistical support; organizational structure and staffing levels by civil service category for both filled and unfilled positions; facilities, equipment, transport including their location and current condition. A Yemeni counterpart will be provided by the MOPH for this activity.

This information will be collected, reviewed, and analyzed by the consultant and Hodeidah health office and used as the foundation for developing operational standards and defining what kind of basic health services the governorate is best able to support within the limits of current resources and constraints. By review of the data recommendations are to be made. These include the location where these services will be delivered and how they will be supervised; and what are the minimum staffing requirements by what type and number of personnel. What type of facility will provide the services and what basic equipment and supplies are needed according to current and/or projected utilization. Special consideration should be given to the provision of MCH services for women and children and to see that the necessary resources are provided to maintain a high level of coverage for the immunization and protection of children against the standard package of childhood diseases now recognized by the MOPH.

In addition, the consultant and the Hodeidah health office will recommend the priority areas where future donor support should be directed in terms of type and

P. O. BOX 10650, SANA'A YEMEN ARAB REPUBLIC, TEL. 275222 - TELEX 3119 JSI YE.  
ص. ب. ١٠٦٥٠ - صنعاء - الجمهورية العربية اليمنية - تليفون ٢٧٥٢٢٢ - تالكس ٣١١٩ ج.س. اس. اى.

kind of technical assistance that is needed to improve and sustain the present PHC system for basic health services.

In conducting this assessment, the consultant and the Yemeni counterpart appointed by the MOPH will consult with members of the Health Manpower projection (HMP) technical committee in Sanaa to assure that the Hodeidah assessment will be done to fit within the plan of the technical committee for HMP. The consultant will also draw on the "lessons learned" and the experienced gained in the rapid expansion of basic health services in the governorate under the Tihama Primary Health Care Project.

This activity is provided for under 4.4 of the FY91 Workplan.

**PART II** The consultant is to conduct a PHC Management Training Workshop at the conclusion of the Mid-term Training Assessment for male and female PHCWs. The purpose of this workshop will be to provide the foundation for preparing the governorates in the task of managing and supervising the PHCWs in the delivery of basic health services once they graduate and are posted to their assigned communities. This workshop will be conducted in collaboration MOPH/HMI with the assistance of the Training consultant. A workshop facilitator will also be provided by the project. The attendees will be from Hodeidah, Mareb, Hajjah, and Saada governorates as well as representatives from the MOPH in Sanaa. Those attending the workshop will include the HTC directors and training cadre; PHC director, trainer; Governorate Coordinators; EPI, MCH and training representatives from MOPH and HMI. The Mid-term training assessment and the assessment of the PHC system in Hodeidah will provide useful background information and illustration for this workshop. A Yemeni counterpart will be provided for this activity by the MOPH.

This activity is provided for under 4.2 of the FY91 workplan.

## II. Specific Tasks - Part I & II

1. Upon arrival, meet with MOPH/HMI/LCCD leadership, Yemeni counterparts, training consultant, workshop facilitator, WHC technical consultant, and governorate coordinators (GCs) at a meeting called in Sanaa by the MOPH and REACH staff to review and make arrangements for both parts of the consultancy. Determine documents

to be translated in Arabic/English.

2. Meet with workshop facilitator, training consultant, MOPH/HMI representatives and prepare agenda for workshop, speakers, and list of participants. Agree on activities that the facilitator is to carry-out while conducting initial phase of Hodeidah consultancy.
3. Proceed to Hodeidah governorate with Yemeni counterpart and GC. Meet with DG/Health Office; PHC Director; GC; LCCD representative and discuss the terms of the consultancy. Agree upon the schedule for the organization of activities in order to complete the work within the period of the consultancy.
4. Prepare survey instrument and determine the best and fastest method to collect the necessary data. Organize and conduct survey.
5. Proceed to Sanaa to conduct management workshop.
6. Return to Hodeidah to complete collection and analysis of data; prepare draft report with counterpart.
7. Conduct one day debriefing meeting with principals involve in the assessment to discuss findings, recommendations, and any necessary follow-up activities.
8. Prepare reading list of background material for MOPH and ACCS project.
9. Prepare groundwork for cost recovery consultancy under 5.1 of the workplan.

### III. End of Consultancy Products

1. Technical report on the Hodeidah Assessment including survey design methodology and the analysis and recommendations based on the data collected and discussions held with the principals involved with the assessment.
2. Technical report including recommendations and follow-up needed to prepare governorates for the supervision of PHCWs.

IV. Relationships: The consultant will work under the general direction of the ACCS/REACH/ Chief of Party, and in collaboration with the designated Yemeni counterpart appointed before arrival by the MOPH for the duration of

the consultancy; the HMI workshop facilitator and the WHO/PHC technical advisor. Prior to the consultant's arrival, an entry briefing and exit debriefing will be arranged with Viviann Gary, USAID/GDO/HPN/Yemen.

SCOPE OF WORK APPROVAL:

*Viviann Gary*  
USAID/GDO/HPN/Yemen

JUNE 12, 1991  
DATE

*[Signature]* 12/11/91  
~~Undersecretary for Health,  
Planning and Development;  
MOPH/Republic of Yemen~~

\_\_\_\_\_  
DATE

## Appendix B List of People Contacted

### Sana'a

Dr. Mohammed Gharama, Director of Planning, MOPH  
Dr. Abdul Halim Hashem, Director of Public Health  
Ahmed Saeed, Director EPI  
Dr. Khaled al Aghali, Medical Supplies  
Abdul Wahab Kahlani, Health Manpower Institute  
Nagi al Samawi, HMI  
Viviann Gary, USAID  
Abdulazziz, USAID  
Charles Swagman, Dhamar RHP  
Peter Petit, Consultant to DRHP  
Noel Brown, ACCS/REACH  
Sereen Thadeus, SEATS/REACH  
Dr Madeleine Taha, Training Consultant, ACCS  
Peter Shipp, Manpower Consultant, ACCS  
Dr. Hassan Sugule, Health Project Office, UNICEF  
Mohammed Beshir, UNICEF  
Jan Lilja, Country Representative, Radda Barnen

### Hodeida

Dr. Ali Omar Fakira, Director General, Health Office  
Dr. Abdul Hafath Saleh, DG's Assistant, Financial Affairs  
Dr. Ahmed Borgi, DG's Assistant, Technical Affairs  
Dr. Ali Shura'i, Public Health  
Dr. Abdul Galeel Qaid Saif, Primary Health Care  
Dr. Mohammed Omar Ibbi, Med. Serv. & Manager for Donor Agencies  
Ahmed Ahmed Wahban, Training  
Asia Sharaf Mohammed Shaibani & Fatima Mohammed Abdulwahab, MCH  
Ali Derwish, PHC Supervision  
Nagib Qaid, Drug and Medical Equipment Supplies  
Saleh Hakari, Planning and Statistics  
Yacoub Hail, Statistics  
Hussein Showkani, Finance  
Yacoub Yussuf Harba, Manpower  
Mohammed Ali Mohammed & Ahmed al Hodeidh, EPI Supervisors  
Abdul Bari al Qubati, Maintenance and Operations  
Dr. Ahmed al Junaid, Hodeida Urban PHC Project  
Dr. Paul Weelen, Hodeida Urban PHC  
Thera de Haas, Hodeida Urban PHC  
Ibrahim Sharif, BOCD  
Zahra No'man, Pathfinder Advisor, HMI Midwifery Training

Zabid: Farouq al Saqaf, Clinic Director  
Ali Othman, EPI Supervisor  
Alam Mohammed Saleh, Suad Mahmoud Mageed, midwives and T/S  
Mohammed al Ahmar, AbdulRahman Mohammed, ) T/S for  
Abdulla Qahtaan, Taher Qutaish ) Murshideen  
Hassan Mansoud, HC Director, Hais

