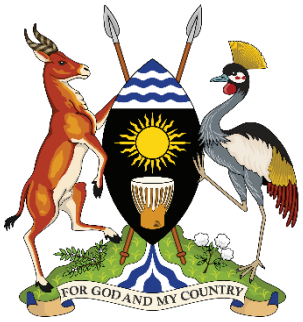
THE REPUBLIC OF UGANDA

MINISTRY OF HEALTH

Uganda Hospital and Health Centre IV Census Survey

2014



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Uganda Hospital and Health Centre IV Census Survey 2014

World Health Organization

FOREWORD MINISTER

The Hospital and Health Centre IV census survey, also known as "Service Availability and Readiness Assessment (SARA-H)", is the first comprehensive assessment of availability of and capacity to offer health care services in hospitals and level IV primary care facilities in Uganda. The report provides detailed information on distribution of hospitals and level IV primary care facilities, the availability of some specific services, and capacity of hospitals and level IV primary care facilities to deliver the services to the desired national or international standards.

The report provides useful evidence for investing in improvement of delivery of health care service through hospitals and level IV primary care facilities. It clearly shows areas where we have done well as a country and areas where we need to redouble our efforts to meet the needs and expectations of our people. The report pays special attention to equity and this includes comprehensive analysis by geographical zone and urban-rural residence. The equity analysis will guide us on which populations need larger infusion of resources, efforts and investments in order to achieve parity as well as improve our national average. It is my anticipation that future similar reports will contain a similar level of analytical thinking.

Conceptualisation, planning, implementation, analysis of data, and writing of the census survey report was done by a team of local experts supported by experts from World Health Organization. This included experts from the Ministry of Health and Makerere University School of Health Sciences. This means that local capacity to conduct such a survey exists in Uganda and has been strengthened further by working closely with experts from the World Health Organization.

The publication of this report is also a major and timely input into our annual review of performance of the health sector and will prove handy to the senior management and technical experts at the Ministry of Health, other government ministries and departments, development partners and agencies that have interest in improving health care services for our people. The report will also be useful for policy makers, parliamentarians, the civil society and the community at large. Some of these may need assistance in interpreting some sections of the report and we are happy to do so. At a personal level, the report provides me with a perfect audit of where we are and what I need to focus on as a leader in the health sector. It is my hope that all stakeholders in the health sector will use this report to improve service delivery through hospitals and level IV primary care facilities in order to improve the health of our people.

On behalf of the Ministry of Health, I would like to express my greatest appreciation to the World Health Organization for providing technical support and to the African Development Bank for providing funds for the census survey.

For God and My Country

Hon. Dr. Elioda Tumwesigye

MINISTER OF HEALTH

ACKNOWLEDGEMENT

Assessment of service availability and readiness in hospitals and level IV primary care facilities was an important undertaking of the Ministry of Health. It involved a huge amount of work that required a lot of resources and dedication. The leadership and staff of the Ministry of Health would not have completed this assignment alone without the support of many individuals and organizations. Hence, I would like to recognise and congratulate all those individuals, institutions and organisations – public or private, national or international – that contributed in one way or the other to this endeavour.

I would however, on behalf of all who contributed, like to single out a few individuals and institutions to highlight the collective effort that went in to producing this report. Foremost, I would like to thank the African Development Bank for their financial support. At the Ministry of Health, I would like to recognise the efforts of the team led by Dr. Jacinto Amandua, Commissioner Clinical Services and Dr. Henry Mwebesa Commissioner Quality Assurance, namely: Dr. Jackson Amone, Dr. Sarah Byakika, Engineer Wanda, Dr. Catherine Muwonge Magezi, Dr. Julliet Nabanja, Dr. Makanga Livingstone, Dr. Bernard Opar, Dr. Jacinta Sabiiti, Ms. Caroline Kyozira, Dr. Peter Mukasa, Ms. Grace Okteka and Dr. Gregory Tumweheire. The vision, leadership and support from the rest of your team made this possible. I would also like to recognise and congratulate the WHO Country Office, AFRO Regional Office and Headquarters in Geneva for accepting the idea and providing technical and moral support to the assignment. In a special way, we would like to thank the WHO Representative in Uganda Dr. Wondimageghenu Alemu, Dr. Juliet Bataringaya, Mr. Nasan Natseri, Dr. Juliet Nabyonga, Ms Anne Araba, Dr. Grace Kabaniha, Dr. Benson Droti, Dr. Kathryn Patricia O'Neil, Dr. Abdhalah K. Ziraba and Dr. Ties Boerma for their technical guidance. Makerere University School of Health Sciences provided a strong contribution in implementation of the census survey. In particular, we would like to thank Prof. Josaphat Byamugisha, Prof. Nazarius M. Tumwesigye, and Mr. Deogratious Sebuwufu for providing technical expertise and support in the planning, implementation, data analysis and report writing. The report would be lacking in quality without the superior knowledge and experience from WHO and Makerere University School of Health Sciences.

Dr. Asuman Lukwago
Permanent Secretary
MINISTER OF HEALTH

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List of Acronyms

APHRC	Africa Population Health Research Center
Ass.	Associate
BEmONC	Basic Emergency Obstetric and New-born Care
C/M	Chairman
CEmONC	Comprehensive Emergency Obstetric and New-born Care
CHS	College of health Sciences
CSPro	Census and Survey Processing System
CT	Computerized Tomography
DHO	District Health Officer
DHO	District Health Officer
E.N.T.	Ears, Nose and Throat
ECG	Electrocardiograph
GHs	General Hospital
HCIVs	Health Centre IVs
HMIS	Health Management Information System
HQ	Head Quarter
HR	Hour
ICU	Intensive Care Unit
IMPAC	Integrated Management of Pregnancy and Childhood
MKCCAP	Mulago Kampala Capital City Authority Project
MoH	Ministry of Health
NACME	National advisory Committee on Medical equipment
NGO	Non-Governmental Organization
NRH	National Referral Hospitals
OBS/GYN	Obstetrics & Gynaecology
OPD	Out-Patient Department
PI	Principal Investigator
RRHs	Regional Referral Hospital
SARA	Service Availability and Readiness Assessment
SPH	School of Public Health
TSC	Technical Service Committee
WHO	World Health Organization

EXECUTIVE SUMMARY

The SARA-hospital/HC IV census survey was a collaborative effort between the Ministry of Health, African Development Bank, and the World Health Organization. It was undertaken to provide information on availability of services and ability of hospitals and level IV primary care facilities to provide services to the desired national standards. The aim was to visit all the 152 hospitals and 193 level IV primary care facilities in Uganda. In practice however, 147 hospitals and 188 level IV primary care facilities were visited. Reasons for not visiting the other 10 hospitals/HC IVs were: not being granted permission to visit the military hospitals/HC IVs (n=6), inaccessibility due to floods (n=1), hospitals/HC IVs being under construction or under renovation (n=3).

The SARA-hospital census data were collected by trained data collectors using both paper questionnaire and mobile electronic devices that had CSPro application. Data were collected on the availability of some specific services and on the availability of items that were considered to be particularly important for offering the services. In addition, data were collected on the availability of systems and practices for ensuring good governance/management of the hospitals/HC IVs, systems and practices for ensuring safety of staff and service users, and systems and practices for delivery of quality health services. A review of facility records on quality of facility data and on facility statistics such as number of outpatient visits, inpatient admissions, institutional deaths, deliveries, and caesarean sections were also undertaken as a key component of the SARA-Hospital/HC IV census survey. A descriptive analysis was done in STATA version 11.0. Where appropriate, methods of analysis, key assumptions or justifications, and key limitations have been discussed under each section.

The report is divided into five sections. The first part of the report examines access to services at hospitals and level IV primary care facilities. Specifically, it examines the hospitals/HC IV density, specific service density, and proportion of hospitals/HC IVs with a specific service. The second part of the report focusses on quality and safety at hospitals/HC IVs in Uganda. The key dimensions of quality and safety examined in the second part of the report include the readiness or ability of hospitals/HC IVs to provide services to the desired standards, infection prevention and control, institutional mortality rates (maternal mortality, stillbirths, and neonatal mortality), rate of caesarean sections, and the availability of systems and practices to ensure safe delivery of health care services. The third part of the report focusses on the health system functions. The key dimensions of the health system examined in the third of the report are hospitals/HC IV governance, health workforce and health care financing. The fourth part of the report focusses on the hospitals/HC IV efficiency.

Findings:

1. Access to hospital/HC IV services

1.1. Hospital/HC IV density:

The target for Uganda is to have at least a hospital or a level IV primary care facility per 100,000 people. In 2014, this target was met i.e., there were 147 hospitals and 188 level IV primary care facilities in Uganda. This represents about one hospital/HC IV for 100,000 people. When level IV primary care facilities are excluded, the target in Uganda is to have one hospital for 500,000 people. The census survey shows that in 2014 this target was surpassed. Uganda had two hospitals for 500,000 people which is twice as many as the number recommended by the MoH. Distribution of the hospitals and level IV primary care facilities was fairly even across Uganda although Central Uganda had higher hospital density than the other geographical zones. All districts in Uganda had at least a hospital or a level IV primary care facility. A third (32%) of the districts in Uganda did not have a hospital. However most of the districts that did not have a hospital were newly created and also had populations way below the 500,000 target that is required by policy in Uganda to have a hospital.

1.2. Bed density

Hospital beds are used to indicate the availability of inpatient services. There is currently no global norm for the density of hospital beds in relation to total population. In 2014, Uganda had 9 hospital/HC IV beds per 10,000 population or one hospital/HC IV bed for 1,065 people which is similar to the average in the African region (10 beds per 10,000 population). About 30% of these beds were in HC IV, 50% in General hospital, 13% in regional hospitals and 7% in national referral hospitals. Eastern Uganda had a substantially lower bed density (6 per 10,000 population) than other geographical zones (9 – 12 per 10,000 population). Bed density in Uganda could be higher than shown because some facilities were not visited were not visited during the census survey.

1.3. OPD utilization rates

There was a fairly high utilization of hospitals/HC IV outpatient services. On average, there were about one million OPD visits in hospitals/HC IVs per month. About a third of the OPD visits were paediatric visits. Zonal differences in hospital/HC IV visits were fairly large, with utilisation rates lower in the Northern Region than in the other geographical zones. One of the reasons for the low utilisation rates in Northern Uganda could be difficulties in physical access in Northern Uganda due to decades of civil war that destroyed the public transport infrastructure. Zonal differences in per capita utilisation was modest (ranging from 0.13 – 0.29 hospital/HC IV OPD visits per persons per year). There is possibility of a considerable

underestimate of the number of outpatient visits due to missing data for the national referral hospitals and hospitals/HC IVs that were not visited.

1.4. Referral services

Most hospitals and level IV primary care facilities (96%) indicated that they referred patients to the next higher level. The estimated average travel time between a referring facility and the next higher level referral facility was fairly modest. Half (51%) of the referring hospitals/HC IVs were estimated to be located within one hour of the next higher level referral facility, 37% within 1-2 hours, 5% within 2-3 hours and 7% over three hours away. Using the most common mode of transport, the estimated average travel time between a referring facility and the next higher level referral facility was 77 minutes (median of 50 minutes). Zonal differences in travel time were fairly modest, the average travel time in Northern Uganda was longer than elsewhere (103 minutes; range 15 – 600 minutes, median of 60 minutes). Central Uganda had the shortest travel time (58 minutes; range: 10 – 600 minutes; median of 40 minutes). Seventeen hospitals/HC IVs were excluded from analysis because the estimated travel time they reported were unbelievably low, ranging from 1 – 7 minutes. Close to three quarters of the hospitals/HC IV had a functional ambulance or other vehicle that could be used for emergency transportation of patients. All hospitals/HC IVs that indicated that they did not have an ambulance reported having access to an ambulance from nearby hospitals/HC IVs.

1.5. The availability of non-specialty services

Hospitals and HC IVs were assessed for the availability of 12 non-specialty services. Most hospitals/HC IVs offered only a subset of the 12 non-specialty services that were enquired about during the census. On average 9 (78%) of the 12 services were reported available at the hospitals/HC IV. Only 17% of the hospitals/HC IV had all the 12 non-specialty services that were enquired about. However, several of the services that were enquired about were nearly universally offered. These included paediatrics (98%), TB services (97%), general medical curative services (96%) and maternity services (95%). Physical rehabilitation (36%) and dermatological services (55%) were the least available services in the hospitals/HC IVs. Urban-rural and zonal differences in the availability of specific non-specialty services were generally small but the services were generally more available in urban than in rural areas, and less available in Eastern Uganda than elsewhere.

1.6. The availability of specialty services

The availability of specialty services was assessed based on the presence of 21 services. The assessment was restricted to hospitals as specialty services, by policy, are not expected at level IV primary care facilities in Uganda. For this analysis, it was assumed that Uganda

should have at least one hospital offering each of the specialty services per 500,000 people because the policy recommends that there should be a hospital (regardless of level) for every 500,000 people. This target was met only for gynaecological services. The other specialty services had less than one hospital per 500,000 people. On average, the hospitals reported offering only 5 (22%) of the 21 specialty services that were enquired about. Specialty services least reported available were nuclear medicine (2%), dialysis (6%), oncology (9%) and geriatric medicine (10%). Gynaecology (47%), infectious disease (40%), psychiatry (39%) and orthopaedics (38%) were the most commonly reported specialty services. More specialist services were offered in Central Uganda than elsewhere.

1.7. *The availability of advanced diagnostic and treatment services*

The availability of advanced diagnostic and treatment services was assessed based on the presence of 12 services. As was the case with the assessment of availability of specialty services, assessment of the availability of advanced diagnostic and treatment services was restricted to hospitals only as most of the services were not expected at level IV primary care facilities. Ideally therefore, there should be at least one hospital offering each of the advanced diagnostic services per 500,000 population. This was only true for ultrasound and X-ray services; with 1.6 and 1.5 hospitals offering the services per 500,000 population or one hospital for 318,327 and 327,048 people, respectively. The other services had more than 500,000 people per hospital with the service. Services such as radiotherapy and cardiac catheterization were so rare that there was only one hospital offering the service for 23 million people. Of the 12 advanced diagnostic and treatment services that were enquired about, only one hospital, the national referral hospital, had all of them. On average, only three (24%) of the 12 services were reported available. More advanced diagnostic and treatment services were offered in Central Uganda than elsewhere. Compared to the other geographical zones, Eastern Uganda generally had a lower percentage of hospitals that indicated that they offered each of the advanced diagnostic and treatment services that were enquired about. The services were unavailable in 33 (29%) of the districts. CT-scan was reported available in 10 (9%) of the districts, ECG in 27 (24%), X-ray in 60 (54%), and ultrasound in 77(69%) of the districts.

1.8. *The availability of emergency services*

Emergency services were generally available in almost all the hospitals/HC IVs. In 2014, the density of hospitals/HC IVs offering emergency services was 0.9 per 100,000 population or one hospital offering emergency services per 108,588 people. This is very close to the target of having at least one hospital/HC IV offering emergency service per 100,000 population. Zonal differences in the availability of emergency services were small. Central and Western Uganda had one hospital offering emergency services for 99,782 and 98,374 people,

respectively. The figures in Eastern and Northern Uganda were fairly large, with one hospital for 113,687 people in Eastern Uganda and one hospital for 133,901 in Northern Uganda. Overall, 96% of the hospitals/HC IVs indicated that they offered emergency services. There is a possible underreporting in the national and regional hospitals but these may not have significantly affected the estimates. Five districts (Alebtong, Amuru, Buvuma, Dokolo and Nwoya) indicated that they did not have emergency services. This needs further investigation as emergency services are offered, to varying degrees, in all facility levels in Uganda.

1.9. The availability of blood transfusion services

In Uganda, blood transfusion services are expected to be available in both hospitals and level IV primary care facilities. Given that a level IV primary care facility in Uganda has a target population of 100,000 people, one would expect that, at the minimum, there is a hospital or a HC IV offering blood transfusion services per 100,000 population. Findings of the census survey show that this target was not met. There was only about half the target number of hospitals/HC IVs offering blood transfusion services per 100,000 population or one hospital/HC IV offering blood transfusion services for close to 200,000 people. The density in Eastern Uganda compared to the other geographical zones was lower, with 0.47 hospitals/HC IV offering blood transfusion services per 100,000 population or one hospital/HC IV offering blood transfusion services for 211,496 people. Among the hospitals/HC IV that indicated that they offered blood transfusion services, 44% indicated that they had stock out of blood in the three months that preceded the census. The most common reasons mentioned for stock out were shortage of blood at the regional blood bank (n=56 hospitals/HC IVs (66%)) and lack of transport for going to pick blood from the regional bank(n= 21 hospitals/HC IVs (25%)).

1.10. The availability of laboratory services

The availability of laboratory services was reported by almost all (99%) hospitals/HC IVs. However, the hospitals/HC IVs that indicated that they offered laboratory services reported the availability of only a small number of the laboratory services that were enquired about during the census. For instance, of the 16 laboratory services that were enquired about, only 5% of the hospitals/HC IVs reported offering all of them and 83% reported offering at least half of the services. Malaria smear was the most commonly reported laboratory test, with its availability reported by 97% of the hospitals/HC IVs followed by urine microscopy (94%) and blood test for HIV (91%). Culture and sensitivity was the least available laboratory service, with only 12% of hospitals/HC IVs indicating that they did culture and sensitivity.

2. Quality and safety in hospitals/HC IVs

2.1. Institutional mortality

Maternal mortality ratio (MMR) in hospitals/HC IVs was 133 during 1st July 2011-30th June 2012 and 276 during 1st July 2012 – 30th June 2013. When level IV primary care facilities are excluded from analysis, the MMR in hospitals was 142 during 1st July 2011-30th June 2012 and 341 during 1st July 2012 – 30th June 2013. These ratio are lower than the national average of 360 per 100,000 live births (UN 2013) or 435 per 100,000 live births (UDHS 2011) and suggest that many maternal deaths occur outside of the hospitals/HC IVs. Central Uganda had a lower MMR than the other geographical zones.

Stillbirth rate in hospitals/HC IVs in Uganda was 5.0% during 1st July 2011 – 30th June 2012 and 4.4% during 1st July 2012 – 30th June 2013. When level IV primary care facilities are excluded from analysis, the stillbirth rate in hospitals was 5.6% during 1st July 2011 – 30th June 2012 and 5.4% during 1st July 2012 – 30th June 2013. These rates are higher than the average in the African region (2.8%). Northern Uganda had a slightly higher stillbirth rate than the other geographical zones.

A neonatal death refers to a death during the first 28 days of life (0-27 days). Modelled estimates by WHO suggest that the neonatal mortality rate (NNMR) in Uganda in 2013 was 43.8 per 1,000 live births which is higher than the average in the African region (30.5 per 1,000 live births). According to the SARA-hospital census, there were 1805 neonatal deaths during 1st July 2011 – 30 June 2012 and 2552 neonatal deaths during 1st July 2012 – 30th June 2013. These represent NNMR of 4 per 1,000 live births during 1st July 2011 – 30 June 2012 and 11 per 1,000 live births during 1st July 2012 – 30th June 2013, respectively. When HCIVs are excluded from analysis, the NNMR remained almost unchanged. It was 3 per 1,000 live births during 1st July 2011 – 30 June 2012 and 10 per 1,000 live births during 1st July 2012 – 30th June 2013. These rates are lower than the national average or the average in the African region – suggesting that many neonatal deaths occur outside of the hospitals/level IV primary care facilities. Northern Uganda had a higher NNMR than other geographical zones.

2.2. Caesarean section rates

Caesarean section rate is a measure of quality of maternal care. The caesarean section rate in hospitals/HC IVs in Uganda was substantially higher than the 10-15% level established by the International Health Care Community. It was 30% during 1st July 2011-30th June 2012 and 25% during 1st July 2012 – 30th June 2013. The rate was even higher when level IV primary care facilities are excluded from analysis; it was 39% during 1st July 2011-30th June 2012 and 34% during 1st July 2012 – 30th June 2013. Because there is currently no global norm for caesarean section rates at hospital level, it is difficult to draw conclusion on whether or not hospitals/HC IVs in Uganda are over performing caesarean sections. The cut-

off points for caesarean section rates considered by the International Health Care Community are the rates at population level. Because most complicated cases end up in hospitals/HC IVs, caesarean section rates in hospitals/HC IVs are expected to be higher than the rates at population level. Therefore, these findings are only a benchmark for future estimates.

2.3. Capacity for infection prevention and control

Generally, the capacity for infection prevention and control in hospitals/HC IVs in Uganda was good. Using a predefined criterion, none of the hospitals/HC IVs was classified as having very poor capacity for infection prevention and control. Three quarters of the hospitals/HC IVs had high or very high capacity for infection prevention and control.

2.4. Systems and practices for ensuring quality health care

The availability of systems and practices for ensuring delivery of quality health care was assessed based on the presence of eight items, namely: participation in the accreditation process, carrying routine quality assurance, having quality assurance committee, having quality monitoring indicators, having systems for obtaining clients' opinions or receiving feedback about the health facility or its services, conducting case reviews, and conducting death reviews. The hospitals/HC IVs reported the availability of only a subset of the items that were enquired about. For instance, only one in five hospitals/HC IVs (19%) reported the availability of all 8 items that were enquired about during the census. On average three quarters (75%) of the items were reported available. Carrying routine quality assurance was the most commonly reported item (91%) followed by having a quality assurance committee (86%). Participation in an accreditation process was the least reported item (38%). Using predefined criteria, three quarters of the hospitals/HC IVs (74%) were classified as having very good capacity to ensure delivery of quality health care, 12% were classified as having moderate capacity, 10% as having good capacity and 4% as having very poor capacity. When level IV primary care facilities were excluded from the analysis, the great majority of the hospitals (88%) were classified as having very good capacity and the rest classified as having very poor (3%), poor (5%) or moderate capacity (4%). All the national, regional and specialty hospitals were classified as having very good capacity. All hospitals in Northern Uganda compared to 91% in Western Uganda, 87% in Central Uganda and 79% in Eastern Uganda were classified as having very good capacity.

2.5. Systems and practices for ensuring safety in hospitals/HC IVs

The availability of systems/practices to ensure safety of staff and service users was assessed based on the presence of 9 tracer items that included a policy on no-smoking in the hospital

environment, a written fire safety plan, a written emergency response plan, a committee for infection prevention and control, guidelines for infection prevention and for isolating patients, and availability of an isolation ward for contagious illnesses such as TB and cholera. Most hospitals/HC IVs in Uganda had only a subset of the tracer items. Of the nine items that were enquired about during the census, only 6% of the hospitals/HC IV reported the availability of all of them. On average, 6(65%) of the 9 items were available. The availability of an occupational health plan and an isolation ward for TB and other contagious illnesses was universal. In contrast, only 16% of the hospitals/HC IVs had a fire safety plan and 19% had an emergency response plan. Central Uganda had more of the systems/practices than the other geographical zones. Capacity for ensuring safety of staff and service users was generally good, especially in the hospitals. Using predefined criteria, 16% of the hospitals/HC IVs were classified as having very good capacity, 38% as having good capacity, 42% as having moderate capacity, and 4% as poor capacity. None of the hospitals/HC IVs was classified as having very poor capacity.

2.6. Readiness to offer emergency services

Readiness or capacity to offer emergency services was assessed among hospitals that indicated that they offered emergency services. The assessment was based on the presence of items that were considered to be particularly important for offering a 24 hour emergency service such as a qualified health worker, an ambulance and a driver, emergency guidelines, a blood bank, a laboratory, and electricity in the emergency area. Most of the hospitals/HC IVs had only a subset of the items for offering emergency services. All hospitals/HC IVs reported having a key staff (a doctor, clinical officer, or a nurse) within an easy reach. A doctor was reported to be onsite 24 hours a day in 64% of hospitals/HC IVs. In hospitals that indicated that they did not have a doctor onsite 24 hours a day, 62% indicated that they had a doctor on call or within an easy reach whenever needed. Capacity to offer emergency services based on predefined criteria was generally poor, with only 5% and 25% of the hospitals/HC IVs classified as having very good and good capacity, respectively. The rest of the hospitals/HC IVs were classified as having moderate (38%), poor (35%) and very poor capacity (5%). The capacity was poorer in Eastern Uganda than elsewhere.

2.7. Readiness to offer delivery services

Delivery services were reported available by nearly all the hospitals/HC IVs (98%). Readiness in facilities that indicated that they offered delivery services was assessed based on the presence of 67 items that were considered to be particularly important for offering the services and that were enquired about during the census. These included the availability of a 24 hour delivery service, presence of a skilled staff to conduct deliveries and neonatal

resuscitation 24 hours a day 7 days a week, guidelines, delivery equipment, items for infection prevention and life-saving priority medicines for mothers and children. The census survey results show that Hospitals/HC IVs had only a subset of the items that were enquired about, with none having all the items and 72% having at least half of the items. On average, only 39 (58%) of the items were found in the hospitals/HC IVs. Presence of a skilled staff to provide delivery services 24 hours a day, 7 days a week was the most commonly available item, with almost all hospitals/HC IVs (99%) having a skilled staff; followed by a delivery bed (98%), sharps container (97%) and disposable latex gloves (97%). The least available items were: national guidelines for basic emergency obstetric care (BEmOC (7%)), betamethasone (13%), pulse oximeter (13%), comprehensive emergency obstetric care (CEmOC (15%)), forceps for high pelvis application (17%), and integrated management of pregnancy and childbirth (IMPAC (18%)).

To assess capacity to offer delivery services, the availability of the 7 signal functions: parenteral administration of antibiotics, oxytocin and anticonvulsant, assisted vaginal delivery, manual removal of placenta, removal of retained products of conception and neonatal resuscitation were added to the 67 items for offering delivery services. Assessment of capacity was therefore based on 74 items. Hospitals/HC IV that had 15 or less of the items were classified as having very poor capacity, 16-30 as having poor capacity, 31-45 as moderate capacity, 46-60 as having good capacity, and 61-74 as having very good capacity. Generally, capacity of hospitals/HC IVs to offer delivery services was modest. Only 5% were classified as having very good capacity but 44% and 46% were classified as having good and moderate capacity, respectively. None was classified as having very poor capacity and 4% were classified as having poor capacity. The capacity was poorer in Eastern Uganda than elsewhere.

2.8. Practices and capacity to offer other inpatients services

Generally, there were important gaps and weaknesses in the practices and capacity to offer other inpatient services in hospitals/HC IVs in Uganda. On the various wards in each hospital/HC IV, five patient-files were randomly picked and checked during the census survey for recording of the following key events in patient management: physician admission notes, physical examination notes, patient progress notes, prescription of medicines, time patients should receive medicines, daily body temperature, and laboratory tests. In all the wards, hospitals/HC IVs had many patient-files that lacked records of key events in patient management. For instance, in all the five patient files that were reviewed on the surgical ward in each hospital/HC IV, only 48% of the hospitals/HC IVs had all five patient files with physician admission notes, while in 25% of the hospitals, no physician notes were seen at all in all the five patient files reviewed. Physical examination notes were available in all the five forms in 49% of the hospitals/HC IVs and in none of them in 18% of the hospitals/HC IVs; record of which medicines the patient should receive was available in all the five files in 55% of the hospitals/HC IVs and in none of them in 12% of them; and

record of daily temperature measurement was available in all the five files in only 30% of the hospitals/HC IV and in none of them in up to half (49%) of the hospitals/HC IVs.

On average, hospitals/HC IVs had only 41-43% of the items that were considered to be particularly important for offering services on the various wards. Using predefined criteria, the percentage of hospitals/HC IVs with wards that were classified as having good or very good capacity to offer services were: surgical ward (13%), post-delivery ward (13%), and paediatric ward (19%).

2.9. The availability of medicines

The availability of medicines was assessed based on the presence of 185 drugs and commodities that were considered to be particularly important for treating the common disease conditions in Uganda. Generally, hospitals/HC IVs had severe shortage of medicines. None of the hospitals/HC IVs had all the medicines that were enquired about and only one in five hospitals/HC IVs (22%) had at least half of the medicines. only 81 (44%) of the medicines were seen or reported available in the hospitals/HC IVs. As is the case with most services and items for offering the services, the availability of medicines in Eastern Uganda was lower compared to other geographical zones.

2.10. Readiness to offer laboratory services

Readiness to offer laboratory services was assessed based on the presence of items such as functioning equipment, rapid test kits, guidelines, and staff that were considered to be particularly important for offering the services. Hospitals/HC IVs had only a subset of the items that were enquired about, with 35% of them having at least half of the items of equipment. On average, 43% of the items of equipment were found in the hospitals/HC IVs. Capacity to offer laboratory services in Uganda was modest. Using predefined criteria, 36% of the hospitals/HC IVs were classified as having good or very good capacity and slightly over half (53%) were classified as having moderate capacity to offer laboratory services. 11% were classified as having poor or very poor capacity. Capacity to offer laboratory services in Eastern Uganda was poorer than in the other geographical zones. A major limitation of the assessment of capacity to offer laboratory services was the assumption that all facilities with laboratory services offered all the services that were enquired. As a matter of fact, some of the advanced tests and therefore items for offering them are not expected at general hospitals and level IV primary care facilities. However in terms of access, the analysis provides a very good assessment of access to laboratory services in Uganda.

3. Health system

3.1. Systems and structures for governance

Most hospitals/HC IVs had only a subset of systems and structures for governance and management. Of the 11 systems and structures that were enquired about, only 15% of the hospitals/HC IVs reported the availability of all of them. On average, the hospitals/HC IVs reported the availability of two thirds (69%) of the systems and structures. The availability of a hospitals/HC IV management committee was the most commonly reported (94%). The least reported governance and management system or structure was a finance (37%) and procurement committee (37%). Capacity for governance and management of the hospitals/HC IVs was fairly modest. Using predefined criteria, 28% of the hospitals/HC IV were classified as having very good capacity and 29% as having good capacity. The rest of the hospitals/HC IVs were classified as having moderate (23%), poor (10%) and very poor capacity (9%).

4. Efficiency:

4.1. *Average length of stay*

The average length of stay in the hospitals and level IV primary care facilities was 10 days with a median of 4 days. Patients were more likely to stay longer in hospitals in Western Uganda than elsewhere.

4.2. Bed occupancy rate

Bed occupancy rate is a measure of demand for hospital beds and hence used to gauge the balance between demands for health care and number of beds. Calculation of bed occupancy rate was based on the actual number of beds and actual number of patients who spent the census night on the ward. Findings on the bed occupancy rate suggest that on average, there were more than enough beds for patients in the hospitals/HC IVs on the night of the census. For instance, the bed occupancy rate was 69% in paediatric ward, 65% in maternity ward, and 8% in surgical ward. These findings are not however in concordance with the severe shortage of inpatient beds in hospitals/HC IVs that are often seen or reported in the media – which may suggest a possible undercounting or underreporting of the number of patients on the wards.

Summary of key findings

1. Access to services in hospitals and level IV primary care facilities

INDICATOR	VALUE	COMMENT
1. Facility density:		▪ Target met. May consider setting a new target
▪ Number of hospitals/HC IV per 100,000 population	1	▪ Target surpassed: Twice as many hospitals as recommended by MoH. However, physical access still remains a challenge for rural communities
▪ Number of hospitals per 500,000 population	2	
2. Bed density		▪ No global norm for bed density. But bed density in Uganda is similar to the average in the African region (10 beds/10,000 population)
▪ Number of hospitals/HC IV beds per 10,000 population	9	
3. Service utilisation rates		
▪ OPD utilisation rate (per 10,000 population per year)	2,000	
▪ Inpatient admission rate (per 10,000 population per year	630	
4. Referral services	Mean: 77	▪ The estimated average travel time between a referring facility and the next higher level referral facility was fairly modest
▪ Estimated travel time between a referring facility and the next higher level facility (in minutes)	Median: 50 range: 10-600	
5. Ambulance services		▪ Ambulances are critical for transportation of emergencies. It is vitally important that all hospitals/HC IVs have an ambulance
▪ % of hospitals/HC IVs with functional ambulance	72%	
▪ Had no ambulance but had access to one	100%	
6. Availability of non-specialty services	▪ There were fewer facilities offering each of the non-specialty services than the target of one facility per 100,000 population.	
▪ Number of hospitals/HC IVs offering non-specialty services per 100,000 population	▪ However, several services were nearly universally offered e.g. Paediatrics (98%), TB services (97%), general medical curative services (96%) and obstetrics (95%)	
▪ % of hospitals/HC IVs with non-specialty services		
7. Availability of specialty services	▪ At the minimum, there should be one hospital offering a specialty services per 500,000 people in Uganda. This was only true for gynaecological services, with one hospital offering the service per 500,000 population. Most commonly available specialty services: Gynaecology (47%), infectious disease (40%), psychiatry (39%) and orthopaedics (38%). Least commonly available specialty services: nuclear medicine (2%), dialysis (6%), oncology (9%) and geriatric medicine (10%).	
▪ Number of hospitals offering specialty medical and surgical services per 500,000 population		
▪ % of hospitals that indicated they offered each of the specialty services		
8. Availability of Advanced diagnostic & treatment services	▪ Most of the advanced diagnostic and treatment services were very rare in hospitals in Uganda. Ideally, there should be at least one hospital offering advanced diagnostic and treatment services per 500,000 population. This was only true for ultrasound and X-ray services; with one hospital offering the services for 318,327 and 327,048 people, respectively	
▪ Number of hospitals with advanced diagnostic and treatment services per 500,000 population		
▪ % with advanced diagnostic & treatment services		
9. Availability of emergency services		▪ Emergency services were generally available.
▪ Number of hospitals/HC IVs offering emergency services per 100,000 population	▪ 0.9	
▪ % of hospitals/HC IVs with emergency services	▪ 96%	

2. Quality and safety in hospitals and level IV primary care facilities

INDICATOR	VALUE	COMMENT
1. Maternal mortality ratio (MMR)/ 100,000 live births		▪ The MMR ratio was slightly lower than the national average (360 per 100,000 live births (UN 2013) & 435 per 100,000 live births (UDHS 2011)), and the average in Africa (500 per 100,000 live births). Possible underestimate of the MMR due to missing data for the national referral hospital.
▪ During 1st July 2011-30th June 2012	▪ 133/100,000LB	
▪ During 1st July 2012 – 30th June 2013	▪ 276/100,000LB	
***2. Stillbirth* rate (%)**		▪ Stillbirth rate was higher than the average in African (2.8%). In absolute numbers, there were 8,182 stillbirths during 1st July 2011-30th June 2012 and 7,750 stillbirths during 1st July 2012 – 30th June 2013. This is very high.
▪ During 1st July 2011-30th June 2012	▪ 5.0%	
▪ During 1st July 2012 – 30th June 2013	▪ 4.4%	
3. Neonatal mortality rate (NMR)/ 1,000 live births		▪ The NMR was lower than the national average (43.8 per 1,000 live births) and the average in Africa (30.5 per 1,000 live births) in 2013. In absolute numbers, there were 1,803 neonatal deaths during 1st July 2011-30th June 2012 and 2,552 neonatal deaths during 1st July 2012 – 30th June 2013. This is very high
▪ During 1st July 2011-30th June 2012	▪ 4/1,000LB	
▪ During 1st July 2012 – 30th June 2013	▪ 11/1,000LB	
4. The Average length of stay (in days)	▪ 10 days ▪ Median: 4 days	
5. Caesarean section rate (%)		▪ Currently no global norm for caesarean section rate in hospitals. At population level, the international healthcare community has considered a rate of 10% - 15% as acceptable. The rate at hospitals may be higher because hospitals handle complicated deliveries. Difficult to know if 25%-30% is high or low, but sets a baseline for future measurements.
▪ During 1st July 2011-30th June 2012	▪ 30%	
▪ During 1st July 2012 – 30th June 2013	▪ 25%	
6. Capacity for infection prevention and control : ▪ % of hospitals/HC IVs with good or very good capacity for infection prevention and control	▪ Good: 54% ▪ Very good: 22%	▪ Capacity for infection prevention and control was generally good, with about three quarters of the hospitals/HC IVs classified as having high or very high capacity for infection prevention and control.
7. Capacity to ensure delivery of quality health care ▪ % of hospitals/HC IVs with good or very good capacity	▪ Good: 0% ▪ Very good: 74%	▪ Most hospitals/HC IVs had only a subset of the systems/practices for ensuring delivery of quality health care. Capacity to ensure delivery of quality health services was modest
***8. Capacity to ensure* safety of staff & service users** ▪ % of hospitals/HC IVs with good or very good capacity to ensure safety of staff and service users	▪ Good: 38% ▪ Very good: 16%	▪ Most hospitals/HC IVs had only a subset of the systems/practices necessary for ensuring delivery of quality health care. Capacity to ensure safety of staff and service users was modest.
9. Capacity to offer emergency services ▪ % of hospitals/HC IV with good or very good capacity	▪ Good: 17% ▪ Very good: 5%	▪ Capacity to offer emergency services was generally poor.
10. Capacity to offer delivery services ▪ % of hospitals/HC IV with good or very good capacity to offer delivery services	▪ Good: 44% ▪ Very good: 5%	▪ Capacity to offer delivery services was modest
11. Availability of medicines ▪ % of hospitals/HC IV with at least half of the medicines	▪ National – 22% ▪ Urban – 41% ▪ Rural – 13% ▪ Public – 13% ▪ Private – 43%	▪ On average, only 81 of the 185 medicines (44%) were seen or reported available in the hospitals/HC IVs

3. Health systems

INDICATOR	VALUE	COMMENT
1. Capacity for governance		
% of hospitals with good or very good capacity for governance	▪ Good: 28% ▪ Very good: 29%	▪ Hospitals/HC IVs only had a subset of the items necessary for ensuring good governance of the facilities. Capacity for governance was therefore modest
2. Health workforce		
2.1. % of approved positions that have been filled		▪ The target for Uganda is to have all of the approved staff positions filled. This target was nearly met
▪ Approved positions filled (all staff categories)	▪ 97%	
▪ Approved positions filled (doctors)	▪ 81%	▪ No national target for density of health workers. WHO recommends a minimum threshold of 23 doctors, nurses and midwives per 10,000 population for delivering essential maternal and child health services. However, whether this threshold applies for each of the key staff category is not clear; but ideally, there should be more nurses than clinical officers and more clinical officers than doctors.
▪ Approved positions filled (clinical officers)	▪ 94%	
▪ Approved positions filled (nurses/midwives)	▪ 91%	
2.2. Density of key health workers		
▪ Number of people per doctor	▪ 23,191	
▪ Number of people per clinical officer	▪ 28,501	
▪ Number of people per nurse/midwife	▪ 4,124	
3. *Health* care financing		Biggest share of funds for hospitals and level IV primary care facilities comes from the government and donors
3.1. Reported sources of funding		
▪ Government	28.5%	
▪ Donors	28%	
▪ User fees	16%	
▪ Insurance	13.6%	
▪ Community programs	13.6%	
▪ Others	0.1%	

INTRODUCTION

1.1. Background

The assessment of service availability and readiness (SARA) reflects the ability of a facility to provide general and specific services at minimum standards (Ref). It provides point in time estimates of the availability of services and capacity of the countries to provide the services. However, as countries conduct many SARA surveys using the same tool and indicators, comparison over time will become a key feature of the SARA-data analysis.

