SITUATION ANALYSIS ON MAPPING OF HEALTH SERVICE PROVIDERS IN KENYA

Submitted by:

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DECEMBER 2007
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1.0 Introduction

The Ministry of Health (MoH) in conjunction with the Health Non-Governmental Organizations Network (HENNET) is conducting a comprehensive situation analysis on mapping of health services and providers activities at regional and national scales. It is envisaged that the study brings afore the current status in mapping of health facilities and service providers in Kenya as well as lessons learnt in the process in preparation for an upcoming nationwide mapping of health service providers. In so doing, this document examines previous studies on HMIS through desktop review of reports and databases generated. Some of the studies highlighted are the Service Availability Mapping (SAM) conducted by Kenya’s MoH in collaboration with WHO, the Kenya MoH’s Human Resource Mapping and KEMRI-WTRP health facility database.

1.1 Objectives

1. Review completeness (and responsiveness to present-day stakeholder needs) of the existing health facility/provider databases in the country and identify gaps (See attached draft tools for expectations of the now stakeholders),
2. Identify important lessons learnt from regional experiences on large scale health facility mapping of health service providers (e.g. Tanzania, South Sudan),
3. Identify important lessons learnt form mapping of other sectors/service providers such as mapping of educational institutions or other organizations conducted in Kenya

1.2 Outlined tasks

The outlined tasks in this activity are:

1. Visiting the HMIS unit of the Ministry of Health, NCAPD, IRLI, Regional Centre for Mapping of Resources for Development (RCMRD), Central Bureau of Statistics (CBS), Survey of Kenya, Faith based organizations secretariats, KEMRI/Welcome, among others and examine available information for its relevance, completeness and use in the mapping of health service providers
2. Visiting the Ministry of Education and collect information on the process, lessons learnt and achievements of the recently concluded mapping of schools and training institutions
3. Identifying existing GIS based databases in the country that capture health provider data
4. Reviewing reports and databases from the region and identify content, indicators, limitations and opportunities for adopting the approaches used to collect and archive the data

1.3 Expected output

A brief report on the findings of the desk review, identifying gaps and recommendations on the way forward is to be submitted to the technical working group TWG.
2.0 Background

Mapping of health service providers in Kenya has come up to be one challenging exercise to key stakeholders in the health industry over the recent past. As the sector wakes to the importance of a Health Information System (HMIS) in planning, monitoring and implementation of policy matters, the need for correct and timely information on various health indicators for effective management cannot be stressed otherwise.

The Kenyan government has over the years undertaken numerous policy reforms to enhance the performance of the health sector. In the 2005 – 2010 Strategic Plan, Ministry of Health (MoH) articulates its strategy to strengthen its co-ordination function with the private sector and non-governmental organizations in health care delivery, proper design and implementation of integrated health information systems. Developing such framework for equitable and effective resource allocation for health depends upon proper knowledge of service providers and their location in relation to the population they should serve.

The recent upsurge in demand for health information cannot be adequately met at present because there has been insufficient investment in building streamlined health information systems capable of generating data on the full array of health-related issues. This has in turn resulted in intermittent mapping of various health indicators by different interest groups to serve their particular needs. However, segmentation, incompleteness and rigid systems characterize previous attempts to create such database.

The Ministry of Health and HENNET, with financial support of several Development Partners plan to carry out a mapping of all health service providers in the country. Such information is currently not available hampering development of guidelines on facility development in the country and assuring equitable distribution of services to the people of Kenya. The existing vacuum is partly contributing to the haphazard growth of facility and non-facility based health interventions hence inefficiency in resource use in the country. The planning and regulatory role of the MoH is rendered ineffective while HENNET, FBOs and the Private for Profit are not able to document their comparative advantages. Thus the effectiveness, geographical spread and access to NGO and FBO health services remains unclear.

During the first stakeholders’ workshop held on June 6, 2007, participants recognized the huge opportunity existing in the country for combining health indicators, population data and other socio-economic variables that impact on health. However, this potential remains un-tapped as a result of insufficient mapping of health service providers and a system for updating the mapping. The Stakeholders mooted the creation of a Technical Working Group to spearhead the creation of a comprehensive GIS based health provider mapping for Kenya. GTZ will finance preliminary and pilot activities. Funds for the main mapping exercise – under consideration of the findings of the pilot mapping – will be sourced from other development partners who are represented in the Technical Working Group. The mapping exercise was contracted to the Regional Centre for Mapping of Resources for Development in Nairobi.

This analysis therefore, builds on previous studies and existing databases on mapping of health services and health providers in Kenya as well as in other regions and show the experiences and challenges faced in the process.
2.1 The Kenyan health system

The Kenyan health system is based upon three types of health facilities: hospitals, health centres and health sub centres, divided into dispensaries and mobile clinics. National referral facilities at Kenyatta National Hospital in Nairobi and Moi Teaching and the Referral Hospital in Eldoret form the peak of a pyramidal health system structure. Provincial, district and sub district hospitals form the pyramid's middle tier and health centres and dispensaries form its base.

The Ministry of Health (MoH) is the main provider of health services in Kenya but, Kenya's strategy of pluralism in health care provision has nevertheless facilitated the growth of a diverse non-government health sector. Health services are provided through a network of providers that comprise the government, Non-governmental Organizations (NGOs)/Faith Based Organizations (FBOs) and private providers. These provide both facility and non-facility based services thought the country. In order to allocate health-care resources (such as doctors, nurses, hospital beds, and drugs), public health officials need to know when and where in the country people are getting sick with which diseases.

Kenya’s Health Information System (HIS) came into being in 1972 following deliberations of a committee of representatives from the Ministry of Health, World Health Organization, Central Bureau of Statistics and the Attorney General Chambers. A pilot project designed and tested in three districts (Mombasa- urban district, Kwale- Peri-urban and Kitui -rural district) was completed in 1976 and its suggestions and recommendations adopted. However, it was not until 1984 that MoH decentralized its reporting activities by establishing HIS offices in all districts where all Health data from all health facilities would be processed.

The central HIS now referred to as Health Management Information System (HMIS) is charged with the responsibility of collecting, processing, analysing and dissemination of health data in collaboration with the Central Bureau of Statistics. It operates under the following visions:

- Assist in Health policy formulation and Health Reforms
- Frequently monitoring of short-term programme outputs;
- Enhanced reporting of health outcomes to monitor MDGs
- Provide a foundation for sound informed decision-making.
- Provide basis for deployment of staff
- Assess Burden of Diseases and
- Institutionalisation of National Health Accounts

The department currently has a good HMIS structure in place at the national level with a well equipped laboratory and technical staff. Provincial and district levels are also considered to be proactive to HMIS activities. It also enjoys a good working collaboration within MoH divisions/departments as well as networking with other stakeholders and development partners.

However, the operation of the department the following challenges:

- Lack of clear HMIS policy guideline and strategic plans for the department
- Inadequate skilled manpower in system operation as well as few qualified and capable personnel to generate reports available.
- Inadequate data collecting tools at the districts & health facilities.
- Late submission of reports/data from the district and provincial levels to the national HMIS
- Poor coordination and networking with other stakeholders/service areas that have similar information systems in place hence duplication of efforts.
- Inadequate capacity for use and dissemination of information
- A few up to date machines for data support with majority being considered obsolete data collecting equipment/machines e.g. computers
- Inadequate allocation of resources for:
  - Printing of feedback reports
  - Facilitative supervision
  - Printing of data collecting tools
- High turn over of staff and natural attrition
- Inadequate motivation and use of information
- High staff turnover
- Low staff morale

**Figure 1:** Some Computer facilities present at HMIS laboratory

![Computer facilities](image1)

**Figure 2:** A data server present at HMIS but not used for data storage. Currently used as a mail server.

![Data server](image2)
Health data are collected and compiled by the Health Information System (HIS) from the Health facilities, districts and provincial levels and submitted to the national level (HIS). The returns are submitted to the District Medical Officer of Health offices where they are summarised and sent to the Ministry headquarters with a copy to the provincial offices where annual statistics are compiled for administrative use and dissemination to users. However, many of the facilities operate under difficult circumstances, and keeping detailed records and reporting them every month is not always achievable. As a result, data from many of the facilities are missing for any given month, and the overall national picture is inevitably incomplete.

The following data sets are collected and disseminated:
- Outpatient morbidity by disease and district/region
- In-patient morbidity by cause and district/facility/region
- In-patient mortality by cause of death and district/facility/region
- Immunisation by antigen, district, region (mothers and children)
- Child Health and Nutrition Information System (CHANIS), by district/region
- HIV/AIDS prevalence by district, sentinel sites and region
- PMTCT, VCT uptakes by district, region
- Laboratory findings by test and region
- Service utilization (workload)
- Disease surveillance by region.
- Facilities per year by region/district
- Personnel category per year
- Benefits and contributions of health insurance funds per year.
- Data on health expenditures for government health institutions is provided in printed estimates.
- The link data to population based data such as census, vital registration and research.

This is manually entered at the national level into a Disc Operating System (CLARION) which is transferable to MS Excel. See Annex 1: Table 1 & 2 for sample data.

The data collected from the ministry of health contained the details about health facilities within the republic of Kenya by giving:
- Full details of each health facility within the country in terms of location, equipment available, staff, drugs availability, service provision and daily operations.
- Summarized report about health facilities at district level.

Its last update was in 2004.

Database in the department however remains fragmented since its not hosted in a central server but exist in standalone workstations within the laboratory as MS Excel spreadsheets. Of importance to note also is the continued use of an old DOS based operating system (CLARION) for data entry and management in standalone computers.
2.2 Integrated District HMIS- Kwale Model by Agha Khan

The Kwale model of an integrated District HMIS was initiated by MOH in collaboration with DANIDA HSP Coast Province and Agha Khan Health Services, Kenya in 2002. The Kwale HMIS is a simple, computer-based information system that provides the DHMT with timely information on preventative, promotive and curative services, as well as on finances and governance from government dispensaries, health centres and hospitals.

Based on four HIS forms already in use, the database incorporate information drawn from these standard reports:

- Monthly outpatient morbidity return, containing statistics on various morbidity cases found in the population visiting the facilities.
- Monthly immunisation summary, containing statistics on immunisations administered, dropout rate, coverage, and stocks.
- Monthly child health and nutrition summary, containing data on nutrition status drawn from growth monitoring activities.
- Monthly workload and revenue report containing statistics on services offered, finances, governance, and the number of days without priority drugs.

In addition, the system logs health education activities, although this information is not currently used. A village population module provides each facility with information on the villages in its catchment area. The system produces reports, graphs and information on key indicators at the click of a button. The system also exports data for further analysis. See Fig 3 below.

Project efforts resulted in request from MOH at national level to roll out to two other provinces with funding support from DANIDA. Kwale HMIS has been replicated in 22 other districts in Coast, North-eastern and Nyanza provinces between 2005 and 2006.