Zaidia: Mohammed Hassan, THC Director  
Ali Ali Mohammed Giberi, T/S

and all the staff and local leaders met during the field visits

**Appendix C Facilities Visited for the Assessment**

| Visit Nbr | Name of Facility | Type of Facility | Supervised from | Where staff were found | am/pm |
|-----------|------------------|------------------|-----------------|------------------------|-------|
| 1         | el Qotai'        | H Centre         | Health Off.     | at facility            | am    |
| 2         | al Daamegh       | PHC Unit         | Mansuria        | at home                | am    |
| 3         | Hosaya           | PHC Unit         | Mansuria        | pat visit              | am    |
| 4         | Dayr Daud        | PHC Unit         | Mansuria        | home=unit;pat visit    | am    |
| 5         | Dayr al Qumaat   | ?PHC Unit?       | ?Health Off     | no services            | am    |
| 6         | al Lawia         | PHC Unit         | B al Faqih      | at home                | pm    |
| 7         | Jurbisha         | PHC Unit         | B al Faqih      | not found              | pm    |
| 8         | al Sa'eed        | PHC Unit         | B al Faqih      | at home                | pm    |
| 9         | Al Mahal         | PHC Unit         | Tahreer         | not found              | am    |
| 10        | Mukheimania      | PHC Unit         | Tahreer         | not found              | am    |
| 11        | Mansuria         | Supvn HC         | Health Off.     | at facility            | am    |
| 12        | Bait al Faqih    | Supvn HC         | Health Off.     | mufraj & HC            | pm    |
| 13        | Mahat            | PHC Unit         | Zabid           | home=unit              | pm    |
| 14        | Bedwa            | PHC Unit         | Zabid           | home=unit              | pm    |
| 15        | Mowqer           | PHC Unit         | Zabid           | at home                | am    |
| 16        | Turaiba          | PHC Unit         | Zabid           | at home                | am    |
| 17        | Qahara           | PHC Unit+MD      | Zabid           | unit;PHCW not found    | am    |
| 18        | Mabraz           | PHCW             | Zabid           | not found              | am    |
| 19        | Muntowfia Sufla  | Cur.U+Supvn      | Zabid/H.Off     | at home                | am    |
| 20        | Qataaba          | PHC Unit         | Zabid           | at home                | pm    |
| 21        | al Fash          | PHC Unit         | Zabid           | at unit                | am    |
| 22        | Qamaria          | PHC Unit         | Tahreer/ElQ     | not found              | am    |
| 23        | Behaah           | PHC Unit         | Tahreer/ElQ     | pat visit, not met     | pm    |
| 24        | 'Obaal           | PHC Unit         | Tahreer/ElQ     | at home                | pm    |
| 25        | Hajeila          | PHC Unit         | Tahreer/ElQ     | met in 'Obaal          | am    |
| 26        | Zabid            | Training HC      | Health Off.     | at facility            | am    |
| 27        | Tahreer          | Training HC      | Health Off.     | at facility            | am    |
| 28        | Zaidia           | Training HC      | Health Off.     | at facility            | am    |
| 29        | Ghuleil          | Urban MCH        | Health Off.     | at facility            | am    |

El Qotai' was visited three times.

Dayr Daud was visited twice as the LBA was busy with a delivery. T/S at Bait al Faqih was visited twice, second time was to check the vaccine stocks and records in the Health Centre.

Turaiba LBA was called to a delivery during the interview.

Zabid was visited three times; the second visit lasted five days.

The Health Centres at Marawa'a, Bajil Workers, Bajil Kuwait and Hais were also visited but were not formally surveyed.

To: Baseline file, Information System file  
From: Rachel Feilden *RF*  
Re: Numeric codes for PHC Sites.  
Date: 3rd November 1984.

Appendix D.1  
Numeric Codes Memo

In any work that may need coding or automated analysis, we should use a consistent coding system for identifying PHC sites. I have developed a simple, expandable coding scheme; here is an explanation of how this scheme works.

### Constraints

1. Site code should not change, once it has been assigned.
2. We may wish to analyse information according to how long the PHC site has been operating.
3. We may wish to have sites arranged by nahia, since some other published data (e.g. population) are available in this format.
4. Coding scheme must be expandable, to accomodate new sites as they are added.

### Scheme adopted

- a) Arrange all the nahiat from north to south and from east to west if they are on the same level. (See Dictionary 1 from the Community Survey, 1981.)
- b) Arrange all sites which opened at the same time (i.e. the PHCWs were certified at the same time) together.
- c) Then, within each group (cohort), arrange them into nahia.
- d) Assign a two-digit code, unique to each site, starting at the top of the first cohort:

EXAMPLE:

|            |    |
|------------|----|
| Bait 'Atta | 01 |
| Munira     | 02 |
| al-Qotai'  | 03 |
| al-Laawia  | 04 |

- e) The most northerly site in the second cohort will be given the next number in sequence after the most southerly site in the first cohort:

EXAMPLE: Al-Laawia is the most southerly site in the first group, and is coded 04.

So the most northerly site in the second group - al-Mirwaagh - will receive code 05.

NOTE: The codes included in my baseline memo of April have been revised after putting the nahiat into the sequence shown in Dictionary 1.

TIHAMA PRIMARY HEALTH CARE PROJECT  
PRIMARY HEALTH CARE UNITS AS OF SPRING 1984

| PHC SITE             | SITE CODE | NAHIA     | 1-WAY TRAVEL TIME..... | FROM    | OPENED IN | STAFF    | BUILDING   | EQUIPMENT           |
|----------------------|-----------|-----------|------------------------|---------|-----------|----------|------------|---------------------|
| 1. al-Mirwaagh       | 05        | Zohara    | 40 min                 | Zaidia  | 1983      | PHCW     | Temporary  | Fully equipped      |
| 2. al-Khamees        | 06        | "         | 1 hr 10 min            | "       | 1983      | PHCW     | "          | Fully equipped      |
| 3. al-Mo'ataradh     | 16        | "         | 1 hr 20 min            | "       | 1984      | PHCW     | "          | No UNICEF equipment |
| 4. No'maan           | 17        | "         | 1 hr                   | "       | 1984      | PHCW     | "          | No UNICEF equipment |
| 5. al-Ma'arras       | 18        | "         | 40 min                 | "       | 1984      | PHCW     | "          | No UNICEF equipment |
| 6. al-Raafa'i        | 19        | "         | 1 hr 30 min            | "       | 1984      | PHCW     | "          | No UNICEF equipment |
| 7. Mawr              | 07        | Luhayya   | 1 hr 30 min            | "       | 1983      | PHCW     | "          | No UNICEF equipment |
| 8. al-Jubairia       | 20        | "         | 1 hr                   | "       | 1984      | PHCW     | "          | Fully equipped      |
| 9. Dayr Abdulla      | 21        | Qanaawis  | 35 min                 | "       | 1984      | PHCW     | Permanent  | No UNICEF equipment |
| 10. Bait 'Atta       | 01        | Zaidia    | 10 min                 | "       | 1982      | PHCW     | Permanent  | Fully equipped      |
| 11. Mahal al-Khobaal | 22        | "         | 45 min                 | "       | 1984      | PHCW     | Temporary  | No UNICEF equipment |
| 12. Ma'arufia        | 23        | "         | 10 min                 | "       | 1984      | PHCW     | "          | No UNICEF equipment |
| 13. al-Hashaabara    | 24        | "         | 25 min                 | "       | 1984      | PHCW     | "          | No UNICEF equipment |
| 14. al-Munira        | 02        | Munira    | 15 min                 | "       | 1982      | PHCW     | Permanent  | Fully equipped      |
| 15. al-Mughaidhafia  | 25        | "         | 30 min                 | "       | 1984      | PHCW     | Temporary  | Fully equipped      |
| 16. al-Hassania      | 26        | "         | 35 min                 | "       | 1984      | PHCW     | "          | No UNICEF equipment |
| 17. Dayr Mahdi       | 08        | Maghlaf   | 25 min                 | "       | 1983      | PHCW     | "          | Fully equipped      |
| 18. Mahal al-Sayyid  | 27        | Dhahi     | 50 min                 | "       | 1984      | PHCW     | "          | Fully equipped      |
| 19. al-Dhahi         | 28        | "         |                        | "       | 1984      | LBA      | Sub-Centre | No UNICEF equipment |
| 20. al-Qamaria       | 09        | Baajil    | 1 hr 25 min            | Hodeida | 1983      | PHCW+LBA | Permanent  | Fully equipped      |
| 21. Kidf Zumaila     | 10        | "         | 1 hr                   | "       | 1983      | PHCW     | Permanent  | Fully equipped      |
| 22. al-Behaah        | 11        | "         | 1 hr 15 min            | "       | 1983      | PHCW     | Temporary  | Fully equipped      |
| 23. 'Obaal           | 29        | "         | 1 hr 30 min            | "       | 1984      | PHCW     | "          | No UNICEF equipment |
| 24. al-Hajaila       | 30        | Hajaila   | 2 hr 05 min            | "       | 1984      | LBA      | "          | No UNICEF equipment |
| 25. al-Jaran         | 31        | Bura'     | 4 hr                   | "       | 1984      | PHCW+LBA | "          | No UNICEF equipment |
| 26. Ruqaab           | 32        | "         | 6 hr                   | "       | 1984      | PHCW+LBA | "          | No UNICEF equipment |
| 27. Manwab           | 33        | "         | 5 hr                   | "       | 1984      | PHCW+LBA | "          | No UNICEF equipment |
| 28. al-Qotai'        | 03        | Maraawa'a | 40 min                 | "       | 1982      | PHCW     | Sub-Centre | Fully equipped      |
| 29. Dayr Daoud       | 12        | Sukhna    | 1 hr 20 min            | "       | 1983      | PHCW+LBA | Temporary  | Fully equipped      |
| 30. al-Mudman        | 13        | "         | 1 hr 5 min             | "       | 1983      | PHCW     | "          | Fully equipped      |
| 31. al-Daamegh       | 34        | "         | 1 hr 25 min            | "       | 1984      | PHCW     | "          | No UNICEF equipment |
| 32. al-Laawia        | 04        | Duraihimi | 1 hr 15 min            | "       | 1982      | PHCW+LBA | "          | Fully equipped      |
| 33. al-Mukaimania    | 14        | "         | 25 min                 | "       | 1983      | PHCW     | "          | Fully equipped      |
| 34. al-Nosayya       | 15        | Mansuria  | 1 hr 25 min            | "       | 1983      | PHCW     | "          | Fully equipped      |

