

# **Service Availability Mapping (SAM)**

**The Republic of Uganda  
Ministry of Health  
in collaboration with the  
World Health Organization**



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## Glossary

AIDS	Acquired Immunodeficiency syndrome
ART	Antiretroviral therapy
ARV	Antiretroviral
AZT	A drug used to slow replication of HIV; it is primarily used in the prevention of mother to child transmission of HIV
BP	Blood pressure
DHT	District health team
DOTS	Directly observed treatment, short course
GIS	Geographical information system
Govt	Government
GPS	Global positioning system
Hb	Haemoglobin
HIV	Human Immunodeficiency Virus
HMIS	Health management information system
INH	Isoniazid
IMCI	Integrated Management of Childhood Illness
IPT	Intermittent preventive therapy
MoH	Ministry of Health
NGO	Nongovernmental organization
PDA	Personal digital assistant
PMTCT	Prevention of mother-to-child transmission (of HIV)
SAM	Service Availability Mapping
TB	Tuberculosis
VCT	Voluntary counselling and testing (of HIV)
WHO	World Health Organization

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## **Executive summary**

Service Availability Mapping (SAM) in Uganda was conducted by Uganda's Ministry of Health (MoH) resource centre and the World Health Organization (WHO) in March 2004. 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 56 districts. SAM provided baseline monitoring information 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 counselling and HIV testing.

Data were obtained directly from 52 districts. Of the four districts that could not be visited due to security concerns, two returned completed self-administered questionnaires. Using personal digital assistants (PDAs) for data entry in the field, data were uploaded in WHO's Health Mapper and linked to a global positioning system (GPS) database containing the geographic coordinates for health facilities in the country. This information was used to produce maps for selected services.

In three districts (Jinja, Kiboga and Mbarara) all health facilities were visited to validate the accuracy of the report by the district team and to demonstrate the utility of SAM as a district-based monitoring tool.

# 1. Introduction

## 1.1 Geography and population

According to the 2001 census Uganda had a population of 24.6 million, with an average of 439 000 people per district, ranging from 125 000 to 1.2 million (Kampala district), which is approximately 5% of the total population. The 54 districts included in the SAM survey cover 97% of Uganda's population. Population density is shown graphically in Map 1.

**Map 1. Population of Uganda by district, 2004**

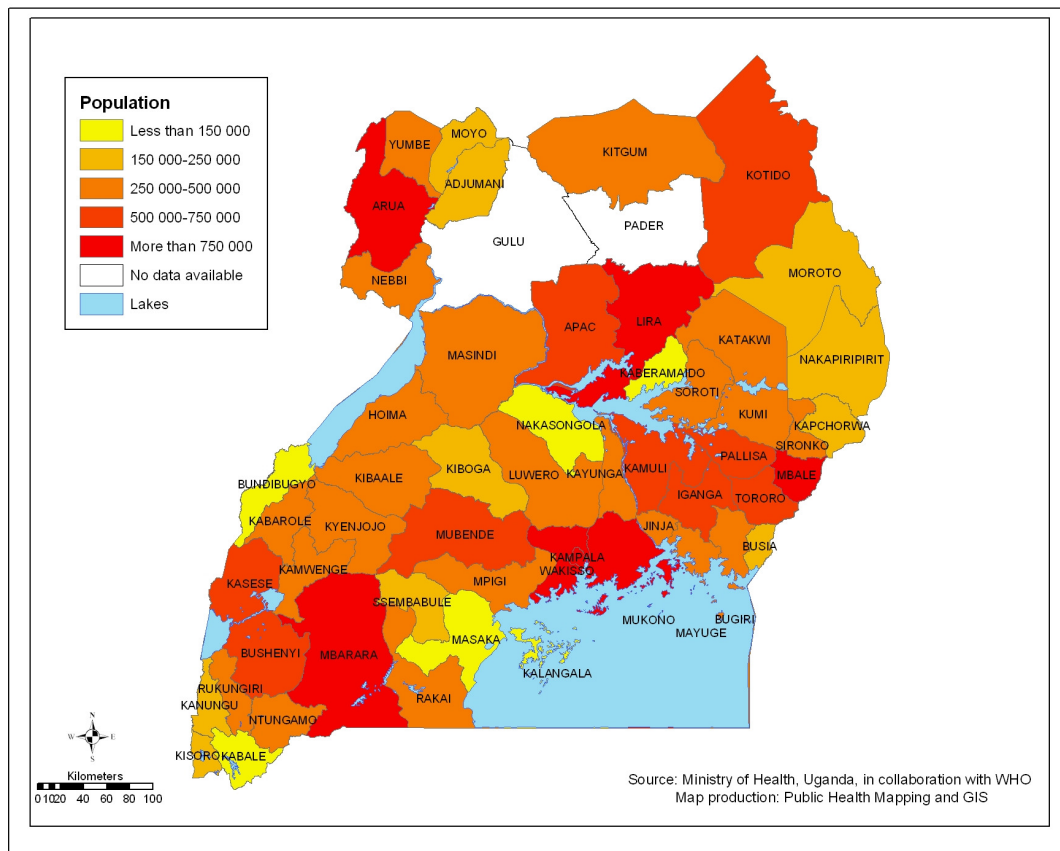


Table 1 lists the districts for which data were collected, and their corresponding populations.

**Table 1. Population of Uganda by district, 2001**

<b>District</b>	<b>Population</b>	<b>District</b>	<b>Population</b>
Adjumani	201 394	Kumi	410 087
Apac	676 244	Kyenjojo	423 921
Arua	855 055	Lira	815 170
Bugiri	447 635	Luwero	487 110
Bundibugyo	235 000	Masaka	768 000
Bushenyi	735 388	Masindi	493 594
Busia	234 704	Mayuge	326 839
Hoima	366 042	Mbale	767 211
Iganga	716 311	Mbarara	1 119 871
Jinja	423 020	Moroto	187 447
Kabale	472 000	Moyo	215 705
Kabarole	370 764	Mpigi	414 757
Kaberamaido	122 926	Mubende	727 000
Kalangala	41 400	Mukono	807 923
Kampala	1 200 000	Nakapiripirit	153 862
Kamuli	735 507	Nakasongola	125 126
Kamwenge	304 971	Nebbi	445 126
Kanungu	204 143	Ntungamo	379 809
Kapchorwa	193 059	Pallisa	538 000
Kasese	532 993	Rakai	488 602
Katakwi	300 008	Rukungiri	331 848
Kayunga	302 932	Sironko	291 000
Kibaale	435 674	Soroti	390 957
Kiboga	230 000	Ssembabule	190 700
Kisoro	231 852	Tororo	581 350
Kitgum	293 679	Wakiso	957 280
Kotido	655 357	Yumbe	253 325

Source: 2001 census

## 1.2 The health system

Uganda implemented health sector decentralization in the mid-1990s to shift responsibility for health care delivery from the central government to the districts (1). The primary functions of the Ministry of Health at the national level include policy formulation, establishment of standards, quality assurance, resource mobilization, capacity development, technical support, provision of nationally coordinated services such as epidemic control, coordination of health research, and, finally, monitoring and evaluation of overall sector performance. District-level responsibilities include planning and management of district services, health promotion, curative and rehabilitative services, vector control and control of communicable diseases, health education, ensuring provision of safe water and sanitation, and data issues (2, 3).

The healthcare delivery system in Uganda is parcelled into districts, which are subdivided into counties and then into subcounties. The subcounties are self-contained service zones headed by a medical officer, but they are not considered distinct administrative units. Nevertheless, according to the 1999 National Health Policy, the subcounties are primarily responsible for health service delivery. Subcounties are further divided into parishes, and parishes into villages (2).

Ugandan health facilities are graded at different levels depending upon the administrative zones that they serve. Health centre grade II (HCII) facilities serve the parish level and provide outpatient care, antenatal care, immunization and outreach. Health centre grade III (HCIII) facilities serve the subcounty level and provide inpatient care and environmental health services in addition to supplying all services of health centre grade II facilities. Health centre grade IV (HCIV) facilities serve as the headquarters for health subdistricts and provide surgical services, supervision of lower level HCII and HCIII units, collection and analysis of data on health and planning for health subdistricts (3). Table 2 summarizes the numbers of health facilities in the country.

**Table 2. Health facilities in Uganda, by level and ownership**

Level of facility	Ownership			Total
	Government	NGO	Private	
Hospital	56	45	7	108
HC IV	148	9	3	160
HC III	706	157	10	873
HC II	945	391	257	1593
<b>Total</b>	<b>1855</b>	<b>600</b>	<b>274</b>	<b>2731</b>

Source: (3).

From 2003 to 2004, the health sector share of the Ugandan government budget was 9.6%. In total, Uganda spent approximately USD\$ 20 per capita on health, of which about US\$ 3.5 was government public expenditure, US\$ 4.0 was donor aid, and US\$ 12.5 was private expenditure (4).

## **2. Service Availability Mapping**

### **2.1 Background**

The most basic information on the availability of essential services and health resources is often incomplete. The aim of Service Availability Mapping (SAM) is to collect key information on the availability of health resources and interventions and to use the results for operations and strategic planning and management. In Uganda, some of the information collected by SAM already exists in different forms. The benefits of SAM, however, are its systematic data collection procedure and 'user-friendly' presentation of data. Maps and summary measures generated through SAM provide a complete picture of the level and distribution of district resources, as well as highlight gaps in the provision of health services and interventions.

A key goal of health programmes is to make essential health services equally accessible to all individuals and communities. Access has a range of dimensions, but the initial hurdle is basic availability. Issues related to access, coverage and utilization can be addressed only if services are first available. In order to determine availability services need to be monitored. Several health measurement tools provide information on access, use and quality of services. These include household surveys, clinic-based statistics and facility surveys; however, none are low-cost rapid methods such as SAM.

SAM was implemented with the support of Uganda's Ministry of Health in collaboration with the World Health Organization (WHO) headquarters, the WHO Regional Office for Africa, and WHO's country office in Uganda during the spring of 2004. Funding was provided by the United States' President's Emergency Plan for AIDS Relief (PEPFAR).

### **2.2 Objectives**

SAM was applied in all districts with the exception of Gulu and Pader which were not reached for security reasons. In total, 54 districts were surveyed. Three districts - Jinja, Kiboga, and Mbarara - were selected for in-depth facility surveys. In these districts, a more comprehensive survey was administered in all known public and private health care facilities. The objectives of SAM were to:

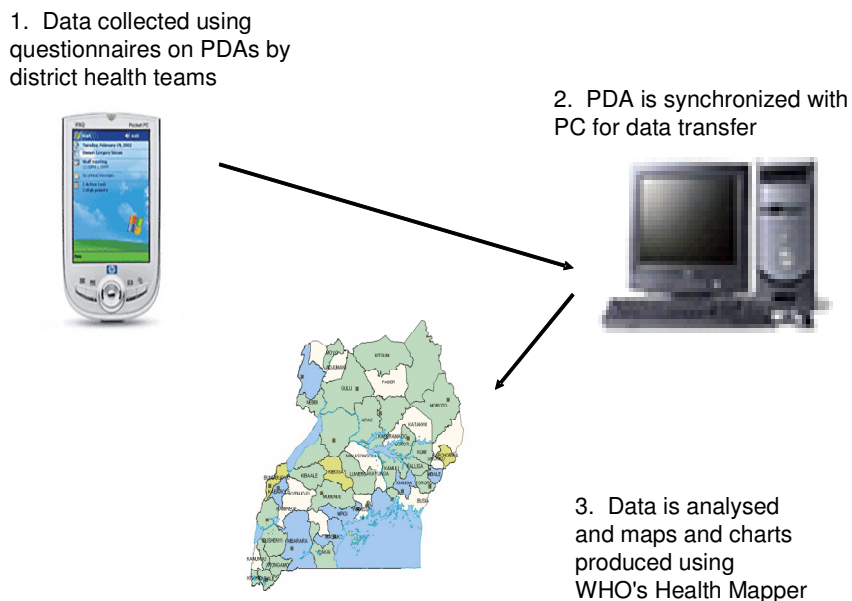
- provide national planners and decision-makers with information on the distribution of services within the country, with a focus on the district level;
- provide the baseline monitoring information for increasing the provision of key services such as antiretroviral therapy (ART), prevention of mother-to-child transmission (PMTCT) of HIV, testing and counselling of HIV/AIDS; and
- assess whether SAM, during which all health facilities are visited, can become a useful and feasible planning and monitoring tool at the district level.

## 2.3 Methodology

In Uganda, SAM was conducted with the goal of collecting information on the availability and distribution of key health services by interviewing the district director of health services and his/her team. SAM provided baseline monitoring information for the scale-up of the provision of key HIV/AIDS-related services such as ART, PMTCT of HIV, and counselling and HIV testing. Data were directly obtained for 52 districts. Of the four districts that could not be visited due to security concerns, two returned completed self-administered questionnaires. Gulu and Pader districts were not visited due to unstable security situations at the time of the survey.

National level data were obtained from the districts using personal digital assistants (PDAs) for data entry in the field. These data were uploaded in Health Mapper, a programme created using Geographical Information Systems (GIS) software, and linked to its global positioning system (GPS) database containing the geographic coordinates for health facilities. Finally, maps were produced based on these data (see Figure 1).

**Figure 1. Data processing procedure**



Four teams collected data. Team leaders included engineer Martin Kiyangi, Dr Eddie Mukooyo, Dr Sarah Asiimwe and Mr Didas Namanya. Each team covered 14 districts using a GPS and a PDA to collect data and satellite geo-coordinates used in the formulation of the national maps.

In Jinja, Kiboga and Mbarara a more detailed assessment was done by visiting all health facilities after the main district-level SAM fieldwork was complete (see section 7). This allowed a validation of the data reports at the district level and also aimed to demonstrate the usefulness of SAM as a monitoring tool to individual districts.

The comparison of the results of the health facilities in Jinja, Kiboga and Mbarara with the general district reports showed several discrepancies with regard to infrastructure and human resources.

Some aspects of the questionnaire, such as the definitions of types of health workers, were not well standardized which may affect comparability. Discrepancies may also be due in part to inaccurate or incomplete reporting by the district team, as some district respondents were relatively new and not completely up-to-date on the status of health services in the district. Private sector health services may also have been underreported. However, the analysis also showed that not all facilities in the districts were visited during the detailed facility level survey. This may affect the extent to which the facility visits can be used as a 'gold standard'. Thus, the results of Uganda SAM should be interpreted with caution, particularly at the district level.

