Knowledge, Attitudes and Practices (KAP) in the Sudanese communities for their health seeking behavior

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EXECUTIVE ACTION DOCUMENT

Title of assignment: Analysis of the KAP Study on primary health care for Northern Sudan

Name of Consultant: Kassem M. Kassak

Country visited: Sudan

Date of assignment: December 10-25, 2010

Terms of reference: The technical assistance for analyzing the KAP study is expected to:

1) Discuss and meet with consultant working on analysis of data on household KAP on health;
2) Receive and review the findings of KAP study and frequency tables and dummy tables (these will be provided beforehand) for their completion;
3) Work with the consultant working on the analysis and update/modify the frequency table;
4) Draw an outline/format of the report and discuss it with the national team; and
5) Write report for national level (covering 15 northern states) on household KAP on health on the agreed format and the report should include, in addition to others the following:
   a) Conduct bi-variant and multi-variant analysis to understand the impact of various factors (demographic, socio-economic etc.) on the key dependent variables in the study;
   b) Link findings from KAP to those emerging from Household survey;
   c) Discuss policy implications of KAP study in the light of the results from the NHA and Household survey;
   d) Review and analyze the qualitative data from the transcripts of focus group discussions and incorporate into the findings and analysis of the study findings;
   e) The report should cover, but not limiting to the following: introduction, country context and background to the study, methodology, findings essentially addressing the TOR 5a, b and c, discussion particularly how the study findings (including on barriers to access) guide the designing and organization/reorganization of PHC in Sudan, conclusions and recommendations.

Brief findings:

The study population consisted of 2322 respondents representing 2182 households. Health of the family was a troublesome issue due to limited financial resources and large household size living in poor sanitary conditions. Knowledge about the availability of primary health care services was not translated into practice, although the preference for seeking medical care in PHC was relatively higher than any other health center. In addition, 85% reported they are immunizing their children on time with variations in terms of place of immunization, although 73% believed that a vaccine can be given at a later time if it is missed. Knowledge about malnutrition complications was acceptable (70%), however most of the respondents did not know about the availability of nutrition awareness sessions in PHCs. Variations between knowledge and practice existed in terms of infant feeding during illness and the use of oral hydration solutions during episodes of diarrhea and vomiting. On the other hand, practices conformed to attitudes in terms of preference for home delivery over hospital deliveries. Hospitals were however
preferred over PHCs when seeking antenatal services. There is a tendency among pregnant women to discontinue pursuing antenatal services, and very few seek postnatal services or practice family planning techniques.

**Recommendations**

This technical report focused on three levels of the Ecological Model, Individual, Organization and Policy levels.

<table>
<thead>
<tr>
<th>Responsible</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| Policy and Decision Makers           | 1. There is an urgent need to focus regulatory efforts and intervention programs that are aimed at improving the living conditions of the poor and the disadvantaged in all aspects of life, including water and sanitation.  
2. To increase the number of primary care centers and to expand the spectrum of services provided at some existing centers. |
| Ministerial                          | 3. Collaborate on the education and the literacy of the public on primary care issues. More specifically this will have to focus on female literacy as the corner stone of the communities for the development of the health of the mother and the child. |
| Provincial and District Level health authorities | 4. Conduct awareness campaigns to scale up knowledge and attitude towards primary care and services  
5. To explore quality improvement options including development of the human resources to better delivery and provision of services. This can be complemented by careful examination of the working environment in terms of adequate supply of providers, their skill mix, and their motivators and incentives to improved performance.  
6. To involve media in all aspects of awareness campaigns. This partnership will not only tend to improve coverage of the promotional messages but it will also facilitate behavioral change.  
7. More importantly, developing the monitoring and evaluation system is crucial to assess the baseline situation for planning purposes but also for monitoring of health and behavioral changes at the community and national levels. |
**EXECUTIVE SUMMARY**

*Introduction:* Primary health care service utilization is a complex behavioral phenomenon that is often determined by the availability, quality and cost of services, as well as by the social structure, health beliefs and personal characteristics of the user. In this paper, an attempt is made to understand the knowledge, practices and attitudes of the Sudanese communities in relation to PHC services. The targeted areas were reproductive health: antenatal, intra-partum and postnatal care, and family planning; integrated management of childhood illnesses; immunization of children; nutrition; and water and sanitation.

*Objectives:* To measure the level of knowledge of women in the reproductive age (15-49 years) and their spouses/care takers towards specific health problems and services and suggest interventions targeting these problems; identify the attitudes and beliefs of women in the reproductive age (15-49 years) and their spouses/care takers towards the benefit of selected primary health care services targeting children and women in the reproductive age; determine the degree of use of primary health care provided to the women and children; measure the level of quality of care of primary health care services as perceived by the women in their reproductive age (15-49 years).

*Methodology:* The study was conducted from January 2009 to December 2009 jointly with the Household health expenditure. A questionnaire was administered to the households to survey on their knowledge, attitude, and practices in regards to key primary services, in addition to 4-6 focus groups in each state to dwell on their perceptions about health service utilization, the perceived barriers and areas for improvement.

*Results:* The study population consisted of 2322 respondents representing 2182 households. Health of the family was a troublesome issue due to limited financial resources and large household size living in poor sanitary conditions. Knowledge about the availability of primary health care services was not translated into practice, although the preference for seeking medical care in PHC was relatively higher than any other health center. In addition, 85% reported they are immunizing their children on time with variations in terms of place of immunization, although 73% believed that a vaccine can be given at a later time if it is missed. Knowledge about malnutrition complications was acceptable (70%), however most of the respondents did not know about the availability of nutrition awareness sessions in PHCs. Variations between knowledge and practice existed in terms of infant feeding during illness and the use of oral hydration solutions during episodes of diarrhea and vomiting. On the other hand, practices conformed to attitudes in terms of preference for home delivery over hospital deliveries. Hospitals were however preferred over PHCs when seeking antenatal services. There is a tendency among pregnant women to discontinue pursuing antenatal services, and very few seek postnatal services or practice family planning techniques.

*Discussion and recommendations:* this report examined the Knowledge, Attitudes and Practices of Sudanese communities in regards to PHC services. Areas that need immediate attention include poor quality of certain services offered at PHCs; lack of knowledge about the availability of certain services in PHCs; sanitary conditions of households, including proper waste and water disposal; children’s welfare and survival in terms of nutrition, growth monitoring, and feeding during illness; home delivery practices,
including regulations, safety and infection control; and awareness and advocacy campaigns on the importance of antenatal and postnatal care for women’s and children’s well-being.
INTRODUCTION

BACKGROUND

COUNTRY PROFILE

Sudan is the largest country in Africa spreading over an area of 2.5 million square kilometers. The Country has a federal system of government and it is administratively and politically divided into twenty-five states. For the last two decades, Sudan has had civil conflicts between the North and the South and more recently, the population of the South has voted for a separation referendum. The Northern Sudan consists of 15 states, each consisting of several localities. Approximately 79% of the population lives in Northern Sudan, and 68% of them live in rural areas. However, there is a recent growing trend in urbanization. Sudan is a low income country and it ranked 139 out of 177 countries based on the Human Development Index; poverty is prevalent with variations between and within states. Civil war, natural disasters and the political situation have limited the economic progress of the country, which resorted to foreign partners to exploit its oil fields.

HEALTH STATUS INDICATORS

The health indicators in Sudan have shown stagnation or deterioration of health care delivery in the last decade. Children under five years of age suffered from malnutrition and stunting. The Household Health survey (2006) revealed that, the under-five mortality rate in Sudan increased from 104 per 1000 live births in 1999 to 112 per 1000 live births, which then decreased to around 78 per 1000 live births in 2010 (SHHS, 2010). Similarly maternal mortality ratio increased from 537 per 100,000 in 1990 to 1107 per 100,000 live births in 2006, and then it significantly dropped to 216 per 100,000 in 2010. Also worthy of mention is that communicable diseases dominate in Sudan, with a new outbreak every 2 to 5 years. The most common infectious diseases are food or waterborne diseases, malaria, and HIV, among many others (Figure 1).

Figure 1: Distribution of causes of deaths in children under 5
A system can be seen as an arrangement of parts and their interconnections that come together for a specific purpose. Applied to health, health systems consist of many parts—patients, families, communities, Ministries of Health, health services organizations, health providers, health financing bodies, pharmaceutical companies—that come together to “promote, restore, and maintain health” (WHO, 2000). The functions of these parts constitute the building blocks of a health system: service delivery; health workforce; information; medical products, vaccines and technologies; financing; and leadership and governance stewardship (WHO, 2007).