Appendix D.1. Numeric Codes Memo (continued)

## Appendix D.2 Job Description for Health Facilitators (PHCWs and Murshidaat)

(These are the main points, roughly translated from a note provided by the Director of Training, Hodeida Governorate.)

1. Advice for parents (father and mother) to be given by the health facilitator.
2. Treatment of common diseases and health problems, for example diarrhoea treated with ORS; respiratory diseases; malaria; accidents.
3. Helping the community to focus on how to protect themselves from disease: environmental sanitation, use of latrines, safe drinking water, cleanliness in the home, bednets, booster doses.
4. First aid for accidents.
5. Identifying cases which are medically "at risk" and referring them.
6. The Expanded Programme on Immunization.
7. Nutrition via health education, and supplementing iron and Vitamin A.
8. Providing family planning services.
9. Identifying children who are at risk on account of social reasons (eg orphans).
10. Helping school teachers teach about disease prevention.
11. Cooperate with other health workers, eg the malaria team and EPI staff.

Readers are also referred to the Proceedings of the Workshop for Planning the Training Programme for Male and Female PHCWs in Sa'ada, Hajja, Hodeida and Mareb, 2nd June - 6th June 1990, which specified tasks in some detail. See the report on Dr. Madeleine Taha's consultancy from May 9th to June 8th 1990 (ACCS/REACH, Sana'a).

Appendix D.3 Basic Training Courses for PHC Staff\* and Jiddaat

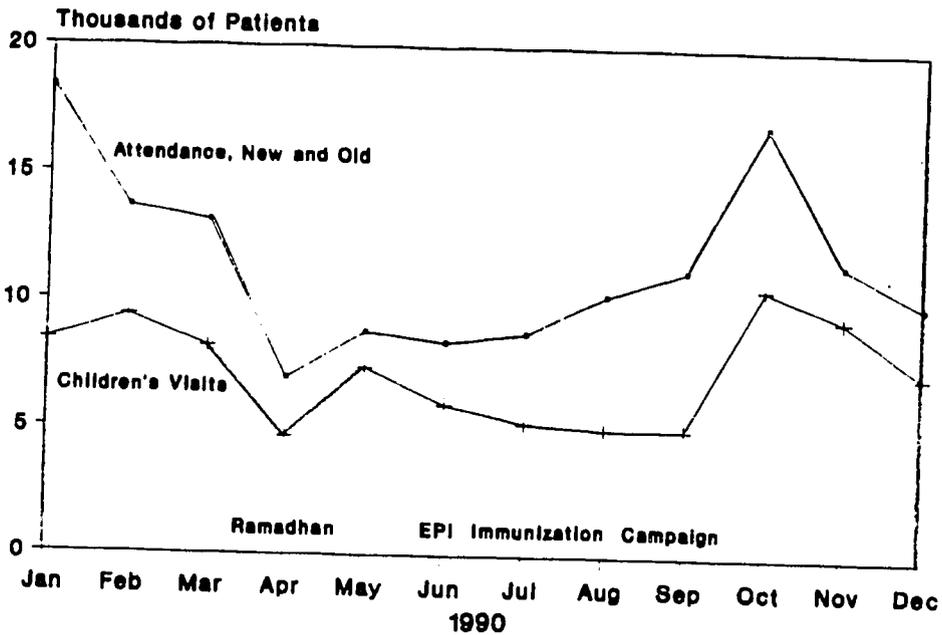
| Cadre     | Trained by    | Date Ended | Number Quali-<br>fied | Number at: |     | Percent Attrition |   |
|-----------|---------------|------------|-----------------------|------------|-----|-------------------|---|
|           |               |            |                       | PHCUs      | HCS |                   |   |
| Male PHCW | Zabid         | Nov-81     | 19                    | 16         | 1   | 11%               | a |
| Male PHCW | Tihama PHCP   | Dec-81     | 4                     | 3          | 1   | 0                 |   |
| LBA       | Tihama PHCP   | Sep-82     | 3                     | 2          | 0   | 33%               | b |
| Male PHCW | Tihama PHCP   | Dec-82     | 11                    | 10         | 1   | 0                 |   |
| Male PHCW | Tihama PHCP   | Dec-83     | 17                    | 14         | 0   | 18%               | c |
| LBA       | Tihama PHCP   | Jan-84     | 7                     | 4          | 1   | 29%               | d |
| LBA       | Zabid         | Sep-85     | 5                     | 4          | 0   | 20%               | e |
| Male PHCW | Tihama PHCP   | Dec-85     | 7                     | 7          |     | 0                 |   |
| Male PHCW | Tihama PHCP   | Jul-86     | 9                     | 7          | 2   | 0                 |   |
| Male PHCW | Tihama PHCP   | Oct-86     | 12                    | 11         | 0   | 8%                | f |
| Male PHCW | Tihama PHCP   | Sep-87     | 15                    | 12         | 0   | 20%               | g |
| Murshida  | Tihama PHCP   | Dec-87     | 8                     | -          | 7   | 13%               | h |
| Murshida  | Hodeida Urban | Oct-86     | 9                     | -          | 5   | 44%               |   |
| Male PHCW | Zabid         | Dec-88     | 14                    | 14         |     | 0                 |   |
| Murshida  | Tihama PHCP   | Feb-89     | 6                     | -          | 6   | 0                 |   |
| Murshida  | Zabid         | Aug-89     | 12                    | 11         | 1   | 0                 |   |
| Murshida  | Hodeida Urban | Dec-89     | 11                    | -          | 11  | 0                 |   |
| Murshida  | Tihama PHCP   | Feb-90     | 11                    | 3          | 7   | 9%                | i |
| Murshida  | Hodeida Urban | May-91     | 19                    | -          | 18  | 5%                | j |
| Male PHCW | Ibb           | ?          | 2                     | 2          |     | 0                 | k |

|       |               |        |    | Trained at:   |  |
|-------|---------------|--------|----|---------------|--|
| Jidda | Tihama PHCP   | Dec-86 | 8  | Zohra         |  |
| Jidda | Tihama PHCP   | Apr-86 | 8  | el Qotai'     |  |
| Jidda | Tihama PHCP   | Jan-87 | 12 | Bajil Workers |  |
| Jidda | Tihama PHCP   | May-86 | 8  | Zaidia        |  |
| Jidda | Tihama PHCP   | Sep-86 | 14 | Mansuria      |  |
| Jidda | Hodeida Urban | Apr-87 | 12 | Ghuleil       |  |