### 3.0 Health infrastructure

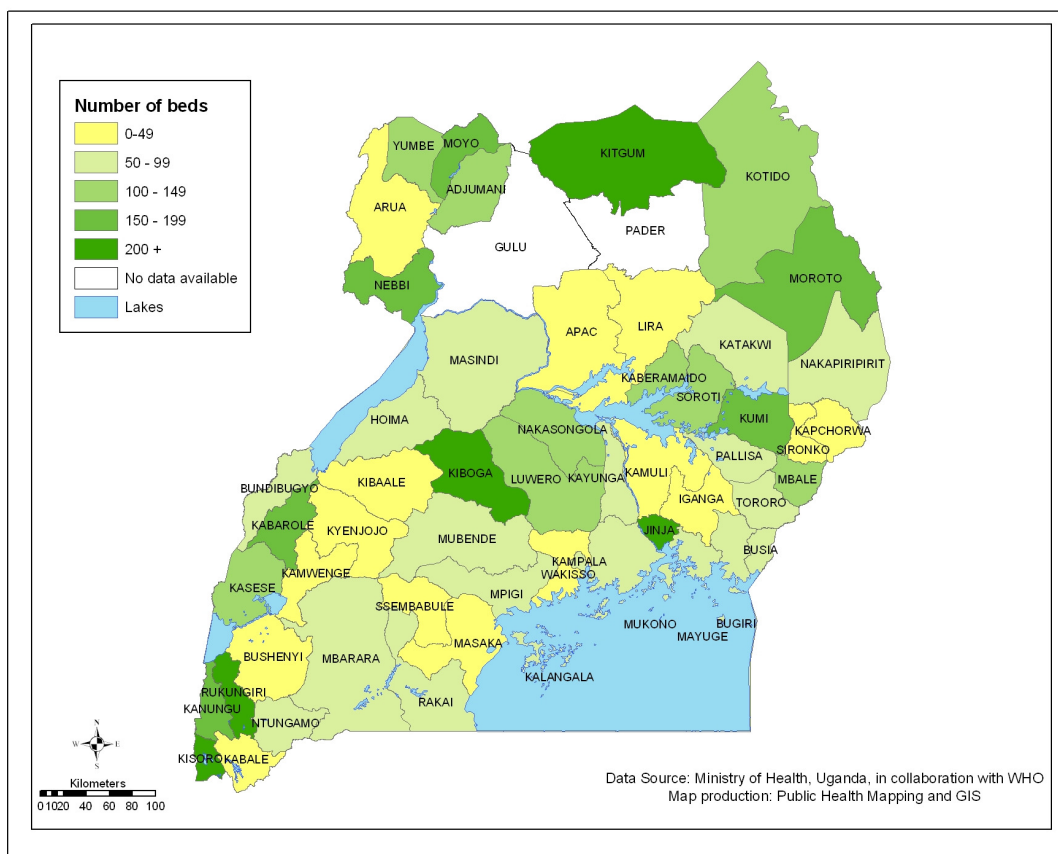
The district questionnaire covered a number of health infrastructure topics including number and type of facilities and beds and availability of core resources such as water, electricity and communications equipment. This section of the questionnaire also asked about laboratory capacity at the district level and the most commonly used needles and syringes for general health services (other than immunization).

In the districts that participated there are 101 hospitals and 144 type IV health centres with inpatient and surgical facilities. Fifty per cent of all districts have at least one hospital or type IV health centre per 100 000 inhabitants.

The distribution of health care facilities between rural districts is uneven: the 10 districts with the fewest facilities have, on average, 5 facilities for 100 000 inhabitants, compared with 15 facilities per 100 000 in the 10 districts in the highest quintile. Kampala has 42 health facilities per 100 000 inhabitants.

Uganda has almost 20 000 inpatient beds in total, or approximately 8.3 per 100 000 inhabitants (Map 2). Eleven per cent of these are in the Kampala district.

**Map 2. Number of inpatient beds per 100 000 inhabitants**





### 3.1 Piped water supply and electricity

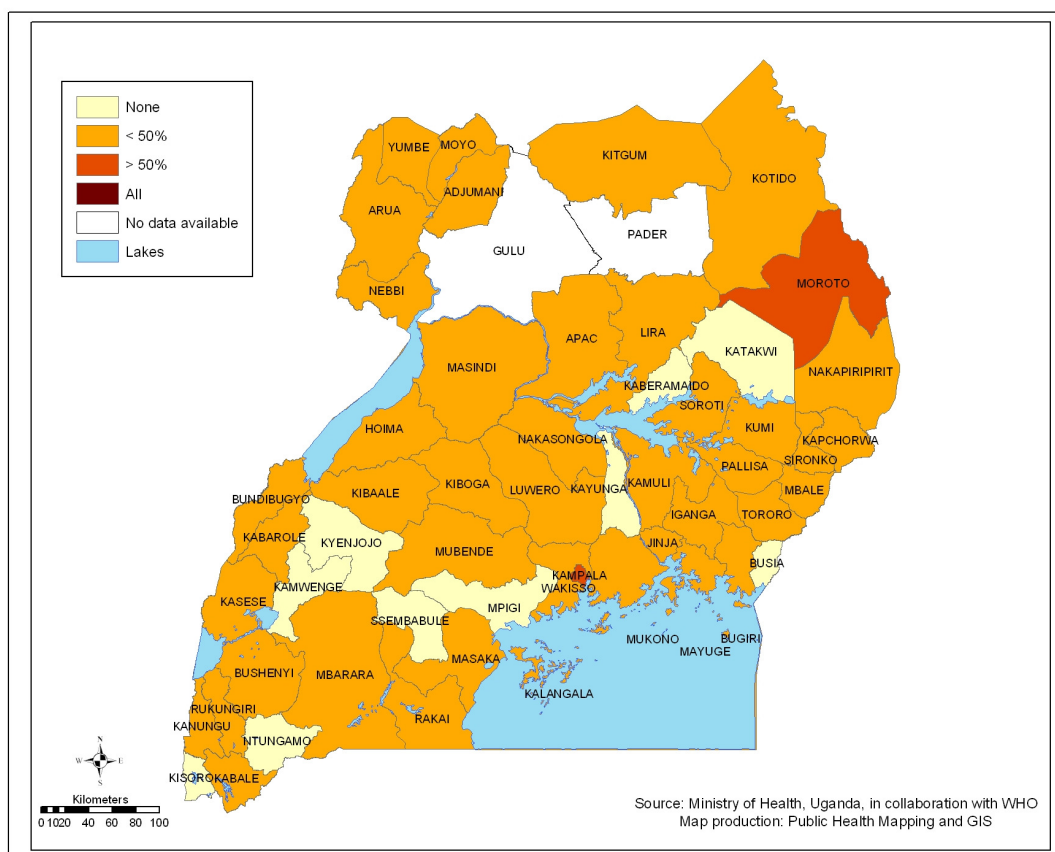
District directors of health services and their teams were asked to estimate the coverage of piped water and electricity in the district. Table 3 and Maps 3 and 4 summarize the results.

**Table 3. Percentage of districts with health facilities that have a piped water supply and electricity<sup>a</sup>**

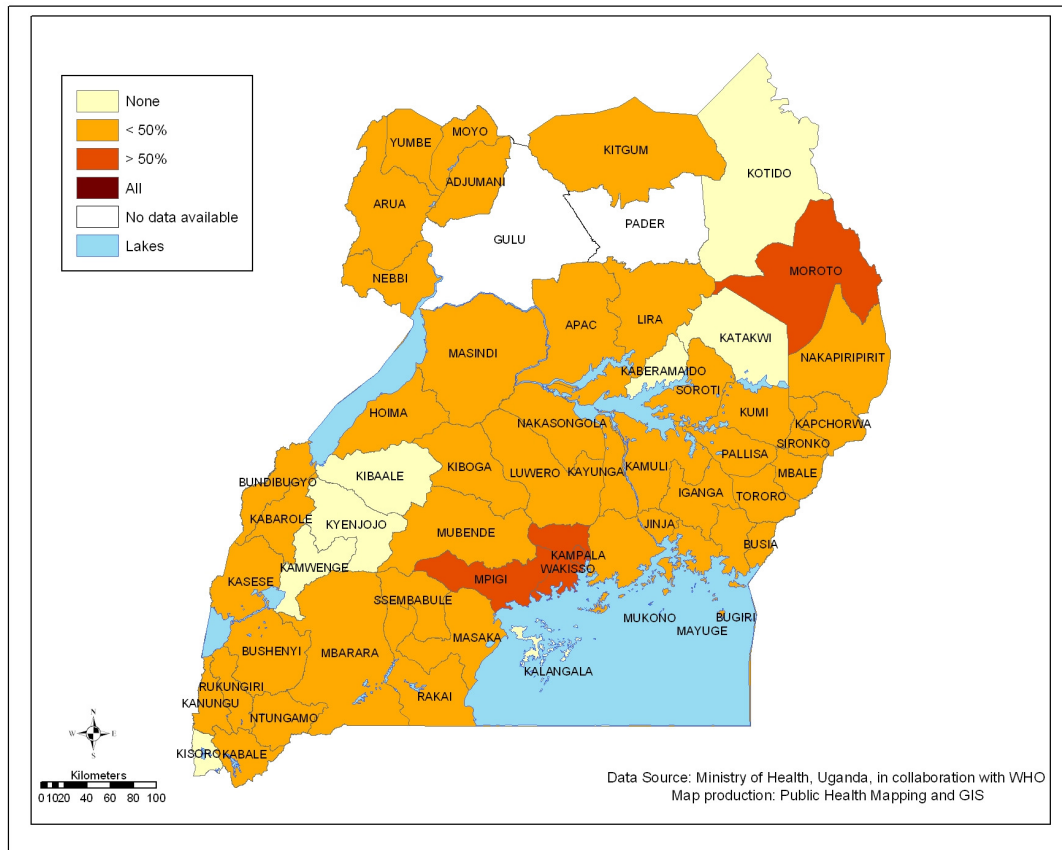
	Percentage of districts			
	0	<50	>50	100
Health facilities with piped water	18.5	77.8	3.7	0
Health facilities with electricity	11.1	81.5	7.4	0

<sup>a</sup> 54 districts reporting.

**Map 3. Percentage of health facilities with functioning piped water supply, by district**



**Map 4. Percentage of health facilities with electricity, by district**



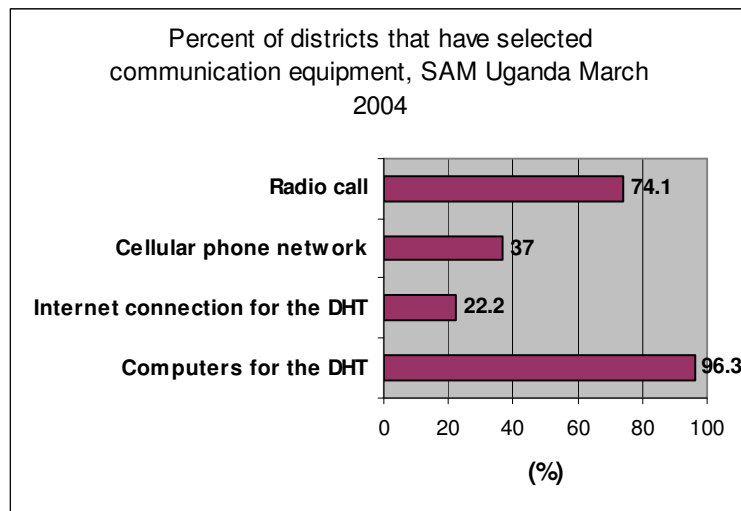
As shown in Maps 3 and 4, no district has 100% facility coverage of either piped water or electricity. About 10 districts (19%) have no piped water supply in any health facilities. Only two districts (4%) have piped water in more than half of their health facilities.

In eight districts electricity is unavailable at any time in any health facility. Only four districts reported availability of electricity in more than 50% of facilities. Katakwi, Kamwenge, Kisoro and Kyenjojo have no facilities with a functioning piped water supply or electricity are available.

## 3.2 Communication equipment

Figure 2 shows that a majority of districts reported the availability of computers for use by district health teams (DHTs). Shortwave radios are the most common communication equipment available to facilities but it should be noted that there are 12 districts where neither shortwave radios nor cellular networks exist. Over one-third of districts are covered by cellular networks making cellular telephones a potential communication tool for some districts.