Fig 3: Sample Kwale HMIS web User interface
3.0 Review of Reports and Databases on Health Mapping.

The following are reviews of existing health mapping reports and databases that have been developed in Kenya over the recent past.

3.1 Service Availability Mapping (SAM)

Service Availability Mapping (SAM) exercise was conducted by Kenya’s Ministry of Health in collaboration with WHO from September to December 2004 in 78 health administrative districts in Kenya. Funding was provided by the United States’ President’s Emergency Plan for AIDS Relief (PEPFAR) and the Joint United Nations Programme on HIV/AIDS (UNAIDS).

The goal was to collect information on the availability and distribution of key health services by interviewing the district director of health services and his/her team in all 72 districts of the country.

During the exercise, 25 enumerators were drawn from national and provincial offices, of which 14 were health records and information officers and 11 public health officers. Each team consisted of two officers and one driver with at least six districts to be visited. In the team there were also 14 supervisors from Ministry Of Health Headquarters, two officers from WHO’s country office in Kenya and one officer from WHO Headquarters Geneva. The team conducted four days of training (11–14 September 2004). Training covered the questionnaires and the use of PDA’s for data collection. In addition, adaptation occurred and variables were added in order to include priority interventions and resources.

The SAM questionnaire investigated the following indicators:

- General characteristics (id, name, type, agency, administrative boundary),
- Electricity and piped water supply,
- Communication equipment (computers and Internet),
- Laboratory capacity (oxygen and X-ray services, blood glucose-level tests),
- Injection practices (needles and syringes used, method of sterilization),
- Human resources and training (number of health-care professionals in various disciplines),
- HIV/AIDS Service availability (ART, PMTCT of HIV, and HIV testing and counselling),
- Maternal and child health (staff trained in maternal and child health),
- Tuberculosis prophylaxis (TB lab, diagnostic and treatment facility),
- Social marketing programmes,
- Basic medical equipment (blood pressure measurements, weighing scales, latex gloves, microscopes and refrigerators),
- Drugs and health commodities availability etc (Table 3).

Data were obtained directly from all districts using personal digital assistants (PDAs) for data entry in the field. Data was then uploaded to WHO’s Health Mapper and linked to a global positioning system (GPS) database containing the geographic coordinates for health facilities in the country. To validate the reported information from District Health Management Teams (DHMT), facility questionnaires were applied by survey teams in three major cities: Nairobi, Mombasa and Nakuru and three districts: Thika, an urban district, and Kilifi and Kisumu, rural districts.

The study documented over 5000 health care facilities in total with 41% being public facilities or those that are owned and operated by the government, 44% were Private, for-profit facilities, and the
remaining 15% being non-profit; these include NGOs and Mission-based facilities (Table 4). The dataset contains GPS coordinates of less than 20% of the facilities and were derived from the Health Provider Mapping data by KEMRI-WTRP. This dataset is hosted at the MoH-HMIS department and is what is in use at the moment.

Health Mapper was used to produce maps that show the distribution of key health services as well as the distribution of services in facilities within the selected districts. SAM results have been used as baseline data for the scale-up of key HIV/AIDS-related services such as antiretroviral therapy (ART), prevention of mother-to-child transmission (PMTCT) of HIV, and HIV testing and counselling (Table 5). It was a first step towards an integrated system of health services monitoring that is operated and led by the district.

3.2 The KEMRI-Welcome Trust Research Programme database

The KEMRI-WTRP health facility database is a reconstruction of health facilities listed by different users in the country. It draws from lists held by the MoH-HMIS division (last updated in April 2001), an independent list created by the family planning and logistics management (FPLM) program supporting the supply of commodities for the Ministry of Health’s Division of Reproductive Health (developed in October 1998), the Kenyan Government’s Gazette (KG) notice of officially recognized health service providers posted in August 1998 and the Kenya service providers assessment (KSPA) report, conducted in 1999 by the MoH and the National Council for Population and Development (NCPD), non-GoK lists of service providers from the Christian Health Association of Kenya (CHAK) developed in September 2000, Central Bureau of Statistics (CBS) to source hand-drawn maps and lists of facilities located in each district (52 districts) as documented in the district development plans for 57 district, Kenya Medical Directory (KMD) 2000 edition etc. Noor et al, 2004. The lists were carefully matched in names and district location and considerable differences in their coverage and completeness were revealed, particularly with respect to the private sector providers. District health management teams in all 69 districts at the time were contacted with a map and list of health facilities and 38 of this returned corrected data sets.

The study employed various methods to determine the longitude and latitude for each health service provider identified during the process.

These included:

- Use of global positioning systems (GPS) by various NGO and research groups;
- Extraction and triangulation of coordinates from hand-drawn maps against GIS data on administrative boundaries and roads through on-screen digitizing using Arcview GIS;
- Use of 1:50,000 topographical maps; matching names of facilities to digital databases of village names and market centres created in 2001 by the International Livestock Research Institute, Kenya; and finally
- Matching facility names to fifth-level administrative boundary units. Where these units were small, a centroid position was extracted.

One hundred and thirty-seven (137) on-screen digitized coordinates from hand-drawn maps and 125 extracted from grid references on 1:50,000 scale maps were subsequently or coincidentally positioned with a GPS unit.

Presently, the database has 3,950 public health facilities and 3,362 private health facilities as provided in Annex 3: Table 6, 7 & 8. About 64% of the public health facilities are run by the Ministry of Health,
29% by the mission and NGO sector and 7% by the local authorities. 6% of the public health facilities are hospitals, 18% health centres, 69% dispensaries while the remaining were maternity and nursing homes (MNH), specialist facilities or belonging to institutions such as schools. A total of 3775 (96%) of the public health facilities were mapped; 36% of this using GPS. Similarly, 75% of the private health facilities were mapped; 43% using GPS. In summary, the KEMRI-WTRP database contains the following fields: ID; HMIS code; Facility Name; Administrative data (Province, district, division, location, sub-location); Facility type; Agency; Longitude/Latitude; EPI services (Y/N); ITN services (Y/N) and volume by month; Personnel; and Outpatient data (all cause and malaria) where possible as the availability of these was limited on whether health facilities in the secondary source could be identified in the KEMRI-WTRP list. Noor, 2007

3.3 Human Resource Mapping of the Health Sector- MoH

Ministry of Health (MoH) in 2004, with support from HLSP (under USAID) commissioned the development of a new, comprehensive Human Resource computerised database of public health staff. The Division of Policy and Planning recognized the need for more detailed and accurate data on all health staff, their skills, their workload, and staffing patterns. It therefore organised the first ever development of national, provincial, district and facility-level staffing and utilization profiles for all Kenya to provide the basis for more effective HR management and planning. (HLSP, 2006)

The mapping exercise involved visits to every health facility in the country and individual interviews with all staff. Data for the study was collected through facility and employee questionnaires, developed in consultation with the MoH Heads of Policy/Planning and Human Resources.

Nine teams mapped the country with each team comprising a researcher, an IT specialist and two MoH staff members. Staff members enlisted on the MoH payroll database were interviewed within a period of two months; heads of facilities completed the questionnaires where staff were unavailable for interview.

All the data was entered into the HR database using a unique employee personnel file number. Any discrepancies between this and the payroll database were investigated and followed up, ensuring harmonisation of the data.

The study identified 35,643 MoH employees serving in 2,158 health facilities, which included 1,536 dispensaries, 440 health centres, 132 district hospitals and 7 provincial hospitals. 450 (1.3%) staff on the payroll were found to have retired, absconded, or died. Overall, medical staff made up two thirds of the workforce (doctors 3.4% clinical officers 6.1%; public health officers 11.9%); enrolled and registered nurses 45.3%; 9% of health workers had received training within the past two years. Only 6.3% of dispensary nurses, responsible for delivering NHSSP II, had had any training in the past year. Most training comprised short, one-day courses Annex 4.

Key observations from the study were as follows:

- The exercise focused on MoH staff hence omitting professionals in the private sector
- Irregular payments to ghost staff and untitled allowances amounted to 1.3% of the payroll budget as a result of a poorly updated HR database.
- There is a serious shortage of staff in health centres and dispensaries hence a need to reduce staffing levels in district hospital to cater for dispensaries and health centres.
- Similarly most staff are resistant to deployment to more isolated/ hardship areas hence need to consider introducing incentives or short-time placements to such places.
The database created was not geo-coded hence linking to a GIS would be tasking.

Similarly, the HMIS coding is not consistent with the other HMIS databases like SAM and KEMRI-WTRP’s hence integration, a nightmare.

3.4 National Coordinating Agency for Population and Development (NCAPD) database

NCAPD conducted a survey in early 2006 designed to establish a resource for NGOs and CBOs working in the field of population, health and development. The survey documented all NGO’s, and FBO’s in Kenya at the district level with their contact details and type of activities being undertaken. Information captured included:

- Organization name and type,
- Contact details (Postal address, telephone no’s, website and email address, fax, contacts persons and their Job titles)
- Physical location by province, district and a brief description of location by street name or nearest landmark in the district.
- The main operation area or issues the organisation is involved
- The type of clients and
- Annual budget

These were entered into an ACCESS database hosted at NCAPD. The survey however, did not capture health indicators nor gather geographic location data of these NGO and CBO facilities thereby being more of a descriptive database of the said organisations. See Annex 5 for sample data.

3.5 Kenya Demographic and Health Survey 2003- CBS

Kenya Demographic and Health Survey (KDHS) conducted in 2003 was implemented by the Central Bureau of Statistics (CBS) in collaboration with the Ministry of Health (MoH) including the National AIDS and STIs Control Programme (NASCOP) and the Kenya Medical Research Institute (KEMRI), and the National Council for Population and Development (NCPD). The survey was funded by the Government of Kenya and a consortium of donors, including: USAID, UNFPA, JICA, UNDP, UNICEF, DFID and CDC. The 2003 KDHS differed in two aspects from the previous KDHS surveys: it included a module on HIV prevalence from blood samples, and it covered all parts of the country, including the arid and semi-arid districts, i.e. the northern half of Kenya that had previously been omitted from the KDHS. Data collection took place over a five-month period, from 18 April to 15 September 2003.

The 2003 KDHS is a nationally representative sample survey of 8,195 women age 15 to 49 and 3,578 men age 15 to 54 selected from 400 sample points (clusters) throughout Kenya. It was designed to provide data to monitor the population and health situation in Kenya as a follow-up of the 1989, 1993 and 1998 KDHS surveys. The survey utilised a two-stage sample based on the 1999 Population and
Housing Census and was designed to produce separate estimates for key indicators for each of the eight provinces in Kenya.

The survey obtained detailed information on:
- Fertility levels
- Marriage
- Sexual activity
- Fertility preferences
- Awareness and use of family planning methods
- Breastfeeding practices
- Nutritional status of women and young children
- Childhood and maternal mortality
- Maternal and child health
- Awareness and behaviour regarding HIV/AIDS and other sexually transmitted infections (STIs).