Sudan has a three-layered health system: Federal Ministry of Health (FMOH), responsible for formulating national health policies, human resource and strategic planning; State Ministries of Health (SMoH), responsible for adopting and implementing policy, detailed health planning, programming and project formulation; and Locality Health Management Authorities, responsible for the provision of health care services through PHC units, dressing stations, dispensaries and health centers.

**Health Care Delivery**

Sudan is politically committed to health for all by the year 2000 and has declared health a top national priority after security (WHO, 2001). The national health strategy places special emphasis on family health, reduction of morbidity and mortality rates among mothers and children, reinforcement of primary health care (PHC), encouragement of scientific research, and coordination between health-related ministries and departments.

Health in Sudan is provided through three levels: teaching, general and specialty hospitals; rural hospitals (at least one in each locality); and PHC centers, dispensaries and dressing stations (Table 1).

Table 1: **Health facilities and their functional status**
<table>
<thead>
<tr>
<th>Type of facility</th>
<th>Total</th>
<th>Functional</th>
<th>Non-functional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals, including rural hospitals</td>
<td>357</td>
<td>357</td>
<td>-</td>
</tr>
<tr>
<td>Urban health centers</td>
<td>558</td>
<td>558</td>
<td>-</td>
</tr>
<tr>
<td>Rural health centers</td>
<td>458</td>
<td>458</td>
<td>-</td>
</tr>
<tr>
<td>Dispensaries</td>
<td>1226</td>
<td>1060</td>
<td>166</td>
</tr>
<tr>
<td>Dressing stations</td>
<td>762</td>
<td>601</td>
<td>161</td>
</tr>
<tr>
<td>PHC units</td>
<td>3044</td>
<td>2404</td>
<td>640</td>
</tr>
</tbody>
</table>

At village level, primary health care units represent the first level of contact between the community and the health services. PHC units provide basic primary health care services. Dressing stations, are staffed by a trained nurse or an experienced community health worker who provides services such as treating common illnesses on an outpatient basis. Dispensaries are staffed by a medical assistant and a nurse, and provide PHC services such as treatment of common illnesses, wound care and some preventive services such as vaccination of children and antenatal care. Rural and urban health centers also exist to assist in the provision of PHC services. In addition, in most rural and urban places, government supported leaders act as focal points in the resolution of various problems. Powerful health committees, supported by the government and laws, are also established and are involved in planning, execution, resource finding and allocation as well as supervision of health services (WHO, 2001).

**PHC Service Delivery**

The interim Constitution of Sudan states that the State is obliged to provide free primary health care (PHC) services for all citizens, in collaboration with the private sector. The development of a National Health Policy was based on existing policies to build a comprehensive Sudanese health system based on a PHC approach (Federal ministry of Health, 2007). The content of the primary health care package includes management of childhood illness and promotion of child health; the promotion of school health; the promotion of reproductive health including family planning; the control of endemic diseases; the protection and promotion of environmental health; and treatment of simple diseases and injuries and mental health.

Results of the WHO report on Primary Health Care facilities in the Red Sea State concludes that almost 30% of the 124 primary health care facilities accessed by the population, are not functioning. In addition, 30.8% of the dispensaries, and 61.9% of primary health care units are not functioning because they lack staff, drugs, basic equipment, or some even need rehabilitation. On the other hand, all 8 rural hospitals
and 93.7% of the health centers are functioning with some gaps. The main concerns are problems with regular power supply of electricity, unavailability of X-Ray service and blood bank, and absence of a referral system in place (WHO, 2006).

Efforts have been expanded locally and internationally to improve service delivery in Sudan. UNICEF, WHO, and the UNDP are developing programs aiming at increasing the availability of PHC centers and PHC services. Table 2 below shows the estimated project costs for the PHC services project for the 15 pilot communities to be served during the first phase of the Integrated Community based Recovery and Development Program (ICRD) in 2007.

Table 2: ICRD 2007 estimated project costs for the PHC services project

<table>
<thead>
<tr>
<th>Activity</th>
<th>Estimated Cost</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction of 10 PHC Units</td>
<td>$150,000</td>
<td>UNICEF</td>
</tr>
<tr>
<td>Provision of medical equipments and health unit furniture</td>
<td>$200,000</td>
<td>UNICEF</td>
</tr>
<tr>
<td>Training of 15 health committees on revolving drug fund</td>
<td>$20,000</td>
<td>WHO</td>
</tr>
<tr>
<td>Youth friendly HIV prevention services and Youth Peer support group activities</td>
<td>$10,000</td>
<td>UNICEF</td>
</tr>
<tr>
<td>PHC system support (capacity building of health workers/promoters on IMCO, Nutrition, safe motherhood; referral care and surveillance systems)</td>
<td>$280,000</td>
<td>WHO</td>
</tr>
<tr>
<td><strong>Primary Health Care</strong></td>
<td><strong>$660,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

The components of the health care package addressed in this paper are nutrition, childhood illnesses and immunization, reproductive health, water and sanitation. In that respect, Sudan is considered as a least developed and low-income food-deficit country. Recent civil strives has been blamed for displaced people, refugees and returnees particularly exposed to food insecurity, health problems and insecurity. It was roughly estimated that around 3.6 million inhabitants were in need of food assistance. Furthermore, it has been reported that among children under 5 years of age, the prevalence of malnutrition is very high and the prevalence of stunting and wasting are classified as very high, in accordance with WHO standards. Unfortunately, data on the health status of nutrition and children in Sudan is lacking but it is speculated that the prevalence of vitamin A, iodine and iron deficiency are high, and that the prevalence of malnutrition is very high. Nevertheless, recent efforts have been intensified to promote better maternal and fetal health outcome. For instance, the National Nutrition Program ensures Folic acid and iron
supplementation for all pregnant women, and vitamin A for lactating women. Furthermore, it follows up on children’s physical growth and development. In addition, certain health centers offer nutrition support services for treating malnourished children aged 6 to 59 months with poor appetite and/or medical complications.

The Expanded Program on Immunization (EPI), one of the PHC departments at the FMoH, was launched in Sudan in 1976. With fluctuating vaccination rates throughout the years due to lack of funding and support, the EPI aimed at increasing the proportion of children less than 1 year fully immunized against the 6 EPI diseases by 2008, interrupting transmission of polio by end of 2005 and eliminating measles by 2010. A step forward, the Comprehensive Multi-Year National Immunization Plan 2006-2010 has set eight new national objectives that will be achieved through service delivery and program management, advocacy and communications, surveillance and data for decision-making, and vaccine supply, quality and logistics.

Besides immunization and nutrition, child welfare and survival are also addressed in the primary health care package with a focus on prevention and treatment of potentially fatal childhood diseases or conditions such as dehydration from excessive vomiting or diarrhea. Furthermore, epidemiological studies have also highlighted the seriousness of health conditions among women especially those in their reproductive age. The Sudanese Household Health Survey (SHHS) of 2006 reported that the Maternal Mortality Ratio (MMR) in North Sudan was 638 deaths per 100,000 live births and that Neonatal Mortality Rate (NMR) was 36 per 1,000 live births, and this has improved to 33 per 1,000 live births in 2010 (SHHS, 2010).

Additionally, it has been reported that family planning is characterized by low contraceptive prevalence rates. In 2010, the utilization of contraceptive methods was 9% and the unmet need for the family planning methods was 28.9%. This discrepancy can be attributed to cultural and political barriers to family planning methods, and hence are in need of appropriate social marketing and political advocacy. In response, the National Health policy mandated the Government to ensure the adequate provision of reproductive health services including antenatal care, intra-partum care, routine and emergency obstetric and neonatal care, counseling and modern family planning services.

Environmental health indicators in Sudan have shown that access to environmental health services is deteriorating. Sudan has suffered a number of long and devastating droughts in the past decades, which have undermined food security and access to secured water sources. This was exacerbated by floods as a result of deforestation and overgrazing in the river’s upper catchment. This has led to severe riverbank erosion in the Nile riverine strip. This has led to major sanitation problems where access to clean water
does not exceed 60% and the percentage of households that have toilets does not exceed 70%.
Furthermore, it has been reported that sewage treatment is grossly inadequate and that solid waste
management practices throughout the country are inadequate and poor. As such, these environmental
health shortcomings have lead to the elevated incidence of waterborne diseases (Table 3), which make up
around 80 percent of reported diseases in the country.