**Figure 2.**



### Map 5. Available communication equipment, by district

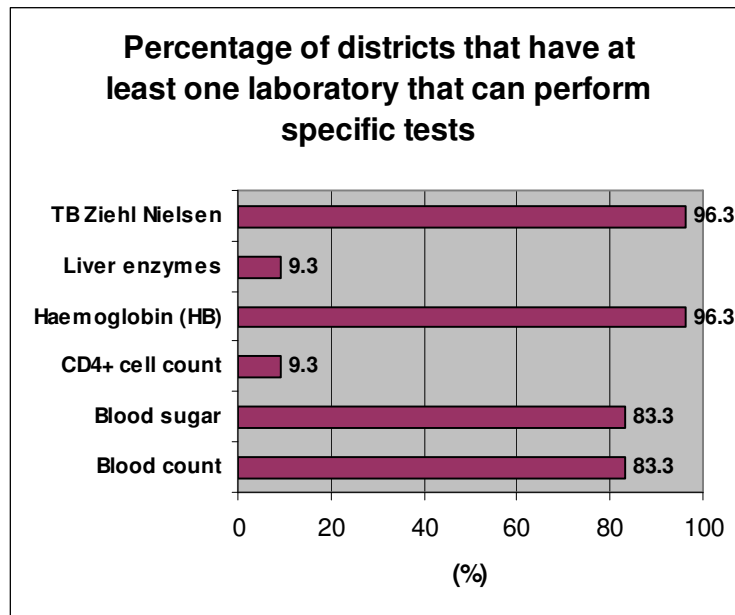


**Table 4. Percentage of districts with health facilities equipped with X-ray machine and oxygen<sup>a</sup>**

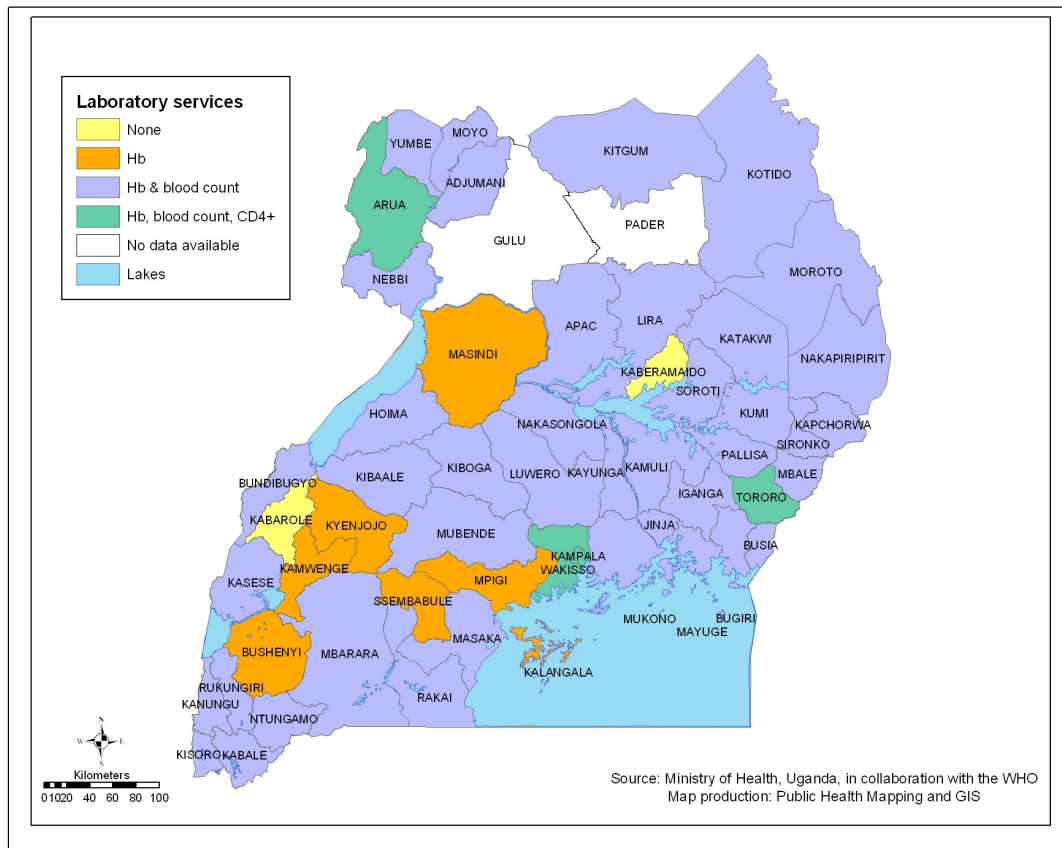
a 53 districts reporting.

Most districts have at least one laboratory where tuberculosis (TB) sputum smears and haemoglobin (Hb) tests can be carried out. Tests of blood glucose levels and blood cell counts can also be carried out in over half of all districts. However, only five districts (9%) have laboratory capacity to carry out liver enzyme tests and CD4 cell counts (Figure 3). Two districts, Kaberamado and Kabarole, have no laboratory capacity whatsoever (Map 7).

Figure 3.



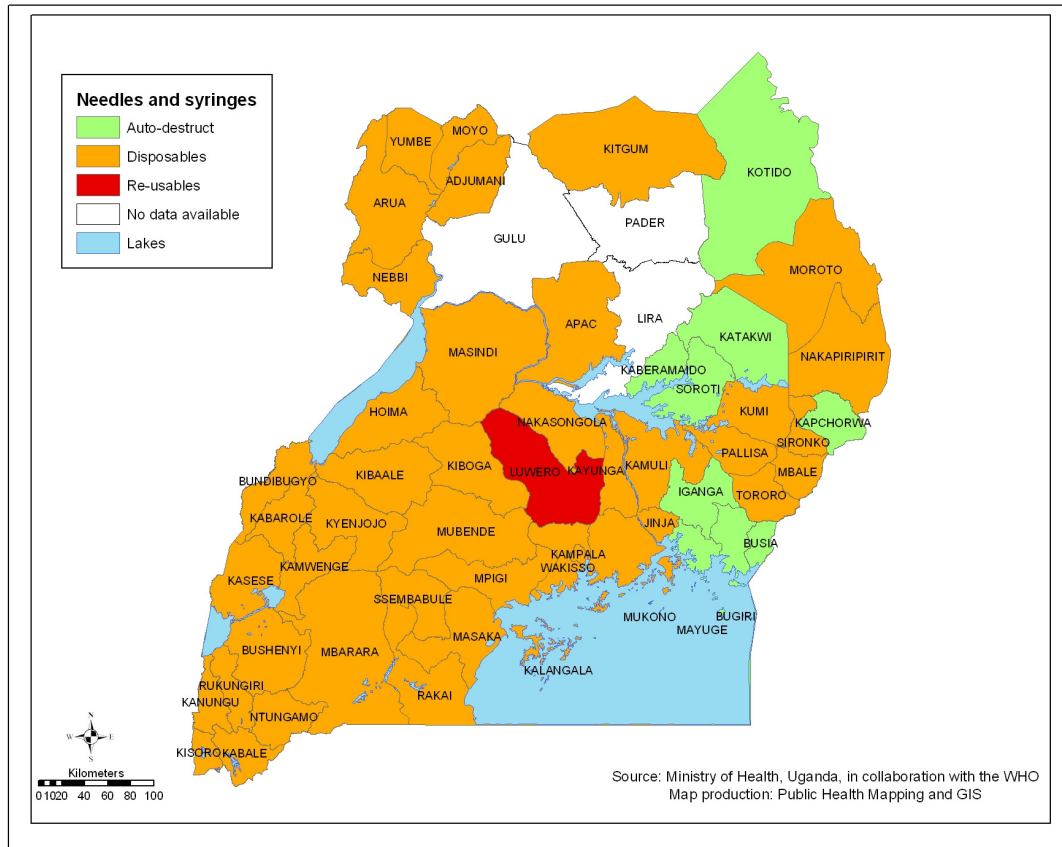
Map 7. Laboratory services, by district



### 3.5 Injection equipment

Disposable needles and syringes are the most commonly used injection equipment throughout the country. Auto-destruct needles and syringes are used in nine districts in eastern Uganda. Two districts reported that they re-use their injection equipment (Map 8).

**Map 8. Most commonly used injection equipment for health services, by district**



## 4.0 Human resources

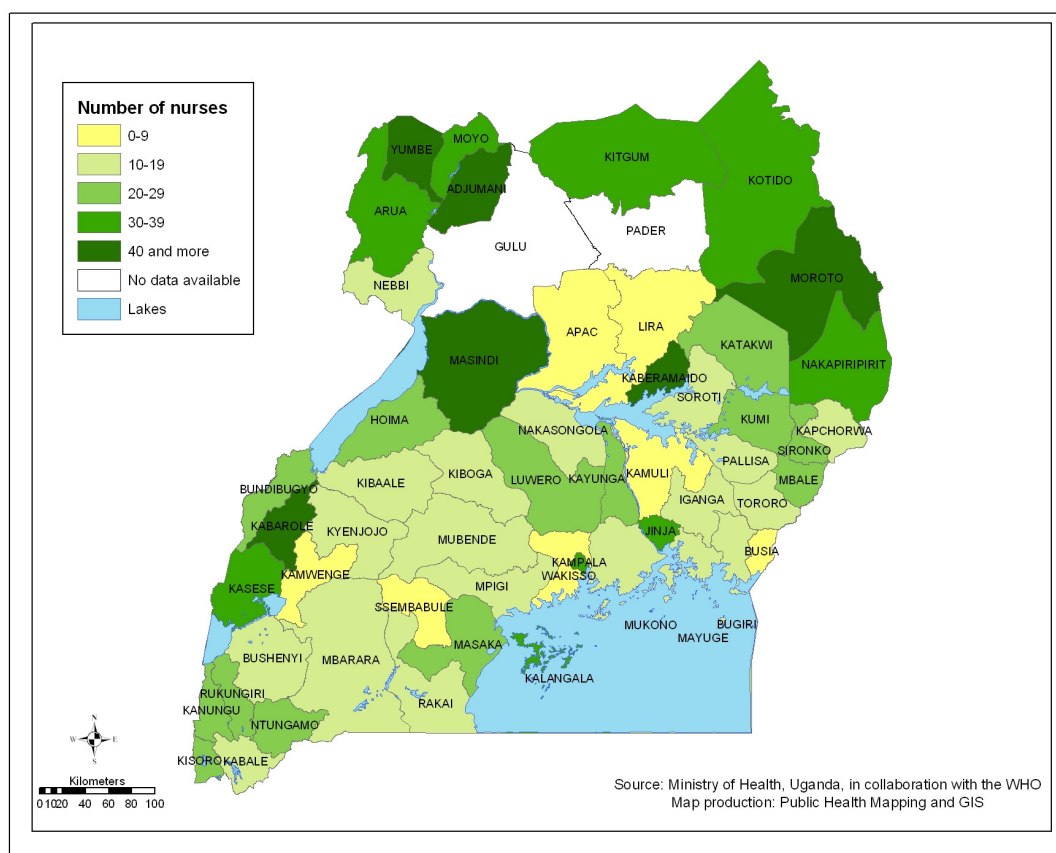
Uganda has 14 doctors/assistant doctors per 100 000 inhabitants overall, ranging from 117 per 100 000 in Kampala district to three in Bushenyi district. Table 5 shows the level of human resources for health in Uganda.

**Table 5. Current level of health resources in Uganda**

Health resources	Ratio of resources:		
	Density of resources per 100 000 inhabitants	Highest to lowest district quintile	Capital to the rest of the country
Doctors	3	5.4	3.3
Assistant doctors	11	2.7	11.3
Midwives	12	4.0	2.6
Nurses	22	5.3	1.7
All health workers	46	3.4	3.9
Health facilities	10	2.9	4.4
Inpatient beds	114	5.6	2.7

Maps 9 and 10 illustrate the numbers of nurses and doctors, respectively, per 100 000 inhabitants.

**Map 9. Number of nurses per 100 000 inhabitants, by district**





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**Figure 4. Number of health workers per 10 000 inhabitants by various district quintile groupings**

Number of health workers per 10,000 population by rural district quintile, Jinja and Kampala, Uganda SAM, 2004

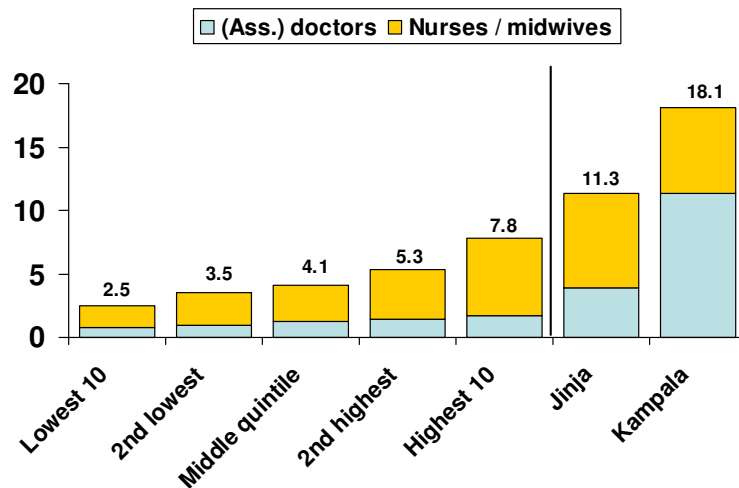
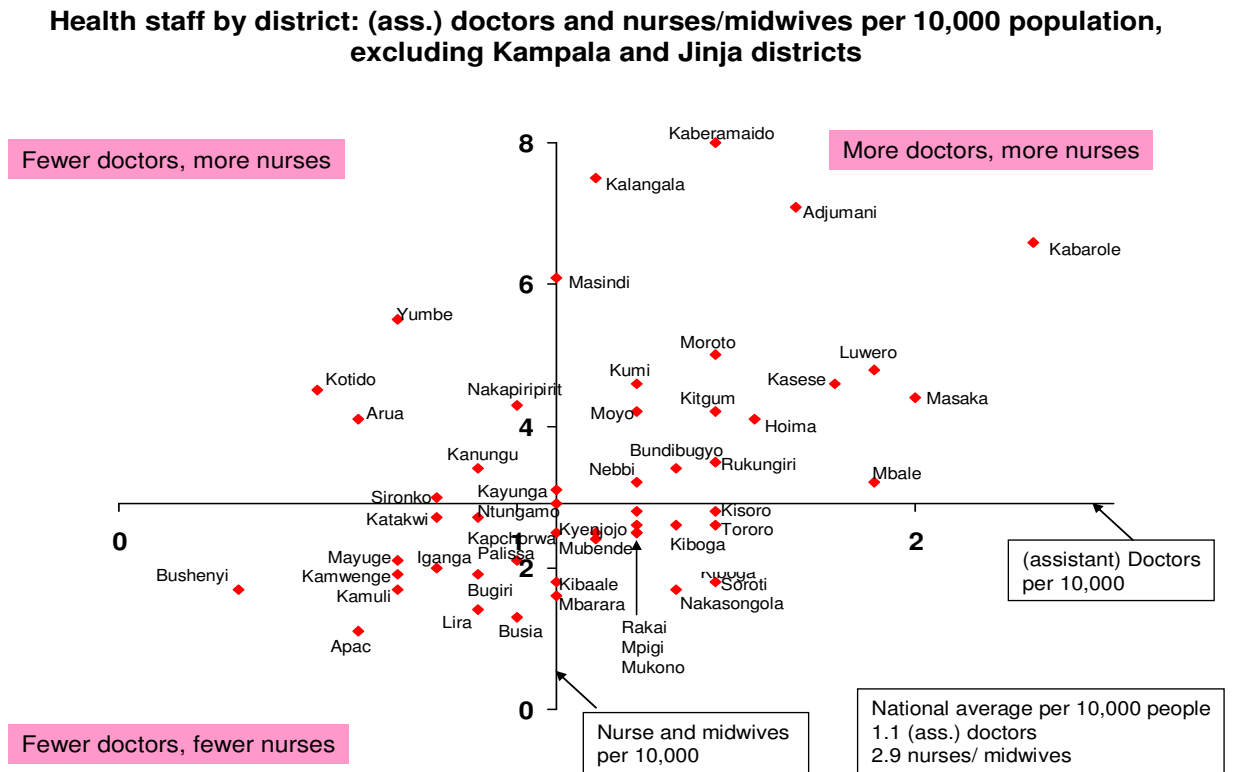


Figure 5 shows the distribution of health workers by district. The upper right quadrant represents the districts with more doctors/assistant doctors and more nurses/midwives than the national average, excluding Kampala and Jinja (both of which have health workers well in excess of the national average). The lower left quadrant shows those districts where both categories of health workers are below the national averages. Apac and Bushenyi districts have the lowest rates.