New features of the 2003 KDHS include the collection of information on malaria and use of mosquito nets, domestic violence, and HIV testing of adults.

A total of 146 field personnel were trained as interviewers, supervisors, health workers and data processing staff. This group was further trained on how to supervise fieldwork and editing of the questionnaires in the field.

Data collection took place over a five-month period, from April 18 to September 15, 2003. Seventeen interviewing teams were involved in the exercise. Each team consisted of one supervisor, one field editor, four female interviewers, one male interviewer, one health worker, and one driver.

The processing of the 2003 KDHS results began shortly after the fieldwork commenced. Completed questionnaires were returned periodically from the field to CBS offices in Nairobi, where they were edited and entered by data processing personnel specially trained for this task. Data were entered using CSPro. All data were entered twice (100 percent verification). The concurrent processing of the data was a distinct advantage for data quality, since CBS was able to advise field teams of errors detected during data. The data entry and editing phase of the survey was completed in October 2003.

Among results presented by 2003 KDHS are the evidence of lower than expected HIV prevalence in the country, stagnation in fertility levels, only a very modest increase in use of family planning methods since 1998, continued increase in infant and under-five mortality rates, and overall decline in indicators of maternal and child health in the country. There is a disparity between knowledge and use of family planning methods. There is also a large disparity between knowledge and behaviour regarding HIV/AIDS and other STIs. Some of the critical findings from this survey, like the stagnation in fertility rates and the declining trend in maternal and child health, need to be addressed without delay.

In as much as the survey portrayed the health situation in the country by focusing on health indicators like fertility levels and trends; family planning trends; maternal and child health care levels; nutrition status of the sample population; HIV/AIDS prevalence level; gender related violence and female genital cutting, the data remains as a projection out of a representative sample population across regions. It did not gather information on health service providers and their geographic distribution in terms of location.
3.6 The Christian Health Association of Kenya (CHAK)

The Christian Health Association of Kenya (CHAK) is a leading non-profit Faith Based Organization (FBO) of Protestant churches' health facilities and programs from all over Kenya.

The core functions of CHAK are:
- Health Services delivery through its Member Health Units
- Advocacy and representation with the Ministry of Health
- Capacity building and training
- Promoting Essential Drugs and Medical Supplies access through MEDS
- Medical equipment procurement, installation, repair and maintenance through the Health Care Technical Services Program (HCTS)
- Networking and Communication
- HIV/AIDS Prevention, treatment, care and support
- Health care financing
- Governance and management support to member health units.
- Monitoring and Evaluation.

CHAK health facilities together with the health facilities under the Kenya Episcopal Conference (KEC) account for 40 per cent of the total health care services in Kenya. Membership amount to 414 comprising 24 hospitals, 43 health Centres, 51 churches/church organisations/church health programs, and 296 dispensaries. See Annex 6 for sample database.

The database is a good listing of the number and type of health facilities owned by CHAK members within various regions across Kenya with contact addresses. It however does not specify services offered in these facilities and their capacities or capture the GIS-based location information. The list can be a good guide to what is where in the CHAK facility ownership and can be adopted to guide the identification and definition of these FBO facilities when building an all inclusive MoH facility database.
4.0 Other studies:

4.1 Ministry of Education’s School Mapping Project (SMP).

The School Mapping Project (SMP) was initiated by Kenya’s Ministry of Education (MoE) and undertaken by Oaker Services Ltd. It was basically a census of educational institutions and provides details on the population of schools in the country. SMP was conducted between Jan and Nov 2007 and sponsored by GoK and USAID. The Pilot phase of the study was conducted between 22nd to 27th January 2007 in Thika District, with the nationwide phase done between February and October 2007.

SMP aimed at:
• promoting evidence based planning and decision making in the education sector;
• Improving relations among stakeholders and foster partnerships;
• serving as an important tool in the implementation of a decentralized education management system
• serving as basis for database integration
• serving as a tool for information dissemination

The objectives of the project were to:
• Collect spatial data on all education facilities using GPS;
• Collect school attribute data using a questionnaire;
• Enter the spatial data onto a GIS platform;
• Link each school to corresponding attributes;
• Establish a GIS database at the MoE;
• Establish a GIS facility at the MoE
• Training and Capacity Development
• Harmonize codes used by KNEC & TSC;
• Produce reports and maps of educational institutions.

Mapping teams which constituted a surveyor, an assistant, ministry official and a driver each, visited the eight (8) provinces, 71 districts in the country to pick GPS coordinate data and collect and verify questionnaires earlier sent to schools as well as pick digital photographs of the schools. The exercise employed the knowledge of District Education Officers to locate the schools in the districts.

Information collected includes:
• Spatial data on all education facilities using GPS
• Photos of the schools
• Information on the administrative locations i.e. from province to Sub-location level
• Type of institution:
  – Early Childhood Development Centres (ECD);
  – Primary Schools;
  – Secondary Schools;
  – Non Formal Education Centres;
  – Adult Education Centres;
  – Youth Polytechnics;
  – Technical Training Institutes (TTI);
– Institutes of Technology (IOT);
– Teacher Training Colleges (TTC);
– National Polytechnics;
– Universities.

• Ownership:
  – Public & Private Schools
  – Ordinary & Integrated Schools
  – Special Schools

• Available facilities i.e. number of classrooms, laboratories, toilets, dormitories

• Number of teachers in a particular school and

• The enrolment record for the particular period.

Data validation was done in the field as well as in office with Spatial data (GPS Coordinates) being verified using ArcPad (Mobile GIS Software) whereas, Attribute data (Questionnaire) was validated in the field and randomly checked by TWG. A full check was done in the office. It is said that the project to date is 95% complete.

Some of the experiences and challenges encountered during the mapping exercise are:

• A good logistical arrangement which involved:
  – Distributing questionnaires for data collection to school before hand
  – Having a large team of mapping staff (15 teams) collecting data per district by provinces.
  – Using District Education Officers to locate schools in their areas and verify attribute data entered in the questionnaires.

These enabled the team to map about 30 to 50 with a maximum of 70 institutions a day in highly populated areas like urban centres. And since questionnaires had been distributed earlier, it became easier to pick GPS and cross-check the questionnaire hence limited time taken in one institution.

• Insecurity faced in some areas of the country during the mapping period. For example, Mt Elgon region and North Eastern Province required special security arrangement to escort the mapping teams.

• Bad weather condition at certain times of the year especially heavy rains rendered some places inaccessible. For example, parts of Central, Rift Valley, Coast (Tana River), Western (Budalangi) and Nyanza (Kano Plains) provinces were inaccessible during rainy season, between April and July due to flooding or muddy terrain. Mapping of these areas was done in the dry season.

• Bad road conditions in some areas for example rough roads or lack of motorable roads, hilly or rocky terrain and swampy areas which challenged accessibility to some schools. Hence, use of 4-wheel vehicles to overcome the terrain. In some areas around Lake Victoria region, boats were used to access schools located in islands like Mbita point.

• Poor communication network especially lack of cell phone and internet coverage in certain areas breached communication between field teams and the project coordination centre.

However, no maps or sample database could be acquired from the project team.
5.0 Key Findings

Some key issues have been identified in the course of reviewing several health mapping exercises conducted in the past and efforts to create a system for managing health information in Kenya. Among the notable ones include:

1) Incomplete Health databases at national scale.

Health database at a national scale can exclusively be considered to be incomplete. This can be attributed to:

i) Small scale mapping of health indicators at sub-national level.
   Most health mapping exercises conducted in the past tended to concentrate at sub-national levels as either pilot projects or focused on regional problems hence databases generated are incomplete at a nation wide scale. Such is the example of HMIS in the “Kwale Model” which stuck in Coast, North Eastern and Nyanza Provinces but was not scaled-up to nationwide mapping.

ii) Non-all inclusive Health indicator mapping
   A majority of health mapping exercises undertaken by Health Programmes in the past tended to focus on specific health issues thereby leaving out some equally important health information at the time un-captured. This has been the case with Malaria Mapping, Human Resource mapping, NCAPD mapping etc resulting in incomplete mapping of health indicators.

iii) Sporadic mapping of health services/providers.
   Some health services or providers have been sporadically mapped in the past by health agencies or well-wishers during field visits resulting in irregular and incomplete datasets. For example, statistical data available at Kenya National Bureau of Statistics (KNBS) collected during field surveys.

iv) Missing Private sector data.
   Data on private health service providers in the country largely remain unavailable. Mapping of health service availability by MoH in the past has tended to concentrate on public health facilities at the expense of the private sector thereby creating a serious gap in the existing MoH database. This is the case with numerous mushrooming private health service providers both in urban and rural areas that are not monitored by MoH.

2) Incorrect geo-coded data for health facilities.

Some of the health facility databases examined were found to have incorrect geographic coordinates. This was the case with KEMRI-WTRPS and SAM databases.

The initial KEMRI-WTRPS database had facility coordinates (longitudes and latitudes) extracted and triangulated from hand drawn maps through a process of on-screen digitization or the names of facilities matched to digital databases of village names and market centres created by ILRI in 2001 and finally matching facility names to fifth-level administrative boundary units where these units were small by extracting a centroid position. Error margins were examined using a root-mean square error analysis. This accounted for over 20% of coordinates provided in the KEMRI-WTRPS database.
It is however, unfortunate to say that the same database was used to determine coordinates for the SAM database which is currently in use at MoH’s HMIS, thus exhibiting serious duplication of errors in a database. As one author purports in his article, “these are not GPS coordinates” and therefore, can be considered erroneous in determining location of health facilities. When such coordinates from centroids are plotted in a map, all points in a centroid supposed to be facilities within the same locality will fall in the same place with little or no longitudinal and latitudinal variance hence exact geographical location remaining illusive in the real world situation.

3) Duplication of Efforts among data collecting Agencies

Currently, several similar health related databases exist within various ministries, organisations, NGOS etc as a result of un-coordinated health mapping exercises where data is generated for particular organisational needs. This is the case with KEMRI, AMREF, MoH’s Department of Planning, HMIS, HIV and Malaria program databases. In most cases, partners are not taken into consideration when planning for such exercises and so the resulting information is not shared between partners. This has led to a lot of duplicated databases amidst stakeholders in the health sector.

4) Old or Non-updated health databases.

Most of the databases in existence today were generated from survey conducted two to three years ago and few have ever been updated. A good example is the SAM database which was generated between September and December 2004 and up to date has not been repeated on a national scale. Few organisations dare to venture again due to cost implications despite enormous recommendations for updates.

5) Fragmented Data Systems within MoH

A visit to MoH headquarters revealed that there are a lot of fragmented data systems in operation within the Ministry that need to be consolidated into a single database. Such is the case with the independent data centres in operation at the department of planning and the department of HMIS whereas all have the same data. Despite HMIS having a well equipped computer lab with a server that can host all these data, all have opted to manage their own datasets. Fragmentation is also evident at the way vertical reporting at the district and provincial levels function with little integration thereby causing delays in data delivery to the central level.