Table 3: Top leading diseases among children under 5 treated in medical institutions

<table>
<thead>
<tr>
<th>Disease</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhea and GA</td>
<td>18.0%</td>
</tr>
<tr>
<td>Others diseases</td>
<td>13.0%</td>
</tr>
<tr>
<td>Malaria</td>
<td>12.0%</td>
</tr>
<tr>
<td>Other severe Malnutrition</td>
<td>12.0%</td>
</tr>
<tr>
<td>Acute Bronchitis</td>
<td>8.0%</td>
</tr>
<tr>
<td>Viral pneumonia</td>
<td>6.0%</td>
</tr>
<tr>
<td>Amoebiasis</td>
<td>4.0%</td>
</tr>
<tr>
<td>Acute tonsillitis</td>
<td>2.0%</td>
</tr>
<tr>
<td>Other eye disorders</td>
<td>2.0%</td>
</tr>
<tr>
<td>Disorders of digestive system</td>
<td>2.0%</td>
</tr>
<tr>
<td>Total</td>
<td>78.0%</td>
</tr>
<tr>
<td>others diseases</td>
<td>22.0%</td>
</tr>
</tbody>
</table>

As a result, the National Health Policy recommended improving environmental health by controlling the
spread of environmental related diseases and increasing water, air and food safety. In that realm, a
strategy has been put in place to monitor water quality through advanced technology, protect sources
against pollution, and to purify and treat contaminated water using highly developed technology.

OBJECTIVES OF THE STUDY
The Knowledge, Attitudes and Practices (KAP) survey aims at examining the knowledge, attitudes and
beliefs of 15 Northern states communities of Sudan towards selected PHC services and these include:

a. Reproductive health: antenatal, intra-partum and postnatal care, and family planning.
b. Integrated management of childhood illnesses.
c. Immunization of children.
d. Nutrition
e. Water and sanitation

The specific objectives of this study are to:

a. Measure the level of knowledge of women in the reproductive age (15-49 years) and their
spouses/care takers towards specific health problems and services and suggest interventions
targeting these problems.
b. Identify the attitudes and beliefs of women in the reproductive age (15-49 years) and their spouses/care takers towards the benefit of selected primary health care services targeting children and women in the reproductive age.

c. Determine the degree of use of primary health care provided to the women and children.

d. Measure the level of quality of care of primary health care services as perceived by the women in their reproductive age (15-49 years).

METHODOLOGY

STUDY DESIGN
The KAP survey was conducted jointly with the Household health expenditure survey and both surveys were a joint effort between the Federal Ministry of Health (FMoH), the Central Bureau of Statistics (CBS) and WHO. The survey included 3 phases: the preparatory phase, the implementation phase, and the outcome phase. The study was conducted from January 2009 to December 2009 to cover the seasonal variations.

STUDY POPULATION
The study includes households that have been living in a dwelling in the respective state for at least 6 months prior to the time of interview. Communities of 15 Northern states were included. The 10 Southern States, which for health matters, are managed by the Ministry of Health, Government of South Sudan, are not covered by this survey. The sample was stratified by state and place of residence (urban/rural) within each state, and a 2-stage cluster sampling design was used: The primary sampling unit (PSU) was defined as a Village in rural areas and a Quarter in urban areas. The secondary sampling unit (SSU) was assigned as the households within the selected clusters. Large PSUs were also segmented and a segment was chosen randomly from each PSU. From each selected household, all married women in the reproductive age (15-49 years) and their spouses/caretakers were interviewed. No replacement was done if a household does not have the eligible respondents.

DATA COLLECTION TOOLS
Both quantitative and qualitative data were collected in this study. A structured questionnaire was developed to survey the households on their knowledge, attitude, and practices in regards to key primary services including water and sanitation, perceived quality of care, child immunization, nutrition, child illness and care, antenatal care, delivery, postnatal care, and family planning (Appendix I). It had parts that are multiple choice questions and others that are open ended to allow the households to express their attitude and perception of specific areas within the services rendered at the primary care level.
Additionally, focus group discussions were held in each of the 15 Northern States; in rural and urban communities which targeted the females at reproductive age and married males. The participants were purposively selected and their selection was based on their age, marital status and level of education. Both males and females groups were recruited through the community and religious leaders mainly with the facilitation of the health workers at the selected areas, their approval was obtained and confidentiality was granted.

The moderators were previously trained on the qualitative methods and specifically trained on the study tools. After assuring the appropriate selection of the groups participants; they assured their approval after explaining the procedure to them and started the sessions and took the notes. The total number of the FGD conducted reached 79 groups distributed among the states, as indicated in Table 4. The average size of the focus groups discussions varied from 8 to 10 participants. The duration of the sessions fluctuate between one hour to hour and half. The themes covered during the discussion were:

a. Awareness about the role of primary health care services 

b. Perceptions and attitudes towards primary health care services and health providers 

b. Perceived barriers to primary health care services 

c. Proposed areas for improving primary health care service delivery 

d. Availability of community resources 

Table 4: Number of groups reached in each state

<table>
<thead>
<tr>
<th>State</th>
<th>Females Group</th>
<th>Males Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khartoum</td>
<td>3</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>River Nile</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Northern State</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Region</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>--------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Gezira</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Sinnar</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Blue Nile</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>White Nile</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>North Kordofan</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>South Kordofan</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>North Darfur</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>West Darfur</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>South Darfur</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>
DATA ANALYSIS
For the quantitative data the descriptive, bivariate and multivariate analyses were attempted to understand the correlations between knowledge, attitudes and practices and primary health care practices. While for the qualitative component of the study, the opinions of the respondents during the focus group discussions were transcribed. Accordingly, a thematic analysis was used to identify the major issues behind the Sudanese communities’ health seeking behavior.

The expert analysis team went through the following steps:

1. Familiarization
2. Themes identification
3. Summarizing and interpreting findings to meet the objectives
4. Selection useful quotes
5. Report writing

Analysis of data from six of the FGDs was done. It was rich in information and opinions because the question guide used was structured loosely that allowed the participants to express their opinion freely. A thematic framework was developed and sent to a qualitative researcher for further validation.

RESULTS

QUANTITATIVE DATA
**Population Characteristics**

The study population consisted of 2322 respondents representing 2182 households. Respondents’ characteristics are summarized in Chart 1. Almost the same number of households was selected from each state.

The age range was between 14 and 51 years, with an average of 31 years (Chart 1), which varies across states. Variations in educational level exist across states (Chart 2). Most of the respondents (96%) were married, and the average size of households was 7 with 25% of the households having at least 9 members (Chart 1). Household size seemed to decrease with educational level (Chart 3).
Results of the study showed that only 4.6% of the total sample was once admitted to the hospital and only 0.2% has received care outside their country. Close to 86% stated they did not consult a health practitioner and the most common reasons were because they did not feel the need to do so (66%), and (23%) they did not know that they had access to medical consultation. Most of the selected households (97%) included a married woman aged between 15-49 years, and the total number of people living in the same dwelling ranged between 1 and 27. Most of the houses are straw based (39.8) or clay based (34.6%). Close to 22% of the houses have 2 rooms, 27% have 3 rooms, and 18% have 4 rooms. In addition, most of the respondents (87.6%) own their houses, while around 6% of the houses are rented. The most common sources of water in the houses were public supply (27%) and pipes (14%) and another 20% get their drinking water from wells (Chart 4). Electricity is generated either from white gas (30%), electricity subscriptions provided by the government (26%), or through generators (14%). Regarding the location and source of fuel for cooking, 21.4% responded that cooking takes place in the living room and another 8% outside the house; 63% reported they use wood for fire and 30% only used gas for cooking. Close to 40% do not have toilets in their place, and almost half use primitive toilets.

**Health Financing**

Regarding the source of health financing, 84.3% of the respondents reported that the main source of paying for healthcare was out of pocket. Also, 20% reported that they pay for medical services either by borrowing money or selling properties. In addition, 15% stated that medical insurance plans cover for their medical services.

When addressing health care costs, 43% of the total sample reported that health care constituted a financial burden on the family, and that the family resorted to either partially complying with the medical treatment regimen (26.8%), borrowing money (22.8%), or cutting down on their expenditures in general (18.1%).