The SARA survey involves visits to health facilities to collect data, through key-informant interviews, on the availability of services and on the capacity of facilities to provide the services. The survey can be carried out either as a sample survey or as a census. A sample survey involves visits to a few of the facilities in a country while a census survey involves visit to all facilities which may be all facilities of the same type or all facilities of different types. The choice between the two survey methodologies depends on a number of factors that include the availability of resources and what the survey aims to achieve.

This report presents findings of SARA census survey in Hospitals and level IV primary care facilities (also known as Health Centre IV (HC IV)) in Uganda. It examines the reported availability of services through the lens of health care access, and the observed and/or reported availability of items, systems and practices for offering the services through the lens of quality of care. Where appropriate, methods of analysis, key assumptions and justifications, and key limitations are discussed under each section.

The first part of the report examines access to services at hospitals and level IV primary care facilities. Assessment of access was based on the density of hospitals/HC IVs and on the proportion of hospitals/HC IVs that indicated they offered the specific services that were enquired about during the census. Firstly, it examines the density of the hospitals/HC IVs per 100,000 population, and density of hospitals per 500,000 population based on the national targets. Districts in Uganda that did not have a hospital are indicated on a map. Bed density, outpatient utilisation rates, and inpatient admissions rates are then presented in section 1.2 – 1.4, respectively. The remaining sections (1.5 – 1.12) examined access to specific services i.e. specific service density and percentage of hospitals/HC IVs with service. Specifically, it examined the access to referral services, ambulance services, non-specialty services, specialty services, advanced diagnostic and treatment services, emergency services, blood transfusion services, and laboratory services. Where appropriate, maps of districts that indicated they did not have a specific service are presented.

The second part of the report examines the capacity of hospitals and level IV primary care facilities to offer quality and safe health care. Firstly, it presents key facility statistics: maternal mortality ratio, stillbirth rate, neonatal mortality rate, and caesarean section rate

in hospitals and level IV primary care facilities in Uganda. The availability of items and capacity for offering specific services are then presented.

Capacity of the health system related indicators are presented in the third part of the report. These include the availability of items and capacity for governance, health workforce, and health care financing. However, data for doing most of the health system analysis were limited or unusable. The full extent of the health system capacity could therefore not be satisfactorily examined.

The fourth and last part of the report attempted to examine health system efficiency but data were again limited and unusable. Analysis of some aspects of health system efficiency, using the data envelopment analysis, is currently being undertaken by a team of health economists in Uganda. This involves examination of some key outputs in relation to selected inputs.

In most cases, the report presents both the national picture and disaggregated results by geographical zone, facility level, public-private ownership, and urban-rural location.

1.2. Understanding delivery of health services in Uganda

Health care services in Uganda are delivered by both public sector (government) and private entities that include private-not-for-profit (PNFP) and private-for-profit (PFP) organisations as well as complementary health service providers such as the traditional medicine providers. The public health facilities make up 55% of the total health care facilities in Uganda, while PNFP and PFP make up 16% and 29%, respectively. Nearly all (90%) of the private-for-profit facilities are located in one district – Kampala district which also hosts Uganda's capital city.

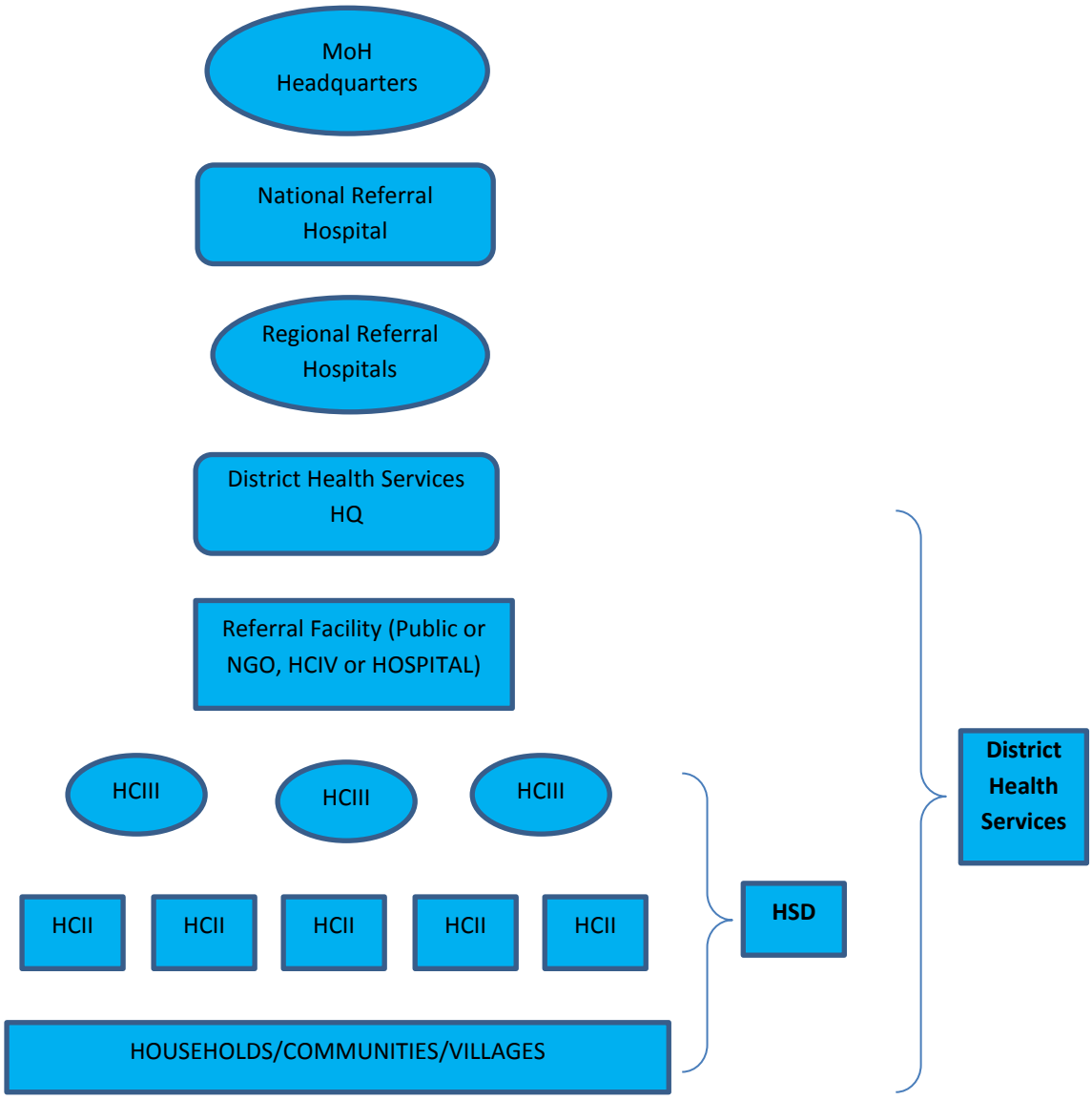
In Uganda's health service delivery structure, the national level stewardship functions are performed by the Ministry of Health (MoH). In the public sector, health services are delivered through the national referral hospitals, regional referral hospitals and district health services. The national referral hospitals are autonomous and have a target population of 10 million people. They provide referral services for the regional and general hospitals across the country. National referral hospitals are expected to offer highly specialised medical and surgical services, advanced diagnostic services, advanced research and training for medical doctors, nurses and paramedical officers such as orthopaedic officers and laboratory technologists.

Regional hospitals are located in each of the 14 health zones and have a target population of 2 million people. They provide referral services and supportive supervision to the district-level hospitals within each health zone. Services expected at the regional hospitals include

specialised medical and surgical care, basic research, and training of nurses and paramedical officers.

The district-level health service includes the district health management team, general hospitals and an array of primary care facilities (also known as health centres (HCs)). The district health service is under a District Health Officer who is appointed by and accountable to the district local government. Because the decentralized system of governance adopted in 1995 devolved most functions and powers to districts, the district health services are administratively independent of regional hospitals and report directly to the MoH.

Figure 1: The health system levels in Uganda



A general hospital in Uganda has a target population of 500,000 people. It is expected to provide preventive and general medical and surgical services, with limited specialist services.

Uganda has three levels of primary care facilities: level II (lower-level primary care facility), III (mid-level primary care facility) and IV (higher-level primary care facility) all focusing mainly on prevention and treatment of infectious illnesses. A level II primary care facility is the lowest level of formal health care delivery. It is mostly staffed by nurse aides and qualified nurses. A level III primary care facility has provisions for basic laboratory services, maternity care, and inpatient care (often for onward referral). It is usually staffed by nurse aides, qualified nurses and clinical officers (physician assistants). A level IV primary care facility is the level immediately below a district hospital and has a target population of 100,000 people. It has provisions for an operating theatre, in-patient and laboratory services, and is a referral facility for 20-30 level II and III primary care facilities under its jurisdiction. A level IV primary care facility is staffed by nurse aides, qualified nurses, clinical officers and doctors, although the majority does not have doctors.

Uganda is in the process of creating a community hospital which is a level between a general hospital and a level IV primary care facility. A community hospital is expected to provide services similar to those provided at general hospitals but closer to the communities.

The organisational structure of the private health services in Uganda is not as elaborate as that of the public sector. Their level or amount of services they provide is also often not as clear as it is in the public sector. Private-not-for-profit health facilities (often faith-based) work very closely with the public sector and are heavily subsidized by the government. Although they are autonomous, they are often supervised by and report to the district health services.

1.3. Uganda's Population

According to population and housing census (UBOS 2014), Uganda had close to 35 million people. The population in the districts ranged from 53,406 to 2,007,700; with a median of 243,876. On average, a district in Uganda had 308,467 people.

Table 1: The organisational structure and functions of government health services in Uganda

Level (location)	Total (public facilities)	Total (private-not-for-profit facilities)	Total (private-for-profit facilities)	Target Population (public facilities	Function (government facilities)
Village health team (in each village)	–	–	–	1,000	Community based preventive and promotive services.
Lower level (level II) primary care facility (Parish level)	1662	496	1391	5,000	Provides preventive, promotive and outpatient curative services, and emergency maternal deliveries.
Mid-level (level III) primary care facility (Sub-County level)	868	251	69	20,000	Provides all the above services. In addition, it provides inpatient, maternity and laboratory services.
Higher level (level IV) primary care facility (County level)	166	14	8	100,000	Provides all the above services. In addition, it provides emergency surgery, blood transfusion, laboratory services. Supervises levels III and II.
General hospital (District level)	50	62	21	500, 000	District level referral facility. Provides all the above services but more comprehensive than PCF IV. Services provided include: Medicine, Surgery, Obstetrics and Gynaecology, Paediatrics, Family medicine, X-ray (plane and mobile)
The district health services (District)	–	–	–	500,000	Stewardship of district health services. Supervises all the above facilities
Regional hospitals	12	–	–	2 million	Provides all services provided by a district level general hospital. In addition, it provides specialised services (Medicine, Surgery, Obstetrics and Gynaecology, Paediatrics, ENT, Ophthalmology, Orthopaedics, Anaesthesia, Pathology, Psychiatry, Dentistry, and Community Medicine. Regional hospitals have specialists, train nurses, have a blood bank, do basic and applied research and provide engineering services to facilities in its health zone.
National hospitals	3	–	–	10 million	Provides all services provided by regional hospitals but more comprehensive and advanced than regional hospital. For instance, national hospitals offer advanced diagnostic services such as MRI and CT scans; they have super-specialists, and train doctors, pharmacists, dental surgeons, and graduate nurses) and carry out advanced research.
MOH	–	–	–	Entire country	Stewardship: policy formulation, setting standards, quality assurance, resource mobilization, capacity building, research coordination, monitoring & evaluation, nationally coordinated services such as epidemic control.

1.4. METHODOLOGY

The census was a collaborative effort between Uganda Ministry of Health, the World Health Organization, The African Development Bank, and Makerere University College of Health Sciences. Funds for the survey were received from the African Development Bank under the *"improvement of health services delivery in Mulago hospital and the city of Kampala project*". The MoH was responsible for the overall coordination of the census survey. It coordinated and provided permission for collection and analysis of data. The MoH is expected to coordinate dissemination of the results and promote use of the findings for policy and planning. Leadership and oversight throughout the process of the census survey, from adaptation of the questionnaire to analysis of data and writing of the survey report was provided by a survey coordinating group that was led by the MoH and comprised the Makerere University College of Health Sciences and key collaborating partners. The survey coordinating group is expected to continue to provide leadership for the dissemination and promotion of use of the results. As the implementing agency, the Makerere University College of Health Sciences was responsible for collecting, processing, and analysing data and writing the survey report. Throughout the process of the census survey, technical support was received from the World Health Organization.

Using a modular approach, a six-part tool with structured questions and pre-coded responses was developed to collect data, namely: 1) a questionnaire for overview of services, governance, management systems, human resources, and capacity, 2) a questionnaire for emergency services, procedures, and surgical services, 3) a questionnaire for delivery and inpatient services, 4) a questionnaire for blood transfusion, diagnostics, and pharmaceutical commodities, 5) a questionnaire for infrastructure and support services, and 6) a questionnaire for facility information system and service statistics. The tools were developed by the World Health Organization and adapted to the country context by the survey coordinating team. The questions were tested in a pilot study in six health facilities: at the national referral hospital, one regional referral hospital, one public general hospital, one private-not-for-profit general hospital, one private-for-profit general hospital, and one level IV primary care facility. The questions were adjusted in light of the experience obtained during the pilot study.

The data were collected through key-informant interviews by trained data collectors using both paper questionnaire and mobile electronic devices that had CSPro application. Typically, data were collected on the availability of health care services such as non-specialty medical and surgical services, specialty medical and surgical services, emergency, maternity, laboratory and advanced diagnostic and treatment services. The availability of specific items that are particularly important for offering each of the health care services were also enquired about during the census and this included guidelines, health care staff, equipment, medicines, laboratory diagnostic services, and items for infection prevention and control.

Data were also collected on the health system functions such as the health facility governance, health care financing, and health workforce. Data on hospital reporting systems and review of records of vital statistics such as number of outpatient visits, number of inpatient admissions, number of beds, average length of stay, number of deliveries, number caesarean sections, and number of deaths (stillbirths, maternal and neonatal deaths) also formed a key component of the census survey.

The aim was to visit all the 152 hospitals and 193 level IV primary care facilities in Uganda. In practice however, 147 hospitals and 188 level IV primary care facilities were visited. Reasons for not visiting the other 10 hospitals/HC IVs were: not being granted permission to visit the military hospitals/HC IVs (n=6), inaccessibility due to floods (n=1), hospitals/HC IVs being under construction or under renovation (n=3).

Data from the field were received and reviewed by the data manager. The data were reviewed for completeness and erroneous entries such as typos, missing data, inconsistency and out of range entries. Where possible, the responsible field teams were contacted to correct any errors, otherwise data with errors were treated as missing data during analysis. Data from the electronic devices were consolidated into one database and backed up on a memory stick.

A descriptive analysis was done in STATA version 11.0. A detailed statistical analysis plan with inputs from key stakeholders (heads of program from the MoH, data analysts, selected hospitals, and representatives of key partners) was developed before data analysis began. Where appropriate, methods of analysis, key assumptions or justifications, and key limitations have been discussed under each section. Generally, categorical variables were summarised as frequencies and proportions while continuous variables were summarised by the mean if normally distributed or median (IQR) if the distribution was skewed. Where categorical variables had some categories with low frequency, categories were combined for analysis where appropriate. As much as possible, the results were disaggregated by geographical zone, facility type, public-private ownership, and urban-rural location.

Findings

1. Access to hospitals and level IV primary care facilities

1.1. The availability of hospitals and Level IV primary care facilities

Key Findings:

- The target for Uganda is to have at least a hospital or a level IV primary care facility per 100,000 people. This target was met i.e. in 2014, there were 147 hospitals and 188 level IV primary care facilities in Uganda – representing about one hospital/HC IV for 100,000 people
- There were considerably more hospitals than recommended by MoH: When level IV primary care facilities are excluded, the target in Uganda is to have one hospital for 500,000 people. In 2014, Uganda had two hospitals for 500,000 people – twice as many as the number recommended by the MoH
- The distribution of hospitals and level IV primary care facilities was fairly even across Uganda although Central Uganda had higher hospital density than the other geographical zone.
- All districts in Uganda had at least a hospital or a level IV primary care facility
- A third (32%) of the districts in Uganda did not have a hospital. However most of them were newly created and also had populations way below the 500,000 target required to have a hospital

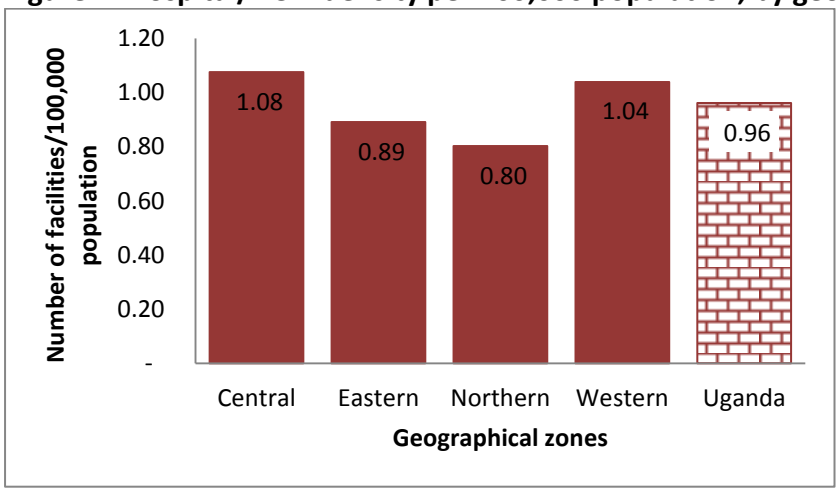
The target population of a level IV primary care facility in Uganda is 100,000 people while that of a general or district hospital is 500,000 people. A regional and national referral hospital has a target population of 2 million and 10 million people, respectively. This means that, at the minimum, there should be a level IV primary care facility or a hospital per 100,000 people. When level IV primary care facilities are excluded, there should, at the minimum, be one hospital per 500,000 people.

Table 2: Absolute number of hospitals and level IV primary care facilities, by key stratifiers

	National referral hospitals	Regional referral hospitals	General hospitals	Specialty hospitals	Level IV primary care facilities	Total
Geographical zone						
Central Uganda	2	3	47	2	49	103
Eastern Uganda	0	3	28	2	48	81
Northern Uganda	0	4	23		31	58
Western Uganda	0	4	27	2	60	93
Ownership						
Public	2	14	47	0	169	232
Private	0	0	78	6	19	103
Location						
Urban	2	14	49	6	35	106
Peri-Urban	0	0	19	0	24	43
Rural	0	0	57	0	129	189
Total	**2**	**14**	**125**	**6**	**188**	**335**

In 2014, Uganda had 147 hospitals and 188 level IV primary care facilities (Table 2). When put together, this represents an average of about one hospital/level IV primary care facility per 100,000 population (Figure 2) – thus meeting the target of one hospital or level IV primary care facility per 100,000 population that has been recommended by the Ministry of Health.

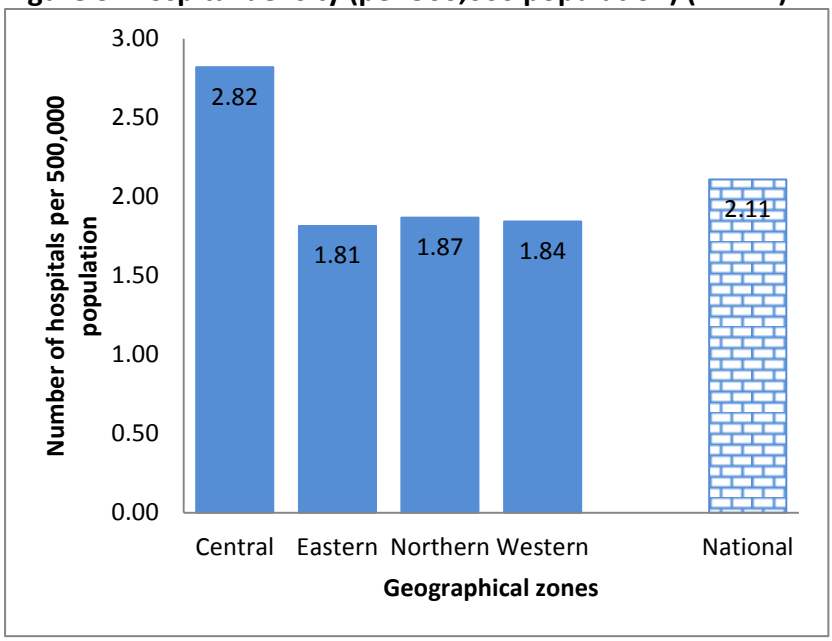
Figure 2: Hospital/HCIV density per 100,000 population, by geographical zone



However, when level IV primary care facilities are excluded, Uganda had two hospitals per 500,000 population which is twice as many as the number recommended by the Ministry of Health (Figure 3). The Density in Central region was higher than in the other geographical zones. It is important to note 10 hospitals and 17 level IV primary care facilities were not visited during the census and therefore not included in the calculation of the density. Including them however does not significantly change the facility density, with the density being 1.0 per 100,000 population if hospitals and level IV primary care facilities are

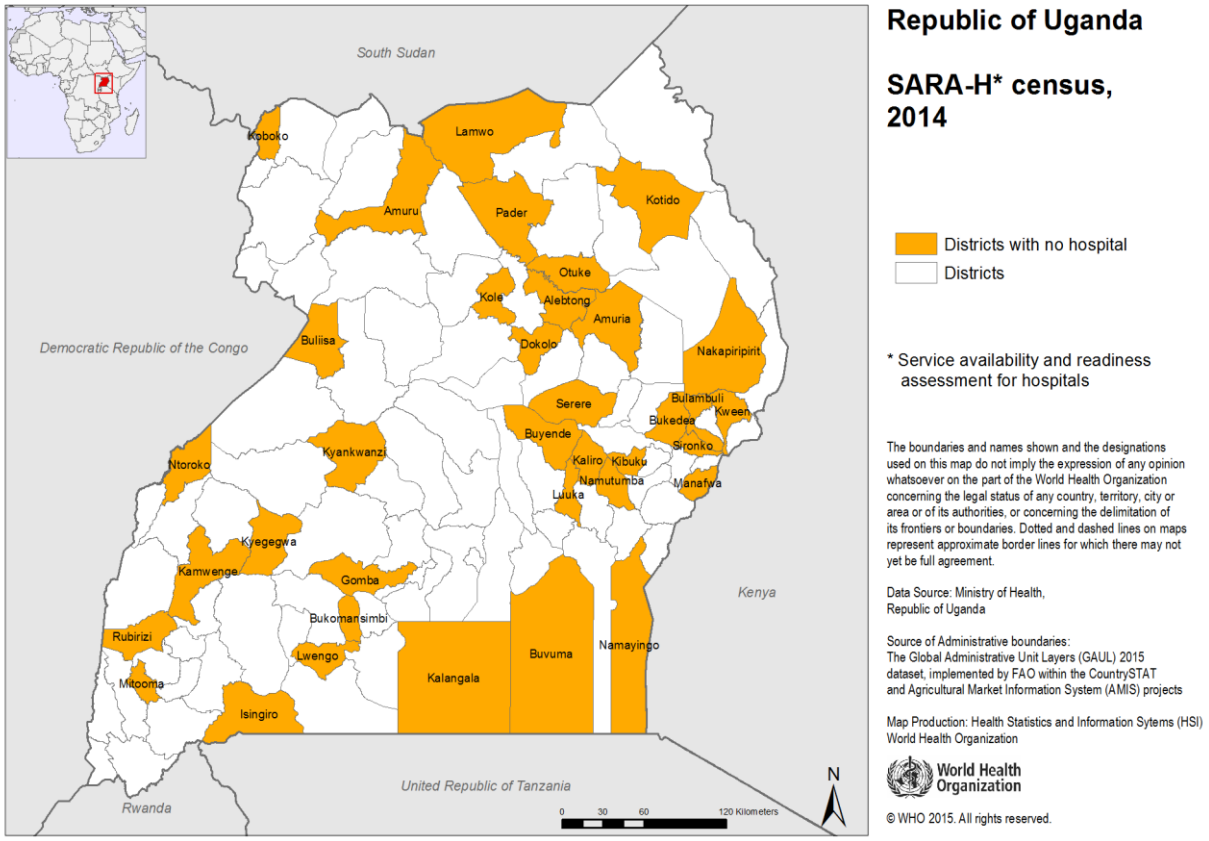
combined and 2.2 per 500,000 population if level IV primary care facilities are excluded from analysis.

Figure 3: Hospital density (per 500,000 population) (n=147)



Each district in Uganda is expected to have a hospital while each county that does not have a hospital is expected to have a level IV primary care facility. However in practice, a third (32%) of the districts did not have a hospital (Figure 4). Most of the districts that did not have a hospital have been newly created and had populations way below the 500,000 target required to have a hospital (Annex 2). However caution should be exercised in using a target population for constructing a hospital in resource poor countries such as Uganda where physical access to hospitals, mainly due to the poor public transport infrastructure, remains limited. Some of the districts, such as the island districts for instance, will require a hospital even though they have small populations.

Figure 4: Districts in Uganda that did not have a hospital



1.2. Hospital bed density

Key findings:

- In 2014, Uganda had 9 hospital/HC IV beds per 10,000 population or one hospital/HC IV bed for 1,065 people. This bed density is similar to the average bed density in the African region (10 beds per 10,000 population).
- 30% of these beds were in HC IV, 50% in General hospital, 13% in regional hospitals and 7% in national referral hospitals
- Bed density in Eastern Uganda (6 per 10,000 population) was substantially lower than in other geographical zones (9 – 12 per 10,000 population)
- Bed density in Uganda could be higher than shown: five hospitals and five level IV primary care facilities were not visited during the census

Hospital beds are used to indicate the availability of inpatient services. There is no global norm for the density of hospital beds in relation to total population. Assessment of hospital bed density was based on the sum of combined maternity and gynaecological beds, maternity beds, medical beds, surgical beds, combined medical and surgical beds, and paediatric beds.

In 2014, Uganda had 9 beds per 10,000 population or one bed for 1,065 people (hospitals and level IV primary care facilities combined). This is similar to the average bed density in the African region of 10 beds per 10,000 population. Eastern Uganda had a notably lower bed density than the other three geographical zones (Figure 5).There was one bed for 1,692 people in Eastern Uganda compared to one bed for 837 in Central, 947 in Northern, and one bed for 1,082 in Western Uganda.

Figure 5: Bed density (per 10,000 population), by geographical zone (n=335)

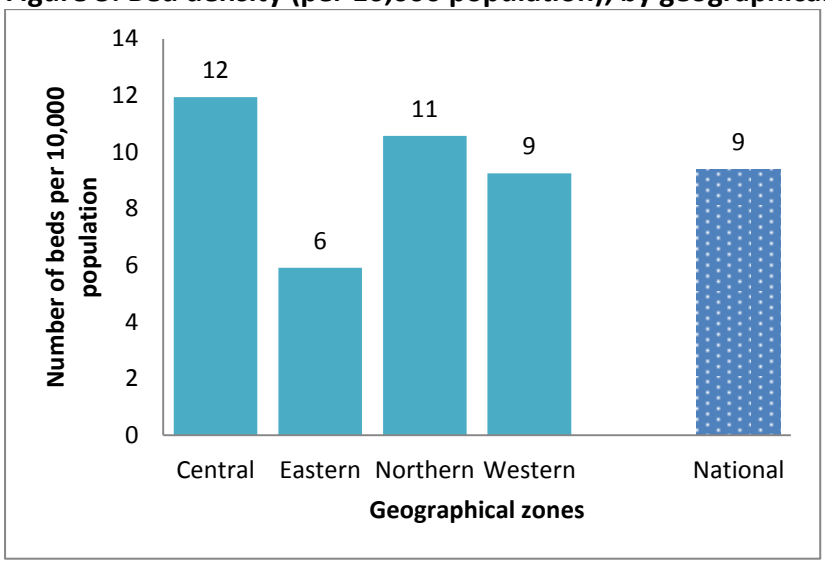


Table 3 shows the bed density per 10,000 population and the number of people per bed for each of the key services. Maternity bed density was higher than the bed density of other services. There were 29 maternity beds per 10,000 expected deliveries or one maternity bed for 346 expected deliveries. Zonal differences in bed density were quite wide, with the bed density in Central Uganda substantially higher than in other geographical zones. Bed density in Eastern Uganda was generally lower than in other geographical zone.

Caution however must be exercised in interpreting the bed density for each key service because major assumptions were made to calculate the densities. For instance, calculation of paediatric bed density was based on the estimated number of children 12 years and below (who constitute about 40.7% of the total population in Uganda). This was premised on the fact that in most instances in Uganda, children aged 12 years or less are admitted to the paediatric ward while those 13-18 years are admitted to the adult wards. There is currently no official policy on which age gets admitted to the paediatric ward; the decision is often made by the clinician attending to the patient. Calculation of maternity bed density was based on the expected deliveries (5% of the total population) and it was assumed that all deliveries would take place in institutions which in reality is not true because only about 47% of the deliveries in Uganda take place in institutions. It was also assumed that all deliveries take place in hospitals and level IV primary care facilities but in reality, quite a substantial number of deliveries take place in level III primary care facilities and a few in level II facilities. Beds in these lower level facilities are not included in the calculation of maternity bed density. Gynaecological bed density was based on the number of all women 13 years and above while medical and surgical bed density was based on both males and females aged 13 years and above – based on the assumption that children 12 years and less are admitted to the paediatric ward regardless of the condition.

Table 3: Bed density, by geographical zone (n=335)

	Maternity bed density	Paediatric bed density	Medical bed density	Surgical beds	Combined medical and surgical bed density	Combined maternity and gynaecological bed density
Bed density (per 10,000 people), by geographical zone						
Central	53.8	3.6	4.5	2.8	8.4	11.4
Eastern	12.8	3.6	1.2	0.6	4.8	5.9
Northern	25.0	5.4	3.7	2.5	5.7	2.1
Western	21.6	3.4	3.2	1.2	2.0	3.3
National	28.9	4.0	3.1	1.8	5.2	5.9

Number of people per bed						
	Number of expected deliveries per maternity bed	**Number of children (12 years and less) per paediatric bed**	**Number of people (13 years and above) per medical bed**	**Number of people (13 years and above) per surgical bed**	**Number of people (13 years and above) per combined medical and surgical bed**	**Number of women per combined maternity and gynaecological bed**
Central	186	2744	2206	3622	1195	877
Eastern	779	2781	8679	15829	2080	1702
Northern	399	1845	2728	3978	1741	4844
Western	462	2899	3128	8267	5128	3015
National	346	2532	3197	5696	1906	1682

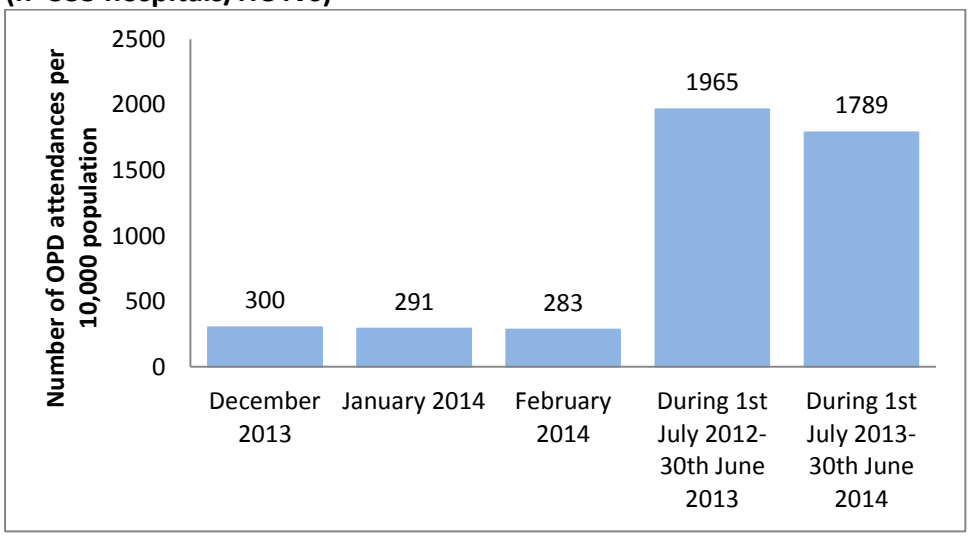
1.3. Outpatient service utilisation rates in Hospitals/HC IVs

Key findings:

- Fairly high utilisation of hospitals/HC IV outpatient services. There were about one million OPD visits in hospitals/HC IVs per month – representing utilisation rates of about 300 visits per 10,000 population or 0.03 visits per person per month. Annually, there were 6.9 million OPD visits during 1st July 2012 – 30th June 2013 and 6.3 visit during 1st July 2013 – 30th June 2014 – representing just under 2,000 visits per 10,000 population of or 0.2 hospital/HC IV OPD visits per person per year
- About a third of the OPD visits were paediatric visits
- Zonal differences in hospital/HC IV visits were fairly large, with utilisation rates being lower than in the other geographical zones. However zonal differences in per capita utilisation was modest (ranging from 0.13 – 0.29 hospital/HC IV OPD visits per persons per year)
- There is possibility of a considerable underestimate of the number of outpatient visits because data for the national referral hospitals were lacking and the census survey was not conducted in 10 hospitals and 17 level IV primary care facilities

Outpatient and inpatient utilisation rates are a measure of access and also measure caseload in health facilities. In the hospitals and HC IVs, there were 1,047,069 OPD attendances in December 2013, 1,014,150 in January 2014, and 987,922 in February 2014. These represent about 300 OPD attendances per 10,000 population per month in the hospitals/HC IVs in Uganda (Figure 6). During the periods 1st July 2012 – 30th June 2013 and 1st July 2013 – 30th June 2014, there were 6,848,395 and 6,235 OPD attendances, respectively – representing slightly under 2,000 OPD attendances per 10,000 population per year or 0.2 OPD visits per person per year in hospitals/HC IVs.