6) Lack of well formulated HMIS Policy Guideline in the Ministry of Health.

MoH lacks a well formulated HMIS policy to guide and monitor the development and use of HMIS in the country both in the public and private sectors of Health. There are no clear policies to guide data collection, delivery
Comments on data from MOH

After keenly analyzing data from the ministry of health, the following issues were noted;

i) The data captured most of the salient issues for decision making although not in the right format. For example most of the responses were a YES or a NO instead of giving responses that would give a quantitative figure which would then help in making a correct and more precise decision.

ii) There was a lot of discrepancy among different pieces of data. This was mainly as a result of designing tools for short term basis instead of designing tools for long term basis. This would result to inaccurate reflection of the state of health facilities on the ground.

iii) There is a lot of repetition of variables thus making some of the data irrelevant. Repetition of irrelevant data will make analysis of data which would otherwise have been simple very complicated thus then hampering smooth decision making.

iv) Data is not up to date. This has been caused mostly by how the data was designed. Data was designed in a way that its updating was never simple.

v) There is no proper normalization of the variables used for collecting data. Having variable that sensitive to time and those that are not sensitive to time together makes the process of updating data difficult.

vi) No data giving summarized information at provincial and national level. This makes the process of decision making at these levels very difficult.
6.0 Conclusion and Recommendation

Much of the existing GIS related database on health service providers can be considered to be either incorrect or incomplete where some level of confidence can be entrusted to the database. This is primarily due to the methodologies employed in the derivation of geographical coordinates and the extent of mapping done which most of the cases was small scale. Previous mapping concentrated more on descriptive determination of health services ignoring the picking of geo-coordinates of respective health facilities mapped. This has created a gap in the mapping of health facilities since location is determined by the mapper’s knowledge of physical location but not with respect to a coordinate system that can be plotted in a map for future reference. This therefore calls for a need to conduct a countrywide GIS-based mapping of health services and service providers in Kenya and developing a strong and well maintained HMIS database at the Ministry of Health.

The following are some recommendations to consider:

1) Need to consolidate and harmonise existing health related databases at MoH and other institutions of health as a first step to determine who has what and where to begin the mapping.
   - The variables for the data need to be moderated so as to avoid the variations among different pieces of data. This can be done through involving all the interested parties in developing a tool that is properly designed and designed for long term. By doing this, proper reflection of what is happening on the ground in a consistent manner will be known.
   - Data needs to be normalized to avoid complicated forms for entering data, repetition when updating data and cumbersomeness. Different variables that can be updated by different personalities and represent different nature of attributes should be pooled in different tables. This will make the understanding and analysis of data very simple and less cumbersome. Hence making the tool more acceptable to its users.
   - There should be data giving summarized information at provincial level and national level. I.e. Data should be layered (as shown on fig 4 below). Giving summaries at different levels with a possibility of drill down makes decision making process easier and faster. Also it enables decision makers at these levels to be up to date with what is happening at the lower layers.
   - SQL Server DBMS should be used for developing the database for the system. This is because SQL server is affordable, compatible with all Microsoft Windows products and it can be distributed hence enabling people on the ground to be able to update the system easily and faster.
   - Visual basic to be used for developing the form for entering data. This is because visual Basic is very simple to learn and enables the development very dynamic and powerful application that will be able to handle very complex analysis and decision making.
Fig 4: Diagrammatic representation of layered data.

2) There is an urgent need to carry out a comprehensive nation-wide mapping of health service providers using GIS technology in order to create a correct geographically referenced database of these facilities.

3) Need to upgrade MoH’s HMIS system to modern standards of data handling, storage and analysis. For example, upgrading the HMIS department to a fully functional Geo-health Unit equipped with high-end data storage server, workstations, database software, GPS’s, and complete data networking in readiness for the national mapping data.

4) Decentralise HMIS operations to the provincial and district levels respectively for effective development, monitoring, management, and upgrading of the national database and consequently achieve the vision of HMIS at MoH.

5) The Ministry of Health should formulate proper policies to guide the process of developing and use of HMIS in the country in order to strengthen MoH role in supporting and monitoring the country’s health status.

For the more details about data collected from ministry of health, its variables and a proposed normalization of this data, see the annex 1 and 7
7.0 References


8.0 Annexes

Annex 1: Ministry of Health’s HMIS Database

*Key Indicators Captured in Various Health facilities Data available at MoH.*

*a*  Data Name: Kenya SAM facility data-original  
Data Format: Excel  
This data contains information about the location of the facility, the people involved in collecting the data, facility equipment, services offered by the facility and the facility staff. The following are the variables that were used.

- Record Id
- Unit ID
- User Name
- Time Stamp
- Facility name
- District
- Town
- Facility type
- LAT
- LONG
- H Map Unit ID
- Est. facility surface area
- (Sq meters)
- Est. Facility Acreage
- Interviewer name
- Respondent name
- Respondent job title
- Facility tel number
- Facility Fax Number
- If HIIV, (Support Organization Name)
- Support org type
- Out-patients, previous month
- Delivery beds
- Maternity beds
- In-patient beds
- No. in-patients, previous month
- Main source, water
- Electricity
- Telephone lines
- Cellular phone services and phones
- Radio
- Functioning computer and accessories
- Functioning internet
- Ambulances
- General purpose vehicles
- Guidelines for malaria
- Guidelines IMCI
- Guidelines HIV care and support
- Guidelines for management of outbreaks
- Guidelines EPI
- Blood pressure machine
- Stethoscope
- Oral thermometers
- U5 weighing equipment
- Adult weighing scale
- Microscope
- Latex gloves
- Refrigerator
- Anesthetic machine
- Surgical equipment
- Surgical tape
- Cotton wool
- Surgical dressings
- Incinerators
- Most commonly used needle and syringes for general health services
- Most common sterilization procedure
- If other, specify:
- Environmental disinfectant available
- ARVs
- Medical doctors, full time
• Medical doctors, part time
• Medical doctors, present today
• Specialists
• Specialists, present today
• Dentists
• Dentists, present today
• Certified/Registered nurses
• Certified/Registered nurses present today
• Clinical officers
• Clinical officers present today
• Lab technicians/technologists
• Lab technicians/technologists present today
• Pharmacists/dispensers/
• pharmaceutical technologists
• Pharmacists/dispensers/
• pharmaceutical technologists present today
• Records assistants
• Records assistants present today
• IMCI
• Safe Motherhood and life saving skills
• HIV/AIDS treatment and care
• HIV/AIDS counseling
• Infection control/ universal precautions
• Malaria, treatment and diagnosis
• Drug and supplies management
• HMIS
• Injectable antibiotics
• Oral antibiotics
• Oral contraceptive pills
• Injectable contraceptives
• Condoms
• Iron
• Vit. A
• Measles vaccine
• BCG vaccine
• DPT vaccine
• OPV vaccine
• Yellow Fever vaccine
• Rabies vaccine
• Pentavalent vaccine
• SPACT drugs
• Quinine
• Antihypertensive drugs
• Magnesium Sulphate for eclampsia
• Ergometrine for pp hemorrhage
• ORS
• NSAID
• Oral allergy drugs
• Injectable allergy drugs
• Anti-helminthics
• Leprosy drugs
• Antifungal Bronchodilators
• Psychotherapeutic drugs
• Gastrointestinal drugs
• Diuretics
• Dermatological drugs
• Antimigrain drugs
• Insuline and antidiabetic drugs
• Intravenous fluids
• ENT preparations
• HIV antibody test
• Hb
• Blood count
• Blood glucose level
• Urea and electrolytes
• Giemsa Stain for malaria
• HIV counseling and testing
• New C&T clients, last month
• ANC
• HIV counseling to pregnant women
• HIV testing for pregnant women
• PMTCT nevirapine or AZT
• New patients, PMTCT, last month
• ART
• Currently enrolled
• No., patients picked up drugs in last month
• Of patients that picked up drugs, how many were newly enrolled
• Smear microscopy for TB diagnosis
• TB register TB treatment
• DOTS, facility or community
• Short course, facility or community
• Cohort analysis, TB
• HIV testing for all TB cases
• INH prophylaxis
b) **Data name: Facility template**  
**Data format: Excel**  
This data contains the information about the location of a health facility and services offered by a health facility. The following are the variables that were used:

- Nearest Town
- Address (box)
- Email address
- Phone Number
- Mobile Number
- Latitude
- Longitude
- Immunization
- Growth Monitoring
- IMCI
- ANC
- Family Planning
- Emergency Obstetric care
- PMTCT
- HIV counseling and testing
- ARV therapy
- TB diagnosis
- TB diagnostic laboratory facilities
- TB treatment
- Caesarean section
- Emergency blood transfusion
- Home based care
- Radiology services
- Youth friendly services

c) **Data name: SAM Kenya facility listing-all geocoded**  
**Data format: Excel**  
It contains the information about the location of the facility, ownership, services offered especially on TB and HIV and equipment to assist the facility in provision of services. The variables used are as follows:

- AUTO
- LONG
- LAT
- Facility Name
- District Name
- TYPE
- OWNERSHIP
- DIVISION
- LOCATION
- VILLAGE
- PROVINCE
- PMTCT
- HIV counselling and testing
- ARV therapy
- TB diagnosis
- TB diagnostic lab facilities
- TB treatment
- Caesarean section
- Emergency blood transfusion
- Home based care
- Spatial Method Reference
- UNIT TYPE

d) **Data name: All District facility listing**  
**Data format: Excel**  
It contains information about the location of the facility without longitudes and latitudes, ownership of the facility, services offered and the equipment available at the facility. The following are the variables that were used:

- Health Facility Name
- District Name
- Type
- Ownership
• Division
• Location
• Village
• Province
• PMTCT
• HIV counseling and testing
• ARV therapy

• TB diagnosis
• TB diagnostic laboratory facilities
• TB treatment
• Caesarean section
• Home based care

e) Data name: SAM Kenya facility final
Data format: Excel

It contains information about the location of health facilities, the services offered, the equipment available at each facility and staff at each facility. The following are the variables that were used in this data.