**Figure 5. Health staff by district: doctors/assistant doctors and nurses/midwives per 10 000 inhabitants<sup>a</sup>**



There are few laboratory technicians in Uganda, and almost half of the country's total are in Kampala. Five districts have no laboratory technician, and 12 have only one. Additionally, there are a total of 154 TB control officers, 722 health information officers and 250 dentists/assistant dentists (56% in Kampala) in the country.

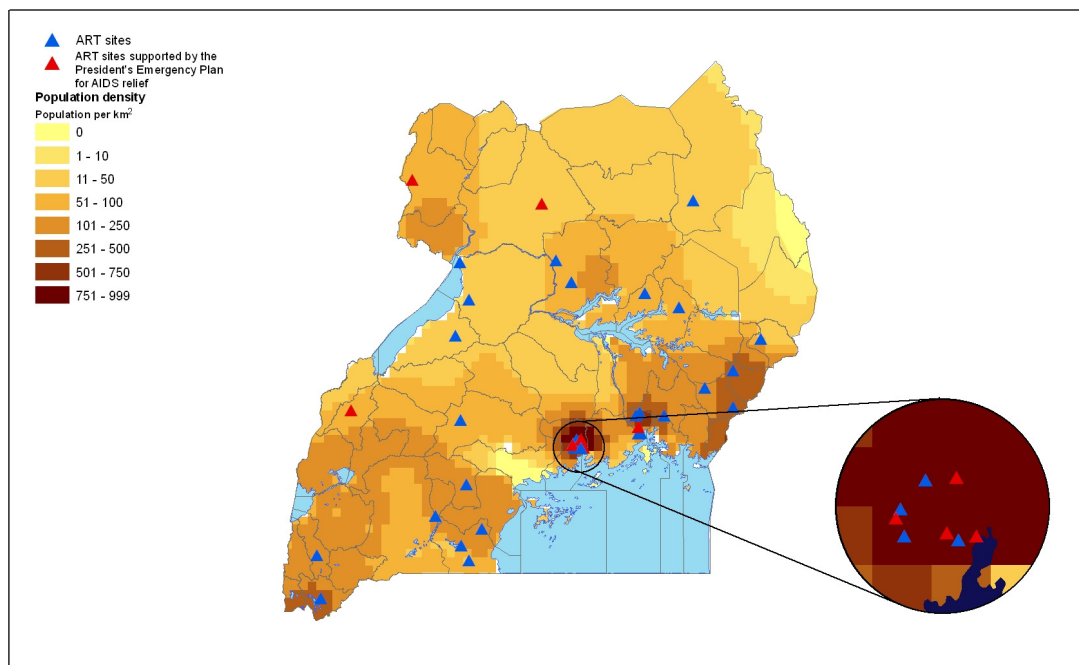
## 5.0 Service availability

### 5.1 HIV/AIDS treatment

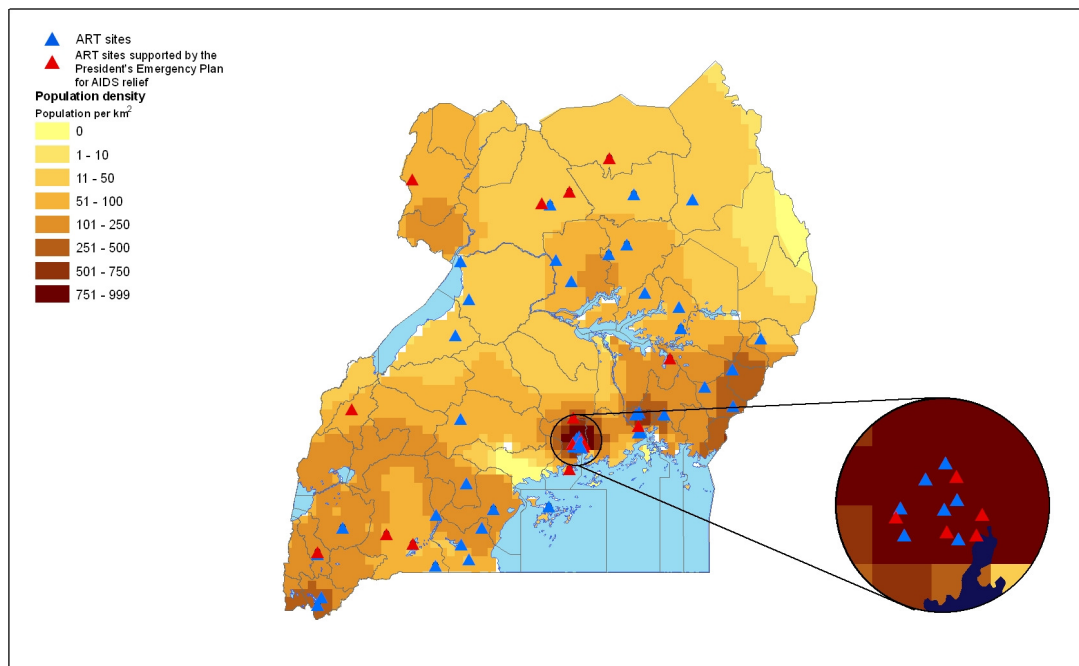
A number of questions were asked concerning the availability of specific HIV/AIDS interventions. These included the provision of antiretroviral therapy (ART), the prevention of mother to child transmission (PMTCT) of HIV, and voluntary counselling and testing (VCT) of HIV. Annex 1 lists all facilities, by district, that provide ART, PMTCT of HIV and VCT.

At the beginning of 2004, nearly 30% of districts had at least one facility providing ART (Map 11a). Maps 11b and 11c demonstrate how ART services have expanded throughout 2004.

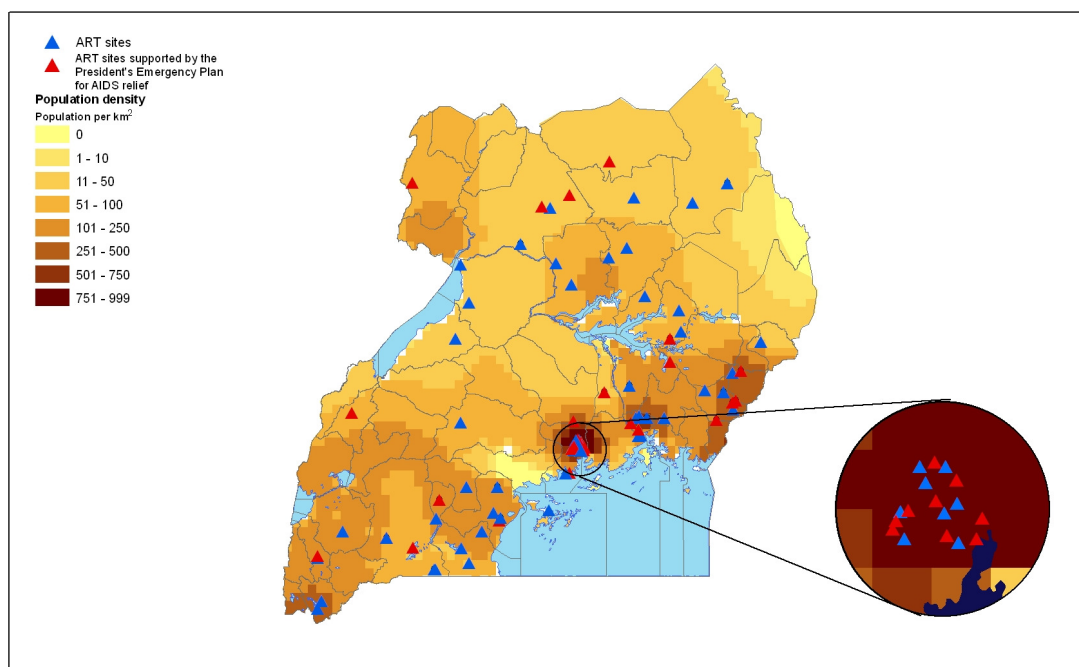
**Map 11a. Location of ART sites in Uganda – early 2004**



**Map 11b. Location of ART sites in Uganda – mid 2004**

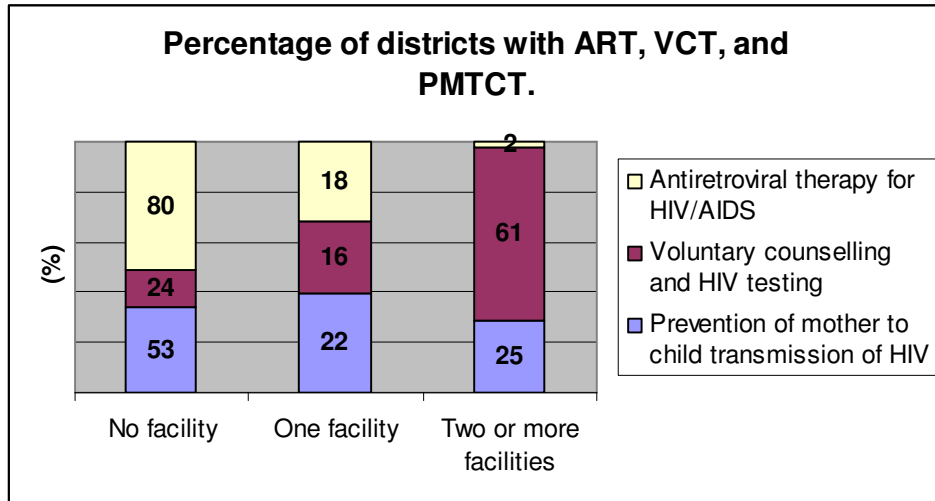


**Map 11c. Location of ART sites in Uganda – late 2004**



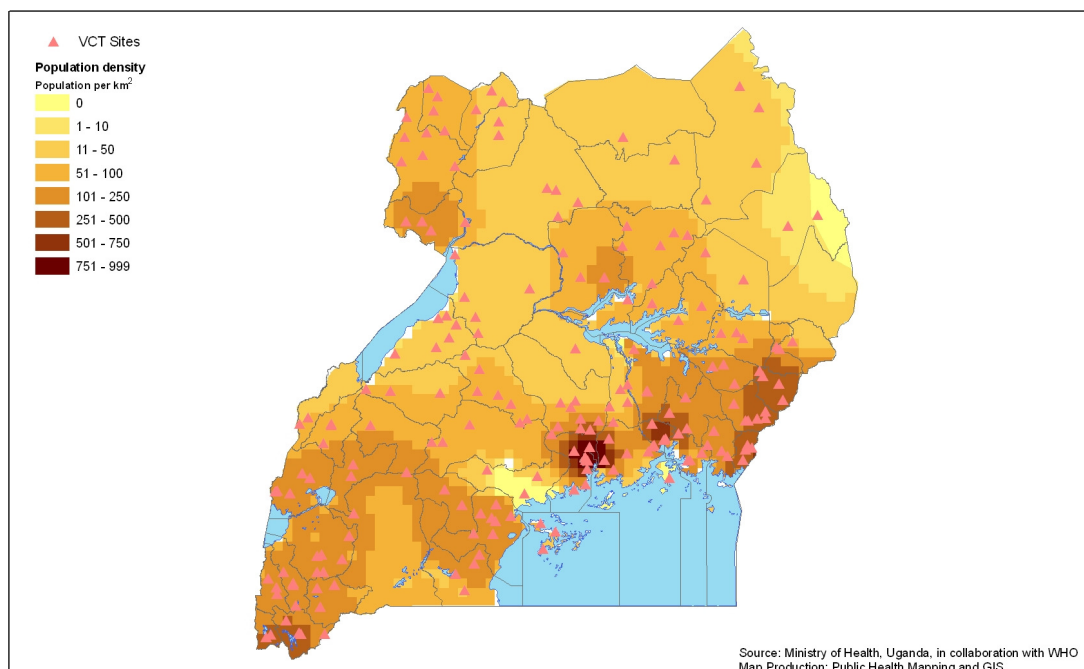
Almost half of all districts have at least one facility that provides PMTCT of HIV, and 70% of districts have two or more counselling and HIV testing facilities (Figure 6).

**Figure 6.**



Map 12 shows the geographical distribution of HIV counselling and testing sites in Uganda.

**Map 12. Location of VCT sites, by district**



## 5.2 Maternal and child health

SAM also provides information on the availability of selected maternal and child health services. Slightly more than 80% of districts are able to provide caesarean sections (Map 13) and emergency blood transfusions to women with postpartum bleeding (Map 14).