**Water and Sanitation**

Approximately 42% of the total population relies on safe piped water whereas 30% obtain their water from river, wells or storage holes. Most of the respondents (97%) tend to believe in sanitary practices and 91% tend to practice sanitary measures. Solid waste disposal was reported to be proper in only 65% of the total study population (Chart 5). The percentage decreases to 23% for waste water disposal (Chart 6). In addition, subjects reported that they get their potable water from pipes inside houses (n=650) or through wells (n= 478) (Chart 7). Close to 10% of the respondents stated that they treat water before drinking, either through filters (27%) or settling (21%) (Charts 8 & 9). More than half of the respondents said that
polluted water may cause diarrhea, while close to 12% think it causes no problem (Chart 10). Results also showed that close to 40% of the total sample do not have toilets in their houses, of them 85% use outdoor as an alternative to toilets (Charts 11 & 12). Regarding hand washing practices, more than 80% reported to wash their hands before and after eating, after going to the toilets, and before food preparations. However, only 55% reported the use of soap during hand washing (Chart 13). Beliefs in the importance of personal hygiene increased significantly with educational level (Chart 14). In addition, hygienic practices increased significantly with household size and better financial status (Charts 15 & 16). As for waste disposal, close to 45% said they discarded wastes in garbage dumpster and another 18% on streets (Chart 17). The most common complications of improper waste disposal are growth of mosquitoes (70%) and flies (42%) (Chart 18). Awareness of such complications increased with age, household size, higher educational level, and better financial status (Charts 19, 20, 21, &22). Regarding water disposal, close to 70% reported that it is disposed directly to the streets and that the most common problems related to improper water disposal are the growth of flies (75%) and rodents (Chart 23). Older females were more aware of problems related to improper water disposal (Chart 24). However, knowledge about this issue decreased with smaller household size, lower educational level, and with lower financial status (Charts 25, 26, &27).

**Health Services Utilization**

The number of respondents included for this section is 2233. Close to 70% are aware that the PHC centers provide medical treatment services and close to 30% know about the availability of immunization services in PHC centers. However, around 23% of the respondents reported that they do not know what services the centers offer (Chart 28). Knowledge about the services increased significantly with educational level and significantly differed by state (Charts 29 &30). In general, 65% reported the use of nearby centers when seeking medical care (Chart 31). Close to 80% of the respondents in North Kordofan, Gezira, and West Darfur stated that they usually go to a nearby PHC center when seeking medical care (Chart 32). This practice significantly increased in those who can afford health bills but decreased with higher educational level (Charts 33 & 34). On the other hand, close to 5% prefer to going to another center while 19% prefer going to a hospital. By state, in Gezira, River Nile, and White Nile, the attitude of people was more towards going somewhere else than going to a nearby health center (Chart 35). The most common reasons behind not going to a nearby center in all the states were the nonexistence of nearby centers, the unavailability of services, and the poor quality of services offered (Charts 36 & 37). In general, there seems to be a medium level of satisfaction with the services at the PHCs (51%, SD=38). Nevertheless, there seems to be a greater variance by state with the highest satisfaction rate with the
health services offered reported in Gezira followed by Khartoum and Kassala (Chart 38). Positive attitudes towards health services significantly increased with educational level (Chart 39).

**Immunization**

Close to 95% of the sample have ever heard of immunization, and 65% (out of 2208 respondents) reported that infant must be immunized directly after birth. On the other hand, 61% (out of 2233) think that immunization has adverse effects on children and 58% immunize their children even when they are sick (Chart 40). Close to 85% of 1588 respondents claimed they are immunizing their children on time, although 73% (of 2231 respondents) believed that a vaccine can be given at a later time if it is missed. Furthermore, 47% (of 2233 respondents) think that by the age of 9 months, children get all their vaccines and most of them (97% of 1587 respondents) agreed that their children receive vaccination at home by health care providers (Chart 41). The most common diseases against which children were immunized were (out of 2233 respondents) Polio (80%), measles (60%), whooping cough (45%), TB (38%), diphtheria (28%), tetanus (25%), and hepatitis (10%) (Chart 42). Regarding the place of immunization, 45% of the 2233 respondents reported that it occurs at home, 37% in a PHC center, 35% in a hospital, and close to 1% in a private clinic (Chart 43). Most of the respondents reported they are aware of the immunization campaigns (96%), of antenatal services (65%), of tetanus (76%) and 80% know how to prevent it. Another 80% know of Oral Rehydration Solution (ORS) and how to prepare it (Chart 44).

**Nutrition**

Close to 70% responded that the lack of a balanced and adequate diet may negatively impact the health of the individual (Chart 45). In that respect, 1813 respondents indicated that the most common reported complications were malnutrition (70%), anemia (32%), and night blindness (10%) (Chart 46). When asked about the availability of nutrition awareness sessions in the nearby PHCs, 71% reported that the centers do not offer such services, and 28% only of those who are aware of the availability of such services actually visit the centers (Charts 47 & 48). In addition, close to 99% of 116 women declared that they practice what they have learnt in the nutritional education sessions they received (Chart 49) and that they believe sessions are beneficial (94%) (Chart 50). To note as well that 966 women have ever heard of growth monitoring in children, of whom less than half actually monitor their children’s growth (Chart 51). In addition, close to 15% (n=337) do not approve taking their children to a PHC to monitor their weight gain; the most common reasons being “not necessary” (40%), gets cursed (magic spell) (20%), and lack of money or time (approximately 10%)(Chart 52).

Comparing knowledge vs. practice in infant feeding during cold and coughs, 28% of 573 women believed feeding should be increased. Of them, 72% increased feeding while approximately 10% decreased
feeding. Approximately 43% believed feeding should be kept the same; of them, only 67% did what they actually believed in. Another 27% believed they should reduce feeding, and around 74% did it during coughs and colds (Chart 53).

**Integrated Management of Childhood Illnesses**

Close to 75% (n=1756) have heard of electrolyte solutions (Chart 54), and 94% of them know that they are used to treat diarrhea in children (Chart 55), and 76% of them know how to prepare it (Chart 56). Furthermore, approximately half usually got them from hospitals, and 40% obtained them from PHC centers or pharmacies (23%) (Chart 56). More than 90% (of 1756 respondents) believe that electrolyte solutions are very useful in treating diarrhea in children (Chart 57). In addition, less than 5% of 2297 respondents resort to traditional medicine while more than 60% prefer going to a hospital to treat their children from diarrhea (Chart 58). Of those who preferred traditional treatments, the most common reasons why they do not resort to a PHC center are that traditional treatment is better, PHC centers are expensive, far, and have ineffective treatment options (Chart 59). Respondents decide to seek medical treatment when diarrhea seems too frequent (48%), when the condition worsens (30%), or when the child gets very high fever (10%) (Chart 60). Furthermore, close to 27% of 1606 respondents stated that at least one child under 5 years has experienced diarrhea in the last 2 weeks. Of them, close to 43% said they took their children to a PHC center for treatment, while 36% reported that they treated the children by themselves (Chart 61). Of those who resorted to PHC centers, most of the times it was the mother who took the decision (70%) followed by the father (25%) (Chart 62). Of those who preferred treatment at home, close to 30% had given their children a homemade remedy while 15% had given electrolyte solutions (Chart 63). To note as well, close to 60% (of 2255 respondents) claimed that they would go to a physician in the event their children caught cold and flu, while 20% (n=424) said that on their own they would give their children treatment. These were mostly bought from pharmacies (52%), grocery stores (37%), or found at home (10%) (Chart 64). Children were taken to a health provider when their condition does not improve (26%), when they have difficulty breathing (17%), or when their breathing becomes rapid (16%) (Chart 65). It is important to note as well that close to 37% of 2283 respondents think they should decrease fluid and food intake in children who have flu (Charts 66 & 67). However, only 24% actually reduced fluid intake and 22% decreased food intake during flu episodes (Charts 68 & 69).

**Delivery Services**

Almost 65% (n=1519) of the total study population is aware of potential problems with delivery (Chart 70), and around 20% specifically identified contractions and complicated deliveries as potential problems (Chart 71). Of those who prefer delivery at home, 90% actually practiced it at home (Chart 72). In fact, 72% of 638 women stated that they delivered their last child at home (Chart 73), and in most of the cases,
a midwife attended the delivery. The most common reasons why women delivered at home were because their pregnancies were not complicated (57%) and because of family tradition (22%) (Chart 74). In addition, 43% of the 1000 women prefer home delivery because it is more comfortable to the mother (62%) or because they think delivery is a natural procedure that does not require a health care setting (20%) (Chart 75). The other 57% who prefer hospital delivery stated that it is better because one can anticipate pregnancy complications (65%), and because physicians are present (39%) (Chart 76).

**Antenatal Services**

More than 70% of the total sample in 7 states reported that they are aware of the signs of antenatal complications and diseases (Chart 77). Of those signs, respondents stated bleeding (45%), edema (32%), and contractions (12%) (Chart 78). Nonetheless, just less than 70% in 9 states indicated their awareness of antenatal services. Respondents (n=1628) reported that they received antenatal care services at hospitals (60%) while 40% received care in PHC centers and 10% in a private clinic. Antenatal services received at home were reported in only 4% of the cases (Chart 79). The antenatal services offered were testing for pregnancy (52%), blood tests (28%), urine tests (23%), providing antenatal vitamins (20%), measuring blood pressure (18%) and counseling (8%) (Chart 80). Around 40% of the respondents are aware that the nearby PHC center offered antenatal services, while another 38% do not know of the existence of such services (Chart 81).