- \* Excludes one female nurse working at Bait al Sheikh and one male nurse working at Shujeera.
- First PHCW assigned to Mowshej left. Husseinia's first PHCW went to train as a nurse, then started a private practice.
  - One LBA from Zaidia went into private practice.
  - 'Obaal's first PHCW became Director of Finance in the LCCD. Ruqaab had PHCWs qualified; one left, one is in jail.
  - LBA from Qamaria died. One from Ruqaab never worked.
  - One of the LBAs from Madan left the area.
  - Dayr al Wali's PHCW never worked.
  - PHCW from Mahal Moh'd Saeed never worked. PHCW from Jebel al Milh was not employed so he stopped working. Shujeera's PHCW left and was replaced by a nurse.
  - One of the Kadan murshidaat died.
  - One (Bajil Central) never worked because of transport problems. Four trainees came from villages; one from Mo'ataradh works at Zohra HC because PHC Unit is in the suq.
  - Seven went to work for the Hodeida Health Office but one went to the mountains and is not now working.
  - Date of qualification for 2 PHCWs trained at Ibb is not known.

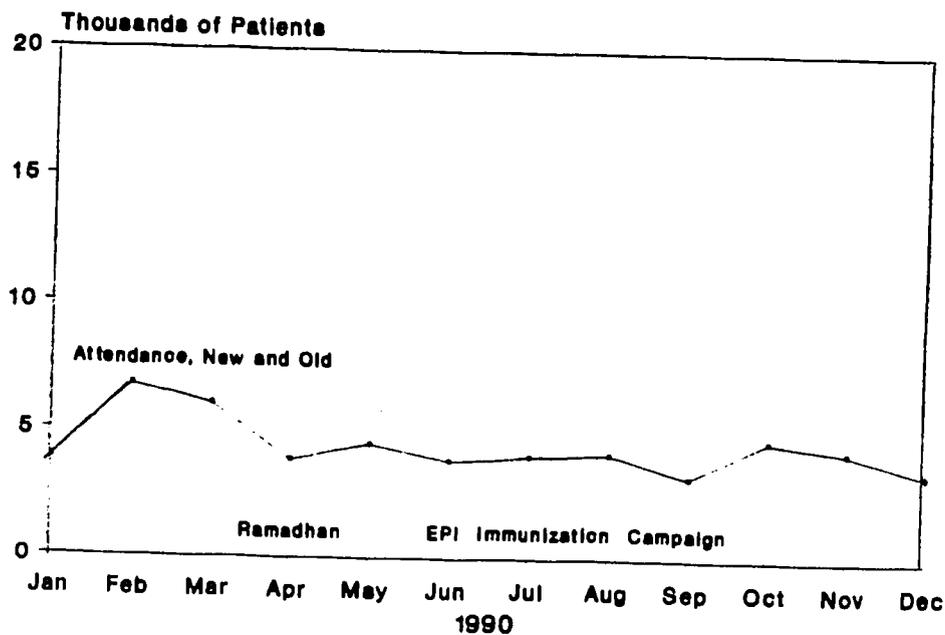
**Appendix D.4**  
**Seasonal Variations in Attendance, Hodeida Governorate**

**Health Centres, January-December 1990**



YMONTHLY.wk1

**PHC Units, January-December 1990**



YMONTHLY.wk1

**Appendix D.5 Diseases and Symptoms reported by PHC Units and Health Centres in 1990, sorted by their frequency**

| Disease or Symptom             | PHC Units     |      | Health Centres |      | Total          |
|--------------------------------|---------------|------|----------------|------|----------------|
|                                | Cases         | Rank | Cases          | Rank |                |
| Malaria                        | 17,334        | 1    | 58,101         | 1    | 75,435         |
| Respiratory, Bronchitis        | 6,933         | 3    | 30,967         | 3    | 37,900         |
| Diarrhoea                      | 5,044         | 5    | 32,030         | 2    | 37,074         |
| Surgical, dressings            | 11,040        | 2    | 14,298         | 8    | 25,338         |
| Anaemia                        | 5,628         | 4    | 17,226         | 5    | 22,854         |
| Malnutrition                   | 754           | 11   | 18,552         | 4    | 19,306         |
| Eye diseases                   | 3,975         | 6    | 14,362         | 7    | 18,337         |
| Intestinal parasites           | 3,415         | 8    | 14,593         | 6    | 18,008         |
| Skin diseases                  | 3,711         | 7    | 12,954         | 10   | 16,665         |
| Urinary tract infections       | 2,239         | 10   | 14,136         | 9    | 16,375         |
| Other                          | 3,368         | 9    | 463            | 19   | 3,831          |
| TB                             | 146           | 14   | 2,910          | 11   | 3,056          |
| Bilharzia                      | 143           | 15   | 2,106          | 12   | 2,249          |
| Mumps                          | 468           | 12   | 1,635          | 14   | 2,103          |
| Hepatitis                      | 130           | 17   | 1,758          | 13   | 1,888          |
| Pertussis                      | 125           | 18   | 1,580          | 16   | 1,705          |
| Insomnia, Depression, Hysteria | 58            | 21   | 1,607          | 15   | 1,665          |
| Measles                        | 81            | 20   | 1,404          | 17   | 1,485          |
| Fractures                      | 297           | 13   | 552            | 18   | 849            |
| Epilepsy, convulsions          | 136           | 16   | 430            | 20   | 566            |
| Central nervous system         | 28            | 22   | 410            | 21   | 438            |
| Mental disturbance, Mania      | 108           | 19   | 271            | 22   | 379            |
| Mental retardation             | 16            | 24   | 159            | 23   | 175            |
| Polio                          | 19            | 23   | 120            | 24   | 139            |
| Diphtheria                     | 12            | 25   | 84             | 25   | 96             |
| Tetanus                        | 0             | 26   | 37             | 26   | 37             |
| <b>Total</b>                   | <b>65,208</b> |      | <b>242,745</b> |      | <b>307,953</b> |
| <b>Total on printout</b>       | <b>64,401</b> |      | <b>240,647</b> |      | <b>305,048</b> |

Not all facilities submitted their Monthly Disease Report for every month in 1990. Some staff report multiple symptoms or diseases for a single patient, and others report only the main one, so these figures will not match the attendance data (which also include visits other than curative care).

## STERILIZABLE PLASTIC SYRINGES

A single sterile needle and a single sterile syringe should be used with each injection.

Disposable syringes and needles should only be used if it can be assured that they will be destroyed after a single use. If this cannot be assured, reusable, sterilizable syringes and needles should be used with scrupulous attention to sterilization or high level disinfection.

Single dose sterilizable plastic syringes are recommended for use in the EPI because they are inexpensive, they can be sterilized repeatedly at temperatures up to 132 degrees Centigrade and, unlike glass syringes, they are not fragile.

Sterilizable plastic syringes can be sterilized more than 200 times in soft water. When sterilized in hard water, the hard water salts deposit on the surfaces of the syringe barrels - this increases friction and reduces the life of the piston seals.

If hard water must be used, its effects can be reduced in the following ways:

- The hard water deposits can be eliminated by distilling the water first. This is the most effective way and syringes sterilized in distilled water will survive well over 200 sterilizations.
- The water can be boiled before use then, without disturbing the salt deposits at the bottom of the pan, carefully poured off into the sterilizer container.
- Hard water pads can be used inside the sterilizer and are quite successful in many cases.

The pads cause the hard water salts to precipitate and to coat the surface of the pads, rather than the surface of the syringe barrels. However, in some hard water conditions the life of the syringe is not extended by use of the pads.

Studies to determine better methods of extending the life of syringes in hard water conditions continue.