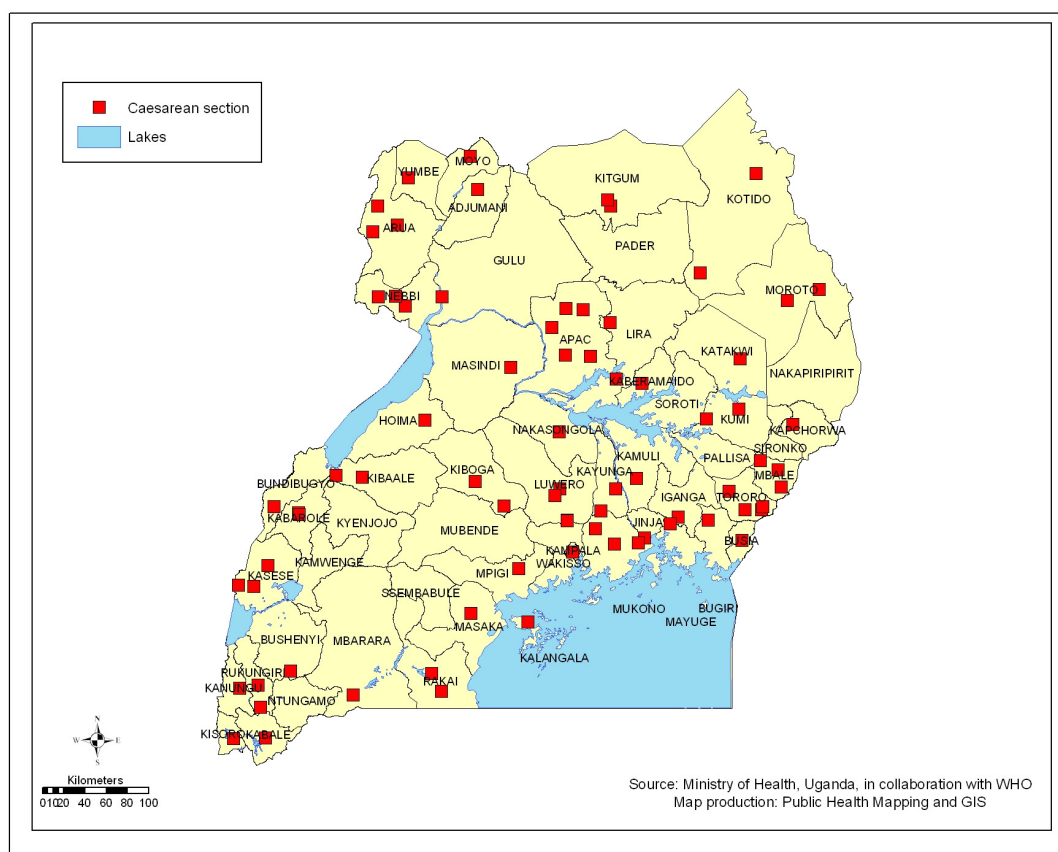
Twenty-seven districts have at least one health worker trained in the Integrated Management of Childhood Illness (IMCI) in over half of their health facilities. Two districts have full coverage ( $\geq 1$  health worker per facility). Most districts with lower IMCI coverage are in central and western Uganda. In general, however, all districts have some facilities that provide IMCI (see Figure 7). Table 6 shows the status of selected maternal and child health services in Uganda.

**Table 6. Percentage of districts with specified health service delivery characteristics<sup>a</sup>**

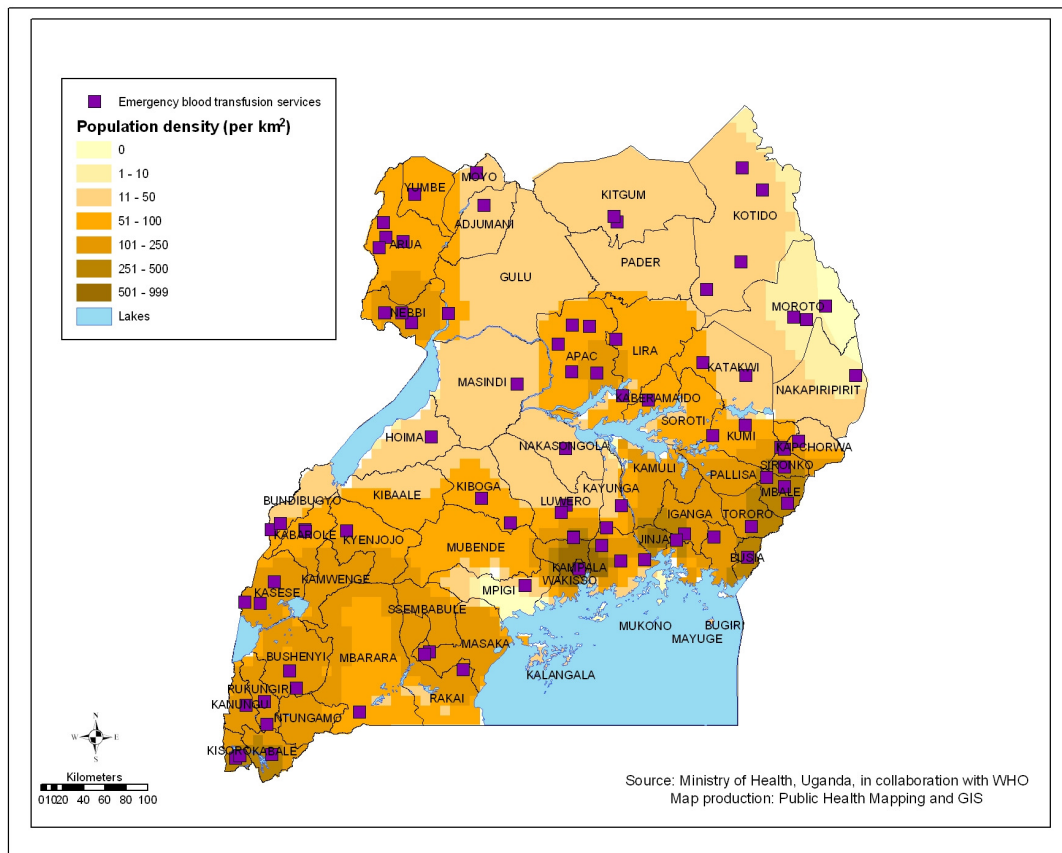
	Percentage of districts			
	0	<50	>50	100
Facilities with staff trained in IMCI	1.9	44.2	50.0	3.8
Facilities with staff trained in neonatal health	5.8	28.8	58.8	9.6
Facilities which provide intermittent preventive therapy for malaria	0.0	36.5	40.4	23.1

<sup>a</sup> 52 districts reporting.

**Map 13. Location of health facilities providing caesarean sections, by district**



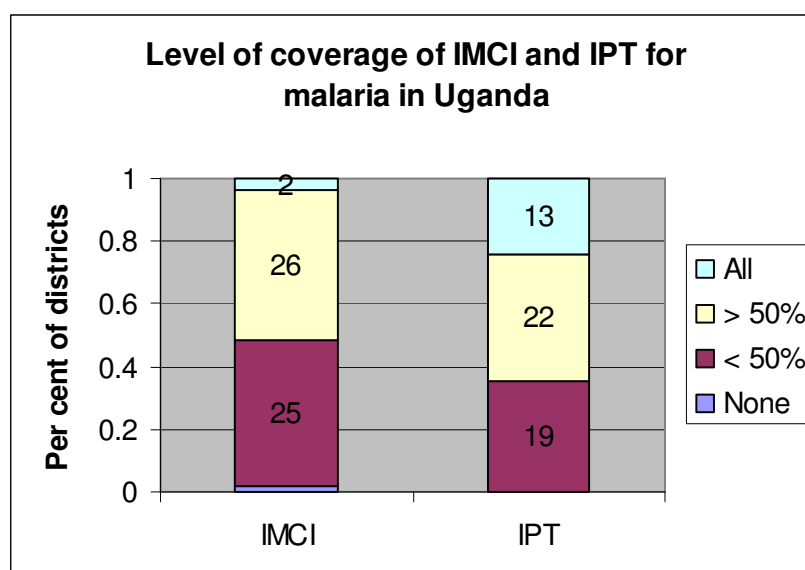
**Map 14. Location of health facilities providing emergency blood transfusion, by district**



As can be seen in Figure 7, the provision of intermittent preventive therapy (IPT) for malaria is now provided in all facilities in a quarter of districts and in more than half of the facilities in 66% of districts.



Figure 7.



### 5.3 Tuberculosis treatment

Questions regarding the availability of specific TB services were asked, including both availability of TB treatment within facilities and availability of directly observed treatment, short course (DOTS) within the facility and/or community. Overall, TB treatment and DOTS services are widely distributed throughout the country. Annex 1 lists all facilities, by district, where such services can be sought.

## 6.0 Social marketing programmes

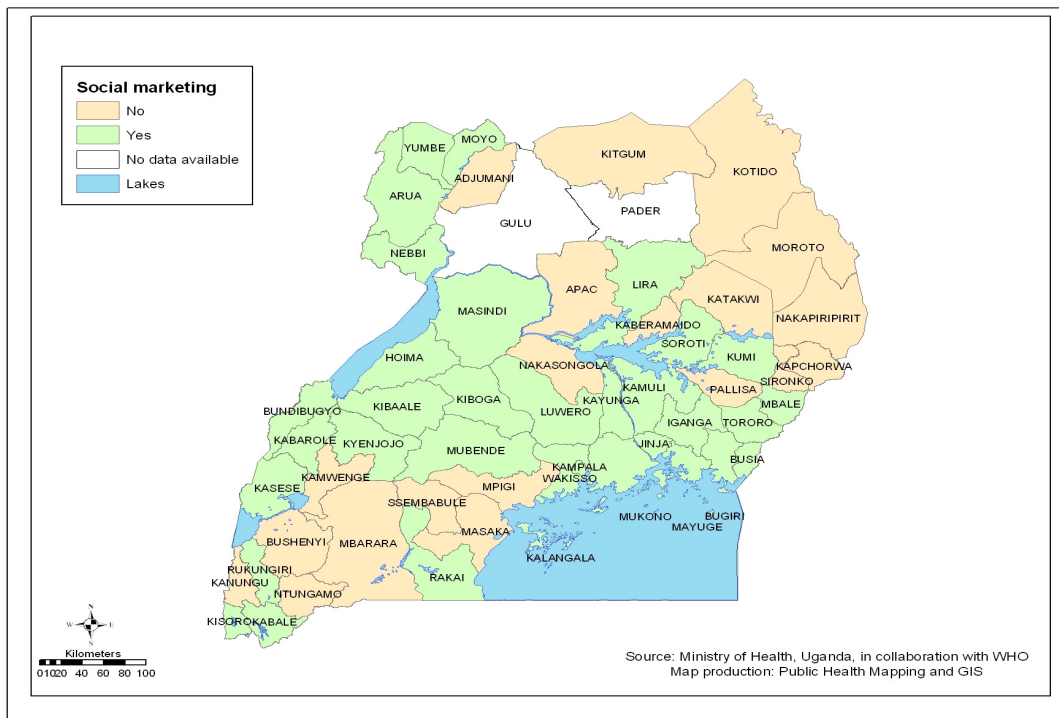
Marketing programmes for condoms and insecticide-treated bednets were also assessed. Programmes promoting condoms are present in nearly two-thirds of districts, with those for insecticide-treated bednets in just over half. Table 7 and Maps 15 and 16 summarize the percentage and location of districts where these social marketing programmes exist.

**Table 7. Percentage coverage of marketing programmes for condoms and bednets<sup>a</sup>**

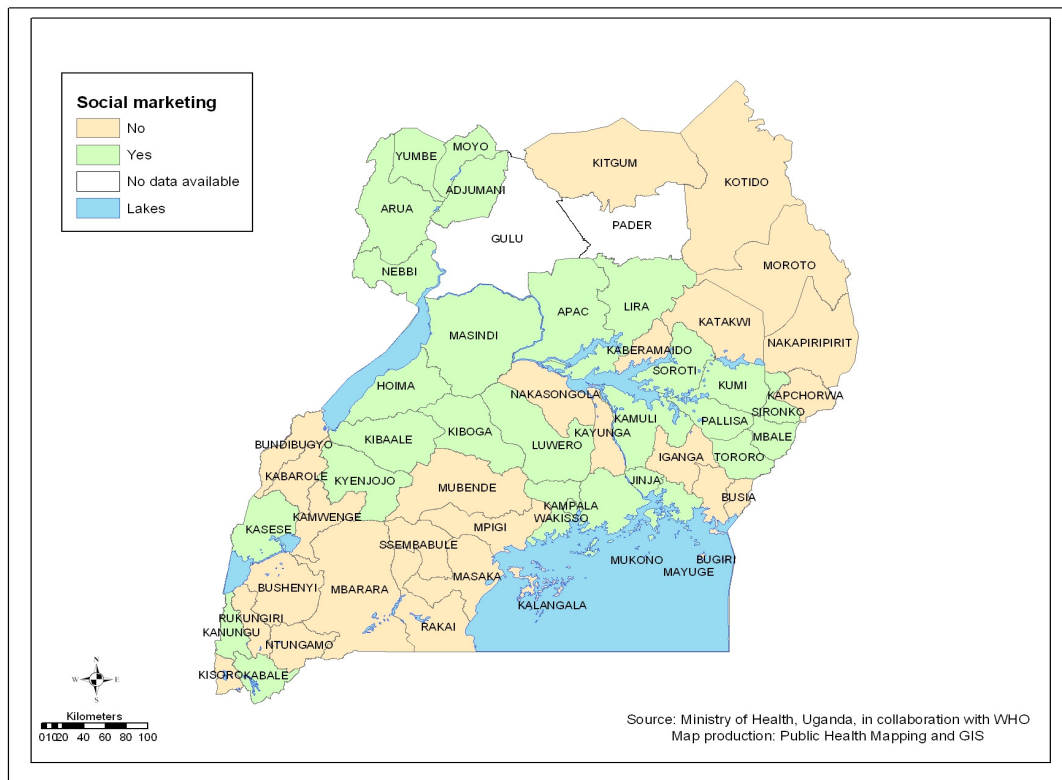
	District with existing programme (%)
Condoms	61.5
Bednets	50.0

<sup>a</sup> 52 districts reporting.

**Map 15. Presence of condom marketing programmes, by district**



**Map 16. Presence of insecticide-treated bednet marketing programmes, by district**



## 7.0 Jinja, Kiboga and Mbarara districts: results of facility questionnaires

A more focused health facility survey was conducted in three districts of Uganda. The goal was to collect information on the availability and distribution of key health services by means of a survey of all public and private health facilities in the target areas.

Data were obtained directly from each of the 240 health facilities identified in the Jinja, Kiboga and Mbarara districts. According to the 2001 census, the population of these three districts was 1 715 919, representing 7.2% of Uganda's population. Thus, one facility served approximately 7150 inhabitants in these districts. Facilities in these districts were mostly second and third level health centres.

### 7.1 Health infrastructure

There were 92 health facilities – four hospitals and 88 health centres – offering inpatient services in the three districts, which corresponds to approximately one per 18 650 inhabitants. All three districts had at least 20 facilities with inpatient beds. Table 8 shows the distribution of hospitals and health centres in these districts.