Figure 6: Overall OPD utilisation rates (per 10,000 population), by month and year (n=335 hospitals/HC IVs)



OPD utilisation rates in hospitals/HC IVs in Northern Uganda were generally lower than in the other geographical zones possibly due to the low density of hospitals/HC IV in that geographical zone (Table 4). Zonal differences in per capita admission was very small. About a third of the OPD attendances were paediatric attendances. There may have been a considerable underestimate of the OPD utilisation rates because data for the nation referral hospitals were incomplete and 10 hospitals and 17 level IV primary care facilities were not visited. Interpretation of these findings should therefore be done with caution.

Table 4: Number of OPD attendances in hospitals/HC IV, by key stratifiers

	December 2013	January 2014	February 2014	During 1st July 2012-30th June 2013	During 1st July 2013-30th June 2014
OPD utilisation rate (per 10,000 population), by geographical zone					
Geographical zone					
Central	424	340	361	2934	2371
Eastern	217	233	218	1370	1403
Northern	187	207	200	1375	1315
Western	344	366	334	2008	1939
Total	**300**	**291**	**283**	**1965**	**1789**
Per capita OPD visits in hospitals/HC IV (Number of outpatient visits per persons per year)					
Central	0.04	0.03	0.03	0.29	0.24
Eastern	0.02	0.02	0.02	0.14	0.14
Northern	0.02	0.02	0.02	0.14	0.13
Western	0.03	0.04	0.04	0.20	0.19
Total	**0.03**	**0.03**	**0.03**	**0.2**	**0.18**
Absolute number of OPD visits, by key stratifiers					
Geographical zone					
Northern	135,516	149,318	144,971	994,109	950,913
Eastern	197,385	211,690	198,570	1,245,755	1,276,246
Central	406,557	325,854	345,539	2,810,696	2,271,685
Western	307,611	327,288	298,842	1,797,835	1,736,233
Facility level					
National hospital	126,931	42,985	47,614	655,575	577,248
Regional hospital	148,906	157,501	136,626	813,096	661,730
General hospital	383,073	415,601	4,17,558	2,796,156	2,234,462
Speciality hospital	48,535	46,902	46,419	103,223	103,339
HC IV	339,624	311,536	339,705	2,480,345	2,658,298
Facility ownership					
Public	777,352	731,596	681,370	5,009,259	4,815,060
Private	269,717	282,554	306,552	1,839,136	1,420,017
Facility location					
Urban	551,108	484,010	481,446	3,375,796	2,674,070
Peri-urban	97,641	105,059	107,689	64,0873	838,781
Rural	398,320	425,081	398,787	2,831,726	2,722,226
Total	**1,047,069**	**1,014,150**	**987,922**	**6,848,395**	**6,235,077**

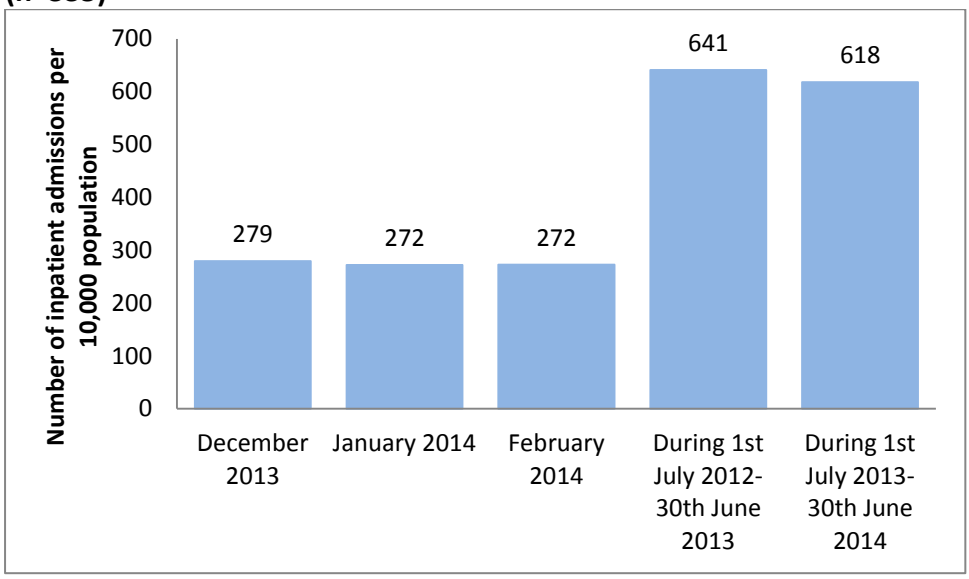
1.4. Inpatient admission rates in hospitals/HC IVs

Key findings:

- Fairly large number of inpatient admissions: between December 2013 and February 2014, there were close to one million admissions every month in hospitals/HC IV in Uganda. This represents slightly over 270 admissions per 10,000 population or per capita admission of 0.03 per person per year. Annual figures indicate about 2.2 million admissions during 1st July 2012 – 30th June 2013 and 1st July 2013 – 30th June 2014 – representing about 630 admissions per 10,000 population annually or 0.06 admissions per person per year
- Between 35-40% of the hospitals/HC IV admissions were paediatric admissions
- Zonal differences in the inpatient admission rates were quite wide, with the admission rates in Western Uganda being about twice as many as the rates in the other geographical zones
- Zonal differences in per capita admission was modest (range: 0.03 – 0.1 per person per year)
- There is possibility of a considerable underestimate of the number of inpatient admissions because data for the national referral hospitals were lacking and the census survey was not conducted in 10 hospitals and 17 level IV primary care facilities

Inpatient admission rates refer to the proportion of a population admitted to hospital/HC IV during a specified period. Inpatient admission rates provide useful information about the general level of illness and the use of hospital services by a population. There were 972,190 inpatient admissions in December 2013, 946,871 in January 2014, and 949,140 in February 2014. This represents about 280 admissions per 10,000 population per month (Figure 7). During the 1st July 2012 – 30th June 2013 and 1st July 2013 – 30th June 2014, there were 2,234,310 and 2,154,563 admissions – representing slightly over 600 admissions per 10,000 population per year or 0.06 admissions per person per year. Between 35 – 40% of the admissions in hospitals/HC IV were paediatric admissions.

Figure 7: Overall inpatient admission rates (per 10,000 population), by month and year (n=335)



Western Uganda had the highest admission rates in hospitals/HC IVs – about twice as many as the rates in the other geographical zones. Admission rates were lowest in Northern Uganda (Table 5). However, zonal differences in per capita admission were very small (Table 5). As was the case with the outpatient utilisation rates, there may have been a considerable underestimate of the OPD utilisation rates because data for the nation referral hospitals were incomplete and 10 hospitals and 17 level IV primary care facilities were not visited. It is also important to note that admission rates depend on how willing people are to make use of medical services, the location and accessibility of services, as well as differences in referral patterns and practices within primary and secondary care. Therefore, caution should be exercised while interpreting these findings.

Table 5: Number of inpatient admissions, by key stratifiers

	December 2013	January 2014	February 2014	During 1st July 2012-30th June 2013	During 1st July 2013-30th June 2014
Inpatient admission rate (per 10,000 population), by geographical zone					
Geographical zone					
Central	300	249	235	536	562
Eastern	120	135	120	344	351
Northern	210	182	246	688	584
Western	473	507	488	1017	976
Total	**279**	**272**	**272**	**641**	**618**
Per capita OPD visits in hospitals/HC IV (Number of outpatient visits per persons per year)					
Central	0.02	0.02	0.02	0.07	0.06
Eastern	0.01	0.01	0.01	0.03	0.04
Northern	0.03	0.02	0.02	0.05	0.06
Western	0.05	0.05	0.05	0.10	0.10
Total	0.03	0.03	0.03	0.06	0.06
Absolute number of inpatient admissions					
Geographical zone					
Northern	151,895	131,789	178,194	497,340	422,258
Eastern	109,121	122,610	109,046	312,869	319,563
Central	287,370	238,955	225,396	513,495	538,608
Western	423,804	453,517	436,504	910,606	874,134
Facility level					
National hospital	0	0	0	0	0
Regional hospital	90,768	94,359	90,153	254,937	239,908
General hospital	469,606	420,477	399,238	967,129	964,658
Specialty hospital	14,627	14,738	14,604	61,512	63,324
HC IV	397,189	417,297	445,145	950,732	886,673
Facility ownership					
Public	544,513	572,472	589,975	1,425,649	1,346,135
Private	427,677	374,399	359,165	808,661	808,428
Facility location					
Urban	365,281	313,292	294,178	776,229	799,997
Peri-urban	60,663	58,915	56,851	180,803	153,012
Rural	546,246	574,664	598,111	1,277,278	1,201,554
Total	**972,190**	**946,871**	**949,140**	**2,234,310**	**2,154,563**

1.5. Referral services

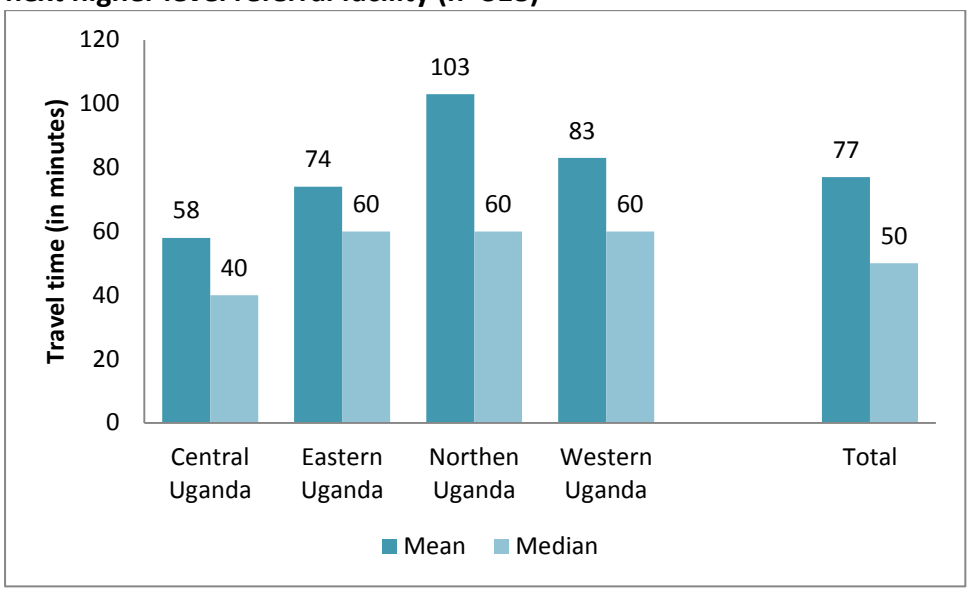
Key Findings:

- Most hospitals and level IV primary care facilities (96%) indicated that they referred patients to the next higher level
- The estimated average travel time between a referring facility and the next higher level referral facility was fairly modest: Half (51%) of the referring hospitals/HC IVs were estimated to be located within one hour of the next higher level referral facility, 37% within 1-2 hours, 5% within 2-3 hours and 7% over three hours away.
- Using the most common mode of transport, the estimated average travel time between a referring facility and the next higher level referral facility was 77 minutes (median of 50 minutes)
- Zonal differences in travel time were fairly modest: The average travel time in Northern Uganda was longer than in the other geographical zones (103 minutes; range 15 – 600 minutes, median of 60 minutes). Central Uganda had the shortest travel time (58 minutes; range: 10 – 600 minutes with a median of 40 minutes)
- 17 hospitals/HC IVs were excluded from analysis because the estimated travel time they reported were unbelievably low, ranging from 1 – 7 minutes

The geographical distance between health facilities or travel time is a key determinant of health care utilization. Evidence suggests that health care utilisation patterns decline with increasing travel time or distance to a facility. There is also a direct correlation between patient mortality and increasing travel time or distance to a health facility. In Uganda, every population is expected to have a health facility within a 5km radius. However, there is no standard guideline in Uganda (and globally) on the optimum distance between facilities, particularly between a lower level facility and the next higher level referral facility. Because there is no gatekeeping in Uganda's health care system, estimating the population that leaves within a 5-Km radius of a health facility is also often difficult. Consequently, travel time remains one of the key indicators of access to health care facilities. This section examines the travel time between hospitals/HC IVs that reported referring patients and the next higher level referral facility. It also examines the availability of ambulance services.

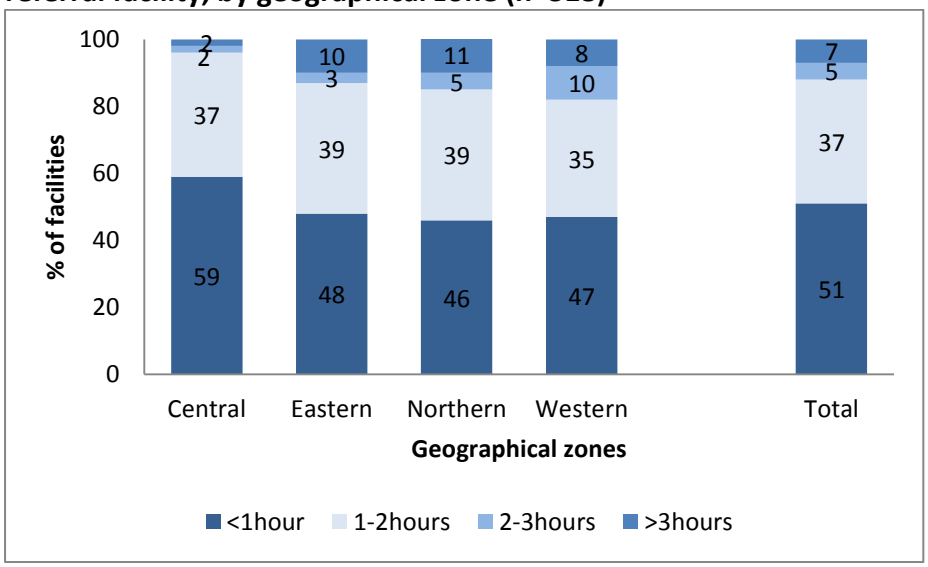
Most of the hospitals/HC IVs (96%) indicated that they referred patients to the next higher level. Using the most common mode of transport, the estimated average travel time between a referring facility and the next higher level referral facility was 77 minutes, with a median of 50 minutes (Figure 8). Northern Uganda had the longest average travel time (103 minutes; range 15 – 600 minute with a median of 60 minutes). The average travel time was lowest in Central Uganda (58 minutes; range: 10 – 600 minutes with a median of 40 minutes). A total of 17 hospitals/HC IVs that reported referring patients to the next higher level were excluded from analysis because the estimated travel time they reported were unbelievably low, ranging from 1 – 7 minutes.

Figure 8: The mean and median travel time between a referring health facility and the next higher level referral facility (n=318)



Overall, 51% of the referring hospitals/HC IVs were estimated to be located within one hour of the next higher level referral facility, 37% within 1-2 hours, 5% within 2-3 hours and 7% over three hours away (Figure 9). Central Uganda had the highest proportion of referring hospitals/HC IVs that were estimated to be located within one hour of the next level referral facility (59%) while Northern Uganda had the lowest (46%). About 2% of the hospitals/HC IVs in Central Uganda compared to 11% in Northern Uganda, 10% in Eastern Uganda and 8% in Western Uganda were estimated to be located over three hours away from the next higher level referral facility.

Figure 9: Reported travel time (in hours) between referring and the next higher level referral facility, by geographical zone (n=318)



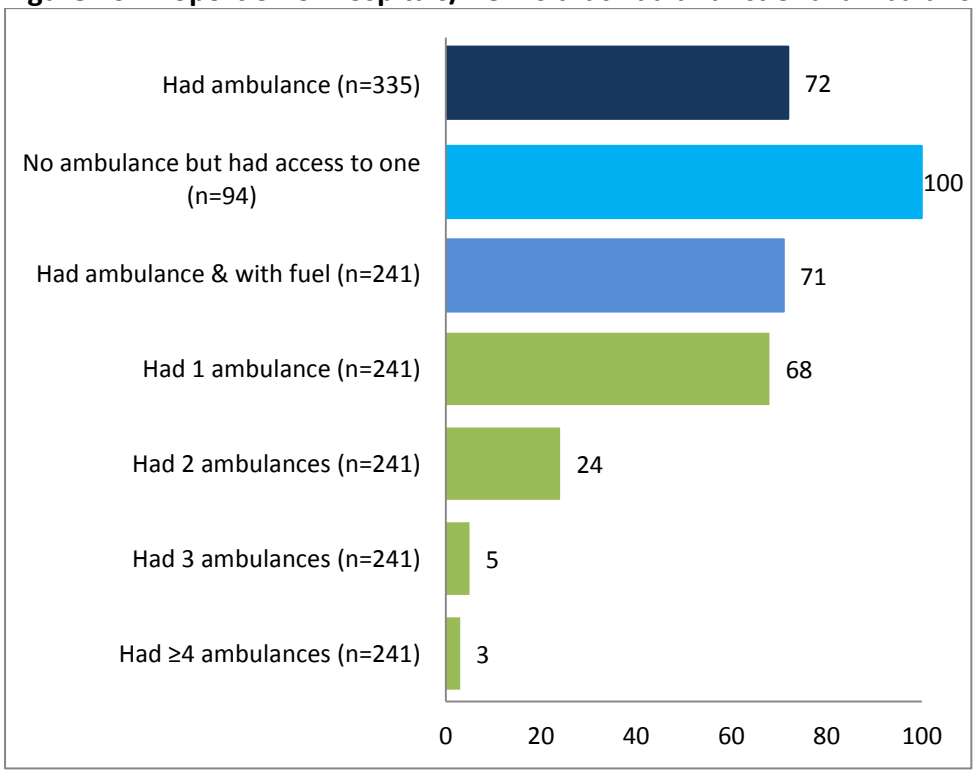
1.6. Ambulance services

Key Findings:

- Close to three quarters of the hospitals/HC IV had a functional ambulance or other vehicle that can be used for emergency transportation of patients.
- hospitals/HC IVs that indicated that they did not have an ambulance had access to an ambulance from nearby hospitals/HC IVs

Figure 10 shows the availability of functional ambulance or emergency vehicle. Close to three quarters of the hospitals/HC IVs (72%) reported that they had a functional ambulance or any other vehicle for emergency transportation of clients. However, all hospitals/HC IVs which indicated that they did not have any ambulance or any other emergency vehicle reported that they had access to an ambulance from other nearby hospitals/HC IVs. Of the hospitals/HC IVs that reported having an ambulance or an emergency vehicle, only 71% had fuel for the vehicle on the day of the census.

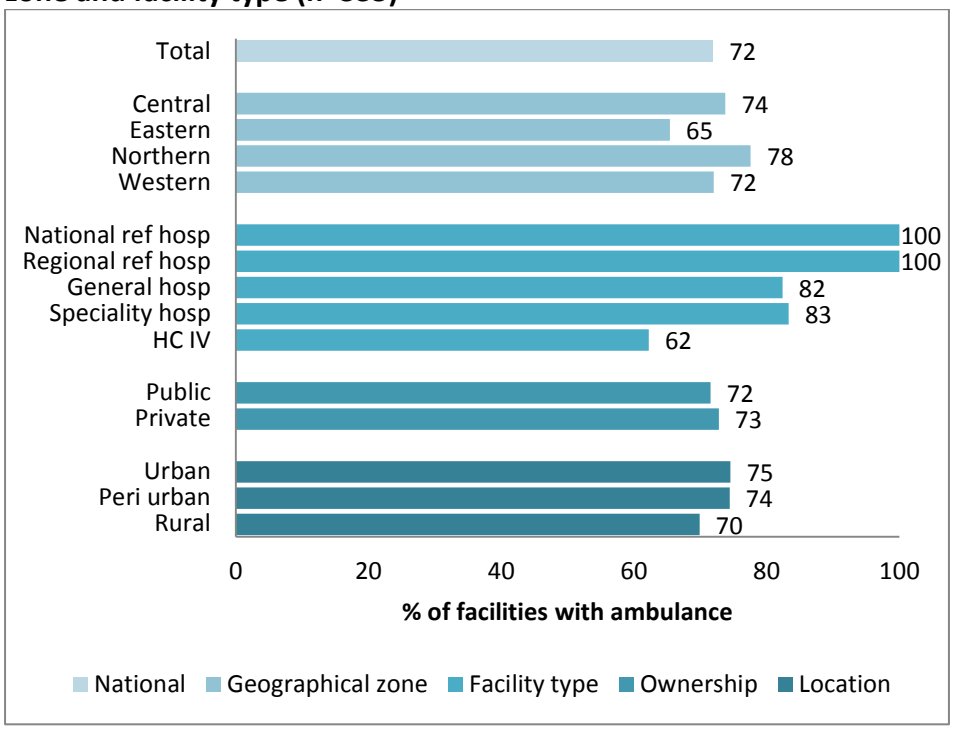
Figure 10: Proportion of hospitals/HC IVs that had a functional ambulance



Number of ambulances calculated among hospitals/HC IVs which indicated that they had an ambulance

Figure 11 shows the distribution of the functional ambulance or other emergency vehicles by geographical zone. The proportion of hospitals/HC IVs that reported that they had an ambulance or other emergency vehicle was highest in Northern Uganda (78%) and lowest in Eastern Uganda (65%).

Figure 11: Availability of a functional ambulance or emergency vehicle, by geographical zone and facility type (n=335)



Eastern Uganda also had the lowest proportion of hospitals/HC IVs that reported having an ambulance or other emergency vehicle and had fuel for the ambulance/emergency vehicle on the day of the census (56%) (Figure 12). Fuel was available in the great majority of the hospitals/HC IVs that reported having an ambulance or other emergency vehicle in Central (80%) and Western Uganda (82%).

Figure 12: The proportion of hospitals/HC IVs that had an ambulance or emergency vehicle with fuel, by geographical zone and facility type (n=241)

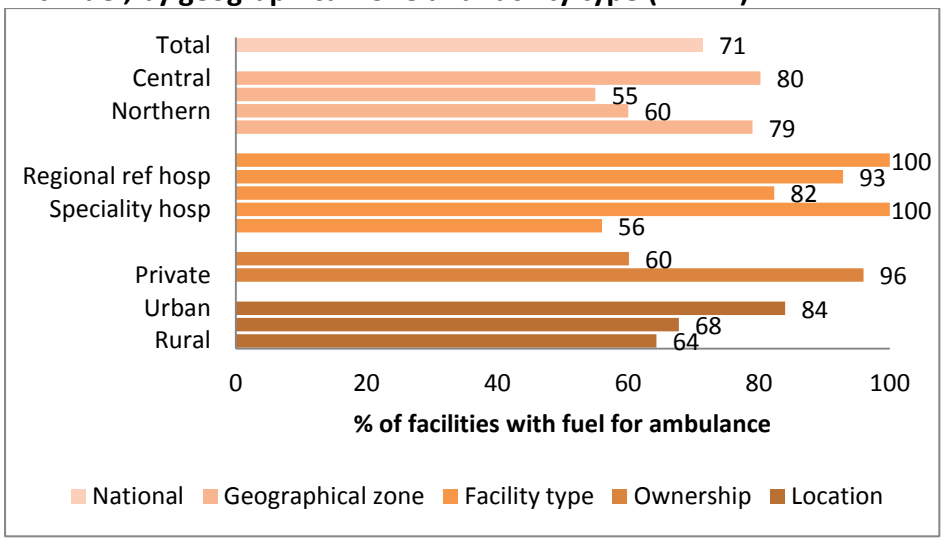
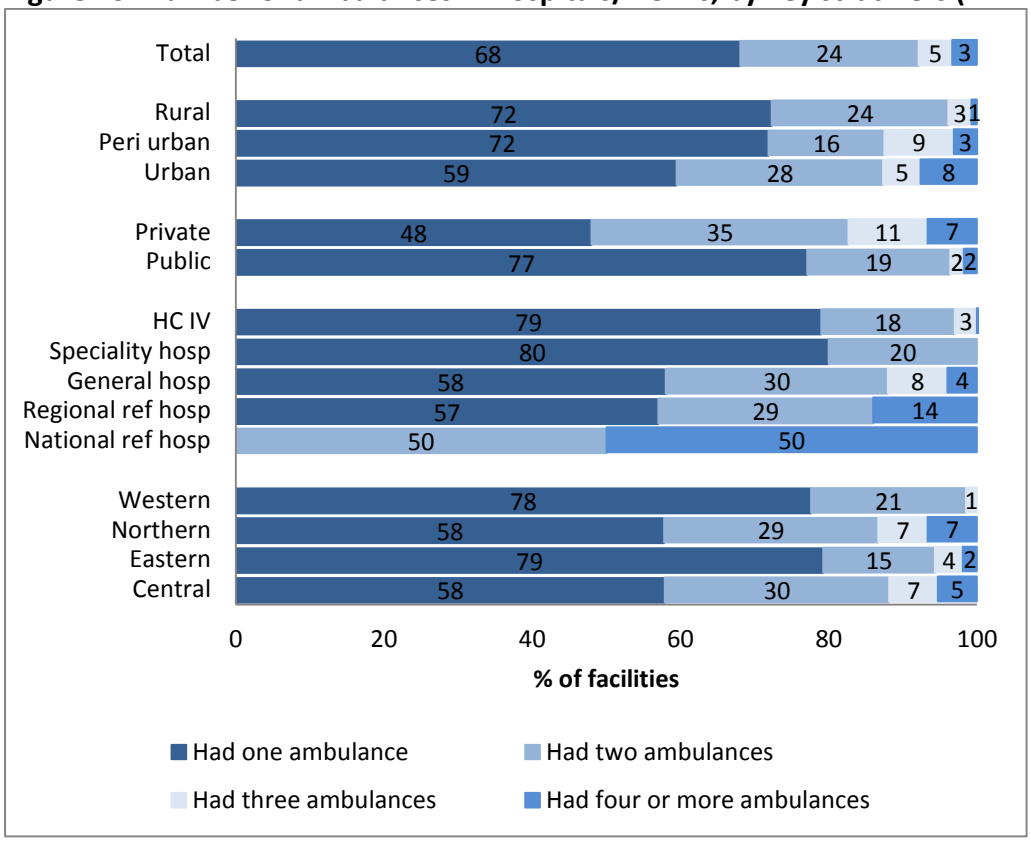


Figure 13 shows the number of ambulances in the hospitals/HC IVs. Two thirds (69%) of the hospitals/HC IVs had only one ambulance, 24% had two ambulances, 5% had three

ambulances and 3% had four or more ambulances. Quite often, ambulances in Uganda are also used for transportation of staff for fieldwork and of other items such as drugs from the central medical stores. In hospitals/HC IVs with one or two ambulances therefore, there is a high likelihood that ambulances are hardly available for transportation of patients.

Figure 13: Number of ambulances in hospitals/HC IVs, by key stratifiers (n=241)



1.7. The availability of non-specialty medical and surgical services

- **Most hospitals offered only a subset of 12 non-specialty services**
  - On average 9 of the 12 services (78%) were reported available at the hospitals/HC IV
  - Only 17% of the hospitals/HC IV had all the 12 non-specialty services that were enquired about
- **Several services were nearly universally offered**
  - Paediatrics (98%), TB services (97%), general medical curative services (96%) and obstetrics (95%) were the most commonly reported services.
  - Physical rehabilitation (36%) and dermatological services (55%) were least commonly offered
  - All the districts had obstetric, TB, paediatric and general medical services:
- **Urban-rural and zonal differences were relatively small**
  - Urban hospitals /HC IV offered only slightly more than rural hospitals
  - Eastern and Northern Uganda had slightly lower scores than Southern and Central Uganda

Assessment of the availability of non-specialty medical and surgical services was based on the reported presence of the following 12 services: allergy and immunology, anaesthesiology, dermatology, emergency medicine, family medicine (community practice), TB diagnosis and treatment, physical/rehabilitation medicine, obstetric (delivery services), paediatric services, general surgical services, oral health, and general medical services. All these services were expected to be offered both at hospitals and level IV primary care facilities except at the national psychiatric referral hospital i.e. the national psychiatric hospital was excluded from analysis.

Density of hospitals/HC IVs offering non-specialty services

In Uganda, a level IV primary care facility has a target of 100,000 people while a district or general hospital has a target of 500,000 people. A regional and national hospital has a target of 2 million and 10 million people, respectively. This means that, at the minimum, there should be a level IV primary care facility or hospital offering a non-specialty service per 100,000 people.

Figure 14: Number of hospitals/HC IVs offering non-specialty services per 100,000 population, by geographical zone (n=334)

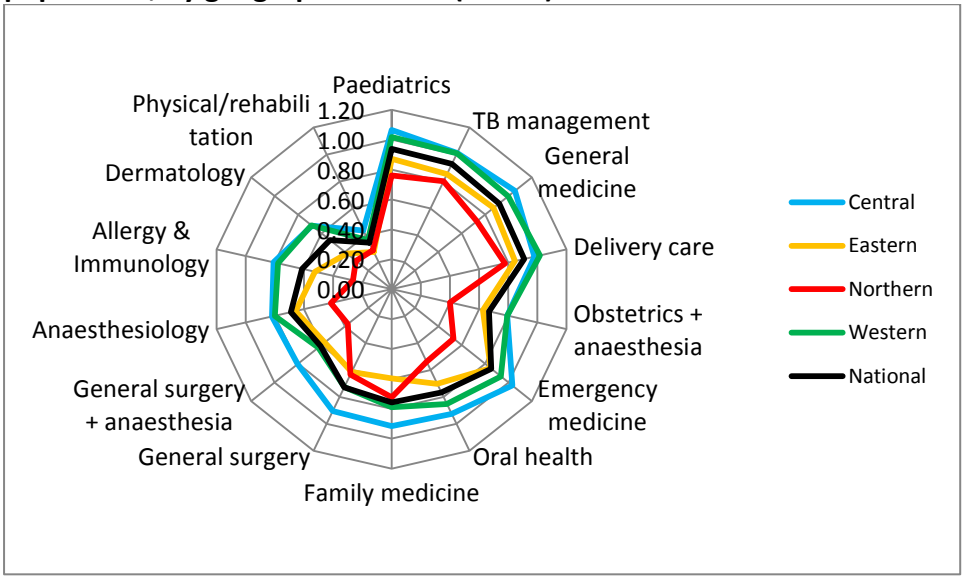


Figure 14 illustrates the density of hospitals/HC IVs offering non-specialty services by geographical zone. There were fewer hospitals/HC IVs offering each of the non-specialty services than the target of one facility per 100,000 population. The number of hospitals/HC IVs offering non-specialty services was lowest for physical rehabilitation (0.34 per 100,000 population) or one facility offering rehabilitation services for 289,894 people (Table 6)) and highest for paediatric services (0.94 hospitals/HC IVs per 100,000 population (Figure 15) or one facility offering paediatric services to 106,492 people (Table 6)). For almost all the services the number of hospitals/HC IVs that reported offering the services per 100,000 population was lowest in Northern Uganda and highest Central Uganda.

Table 6: Number of people per facility offering non-specialty services, by geographical zone (n=334*)

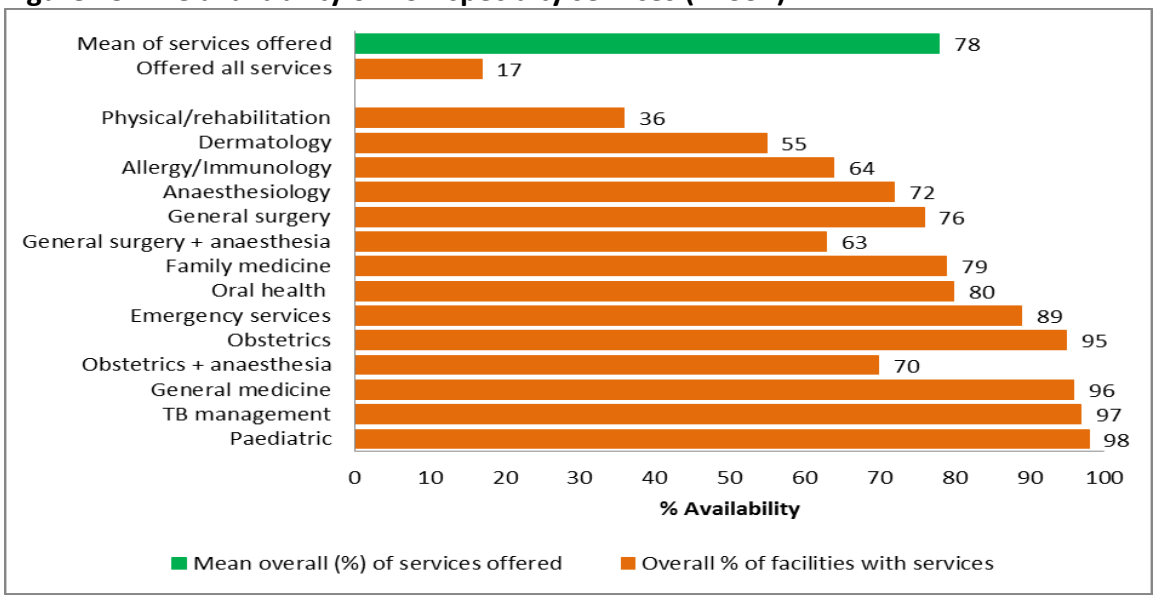
	Central	Eastern	Northern	Western	Overall
Physical/rehabilitation medicine	229,056	362,205	346,296	275,025	289,894
Dermatology	146,739	261,124	328,070	145,847	189,749
Allergy and Immunology	123,570	190,311	377,777	128,345	163,065
Anaesthesiology	121,965	151,734	239,743	125,011	144,947
General surgery	110,486	162,730	157,806	137,513	137,318
General surgery + anaesthesia	*124,404*	*174,896*	*267,812*	*159,845*	*164,427*
Family medicine	109,201	167,587	138,518	126,656	132,103
Oral health	107,946	142,131	186,070	117,389	130,452
Emergency medicine	96,817	118,193	188,889	106,954	117,260
Obstetrics (delivery)	102,079	118,193	128,522	98,223	109,854
Obstetrics + anaesthesia	*126,041*	*159,562*	*249,333*	*126,092*	*149,601*
General medical curative services	94,862	114,575	136,996	100,270	108,710
TB diagnosis and treatment	98,856	116,962	124,667	99,236	107,589
Paediatrics	93,913	114,575	131,228	98,223	106,492
Offered all the above services	**494,279**	**1,020,759**	**890,475**	**437,540**	**613,892**

**Excludes the National Psychiatric Referral hospital*

The percentage of hospitals/HC IVs that indicated that they offered non-specialty services

Figure 15 shows the overall availability of the non-specialty services. Of the 12 non-specialty services that were enquired about during the census, only 17% of the hospitals/HC IVs reported offering all of them. On average, the hospitals/HC IVs reported offering 78% (9 out of 12) of the non-specialty services. The most common non-specialty services reported available were paediatric services, TB diagnosis and treatment, general medical services and obstetric (delivery) services. Physical/rehabilitation and dermatological services were the least available services reported.