High level disinfection can be achieved by immersing syringes and needles in boiling water for 20 minutes. The 20 minutes should be timed from the moment the last syringe is introduced into the boiling water. If a dirty syringe is dropped into a boiling load during disinfection, the timer has to be restarted. High level disinfection kills all bacteria but not all spores and is only recommended when sterilization cannot take place.

Manufacturers have also produced sterilizable syringes in 2.0 ml and 5.0 ml sizes for use in other primary health care programmes.

The policy agreed on by WHO and UNICEF on the choice of syringes, needles, sterilizers and other injection equipment has been issued as a separate guideline in the WHO/UNICEF EPI Technical Series as document 1986, No 2. This document will be revised in the near future to include recent developments in injection technologies, particularly in the area of single dose auto-destruct syringes.

From EPI Product Information Sheets: 1989/90, No.1,  
Expanded Programme on Immunization, WHO, Geneva  
(WHO/UNICEF/EPI.TS/89.1): July 1989.

Appendix D.7 PHC Unit's Equipment, from UNICEF and Health Office Lists

a) UNICEF Issue Order for Equipment, packed March 1990

Items which also appear on the list in the Health Office files are marked / in the last column, which also shows the identifying number on that list. If the quantity of items per unit differs, the Health Office list's quantity is shown in brackets [ ]

This list does not include items supplied to Murshidaat in their delivery kits. It does not contain some items (eg bassinet) which have been supplied in the past.

| ID Item  | US \$,<br>1990 | Quantity<br>per PHCU | Cost/<br>PHCU | On H.Off<br>List? |
|--|----------------|----------------------|---------------|-------------------|
| 1 Height measuring instrument to 2 metres      | \$9.19         | 1                    | \$9.19        | / 61              |
| 2 Scale adult metric 140kgx100g                | \$116.60       | 1                    | \$116.60      | / 74              |
| 3 Scale infant metric                          | \$35.75        | 1                    | \$35.75       | x                 |
| 4 Disinfector instr.boiling 430x250x180mm      | \$43.29        | 1                    | \$43.29       | / 60              |
| 5 Stove kerosene single burner pressure type   | \$13.96        | 1                    | \$13.96       | x                 |
| 6 Stretcher army folding                       | \$72.93        | 1                    | \$72.93       | / 73              |
| 7 Table examining folding 2-section w/pad      | \$245.85       | 1                    | \$245.85      | x                 |
| 8 Table utility w/drawer & rails 500x400x800mm | \$143.93       | 1                    | \$143.93      | x                 |
| 9 Waste receptacle 13 ltr capacity             | \$10.66        | 1                    | \$10.66       | / 68              |
| 10 Basin kidney 475 ml stainless steel         | \$1.60         | 5                    | \$8.00        | x                 |
| 11 Basin kidney 800ml autoclavable PP          | \$0.47         | 5                    | \$2.35        | / 50              |
| 12 Basin solution 6 ltr autoclavable PP        | \$1.66         | 2                    | \$3.32        | / 30              |
| 13 Basin wash shallow 4-ltr autoclavable PP    | \$1.41         | 2                    | \$2.82        | / 58              |
| 14 Bedpan adult autoclavable PP                | \$4.19         | 1                    | \$4.19        | / 65              |
| 15 Bedpan child autoclavable PP                | \$4.02         | 1                    | \$4.02        | / 29              |
| 16 Cup solution 180ml stainless steel          | \$0.80         | 4                    | \$3.20        | / 34              |
| 17 Irrigator 1.5ltr stainless steel            | \$5.68         | 1                    | \$5.68        | x                 |
| 18 Connector 3-in-1 for 6-8mm nylon tubing     | \$0.22         | 1                    | \$0.22        | x                 |
| 19 Tubing medical latex rubber 150cm           | \$0.72         | 1                    | \$0.72        | x                 |
| 20 Clamp tubing regulating Hoffman 13x19mm     | \$0.21         | 1                    | \$0.21        | x                 |
| 21 Jar dressing w/cover 2.13ltr SS             | \$4.24         | 2                    | \$8.48        | / 55              |
| 22 Measure graduated w/handle 1000ml SS        | \$2.76         | 1                    | \$2.76        | / 36              |
| 23 Tray instrument covered 225x125x50mm SS     | \$5.43         | 2                    | \$10.86       | / 35              |
| 24 Apron utility 900mmx1m plastic              | \$1.37         | 4                    | \$5.48        | / 39              |

a) UNICEF Issue Order for Equipment, packed March 1990 (continued)

| ID Item  | US \$,<br>1990 | Quantity<br>per PHCU | Cost/<br>PHCU | On HO<br>List? |
|--|----------------|----------------------|---------------|----------------|
| 25 Aspirator nasal infant size 30ml                  | \$0.63         | 1                    | \$0.63        | ✓ 38           |
| 26 Jar forceps 180mm deep PP                         | \$3.77         | 2                    | \$7.54        | ✓ 37           |
| 27 Sheeting rubber double-coated 910mm wide          | \$4.25         | 6                    | \$25.50       | x              |
| 28 Tourniquet latex rubber 75cm                      | \$0.34         | 6                    | \$2.04        | ✓ 43           |
| 29 Dropper medicine straight tip ungraduated         | \$0.09         | 10                   | \$0.90        | ✓ 44           |
| 30 Thermometer oral dual C/F scale                   | \$0.73         | 12                   | \$8.76        | ✓ 4            |
| 31 Lamp alcohol w/screw cap 60ml metal               | \$1.78         | 1                    | \$1.78        | ✓ 42           |
| 32 Lancet SS Hagedorn needle 75mm pkt of 6           | \$1.51         | 6 [2]                | \$9.06        | ✓ 9            |
| 33 Splint set, multipurpose (12 pieces per set)      |                | 1                    |               | ✓ 62           |
| 33.1 Splint-board full body 1.5m                     | \$4.10         | 2                    | \$8.20        | "              |
| 33.2 Splint-board leg 750mm                          | \$2.19         | 4                    | \$8.76        | "              |
| 33.3 Splint-board arm 500mm                          | \$1.74         | 6                    | \$10.44       | "              |
| 33.4 Triangular bandage cloth 910mm sides            | \$0.35         | 24                   | \$8.40        | "              |
| 34 Splint-board full body 1.5m                       | \$4.10         | 2                    | \$8.20        | x              |
| 35 Splint-board leg 750mm                            | \$2.19         | 4                    | \$8.76        | x              |
| 36 Splint-board arm 500mm                            | \$1.74         | 6                    | \$10.44       | x              |
| 37 Triangular bandage cloth 910mm sides              | \$0.35         | 24 [20]              | \$8.40        | ✓ 63           |
| 38 Suture silk black, set of 3 sizes                 |                | 12                   |               | ✓ 40           |
| 38.1 Suture silk black size 00 USP 2x76cm lgth       | \$0.36         | 12                   | \$4.32        | "              |
| 38.2 Suture silk black size 1 USP 2x76cm             | \$0.40         | 12                   | \$4.80        | "              |
| 38.3 Suture silk black size 3 USP 2x76cm lgth        | \$0.60         | 12                   | \$7.20        | "              |
| 39 Suture silk black size 00 USP 2x76cm lgth         | \$0.36         | 12                   | \$4.32        | x              |
| 40 Suture silk black size 1 USP 2x76cm               | \$0.40         | 12                   | \$4.80        | x              |
| 41 Suture silk black size 3 USP 2x76cm lgth          | \$0.60         | 12                   | \$7.20        | x              |
| 42 Tape measure 1.5m vinyl-coated fibreglass         | \$0.35         | 1                    | \$0.35        | ✓ 10           |
| 43 Towel huck 430x500mm                              | \$0.33         | 6                    | \$1.98        | ✓ 49           |
| 44 Tongue depressor 165mm metal                      | \$0.62         | 2                    | \$1.24        | x              |
| 45 Flashlight prefocused 2-cell right-angled head    | \$1.84         | 2 [1]                | \$3.68        | ✓ 53           |
| 46 Battery alkaline dry cell D type 1.5V             | \$0.70         | 4 [2]                | \$2.80        | ✓ 57           |
| 47 Forceps dressing spring type 155mm SS             | \$0.74         | 2                    | \$1.48        | ✓ 26           |
| 48 Forceps hemostat curved Kelly 140mm SS            | \$1.46         | 2                    | \$2.92        | ✓ 27           |
| 49 Forceps hemostat straight Rochester-Pean 160mm SS | \$1.86         | 2                    | \$3.72        | ✓ 22           |
| 50 Forceps sinus straight Lister 125mm SS            | \$1.43         | 1                    | \$1.43        | ✓ 20           |
| 51 Forceps splinter spring type fine points 90mm     | \$0.57         | 1 [2]                | \$0.57        | ✓ 24           |