**Table 8. Number and type of health facility visited, by district**

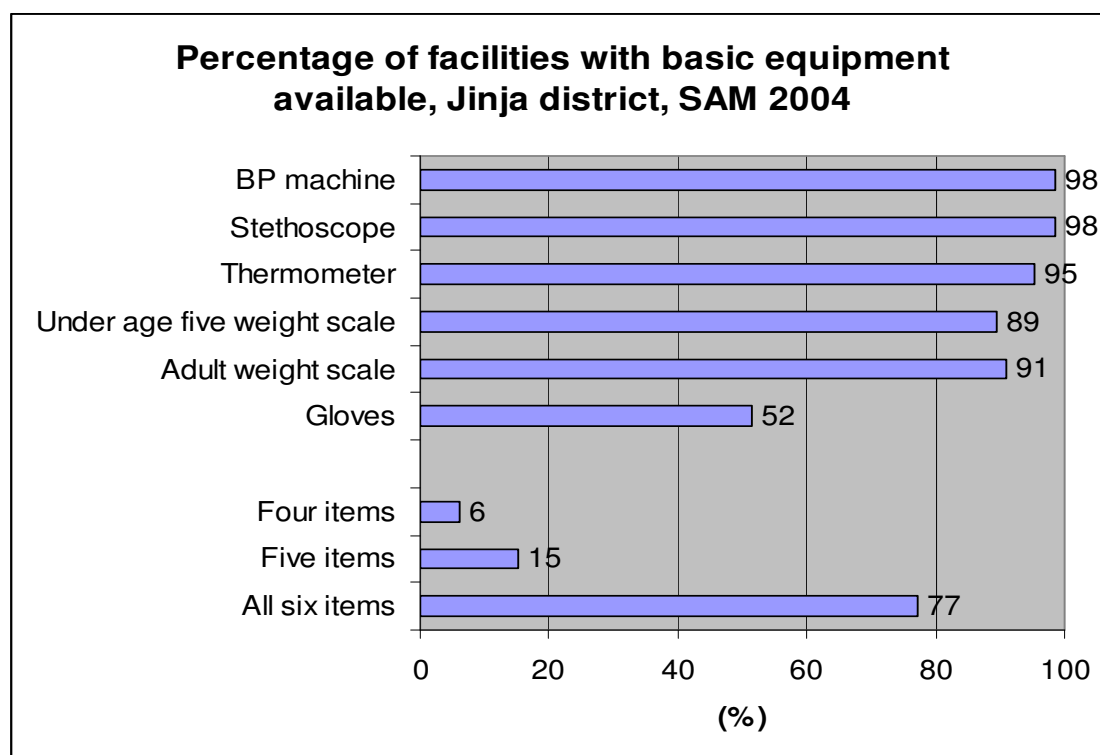
	<b>Jinja</b>	<b>Kiboga</b>	<b>Mbarara</b>
<i>Hospitals</i>			
Regional	1	0	2
District	1	1	0
<i>Health centres</i>			
Type IV	8	2	11
Type III	13	13	48
Type II	43	21	71
<i>Private</i>	0	0	2
<i>Other (unknown)</i>	0	0	3
<b>Total</b>	<b>66</b>	<b>37</b>	<b>137</b>

There were 2073 total inpatient beds available across the three districts, or about 120 per 100 000 inhabitants. Kiboga had the highest density of beds available with 187 per 100 000.

### 7.1.1 Basic medical equipment

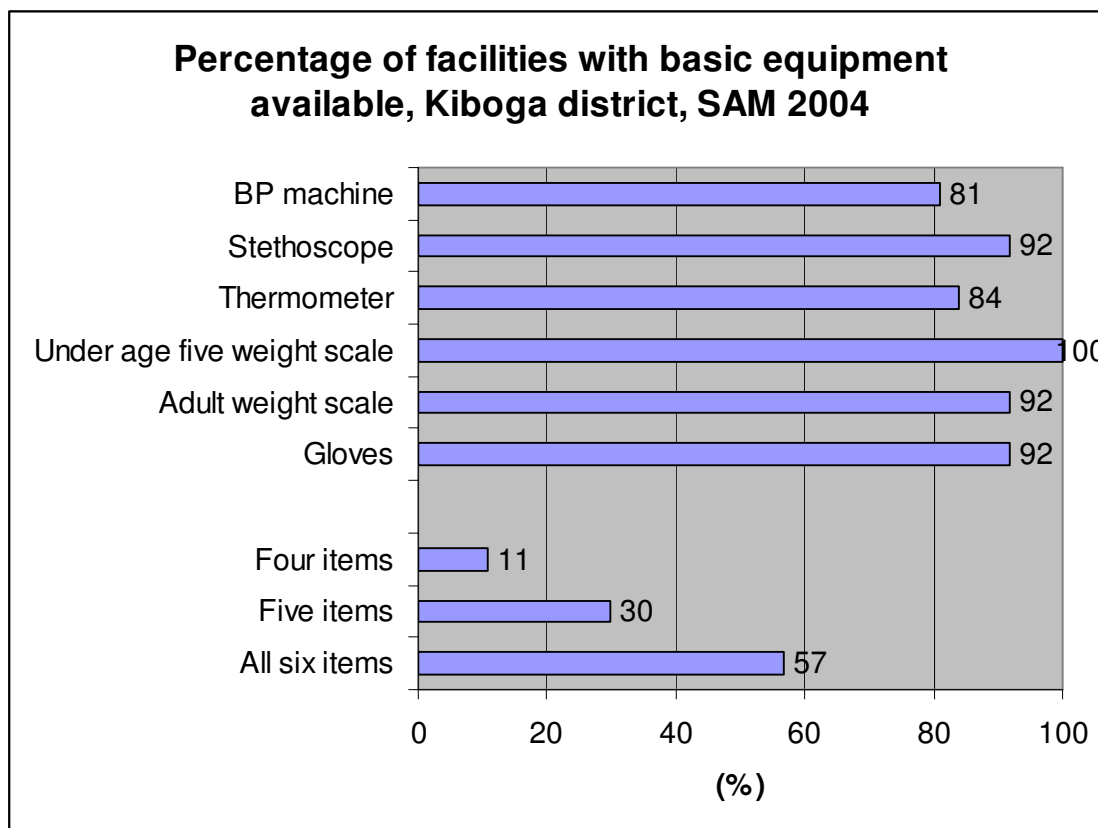
Figures 8a–c show the percentages of health facilities with basic equipment available.

**Figure 8a. Availability of basic medical equipment: Jinja district**



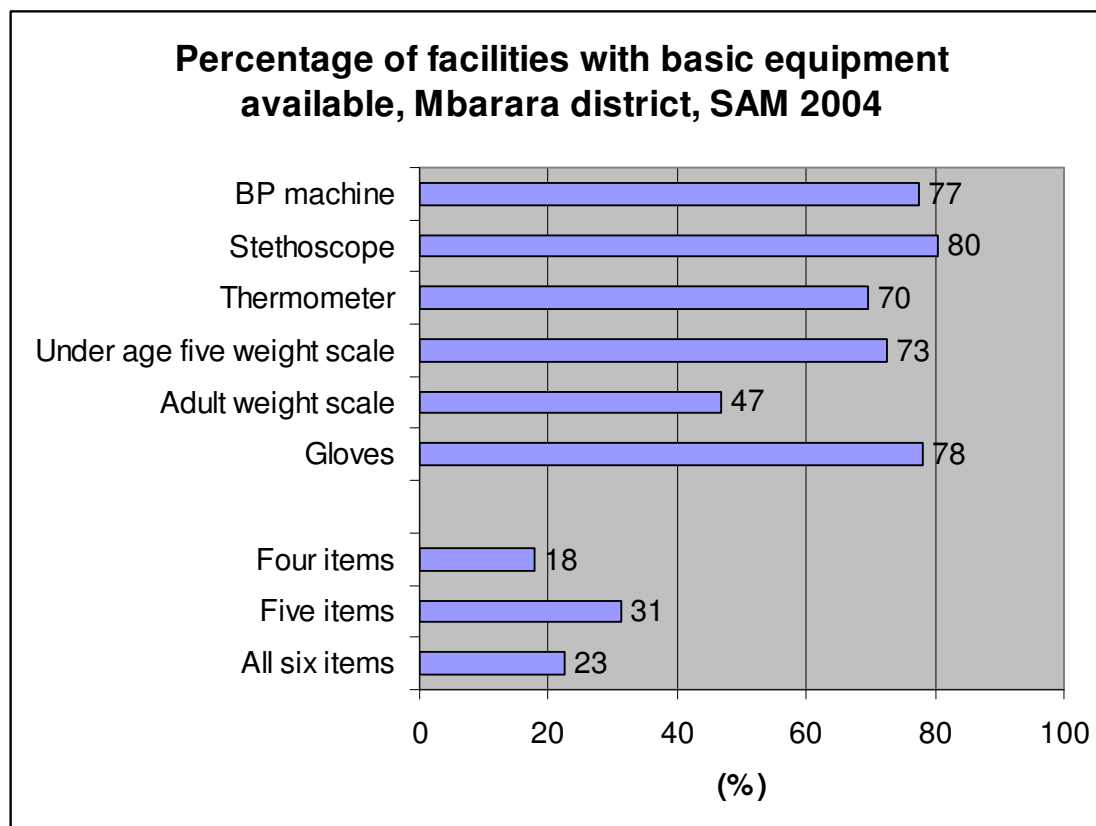
N = 66

Figure 8b. Availability of basic medical equipment: Kiboga district



N = 37 facilities.

**Figure 8c. Availability of basic medical equipment: Mbarara district**

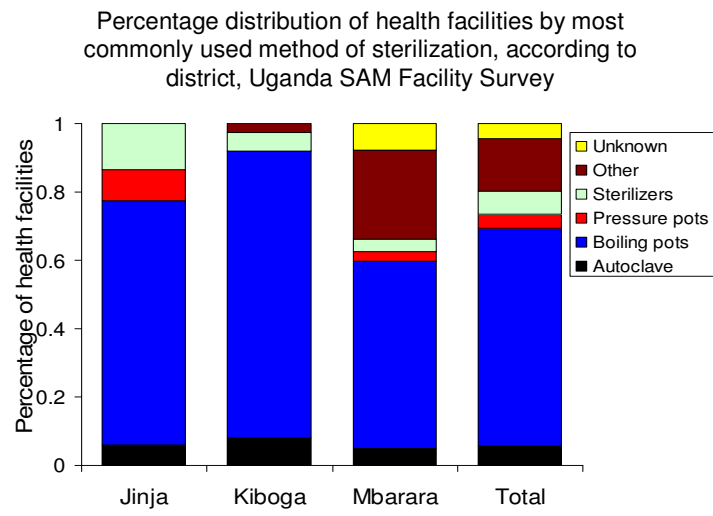


N = 128 facilities (9 of the 137 facilities surveyed did not report)

Other findings from the focused survey include the following.

- Microscopes were available in 19 (29%) facilities in Jinja, nine (24%) in Kiboga, and 43 (36%) in Mbarara.
- Less than one-quarter of facilities in any of the three districts had electricity continuously available.
- Facilities in Kiboga were the least likely to have electricity, piped water or telephone services (basic land line or cellular), but were most likely to have a shortwave radio.
- Less than one facility in ten had a computer or Internet services available for staff; facilities in Mbarara were the least likely to have this equipment.
- Facilities in Kiboga were the most likely to have a refrigerator, while those in Jinja were most likely to have latex gloves and environmental disinfectants available.
- Use of boiling pots was the most common method of sterilization for general health services among facilities in all three districts (Figure 9).

**Figure 9.**

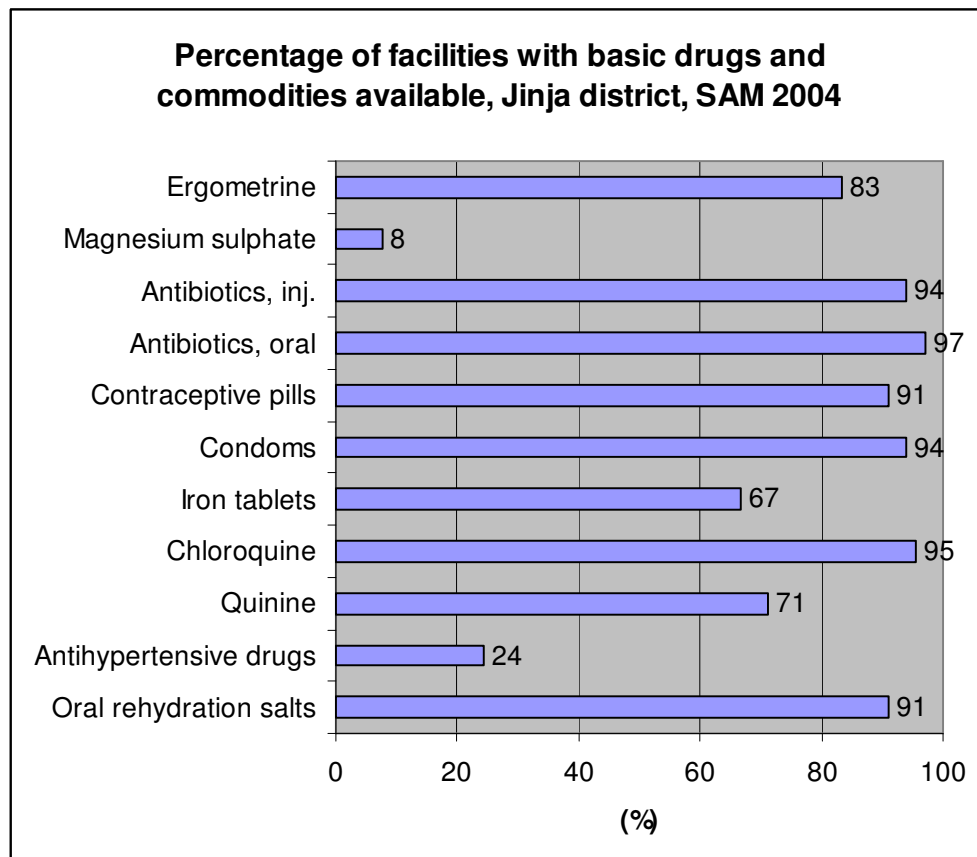


### 7.1.2 Drugs and health commodities

The survey recorded information about the availability of specific drugs and commodities in each health facility on the day of data collection. Injectable and oral antibiotics were widely available across facilities in all three districts. However, very few facilities had magnesium sulphate to treat postpartum haemorrhage.