Figure 15: The availability of non-specialty services (n=334)



**Obstetrics + anaesthesia& general surgery + anaesthesia not included in the calculation of the mean and % with all services*

Figure 16 shows the availability of the non-specialty services by geographical zone and facility type. Western Uganda had the highest percentage of hospitals/HC IVs that reported offering all the services (22%), about twice that in Eastern Uganda (11%). The absolute gap between the geographical zones in the mean availability of the services was also fairly large, with hospitals/HC IVs in Central Uganda reporting offering on average 83% of the services compared to 70% for hospitals/HC IVs in Northern Uganda for instance. None of the specialty hospitals and only 8% of level IV primary care facilities reported offering all the services. The great majority of the services were reported available at the national, regional and general hospitals. Level IV primary care facilities reported offering on average three quarters of the services while specialty hospitals reported offering 40% of the services. Detail of the availability of the specific services is presented on Figure 17.

Figure 16: The availability of non-specialty services, by key stratifiers(n=334)

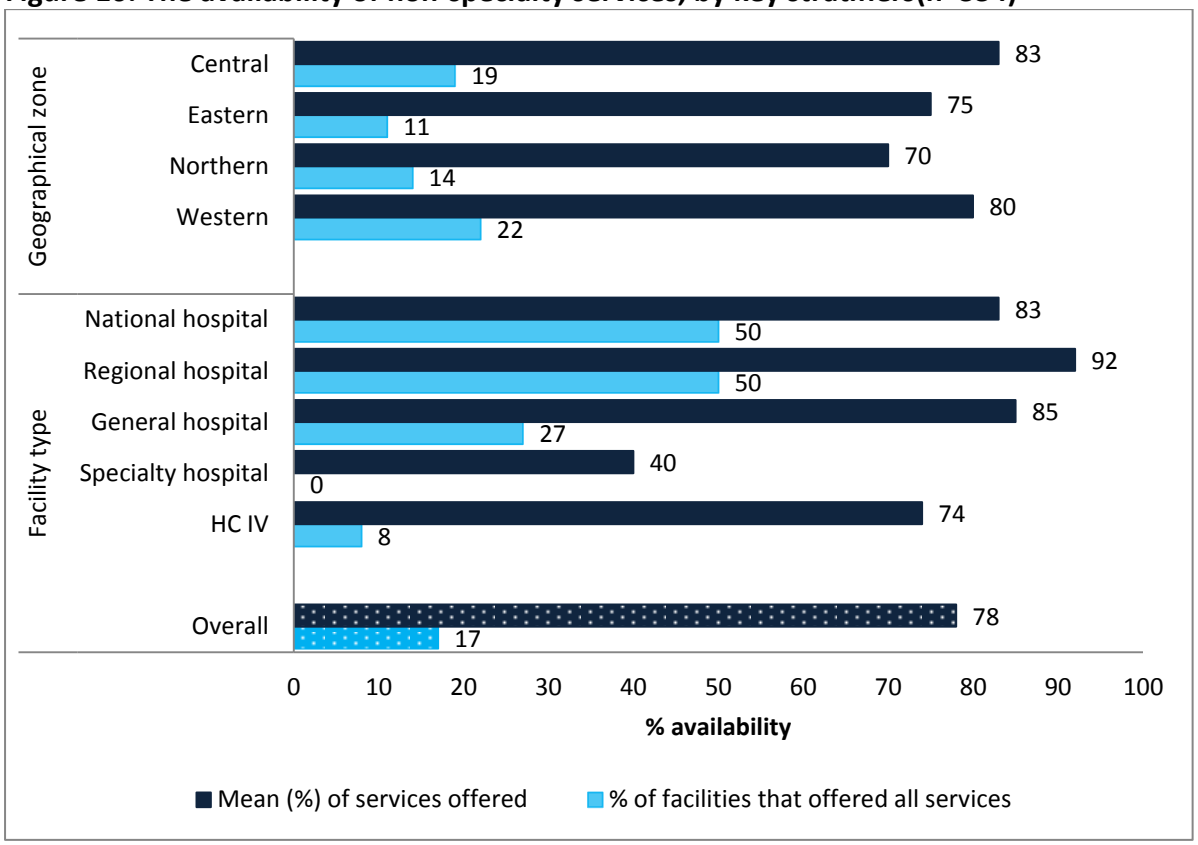


Figure 17: The percentage of hospitals/HC IVs that reported offering non-specialty services, by geographical zone and facility type (n=334*)

	Geographical zone				Facility type					Ownerhsip		Location		
	Central	Eastern	Northern	Western	National hospital	Regional hospital	General hospital	Specialty hospital	HC IV	Public	Private	Urban	Rural	Overall
Paediatrics	100	98	95	98	100	100	99	50	98	99	96	98	98	98
TB diagnosis and treatment	95	96	100	97	100	100	97	67	97	99	91	95	98	97
General medical curative services	99	98	91	96	100	100	99	33	96	97	96	97	96	96
Obstetrics (delivery)	93	95	97	98	100	100	97	33	96	97	91	91	99	95
Onstetrics + anaesthesia	75	70	50	76	100	93	90	33	55	63	84	75	67	70
Emergency medicine	97	95	66	90	100	86	94	50	88	88	92	91	88	89
Oral health	87	79	67	82	100	100	83	17	79	83	75	86	76	80
Family medicine	86	67	90	76	100	93	78	33	81	78	83	74	83	79
General surgery	85	69	79	70	100	100	98	0	62	70	90	80	73	76
Anaesthesiology	77	74	52	77	100	93	93	67	56	64	89	81	65	72
General surgery + anaesthesia	75	64	47	60	100	93	91	0	45	55	84	72	59	63
Allergy and Immunology	76	59	33	75	100	71	69	33	62	62	70	64	65	64
Dermatology	64	43	38	66	100	71	60	33	51	51	63	80	55	55
Physical/rehabilitation medicine	41	31	36	35	100	93	54	67	19	29	52	48	27	36
Offered all the above services	**19**	**11**	**14**	**22**	**100**	**50**	**27**	**0**	**8**	**13**	**25**	**18**	**16**	**17**
Mean of the services offered	**83**	**75**	**70**	**80**	**100**	**92**	**85**	**40**	**74**	**76**	**82**	**82**	**77**	**78**

***excludes the national psychiatric referral hospital. Obstetric + anaesthesia and general surgery +anaesthesia not included in calculation of the mean and % offering all services**

1.8. The availability of specialty medical and surgical services

Key findings:

- **Some specialty services were available in more than one-third of hospitals, others were quite rare**
  - At the minimum, there should be one hospital offering each of the specialty services per 500,000 people in Uganda. This was only true for gynaecological services, with one hospital offering the service per 500,000 people. Other specialty services had less than one hospital per 500,000 people
  - On average, hospitals reported offering only 5(22%) of the 21 specialty services
  - Services least reported available were nuclear medicine (2%), dialysis (6%), oncology (9%) and geriatrics (10%). The most reported were gynaecology (47%), infectious disease (40%), psychiatry (39%) and orthopaedics (38%)
- **More specialist services were offered in Central Uganda than elsewhere**
  - For almost all the services, Central Uganda had the highest number of hospitals offering service per 500,000 population and Eastern Uganda had the lowest

The availability of specialty services was assessed based on the presence of 21 services (Table 7). The assessment was done among facilities that were expected to offer the services.

Table 7: List of the specialty services that were enquired about during the hospital census

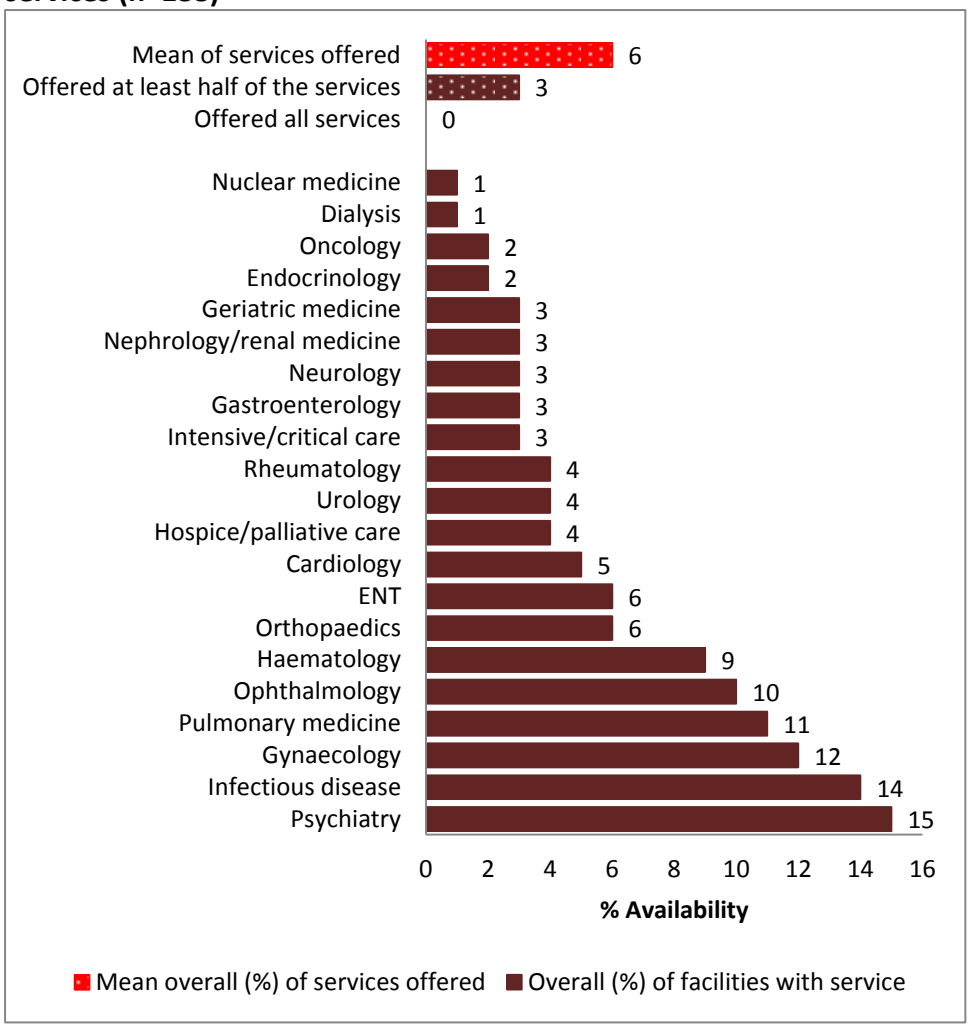
1. Critical care/intensive care
2. Dialysis
3. Endocrinology
4. Gastroenterology
5. Geriatric medicine
6. Haematology
7. Hospice and palliative care
8. Infectious diseases
9. Cardiology
10. Oncology
11. Nephrology and renal medicine
12. Pulmonary medicine
13. Rheumatology
14. Neurology
15. Nuclear medicine
16. Gynaecology
17. Ophthalmology
18. Orthopaedics
19. Otolaryngology
20. Psychiatry
21. Urology

Key assumptions that formed the basis for analysis of availability of specialty services

A general hospital in Uganda has a target population of 500,000 people while a regional and a national referral hospital has a target population of 2 million and 10 million, respectively. This means that at the minimum, there should be a hospital offering a specialty service per 500,000 population. It was assumed that all level IV primary care facilities do not offer specialty services that were enquired about. Consequently, level IV primary care facilities were excluded from analysis. However, some level IV primary care facilities reported that they offered specialty services (Figure 18). This needs further investigation as it is highly unlikely that they offered some of the services. The national psychiatric hospitals was also assumed to only offer psychiatric services and therefore only included in the analysis of

availability of psychiatric services. The remaining hospitals were expected to offer all the specialty services, even though this may not be entirely true.

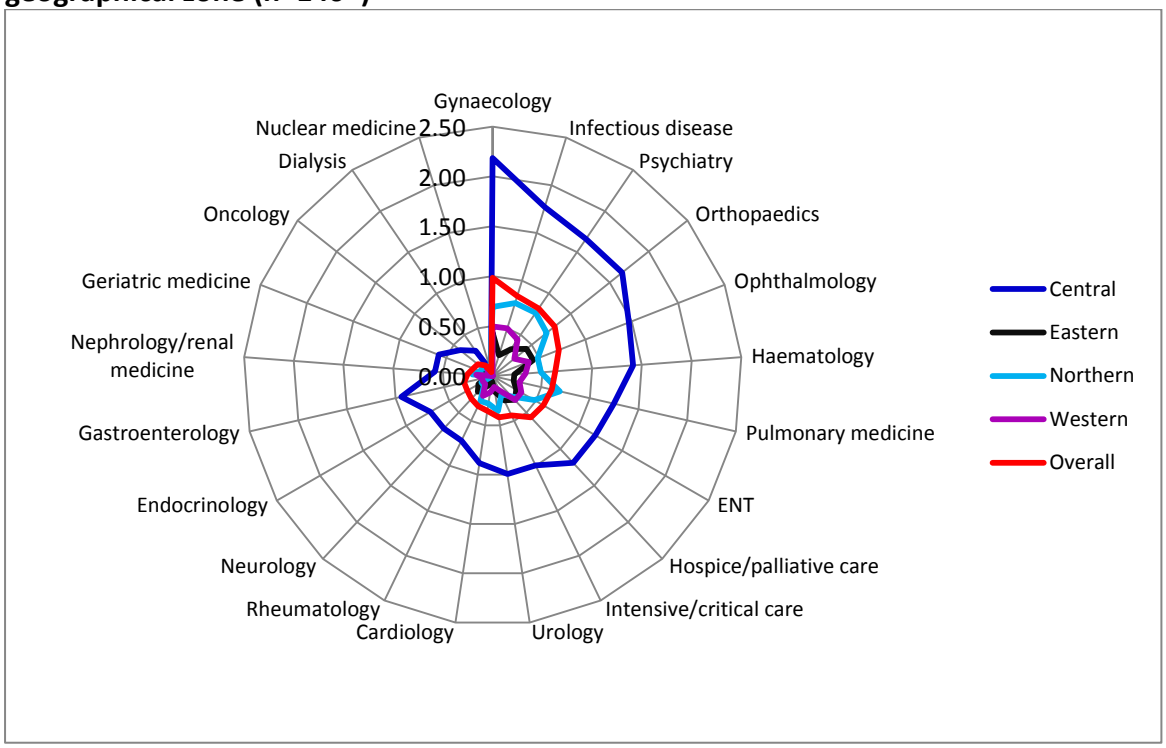
Figure 18: Percentage of level IV primary care facilities that reported offering specialty services (n=188)



Density of hospitals that indicated that they offered specialty services

Figure 19 shows the density of hospitals offering specialty services. At the minimum, there should be one hospital offering specialty services per 500,000 people in Uganda. This was only true for gynaecological services; with on average one hospital offering the service per 500,000 people. Other specialty services had more than 500,000 people per hospital offering the service (Table 8). Nuclear medicine was the least available; with 0.04 hospitals with nuclear medicine per 500,000 population or one hospital offering nuclear medicine per 12 million population, followed by dialysis (0.13 hospitals offering dialysis per 500,000 population or one hospital offering dialysis per four million people), oncology (0.19 hospitals per 500,000 population or one hospital per 2.7 million population) and geriatrics (0.21 hospitals per 500,000 population or one hospital offering geriatric care per 2.4 million population). More specialty services were offered in Central Uganda than elsewhere.

Figure 19: Number of hospitals offering specialty services per 500,000 population, by geographical zone (n=146*)



**** Excludes level IV primary care facilities. The national psychiatric hospital only included in analysis of availability of psychiatric services***

Table 8: Number of people per hospital offering specialty services (n=147*)

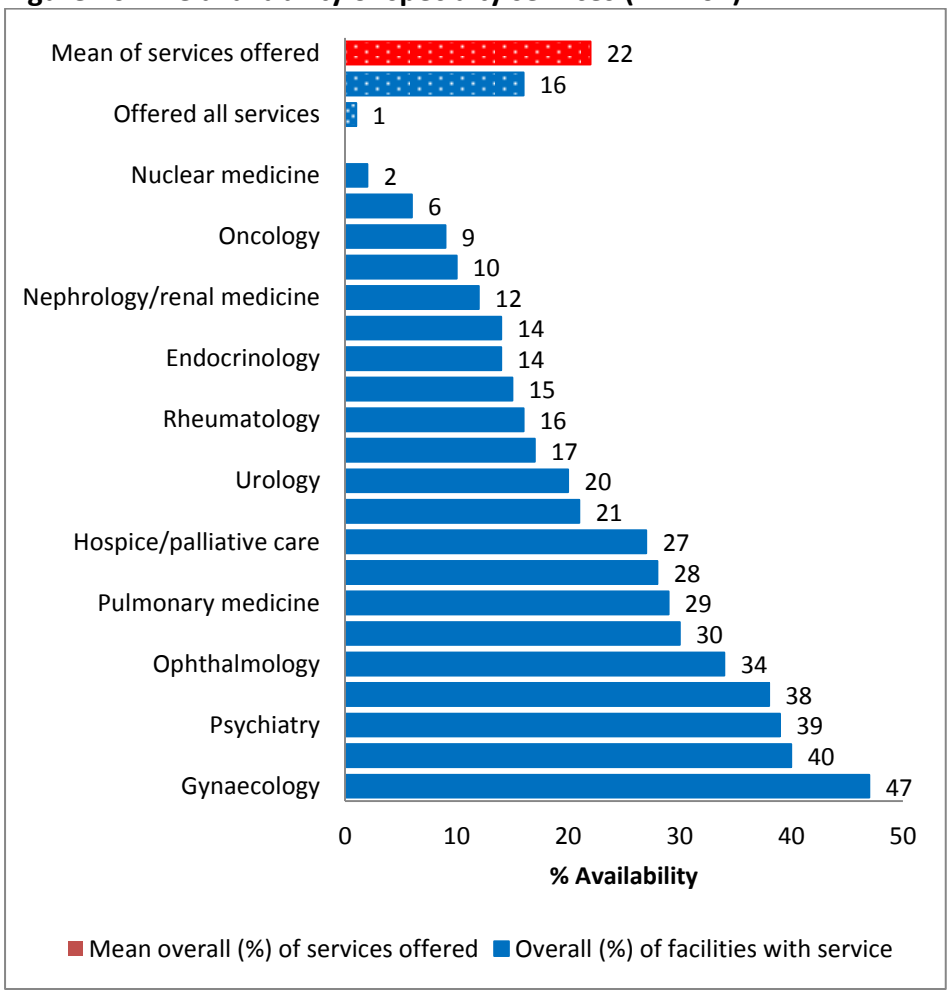
	Central	Eastern	Northern	Western	Overall
Gynaecology	228,782	1,148,354	723,790	1,004,722	507,969
Infectious disease	282,403	2,296,707	653,176	1,004,722	596,863
Psychiatry	291,159	1,531,138	653,176	1,130,312	608,321
Orthopaedics	301,230	1,148,354	723,790	1,808,500	628,277
Ophthalmology	341,015	1,148,354	1,030,009	1,291,785	702,192
Haematology	354,388	2,296,707	1,030,009	1,507,083	795,818
Pulmonary medicine	401,640	2,296,707	723,790	1,808,500	823,260
ENT	420,321	1,837,366	1,030,009	1,507,083	852,662
Hospice/palliative care	420,321	1,531,138	1,785,348	1,507,083	884,242
Intensive/critical care	502,050	1,837,366	2,434,566	3,014,166	1,136,882
Urology	502,050	3,062,276	1,409,486	4,521,249	1,193,726
Cardiology	564,807	9,186,828	1,785,348	3,014,166	1,404,384
Rheumatology	695,147	4,593,414	1,785,348	2,260,624	1,492,158
Neurology	695,147	2,296,707	3,825,747	4,521,249	1,591,635
Endocrinology	695,147	3,062,276	3,825,747	4,521,249	1,705,324
Gastroenterology	531,583	9,186,828	NA	4,521,249	1,705,324
Nephrology/renal medicine	860,658	NA	2,434,566	3,014,166	1,989,544
Geriatric medicine	860,658	9,186,828	3,825,747	NA	2,387,453
Oncology	1,204,921	4,593,414	3,825,747	9,042,498	2,652,725
Dialysis	1,643,074	NA	6,695,056	4,521,249	3,979,088
Nuclear medicine	9,036,905	9,186,828	6,695,056	NA	11,937,265
Offered all services	**9,036,905**	**NA**	**NA**	**NA**	**23,874,529**
Offered at least half of the services	**645,493**	**3,062,276**	**1,785,348**	**4,521,249**	**1,492,158**

**Excludes level IV primary care facilities. The national psychiatric hospital only included in analysis of availability of psychiatric services*

The percentage of hospitals that indicated that they offered specialty services

Figure 20 shows the overall availability of the specialty services. Of the 21 specialty services that were enquired about during the census, only one hospital out of 146 (1%) reported offering all of them, and 23 hospitals out of 146 (16%) reported offering at least half of the services. On average, the hospitals reported offering only 5of the 21 (22%) specialty services. The least available specialty services reported were nuclear medicine (2%), dialysis (6%), oncology (9%) and geriatric medicine (10%) while the most commonly reported were gynaecology (47%), infectious disease (40%), psychiatry (39%) and orthopaedics (38%).

Figure 20: The availability of specialty services (n=146*)



**Excludes level IV primary care facilities. The national psychiatric hospital only included in analysis of availability of psychiatric services*

Figure 21 shows the mean availability of the specialty services by geographical zone and facility type. Central Uganda had the highest mean availability of the specialty services, with hospitals offering about 8 out of 21 (37%) of the services. The mean availability was lowest in Eastern and Northern Uganda, with the hospitals offering 11% and 12% of the services, respectively. There were big differences between the facility types in the availability of specialty services, with national referral hospital reporting offering all the specialty services compared to 45% for regional referral hospitals, 19% for general hospitals and 18% for specialty hospitals.

Figure 21: The availability of specialty services, by geographical zone and facility type (n=146)

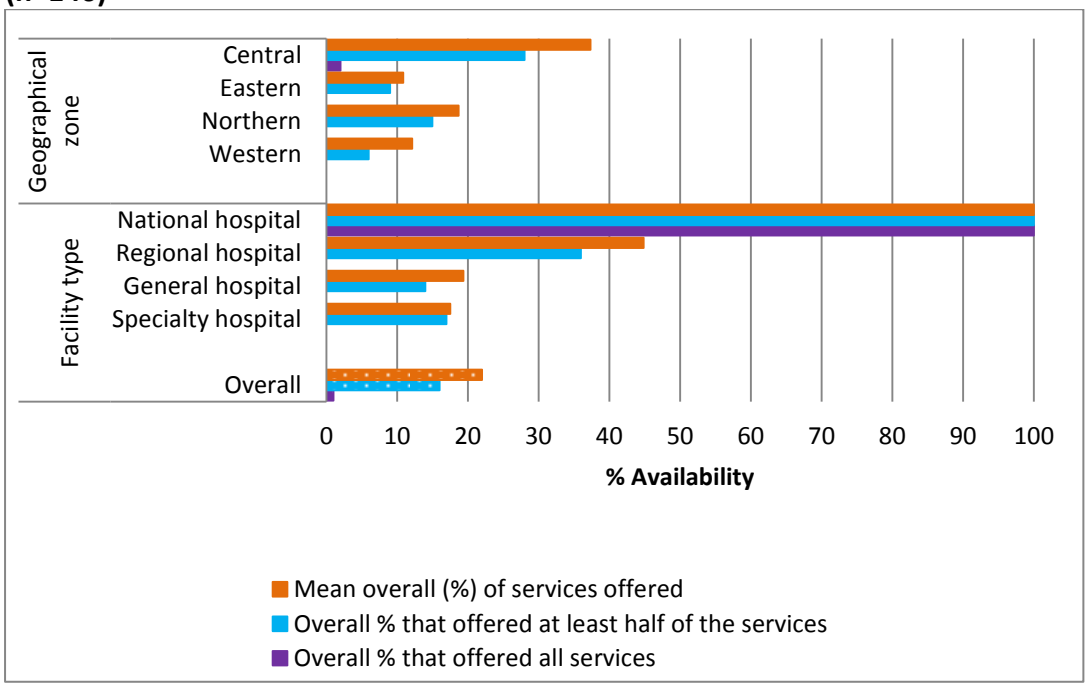


Figure 22 shows districts in Uganda that did not have any of the specialty services that were enquired about during the 2014 SARA-Hospital Census. In total, 33 districts did not have any of the specialty services that were enquired. Most of the districts have been newly created. Figure 23 provides details of the availability of the specific specialty services.

Figure 22: Map showing the districts in Uganda that did not have any of the specialty services that were enquired about during the 2014 SARA-Hospital census

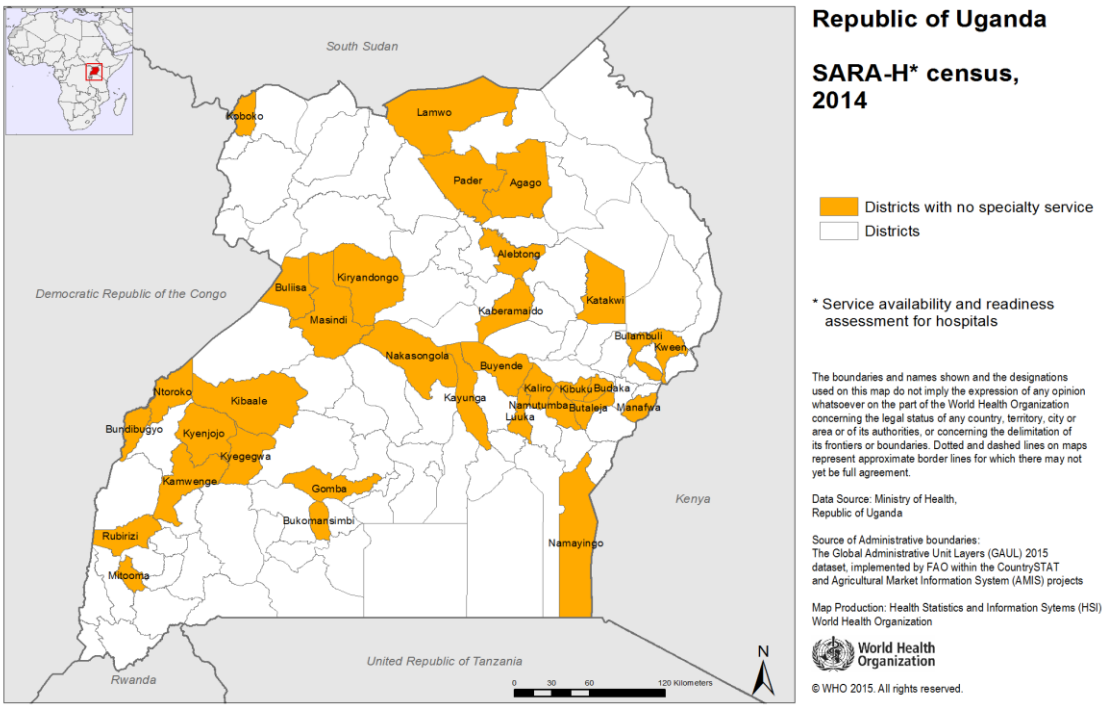


Figure 23: The percentage of hospitals that indicated that they offered the indicated specialty services, by key stratifiers (n=146*)

	Geographical zone				Hospital level				Ownership		Location			
	Northern	Eastern	Central	Western	National hospital	Regional hospital	General hospital	Specialty hospital	Public	Private	Urban	Peri-urban	Rural	National
Intensive care	11	15	36	9	100	50	16	33	18	23	36	5	7	21
Dialysis	4	0	11	6	100	7	6	0	3	8	11	5	0	6
Endocrinology	7	9	26	6	100	29	12	17	13	15	23	16	4	14
Gastroenterology	0	3	34	6	100	21	13	17	6	20	23	16	4	14
Geriatric medicine	7	3	21	0	100	14	9	0	5	13	14	0	7	10
Haematology	26	12	51	18	100	64	26	17	32	29	39	37	18	30
palliative medicine/Hospice	15	18	43	18	100	57	23	17	31	24	29	32	23	27
Infectious disease	41	12	64	27	100	71	36	33	40	39	54	32	25	40
Cardiology	15	3	32	9	100	36	14	17	13	20	29	5	7	17
Oncology	7	6	15	3	100	14	8	0	6	11	16	0	4	9
Nephrology /renal medicine	11	0	21	9	100	14	10	17	6	15	20	5	4	12
Pulmonary medicine	37	12	45	15	100	57	26	17	31	29	41	21	18	29
Rheumatology	15	6	26	12	100	36	14	17	15	18	26	11	7	16
Neurology	7	12	26	6	100	14	14	33	8	20	26	5	5	15
Nuclear medicine	4	3	2	0	100	0	2	0	2	2	1	0	4	2
Gynaecology	37	24	79	27	100	93	42	33	45	49	61	47	30	47
Ophthalmology	26	24	53	21	100	86	27	50	40	30	49	21	21	34
Orthopaedics	37	24	60	15	100	86	34	0	40	36	54	32	19	38
ENT	26	15	43	18	100	71	23	17	31	26	47	11	11	28
Mental health/psychiatry	41	18	61	24	100	93	33	33	52	30	56	42	18	39
Urology	19	9	36	6	100	29	19	0	10	27	30	5	12	20
Had all services	**0**	**0**	**2**	**0**	**100**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**1**
Had at least half of the services	**15**	**9**	**28**	**6**	**100**	**36**	**14**	**17**	**11**	**20**	**27**	**5**	**7**	**16**
Mean	**19**	**11**	**38**	**12**	**100**	**45**	**19**	**17**	**21**	**23**	**33**	**17**	**12**	**22**

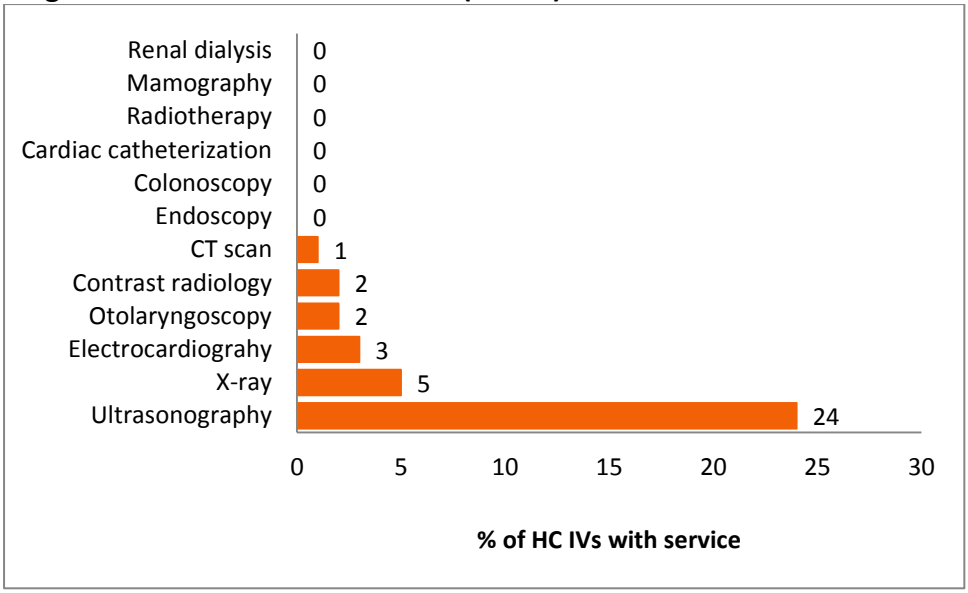
**Excludes level IV primary care facilities. The national psychiatric hospital only included in analysis of availability of psychiatric services*

1.9. The availability of advanced diagnostic and treatment services

Key findings:

- Most advanced diagnostic and treatment services that were enquired about during the census were very rare in hospitals in Uganda. Ideally, there should be at least one hospital offering each of the advanced diagnostic and treatment services per 500,000 population. This was only true for ultrasound and X-ray services; with 1.57 and 1.53 hospitals offering the services per 500,000 population or one hospital for 318,327 and 327,048 people, respectively. The other services had more than 500,000 people for one hospital offering an advanced diagnostic and treatment services; with services such as radiotherapy and cardiac catheterization so rare that there is only one hospital offering the service per 23 million people.
- Of the 12 advanced diagnostic and treatment services that were enquired about, only one hospital, the national referral hospital, had all of them. A total of 26 hospitals (2 regional hospitals, 23 general hospitals & 1 specialty hospital) indicated that they did not have any of the advanced diagnostic and treatment services. On average, only three of the 12 services (24%) were reported available.
- More advanced diagnostic and treatment services were offered in Central Uganda than elsewhere. Eastern Uganda generally had the lowest number of hospitals offering advanced diagnostic and treatment services per 500,000 population.
- 33 districts (29%) did not have any of the specialty services that were enquired about. CT-scan was reported available in 10 (9%) of the districts, ECG in 27 (24%), X-ray in 60 (54%), and ultrasound in 77(69%) of the districts.

Figure 24: Proportion of level IV primary care facilities that reported offering advanced diagnosed and treatment services (n=188)

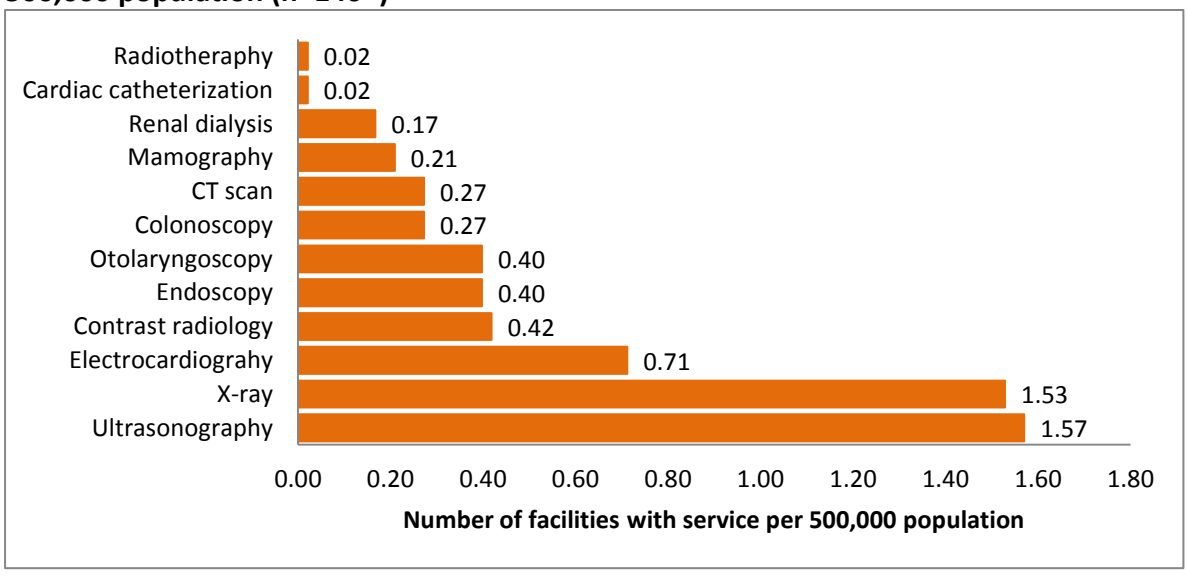


The availability of advanced diagnostic and treatment services was assessed based on the presence of 12 services, namely: endoscopy, colonoscopy, otolaryngoscopy (e.g. laryngoscopy, oesophagoscopy), cardiac catheterization, electrocardiography, contrast radiology, X-ray, mammography, ultrasonography, Computerised tomography (CT scan), radiotherapy, and renal dialysis. The assessment was done among facilities that were expected to offer the services. The national psychiatric hospitals and level IV primary care facilities were therefore excluded from analysis. However, some level IV primary care facilities reported offering some of the advanced diagnostic and treatment services (Figure 24). This needs further investigation.

Density of hospitals with advanced diagnostic and treatment services

Figure 25 shows the density of the advanced diagnostic and treatment services in Uganda. As was the case with specialty services, there should at the minimum be at least a hospital offering advanced diagnostic and treatment service per 500,000 population. This was only true for ultrasound and X-ray services. There were 1.57 hospitals offering ultrasound per 500,000 population or one hospital with ultrasound services for 318,327 people, and 1.53 hospitals offering X-ray services per 500,000 population or one hospital with X-ray for 327,048 people. The other advanced diagnostic and treatment services were extremely rare. For instance, there was only one hospital with radiotherapy or cardiac catheterisation for 23 million people in Uganda (Table 9).