• NAME
• DISTRICT
• TOWN
• TYPE
• METERS
• ACREAGE
• NAME1
• NAME2
• JOB
• TELNUMBER
• FAX
• SUPPORTNAME
• SUPPORTTYPE
• OUTPATIENTS
• DELIVERYBEDS
• MATERNITYBEDS
• INPATIENTBEDS
• INPATIENTS
• INPATIENTDAYS
• WATER
• TELEPHONE
• CELLPHONE
• RADIO
• COMPUTER
• INTERNET
• AMBULANCES
• VEHICLES
• GMALARIA
• GIMCI
• GHIV

• GOUT BREAKS
• GEIP
• BPMACHINE
• STETHOSCOPE
• THERMOMETERS
• U5WEIGHT
• ADULTWEIGHT
• MICROSCOPE
• GLOVES
• REFRIGERATOR
• ANESTHETIC MACHINE
• SURGICAL EQUIP
• TAPE
• WOOL
• DRESSINGS
• INCINERATORS
• NEEDLES
• STERILIZATION
• OTHER1
• DISINFECTANT
• DOCSFT
• DOCSPT
• DOCSPRESENT
• SPECIALISTS
• SPECIALISTS PRESENT
• DENTISTS
• DENTISTS PRESENT
• NURSES
• NURSES PRESENT
• CLINICAL OFFICERS
- CLINICAL OFFICERS PRESENT
- LAB
- LAB PRESENT
- PHARMACISTS
- PHARMACISTS PRESENT
- RECORDS ASSITANTS
- RECORDS PRESENT
- TIMCI
- TMOTHERHOOD
- THIVCARE
- THIVCOUNSELLING
- TUNI
- TMALARIA
- TDRUG
- THMIS
- INJ ANTIBIOTICS
- ORAL ANTIBIOTICS
- PILL
- INJ CONTRACEPTIVES
- CONDOMS
- IRON
- VITA
- MEASLES
- BCG
- DPT
- OPV
- YELLOW FEVER
- RABIES
- PENTAVALENT
- SPACT
- QUININE
- ANTIHYPERTENSIVE
- MAGNESIUM SULPHATE
- ERGOMETRINE
- ORS
- NSAID
- ORAL ALLERGY
- INJ ALLERGY
- ANTIHELMINTHICS
- LEPROSY
- ANTIFUNGALS
- BRONCHODILATORS
- PSYCHOTHERAPEUTICS
- GASTROINTESTINALS
- DIURETICS
- DERMATOLOGICALS
- ANTIMIGRAINE
- INSULINE
- INTRAVENOUS
- ARV
- ENT
- HIVAB
- HB
- BLOOD COUNT
- BLOOD GLUCOSE
- UREA
- GIEMSA
- AV HIV COUNSELLING
- NEW HIV
- ANC
- HIV PREGNANT
- HIV TEST PREG
- AZT
- CLIENTS AZT
- AV ART
- ENROLLED ART
- PICKEDUP ART
- NEW ENROLLAR
- MICROSCOPY
- TB REGISTER
- AV TB TREAT
- DOTS
- SHORT COURSE
- TB COHORT
- HIV TEST TB
- INH
f) **Data name:** SAM Kenya update  
**Data format:** Excel  
Contains the information about the location of health facilities, ownership and the services offered by the facilities. The variables used include the following.

- Auto
- Status
- Score
- X
- Y
- ARC City
- ARC Country
- Health Facility
- District_N
- Type
- Ownership
- Division
- Location

- Village
- Province
- PMTCT
- HIV_counselling
- ARV_therapy
- TB_diagnosis
- TB_diagn_1
- TB_treatment
- Caesarean Emergency
- Homebased
- Source
- Unit Type

g) **Data name:** SAMFac1  
**Data format:** Excel  
This data contains information about the names of the health facilities and the services they offer. The following are the variables that were used.

- AUTO
- Facility Name
- PMTCT
- HIV_counseling and testing
- ARV_therapy
- TB_diagnosis
- TB_diagnostic lab facilities
- TB_treatment
- Caesarean section
- Emergency blood transfusion
- Home based Care
DATA CONTAINING SUMMARIES AT DISTRICT LEVEL

a) Data name: Kenya annex summary
Data format: Excel
This data gives in summary the number of districts within the country that have health facilities that offer services described by the following variables.

- PMTCT
- HIV counseling and testing
- ARV therapy
- TB diagnosis
- TB diagnostic laboratory facilities
- TB treatment
- Caesarean section
- Emergency blood transfusion
- Home based care
- Caesarean section
- Emergency blood transfusion
- Home based care

b) Data name: District data
Data format: Excel
This data gives summary of the number of health facilities per district that offer certain services and have staff as described by the following variables.

- Record Id
- Unit ID
- Palm number
- Time Stamp
- District
- Population
- Interviewer
- Respondent
- Respondent Job Title
- Respondent Tel.
- Respondent Fax
- Additional Contact Information
- Number Of Public Facilities
- Number Of Private Non Profit And NGO Facilities
- Number Of Private For Profit Facilities
- Medical Doctors In Public And NGO Facilities
- Medical Doctors In Private Facilities
- Dentists
- Certified / Registered Nurses
- Clinical Officers
- Laboratory Technicians & Technologists
- Pharmacists
- Medical Records and Information Personnel
- In-Patient Beds In Public Facilities
- In-Patient Beds In Private And NGO Facilities
- Delivery Beds In All Facilities
- Maternity Beds In All Facilities
- Blood Transfusion Services Available In District
- Interruptions In Blood In District, last 3 months
- Blood Collected From Donors
- Donor Blood Tested / Screened
- Voluntary Paid
- Relatives Of Friends
- Blood Count
- Blood Sugar Levels
- HB
• Liver Enzymes
• Urea & Electrolytes
• HIV Antibody Test
• CD4 Cell Count
• Oxygen
• X-rays
• Computers
• Internet
• Telephone lines
• Cellular networks
• Radio connections
• Most commonly used needle and syringes for general health services
• Most common sterilization procedure
• GFATM
• Bilaterals
• Bilaterals active
• Multilaterals
• Multilaterals, active
• NGOs
• NGOs, active
• TB treatment

• Pain relief for HIV/AIDS
• Drugs for OIs
• ARVs through public sector
• Antibiotics for U5 pneumonia
• ORS for U5 diarrhea Delivery kits
• Contraception
• Condoms ITNs
• IMCI trained ITNs
• Safe motherhood trained staff
• HIV/AIDS treatment and care trained staff
• HIV/AIDS counseling trained staff
• Facilities with TB drug stock out, last 2 months
• Facilities providing iso prophylaxis to TB patients
• Facilities providing inter. preventive therapy for malaria during pregnancy
• Facilities with access to improved water supply
• Facilities with electricity 100% of the time

c) Data name: Kenya District Imported
Date format: Excel

This data gives summarized report on health facilities in each district that have equipment, facilities and offer services as described by the following variables;

• ID
• Username
• DISTNAME
• NAME1
• LVL1D1
• Blood Donors Score
• Blood transfusion
• Interruptio0sI0 Blood Availability
• Blood Donors
• Blood Tested
• Blood Voluntary Donors
• Blood Paid Donors
• Blood Relatives
• Laboratory services
• Blood Count
• Blood Sugar

• Blood Hb
• Blood Liver
• Urea And Electrolytes
• HIV Antibody Test
• BloodCD4 Oxygen
• X-ray machine
• Computer facilities
• Computers Internet
• Radio
• Basic Telephone Connection
• Cellular
• Field62
• Used Needles
• Used Sterilization
• HIV/AIDS treatment care trained staff
• HIV/AIDS counseling trained staff
• TB drug stock outs
• Isoprophyaxis to TB patients

Data name: SAM Kenya districts
Data format: Excel

This data contains in summarized form the information about the average number of staff in facility per population of a district, the various types of health facilities in each district, services offered in the facilities, the equipment availability and the people involved in collecting data as described by the following variables.

• ID
• Record Id
• Unit ID
• User Name
• Time Stamp
• Pop Census 2004
• NAME
• LVLID
• District Name
• District Population
• Interviewer Name Last First
• Respondent Name Last First
• Respondent Job Title
• Respondent Telephone Including Local Telephone Codes
• Respondent Fax Including Local Telephone Codes
• Additional Contact Information
• Number Of Public Health Care Facilities
• Docs
• Docs per 100K
• Number Of Private Non Profit And NGO Health Care Facilities
• Docs publics
• Docs private
• Dentists
• Reg Nurses
• Nurses Per 100K

• Malaria Pregnant Woman
• Safe Water
• Electricity
• Clinical officers
• Laboratory Technicians
• Labtech Per 100K
• Pharmacists
• Health information officers
• Number Of Hospital In Patient Beds Available For Use In The District
• Bedsper100K
• Beds public
• Beds private
• Delivery Beds
• Maternity beds
• Blood Donors Score
• Blood transfusion
• Interruptions In Blood Availability
• Blood Donors
• Blood Tested
• Blood Voluntary Donors
• Blood Paid Donors
• Blood Relatives
• Laboratory services
• Blood Count
• Blood Sugar
• Blood Hb
• Blood Liver
• Urea And Electrolytes
• HIV Antibody Test
• Blood CD4
• Oxygen
• X-ray machine
• computer facilities
• Computers
• Internet
• Radio
• Basic Telephone Connection
• Cellular
• Radio
• Used Needles
• Used Sterilization
• Donor Assistance To The District
• Bilateral
• If Yes Please List
• Multilateral
• If Yes Above Please List
• NGOs
• If Yes To Previous Please List
• TB treatment
• Pain treatment
• Drug HIV
• ARV public service
• Antibiotics
• ORS packet
• Delivery kit
• Oral contraceptive pills
• For condoms
• For insecticide
• IMCI
• Neonatal care
• HIV/AIDS treatment care trained Staff
• HIV/AIDS counseling trained staff
• TB drug stock outs
• Isoprophylaxis to TB patients
• Malaria Pregnant Woman
• Safe Water
• Electricity
Table 1: Kenya’s health facilities by district, type and running agency as by 2005