In addition, 20% of the total sample reported they were pregnant in the last 12 months but only 30% (n=475) indicated that they followed up with a health provider during pregnancy (Chart 82). Of them, 40% have received care in a governmental hospital, 30% in a PHC center, and close to 20% at a private clinic (Chart 83). The most common reported reasons for choosing the above sites were that the center was close (50%), services were good (33%), and services were free/inexpensive (<10%) (Chart 84). Furthermore, 70% of the sample declared that receiving care through health care providers is beneficial because of early problem identification (50%), planning of delivery (50%), advising given to expecting mothers (23%), and providing antenatal supplementation (Charts 85 & 86). Most of the respondents in the study population (94%) agreed to receive antenatal follow up care with a health care provider either at home (26%) or in a health care center (68%) (Chart 87).

When asked on knowledge about tetanus, close to 80% said they are aware of preventive measures, whether through mother vaccination (83%) or child vaccination (4%) (Charts 88 & 89). More than half of the 1218 (those indicating mother vaccination) indicated that it occurred at hospitals (56%), 43% at a PHC center, and less than 5% in a private hospital or clinic (Chart 90). Most women (75% of 475 women) have received tetanus vaccine during their antenatal visits (Chart 91).
**Postnatal Services**

In 12 out of the 15 states, less than half of the women stated that they are aware of postnatal services, with an average of 36% in all states (Chart 92). In addition, across the states, less than 20% of those aware of postnatal services actually seek to receive them (Chart 93). Although most knew that postnatal care is important (Chart 94), 76% did not seek it (Chart 95). In most of the cases, there was no specific reason behind not seeking postnatal follow up care (Chart 96). Knowledge about postnatal services differed significantly among states (Chart 97).

**Family Planning**

Close to 90% of the total sample have children and close to 60% have ever heard of family planning services. Knowledge about family planning differed significantly among states (Chart 97). Less than 15% reported the use of contraceptive methods (Chart 98).

**Qualitative Data**

**Perceptions and Attitudes**

The study revealed that the community perception regarding the Primary health care services, was revolving around four areas, indicating that these were the major community concerns regarding Primary Health Care Services; those areas were the following

*Availability of Primary health care services:*

Regarding the availability of the primary health care services; it was quietly recognized that the community was fully aware about most of primary health care services modalities but on the other hand there was generalized agreement among most of the respondents from different states and regardless of their urban-rural variation that the primary health care services are not available at almost all of the governmental primary health care units.(*There was a nearby Red Crescent health center used to provide all the primary health care services but when the same centre shifted to the authority of the ministry of health it lacked all of the services that pushed all of us to seek the health services in far areas.*)  *Quote from Kassala State*

Almost everyone agreed that child immunization services provided through health facilities or mobile teams, are the most available and regular services. These are followed by antenatal care services. However, the availability of other services is below the communities’ expectations. Below is a list of services that the participants thought should be provided as part of the Primary Health Care package and that are currently missing. Services are ranked according to frequency and perceived importance:
• Health education, especially for women regarding child health and nutrition. Also health education messages targeting illiterate individuals are also missing.
• Vector control activities, specifically those targeting mosquitoes such as house spraying or bed net distribution.
• Drugs and medicines
• Diagnostic and laboratory services
• Nutritional services. However, it is noticed that, when talking about nutritional services people perceive it as a service that provide meals for children.
• PHC (maternal - postnatal - Family Planning – nutrition – Health Education) at hospitals
• More advanced curative services only basic services before referral
• Immunization for dangerous diseases such as meningitis
• Home visits from health providers
• School health
• Adult education

Accessibility:

According to the target population of the study; the community accessibility to the service were considered to be one of the grand concerns of primary health care services beside its availability; and were mainly around the geographical and financial accessibility.

For the majority of the groups, the low geographical accessibility to the primary health services was the foremost concern to them. In almost all cases, the situation is especially aggravated during rainy seasons where roads are closed. Furthermore, this creates problems in cases of emergency due to the lack of transportation.

The most frequent reasons for low accessibility were the lack of a local functioning primary health care facility and the shortage of qualified human resources for health specifically midwives, doctors, nurses, laboratory technicians and statisticians. This is coupled with inconvenient working hours of the center given that most centers work only one shift during the day. (If a child developed an emergency condition at night there is no close functioning health facility and there is also lack of transportation and such accidents happens) Quote from Kassala State

Consequently, people are forced to resort to the private sector and health insurance facilities or seek care from distant public health facilities. Even when a local health facility is available, the provision of services is affected by a number of factors ranked according to their frequency and perceived importance to the local community: lack of equipment and infrastructure, bad working environment, limited number of specialists, and limited space availability affecting the privacy during physical examination. One of the most recognized negative impacts of the low accessibility was demonstrated at most of the rural areas by increasing the cost of provided medications.
Regarding the financial accessibility, and although it is a constitutional right for all Sudanese citizens to receive Primary health care services for free, but it was found the majority of the respondents think that the cost of health services is high and they rely on out of pocket payments especially regarding the purchase of drugs (including iron and folic acid tablets for pregnant women). Also some groups declared that even child curative services that are supposed to be free of charge are actually provided for fees; and this finding particularly was found to be supported by another study conducted in Sudan in 2010 to assess the free care policy for children <5 years and pregnant women. *(if you didn’t pay for the services you will never be treated even if you drop dead)* Quoted from Red Sea State

In certain times as well, people have to pay for immunization services and antenatal care. Some of the consequences as mentioned by the groups are that women resort to home delivery and many children do not have birth certificates. Some of the respondents thought that since citizens are paying taxes, they should have access to free health care.

*Quality of care:*

Respondents reported a poor quality of governmental health services compared to the private ones. These poor quality services were manifested at different levels; at the facility level and at the health services provider level also.

At the facility level; the most prominent manifestation was the long waiting time, specially for the immunization and the laboratory services, lack of electricity in the health facilities at most of the times in addition to the working hours of the health facilities which are not sufficient and fulfilling the community needs with the lack of appropriate referral system leading to the net result of less comprehensive and satisfying health services at the primary health care facilities.

While at the health provider level; there are many factors affecting their quality of their provided services and performance like for example; their availability and qualifications and as most of the participants are claiming that most of the available health providers nowadays are not qualified enough to perform their basic functions particularly the laboratory technicians *(There is always contradiction in the laboratory results specifically for the malaria test)* Quoted from Red Sea State. In addition to the fact that they are lacking basic discipline rules, not cooperative and kind to the patients at most of the cases; some also reported that some of the health providers are corrupted and they refuse to treat you if you don’t have money. *(It happened that I was sick and the doctor refused to treat me free so I sold a sheep to pay for the treatment)* Quoted from Red Sea State

*Environmental health:*
Environmental health was one of the major components of primary health care that concerns communities. Most of the groups complained of the bad environmental health; especially during the rainy season. The majority said that they do not have a regular effective system for solid waste collection from households. Also a considerable proportion of the groups complained of the lack of safe water supply. Some of the groups complained of some specific issues regarding environmental health such as the effect of slaughterhouses on the nearby environment.

**Barriers to Primary Health Care Services**

When asked about the barriers to primary health care services, the most mentioned factor was that health was not considered as a priority by the government. One focus group also mentioned that individuals working at the state ministry of health have no health background. In addition, respondents reported lack of resources to provide health services. Some of the reasons mentioned are that revenues from local health facilities are not used locally to expand and improve health services. The lack of health awareness and the low educational level of the local communities especially women were also considered as important barriers. Furthermore, the respondents stated that the high turnover rate of health workers because of the lack of incentives to work in remote areas and lack of accommodation for doctors are also important factors in hindering access to primary health care services. It is also worthy of mention that cultural norms prevent local females to go for midwifery training and come back to serve their communities; also the lack of job opportunities in the government health system for trained midwives discourage female to train as midwives. Other reported barriers included lack of transportation, security problems, lack of electricity supply, ineffective local health committees, lack of staff training, the presence of small health centers to serve several villages, and the fact that local health centers are run by NGOs and not the MoH.

*Role of the Health Insurance in providing primary health care services:*

Although health insurance was not one of the major and direct questions in this study but some valuable conclusions were obtained from it; as for some of the respondents health insurance facilities were like the way out, while the majority of them explained why health insurance had no significant role in enhancing the affordability of health services. The low coverage by the health insurance services because of its high cost it is the main issue and reflected in other problems like the increased cost of drugs without insurance coverage. Also one of the other health insurance problems appreciated by the participants was, the poor quality of services provided to the insured patients like complicated referral system and deficient health specialists in addition to the lack of drug coverage, and limited services offered by health insurance plans.