a) UNICEF Issue Order, packed March 1990 (continued)

| ID Item   | US \$,<br>1990 | Quantity<br>per PHCU | Cost/<br>PHCU | On HO<br>List? |
|---|----------------|----------------------|---------------|----------------|
| 52 Forceps sponge holding straight 200mm            | \$2.84         | 1                    | \$2.84        | ✓ 21           |
| 53 Forceps sterilizer Cheatle 270mm                 | \$4.70         | 1                    | \$4.70        | ✓ 19           |
| 54 Forceps tissue spring type 1x2 teeth 145mm       | \$0.91         | 1                    | \$0.91        | ✓ 23           |
| 55 Holder needle straight narrow jaw Mayo-Hgr 160mm | \$1.97         | 1                    | \$1.97        | ✓ 25           |
| 56 Knife handle surgical for minor surgery #3       | \$1.48         | 1                    | \$1.48        | ✓ 15           |
| 57 Knife blade surgical for minor surgery #11 pkt 5 | \$0.29         | 6 [1]                | \$1.74        | ✓ 13           |
| 58 Knife blade surgical for minor surgery #15 pkt 5 | \$0.30         | 6                    | \$1.80        | ✓ 14           |
| 59 Needle hypo .70x32mm/22gx1.25" Luer box of 12    | \$0.38         | 2                    | \$0.76        | x              |
| 60 Needle hypo .55x19mm/24gx0.75" Luer box of 12    | \$0.51         | 2                    | \$1.02        | x              |
| 61 Needle suture 3/8 circ tri pt pkt of 6 assorted  | \$1.18         | 2                    | \$2.36        | ✓ 11           |
| 62 Scissors bandage angular Lister 180mm SS         | \$2.51         | 1                    | \$2.51        | ✓ 18           |
| 63 Scissors surgical straight 145mm S/B SS          | \$1.13         | 2                    | \$2.26        | ✓ 16           |
| 64 Syringe hypo 2ml Luer glass                      | \$0.45         | 3                    | \$1.35        | x              |
| 65 Syringe hypo 5ml Luer glass                      | \$0.45         | 3                    | \$1.35        | x              |
| 66 Sheeting cotton width 1.45m +/-2cm               | \$0.99         | 10 [8]               | \$9.90        | ✓ 3            |
| 67 Chair folding steel                              | \$8.84         | 6                    | \$53.04       | ✓ 72           |
| 68 Lantern hurricane non-pressure kerosene 340ml    | \$5.90         | 1                    | \$5.90        | ✓ 1            |
| 69 Table folding 105cm L x 70cm W x 74cm H          | \$30.45        | 2                    | \$60.90       | x              |

Total per PHCU \$1,091.88

b) Equipment List for Murshid and Murshida from Hodeida Health Office Files

Health Office's list in Arabic is for Murshid and Murshida and has 76 items; there are 75 ID numbers listed but Item 47 is two separate items. Out of these 76 items, 47 are on the UNICEF list (a), above.

As with list (a), items in the Murshida's kit (about 30 items) are not included in the list from the Health Office.

The following 29 items are not on the UNICEF list (a). Some are alternative models to those on the UNICEF list; their catalogue numbers and the Item ID from List (a) is shown in the last column. Other items are clearly additional (eg breast pump).

b) Equipment List for Murshid and Murshida from Hodeida Health Office Files (cont.)

| H.Off. ID | Item (sorted by the Health Office ID Number)        | Catalog Number                  | Quantity per PHCU | Alternative? Cat.Num | ID in List a |
|-----------|---|---------------------------------|-------------------|----------------------|--------------|
|           | 2 Sheet plastic white                               | number not in catalog x 0361000 | 6                 | 0360000              | 27           |
|           | 5 Catheter urethral w/set of 12 tubes assorted      | 0323400                         | 1                 |                      |              |
|           | 6 Thermometer rectal dual C/F scale                 | 0481060                         | 12                |                      |              |
|           | 7 Nipple shield                                     | 0363000                         | 6                 |                      |              |
|           | 8 Measuring cylinder 10ml in 0.2ml PP               | 0334500                         | 2                 |                      |              |
|           | 12 Suture catgut obstetric sterile w/needle box 36  | 0563500                         | 12                |                      |              |
|           | 17 Scissors sewing                                  | number not in catalog x 0774645 | 1                 |                      |              |
|           | 28 Nasal speculum child size 140mm                  | 0681000                         | 1                 |                      |              |
|           | 31 Mosquito netting polyester 2.4x6m                | 0537210                         | 6                 |                      |              |
|           | 32 Insecticide pump hand (dust gun)                 | 0521000                         | 1                 |                      |              |
|           | 33 Gloves latex size 6.5                            | 0328000                         | 2                 |                      |              |
|           | 41 Catheter tracheal Delee w/glass mucus trap 16FR  | 0319000                         | 2                 |                      |              |
|           | 45 Gloves latex size 7 reusable                     | 0328500                         | 1                 |                      |              |
|           | 46 Syringe rectal infant rubber bulb hard tip       | 0365000                         | 1                 |                      |              |
| 47.1      | Rectal tube one-eye funnel end FR 20                | 0378000                         | 1                 |                      |              |
| 47.2      | Rectal tube one-eye funnel end FR 22                | 0378500                         | 1                 |                      |              |
|           | 48 Volumetric cylinder 125ml                        | number not in catalog x 0441000 | 2                 |                      |              |
|           | 51 Blankets child's 910x1270mm 70% cotton           | 0512688                         | 6                 |                      |              |
|           | 52 Breast pump hand rubber glass/plastic bell       | 0345000                         | 1                 |                      |              |
|           | 54 Finger gloves med.size rolled end box of 72      | 0327001                         | 2                 |                      |              |
|           | 56 Cup medicine 30ml autoclavable PP                | 0324970                         | ?500?             |                      |              |
|           | 59 Basin sponge 1700ml autoclavable PP              | 0225420                         | 4                 |                      |              |
|           | 64 Blanket wool blend 1.5x2m adult                  | 5003500                         | 1                 |                      |              |
|           | 66 Basin kidney 475ml autoclavable PP               | 0210020                         | 5                 | 0210000              | 10           |
|           | 67 Hand brush white nylon bristles                  | 0514000                         | 6                 |                      |              |
|           | 69 Scale w/trousers infant spring type hanging 25kg | 0145550                         | 1                 | 0145500              | 3            |
|           | 70 Stove gas butane 3-burner                        | 2004200                         | 1                 | 0170000              | 5            |
|           | 71 Scale infant portable to 5kg                     | 0557000                         | 1                 |                      |              |
|           | 75 Dressings trolley 500x910x860mm                  | 0102000                         | 1                 | 0188400              | 8            |

7 items had typing errors in the catalogue numbers, and 3 others (marked x above) had catalogue numbers which could not be traced in the 1990 UNICEF Copenhagen Warehouse Catalogue.

## Appendix D.8 Vehicle Use Policy

This is a copy of the Tihama PHC Project's policy on vehicle use, dating from 1985-6.

With minor modifications it can be used by the Health Office; for example, substitute "Health Office" for "TPHCP" throughout.