Figure 25: Number of hospitals offering advanced diagnostic and treatment services per 500,000 population (n=146*)



National psychiatric hospital and level IV primary care facilities excluded from analysis

Zonal differences were quite wide, with more advanced diagnostic and treatment services offered in Central Uganda than elsewhere. Eastern Uganda generally had the lowest number of hospitals offering advanced diagnostic and treatment services per 500,000 population.

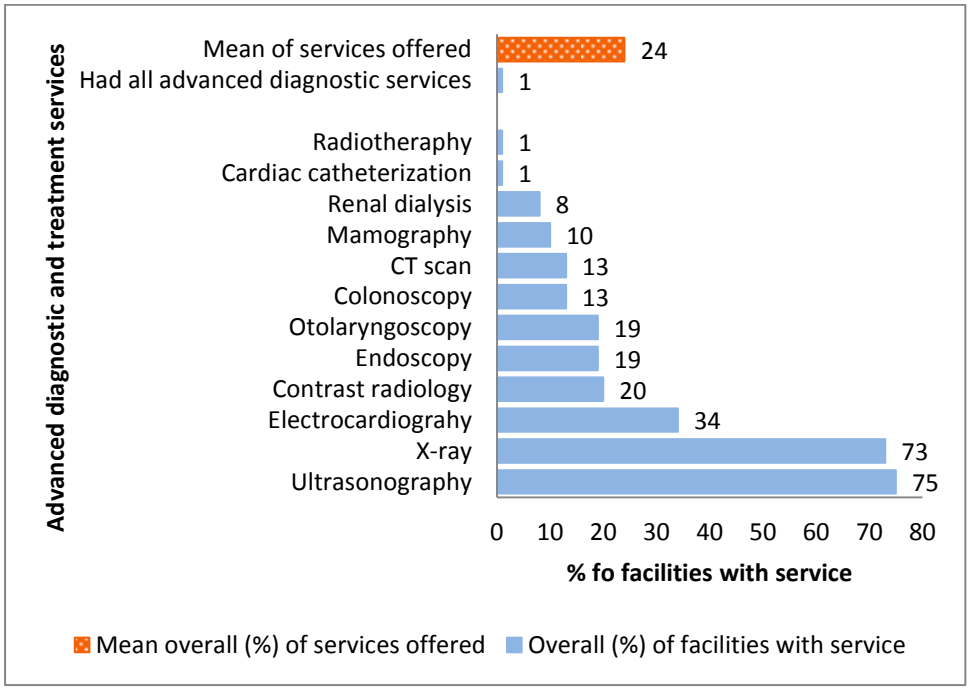
Table 9: Number of people per hospital offering advanced diagnostic and treatment services, by geographical zone

	Central	Eastern	Northern	Western	Overall
Electrocardiography	354,388	2,296,707	811,522	877,654	702,192
Ultrasonography	203,077	451,811	382,575	360,680	318,327
Endoscopy	602,460	3,062,276	1,785,348	1,755,308	1,256,554
Colonoscopy	860,658	4,593,414	1,409,486	8,776,542	1,836,502
Otolaryngoscopy	722,952	1,531,138	1,030,009	4,388,271	1,256,554
Cardiac catheterization	18,073,809	NA	NA	NA	23,874,529
X-ray	217,757	430,633	453,902	346,442	327,048
Contrast radiology	602,460	3,062,276	1,409,486	1,755,308	1,193,726
Mammography	1,204,921	9,186,828	6,695,056	2,194,136	2,387,453
CT scan	785,818	4,593,414	3,825,747	2,925,514	1,836,502
Radiotherapy	9,036,905	NA	NA	NA	23,874,529
Renal dialysis	1,204,921	NA	3,825,747	8,776,542	2,984,316
All the above services	**9,036,905**	**NA**	**NA**	**NA**	**23,874,529**

Proportion of hospitals with advanced diagnostic and treatment services

Figure 26 shows the percentage availability of the advanced diagnostic and treatment services. Of the 12 services that were enquired about during the census, only one facility, the national referral hospital, had all of them. On average, the hospitals had only 3 (24%) of the 12 services. Ultrasound and X-ray services were the most commonly available services while radiotherapy and cardiac catheterization were the least available. Details of the availability of the advanced diagnostic and treatment services are shown in Figure 31.

Figure 26: The availability of advanced diagnostic and treatment services (n=146*)



**National psychiatric hospital and level IV primary care facilities excluded from analysis*

Districts that did not have advanced diagnostic and treatment services

Table 10 shows the list of districts that did not have any of the advanced diagnostic and treatment services. In total, 33 districts (29%) did not have the services

Table 10: List of districts that did not have any of the advanced diagnostic and treatment services that were enquired about

Agago	Kiryandongo
Alebtong	Koboko
Budaka	Kween
Bukomansimbi	Kyegegwa
Bulambuli	Kyenjojo
Buliisa	Lamwo
Bundibugyo	Luuka
Butaleja	Manafwa
Buyende	Masindi
Gomba	Mitooma
Kaberamaido	Nakasongola
Kaliro	Namaingo
Kamwenge	Namutumba
Katakwi	Ntoroko
Kayunga	Pader
Kibaale	Rubirizi
Kibuku	

Figure 27 shows the districts that did not have an X-ray in 2014. A total of 52 districts (46%) did not have an X-ray.

Figure 27: Map showing the districts in Uganda that did not have an X-Ray in 2014

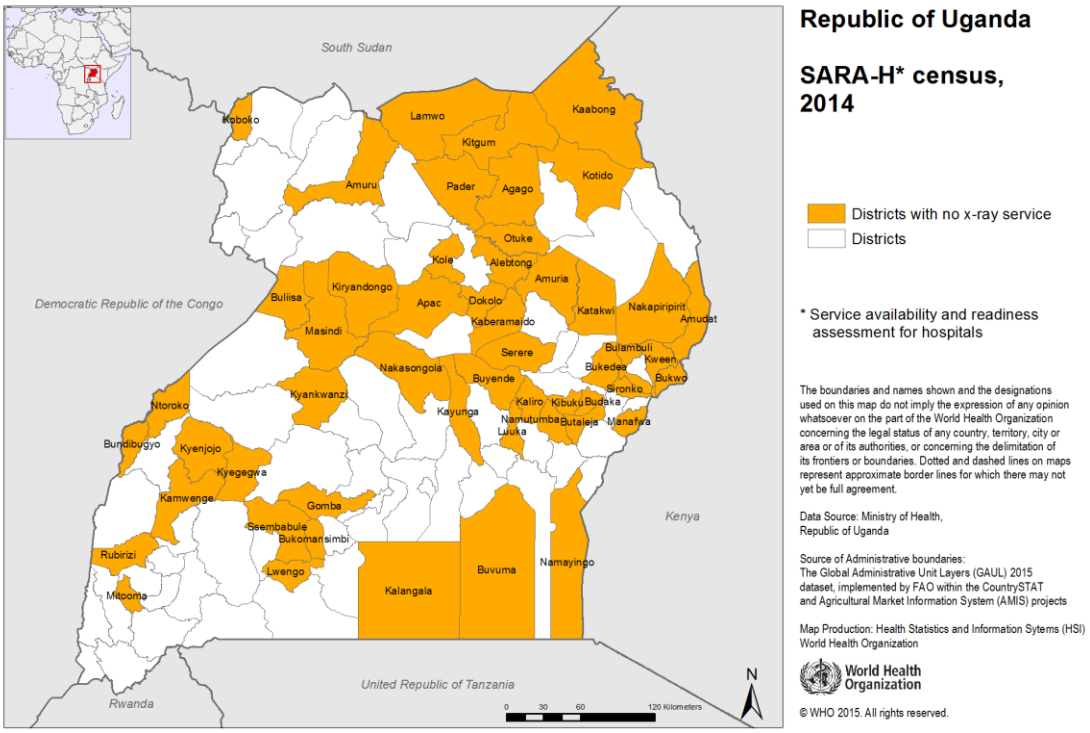


Figure 28 shows the districts that did not have an ultrasound in 2014. A total of 35 districts (31%) did not have an ultrasound.

Figure 28: Map showing the districts in Uganda that did not have an ultrasound in 2014

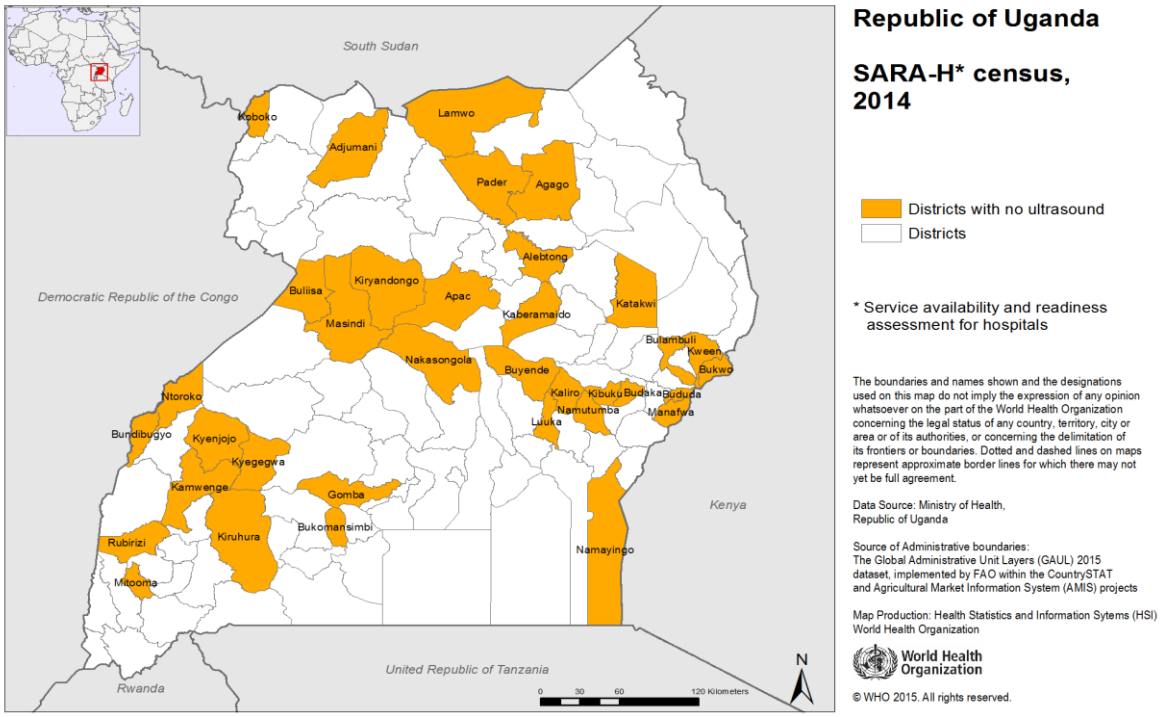


Figure 29 shows the districts in Uganda in 2014 that did not have an ECG. In total 85 districts (76%) did not an ECG.

Figure 29: Map showing the districts in Uganda that did not have an ECG in 2014

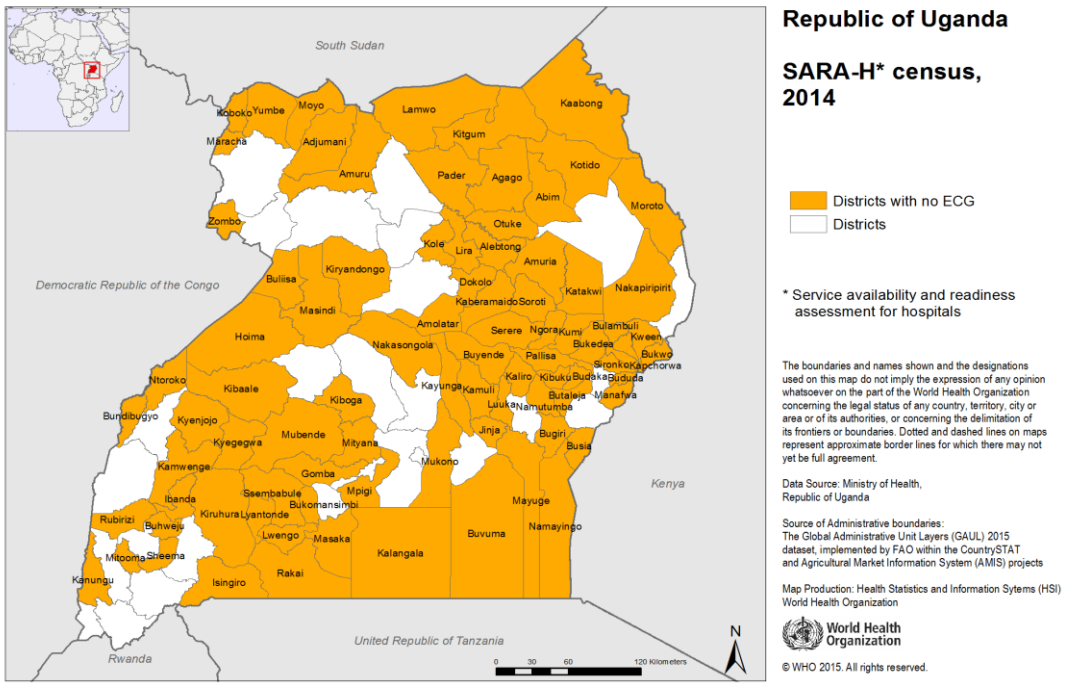


Figure 30 shows the districts in Uganda that did not have a CT-Scan in 2014. Nearly all the districts (102 (91%)) did not have a CT-scan.

Figure 30: Map showing the districts in Uganda that did not have a CT-Scan in 2014

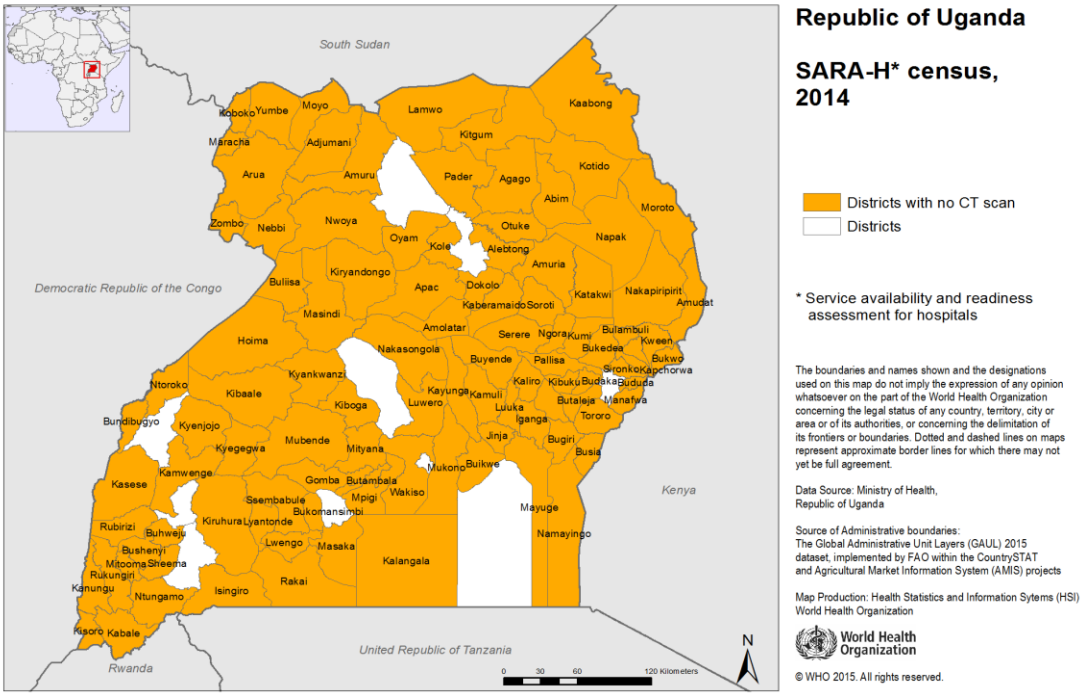


Figure 31: Percent of hospitals that indicated that they offered advanced diagnostic and treatment services, by key stratifiers (n=146*)

	Geographical zone					Ownership		Location			
	Central (n= 53)	Eastern (n=33)	Northern (n=27)	Western (n=33)	National (n=146)	Public (n=62)	Private (n=84)	Urban (n=70)	Peri-Urban (n=19)	Rural (n=57)	Overall (n=146)
Ultrasonography	89	61	70	73	75	61	86	83	58	72	75
X-ray	83	64	59	76	73	65	79	79	74	65	73
Electrocardiography	51	12	33	30	34	19	45	44	21	26	34
Endoscopy	30	9	15	15	19	10	27	26	16	14	20
Contrast radiology	30	9	19	15	20	11	25	23	16	16	19
Otolaryngoscopy	25	18	26	6	19	16	21	16	16	25	19
CT scan	23	6	7	9	13	10	15	14	11	12	13
Colonoscopy	21	6	19	3	13	10	15	26	0	2	13
Mamography	15	3	4	12	10	3	14	16	0	5	10
Renal dialysis	15	0	7	3	8	5	10	14	0	2	8
Radiotheraphy	2	0	0	0	1	2	0	1	0	0	1
Cardiac catheterization	1	0	0	0	1	2	0	1	0	0	1
Had all advanced services	**2**	**0**	**0**	**0**	**1**	**2**	**0**	**1**	**0**	**0**	**1**
Mean of the services	**32**	**16**	**22**	**20**	**24**	**18**	**28**	**29**	**18**	**20**	**24**

1.10. The availability of emergency services

Key findings:

- Emergency services were generally available. There should be at least one hospital/HC IV offering emergency service per 100,000 population. In 2014, the density of hospitals/HC IVs offering emergency services was 0.9 per 100,000 population or one hospital offering emergency services per 108,588 people. This is very close to the target
- Zonal differences in the availability of emergency services were small. Central and Western Uganda had one hospital offering emergency services for 99,782 and 98,374 people, respectively. The figures in Eastern and Northern Uganda were fairly large, with one hospital for 113,687 people in Eastern Uganda and one hospital for 133,901 in Northern Uganda
- Overall, 96% of the hospitals/HC IVs indicated that they offered emergency services. There is a possible underreporting in the national and regional hospitals but these may not have significantly affect the estimates
- Five districts (Alebtong, Amuru, Buvuma, Dokolo and Nwoya) indicated that they did not have emergency services. This needs further investigation as emergency services are offered, to varying degrees, in all facility levels in Uganda

Safe and effective emergency care requires an adequately functioning healthcare system as failure to render immediate care can result in death of a patient. Emergency services in Uganda are offered, to varying degrees, at all levels of health care delivery, right from level II primary care facilities. The emergency services offered at level II and III primary care facilities are in most cases aimed at stabilising the patients for onward referral while Level IV primary care facilities and hospitals are expected to manage all emergencies and only refer to the next higher level whenever appropriate.

Density of hospitals/HC IV offering emergency services

A level IV primary care facility has a target population of 100,000 people. This means that there should be at least a hospital or HC IV offering emergency services per 100,000 population in Uganda. This target was nearly met. There were 0.9 hospitals offering emergency services per 100,000 population in Uganda (Figure 32). This represents one hospital/HC IV offering emergency service for 108,588 people. Central and Western Uganda had one hospital offering emergency services for 99,782 and 98,374 people, respectively. The hospital/HC IV density in Eastern and Northern Uganda was lower, with one hospital/ HC IV offering emergency service for 113,687 and 133,901 people, respectively.

Figure 32: Density of emergency services (per 100,000 population), by geographical zone (n=335)

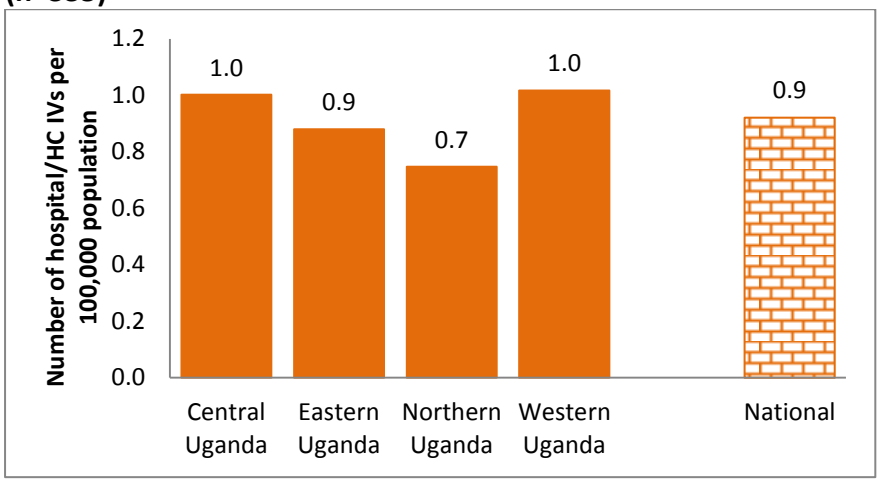
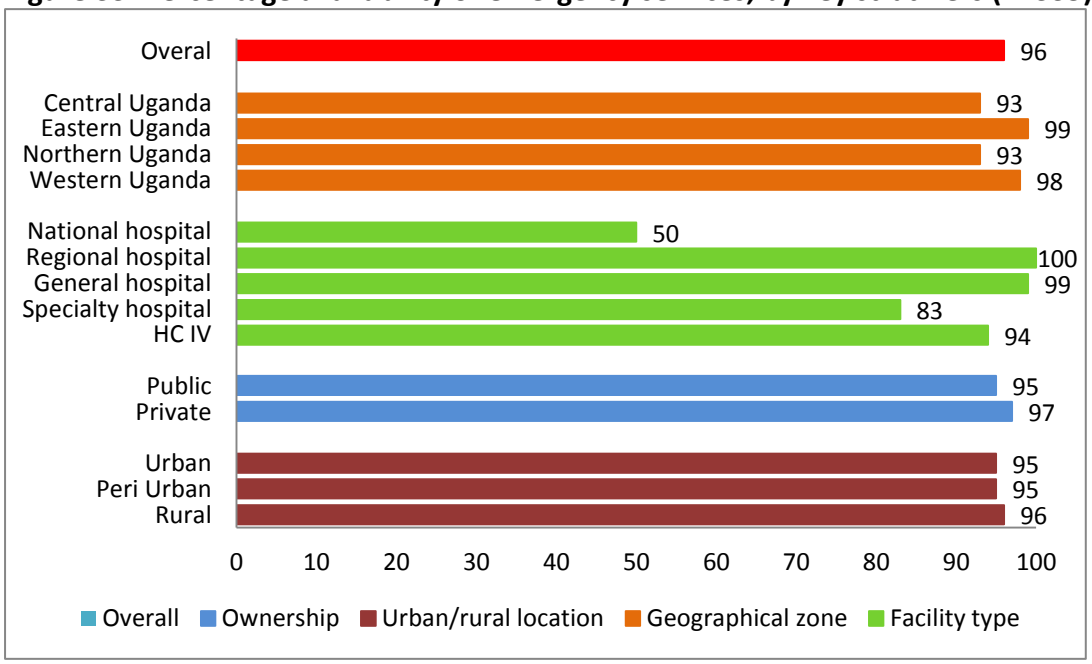


Figure 33 shows the percentage of hospitals/HC IVs that indicated that they offered emergency services. Nearly all of them (96%) reported that they offered emergency services. Differences by geographical zone, public-private ownership, and rural-urban location were very small.

Figure 33: Percentage availability of emergency services, by key stratifiers (n=335)



Emergency services were reported unavailable in five districts: Alebtong, Amuru, Buvuma, Dokolo, and Nwoya. Four of the five districts are located in Northern Uganda. It is important to further investigate this as emergency services are expected to be offered at all facility levels, including level II (lowest level) facilities.

Figure 34: Among hospitals/HC IVs that reported offering emergency services, the percentage that reported offering the indicated services in the emergency area

		Medical emergency	Minor surgical emergency	Major surgical emergency	Obstetric emergency	Emergency newborn care
Facility type	National hospital	100	100	100	0	0
	Regional hospital	100	93	71	43	50
	General hospital	97	93	62	67	71
	Specialty hospital	80	80	60	20	20
	HC IV	92	91	29	53	52
Geographical zone	Northern Uganda	94	91	61	59	69
	Eastern Uganda	85	90	40	49	43
	Central Uganda	99	98	57	64	70
	Western Uganda	97	87	24	56	55
Public/private ownership	Public	92	91	38	52	53
	Private	98	92	57	66	70
Urban/rural location	Urban	94	94	57	52	56
	Peri-urban	93	88	41	54	49
	Rural	94	91	37	60	62
Overall	Overall	94	92	44	57	59

Figure 34 shows the percentage of hospitals/HC IVs that reported that they offered the indicated emergency services in the emergency area. Nearly all the medical and minor surgical emergency services were reported offered in the emergency area. Obstetric and newborn care services at the national referral hospital were not offered in the emergency area. This however is because the national referral hospital has the obstetrics department where obstetric and newborn emergencies are admitted and managed – separate from the general emergency outpatient department. Similarly, the low percentage of regional and general hospitals that reported offering major surgical, obstetric emergency and newborn emergency care could be because the emergencies are handled in separate departments within the hospital.

1.11. The availability of blood transfusion services

Key findings:

- The target for Uganda is to have one hospital or HC IV offering blood transfusion services per 100,000 population. This target was not met. There was only about half the target number of hospitals/HC IVs offering blood transfusion services per 100,000 population or one hospital/HC IV offering blood transfusion services for close to 200,000 people.
- The density in Eastern Uganda was lower than elsewhere, with 0.47 hospitals/HC IV offering blood transfusion services per 100,000 population or one hospital/HC IV offering blood transfusion services for 211,496 people.

In Uganda, blood transfusion services are expected to be offered at hospitals and level IV primary care facilities. A level IV primary care facility in Uganda has a target population of 100,000 people. This means that, at the minimum, there should be at least one hospital or HC IV offering blood transfusion services per 100,000 population in Uganda.

Figure 35: Density of hospitals/HC IVs offering blood transfusion services, by geographical zone

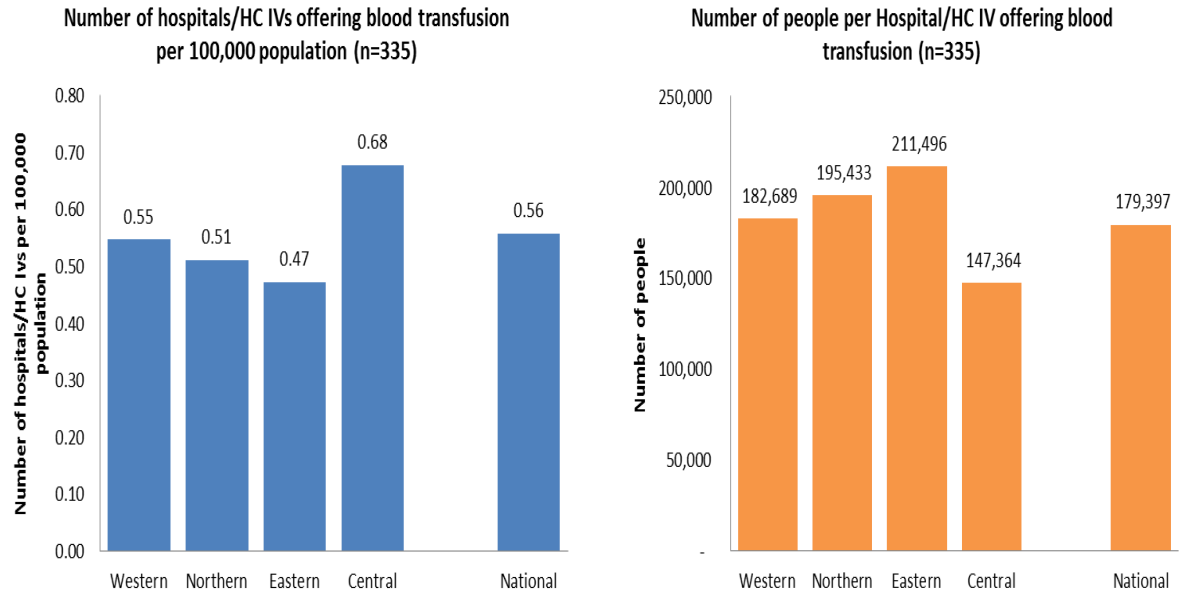
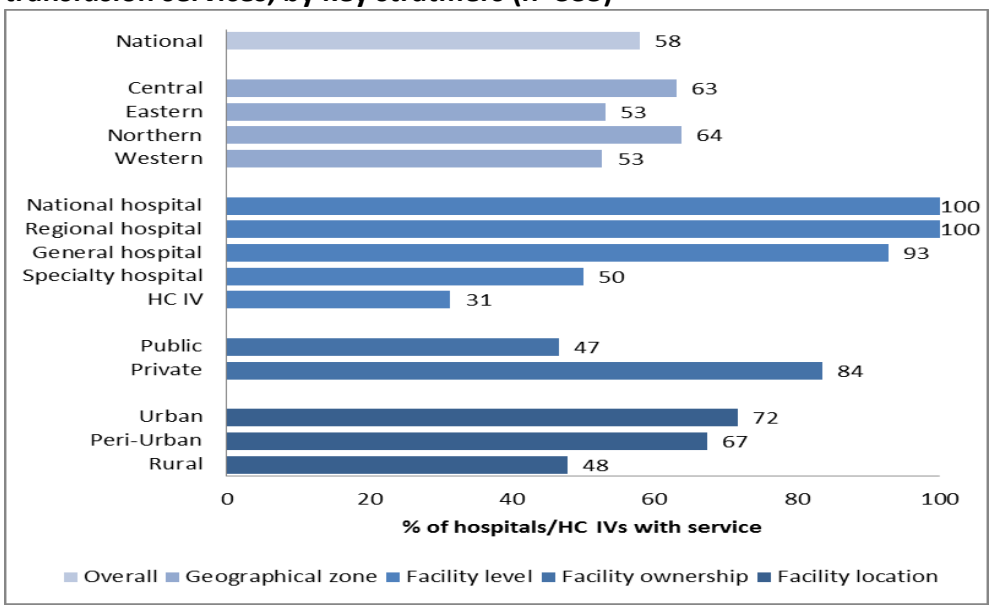


Figure 35 illustrates the density of blood transfusion services in Uganda. There were 0.56 hospitals/HC IV offering blood transfusion services in Uganda per 100,000 population. This represents one hospitals/HC IV with blood transfusion services for close to 200,000 people which is about half the target number of hospitals/HC IVs offering blood transfusions services.

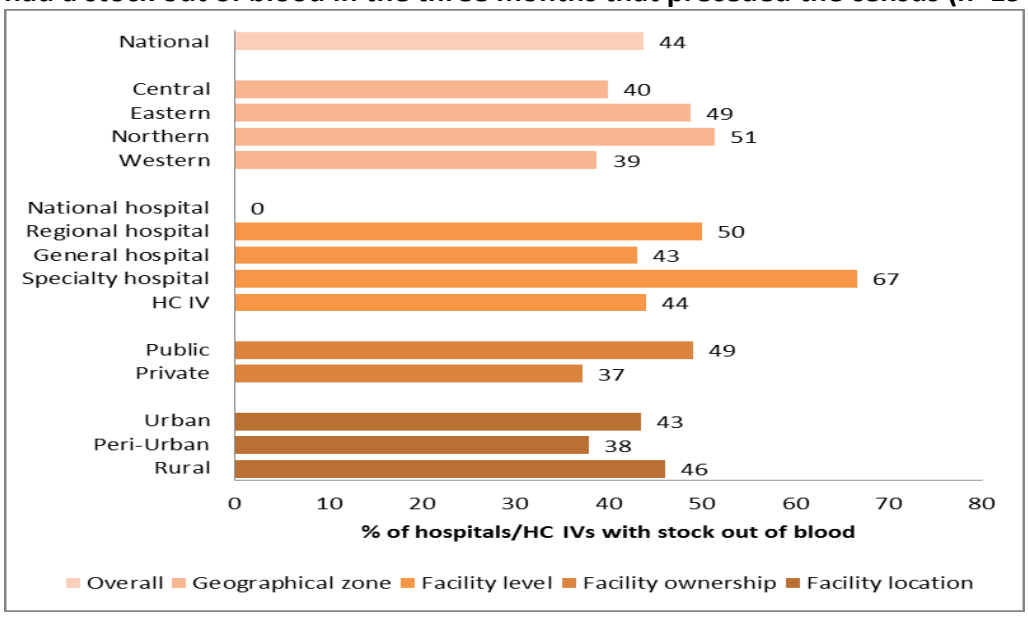
Figure 36 shows the proportion of hospitals/HC IVs that indicated that they offered blood transfusion services. Only 58% of the hospitals/HC IVs indicated that they offered the service, with only about a third of level IV primary care facilities indicating that they offered the service.

Figure 36: Percentage of hospitals/HC IV that indicated that they offered blood transfusion services, by key stratifiers (n=335)



Among hospitals/HC IV that indicated that they offered blood transfusion services, close to half (44%) indicated that they had stock out of blood in the three months that preceded the census (Figure 37). The most common reasons mentioned for the stock out were shortage of blood at the regional blood bank (n=56 hospitals/HC IVs (66%)) and lack of transport for going to pick blood from the regional bank(n= 21 hospitals/HC IVs (25%)). Delays in screening blood at the regional bank (n=4 hospitals/HC IVs (5%)), lack of storage space (n=2 hospitals/HC IVs (2%)), absence of the person responsible for collecting blood from the regional bank (n=1 hospital/HC IV(1%)), and failure to order because “there was no demand for blood” (n=1 hospital/HC IV(1%)) were the other reasons mentioned.

Figure 37: Percentage of hospitals/HC IVs offering blood transfusion that indicated they had a stock out of blood in the three months that preceded the census (n=194)



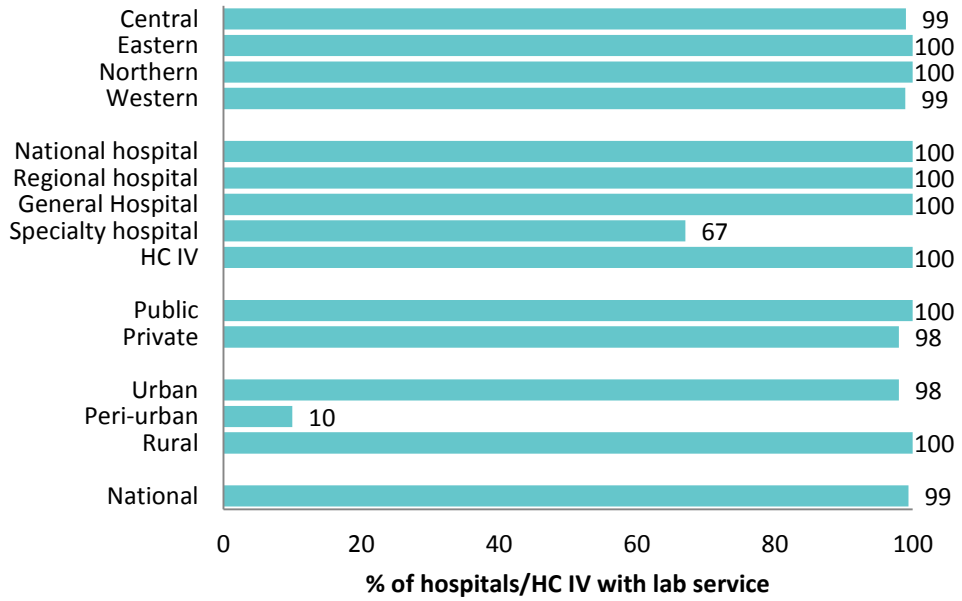
1.12. The availability of laboratory services

Key findings:

- The availability of laboratory services was reported by almost all (99%) hospitals/HC IVs. However, only a small number of the laboratory services that were enquired about during the census were reported available. For instance, of the 16 laboratory services that were enquired about, only 5% of the hospitals/HC IVs reported offering all of them and 83% reported offering at least half of the services.
- The availability of a malaria smear was the most reported (by 97% of hospitals/HC IVs) followed by urine microscopy (94%) and blood test for HIV (91%). Culture and sensitivity was the least available laboratory service, with only 12% of hospitals/HC IVs indicating that they did culture and sensitivity.