*Proposed Areas for Improving Primary Health Care Service Delivery*
General suggestions on improving PHC service delivery were that health should be put as a priority by the government. In addition, improving the educational level of people, establishing woman development centers as well as income generating schemes for women, and providing electrical supply to communities and centers were recommended to improve PHC services.

On the financial aspects, revenues from local health facilities, or a proportion of it, should be used to finance local health services. Other suggested revenue sources included water services and other tariffs. Allocating more resources to health and developing fund raising schemes were perceived necessary.

Improving the coverage through constructing, rehabilitating or upgrading local primary health care facilities was perceived as essential by the respondents. They stated that planning of health services should be based on population distribution. Almost all groups agreed that the primary health care facilities should be adequately staffed, specifically with doctors/qualified midwives, health consultants, laboratory technicians, nurses, and health inspectors. To ensure retention of health workers, it was suggested to train health workers from the local or neighboring communities. Other suggestions included improving the work environment, providing accommodations, improving salaries and benefits to increase retention and decrease corruption, ensuring and maintain better equipment at the local health facilities, providing comprehensive services, improving transportation (availability of ambulances and safe roads), and appointing community health workers in each Quarter.

To ensure affordability, it was suggested that coverage by Health insurance should be increased, services package should be expanded, health insurance services should be efficient, and provided through trained and accountable staff.

Other suggestions to improve coverage and accessibility included the following: extending working hours at local primary health care facilities to more than one shift, scheduling services such as immunization sessions, establishing an outreach clinic and assigning a female doctor to encourage women to seek health care.

The most needed services mentioned by the respondents in order of frequency were health education services (nutrition and antenatal care - first aid - the role of health services), vector control especially bed nets (even at a cost), diagnostic and laboratory services, antenatal care, family planning services and nutritional services, increasing coverage by immunization, meningitis vaccine, concentrating on preventive services, improving current services, local short stay ward, and a local labor room.
On quality of care, improving the environment and infrastructure of health facilities (waiting area for children and pregnant women), good treatment to patients, and presence of separate wards for women were suggestions provided by the respondents.

On environmental health, respondents suggested improvements through providing safe water (filters) and waste disposal services fill pits to improve slaughterhouse, latrines and environmental health campaigns.

In addition, a good coordination between the Government and local communities was reported as essential by respondents. Involving local communities to solve problems and getting support from bilateral parties (sugar companies) were also suggested as ways to improve PHC services.

**Availability of Community Resources**

Most of the participants expressed positive attitude towards the community resources represented in the following areas:

*Financial resources:*

Most of the participant’s expressed positive attitude by provision of financial resources to support the primary health care services. This was reflected in the provision of money to construct the local health centers and provide fees for vector control from citizens and incentives to midwives and health providers.

Women promised to provide products for sale to support primary health care. Also there was an initiative to use the already existing building to provide accommodation for the health workers not originally from the local community.

At the same time some of the participants expressed negative attitude regarding the availability of community resources, mentioning that; it is the responsibility of the government to provide infrastructure of the health facilities.

*Human resources:*

Most of the community participants expressed their willingness to support the primary health care services through the initiatives of enrollment of the local man power in health services field. Those initiatives were presented in selecting young ladies from villages to be trained as midwives and young people (males and females) to be trained in first aid. They also offered to provide physical support through participating in building health facilities.
DISCUSSION

It was evident throughout the study that the population surveyed had a low educational level, for more than 80% of participants reported receiving only low to middle level education. Moreover, the surveyed populations suffered from poor living conditions, as a large number of people dwell in the same place, with an average household size of 7, and 25% of households comprising at least 9 members. Further, and even though the surveyed sample believed in the importance of hygiene in daily functioning, few had proper sanitary practices and waste disposal mechanisms, a condition further demoted by the absence of toilets in a significant percentage of Sudanese households.

Importantly, it was found that caring for the health of the family is a troublesome issue, probably due to the large number of people present within a family and the scarce financial resources present to cover for the burden of ill health. Hence, seeking care and compliance with treatment in the surveyed sample was a noteworthy problem threatening the health status of the populations. Literature abounds with evidence on financial and non-financial barriers which may prevent households from seeking health care (O’Donnell, 2007). It was clear in this study that such barriers included geographical access (distance), financial barriers, and lack of knowledge and awareness. All these when brought together would lead to low demand for and use of services, particularly by the poor. While participants indicated knowledge of the presence of primary care services, however they did not tend to use them as much. This was attributed to three reasons: 1) Their indication that there were no primary healthcare centers near them, 2) The primary healthcare center available did not offer the needed services and 3) The services offered were of poor quality. Nonetheless, preference for going to a nearby primary care center was still higher than that of going to a hospital or somewhere else, but this was offset by the poor quality of services offered at the center.

Child immunization was carried out by a majority of the surveyed, nevertheless, but certain knowledge elements were missing. Participants were not fully aware that vaccines should be given on a timely basis, and that children cannot be vaccinated when they are sick. This was countered with a very high level of knowledge about the importance of immunization, the presence of immunization campaigns and the diseases against which vaccines exist. Though this might present itself as a contradiction, however literature has shown that little knowledge about vaccination does not necessarily mean negative attitudes towards it(Jheeta et al, 2008) which can be characterized by passive acceptance(Nichter, 1995). Rather, there are other factors that might contribute to compliance with vaccination campaigns and immunization.
practices. These include trust in the health services provider as well as cultural understanding of the community’s beliefs and attitudes (Streefland, 2001; Jheeta et al, 2008).

Similarly, there was a high level of knowledge about the importance of nutrition, the associated complications of malnutrition and the presence of nutritional awareness campaigns. However, when it came to utilization, only few visited the primary healthcare centers for awareness sessions despite the high knowledge rate on the importance of this issue. While those who actually visited the care center for awareness campaigns declared that they practiced what they learned, and it was very beneficial. Thus, there is a need to intensify social marketing of such awareness campaigns to improve attitude as well as proper practice.

Variations between knowledge and practice also existed in terms of infant feeding during illness, where the majority of the sample decreased or maintained their child food intake while they believed it should be increased. In addition, there were significant problems regarding growth monitoring in children, as many did not even acknowledge the importance of such a practice. As for the Integrated Management of Childhood Illness, most of the population was aware of the presence and importance of oral rehydration solutions in treating diarrhea, but very few used them in actual episodes of child diarrhea and vomiting. Medical care was sought only when conditions became very severe and home treatment was not an option.

Besides, and although close to half of the population knows of the potential arousal of delivery problems, the most common preferred site for delivery was home. Practices in this field conformed to attitudes, as 70% of the surveyed sample actually had their last child at home, delivered by a midwife. It is thus clear that delivery is a segment that needs additional monitoring, for problems with delivery present a grave issue that is underestimated in the Sudanese communities, and there is hence an urgent need to ensure the regulation of the midwifery profession in order to ensure safety, quality and infection control.

It is also worth mentioning that most antenatal care services were being sought in hospitals instead of primary care centers, and this carries major financial implications, as the cost of affiliated services in a hospital is much higher than that in a primary care center. This preference for hospitals may be attributed to the fact that a considerable percentage of participants did not know of the availability of antenatal services at primary care centers, and the distrust in the quality of care offered among those who knew. This was in concordance with studies in several developing countries that reported under-utilization by the pregnant mother due to lack of knowledge (Mondal, 1997). Further, this study reported that there is a tendency among pregnant women to discontinue pursuing antenatal services, and this is an area that needs
immediate awareness and advocacy campaigns, as antenatal care is imperative for the well-being of both
the mother and the baby.

Likewise, postnatal services are suffering from underutilization. Knowledge of their importance was
high, but that of their availability was relatively low, and so were the attitudes and practices of seeking
this type of services. This was in line with other studies in developing countries on non-utilization of
postnatal services. The reason cited included financial barriers, physical inaccessibility (distance), lack of
awareness about the importance of these services, and the use of untrained delivery attendants(Titaley et
al, 2009; Titaley et al 2010). Hence, this field is also one that needs immediate interventions to raise
advocacy and awareness, as postnatal care complements antenatal care and is equally important in
maintaining the health of the mother and the child.

On slightly different premise, very few families use family planning which is in congruence with recent
reports of contraceptive prevalence rate of 9% in North Sudan. Furthermore, fertility is highly valued by
the communities, which to a certain extent explains the high fertility rate of 5.6 children per woman in
North Sudan. As a result, most families comprise a large number of individuals but yet their financial
resources are modest which competes with their provision of proper education and healthcare to their
family members. This calls for major social marketing among the communities and households and more
so among the leadership in the communities. It is believed that there is no political support for family
planning practices, and that community leaders condemn the use of contraception.