Figures 10a–c summarize the drugs and commodities available in health facilities.

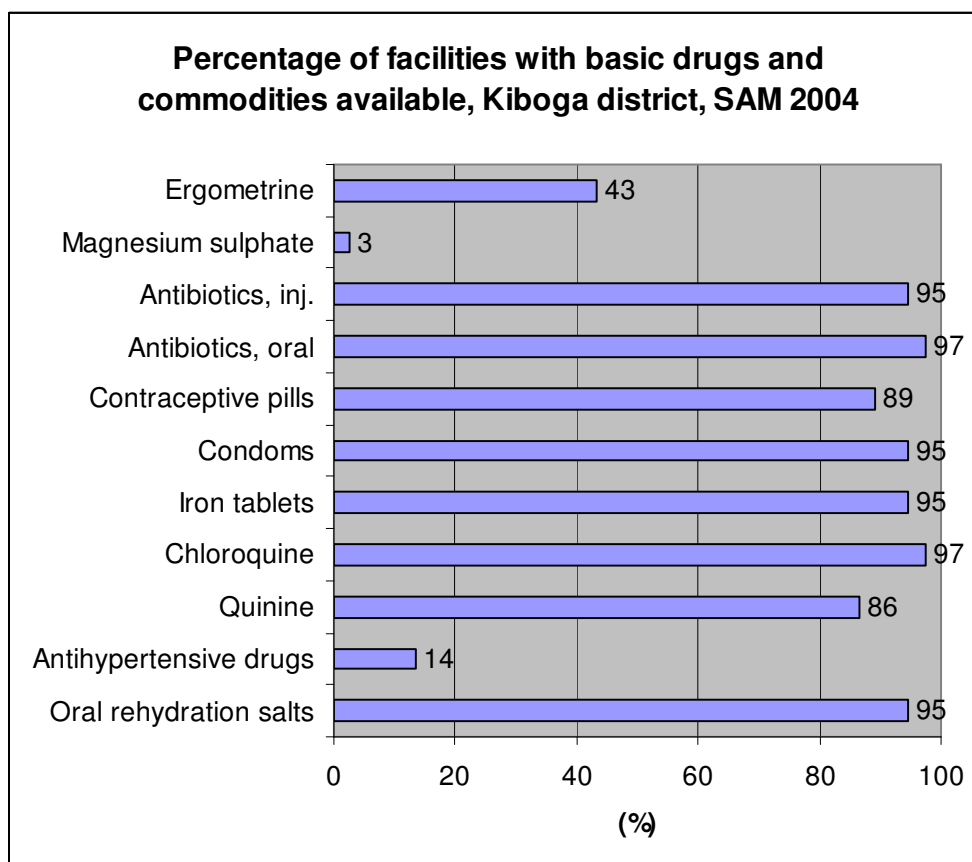
**Figure 10a. Percentage of health facilities with basic drugs and health commodities available: Jinja district**



N = 66 facilities.

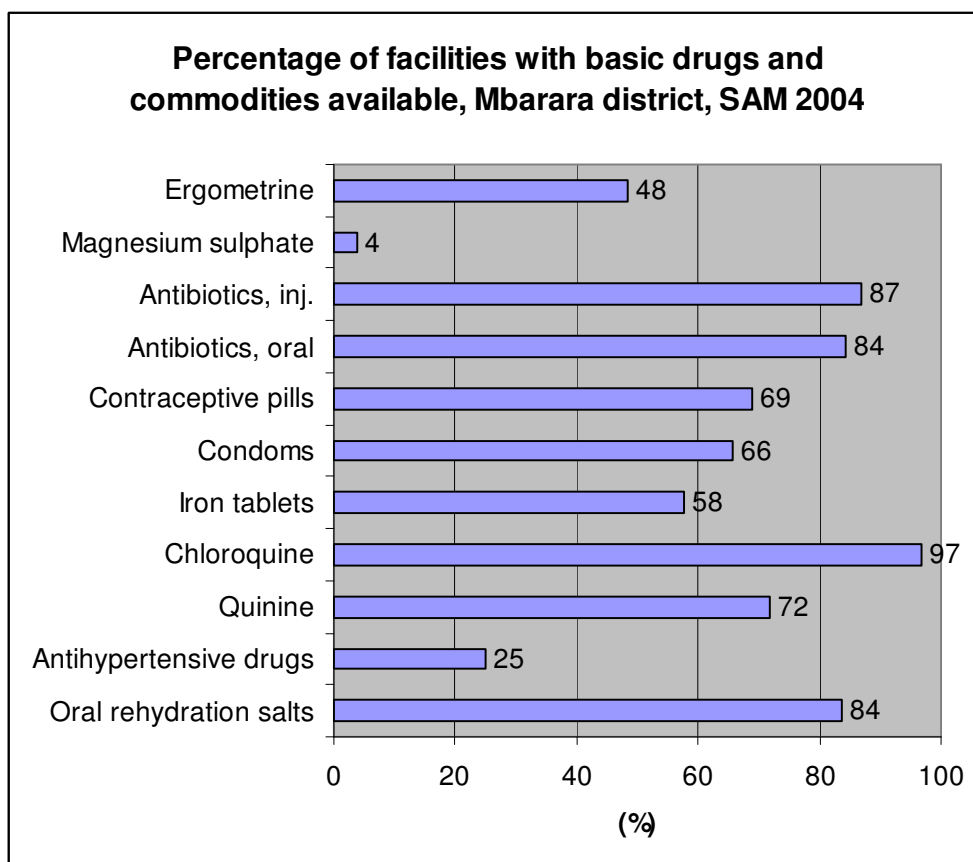


**Figure 10b. Percentage of health facilities with basic drugs and health commodities available: Kiboga district**



N = 37 facilities.

**Figure 10c. Percentage of health facilities with basic drugs and health commodities available: Mbarara district**

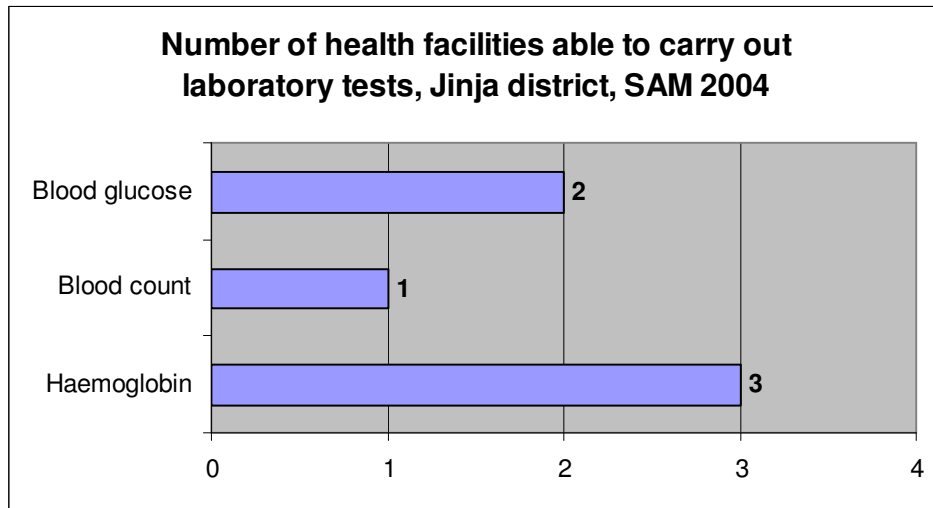


N = 128 facilities (9 of the 137 facilities surveyed did not report)

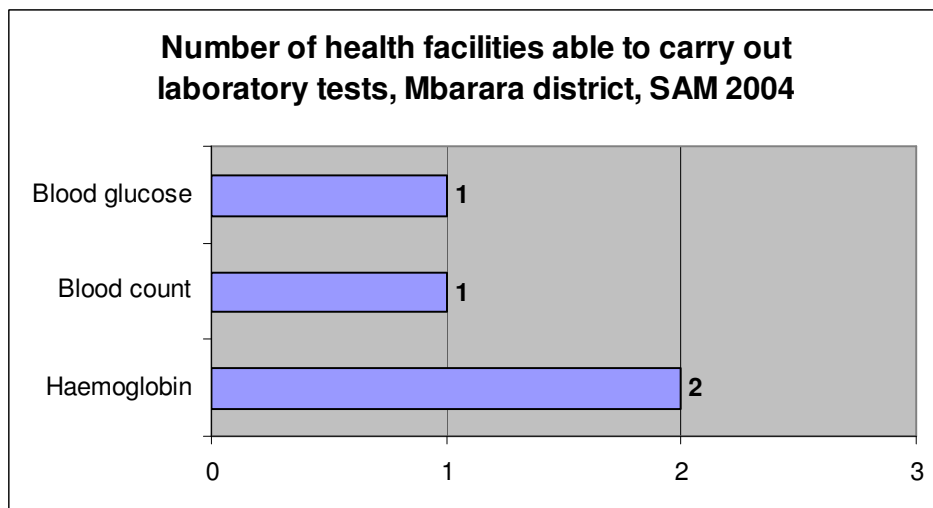
### 7.1.3 Laboratory capacity

Facilities were asked about their ability to carry out select basic laboratory tests. Districts reported very little capacity to perform blood glucose, blood cell count and haemoglobin level tests. No facility in Kiboga had the ability to carry out any of these tests. Figures 11a–b show the capacity for tests in two districts, Jinja and Mbarara.

**Figure 11a.**



**Figure 11b.**



## 7.2 Human resources

A total of 1550 health personnel work in the surveyed facilities. Jinja had the highest density: 177 workers per 100 000 inhabitants. Mbarara had the lowest density at 61 health workers per 100 000. This includes physicians, registered and enrolled comprehensive nurses, registered midwives, nursing assistants and nursing aides, dentists and dental assistants, laboratory technicians and technologists, laboratory assistants, pharmacists and dispensers, health management information system (HMIS) personnel and records assistants (Table 9).

In particular, Jinja had by far the highest density of physicians, nurses and midwives among the three districts. Kiboga exhibited the lowest density of physicians.

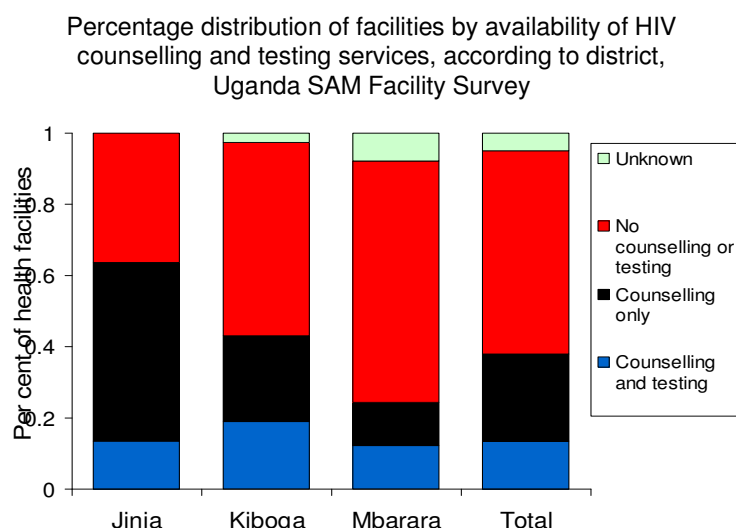
**Table 9. Density of health workers per 100 000 inhabitants, by district**

	<b>Jinja</b>	<b>Kiboga</b>	<b>Mbarara</b>
Physicians	10.7	1.3	3.2
Nurses	46.0	13.4	14.1
Midwives	33.7	15.1	12.2
Medical assistants/ Clinical officers	12.8	6.1	4.6
Laboratory technicians/ Technologists	4.6	0.9	1.0
Pharmacists/ Dispensers	2.6	0.4	0.3
Other health workers	67.7	42.8	26.7
<b>Total health workers</b>	<b>176.8</b>	<b>80.9</b>	<b>61.4</b>

## 7.3 HIV/AIDS services

There are 33 facilities across the three districts offering HIV antibody testing and counselling services. Another 59 facilities offered counselling services alone. Over half of facilities in Jinja district report that counselling services were offered. This is shown in Figure 12.

**Figure 12.**



ART was rarely available in the surveyed health facilities (two facilities in Jinja and three in Mbarara reported providing ART; in Kiboga, none provided ART). Overall one facility in 10 offered nevirapine or AZT to pregnant women for the prevention of mother-to-child transmission of HIV, but again this service was less widely available in Kiboga (Table 10).

Three facilities, all in Mbarara, reported offering isoniazid (INH) chemoprophylactic therapy to HIV-positive patients for the prevention of TB, one of the principal opportunistic infections associated with HIV.

**Table 10. Percentage of health facilities offering selected interventions for HIV/AIDS prevention and treatment, by district**

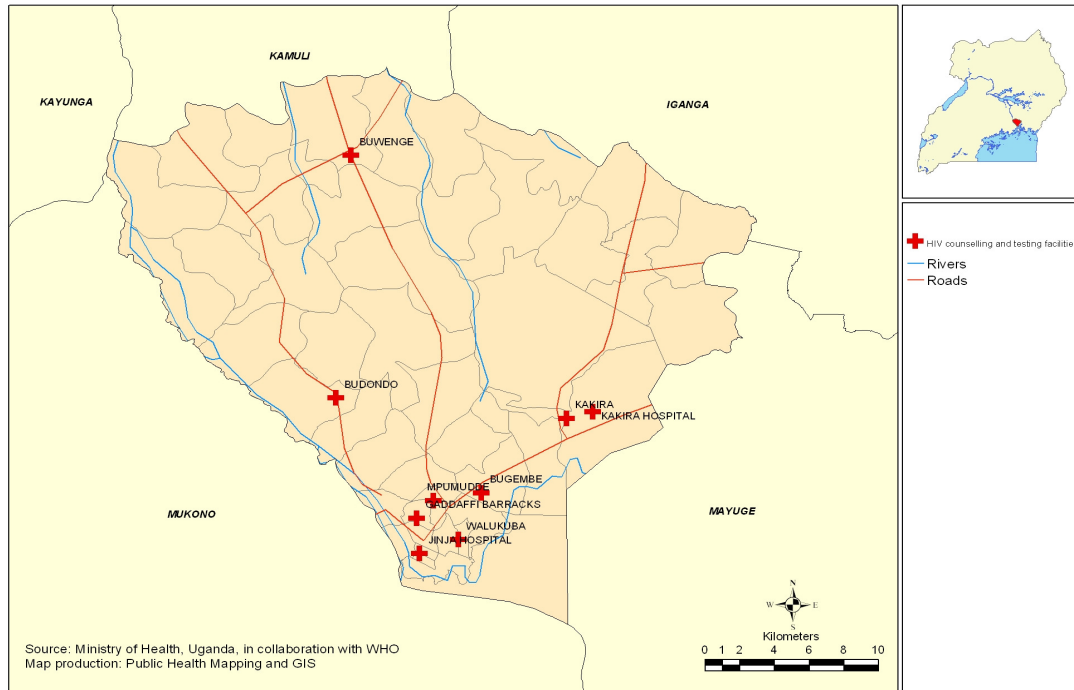
Intervention	Jinja	Kiboga	Mbarara	Total
ARV combination therapy	3%	0%	2% <sup>a</sup>	2%
Nevirapine or AZT for PMTCT of HIV	11%	3%	12% <sup>b</sup>	10%
INH prophylaxis for HIV+ patients	0%	0%	2%	1%

<sup>a</sup> 121 facilities reporting.