Laboratory services in the public health sector in Uganda are expected to be offered at all facility levels except level II primary care facilities. However, the range of laboratory services offered differs quite substantially by level of facility. Level III and IV primary care facilities mostly offer basic laboratory tests. These include tests for the most common infectious illnesses such as malaria and worms, and urine tests for sugar and pregnancy. General hospitals offer most laboratory tests except the more advanced ones such as culture and sensitivity that are expected to be offered mostly in regional and national referral hospitals.

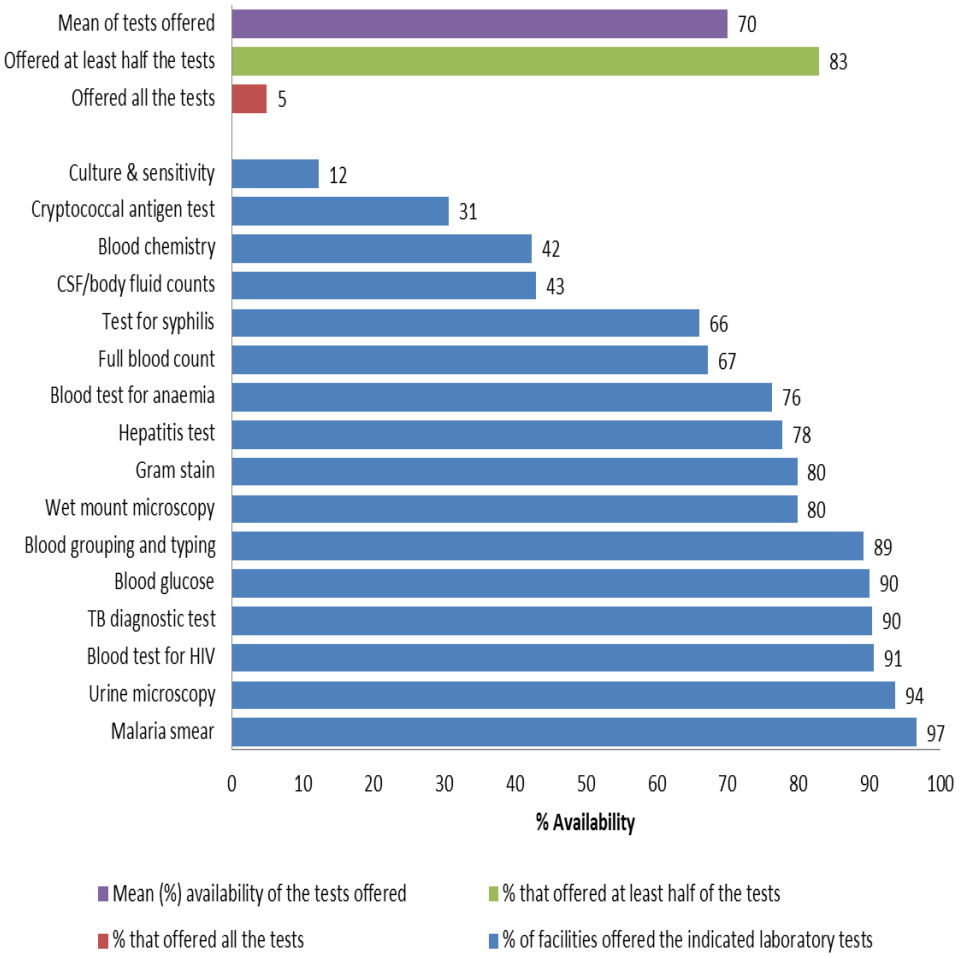
Figure 38 Percentage of hospitals/HC IVs that indicated they offered laboratory services (n=335)



Findings of the SARA-Hospital census show that the availability of laboratory services in hospitals/HC IVs in Uganda was nearly universal (Figure 38). However, the hospitals/HC IVs that indicated that they offered laboratory services (n=333) reported the availability of only

a subset of the tests that were enquired about during the census. For instance, of the 16 tests that were enquired about, only 5% of the hospitals/HC IVs reported offering all of them and 83% reported offering at least half of the tests (Figure 39). On average, 11 (70%) of the 16 tests were reported available.

Figure 39 Percentage of facilities with the indicated laboratory tests, nationally (n=333)



Malaria smear was the most commonly reported test followed by urine microscopy and blood test for HIV. Culture and sensitivity was the least available test, with only 12% of the hospitals/HC IVs indicating that they did culture and sensitivity (Figure 39). Detailed disaggregation of availability of the tests by geographical zone, facility type, ownership and location is shown on Figure 40.

Figure 40: Percent of facilities that indicated they offered each of the services (in facilities with lab services) (n=333)

	Blood glucose	Blood test for anaemia	Blood chemistry	Full blood count	Blood test for HIV	Test for syphilis	Blood grouping and typing	TB diagnostic test	Hepatitis test	Wet mount microscopy	Urine microscopy	Malaria smear	CSF/body fluid counts	Cryptococcal antigen test	Gram stain	Culture & sensitivity	Offered all tests	Offered at least half the tests	Mean of the tests
Northern	86	81	43	78	84	52	93	97	83	83	93	98	69	36	86	12	7	88	73
Eastern	80	75	35	63	85	60	83	84	70	67	88	94	31	20	72	9	2	78	63
Central	93	80	51	68	92	76	91	88	80	85	98	98	34	40	77	15	8	85	73
Western	98	70	39	64	98	68	90	95	78	84	95	97	47	26	86	13	4	84	72
National hospital	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Regional hospital	86	93	93	100	86	57	100	100	79	100	93	93	93	71	100	50	14	100	87
General hospital	96	91	76	90	92	86	96	90	82	86	96	99	67	49	86	22	9	96	81
Specialty hospital	100	100	75	100	100	100	100	100	75	75	100	100	75	50	100	50	50	100	88
HC IV	86	64	15	49	90	53	84	90	74	74	92	95	22	14	74	2	1	73	61
Public	86	69	28	59	90	53	87	91	77	77	93	96	36	25	77	8	2	78	66
Private	99	93	74	85	93	95	95	88	80	87	96	98	59	44	86	23	13	95	81
Urban	94	88	64	84	93	75	96	86	81	85	91	97	46	41	84	24	11	92	77
Peri-urban	91	84	44	77	91	58	95	95	86	72	100	100	47	26	81	12	2	86	72
Rural	88	68	30	56	89	63	84	92	74	79	94	96	40	26	77	6	3	78	66
National	**90**	**76**	**42**	**67**	**91**	**66**	**89**	**90**	**78**	**80**	**94**	**97**	**43**	**31**	**80**	**12**	**5**	**83**	**70**

2. Quality and safety

- Institutional mortality (MMR, stillbirth, neonatal mortality)
- Caesarean section
- Readiness to offer services
- Capacity assessment
- Systems for quality
- Infection prevention in the laboratory
- The availability of medicines

2.1. Maternal Mortality

Key findings:

- Maternal mortality ratio (MMR) in hospitals/HC IVs was slightly lower than the national average and the average in the African region. It was 133 per 100,000 live births during 1st July 2012 – 30th June 2013, and 276 per 100,000 live births during 1st July 2013 – 30th June 2014. The national average and the average in the African region were 360 and 500,000 per 100,000 live births, respectively (modelled estimates by UN 2013). According to the UDHS (2011), the MMR in the 7 years that preceded the survey was 435 per 100,000 live births.
- When HC IV are excluded from analysis, the MMR in hospitals was 142 during 1st July 2011-30th June 2012, and 341 during 1st July 2012 – 30th June 2013 which was still lower than the national average and the average in the African region.
- MMR in Central Uganda was substantially lower than elsewhere in Uganda.
- MMR for December 2013 in Western Uganda is unbelievably high (2,048 per 100,000 live births). This is possibly due to underreporting of live births for that month.
- Possible underestimate of MMR due to missing data for national referral hospital.

Estimates by the UN suggest that in 2013 the maternal mortality ratio (MMR) in Uganda was 360 per 100,000 live births. An earlier estimate by the Uganda Demographic and Health Survey shows that the MMR in Uganda in the seven years that preceded the survey was 435 per 100,000 live births. UN estimates also suggest that the MMR in the African region in 2013 was 500 per 100,000 live births.

Figure 41: Maternal mortality ratio in hospitals and HC IVs

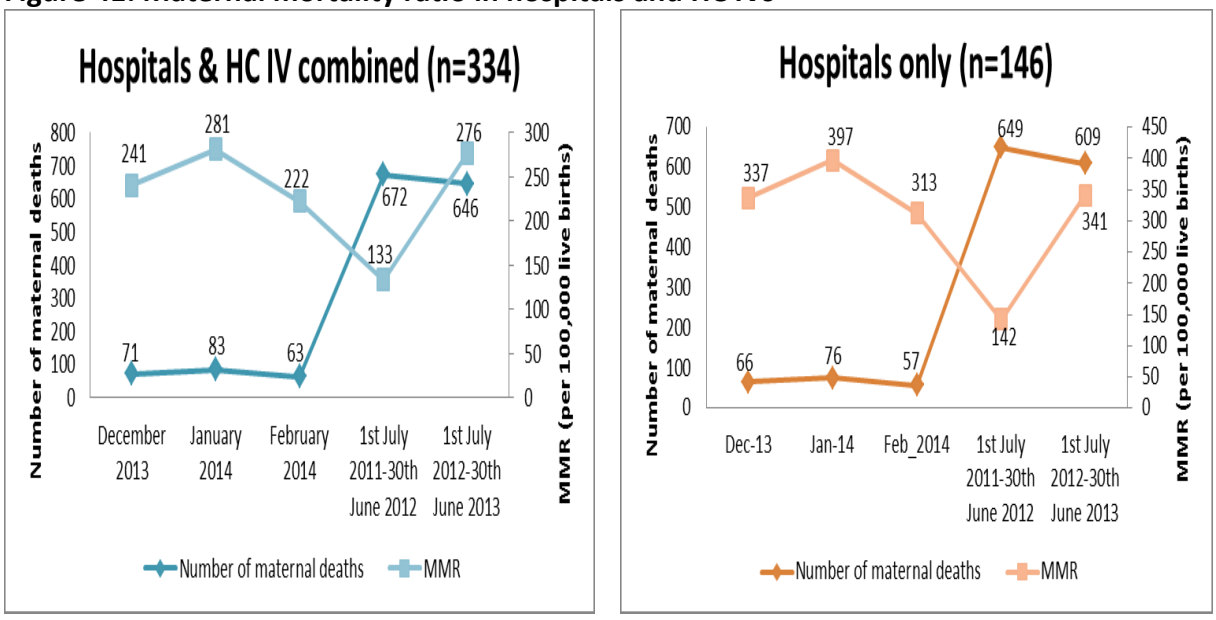


Figure 41 shows the MMR in hospitals and level IV primary care facilities in Uganda. The MMR in hospitals and level IV primary care facilities was 133 per 100,000 live births during 1st July 2012 – 30th June 2013, and 276 per 100,000 live births during 1st July 2013 – 30th

June 2014. When level IV primary care facilities are excluded from analysis, the MMR per 100,000 live births was 142 during 1st July 2012 – 30th June 2013, and 341 during 1st July 2013 – 30th June 2014. In absolute numbers, there were 672 maternal deaths during 1st July 2012 – 30th June 2013, and 646 maternal deaths during 1st July 2013 – 30th June 2014. These estimates are lower than the national average and the average in the African region and suggest that many maternal deaths occur outside of the hospitals/HC IVs.

Zonal differences in the MMR in hospitals and level IV primary care facilities was quite wide but the differences narrow slightly when level IV primary care facilities are excluded from analysis (Figure 42). The MMR for December 2013 in Western Uganda is unbelievably high (2,048 per 100,000 live births). This may have been due to underreporting of live births in that month. Generally, the MMR increased with increase in facility level and was higher in private than public hospitals/HC IVs. Urban-rural differences in the MMR were not clear but generally, the MMR in peri-urban areas was higher compared to other locations (Figure 42). There is also a possible underestimate of the MMR in hospitals because data for deliveries and maternal deaths in the national referral hospital was lacking.

Figure 42 Maternal mortality ratio, by key stratifiers

Hospitals & HC IV combined (n=334)

	Dec-13	Jan-14	Feb-14	During 1st July 2011-30th June 2012	During 1st July 2012-30th June 2013
Geographical zone					
Northern	280	316	140	563	404
Eastern	327	263	217	208	304
Central	175	244	180	60	226
Western	2048	314	317	380	289
Facility level					
National hospital					
Regional hospital	317	584	502	489	572
General hospital	346	315	233	412	362
Speciality hospital					
HC IV	50	67	59	48	67
Facility ownership					
public	178	243	196	87	235
Private	463	414	320	479	420
Facility location					
urban	231	350	304	90	289
periurban	285	182	103	350	250
rural	236	230	167	322	262
National	241	281	222	133	276

Hospitals only (n=146)

	December 2013	January 2014	February 2014	During 1st July 2011-30th June 2012	During 1st July 2012-30th June 2013
Geographical zone					
Central Uganda	230	314	236	59	267
Eastern Uganda	475	386	337	316	433
Northern Uganda	421	439	211	646	430
Western Uganda	289	480	457	438	399
Facility level					
National hospital					
Regional hospital	317	584	502	489	572
General hospital	346	315	233	412	362
Speciality hospital					
Facility ownership					
public	273	387	310	93	311
Private	484	419	319	502	425
Facility location					
urban	264	405	359	92	324
periurban	493	247	184	514	404
rural	440	436	265	464	363
National	337	397	313	142	341

2.2. Still births

Key findings:

- Stillbirth rate in the Ugandan hospitals and level IV primary care facilities was higher than the average in the African region (2.8%). The the stillbirth rate was 5.0% during 1st July 2011 – 30th June 2012, and 4.4% during 1st July 2012 – 30th June 2013
- When level IV primary care facilities are excluded from analysis, the stillbirth rate in hospitals was 5.6% during 1st July 2011 – 30th June 2012, and 5.4% during 1st July 2012 – 30th June 2013 which was still higher than the average in the African region.
- The stillbirth rate in Northern Uganda was slightly higher than elsewhere

According to the World Health Organization, a stillbirth is "a baby born with no signs of life at or after 28 weeks' gestation". Recent data on the number of stillbirths is currently lacking but WHO estimates show that in 2009, there were 2.6 million stillbirths globally, with the great majority of the stillbirth occurring in the developing countries. The stillbirth rate in Sub-Saharan Africa (2.8% or 28 per 1,000 births) is about 10 times as high as that in the developed countries (0.3% or 3 per 1,000 births). Major causes of stillbirth include childbirth complications, maternal infections in pregnancy, maternal disorders such as hypertensions and diabetes, foetal growth restriction, and congenital abnormalities. At least half of all stillbirths occur in the intra-partum period, representing the greatest time of risk. Quality of antenatal and delivery care therefore has a direct bearing on the rates of stillbirths.

Figure 43: Stillbirths in Hospitals and level IV primary care facilities in Uganda

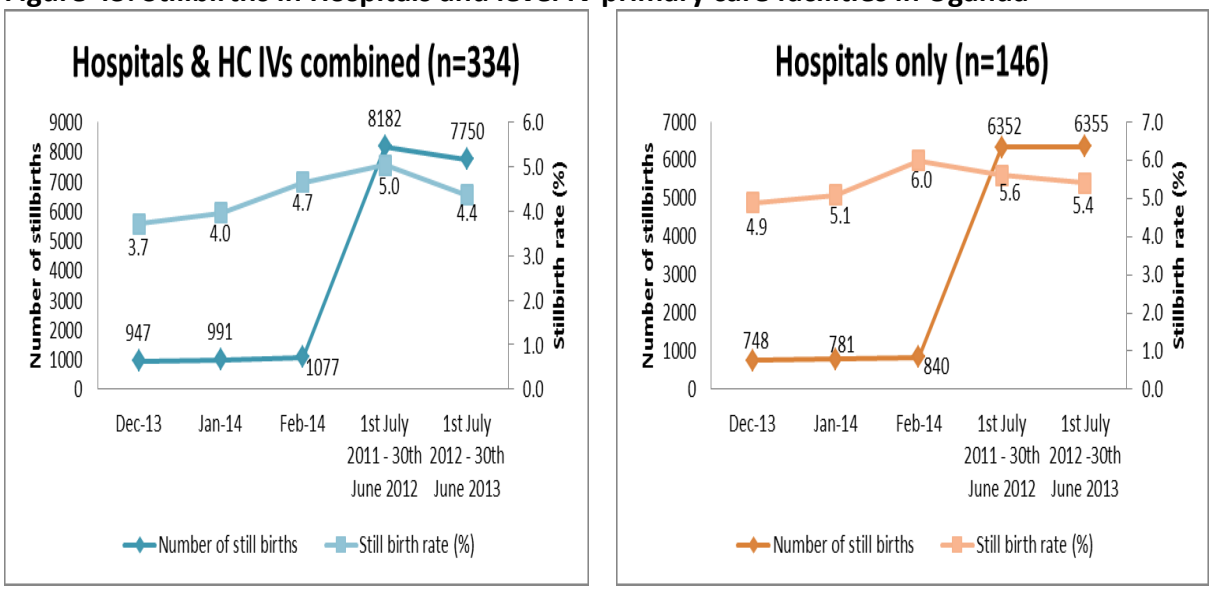


Figure 43 shows the stillbirth rate in Ugandan hospitals and level IV primary care facilities. The stillbirth rate was 5.0% during 1st July 2012 – 30th June 2013 and 4.4% during 1st July 2013 – 30th 2014. This represents about 5 stillbirths for every 100 births. These estimates are about twice as high as the average in the African region (2.8%) and 17 times as high as the average in the developed countries. In absolute numbers, there were about 8,182

stillbirths in Ugandan hospitals and level IV primary facilities during 1st July 2012 – 30th June 2013, and 7,750 stillbirths during 1st July 2013 – 30th 2014. When one considers the fact that over 50% of the deliveries in Uganda occur at home, then stillbirth rate in Uganda could be way higher than these estimates. There could also have been a considerable underestimate of the stillbirth rate in the hospitals because of the missing data for the national referral hospital.

Figure 44 shows the stillbirth rate by key stratifiers. Zonal differences in stillbirth rates were small but the rate in Northern Uganda was higher compared to the other geographical zones. As was the case with the maternal mortality ratio, stillbirth rate generally increased with increase in level of facility. The rates were higher in private than in public hospitals/HC IVs but when HC IVs are excluded from analysis, the rates were generally higher in public than private hospitals. The pattern by urban-rural location was not so clear.

Figure 44: Stillbirth rate (%), by key stratifiers

Hospitals/HC IVs combined (n=334)

	Dec 2013	Jan 2014	Feb 2014	1st July 2011-30th June 2012	1st July 2012-30th June 2013
Geographical zone					
Northern	3.7	3.7	3.6	5.5	5.2
Eastern	3.1	3.9	3.6	4.7	4.7
Central	4.4	3.9	3.9	5.1	4.0
Western	3.8	4.2	7.5	5.0	4.0
Facility type					
National hospital	No data	No data	No data	No data	No data
Regional hospital	5.3	5.8	5.7	4.7	6.1
General hospital	4.7	4.8	6.1	6.1	5.1
Speciality hospital	0.0	No data	No data	0.0	0.0
HC IV	2.0	2.2	2.6	3.7	2.3
Facility ownership					
Public	3.5	3.6	3.7	4.9	4.1
Private	4.5	5.3	8.9	5.3	5.1
Facility location					
Urban	4.0	4.6	4.4	4.6	4.8
Peri-urban	4.3	2.9	2.8	5.9	4.1
Rural	3.2	3.6	5.5	5.4	3.9
Total	3.7	4.0	4.7	5.0	4.4

Hospitals only (n=146)

	Dec 2013	Jan 2014	Feb 2014	1st July 2011 to 30th June 2012	1st July 2012 to 30th June 2013
Geographical zone					
Northern	4.1	4.3	4.2	5.8	5.6
Eastern	4.7	5.7	5.0	7.4	6.6
Central	5.4	4.7	4.6	6.8	4.7
Western	5.2	5.6	6.4	3.3	5.3
Facility type					
National hospital	No data	No data	No data	No data	No data
Regional hospital	5.3	5.8	5.7	4.7	6.1
General hospital	4.7	4.8	6.1	6.1	5.1
Speciality hospital	0.0	No data	No data	0.0	0.0
Facility ownership					
Public	5.0	5.0	4.8	5.8	5.6
Private	4.7	5.3	9.0	5.3	5.0
Facility location					
urban	4.6	5.2	5.1	5.2	5.4
periurban	7.0	3.9	3.4	8.7	6.0
rural	4.6	5.4	9.3	5.4	5.1
Total	4.9	5.1	6.0	5.6	5.4

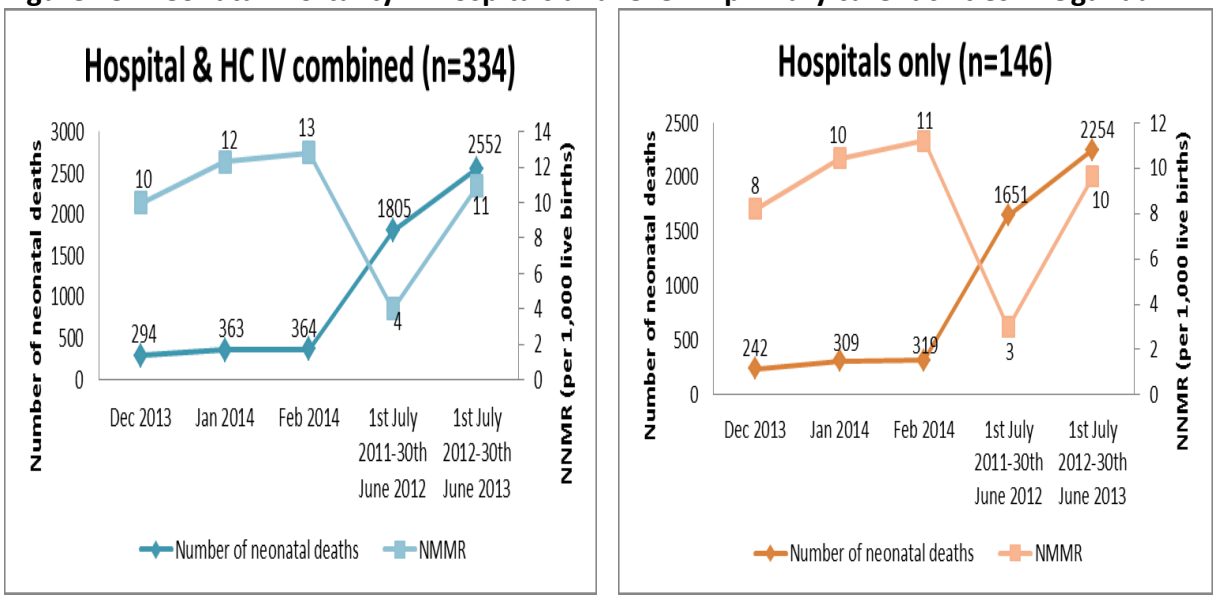
2.3. Neonatal mortality

Key findings:

- The neonatal mortality rate (NNMR) in the Ugandan hospitals and level IV primary care facilities was lower than the national average (43.8 per 1,000 live births) and the average in the African region (30.5 per 1,000 live births) in 2013. It was 4 per 1,000 live births during 1st July 2011 – 30 June 2012, and 11 per 1,000 live births during 1st July 2012 – 30th June 2013.
- When level IV primary care facilities are excluded, the NNMR in hospitals was 3 per 1,000 live births during 1st July 2011 – 30 June 2012, and 10 per 1,000 live births during 1st July 2012 – 30th June 2013.
- The NNMR in Northern Uganda was higher than elsewhere in Uganda.
- ❖ There may have been a considerable underestimate of the NNMR due to missing data for the national referral hospital and a possible underreporting or undercounting of the neonatal deaths in some hospitals/HC IVs. There is also a possibility that neonatal deaths for some deliveries that took place in hospitals/HC IVs occurred outside the hospitals/HC IVs.

A neonatal death refers to a death during the first 28 days of life (0-27 days).The neonatal mortality rate (NNMR) is a key outcome indicator for maternal and newborn care and directly reflects the quality of prenatal, intra-partum, and neonatal care. Early neonatal deaths are closely associated with pregnancy-related factors and maternal health, whereas late neonatal deaths are associated more with factors in the new-born's environment.

Figure 45: Neonatal mortality in hospitals and level IV primary care facilities in Uganda



Modelled estimates by WHO suggest that at population level, the in Uganda in 2013 was 43.8 per 1,000 live births which was higher than the rate in the African region (30.5 per 1,000 live births). The NNMR in Ugandan hospitals and level IV primary care facilities was 4 per 1,000 live births during 1st July 2012 – 30th June 2013, and 11 per 1,000 live births during 1st July 2013 – 30th June 2014 (Figure 45). When level IV primary care facilities are excluded from analysis, the NNMR in hospitals was 3 per 1,000 live births during 1st July 2012 – 30th June 2013, and 10 per 1,000 live births during 1st July 2013 – 30th June 2014 (Figure 45). These rates in hospitals and primary care facilities are lower than the national average and the average in the African region – suggesting that many neonatal deaths occur outside of the hospitals/level IV primary care facilities.

Figure 46: Neonatal mortality rate (per 1,000 live births), by key stratifiers

Hospitals and HC IV combined (n=334)

	Dec 2013	Jan 2014	Feb 2014	1st July 2011-30th June 2012	1st July 2012-30th June 2013
Geographical zone					
Northern	13	17	24	12	20
Eastern	11	14	15	10	12
Central	9	11	9	2	9
Western	82	10	7	7	10
Facility level					
National hospital	No data	No data	No data	No data	No data
Regional hospital	9	12	12	8	18
General hospital	14	18	20	13	15
Speciality hospital	No data	No data	No data	No data	No data
HC IV	5	5	4	3	5
Facility ownership					
Public	8	10	10	2	9
Private	16	21	25	15	18
Facility location					
Urban	10	12	12	2	10
Periurban	10	11	11	16	13
Rural	11	13	14	7	11
National	10	12	13	4	11

Hospitals only (n=146)

	Dec 2013	Jan 2014	Feb 2014	1st July 2011-30th June 2012	1st July 2012-30th June 2013
Geographical zone					
Northern	9	14	22	11	18
Eastern	10	13	13	9	10
Central	9	9	9	2	8
Western	53	7	5	7	8
Facility type					
National hospital	No data	No data	No data	No data	No data
Regional hospital	9	12	12	8	18
General hospital	14	18	20	13	15
Speciality hospital	No data	No data	No data	No data	No data
Facility ownership					
Public	6	8	8	2	8
Private	15	19	24	13	16
Facility location					
Urban	10	11	2	2	10
Periurban	7	9	37	15	12
Rural	7	10	4	6	9
National	8	10	11	3	10

In absolute numbers, there were 1,805 neonatal deaths in hospitals and level IV primary care facilities during 1st July 2012 – 30th June 2013, and 2,552 neonatal deaths during 1st July 2013 – 30th June 2014. There may however have been considerable underestimate of the NNMR due to the lack of data for the national referral hospital, and a possible underreporting or undercounting of neonatal deaths in the hospitals/HC IVs.

Generally, the neonatal mortality rate in Northern Uganda was higher compared to the other geographical zones (Figure 46). Neonatal mortality rate for December 2013 in Western Uganda was substantially high. This is possibly due to underreporting of live births for that month. The rates were higher in private than public hospitals/HC IVs and generally higher in peri-urban than other locations. Caution should be exercised when viewing the neonatal mortality rate through the quality of care lens because neonatal mortality rate in a facility is very sensitive to the case mix of deliveries and neonatal admissions. A high neonatal mortality rate may not necessarily mean that the quality of care is poor. In fact, improvements in prenatal and intrapartum care may increase the neonatal mortality rate because babies who may otherwise have been stillbirths may survive delivery only to die in the neonatal period.

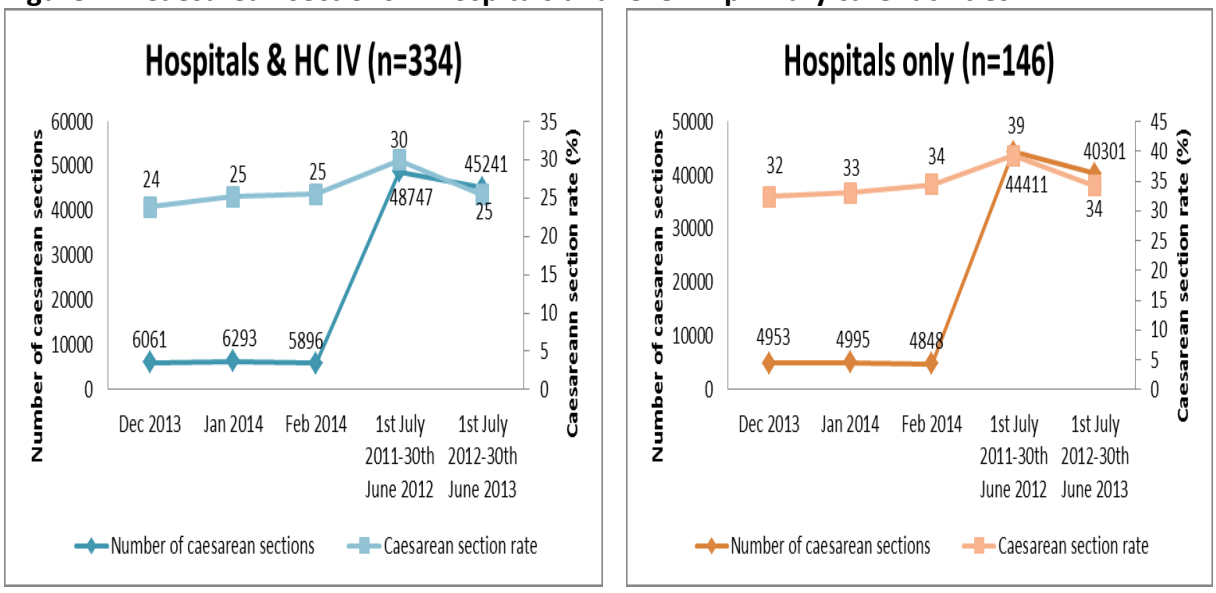
2.4. Caesarean sections

Key findings:

- The caesarean section rate in Uganda's hospitals and level IV primary care facilities was quite high. The rate was 30% during 1st July 2011-30th June 2012, and 25% during 1st July 2012 – 30th June 2013.
- When level IV primary care facilities are excluded, the rate was 39% during 1st July 2011-30th June 2012, and 34% during 1st July 2012 – 30th June 2013
- There may have been a considerable underestimate of the caesarean section rate due to missing data for the national referral hospital

Caesarean sections are effective in saving maternal and infant lives, but only when they are required for medically indicated reasons. Caesarean sections can cause significant and sometimes permanent complications, disability or death particularly in settings that lack the facilities and/or capacity to properly conduct safe surgery and treat surgical complications. Caesarean section rate is a measure of quality of maternal care.

Figure 47: Caesarean sections in hospitals and level IV primary care facilities



There were 48,747 caesarean sections during 1st July 2012 – 30th June 2013 and 45,241 during 1st July 2013 – 30th June 2014. This represents a caesarean section rate of 30% and 25%, respectively (Figure 47). It is however difficult to know whether or not these caesarean section rates are high due to lack of a global norm for caesarean section rates in hospitals. Since 1985, the international healthcare community has considered the ideal rate for caesarean sections at population level to be between 10% and 15%. In fact, caesarean section rates higher than 10% at population level have not been found to be associated with reductions in maternal and newborn mortality rates. Because most complicated cases end up in hospitals, caesarean section rates in hospitals could be higher than the rates at population level. The caesarean section rate was higher when level IV primary care facilities

were excluded from analysis (Figure 47). Table 11 shows the rates by key stratifiers. Data were not available for the national referral hospital.

Table 11 Caesarean section rate, by key stratifiers

Hospitals & HC IV combined (n=334)

	Dec 2013	Jan 2014	Feb 2014	1st July 2011-30th June 2012	1st July 2012-30th June 2013
Geographical zone					
Northern	17	17	16	24	26
Eastern	24	25	26	25	23
Central	27	27	26	37	25
Western	25	29	31	30	3
Facility type					
National ref hosp					
Regional ref hosp	30	35	36	31	34
General hosp	34	31	34	44	34
Speciality hosp	100			683	187
HC IV	11	13	12	9	8
Facility ownership					
Public	19	20	21	21	20
Private	45	45	47	55	42
Facility location					
Urban	27	29	30	32	26
Periurban	31	29	29	34	21
Rural	18	20	20	26	26
National	24	25	25	30	25

Hospital only (n=146)

	Dec 2013	Jan 2014	Feb 2014	1st July 2011-30th June 2012	1st July 2012-30th June 2013
Geographical zone					
Northern	24	24	23	26	32
Eastern	28	28	31	35	31
Central	38	35	35	54	33
Western	36	41	46	37	44
Facility type					
National hospital					
Regional hospital	30	35	36	31	34
General hospital	34	31	34	44	34
Speciality hospital	100			683	187
Facility ownership					
Public	27	28	30	29	30
Private	46	44	47	58	43
Facility location					
Urban	31	33	35	38	31
Periurban	32	25	30	39	32
Rural	36	35	36	43	42
National	32	33	34	39	34

Possible undercount of CS

2.5. Infection prevention and control

Key findings:

- Capacity for infection prevention and control in hospitals/HC IVs in Uganda was generally good. Using predefined criteria, none of the hospitals/HC IVs was classified as having very poor capacity for infection prevention and control. Three quarters of the hospitals/HC IVs were classified as having high or very high capacity for infection prevention and control.
- All districts had a hospital or HC IV classified as having good or very good capacity to prevent and control infections except: Kalangala, Kamwenge, Kapchorwa, Kayunga, Kole, Kyenjojo, Lyantonde, manafwa, Mayuge, Mitooma, Rubirizi and Sironko.

Capacity for infection prevention and control was assessed based on the presence of various items that hospitals/HC IVs were expected to have (Table 12). The availability of the items was assessed in the various departments of the hospitals/HC IV, namely: Emergency walk in service area, Labour suit, Maternity ward, Paediatric ward, Surgical/medical inpatient ward, Intensive care Unit, and Laboratory. For the aggregated analysis, only hospitals and HC IVs that had all the departments were included. Because intensive care unit was reported available in only 23 hospitals/HC IVs, it was excluded from the aggregated analysis.