CONCLUSION AND RECOMMENDATIONS

Primary health care is a basic service designed to be cost effective and readily utilized by the population,
particularly by people of low economic status. This paper examined the knowledge, attitudes and
practices of the Sudanese communities towards selected PHC services. The 15 communities surveyed
suffer from poor living and sanitary conditions, including lack of toilets, and improper waste and water
disposal. Beliefs in the importance of personal hygiene and sanitary practices increased significantly with
educational level and financial status. In addition, health financing is seen by almost all respondents as a
burden on the family, as out of pocket was reported to be the main source of health financing. In addition,
there is a need to advocate for the achievement of equity in terms of access to free health care. Access to
primary health care should be seen as a basic social right and the reasons impeding it (poor quality of
services, lack of centers, and lack of needed services) should be immediately addressed.
Despite the high knowledge about the importance of child vaccination, misconceptions about vaccines still exist. Child nutrition and growth monitoring need more attention as poor knowledge about the availability of nutrition awareness sessions in PHCs and about the importance of growth monitoring in children is very common. In addition, underutilization of PHCs was reported during periods of childhood illness, and the major factors affecting utilization were the type and duration of illness or severity of symptoms experienced, and the preference to resort to traditional treatments that are believed to be more effective and less expensive than PHCs treatments.

Preferences for and practices of home deliveries raise certain questions in terms of complications management, safety, and infection control. Furthermore, seeking antenatal care services in hospitals increases health care expenditure and amplifies the burden on families. Although no specific reason was reported behind not seeking postnatal care, studies have shown that the main problem of under-utilization of postnatal services is embodied in the socio-economic and cultural background of the care-seekers (Mondal, 1997). Finally, it is worthy to note that female education positively influences her well being and the well being of her child as educated women are more involved in decision making, can better communicate with health care providers, are more aware about disease causation and cures, are motivated to seek antenatal care, deliver their babies in health centers, and are more aware of family planning techniques (Elo, 1992; and Navaneetham & Dharmalingam, 2000).

In light of the above discussion, several recommendations arise:

- The main problem of under-utilization is rooted in the socio-economic and cultural background of the seekers, the consumers. The study highlighted the fact in most cases they were unaware of the services as available. Not only that, but it seems that there is no motivating force, internal or external, within their health belief system to help or guide them to use maternal care services. In this context it is crucial that any primary care strategy has to start with education and the literacy of the public on primary care issues. More specifically this will have to focus on female literacy as the corner stone of the communities for the development of the health of the mother and the child. If literacy is enhanced this should boost the utilization of health care services and through which the utilization of maternal health including antenatal services can be scaled-up.
- Awareness campaigns about primary health care and services rendered at the centers need to be promoted. More specifically, there is a need to:
  - Raise awareness about the importance of on time vaccination and growth monitoring in children through mass media campaigns and free vaccination.
- Raise awareness about the need for medical treatment during episodes of childhood illness, and offering affordable child care in PHCs.
- Raise awareness about the importance of delivery attended by a health care provider by offering information and advice to women about pregnancy related complications and possible curative measures for the early detection and management of complications.
- Raise awareness about the availability of antenatal and postnatal services in PHCs.

- There is an urgent need to focus regulatory efforts and intervention programs that are aimed at improving the living conditions of the poor and the disadvantaged in all aspects of life, including water and sanitation. Interventions targeting households should be key priorities of the central as well as the provincial governments, public health organizations, and communities.

- The provincial authorities might want to reconsider the geographical mapping of the existing primary healthcare centers as well as the provision of the whole spectrum of primary health services. Accordingly, additional PHCs might be considered for some underserved communities and the expansion of others to cover more services. Furthermore, some centers might need to reconsider their working hours to accommodate the needs of the community beyond the current working hours at these centers.

- To ensure continuous utilization of health services by the community at large, there is a need to improve the image of these centers. As indicated through the study, there were concerns about the quality of services and as such low utilization. For that, it is crucial to explore quality improvement options including development of the human resources to better delivery and provision of services. This can be complemented by careful examination of the working environment in terms of adequate supply of providers, their skill mix, and their motivators and incentives to improved performance. Along this line, regulating the supply and capacity development of health providers might help make available alternative qualified providers to underserved areas including certified midwives and medical assistants.

- The need for efficient referral systems and coordination among centers providing antenatal services, delivery services and postnatal services.

- Almost all intervention programs should have well-planned media messages and for that it is essential to involve media in all aspects of awareness campaigns. This partnership will not only tend to improve coverage of the promotional messages but it will also facilitate behavioral change. For that, it might prove valuable if key media agencies and personalities are trained on public health and primary care. This will help frame their messages in alignment with the national primary care strategy and action plans.
• More importantly, developing the monitoring and evaluation system is crucial not only to assess the baseline situation for planning purposes but also for monitoring of health and behavioral changes at the community and national levels. Among other things, such a system will monitor the operational progress of intervention programs and its outcomes including target behaviors and practices and as such will prove to be indispensable as an intervention tool.

ACKNOWLEDGEMENT

This Technical Assistance would not have been accomplished without the dedication and the persistence of Dr. Rania Hussein, and Dr. Nahid Ali to whom I am grateful. Sincere gratitude has to go to Dr Mustafa Mustafa, and Dr. Ehsanullah Tarin for their guidance and support.
APPENDIX I: CHARTS AND FIGURES

Chart 1. Characteristics of the Respondents

Proportion Distribution of Respondents by Age Groups

- Less than 25 years: 24%
- 25 - 34 years: 38%
- 35 years and above: 38%

Proportion Distribution of Respondents by Marital Status

- Single: 2.4%
- Married: 96.4%
- Divorced: 0.9%
- Widowed: 0.3%

Proportion Distribution of Respondents by Educational Level

- Illiterate: 1.7%
- Primary: 79.2%
- Secondary: 14.1%
- University: 5.0%

Proportion Distribution of Respondents by Household Size

- 1-2: 5%
- 3-5: 34%
- 6-8: 37%
- 9+: 25%
Chart 2. Distribution of respondents by educational level and State

Chart 3. Household size by educational level
Chart 4. Reported source of water

Chart 5. Distribution of households by type of solid waste disposal
Chart 6. Distribution of households by type of water waste disposal

Chart 7. Sources of drinking water
Chart 8. Percentage of water Treatment before drinking

- Yes: 11.0%
- No: 89.0%

Chart 9. Practices used for Water treatment before drinking
Chart 10. Knowledge of the consequences of untreated water

Chart 11. Percentage of WC present at respondent's house
Chart 12. Locations of toilets used for waste excretion

Chart 13. Distribution of respondents practicing Hand Washing
Chart 14. Mean AWS by educational level

Chart 15. Mean BWS by educational level
Chart 16. Mean of the relation between the hygienic practices, and household size and financial status by women age group

Chart 17. Waste disposal methods used by respondents
Chart 18. Women perception of improper solid waste disposal

Chart 19. Waste Disposal Practices by age group
Chart 20. Waste Disposal Practices by household size

Chart 21. Waste Disposal Practices by Educational level
Chart 22. Waste Disposal Practices by financial status

Chart 23. Women perception on outcomes of improper water waste disposal
Chart 24. Perception of harmfulness of Waste Collection next to residence by age group

Chart 25. Perception of harmfulness of Waste Collection next to residence by Household size
Chart 26. Perception of harmfulness of Waste Collection next to residence by educational level

Chart 27. Perception of harmfulness of Waste Collection next to residence by financial status

Chart 28. Distribution of respondents by knowledge of services offered at PHCs
Chart 29. Perception of Quality of Care at PHCs by educational level

Chart 30. Perception of Quality of Care at PHCs by state
Chart 31. Distribution of respondents by use of nearby centers

Chart 32. Percentage of respondents seeking a nearby health center by state
Chart 33. Utilization of proximal PHC by Affordability of Health Care Bill
Chart 34. Utilization of proximal PHC by Educational level

Chart 35. Attitudes towards services at health centers by preferences and states
Chart 36. Reasons for not seeking care at the health care center:

Chart 37. Reasons for not using the closest healthcare center by state
**Chart 38. Overall satisfaction with health services by state**

[Bar chart showing overall satisfaction with health services by state, with bars representing different states, each numbered from 1 to 20, and the y-axis labeled from 0 to 90.]