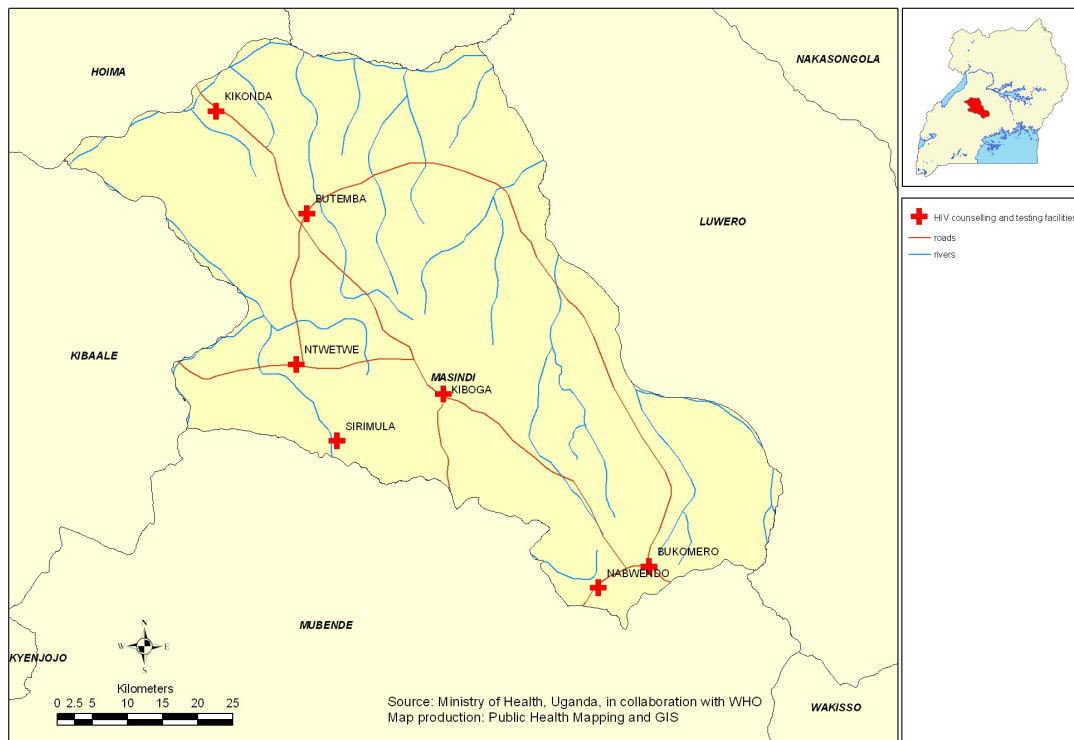
<sup>b</sup> 123 facilities reporting.

Maps 17a–c illustrate the location of facilities in Jinja, Kiboga, and Mbarara, respectively, that provide VCT.

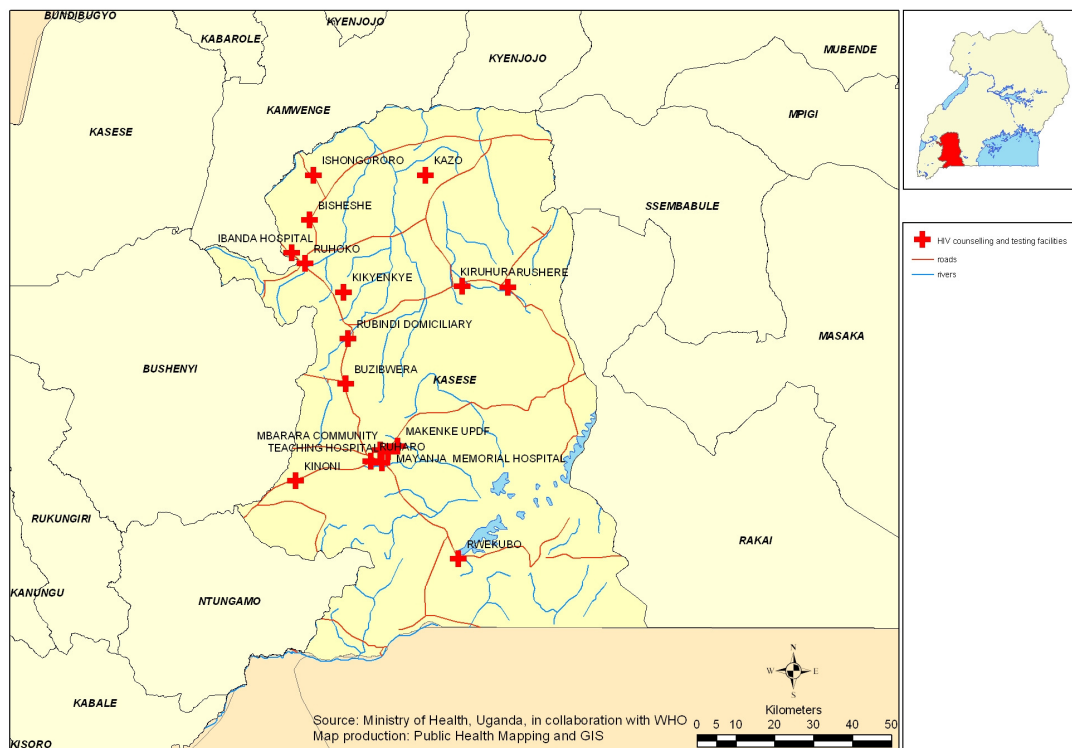
**Map 17a. Voluntary counselling and testing sites: Jinja district**



**Map 17b. Voluntary counselling and testing sites: Kiboga district**



**Map 17c. Voluntary counselling and testing sites: Mbarara district**



## 7.4 Tuberculosis treatment

Health facilities in the three districts were also queried about TB prevention. They were asked if:

- HIV antibody tests are routinely offered to all TB patients;
- TB outcome monitoring using cohort analysis is carried out;
- short course treatment is provided;
- a register of suspected TB cases is kept;
- smear microscopy is used to make a TB diagnosis;
- direct observation of treatment is provided; and
- TB treatment is provided on-site.

About 38% of all facilities surveyed provided TB treatment. Almost one-quarter (24%) of facilities surveyed offered smear microscopy for TB diagnosis. This figure varied little across districts, from 22% in Kiboga to 27% in Jinja. Few facilities offered systematic testing for HIV antibodies among TB patients (suspected or confirmed). Facilities in Kiboga were most likely to provide referrals to TB patients for HIV testing.

Figures 13a–c present the percentage of facilities providing the various services described above.

**Figure 13a.**

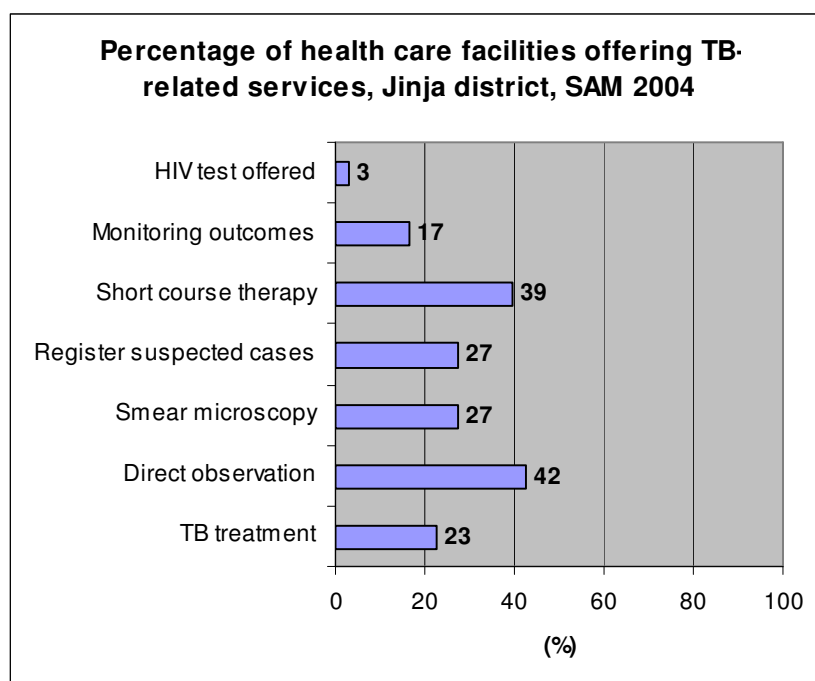




Figure 13b.

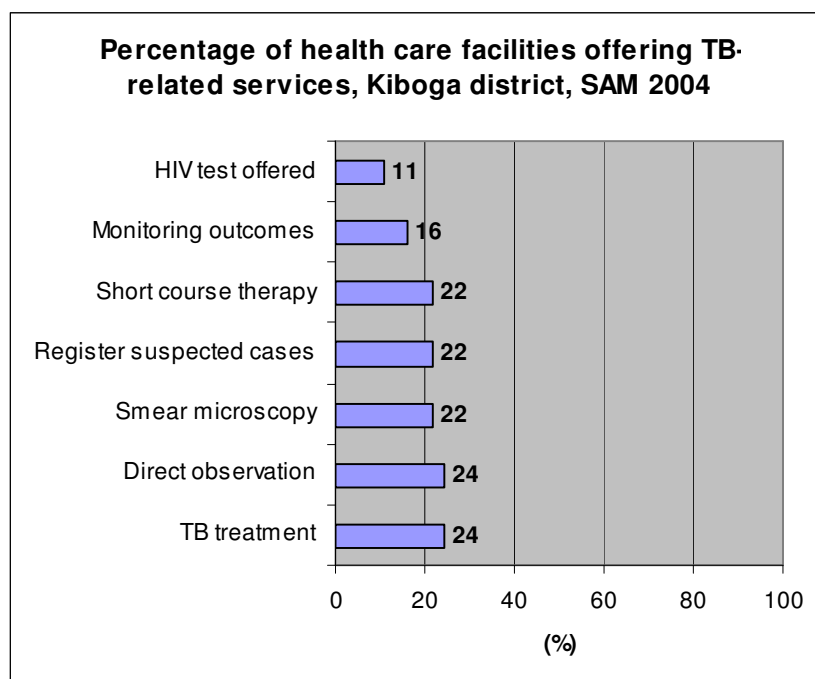
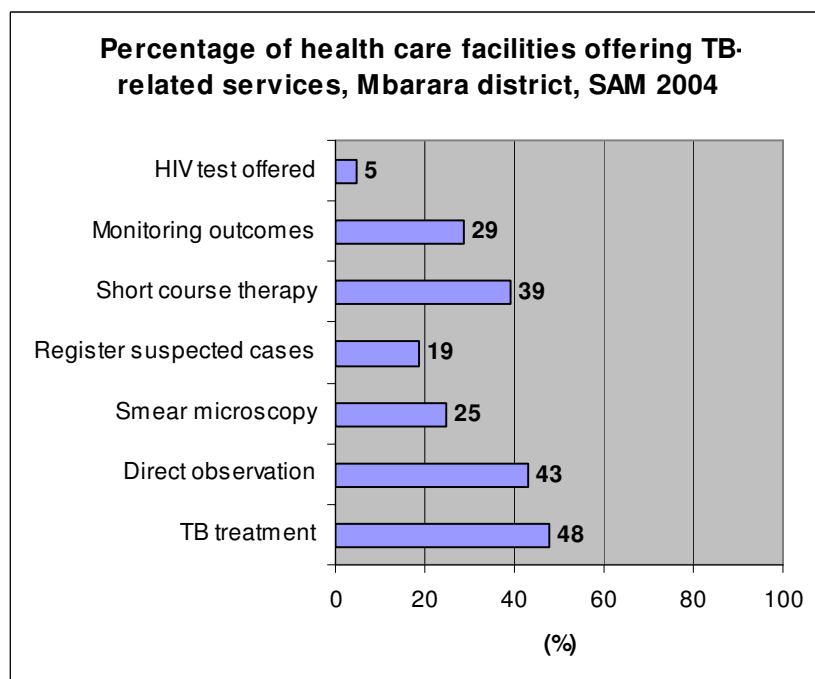


Figure 13c.



## 8.0 Future directions

This report summarizes the results from the 2004 SAM survey in Uganda. The district-level SAM was a first step towards an integrated system of monitoring health services, both operated and led by the district. Supervisory visits to health facilities could benefit greatly from using a simple monitoring tool that allows the supervisor to summarize the results at the end of a visit using Health Mapper. For example, results on human resources could be included in a national monitoring system with very little extra effort for the health workers involved.

The MoH is planning to integrate SAM into the HMIS. The linking of the SAM tool with the existing information systems for health service monitoring, including the HMIS, is crucial. Although the process has not yet been developed, district operation of SAM could assist the current reporting systems in many ways. WHO has transferred responsibility for this procedure to the MoH whose representatives have received extensive training in data management and GIS.

Funding for subsequent SAM activities will have to be incorporated in the existing district planning and budget system, while additional resources must be sought for training, provision of GPS equipment, PDAs, software and technical support.

Close collaboration with the Bureau of Statistics in Uganda is also essential. Detailed population data obtained from the latest census will allow for a better estimate of physical access to key health services by providing information that can be used to model the volume of patients accessing a particular health facility.

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