1. Any person using a TPHCP vehicle for any purpose must:
  - a. have a valid YAR driving license;
  - b. have and maintain a good driving record;
  - c. be an employee of the TPHCP;
  - d. have demonstrated, to the satisfaction of the TPHCP dispatcher (Hodeida) of MSH COP (Sana'a), proper concern for the maintenance of all project vehicles.
2. No project vehicle will be used for personal business during official working hours.
3. The TPHCP's dispatcher, in consultation with the project logistics officer, will assign each project-financed vehicle to a specific project driver or other project staff member who will be responsible for ensuring that the vehicle is maintained and used according to the project policy.
4. The TPHCP's dispatcher, in consultation with the project logistics officer, will determine where the vehicles will be garaged during off-duty hours.
5. Each staff member assigned responsibility for a project-financed vehicle will ensure, in collaboration with the project's dispatcher, that his vehicle's preventive maintenance schedule is followed.
6. The project dispatcher will review each vehicle's logbook monthly to ascertain that they are being maintained properly. He will also prepare a report to the project accountant listing all private use of project vehicles.
7. Each kilometer of non-official use of a project-financed vehicle will be charged to the user at a rate of US\$0.13, payable in local currency at the current rate of exchange.
8. If a logbook is not maintained in terms of an exact accounting for kilometrage, it will be assumed that the car was used for personal reasons by the staff member responsible for the vehicle. The staff member will then be charged the rate specified for any kilometer not accounted for.
9. On the last day of each month, all vehicle logbooks will be turned in to the project dispatcher who will be responsible for working with the project accountant in order to calculate and collect the personal usage fees due for each vehicle. The money collected as personal usage fees will then be deposited and accounted for in the project's operational account.

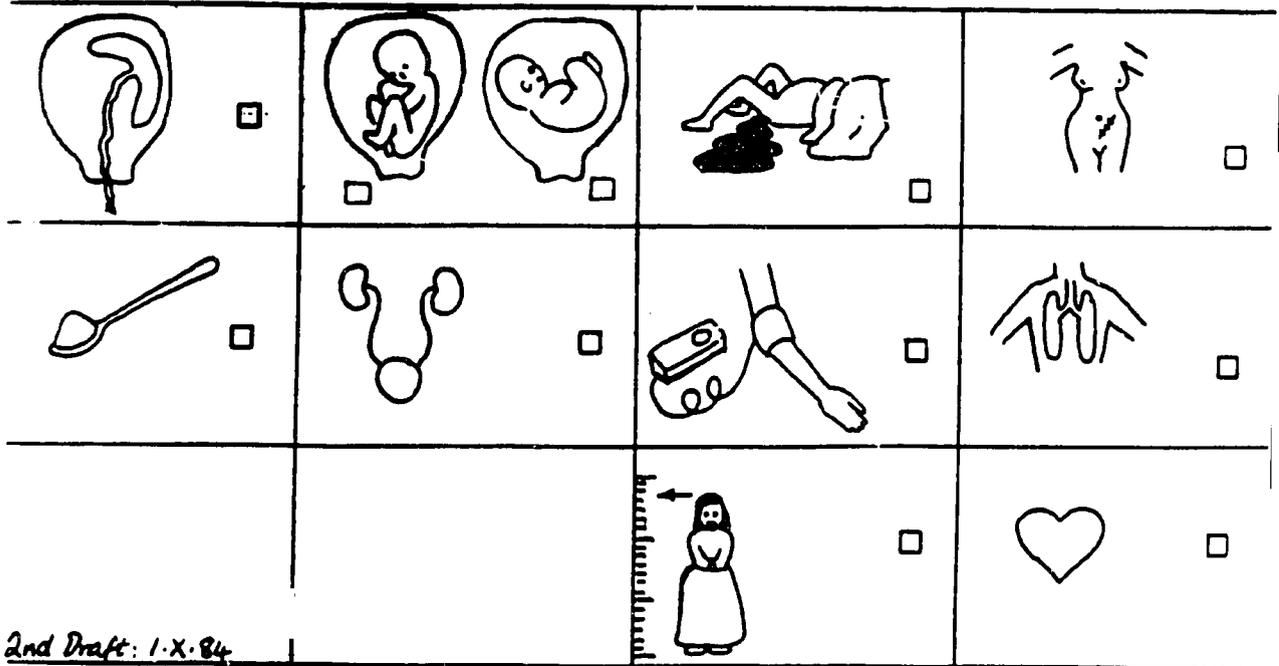
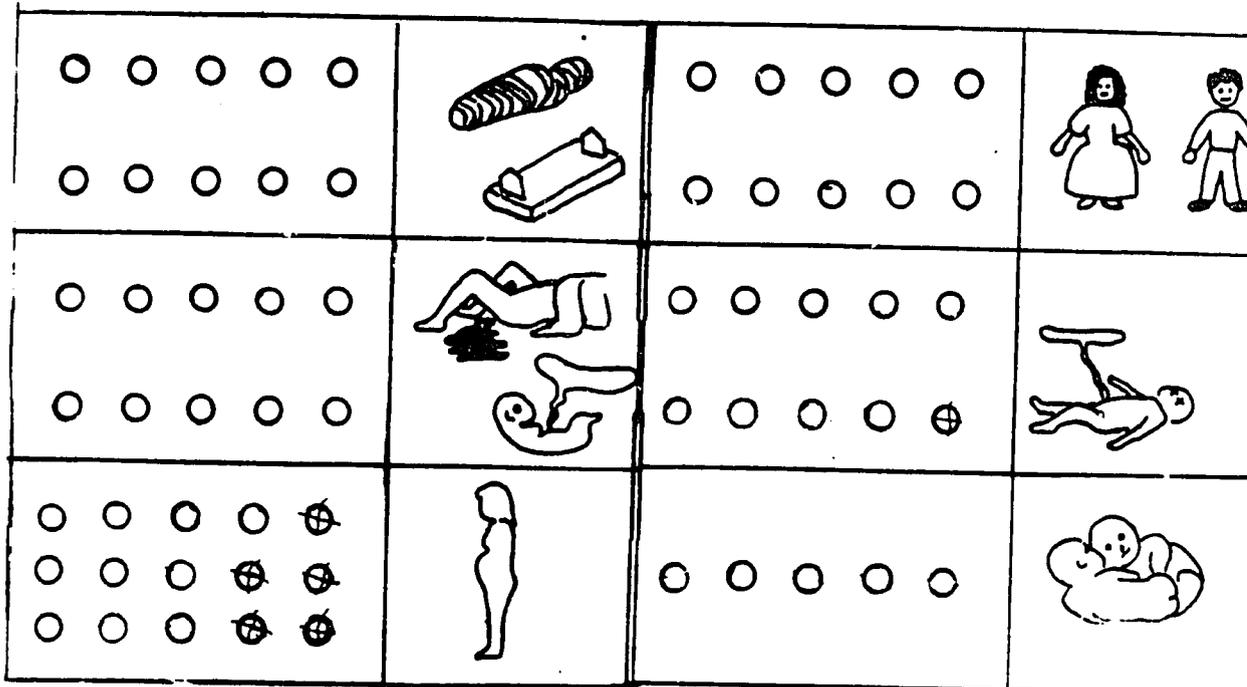
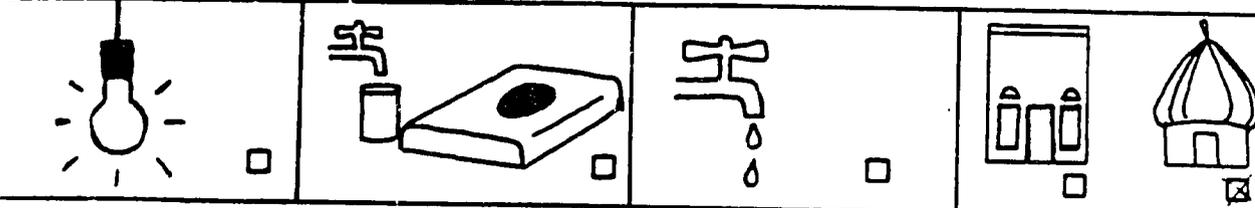
**Appendix D.8 Vehicle Use Policy (continued)**

10. Use of a project vehicle for personal use by project personnel other than the responsible staff member will be authorized by the dispatcher. If there is a conflict in scheduling the use of a vehicle for personal use, the conflict will be resolved by the dispatcher in consultation with the persons wanting to use the vehicle. If the dispatcher feels that he cannot resolve the conflict, he will refer the problem to the project's logistics officer for final arbitration.
11. All project vehicles will have full-coverage, 3rd party insurance which covers the vehicles and all passengers up to the manufacturer's recommended limit.