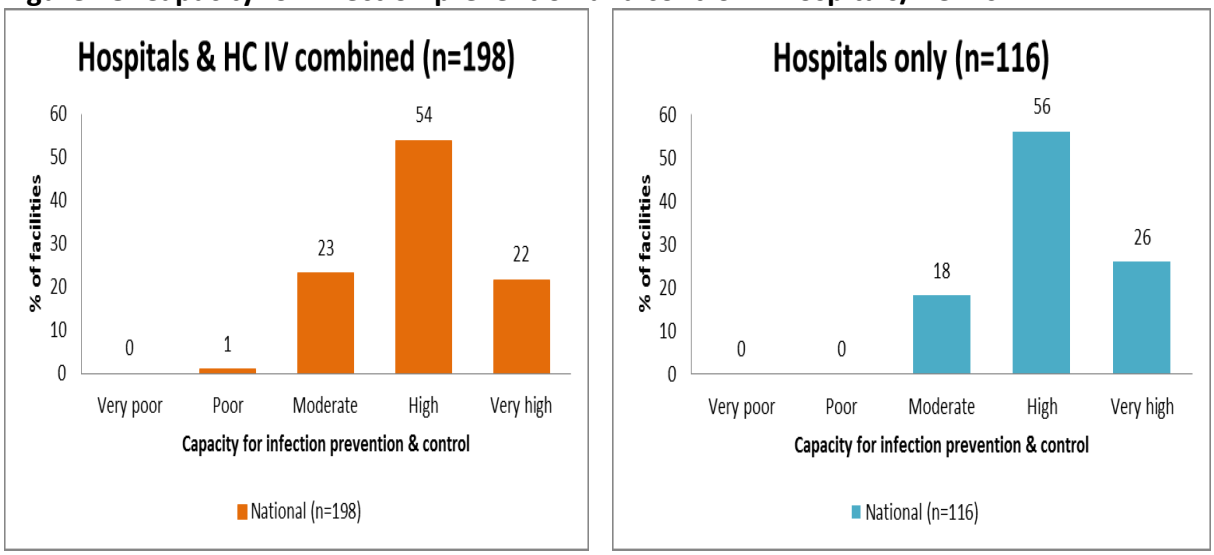
Table 12: Items enquired about to assess capacity for infection prevention and control

- Clean running water
- Soap
- Alcohol hand rub
- Gloves
- Red waste bin with liner & a pedal for opening
- Yellow waste bin with liner & pedal for opening
- Black waste bin with liner & pedal for opening
- Sharps box
- Disinfectant
- Disposable syringe with needles
- Auto-disable syringes
- In lab, six additional items were enquired about:
  - Gumboots
  - Aprons
  - First aid kit
  - Lab coat
  - Eyewash
  - Eye protection gear
- In the emergency walk in areas, three additional items enquired about:
  - Gumboots
  - Eye protection gear
  - Aprons
- Each hospital/HC IV also asked about the presence of:
  - Infection control committee
  - Infection prevention and control guidelines
  - Guidelines for isolation
  - TB isolation ward
  - Isolation ward for other infectious diseases
  - Occupational health programs

Items were considered available if they were reported available, even if they were not seen by the interviewer. The SARA standard generally considers an item to be available if it is reported and also confirmed by the interviewer to be available at the service delivery area; with the presence of just one of each item required to make a pronouncement of availability. For this analysis however, items were considered available if they were reported to be available even if they were not seen by the interviewer. This allowed for items such as

coats and gumboots which may have been taken for cleaning or which may have been worn by staff who were not present at the time of the interviews. This also allowed for items that were not available in the department at that moment but were reported available and easily accessible within the facilities. It was also assumed that staff would not deliberately lie about the availability of an item.

Figure 48: Capacity for infection prevention and control in hospitals/HC IVs



All the items were assumed to be of equal importance and therefore assigned an equal weight. The responses were coded such that a score "1" indicated the item was available and "0" indicated the item was not available. Putting together all the questions administered in the various departments, the highest potential achievable scorewas"92" points and lowest score was "0". Arbitrary cut-off points based on high-level consultations with WHO and officials at the Ministry of Health in Uganda were then introduced. This involved dividing the total score into about five equal parts and then recoding the scores such that a hospital/HC IV that scored 20 or less points was considered to have a very low capacity, 21-38 as low capacity, 39-56 as moderate capacity, 57-74 as high capacity and 75-92 as very high capacity. The percentage of hospitals that had very low, low, moderate, high and very high capacity was then calculated overall and then by facility type, geographical zone, public-private ownership and urban-rural location. Capacity for infection prevention and control in each ward/department was also assessed separately and in a similar way.

Figure 48 shows the capacity for infection prevention and control in hospitals and level IV primary care facilities in Uganda. Generally, the capacity for infection prevention and control was good. Using the pre-defined criteria described above, none of the hospitals/HC IVs was classified as having very poor capacity while only 1% of the hospitals/HC IVs were classified as having poor capacity. Three quarters of the hospitals/HC IVs were classified as having high or very high capacity. The capacity for infection prevention and control was even better when level IV primary care facilities are excluded from analysis, with none of

the hospitals classified as having very poor or poor capacity and the great majority classified as having high or very high capacity.

Figure 49 Capacity for infection prevention and control, by key stratifiers

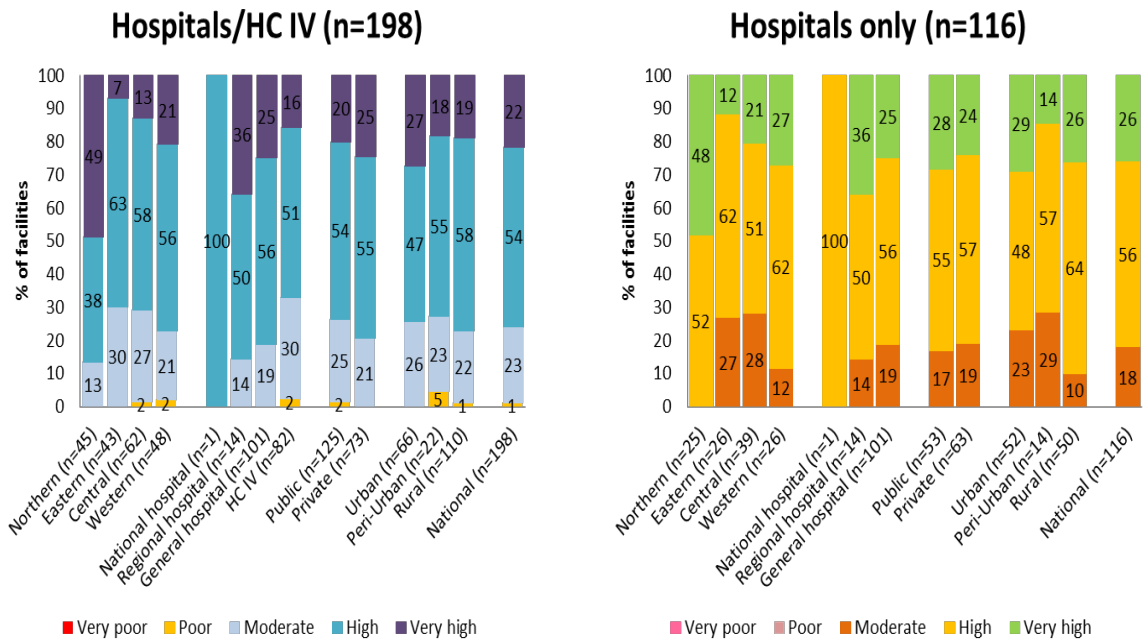


Figure 49 shows the capacity for infection prevention and control by key stratifiers. Generally, the capacity for infection prevention and control in Northern Uganda was better compared to other geographical zones. Public-private and urban-rural differences were generally small.

Figure 50 shows the capacity for infection prevention and control by point of service delivery. In both hospitals and level IV primary care facilities, the capacity for infection prevention and control in the paediatric ward was poorer compared to the other wards/departments, and better in the operating theatre.

Figure 51 shows the availability of the individual items for infection prevention and control in specific service delivery points. On average, the availability in the intensive care unit was higher than elsewhere, with facilities with intensive care unit having 83% of the items that were enquired about during the census survey. However, none of the facilities with intensive care unit had all the items that were enquired about. Across all the service delivery points, the availability of alcohol hand rub and a waste bin with liner and a pedal for opening was lower compared to other items. A sharps container was the most commonly available item, with the item available in at least 81% of the service delivery points.

Figure 50: Capacity for infection prevention by point of service delivery

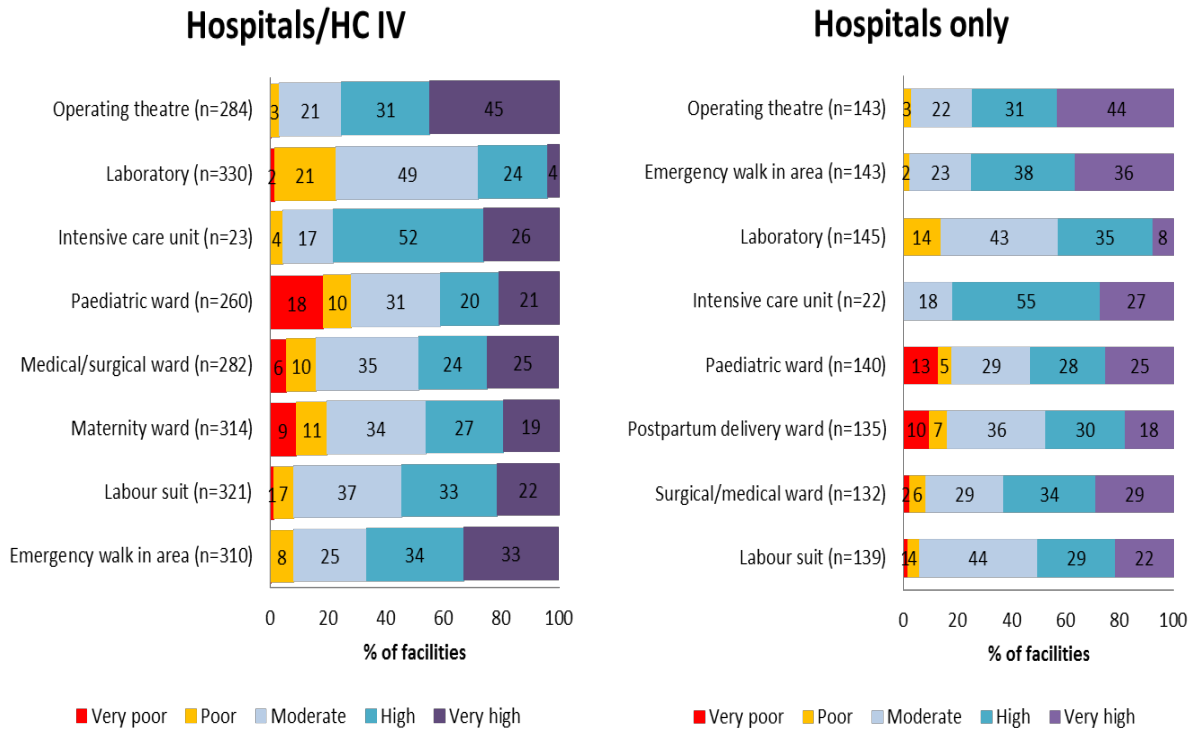


Figure 51: The availability of individual items for infection prevention and control by point of service delivery

	Emergency walk in area (n=310)	Intensive care unit (n=23)	Delivery room (n=321)	Post-delivery ward (n=314)	Medical/ surgical ward (n=282)	Paediatric ward (n=260)	Laboratory (n=330)	Operating theatre (n=284)
Running war	85	96	91	75	83	64	84	84
Hand washing soap	86	96	87	74	78	65	88	93
Alcohol handrub	48	91	33	35	33	35	55	65
Displosable latex gloves	95	100	97	89	94	80	97	96
Non-infectious waste bin	54	35	41	39	46	36	66	61
Organ tissue waste bin	49	35	42	37	40	33	52	58
General waste bin	53		37	37	41	32	51	56
Sharps container	96	96	97	92	95	81	97	98
Disinfectant	87	96	90	78	82	69	96	95
Disposable syringes with needles	88	100	92	88	90	78	79	93
Auto-disable syringes	81	83	77	73	70	64	69	87
Gowns or coats	48						88	
Gumboots or clogs	47						21	
Aprons	63						45	
Eye wash							12	
Safety shower							11	
First aid kit							16	
Had all items	9	0	7	8	11	11	1	26
Mean of items	70	83	71	65	68	58	60	81

2.6. Systems and practices to ensure quality of health care

Key findings:

- Most hospitals/HC IVs had only a subset of the systems/practices for ensuring delivery of quality health care.
  - Of the eight systems/practices that were enquired about, only one in five hospitals/HC IVs(19%) had all of them
  - On average, only three quarters (75%) of the 8 systems/practices were reported available
  - While most hospitals (91%) indicated that they carried out routine quality assurance, only 38% indicated that they participated in an accreditation
- Using predefined criteria, three quarters of the hospital/HC IVs were classified as having very good capacity to ensure delivery of quality health care. The rest of the hospitals/HC IVs were classified as having very poor (4%), poor (10%) or moderate (12%) capacity. However, capacity to ensure delivery of quality health care improves when level IV primary care facilities are excluded from analysis, with the great majority of the hospitals (88%) classified as having very good capacity and the rest classified as having very poor (3%), poor (5%) or moderate capacity (4%)
- Generally, the availability of the systems/practices increased with increase in level of the facilities. Zonal and urban-rural differences both in the availability of the systems/practices and in the capacity to ensure delivery of quality health care were modest. The systems/practices and capacity to ensure delivery of quality health care were substantially better in private than in public hospitals/HC IVs

The availability of systems/practices for ensuring delivery of quality health care

The availability of systems and practices to ensure delivery of quality health care was assessed based on the presence of the following eight items: participation in the accreditation process, carrying routine quality assurance, having quality assurance committee, having quality monitoring indicators, having systems for obtaining clients' opinions or receiving feedback about the health facility or its services, conducting case reviews, and conducting death reviews.

Figure 52 shows the availability of systems/practices for ensuring delivery of quality health care. The hospitals/HC IVs reported only a subset of the systems/practices for ensuring delivery of quality health care. Of the eight systems/practices that were enquired about, only one in five hospitals/HC IVs (19%) reported the availability of all of them. On average three quarters (75%) of the systems/practices were reported available by the hospitals/HC IVs. The most commonly reported systems/practices for ensuring quality of health care were carrying a routine quality assurance, having a quality assurance committee, having indicators for monitoring quality, and having systems for reviewing and reporting clients'

views. Participation in an accreditation process was the least reported, with only 38% of the hospitals/HC IVs reporting that they participated in an accreditation process.

Figure 52: Percentage of hospitals/HC IVs with systems and practices for ensuring quality health care (n=335)

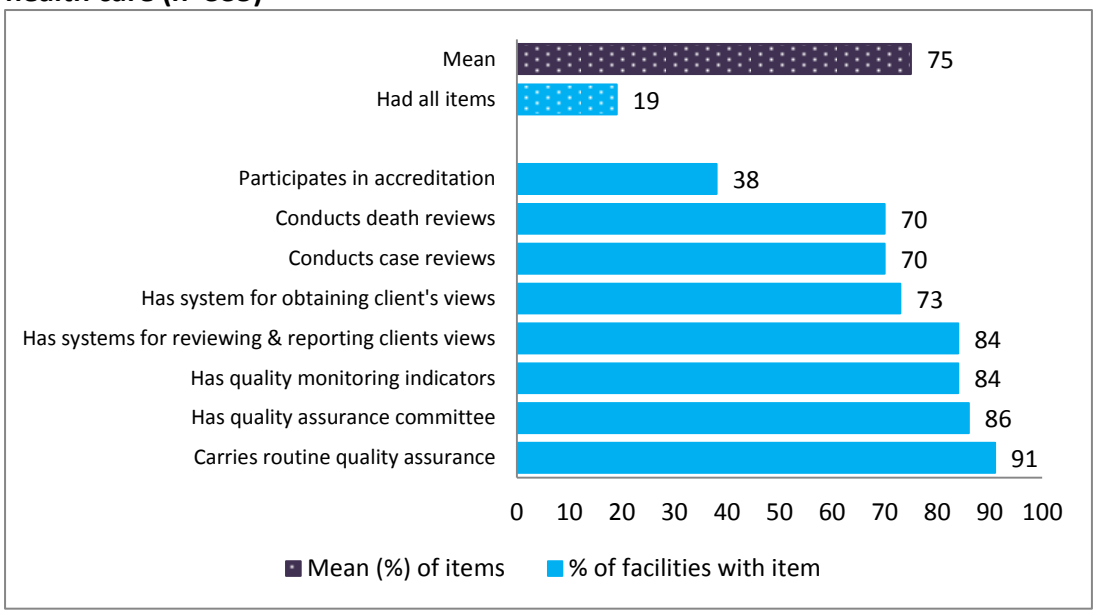
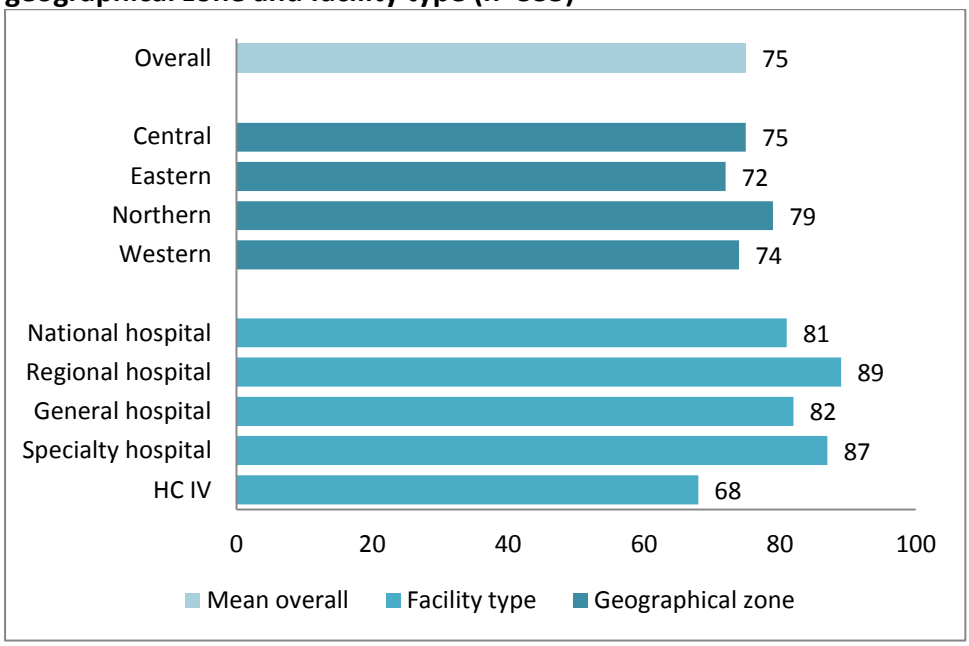


Figure 53 shows the mean availability of the systems/practices for ensuring delivery of quality of health care, by geographical zone and facility type. Northern Uganda had the highest mean availability, with the hospitals/HC IVs having on average six of the eight systems/practices (79%) that were enquired about. Eastern Uganda had the lowest mean availability, with the hospitals/HC IVs having on average 72% of the systems/practices. Details of the availability of the systems/practices to ensure delivery of quality health care are shown on Figure 55.

Figure 53: Mean (%) of systems and practices for ensuring quality of health care, by geographical zone and facility type (n=335)

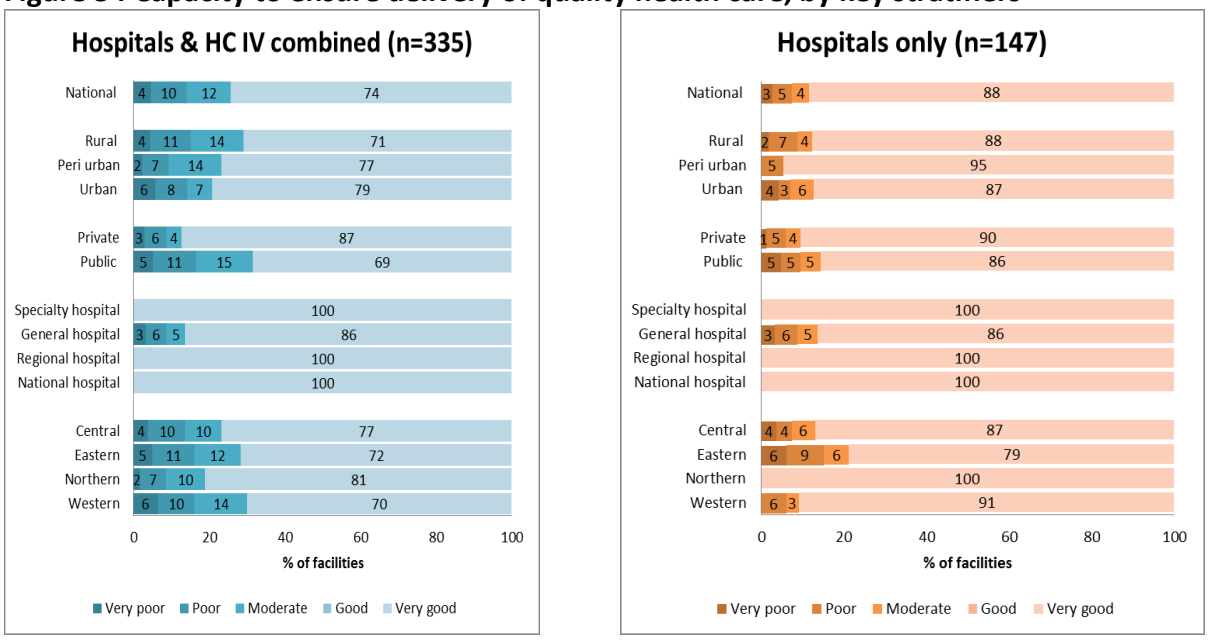


Capacity to ensure delivery of quality health care

Capacity to provide quality health care was assessed based on the reported presence of the eight systems/practices that were enquired about during the census survey. All the systems/practices were assumed to be of equal importance and therefore assigned an equal weight. Responses were then coded, with a score "1" indicating the availability and "0" indicating no availability of the system/practice. Arbitrary cut-off points were then introduced. This involved dividing the total score into about five equal parts such that hospitals/HC IVs that reported the availability of 0-1 of the systems/practices were classified as having very low capacity, 2-3 systems/practices as having low capacity, 4 systems/practices as having moderate capacity, 5-6 systems/practices as good capacity and 7-8 systems/practices as having very good capacity. The proportion of hospitals/HC IVs that had very good, good, moderate, poor and very poor capacity was then calculated overall, and then by geographical zone, facility type, public-private ownership, and urban-rural location.

Figure 54 illustrates the capacity to ensure delivery of quality health care in the hospitals and level IV primary care facilities in Uganda. Using the predefined criteria described above, three quarters of the hospitals/HC IVs were classified as having very good capacity while 4% were classified as having very poor capacity, 10% as having poor capacity and 12% as having moderate capacity. Capacity to ensure delivery of quality health care improves when level IV primary care facilities are excluded from analysis, with the great majority of the hospitals (88%) classified as having very good capacity and the rest classified as having very poor (3%), poor (5%) or moderate capacity (4%).

Figure 54 Capacity to ensure delivery of quality health care, by key stratifiers



Generally, the availability of the systems/practices increased with the increase in level of the facilities. Zonal and urban-rural differences, both in the availability of the systems/practices and in the capacity to ensure delivery of quality health care, were modest. The capacity to ensure delivery of quality health care was substantially better in private than in public hospitals/HC IVs but only slightly better in private than public hospitals/HC IVs when level IV primary care facilities are excluded from analysis.

Figure 55: Proportion of hospitals/HC IVs with systems and practices for ensuring quality of health care, by geographical zone and facility type (n=335)

	Geographical zone				Facility type					
	Central	Eastern	Northern	Western	National hospital	Regional hospital	General hospital	Specialty hospital	HC IV	Overall
Participates in accreditation	40	35	40	38	50	43	51	83	27	38
Carries routine quality assurance	91	86	93	94	100	100	90	83	91	91
Has quality assurance committee	80	93	87	85	50	100	86	80	85	86
Has quality monitoring indicators	77	83	95	86	100	100	88	83	80	84
Has systems for obtaining client's views	76	77	74	68	100	93	86	100	63	73
Has systems for reviewing/reporting clients views	85	81	79	89	50	85	92	100	76	84
Conducts case reviews	79	63	72	66	100	100	75	100	63	70
Conducts death reviews	69	59	90	67	100	100	86	67	56	71
Had all essential quality items	22	9	26	20	0	21	34	33	9	19
Mean availability	75	72	79	74	81	89	82	87	68	75

2.7. Systems and practices for ensuring safety of staff and service users

Key Findings:

- Most hospitals/HC IVs in Uganda had only a subset of the systems/practices necessary for ensuring the safety of staff and service users
  - Of the nine systems/practices that were enquired about during the census, only 6% of the hospitals/HC IV reported the availability of all of them
  - On average, only 65% of the systems/practices were reported available by the hospitals/HC IVs
  - While all the hospitals/HC IVs reported that they had an occupational health plan and an isolation ward for TB and other contagious illnesses, only 16% had a fire safety plan and 19% had an emergency response plan.
- Central Uganda had more of the systems/practices than the other geographical zones.
- Capacity for ensuring safety of staff and service users was generally good, especially in the hospitals
  - Using predefined criteria, 16% of the hospitals/HC IVs were classified as having very good capacity, 38% as having good capacity, and 42% as having moderate capacity. None of the hospitals/HC IVs was classified as having very poor capacity and 4% were classified as having poor capacity.
  - When level IV primary care facilities are excluded from analysis, 25% of the hospitals were classified as having very good capacity, 41% as having good capacity, and just under a third (31%) as having moderate capacity. None of the hospitals was classified as having very poor capacity, and 3% were classified as having poor capacity.

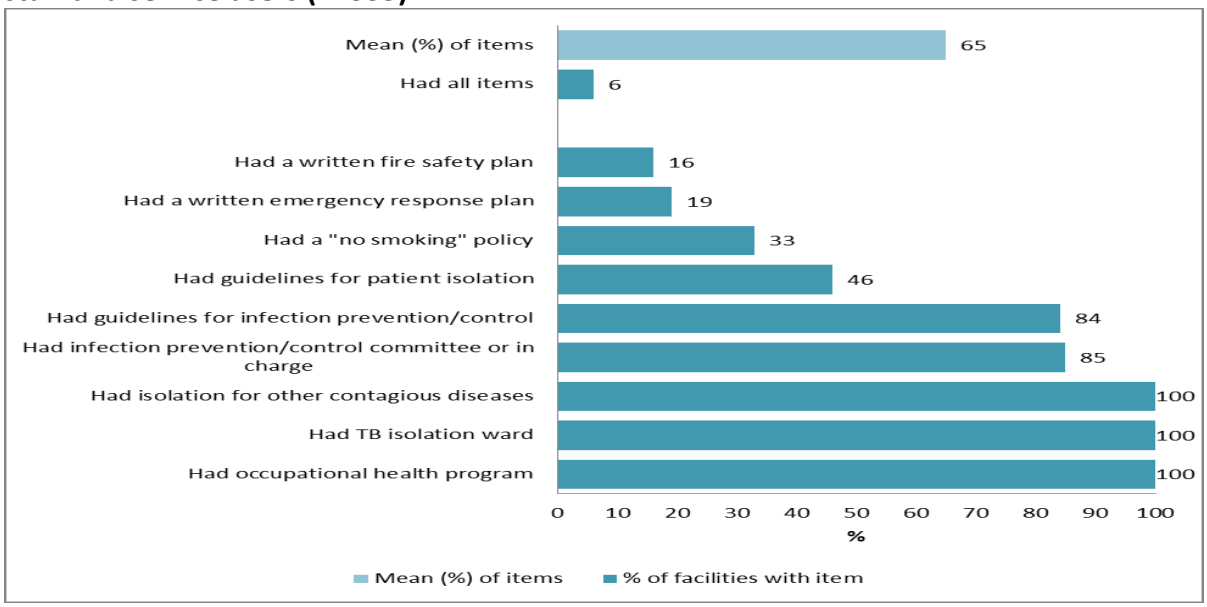
The availability of systems/practices to ensure safety of staff and service users was assessed based on the reported presence of the following eight items:

- A policy on “no smoking” in the hospital/HC IV environment
- A written fire safety plan
- A written emergency response plan
- An infection control/prevention committee or a person specifically assigned to oversee infection prevention/control activities
- Guidelines for infection control and prevention
- Guidelines for isolation or precautions against additional infections

- An occupational health program for protecting, monitoring, and treating health workers
- An isolation ward for TB patients
- An isolation ward for contagious infections other than TB.

Figure 56 shows the availability of systems and practices for ensuring safety of staff and service users. Of the nine systems and practices that were enquired about during the census, only 6% of the hospitals/HC IVs reported the availability of all of them. On average, the hospitals/HC IVs reported the availability of only 65% of the safety systems/practices. The availability of an isolation ward for TB and other contagious illnesses, and the availability of an occupational health program for protecting, monitoring and treating health workers was reported by all the hospitals/HC IVs. The great majority of the hospitals/HC IVs reported the availability of standard guidelines for infection prevention and control, and a committee or someone assigned to oversee the infection prevention and control activities. In contrast, the great majority of the hospitals/HC IVs lacked a written fire safety and an emergency response plan, with only 16% and 19% of the hospitals/HC IVs reporting their availability, respectively. Details of the availability of the safety systems/practices are presented on Figure 59.

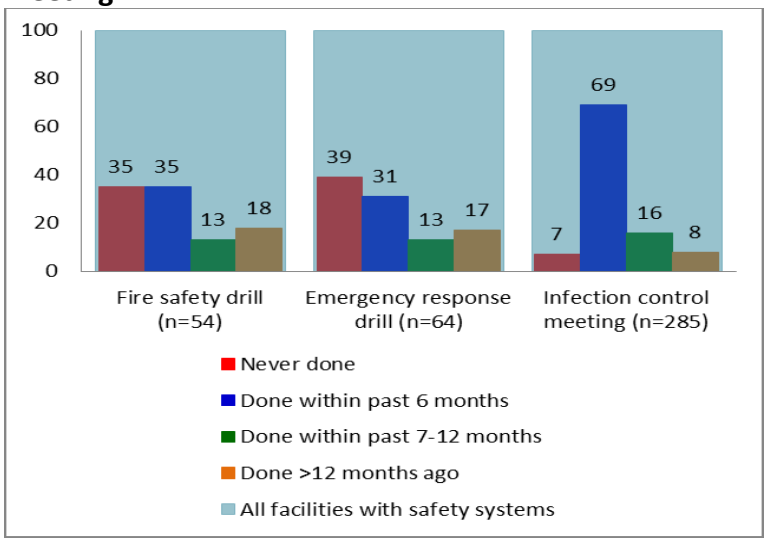
Figure 56: Proportion of hospitals/HC IVs with systems and items for ensuring safety of staff and service users (n=335)



The actual practices for ensuring safety of staff and service users were generally poor (Figure 57). In hospitals/HC IVs that indicated that they had a written fire safety plan, over a third (35%) said they had never done any drill while 18% said they last did a drill over 12 months prior to the census. 35% said they did the drill within six months of the census while 13% said they did the drill 7-12 months prior to the census. Similarly, 39% of the hospitals/HC IVs that reported that they had a written emergency response plan said they

had never done any drill while 17% said they last did a drill over 12 months prior the census. 31% and 13% said they did the drill within 6 months of the census, and 7-12 months prior to census, respectively.

Figure 57: Overall % of hospitals/HC IVs with safety systems that did safety drills or held meeting



Capacity for ensuring safety of the staff and service users

Capacity for ensuring safety of the staff and service users was assessed based on the presence of the 9 items mentioned above. First, responses were coded such that a score one was awarded if the item was available and 0 awarded if item was not available. The highest potential achievable score was therefore 9 and lowest was 0. Arbitrary cut-off points were then introduced and scores recoded into about five equal parts such that a hospital/HC IV that scored 0 or 1 point was classified as having very poor capacity, 2-3 as having poor capacity, 4-5 as having moderate capacity, 6-7 as having good capacity, and 8-9 as having very good capacity for ensuring safety of the staff and service users. The proportion of hospitals/HC IVs with very poor, poor, moderate, good or very good capacity was then calculated overall and then by geographical zone, facility level, facility ownership, and urban-rural location.

Figure 58: Capacity for ensuring safety of staff and services users, by key stratifiers

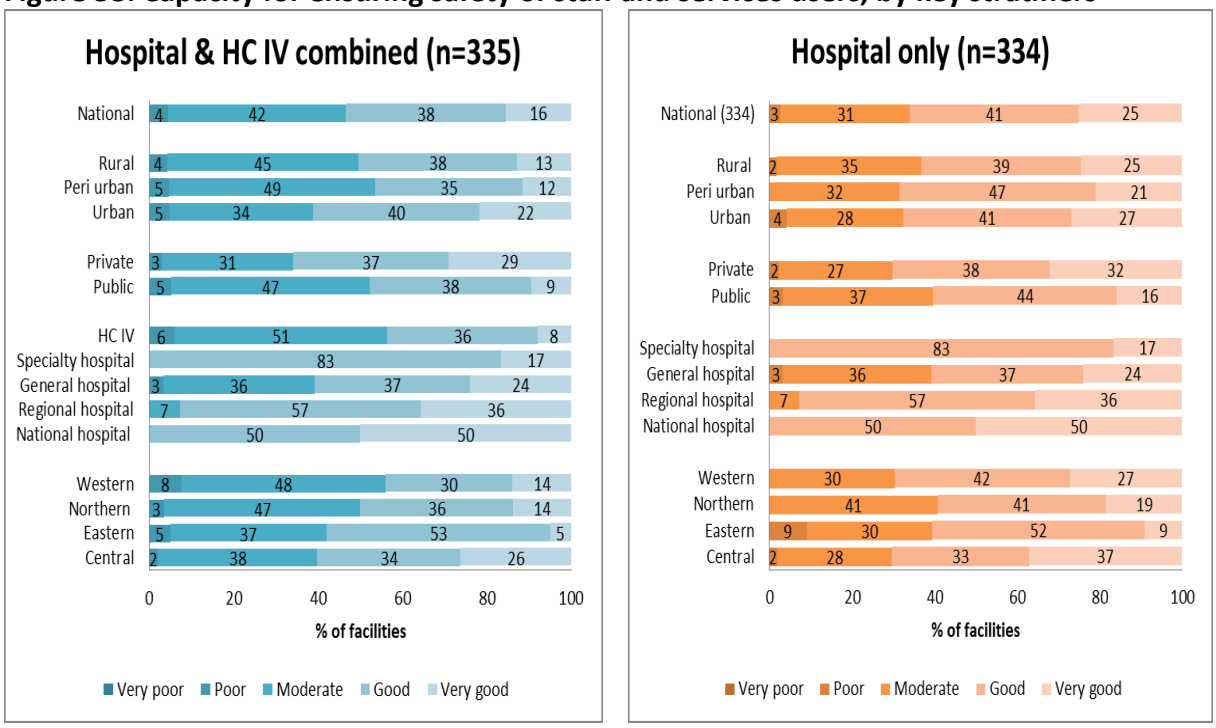


Figure 58 illustrates the capacity for ensuring safety of staff and service users in hospitals and level IV primary care facilities in Uganda. Capacity for ensuring safety of staff and service users was modest. Using the predefined criteria described above, 16% of the hospitals/HC IVs were classified as having very good capacity, 38% as having good capacity, and 42% as having moderate capacity. None of the hospitals/HC IVs was classified as having very poor capacity and 4% were classified as having poor capacity. The capacity was slightly better when level IV primary care facilities are excluded from analysis, with 25% of the hospitals classified as having very good capacity, 41% as having good capacity, and just under a third (31%) as having moderate capacity. None of the hospitals was classified as having very poor capacity, and 3% were classified as having poor capacity.

Figure 59: The percentage of hospitals/HC IVs that reported the availability of systems and practices for ensuring safety of staff and service users, by geographical zone and facility type (n=335)

	Geographical Zone				Facility type					
	Central	Eastern	Northern	Western	National hospital	Regional hospital	General hospital	Specialty hospital	HC IV	Overall
No smoking policy	45	38	35	15	100	36	47	67	22	33
Written fire safety	30	6	14	12	100	43	26	67	6	16
Written emergency response plan	29	4	16	24	100	43	23	17	14	19
Infection prevention/control committee or in charge	85	89	85	84	100	100	82	83	86	85
Guidelines for infection prevention/control	85	89	86	77	100	100	84	100	82	84
Guidelines for patient isolation	54	46	40	40	100	86	55	83	35	46
Had occupational health program	99	100	100	100	50	100	100	100	100	100
Had TB isolation ward	99	100	100	100	50	100	100	100	100	100
Had isolation for other contagious diseases	99	100	100	100	50	100	100	100	100	100
All items	**14**	**1**	**3**	**4**	**50**	**21**	**10**	**17**	**2**	**6**
Mean	**69**	**64**	**64**	**61**	**83**	**79**	**69**	**80**	**60**	**65**

2.8. Readiness for offering emergency services

Key findings:

- Most of the hospitals/HC IVs only had a subset of the items for offering emergency services. However, all had a clinician (clinical officer or doctor) within reach
- Capacity to offer emergency services in hospitals and level IV primary care facilities was generally poor.
  - Only 5% and 25% of the hospitals/HC IVs were classified as having very good and good capacity to offer emergency services, respectively. The rest of the hospitals/HC IVs were classified as having moderate (38%), poor (35%) and very poor capacity (5%).