| DISTRICT     | HOSPITALS | SUB-DIST.
|--------------|------------|----------------
|              | GOK | NGO/MISS | PRIVATE | GOK | NGO/MISS | PRIVATE/COMM | GOK | NGO/MISS | PRIVATE/COMM |
| Baringo      | 1   | 0        | 0        | 1   | 0        | 16           | 0   | 0        | 53           | 4   | 6   | 0        | 0   | 81
| Bomet        | 1   | 1        | 0        | 1   | 1        | 10           | 1   | 0        | 32           | 0   | 0   | 15       | 0   | 62
| Bureti       | 1   | 2        | 0        | 1   | 0        | 5            | 0   | 0        | 25           | 2   | 10  | 0        | 0   | 46
| Kajiado      | 1   | 1        | 1        | 1   | 6        | 12           | 5   | 1        | 23           | 5   | 6   | 47       | 0   | 109
| Keiyo        | 1   | 0        | 0        | 3   | 0        | 6            | 1   | 0        | 18           | 1   | 3   | 2        | 0   | 35
| Kericho      | 1   | 1        | 6        | 1   | 1        | 7            | 2   | 0        | 38           | 10  | 14  | 4        | 0   | 85
| Koibatek     | 1   | 1        | 0        | 0   | 0        | 4            | 0   | 0        | 19           | 1   | 0   | 0        | 0   | 26
| Laikipia     | 1   | 0        | 1        | 0   | 2        | 7            | 0   | 0        | 18           | 8   | 0   | 21       | 0   | 58
| Marakwet     | 0   | 1        | 0        | 0   | 0        | 4            | 4   | 0        | 29           | 3   | 0   | 3        | 0   | 44
| Nakuru       | 3   | 0        | 5        | 2   | 8        | 16           | 4   | 0        | 52           | 16  | 4   | 43       | 0   | 153
| Nandi North  | 1   | 0        | 0        | 1   | 2        | 5            | 3   | 0        | 21           | 4   | 0   | 0        | 0   | 37
| Nandi South  | 1   | 0        | 0        | 1   | 0        | 3            | 1   | 0        | 13           | 30  | 10  | 0        | 0   | 59
| Narok        | 1   | 0        | 0        | 0   | 1        | 7            | 2   | 1        | 17           | 24  | 0   | 1        | 0   | 54
| Samburu      | 1   | 1        | 0        | 0   | 0        | 3            | 3   | 0        | 24           | 10  | 0   | 1        | 0   | 43
| Transmara    | 1   | 1        | 1        | 0   | 1        | 5            | 1   | 0        | 14           | 2   | 4   | 16       | 0   | 46
| TransNzioa   | 1   | 1        | 3        | 0   | 2        | 6            | 0   | 2        | 9            | 6   | 9   | 26       | 0   | 65
| Turkana      | 1   | 3        | 0        | 1   | 0        | 2            | 6   | 0        | 25           | 33  | 5   | 0        | 0   | 76
| Uasin Gishu  | 2   | 1        | 2        | 0   | 0        | 16           | 7   | 1        | 40           | 8   | 5   | 21       | 0   | 103
| West Pokot   | 1   | 1        | 0        | 0   | 0        | 4            | 0   | 0        | 19           | 17  | 8   | 11       | 0   | 61
| Rift Valley  | 21  | 15       | 19       | 13  | 24       | 138           | 40  | 5        | 489          | 184 | 84  | 211      | 0   | 1243

Rift Valley: 21, 15, 19, 13, 24, 138, 40, 5, 489, 184, 84, 211, 0, 1243
**Table 2:** A Sample listing of Facilities in Nairobi District and the services they provide as identified in MoH Database.

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<th>Division</th>
<th>Location</th>
<th>Village</th>
<th>Province</th>
<th>PMTCT</th>
<th>HIV counseling and testing</th>
<th>ARV therapy</th>
<th>TB diagnostic facilities</th>
<th>TB treatment</th>
<th>Caesarean section</th>
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### Annex 2: Service Availability Mapping (SAM) Database

#### Table 3: A Sample listing of facilities identified in SAM and the services they provide.

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<tr>
<th>Health Facility Name</th>
<th>Type</th>
<th>Ownership</th>
<th>Division</th>
<th>Location</th>
<th>Village</th>
<th>Province</th>
<th>PMTCT</th>
<th>Antenatal &amp; Delivery Unit</th>
<th>TB diagnostic laboratory facilities</th>
<th>TB treatment</th>
<th>Case Management</th>
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Table 4: Kenya's Health Facilities by district, type and running agency as by 2005-2006

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<th>Number of Health districts</th>
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<th>NURSING HOMES</th>
<th>HEALTH CENTRES</th>
<th>DISPENSARIES</th>
<th>CLINICS</th>
<th>VCT SITES</th>
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<td>27</td>
<td>23</td>
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Kenya = 78 | 85 | 74 | 68 | 73 | 191 | 459 | 172 | 21 | 1503 | 546 | 203 | 1734 | 41 | 5170 |

Table 5: Summary of Kenya’s Health Facilities by type and running agency

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<th>Health Centre</th>
<th>Dispensary</th>
<th>Nursing Home</th>
<th>Clinics</th>
<th>VCT Centers</th>
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<th>% Total</th>
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<tr>
<td>Total NGO/ Mission</td>
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<td>546</td>
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<td>792</td>
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<tr>
<td>Total Private/ Comm</td>
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<td>203</td>
<td>191</td>
<td>1734</td>
<td>41</td>
<td>2258</td>
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<tr>
<td>Grand Total</td>
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<td>73</td>
<td>652</td>
<td>2252</td>
<td>191</td>
<td>1734</td>
<td>41</td>
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% Total = 4% | 1% | 13% | 44% | 4% | 34% | 1% | 100% |

Fig 5: Distribution of facilities where HIV testing and counselling is available, by district
### Annex 3: KEMRI-WTRP Database

#### Table 6: Public health facilities by province and agency responsible

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<th>Local Authority</th>
<th>Other ministries</th>
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#### Table 7: Private health facilities by province

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#### Table 8: Public health facilities mapped by province

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<td>378</td>
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<tr>
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<td>183 (27%)</td>
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<td>679</td>
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<tr>
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<td>202 (99%)</td>
<td></td>
<td></td>
<td>1</td>
<td>203</td>
</tr>
<tr>
<td>North Eastern</td>
<td>45 (52%)</td>
<td>38</td>
<td>2</td>
<td>2</td>
<td>87</td>
</tr>
<tr>
<td>Nyanza</td>
<td>231 (36%)</td>
<td>356</td>
<td>12</td>
<td>37</td>
<td>636</td>
</tr>
<tr>
<td>Rift Valley</td>
<td>331 (28%)</td>
<td>741</td>
<td>63</td>
<td>52</td>
<td>1187</td>
</tr>
<tr>
<td>Western</td>
<td>167 (56%)</td>
<td>112</td>
<td></td>
<td>17</td>
<td>296</td>
</tr>
<tr>
<td>Total</td>
<td>1434</td>
<td>2242</td>
<td>99</td>
<td>175</td>
<td>3950</td>
</tr>
</tbody>
</table>
Table 9: Private health facilities mapped by province

<table>
<thead>
<tr>
<th>Province</th>
<th>GPS</th>
<th>Maps</th>
<th>District Estimates</th>
<th>Not mapped</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central</td>
<td>70</td>
<td>152</td>
<td></td>
<td>98</td>
<td>320</td>
</tr>
<tr>
<td>Coast</td>
<td>175</td>
<td>133</td>
<td></td>
<td>139</td>
<td>447</td>
</tr>
<tr>
<td>Eastern</td>
<td>114</td>
<td>239</td>
<td></td>
<td>131</td>
<td>484</td>
</tr>
<tr>
<td>Nairobi</td>
<td>488</td>
<td></td>
<td></td>
<td>155</td>
<td>643</td>
</tr>
<tr>
<td>North Eastern</td>
<td>4</td>
<td>24</td>
<td>10</td>
<td>11</td>
<td>49</td>
</tr>
<tr>
<td>Nyanza</td>
<td>217</td>
<td>193</td>
<td></td>
<td>157</td>
<td>567</td>
</tr>
<tr>
<td>Rift Valley</td>
<td>207</td>
<td>286</td>
<td></td>
<td>102</td>
<td>595</td>
</tr>
<tr>
<td>Western</td>
<td>157</td>
<td>65</td>
<td></td>
<td>35</td>
<td>257</td>
</tr>
<tr>
<td>Total</td>
<td>1432(43%)</td>
<td>1092(32%)</td>
<td>10</td>
<td>828(25%)</td>
<td>3362</td>
</tr>
</tbody>
</table>

Table 10: Number of registered practicing medical personnel and those in training 2006

<table>
<thead>
<tr>
<th>TYPE OF PERSONNEL</th>
<th>PRACTICING</th>
<th>IN TRAINING</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER</td>
<td>NO. PER 100,000 POP</td>
<td></td>
</tr>
<tr>
<td>DOCTORS</td>
<td>1398</td>
<td>3.9</td>
</tr>
<tr>
<td>DENTISTS</td>
<td>164</td>
<td>0.5</td>
</tr>
<tr>
<td>PHARMACISTS</td>
<td>322</td>
<td>0.9</td>
</tr>
<tr>
<td>PHARMACEUTICAL TECHNOLOGISTS</td>
<td>214</td>
<td>0.6</td>
</tr>
<tr>
<td>BSC. NURSING</td>
<td>18</td>
<td>0.1</td>
</tr>
<tr>
<td>REGISTERED NURSES</td>
<td>3803</td>
<td>10.7</td>
</tr>
<tr>
<td>ENROLLED NURSES</td>
<td>12343</td>
<td>34.6</td>
</tr>
<tr>
<td>CLINICAL OFFICERS</td>
<td>2060</td>
<td>5.8</td>
</tr>
<tr>
<td>PUBLIC HEALTH OFFICERS</td>
<td>1152</td>
<td></td>
</tr>
<tr>
<td>PUBLIC HEALTH TECHNICIANS</td>
<td>1845</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>23,319</td>
<td>35,644,982</td>
</tr>
</tbody>
</table>

Table 11: Numbers and distribution of medical staff working in public sector hospitals, health centers and dispensaries

<table>
<thead>
<tr>
<th>TYPE OF PERSONNEL</th>
<th>Provincial hospital</th>
<th>District/sub-district hospital</th>
<th>Health Centre</th>
<th>Dispensary</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of facilities</td>
<td>7</td>
<td>132</td>
<td>440</td>
<td>1,536</td>
</tr>
<tr>
<td>Doctors</td>
<td>306</td>
<td>35.3%</td>
<td>547</td>
<td>63.2%</td>
</tr>
<tr>
<td>Clinical officers</td>
<td>210</td>
<td>10.3%</td>
<td>1,427</td>
<td>70.1%</td>
</tr>
<tr>
<td>Nurses</td>
<td>528</td>
<td>16.5%</td>
<td>2,049</td>
<td>64.0%</td>
</tr>
<tr>
<td>Registered</td>
<td>1,571</td>
<td>13.1%</td>
<td>6,123</td>
<td>51.0%</td>
</tr>
<tr>
<td>Enrolled</td>
<td>2,099</td>
<td>13.7%</td>
<td>8,172</td>
<td>53.7%</td>
</tr>
<tr>
<td>All nurses</td>
<td>2,615</td>
<td>14.4%</td>
<td>10,146</td>
<td>56.0%</td>
</tr>
<tr>
<td>Medical staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Annex 5: NCAPD Database