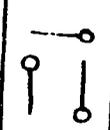
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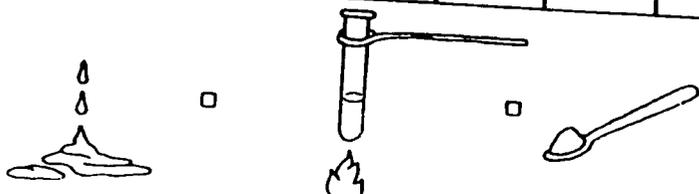


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المؤلف:  
 الجرعة الاولى. التاريخ  
 الجرعة الثانية التاريخ



## Appendix E Reference Materials

Copies of starred (\*) items have been left with the Health Office to use as resource materials.

### Methodology

- \* "Evaluation of the Danida-Assisted Health Care and Family Welfare Projects, India."  
Volume I Framework and Methodology  
Volume II Management, using Health Services Indicators for Systems Assessment and Monitoring  
Anthony Battersby, Rachel Feilden and Chitra Sundaram. Danida, Copenhagen: April 1987
- "How to Assess Health Services Logistics with Particular Reference to Peripheral Health Facilities: Volume I Checklists".  
3rd Draft, WHO/Geneva: April 1985.

Minimum Evaluation Procedure for Water Supply and Sanitation Projects, WHO/ETS Publication No.6. Geneva: May 1985.

Health Manpower Projection HMP (1991-2010). Ministry of Public Health, Republic of Yemen, Planning and Development Sector, General Directorate of Planning, Statistics and Follow-Up: 1991.

### Background

- Tihama Primary Health Care Project: Trip Report, March-April 1981. Peter Cross, Management Sciences for Health: April 1981.
- Tihama Primary Health Care Project, Yemen Arab Republic: Project Development Consultancy Report. James Bates, William Emmet, Rachel Feilden, John Gill and Ron O'Connor, Management Sciences for Health: April 13th-May 20th 1983.
- Traditional Mother and Child Care in the Tihama Primary Health Care Project Area. Mary Hébert, Management Sciences for Health: 1984.
- \* Review of Immunization Activities in the Geographical Area of the Tihama Primary Health Care Project. Anthony Battersby, Management Sciences for Health: March 1985.
- The Improvement of Quality of Work in the Tihama PHC Project by Improvements in Staff Motivation and Discipline. Peter Shipp, Management Sciences for Health: April 1985.
- Survey of Maternal and Child Health Status in the Tihama. Youssef Tawfik and Joseph Bastian, Management Sciences for Health: March 1986. (Arabic draft is called Household Survey: Demographic Characteristics, Morbidity, Mortality and Maternal and Child Health, by Youssef Tawfik. December 1985)
- External Evaluation of the Tihama Primary Health Care Project (279-0065). March 8th 1987.

## Appendix E Reference Materials (continued)

### Background (continued)

1990 Assessment Report after visiting all PHC Units from Zohra to Bait al Faqih, by the Training Director, PHC Department, Hodeida Health Office.

Hodeida Urban Primary Health Care Project: Annual Report 1990, and First and Second Quarterly Report 1991. Ahmed Mohammed al Gunaid and Paul Weelen.

Taiz Governorate Primary Health Care Survey 1989. Taiz PHC, Radda Barnen and UNICEF. Swedish Save the Children, Sana'a.

Trip Report: Planning the training programme for male and female PHCWs on Sa'ada, Hajja, Hodeida and Mareb, 9th May - 8th June 1990. Madeleine Taha, ACCS/REACH consultant, Sana'a: 1990

Trip Report: Review of EPI Activities in the Northern Governorates. Mark Grabowsky, REACH Project, John Snow Inc. Sana'a, August 1990.

Health Information System. Ministry of Public Health, Republic of Yemen. 1991.

### Manuals produced during the Tihama PHC Project

A Reference Manual for PHCWs: Child Health Services. Tihama PHC Project, January 1987.

- \* Supervision System Manual, Tihama PHC Project, December 1987. (in Arabic. Copies also given to HMI)

Reference Manual for the Vehicle Maintenance System of the TPHCP. Tihama PHC Project, March 1987.

- \* Information Systems Manual, Tihama PHC Project, January 1987.

### Nutrition

Yemen Arab Republic National Nutrition Survey 1979, Yemen General Grain Corporation (Ministry of Supply), Ministry of Health, Centres for Disease Control (US Department of Health and Human Services, Public Health Service) and USAID. Centres for Disease Control, Atlanta, Georgia, USA: November 1980.

Normalized NCHS/CDC Anthropometric Reference: Length and Stature for Age, Weight for Age, and Weight for Length and Stature. Manual accompanying software package from the Centres for Disease Control, Atlanta, Georgia, USA (no date).

Development of Indicators for Monitoring Progress Towards Health for All by the Year 2000. World Health Organization: Geneva 1981. Annex 1, Weight (kg) for Age: Reference Values.

Childhood Malnutrition in Rural Dhamar and Mortality Survey, Sharon Beatty and Ronald van Dijk. Dhamar Rural Health Project Health Systems Research: Dhamar, 1988.

## Appendix E Reference Materials (continued)

### Nutrition (continued)

Food habit survey among under five: al Lawia, by Ulla Stern, Faisal Mohammed Musleh, Zahra Saleh Ali and Azze din Nabeih, Swedish Save the Children (Rädda Barnen) Tihama Nutrition Program, Hodeida. October 1981.

### Information Systems

"Report on PHC Information Systems, Hodeida Governorate," Erik Heydelberg, Public Health Consultants, Amsterdam: October 1990.

Programme for Identification and Management of Mental Health Problems, B. Essex and H. Gosling. Tropical Health Series, Churchill Livingstone: 1982. ISBN 0 582 77701 1.

\* EPI-INFO User's Manual. Version 5: April 1990.

### Malaria Control

\* Guidelines for the Incorporation of Health Safeguards into Irrigation Projects through Intersectoral Cooperation. Mary Tiffen. Joint WHO/FAO/UNEP Panel of Experts on Environmental Management for Vector Control (PEEM Guidelines Series 1), VBC/89.5. Overseas Development Institute, London NW1 4NS.

"Economic aspects of impregnated bed-nets from the Gambia," C.P. MacCormack, R.W. Snow, B.M. Greenwood. Bulletin of the WHO, Vol. 67, No. 2 (1989).

\* Cost Estimates to Cover Population of 7000 with Permethrin-Treated Mosquito Nets. Personal communication from UNICEF, Kenya Country Office, 1990.

### Other

Financing Essential Drugs: Report of a WHO Workshop, Harare, Zimbabwe, 14-18 March 1988. Action Programme on Essential Drugs and Vaccines, WHO, Geneva (WHO/DAP/88.10): 1988.

UNICEF Copenhagen Warehouse Catalogue 1990. UNICEF Plads, Freeport, DK-2100, Copenhagen 0, Denmark.

Problem Drug Pack, Health Action International. Arabic edition from the Arab Resource Collective, POB 7047, Nicosia, Cyprus.

Contraceptive Technology 1990-1992 (15th Revised Edition). Robert A. Hatcher et al. Irvington Publishers Inc., New York, 1990. ISBN 0-8290-2420-4.

Tanzania EPI Joint Review Report, Ministry of Health and Danida Review Team. Danida, Copenhagen: September 1987.

Participatory Planning for Rural Health Facilities, Geetha Ravishankar, Chitra Sundaram and Bo Vangby. Danida, New Delhi: 1985.

## Appendix F Questionnaires

|   |                    |          |
|---|--------------------|----------|
| 1 | PHC Unit           | 19 pages |
| 2 | Trainer/Supervisor | 18 pages |
| 3 | Health Centre      | 11 pages |

These questionnaires were developed for use by experienced staff. They are designed for ease of use in obtaining reliable information during the interview, not for rapid tabulation. They are not suitable for use by enumerators.

Due to their length the questionnaires have been bound separately and can be obtained from ACCS/REACH.