**Chart 39. Mean Satisfaction with Primary Care by educational level**

[Line graph showing mean satisfaction with primary care by educational level, with points at 71.35, 74.23, and 76.73 for Primary or less, Secondary, and University, respectively.]
Chart 40. Knowledge of immunization

<table>
<thead>
<tr>
<th>Immunization Descriptive</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heard of Child Immunization?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2233</td>
<td>96.2%</td>
</tr>
<tr>
<td>No</td>
<td>88</td>
<td>3.8%</td>
</tr>
<tr>
<td>Time for Immunization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right after birth</td>
<td>1457</td>
<td>66.1%</td>
</tr>
<tr>
<td>After one month</td>
<td>455</td>
<td>20.3%</td>
</tr>
<tr>
<td>After one year</td>
<td>53</td>
<td>2.4%</td>
</tr>
<tr>
<td>DK</td>
<td>140</td>
<td>6.7%</td>
</tr>
<tr>
<td>Other</td>
<td>126</td>
<td>5.6%</td>
</tr>
<tr>
<td>Child immunization side effect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1368</td>
<td>61.2%</td>
</tr>
<tr>
<td>No</td>
<td>724</td>
<td>32.4%</td>
</tr>
<tr>
<td>DK</td>
<td>142</td>
<td>6.4%</td>
</tr>
<tr>
<td>Immunizing Child while sick</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1298</td>
<td>58.2%</td>
</tr>
<tr>
<td>No</td>
<td>782</td>
<td>35.1%</td>
</tr>
<tr>
<td>DK</td>
<td>151</td>
<td>6.8%</td>
</tr>
</tbody>
</table>

Chart 41. Knowledge of immunization (cont)

<table>
<thead>
<tr>
<th>Immunization Descriptive (cont)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>If your child was not vaccinated on time, do you compensate for it another time?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1632</td>
<td>73.2%</td>
</tr>
<tr>
<td>No</td>
<td>599</td>
<td>26.8%</td>
</tr>
<tr>
<td>The vaccination is over at?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 month</td>
<td>1064</td>
<td>47.6%</td>
</tr>
<tr>
<td>One Year</td>
<td>122</td>
<td>5.5%</td>
</tr>
<tr>
<td>5 years</td>
<td>595</td>
<td>26.6%</td>
</tr>
<tr>
<td>DK</td>
<td>206</td>
<td>9.2%</td>
</tr>
<tr>
<td>Other(specify)</td>
<td>246</td>
<td>11.0%</td>
</tr>
<tr>
<td>did you give your child the vaccine on time?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>1351</td>
<td>85.1%</td>
</tr>
<tr>
<td>Sometimes</td>
<td>137</td>
<td>8.6%</td>
</tr>
<tr>
<td>Never</td>
<td>100</td>
<td>6.3%</td>
</tr>
<tr>
<td>do you agree that health professionals vaccinate your child</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1541</td>
<td>97.1%</td>
</tr>
<tr>
<td>No</td>
<td>46</td>
<td>2.9%</td>
</tr>
</tbody>
</table>
Chart 42. Diseases to which vaccination was received

Chart 43. Distribution of vaccination places
**Other Services**

- Immunization Campaign is a success
  - 96% are aware of campaigns
- 80% are aware of ORS and know how to prepare
- Antenatal Care
  - 65% are aware of such services
  - 78% are aware of tetanus and 80% know of its prevention

**Chart 45**  Knowledge of harmfulness of lack of a balanced and adequate diet

**Chart 46**  Reported complications on Lack of balanced and adequate diet
Chart 47  Knowledge of health care center provision of guidance lessons on food and nutrition

Yes; 8%
DK; 21%
No; 71%

Chart 48  Proportion of respondents attending the guidance sessions at PHC

Always; 28%
Sometimes; 40%
No; 32%

Chart 49  Do you practice what you have learnt in the nutritional education sessions?
Chart 50  Compliance with health tips provided during the nutritional sessions

- Yes: 99.1%
- No: 0.9%

Chart 51  Knowledge of the follow-up on growth monitoring in children
Chart 52  Reasons for refusing taking the weight of the child at a health care center

Chart 53  Knowledge VS practice on feeding infant in case of cough or cold
Chart 54  Knowledge on the existence of oral rehydration therapy

Yes; 75.7%

No; 24.3%

Chart 55  Knowledge on the purposes of the oral rehydration therapy

Diarrhea Rx for adults; 2.1%

Diarrhea treatment for young; 94%

DK; 3.9%

Chart 56  Knowledge on the oral rehydration therapy
Chart 57  The extent to which the oral rehydration therapy might be useful

- Very useful; 92.2%
- To some extent; 6.6%
- Useless; 1.2%
- No; 24.3%

Chart 58  Practices done when the child gets diarrhea
Chart 59  Reason for taking the child to a traditional healer

- Taking him to a health care center
- Providing treatment at home
- Other
- Taking him to a traditional healer

Reasons for taking the child to a traditional healer:

- Traditional treatment is better
- Expensive
- Far
- Ineffective treatment options
- Other
Chart 60  Decisions made to seek medical treatment

Chart 61  Decisions taken by the caregiver when the child got diarrhea.
Chart 62  The person who takes the decision to take the child to the health care unit

- Mother: 70%
- Father: 20%
- Relative: 10%
- Other: 0%

Chart 63  Treatment practices at home

- Scent: 10%
- Electrolyte solutions: 20%
- Other: 30%
- Homemade remedy: 40%
Chart 64  Places from which the participants sought to get medicine

Chart 65  Signs to take the child to a health care professional
Chart 66  Knowledge in Change of water supply given to a child with cough or cold

Chart 67  Knowledge in change of food supply given to a child with cough or cold
Chart 68: Practices of changing the supply of water when the child gets cough or cold

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Same</th>
<th>More</th>
<th>Less</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>10%</td>
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<td>15%</td>
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<td>20%</td>
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<td>25%</td>
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<td>30%</td>
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<td>35%</td>
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<td></td>
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<tr>
<td>40%</td>
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<td></td>
</tr>
<tr>
<td>45%</td>
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</tbody>
</table>

Chart 69: Practices of changing the supply of food when the child gets cough or cold

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Same</th>
<th>More</th>
<th>Less</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5%</td>
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<tr>
<td>10%</td>
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<tr>
<td>15%</td>
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<tr>
<td>20%</td>
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<td>25%</td>
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<td>30%</td>
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<td>35%</td>
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<td>40%</td>
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<td>45%</td>
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<td>50%</td>
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<td></td>
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<tr>
<td>55%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chart 70  Knowledge of complications that happen after birth

Yes (1519, 65%)

No (802, 35%)

Chart 71  Knowledge of types of complications that happen after birth

Types of Complications as reported by 1519 respondents

Delayed placenta (267)

Contractions (344)

Complicated Deliveries (389)

Hemorrhage (1094)

Chart 72  Preferred place for delivery
Chart 73. Place of delivering the last child (within 12 months)

- Home: 70%
- Hospital: 20%
- Other: 10%
- Private hospital: 0%
- Primary health care center: 0%

Chart 74. Reasons for delivering at home

- No complications: 60%
- Practice/habit: 20%
- Preference to deliver at home: 10%
- Far health care center: 0%
- Unaffordable: 0%
- Have kids: 0%
Chart 75. Reasons for preferring home delivery

- Absence of men
- Cheaper
- Doesn’t need a health care center
- More comfortable

Chart 76. Reasons for preferring hospital delivery

- Extraction of birth certificate
- Immunization
- Follow-up on child
- Physicians are present
- Anticipate pregnancy complications
Chart 77. Knowledge of the problems and signs of serious diseases happening with pregnancy according to the state

Chart 78. Knowledge of signs, problems, and serious diseases happening with pregnancy
Chart 79. Place of providing antenatal care

Chart 80. Things done in the antenatal care visits
Chart 81. Knowledge of provision of antenatal care at closest health care center

- Yes: 40%
- No: 22%
- DK: 38%

Chart 82. Antenatal care

Follow up with a health care professional

- 30%

Pregnant within the last 12 months

- 20%
Chart 83. Place of receiving the antenatal care

Chart 84. Reasons for choosing the specific antenatal care center
Chart 85. Knowledge of usefulness of pregnancy follow-up

Chart 86. Usefulness of follow up by health care providers
Chart 87. Pursuance practices of antenatal care and place of choice

Chart 88. Knowledge on how to prevent Tetanus
Chart 89. Methods for preventing Tetanus

- Vaccinating pregnant woman
- Vaccinating children
- Personal hygiene

Chart 90. Vaccination places for pregnant women

- Hospital (680)
- Health care center (527)
- Private hospital/clinic (32)
Chart 91. Did you receive tetanus vaccine during your antenatal care visit?

Yes; 75%
No; 25%

Chart 92. Proportion of women reporting awareness about post-natal services by state
Chart 93. Proportion of women indicating use of postnatal services

Chart 94. Perception on importance of postnatal care services
Chart 95. Importance of post natal care perceived by women who followed or didn’t the postnatal care

Chart 96. Reasons for not seeking post natal care
Chart 97. Knowledge about postnatal services

Chart 98. Description of practices in family planning
REFERENCES