**Table 12: Sample NCAPD Database of NGO’s with Doctors.**

<table>
<thead>
<tr>
<th>NGO Name</th>
<th>Address</th>
<th>Province</th>
<th>District</th>
<th>PostalCode</th>
<th>Physical Location</th>
<th>Phone1</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action Aid International - Kieni Dev. Initiative</td>
<td>259 Narumoru</td>
<td>Nyeri</td>
<td></td>
<td>00100</td>
<td>Timberland Building</td>
<td>062-62037</td>
<td><a href="mailto:margaret.wanjiru@actionaid.org">margaret.wanjiru@actionaid.org</a></td>
</tr>
<tr>
<td>Africa Medical Research Foundation (AMREF)</td>
<td>30125 Nairobi</td>
<td></td>
<td>Makueni</td>
<td>00100</td>
<td>Wote town Makueni</td>
<td>-44-30125</td>
<td></td>
</tr>
<tr>
<td>African Population Advisor Council (APAC)</td>
<td>10569 Nairobi</td>
<td>Nairobi</td>
<td></td>
<td>00100</td>
<td>Chancery 4th floor</td>
<td>2724852</td>
<td><a href="mailto:apace@wananchi.org">apace@wananchi.org</a></td>
</tr>
<tr>
<td>Assn for the Physically Disabled of Kenya (APDK) - Machakos</td>
<td>656 Machakos</td>
<td></td>
<td></td>
<td></td>
<td>Machakos town</td>
<td>044-21842</td>
<td><a href="mailto:apdkmki@yahoo.com">apdkmki@yahoo.com</a></td>
</tr>
<tr>
<td>Basis for integrated Development Initiatives (BIDII)</td>
<td>143 Marimali</td>
<td></td>
<td></td>
<td></td>
<td>Nkulu</td>
<td>0733-438841</td>
<td></td>
</tr>
<tr>
<td>Benevolent Institute of Dev. Initiatives (BIDII)</td>
<td>1682 Machakos</td>
<td></td>
<td></td>
<td></td>
<td>Machakos town</td>
<td>044-21732</td>
<td><a href="mailto:bidii@cooperbelt.net">bidii@cooperbelt.net</a></td>
</tr>
<tr>
<td>Bosongo Community Health Outreach Services (BCHOS)</td>
<td>2200 Kisii</td>
<td></td>
<td></td>
<td>40200</td>
<td>Kisumu-Migori-Kisii junction</td>
<td>058-30311</td>
<td><a href="mailto:bchoskisii@yahoo.com">bchoskisii@yahoo.com</a></td>
</tr>
<tr>
<td>Catholic Diocese of Kitui</td>
<td>300 Kitui</td>
<td></td>
<td></td>
<td></td>
<td>Kitui town</td>
<td>044-22855</td>
<td></td>
</tr>
<tr>
<td>Catholic Diocese of Muranga (CDM)</td>
<td>734 Muranga</td>
<td></td>
<td></td>
<td></td>
<td>CDM Building Muranga</td>
<td>060-31251</td>
<td></td>
</tr>
<tr>
<td>Catholic Diocese of Isiolo</td>
<td>577 Isiolo</td>
<td></td>
<td>Isiolo</td>
<td></td>
<td>Kula mawe</td>
<td>064-52107</td>
<td></td>
</tr>
<tr>
<td>Centre for AIDS, Awareness, Youth and Environment (VUMA)</td>
<td>389 Nanyuki</td>
<td></td>
<td></td>
<td>10400</td>
<td>Dr. Somba's Clinic next to Barclays Bank</td>
<td>062-32563</td>
<td><a href="mailto:viewsafrica@yahoo.com">viewsafrica@yahoo.com</a></td>
</tr>
<tr>
<td>Centres for Disease Control (Kenya)</td>
<td>1584 Kisumu</td>
<td></td>
<td></td>
<td></td>
<td>Gucha</td>
<td>0735-381126</td>
<td></td>
</tr>
<tr>
<td>Chanukeni youth group</td>
<td>47 Kendu bay</td>
<td></td>
<td></td>
<td>00502</td>
<td>Old town - Kendu bay</td>
<td>0725-377593</td>
<td></td>
</tr>
<tr>
<td>Children of God Relief Institute (COGRI) Nyumbani village Kitui</td>
<td>24970</td>
<td></td>
<td></td>
<td></td>
<td>Mikuyuni kwa Vonza - Kitui</td>
<td>0735-265002</td>
<td></td>
</tr>
<tr>
<td>Christian Children's Fund - Mwingi</td>
<td>166 Mwani</td>
<td></td>
<td></td>
<td></td>
<td>Mwani town</td>
<td>044-822462</td>
<td></td>
</tr>
<tr>
<td>Christian Comm. Service (Mount Kenya E., Maua station)</td>
<td>263 Maua</td>
<td></td>
<td></td>
<td></td>
<td>Maua location, Igembe central</td>
<td>064-21180</td>
<td></td>
</tr>
<tr>
<td>Christian Community Services - Nanyuki</td>
<td>299 Nyeri</td>
<td></td>
<td></td>
<td>100100</td>
<td>Kenyatta Rd opposite St. George Church</td>
<td>0722947973</td>
<td><a href="mailto:eabarns22@yahoo.com">eabarns22@yahoo.com</a></td>
</tr>
<tr>
<td>Christian Health Association of Kenya</td>
<td>30690 Nairobi</td>
<td></td>
<td>Nairobi</td>
<td>00100</td>
<td>Musa Gitau Road off Waivaki Way</td>
<td>4441920</td>
<td><a href="mailto:secretariat@chak.or.ke">secretariat@chak.or.ke</a></td>
</tr>
<tr>
<td>Chuka Peer Youth Educators</td>
<td>Box 8 Chuka</td>
<td></td>
<td></td>
<td></td>
<td>Chuka General Hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIWIT (CBO) Home Based Care</td>
<td>35 Muthara</td>
<td></td>
<td></td>
<td></td>
<td>Mutitri D.O.'s office</td>
<td>0720-398624</td>
<td><a href="mailto:ciwitshg@yahoo.com">ciwitshg@yahoo.com</a></td>
</tr>
<tr>
<td>Climatic and Environmental Conservation - Kenya</td>
<td>1354 Kitui</td>
<td></td>
<td></td>
<td></td>
<td>Kitui town - Kalundu</td>
<td>0722-957917</td>
<td></td>
</tr>
<tr>
<td>Core Health Providers</td>
<td>438 Maua</td>
<td></td>
<td></td>
<td></td>
<td>Makirir-Maua-Kamunzi road</td>
<td>064-21147</td>
<td></td>
</tr>
<tr>
<td>District Based Health Service Project</td>
<td>1000 Garissa</td>
<td></td>
<td></td>
<td>70100</td>
<td>Provincial Headquarters</td>
<td>46-3149</td>
<td></td>
</tr>
<tr>
<td>District Women Counsel HIV/AIDS (DIWOCHA)</td>
<td>1288 Kangundo</td>
<td></td>
<td></td>
<td></td>
<td>Kangundo town</td>
<td>0733-370688</td>
<td><a href="mailto:diwocha@yahoo.com">diwocha@yahoo.com</a></td>
</tr>
<tr>
<td>Doctors of The World</td>
<td>1035 Kirale</td>
<td></td>
<td>Transnzoia</td>
<td></td>
<td>Mt. Elgon Hospital Road</td>
<td>0724204702</td>
<td><a href="mailto:echeropkini@yahoo.com">echeropkini@yahoo.com</a></td>
</tr>
<tr>
<td>Eldoret Children's Rescue Centre</td>
<td>5083 Eldoret</td>
<td></td>
<td></td>
<td></td>
<td>Karnukunjii, next to our Lady's Assumption Church</td>
<td>053-2061014</td>
<td></td>
</tr>
<tr>
<td>Eldoret Hospital</td>
<td>2234 Eldoret</td>
<td></td>
<td></td>
<td></td>
<td>Makasembo Road</td>
<td>2062000</td>
<td><a href="mailto:eldohosp@mulitee.com">eldohosp@mulitee.com</a></td>
</tr>
<tr>
<td>Embu Youths AIDS Advocates</td>
<td>1592 Embu</td>
<td></td>
<td></td>
<td>60100</td>
<td>Social hall building next to national library service</td>
<td>0721-589597</td>
<td></td>
</tr>
</tbody>
</table>
## Annex 6: CHAK Database

### Table 13: Sample list of CHAK Members’ Health Facilities

<table>
<thead>
<tr>
<th>REGION</th>
<th>DISTRICT</th>
<th>NAME OF MEMBER UNIT</th>
<th>Type</th>
<th>CHURCH</th>
<th>ADDRESS</th>
<th>PLACE</th>
<th>TEL/FAX/EMAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Meru Central</td>
<td>Kiairugu Dispensary</td>
<td>Dispensary</td>
<td>PCEA: Presbyterian Ch. of E. Africa</td>
<td>35 -60401</td>
<td>Chogoria</td>
<td></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Meru Central</td>
<td>Kieni Dispensary</td>
<td>Dispensary</td>
<td>PCEA: Presbyterian Ch. of E. Africa</td>
<td>35 -60401</td>
<td>Chogoria</td>
<td></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Embu</td>
<td>Emmanuel Kigari Dispensary</td>
<td>Dispensary</td>
<td>ACK: Anglican Ch. of Kenya</td>
<td>119 - 60100</td>
<td>Embu</td>
<td>068 - 53206, 0722 - 824772</td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Embu</td>
<td>Kagumoini Dispensary</td>
<td>Dispensary</td>
<td>ACC&amp;S: African Christian Churches and Schools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Emu</td>
<td>Kianjokoma Trinity Health Centre</td>
<td>Health Center</td>
<td>ACK: Anglican Ch. of Kenya</td>
<td>712 -60100</td>
<td>Emu</td>
<td></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Emu</td>
<td>Kigumo Dispensary</td>
<td>Dispensary</td>
<td>EAPC: E. African pentecostal Churches</td>
<td>54 -60103</td>
<td>Runyenjes</td>
<td></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Embu</td>
<td>Kiriari Dispensary</td>
<td>Dispensary</td>
<td>ACK: Anglican Ch. of Kenya</td>
<td>2467 -60100</td>
<td>Embu</td>
<td>53044 0722-648212</td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Embu</td>
<td>Kirigi Dispensary</td>
<td>Dispensary</td>
<td>NICA</td>
<td>156 -60100</td>
<td>Embu</td>
<td></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Embu</td>
<td>Ndumari Dispensary</td>
<td>Dispensary</td>
<td>ACK: Anglican Ch. of Kenya</td>
<td>78 -60117</td>
<td>Karurumo</td>
<td></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Emu</td>
<td>St. Mary Magdalene Medical Centre</td>
<td>Health Center</td>
<td>ACK: Anglican Ch. of Kenya</td>
<td>848 - 60100</td>
<td>Emu</td>
<td></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Kirinyaga</td>
<td>ACK Mutira Nursing Home</td>
<td>Dispensary</td>
<td>ACK: Anglican Ch. of Kenya</td>
<td>36 -10300</td>
<td>Kerugoya</td>
<td></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Kirinyaga</td>
<td>St. John's Thaita Dispensary</td>
<td>Dispensary</td>
<td>ACK: Anglican Ch. of Kenya</td>
<td>476 -10300</td>
<td>Kerugoya</td>
<td>060-21017 0721-965134</td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Kitui</td>
<td>Clinics of Care</td>
<td>Dispensary</td>
<td>IPC</td>
<td>401 - 90400 or 1170 -90200</td>
<td>Mwingi or Kitui</td>
<td>0733-445813</td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Kitui</td>
<td>Diocese of Kitui, CBHC Prog</td>
<td>Health Prog.</td>
<td>ACK: Anglican Ch. of Kenya</td>
<td>1054 -90200</td>
<td>Kitui</td>
<td>044-22119 Fax: 22119 <a href="mailto:akitui@swiftkenya.com">akitui@swiftkenya.com</a></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Kitui</td>
<td>Kyome Dispensary</td>
<td>Dispensary</td>
<td>AIC: Africa Inland Church</td>
<td>18 -90402</td>
<td>Migwani</td>
<td>734806184</td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Kitui</td>
<td>Mulango Dispensary</td>
<td>Dispensary</td>
<td>AIC: Africa Inland Church</td>
<td>624 -90200</td>
<td>Kitui</td>
<td>044-22326</td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Kitui</td>
<td>Zombe Dispensary</td>
<td>Dispensary</td>
<td>AIC: Africa Inland Church</td>
<td>30 -90213</td>
<td>Zombe</td>
<td>Tel: 11 Zombe /0734 - 871060</td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Machakos</td>
<td>Diocese of Machakos</td>
<td>Health Prog.</td>
<td>ACK: Anglican Ch. of Kenya</td>
<td>282 -90100</td>
<td>Machakos</td>
<td>044-20140/ 21379 E-mail: <a href="mailto:ackmachakos@swiftkenya.com">ackmachakos@swiftkenya.com</a></td>
</tr>
<tr>
<td>Eastern &amp; North Eastern</td>
<td>Machakos</td>
<td>Kangundo Reedeemed Medical Clinic</td>
<td>Dispensary</td>
<td>Reedemed Gospel Church</td>
<td>1380 - 90115</td>
<td>Kangundo</td>
<td>Tel:044-21041</td>
</tr>
</tbody>
</table>
Annex 7: PROPOSED MOH DATA NORMALIZATION

DATA GIVING DETAILS OF EACH HEALTH FACILITY

All data should be categorized under the following sub-heading.

- Health facility
- Facilities
- Equipment
- Drugs
- Services
- Staff
- Daily operations

HEALTH FACILITY

This should contain the information about the aspects of a health facility the hardly change. The following are the variables that should be in this category.

- Facility code
- Facility name
- Province name
- District name
- Division name
- Location name
- Sub-location name
- Facility type
- Ownership
- Supporting organization
- Latitudes
- Longitudes
- Facility square area
- Facility acreage
- Facility fax number
- Facility telephone number

FACILITIES

This contained the information about the facilities/items that are used within the health institution to facilitate in the day to day running of the institution. The following are the variables that should be used under this;

- Facility code
- Date
- Delivery beds
- Maternity beds
- Electricity availability
- Power backup
- Main source of water
- Functioning telephone connection
• Functioning short wave radio
• Functioning computer system
• Functioning internet services
• Number of ambulances
• Number of general purpose vehicles

EQUIPMENT
Information that will be contained in this section will be about items used in a health facility to help in provision of health services to the people. The variables under this section include the following:
• Facility code
• Date
• Blood pressure machines
• Stethoscopes
• Oral clinical thermometers
• Weighing equipment for U5-years
• Weighing scale for adults
• Microscopes
• Enough latex gloves
• Refrigerators
• Anesthetic machines
• General surgical equipment
• Enough cotton wool
• Incinerators
• Smear microscope
• Injection tape
• Injection sterilizer
• National acceptable environmental sterilizer

DRUGS
This section contains the information about the drugs available at a health facility. The variables in this section should therefore include the following:
• Facility code
• date
• Injectable antibiotics
• Oral antibiotics
• Oral contraceptives pills
• Condoms
• Iron (e.g. ferrous sulphate)
• Vitamin A capsules
• Measles vaccine
• BCG vaccine
• DPT vaccine
• OPV vaccine
• Yellow fever vaccine
• Pentavalent vaccine
• SP and/or ACT (first-line anti malarial drug)
• Quinine (second line anti malarial drugs)
• Antihypertensive Drugs
• Magnesium sulphate for enclampsia
• Ergometrine for post-partum haemorrhage
• Oral rehydration salts/ORS
• Analgesics / Antipyretics NSAID
• Oral allergy drugs
• Injectable allergy drugs
• Anti helmithics
• Leprosy drugs
• Antifungals
• Bronchodilators
• Psychotherapeutic drugs
• Diuretics
• Dermatological drugs
• Antimigraine drugs
• Anti-ritrovirals
• Insuline and antidiabetics drugs
• Intravenous fluids

SERVICES
This contains the information about the services provided by a health facility. The variables that should be used in this area are as follows;
• Facility code
• Date
• ENT preparations
• Rapid HIV antibody test
• Non rapid HIV antibody test
• On site hemoglobin test
• Off site hemoglobin test
• On site blood count test
• Off site blood count test
• On site blood glucose level count test
• On site field stain for malaria test
• Off site field stain for malaria test
• On site urea and electrolyte test
• Off site urea and electrolyte test
• HIV counseling services
• Antenatal services
• Nevirapine or AZT provision
• ARV combination therapy provision
- TB diagnosis
- TB treatment
- Short course TB chemotherapy
- Monitoring of TB outcome through cohort analysis
- INH prophylaxis for HIV positive patients
- Guidelines for management of malaria
- Guidelines for the integrated management of people living with HIV/AIDS
- Guidelines for the management of outbreaks
- EPI management guidelines available

**STAFF**
Contains information about workers of each health facility. The variables that should be used in this section are as follows;
- Facility code
- Date
- Full time medical doctors
- Part time medical doctors
- Specialists
- Dentists
- Certifies nurses
- Clinical officers
- Lab technicians
- Pharmacists/dispensers
- Health record personnel
- Trained personnel on integrated management on childhood illness
- Personnel with safe motherhood/life saving skills
- Counselors for HIV/AIDS
- Trained personnel on infection control / universal precaution for holding blood and other body fluids
- Trained personnel on diagnosis and treatment of malaria
- Drug & supplies management personnel
- HMIS trained personnel

**OPERATION REPORT**
This contains the information about how the facility is run i.e. the number of various categories of the facility staff that are on duty on daily basis, number of patients that are treated after a certain period of time and much more information. The variables that should be used on this section include the following.
- Facility code
- Date
- Number of outpatients last month
- Number of inpatients last month
- Daily average number of doctors
- Daily average number of specialists
- Daily average number of dentists
- Daily average number of clinical officers
• Daily average number of certified nurses
• Daily average number of lab technicians
• Daily average number of pharmacists/dispensers
• Daily average number of health record personnel
• Number of patients currently enrolled on ARV drugs
• Number of new HIV antibody testing and counseling clients last month
• Number of new patients that received nevirapine/AZT last month
**DATA ON SUMMARIES OF HEALTH FACILITIES AT DISTRICT LEVEL**

Data should broken into following categories

- Facilities
- Equipment
- Drugs
- Services
- Staff
- Daily operations

**FACILITIES**

This section contains in summary the number of health facilities within a district that have the following facilities.

- Delivery beds
- Maternity beds
- Electricity availability
- Power backup
- Safe water availability
- Functioning telephone connection
- Functioning short wave radio
- Functioning computer system
- Functioning internet services
- Ambulances
- General purpose vehicles

**EQUIPMENT**

Gives summarized report on the number of health facilities within the district that have the equipments listed below.

- Blood pressure machines
- Stethoscopes
- Oral clinical thermometers
- Weighing equipment for U5-years
- Weighing scale for adults
- Microscopes
- Enough latex gloves
- Refrigerators
- Anesthetic machines
- General surgical equipment
- Enough cotton wool
- Incinerators
- Smear microscope
- Injection tape
- Injection sterilizer
- National acceptable environmental sterilizer
DRUGS
Gives summarized report on the number of health facilities in each the have the following drugs

- Injectable antibiotics
- Oral antibiotics
- Oral contraceptives pills
- Condoms
- Iron (e.g. ferrous sulphate)
- Vitamin A capsules
- Measles vaccine
- BCG vaccine
- DPT vaccine
- OPV vaccine
- Yellow fever vaccine
- Pentavalent vaccine
- SP and/or ACT (first-line anti malarial drug)
- Quinine (second line anti malarial drugs)
- Antihypertensive Drugs
- Magnesium sulphate for eclampsia
- Ergometrine for post-partum hemorrhage
- Oral rehydration salts/ORS
- Analgesics / Antipyretics NSAID
- Oral allergy drugs
- Injectable allergy drugs
- Anti helmithics
- Leprosy drugs
- Anti-fungals
- Bronchodilators
- Psychotherapeutic drugs
- Diuretics
- Dermatological drugs
- Anti-migraine drugs
- Anti-ritrovirals
- Insulin and anti-diabetics drugs
- Intravenous fluids

SERVICES
Contains summarized report on the number of health facilities within the district that offer the following services

- ENT preparations
- Rapid HIV antibody test
- Non rapid HIV antibody test
- On site hemoglobin test
- Off site hemoglobin test
• On site blood count test
• Off site blood count test
• On site blood glucose level count
• On site field stain for malaria test
• Off site field stain for malaria test
• On site urea and electrolyte test
• Off site urea and electrolyte test
• HIV counseling services
• Antenatal services
• Nevirapine or AZT provision
• ARV combination therapy provision
• TB diagnosis
• TB treatment
• Short course TB chemotherapy
• Monitoring of TB outcome through cohort analysis
• INH prophylaxis for HIV positive patients
• Guidelines for management of malaria
• Guidelines for the integrated management of people living with HIV/AIDS
• Guidelines for the management of outbreaks
• EPI management guidelines available

STAFF
Gives summaries of the number of staff that work in health facilities within a district under the following titles
• Full time medical doctors
• Part time medical doctors
• Specialists
• Dentists
• Certifies nurses
• Clinical officers
• Lab technicians
• Pharmacists/dispensers
• Health record personnel
• Trained personnel on integrated management on childhood illness
• Personnel with safe motherhood/life saving skills
• Counselors for HIV/AIDS
• Trained personnel on infection control / universal precaution for holding blood and other body fluids
• Trained personnel on diagnosis and treatment of malaria
• Drug & supplies management personnel
• HMIS trained personnel

OPERATIONS REPORT
Contains information about the daily operations of the health facilities within a district. It is summarized report under the following subtitles
• Number of outpatients last month
• Number of inpatients last month
• Daily average number of doctors
• Daily average number of specialists
• Daily average number of dentists
• Daily average number of clinical officers
• Daily average number of certified nurses
• Daily average number of lab technicians
• Daily average number of pharmacists/dispensers
• Daily average number of health record personnel
• Number of patients currently enrolled on ARV drugs
• Number of new HIV antibody testing and counseling clients last month
• Number of new patients that received nevirapine/AZT last month