Figure 60 shows the availability of selected support services in hospitals/HC IVs that reported offering emergency services. Generally, most of the hospitals/HC IVs had only a subset of the emergency support services that were enquired about. However, all the hospitals/HC IVs had a key staff (doctor, clinical officer, or a nurse) and laboratory staff within reach (onsite or on call) to attend to emergencies. With regard to having the items onsite, almost all the hospitals/HC IVs with emergency services reported that they had a nurse or a clinician (a doctor or clinical officer) on site 24 hours daily to attend to emergencies. A doctor was reported to be onsite in 64% of the hospitals/HC IVs. In hospitals/HC IVs that indicated that they did not have a doctor on site, a doctor was reported to be on call and therefore within reach in 62% of the hospitals/HC IVs (Table 12). Only 35% of the hospitals/HC IVs indicated that they had staff that received refresher training during the past two years prior to the census.

Differences by facility type were very wide, with the national hospital having all the support services and level IV primary care facilities having fewer support services than the other facilities. The emergency support services were more available in Central Uganda than in the other geographical zones. Public-private and urban-rural differences were small (Table 13).

Figure 60 Among hospitals/HC IVs that reported offering emergency services, the percentage that had the selected support services on site or within easy reach 24 hours every day (n=321)

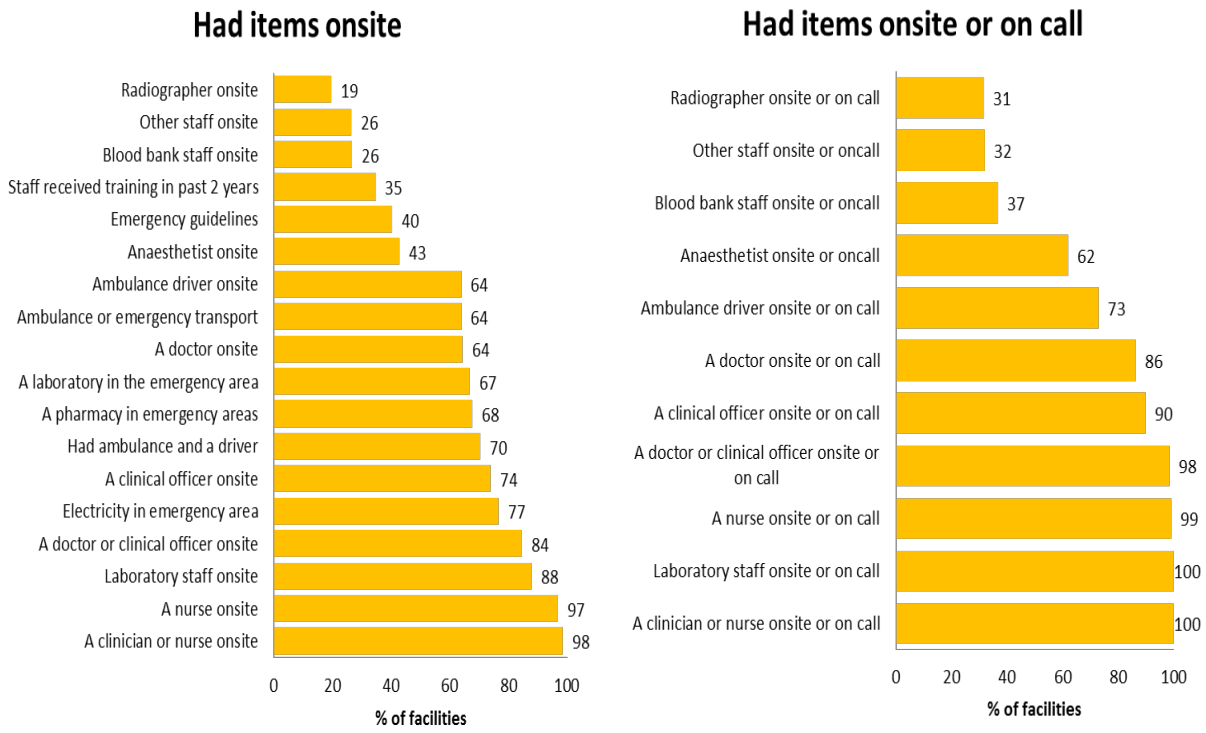
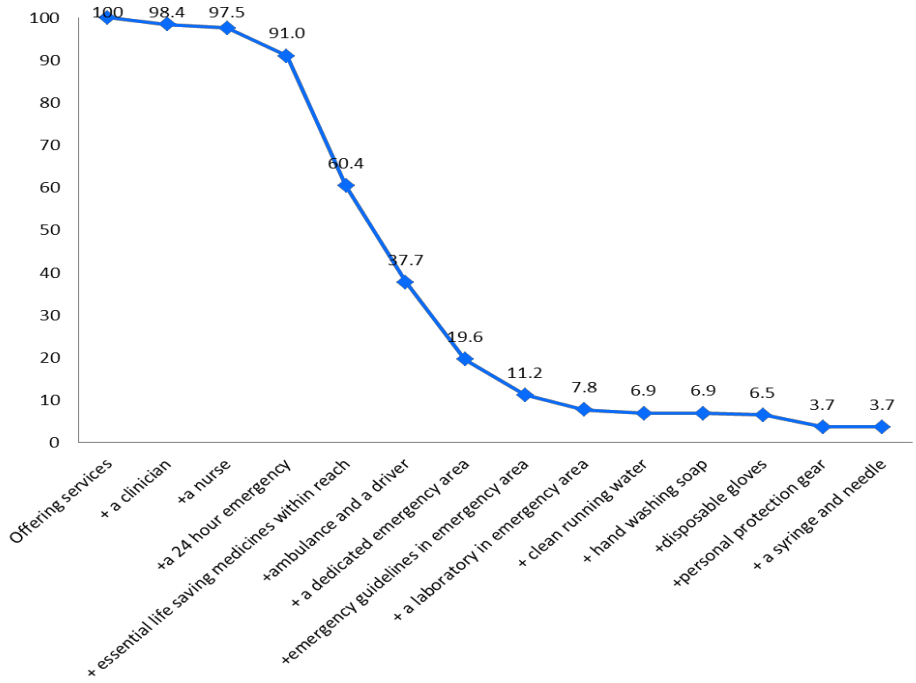


Figure 61 shows a cascading graph of the emergency support services. Building of the cascading graph follows a logical pattern where items are added to the model one by one based on their importance for offering a service. In the figure, having a clinician was considered critically important for offering an emergency service and was therefore added first, followed by having a nurse, a 24 hour emergency service etc. As more items are added to the model, the percentage of hospitals/HC IVs that indicated they offered emergency services and had the items reduces. The first major break in the model is when "having essential life-saving medicines within reach" is added; meaning that only 60% of the hospitals/HC IVs that indicated that they offered emergency services had a clinician, a nurse, a 24 hour emergency service and essential life-saving medicines within reach.

Figure 61: A cascading graph of emergency support services



Capacity to offer emergency services

Capacity to offer emergency services was assessed based on the presence of 66 items that were considered to be particularly important for offering the service (Table 13). First, responses were coded such that a score one indicated the availability of the item and 0 no availability. The highest potential achievable score was therefore 66 and lowest was 0. The scores were then recoded such that a hospital/HC IV that received 13 or less points (i.e. at most one fifth of the total points) was classified as having very poor capacity, 14-26 as having poor capacity, 27-39 as having moderate capacity, 40-52 as having good capacity, and 53-66 as having very good capacity for offering emergency services. The proportion of hospitals/HC IVs with very poor, poor, moderate, good or very good capacity was then calculated overall and then by geographical zone, facility level, facility ownership, and urban-rural location.

Table 13: List of items used to assess capacity to offer emergency services

Staff: (onsite or on call)
1. Clinical officer or doctor
2. A nurse
3. Laboratory staff
4. Blood bank staff
5. Radiology staff
6. Anaesthetist
7. Other staff

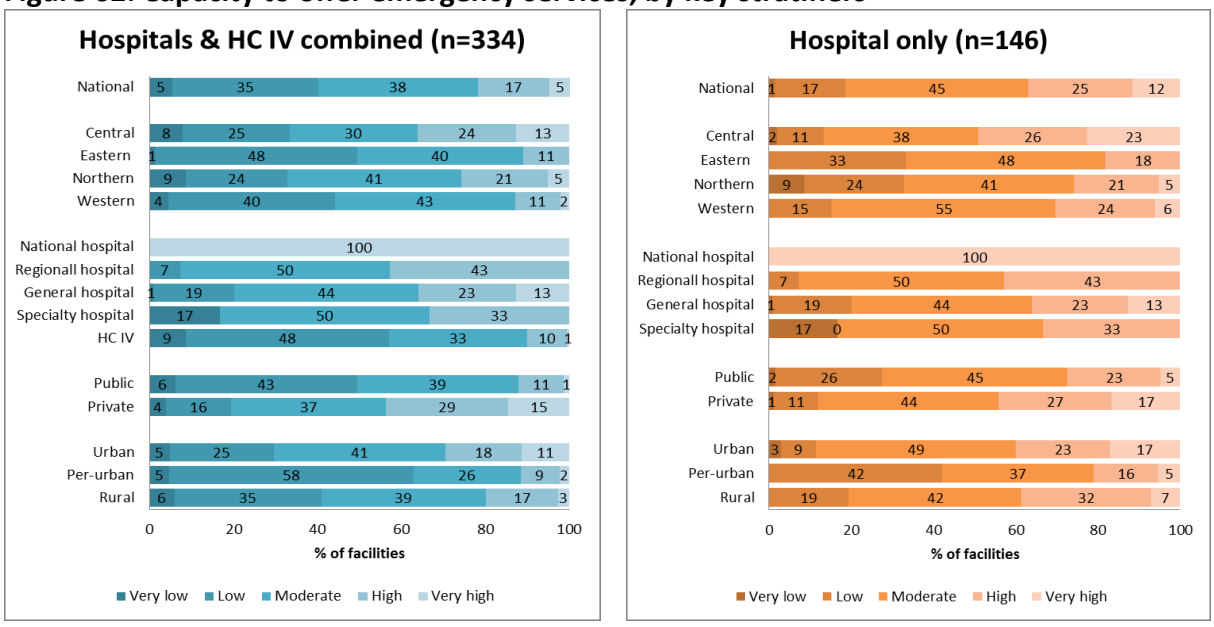
Other emergency support services
8. Electricity in emergency area
9. 24 hour dispensing pharmacy
10. Laboratory services
11. Emergency guidelines
12. Staff training
13. Ambulance with driver

Infection prevention & control
14. Clean running water
15. Hand washing soap
16. Alcohol based hand rub
17. Disposable latex gloves
18. Red waste receptacle bin
19. Yellow waste receptacle bin
20. Black waste receptacle bin
21. Sharps container
22. Disinfectant
23. Gowns
24. Eye protection gears
25. Masks
26. Disposable syringes with disposable needles
27. Auto-disable syringes
28. Gumboots or clogs
29. Aprons

Functional equipment
30. Stretcher
31. Wheel chair
32. Adult weighing scale
33. Infant weighing scale
34. Child weighing scale
35. Thermometer (mercury)
36. Thermometer (digital)
37. Stethoscope
38. Blood pressure apparatus (manual)
39. Blood pressure apparatus (digital)
40. Examination light
41. Otoscope
42. Ophthalmoscope
43. Ultrasound machine
44. Micro nebulizer
45. Doppler
46. Electrocardiogram
47. Cardiac monitor
48. Defibrillator
49. Thoracotomy pack
50. Ventilator
51. Suction apparatus (manual)
52. Suction apparatus (electric)
53. Cricothyroidotomy set
54. Chest tube insertion set
55. Oropharyngeal airway (adult)
56. Oropharyngeal airway (paediatric)
57. Endotracheal tube un-cuffed (sizes 3.0-5)
58. Endotracheal tube un-cuffed (sizes 5.5-9)
59. Ambu bag (adult)
60. Ambu bag paediatric)
61. Neonatal bag and mask
62. Pulse oximeter
63. Oxygen concentrator
64. Flow meter for oxygen therapy
65. Oxygen delivery apparatus
66. Filled oxygen cylinder

Figure 62 illustrates the capacity to offer emergency services in hospitals and level IV primary care facilities. Generally, capacity to offer emergency services in hospitals and level IV primary care facilities was poor. Only 5% and 25% of the hospitals/HC IVs were classified as having very good and good capacity to offer emergency services, respectively. The rest of the hospitals/HC IV were classified as having moderate capacity (38%), poor capacity (35%) and very poor capacity (5%).

Figure 62: Capacity to offer emergency services, by key stratifiers



National psychiatric referral hospital excluded because they are not expected to have most of the emergency items

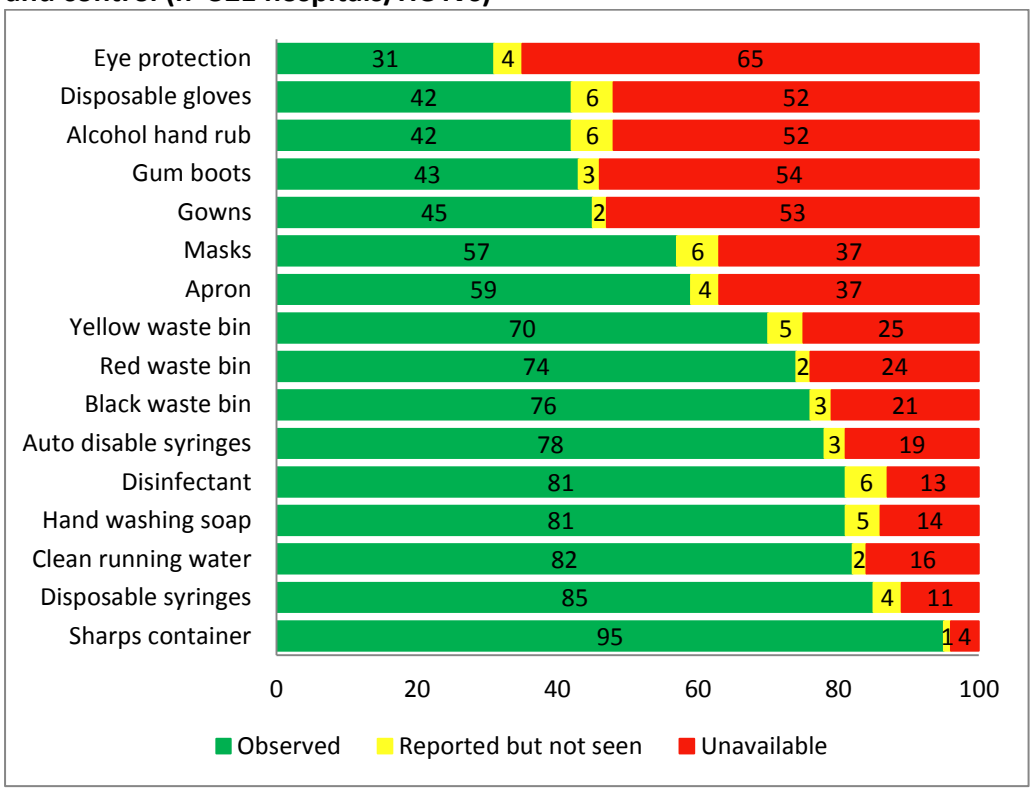
Table 14: Among the hospitals/HC IVs that reported offering emergency services, the percentage that reported having the indicated emergency support services

	Facility type					Geographical zone				Public/private ownership		Urban/rural location			Overall
	National hospital	Regional hospital	General hospital	Specialty hospital	HC IV	Northern Uganda	Eastern Uganda	Central Uganda	Western Uganda	Public	Private	Urban	Peri-urban	Rural	Overall
Had emergency services (n=334)	50	100	99	83	94	93	99	93	98	95	97	95	95	96	96
Among hospitals/HC IVs that offered emergency services (n=321)															
Had 24 hour emergency service	100	93	95	60	92	93	90	95	92	92	94	93	90	93	93
Had a dedicated emergency area	100	93	43	40	27	39	18	32	56	32	46	50	34	30	36
Had a clinician or nurse on site	100	100	98	100	99	100	98	98	99	99	97	100	100	97	98
Had a doctor on site	100	71	75	100	55	72	48	79	58	57	79	70	56	63	64
Electricity in emergency area	100	93	87	100	67	69	69	83	81	67	97	92	63	71	77
Had a pharmacy	100	64	76	60	62	69	58	77	66	62	80	68	63	68	68
Had a laboratory	100	43	66	40	70	70	81	69	49	67	65	62	61	70	67
Emergency guidelines	100	57	40	40	39	39	38	48	35	37	47	23	34	44	40
Staff received refresher training in the past 2 years	100	29	40	100	29	41	26	38	35	31	43	35	37	34	35
Had essential medicines within reach	100	86	71	100	58	80	44	70	70	61	75	76	61	60	65
Had ambulance & a driver	100	79	76	100	63	73	64	81	61	68	75	78	69	66	70
Among hospitals/HC IVs that did not have a doctor on site															
Had a doctor on call	NA	100	87	NA	50	60	64	80	50	54	95	83	83	73	62

The availability of items for infection prevention and control in the Emergency area

Figure 63 shows the availability of items for infection prevention and control in the emergency area. Most hospitals/HC IVs had only a subset of the items that are particularly important for infection prevention and control in the emergency area. A sharps container was the most available while eye protection equipment was the least available. Details of availability of items for infection prevention and control in the emergency area are presented on Table 15.

Figure 63 The overall percentage availability of items necessary for infection prevention and control (n=321 hospitals/HC IVs)



Yellow waste bins are used for organ or tissue disposable; black bins for general waste, and red bins for infectious non-sharps waste. Availability was assessed for a waste bin with a bin liner and a pedal for opening

Table 15 Among hospitals/HC IVs with emergency services, the percentage that had items for infection prevention and control in the emergency area (n=321)

	Facility type					Geographical zone				Public/private ownership		Urban/rural location			Overall
	National hospital	Regional hospital	General hospital	Specialty hospital	HC IV	Northern Uganda	Eastern Uganda	Central Uganda	Western Uganda	Public	Private	Urban	Peri urban	Rural	
Clean running water	100	86	90	100	80	78	83	86	88	78	98	88	88	82	84
Hand washing soap	100	93	92	100	81	91	83	89	85	84	92	90	80	85	86
Alcohol hand rub	100	71	49	80	45	49	50	30	44	69	49	50	37	51	49
Disposable gloves	100	93	98	100	94	96	93	97	96	95	97	94	100	95	95
Red waste bin	100	71	77	100	75	76	76	73	79	75	79	71	73	79	76
Yellow waste bin	100	93	76	100	71	74	79	74	71	76	72	74	73	75	75
Black waste bin	100	93	80	80	76	81	79	81	74	78	80	81	78	77	79
Sharps container	100	100	98	80	95	91	94	98	100	96	96	96	95	97	96
Disinfectant	100	100	90	100	84	91	89	88	84	85	93	89	78	88	87
Gowns	100	64	58	80	37	52	39	52	47	43	57	54	29	47	47
Eye protection	100	43	46	60	27	56	11	46	34	29	49	36	29	37	36
Masks	100	93	71	80	54	69	54	72	58	62	66	65	49	65	63
Disposable syringes	100	93	89	100	88	93	88	94	82	88	91	90	88	88	89
Auto disable syringes	100	100	86	60	77	93	74	90	73	79	86	86	93	76	81
Gum boots	100	71	58	20	37	57	39	52	41	41	58	49	32	49	46
Apron	100	93	77	80	49	74	58	72	51	53	83	67	49	63	63
Had all items	**100**	**14**	**16**	**0**	**7**	**13**	**4**	**15**	**13**	**7**	**21**	**15**	**5**	**11**	**11**
Mean	**100**	**85**	**77**	**83**	**67**	**76**	**68**	**75**	**69**	**71**	**78**	**74**	**67**	**72**	**72**

Yellow waste bins are used for organ or tissue disposable; black bins for general waste, and red bins for infectious non-sharps waste. Availability was assessed for a waste bin with a bin liner and a pedal for opening

The availability of equipment in hospitals/HC IVs that indicated that they offered emergency services

Generally, hospitals/HC IVs offering emergency services lacked the necessary equipment for offering the services (Figure 64). A stethoscope, adult weighing scale and manual blood pressure apparatus were the only items that were available in the great majority of the hospitals/HC IVs. Equipment such as thoracotomy pack, cricothyroidotomy set, defibrillator and Doppler were extremely rare.

Figure 64 Percentage of hospitals & level IV primary care facilities that offered emergency services and with the indicated equipment in working condition

	Hospitals and HC IV combined (n=321)	Hospital only (n=144)
Stethoscope	91	92
Adult weighing scale	82	81
Blood pressure apparatus manual	79	81
Stretcher	64	77
Wheel chair	63	76
Thermometer digital	61	72
Examination light	45	64
Ambu bag adult	42	56
Oxygen concentrator	34	53
Oxygen delivery apparatus	31	50
Blood pressure apparatus digital	39	49
Child weighing sale	51	49
Pulse oximeter	28	47
Otoscope	34	47
Ambu bag paediatric	34	45
Flow meter for oxygen therapy	28	44
Filled Oxygen cylinder	27	43
Oropharyngeal airway adult	33	43
Thermometer mercury	43	42
Suction apparatus electronic	30	40
Infant weighing sale	44	40
Ultrasound machine	30	39
Micro nebulizer	20	38
Suction apparatus manual	33	35
Ophthalmoscope	25	34
Oropharyngeal airways paediatric	25	34
Endotracheal tube (un-cuffed sizes 5.5-9)	24	33
Neonatal bag and mask	25	33
Ventilator	23	33
Endotracheal tube (un-cuffed sizes 3.0-5)	22	31
Chest tubes and insertion set	20	27
Cardiac monitor	12	22
Electrocardiogram	12	21
Doppler	9	17
Defibrillator	7	13
Cricothyroidotomy set	6	10
Thoracotomy pack	5	10
Offered & had at least half of the equipment	24	38
Offered & had all equipment	1	1

National psychiatric referral hospital excluded because it is not expected to have most of the equipment

2.9. Readiness for offering advanced diagnostic and treatment services

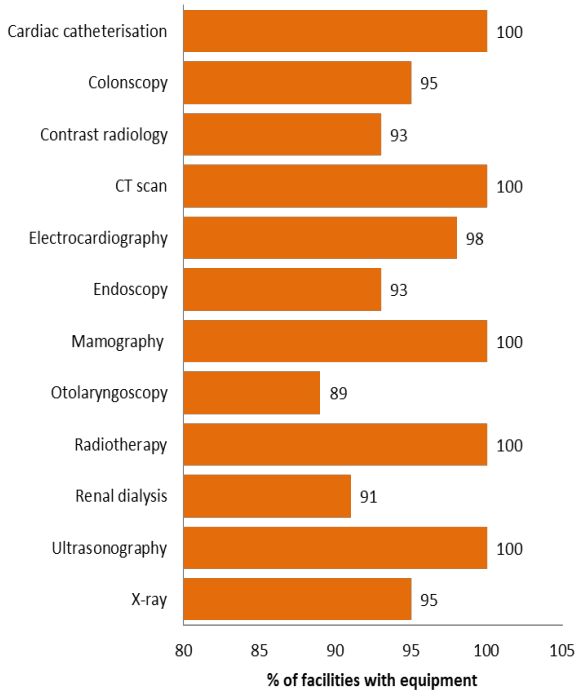
Key findings:

- Most of the hospitals that indicated that they offered advanced diagnostic and treatment services had equipment and trained staff to offer the services

Figure 65 shows the availability of equipment and trained staff in hospitals that indicated that the offered advanced diagnostic and treatment services. Most of the hospitals that indicated that they offered advanced diagnostic and treatment services had the necessary equipment and also staff trained to offer the services. Details of hospitals that indicated they offered advance diagnostic and treatment services and had the necessary equipment and staff are presented in table 17.

Figure 65 Readiness for advanced diagnostic and treatment services (n=146)

Hospitals with the indicated advanced diagnostic and treatment services that had equipment to offer the service



Hospitals with the indicated advanced diagnostic and treatment services that had trained staff to offer the service

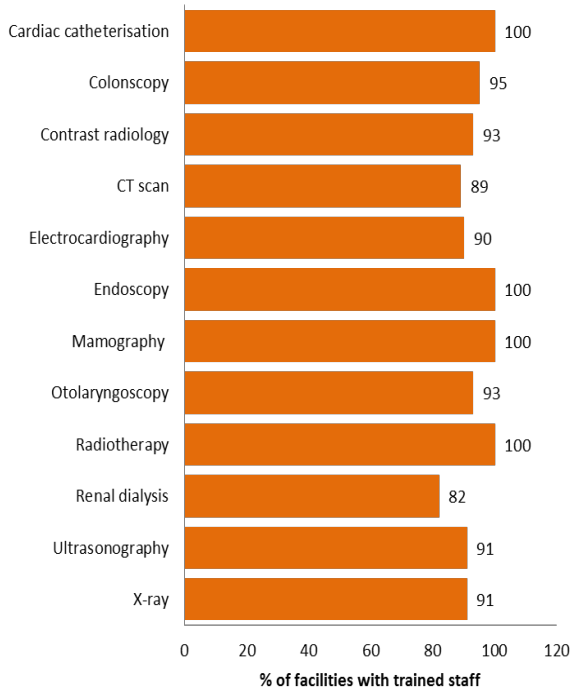


Table 16 shows a cascade for hospitals that indicated that they offered advanced diagnostic and treatment services and had the necessary items. Building of the cascading table followed a logical pattern where items were added to the model one by one based on their importance for offering the service. Because offering each of these services requires specific equipment, the availability of equipment was added to the model first, and then followed

by availability of trained staff and interpretation of results onsite. It can be seen from the table that all hospitals that indicated that they offered X-ray, cardiac catheterization, and radiotherapy services had equipment, trained staff, and also interpreted the results onsite. Most of the hospitals offering other services had equipment and the great majority had equipment and staff. When interpretation of the results onsite was added to the model, there was a major break in the cascade for renal dialysis – implying that interpretation of renal dialysis results in many hospitals offering the service was done elsewhere.

Table 16: A cascade for hospitals offering each of the advanced diagnostic and treatment services and that had items necessary for offering the services

	Offering and with equipment	Offering and with equipment and trained staff	Offering and with equipment, trained staff and results interpreted onsite
Endoscopy	93	93	93
Colonoscopy	95	89	84
Otolaryngoscopy	89	82	79
Cardiac catheterisation	100	100	100
Electrocardiography	98	88	86
Contrast radiology	93	86	83
X-ray	95	88	85
Mammography	100	100	100
Ultrasonography	95	87	86
CT scan	100	89	79
Radiotherapy	100	100	100
Renal dialysis	91	82	45

Table 17: The number (%) of hospitals that indicated that they offered each of the indicated advanced diagnostic and treatment services and had the necessary equipment and staff for offering the service, by key stratifiers (n=146)

	Facility type				Geographical zone				Ownership		Location			National
	National hospital	Regional hospital	General hospital	Specialty hospital	Northern	Eastern	Central	Western	Public	Private	Urban	Peri-Urban	Rural	
	PROPORTION OF HOSPITALS THAT INDICATED THEY OFFERED ADVANCED DIAGNOSTIC AND TREATMENT SERVICES AND HAD THE NECESSARY EQUIPMENT AND IN WORKING CONDITION													
Endoscopy	1(100)	4(100)	21(91)		4(10)0	2(67)	15(94)94	5(100)	6(86)	20(95)	16(100)	3(100)	7(78)	26(93)
Colonoscopy	1(100)	2(100)	15(94)		5(100)	2(100)	10(91)	1(100)	5(83)	13(100)	10(100)	2(100)	6(86)	18(95)
Otolaryngoscopy	1(100)	3(100)	21(89)		5(71)	6(100)	12(92)	2(100)	9(90)	16(89)	10(91)	3(100)	12(86)	25(89)
Cardiac catheterisation	1(100)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1(100)
Electrocardiography	1(100)	2(100)	44(98)	2(100)	9(100)	4(100)	26(96)	10(100)	11(92)	38(100)	31(100)	4(100)	14(93)	49(98)
Contrast radiology	0	2(100)	24(96)	1(100)	5(100)	3(100)	15(94)	4(80)	5(83)	22(96)	17(94)	3(100)	7(88)	27(93)
X-ray	1(100)	12(100)	85(94)	3(100)	15(94)	20(95)	42(95)	24(96)	37(93)	64(97)	54(98)	11(79)	36(97)	101(95)
Mammography	1(100)	1(100)	12(100)		1(100)	1(100)	8(100)	4(100)	2(100)	12(100)	11(100)		3(100)	14(100)
Ultrasonography	1(100)	11(100)	88(95)	5(100)	19(100)	18(90)	45(96)	23(96)	36(95)	69(96)	56(97)	10(91)	39(95)	105(95)
CT scan	1(100)	3(100)	14(100)	1(100)	2(100)	2(100)	12(100)	3(100)	6(100)	13(100)	18(100)		1(100)	19(100)
Radiotherapy	1(100)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1(100)
Renal dialysis	1(100)	1(100)	8(89)		2(100)		7(88)	1(100)	3(100)	7(88)	9(90)		1(100)	10(91)
	PROPORTION OF HOSPITALS THAT INDICATED THEY OFFERED ADVANCED DIAGNOSTIC AND TREATMENT SERVICES AND HAD THE NECESSARY STAFF													
Endoscopy	1(100)	4(100)	23(100)		4(100)	3(100)	16(100)	5(100)	7(100)	21(100)	16(100)	3(100)	9(100)	28(100)
Colonoscopy	1(100)	2(100)	15(94)		5(100)	2(100)	10(91)	1(100)	5(83)	13(100)	10(100)	2(100)	6(86)	18(95)
Otolaryngoscopy	1(100)	2(67)	23(96)		6(86)	6(100)	12(92)	2(100)	8(80)	18(100)	10(91)	3(100)	13(93)	26(93)
Cardiac catheterisation	1(100)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1(100)
Electrocardiography	1(100)	1(50)	41(91)	2(100)	9(100)	3(75)	25(93)	8(80)	8(67)	37(97)	28(90)	3(75)	14(93)	45(90)
Contrast radiology	1(100)	2(100)	23(92)	1(100)	5(100)	3(100)	14(88)	5(100)	5(83)	22(96)	17(94)	3(100)	7(88)	27(93)
X-ray	1(100)	11(92)	81(90)	3(100)	13(81)	19(90)	40(91)	24(96)	35(88)	61(92)	52(95)	12(86)	32(86)	96(91)
Mammography	1(100)	1(100)	12(100)		1(100)	1(100)	8(100)	4(100)	2(100)	12(100)	11(100)		3(100)	14(100)
Ultrasonography	1(100)	10(91)	84(90)	5(100)	16(84)	18(90)	43(91)	23(96)	34(89)	66(92)	54(93)	10(91)	36(88)	100(91)
CT scan	1(100)	3(100)	12(86)	1(100)	2(100)	2(100)	10(83)	3(100)	5(83)	12(92)	17(94)		0 (0)	17(89)
Radiotherapy	1(100)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1(100)
Renal dialysis	1(100)	1(100)	7(78)		2(100)		6(75)	1(100)	2(67)	7(88)	9(90)		0	9(82)

2.10. Readiness to offer delivery care

Key findings:

- Delivery services were reported available by nearly all the hospitals/HC IVs (98%) that were expected to offer them
- However the hospitals/HC IVs that indicated that they offered delivery services had only a subset of the items that are particularly important for offering the services and that were enquired about during the census; with none (0%) of the hospitals/HC IVs having all the items that were enquired about during the census and 72% having at least half of the items. On average, only 39 (58%) of the 67 items were found in the hospitals/HC IVs
- Trained staff to provide delivery services was the most commonly available item, with nearly all hospitals/HC IVs (99%) having a skilled staff to offer delivery services 24 hours a day 7 days a week; followed by a delivery bed (98%), sharps container (97%) and disposable latex gloves (97%)
- National guidelines for basic emergency obstetric care (BEmOC (7%)), Comprehensive emergency obstetric care (CEmOC (15%)), and integrated management of pregnancy and childbirth (IMPAC (18%)) were among the least available items for offering delivery services. The other least available items were betamethasone (13%), pulse oximeter (13%) and forceps for high pelvis application (17%).
- Capacity to offer delivery services was modest. Using predefined criteria, none of the hospitals/HC IVs was classified as having very poor capacity and 4% were classified as having poor capacity to offer delivery services. Only 5% were classified as having very good capacity and 44% and 46% were classified as having good and moderate capacity, respectively.
- Capacity was slightly better when level IV primary care facilities were excluded from analysis, with 12% of the hospitals classified as having very good capacity and 54% classified as having good capacity to offer delivery services. Only 3% were classified as having poor capacity while 30% were classified as having moderate.

- NB: Specialty hospitals and the national psychiatric hospital were excluded from this analysis because they are not expected to offer delivery services

Readiness to offer delivery care was assessed based on the presence of 67 items that were considered to be particularly important for offering the services (Table 18). For the analysis, all items were assumed to be of equal importance and therefore assigned the same weight. The national psychiatric hospital and the specialty hospitals were excluded from this analysis because they are not expected to offer delivery services.

Table 18: List of items used to assess readiness for delivery services

Human resources & guidelines

1. A 24 hour delivery services
2. A 24 hour presence of a skilled staff to conduct deliveries
3. A clinician or midwife to conduct deliveries during day
4. A clinician or midwife to conduct deliveries during night
5. Presence during the day of a delivery staff who has been trained in neonatal resuscitation
6. Presence during the night of a delivery staff who has been trained in neonatal resuscitation
7. National guidelines for integrated management of pregnancy and childbirth (IMPAC)
8. National guidelines for comprehensive emergency obstetric care (CEmOC)
9. National guidelines for basic emergency obstetric care (BEmOC)
10. Presence of staff who has received training on IMPAC during the last two years
11. Presence of staff who has received training on CEmOC during the last two years
12. Presence of staff who has received training on BEmOC during the last two years

Delivery equipment

13. Blank partograph
14. Catheter for suction
15. Cord clamp
16. D & C kit
17. Delivery pack
18. Delivery bed
19. Disposable gloves
20. Electricity in the service area
21. Episiotomy scissors
22. Examination light
23. Filled oxygen cylinder
24. Flow meter for oxygen therapy
25. Forceps for outlet application
26. Forceps for high pelvis application
27. Incubator
28. Manual vacuum extractor
29. Needle holder
30. Neonatal mask with bag and valve size 0 for pre-term babies
31. Neonatal mask with bag and valve size 1 for term babies
32. Oxygen concentrator
33. Oxygen delivery apparatus
34. Pulse oximeter
35. Resuscitation table
36. Scissors or blade to cut cord
37. Suction apparatus (bulb)
38. Suction apparatus (electric)
39. Suction apparatus (manual)
40. Sutures with needles
41. Vacuum aspirator

Essential drugs

42. Calcium gluconate
43. Injectable diazepam
44. Antibiotic eye ointment
45. Ceftriaxone injection
46. Betamethasone
47. Chlorhexidine 4% gel or solution
48. Dexamethasone injection
49. Gentamicin injection (10, 20 0r 40mg/ml ampoule)
50. Injectable magnesium sulphate
51. Intravenous infusion set
52. Oxytocin injection
53. Plasma expander
54. Procaine benzyl penicillin powder for injection
55. Procaine penicillin injection
56. Skin disinfectant

Infection prevention

57. Running water
58. Hand washing soap
59. Alcohol hand rub
60. Disposable latex gloves
61. Non-infectious waste receptacle bin with liner and pedal
62. Organ tissue waste bin with liner and pedal
63. General waste bin with liner and pedal
64. Sharps container
65. Disinfectant
66. Disposable syringes with needle
67. Auto-disposable syringe

Figure 66 illustrates the availability of delivery services in hospitals/HC IVs in Uganda. Most of the hospitals/HC IVs (98%) indicated that they offered delivery services. However none of the hospitals/HC IV that indicated that they offered delivery services had all the items that were enquired about during the census, and 72% had at least half of the items. On average, 39 (58%) of the 67 items were available (Figure 67). Details of the availability of the items for offering delivery care are presented on Figures 69– 74.

Figure 66: Percentage of hospitals/HC IVs that indicated they they offered delivery services, by key stratifiers (n=328)

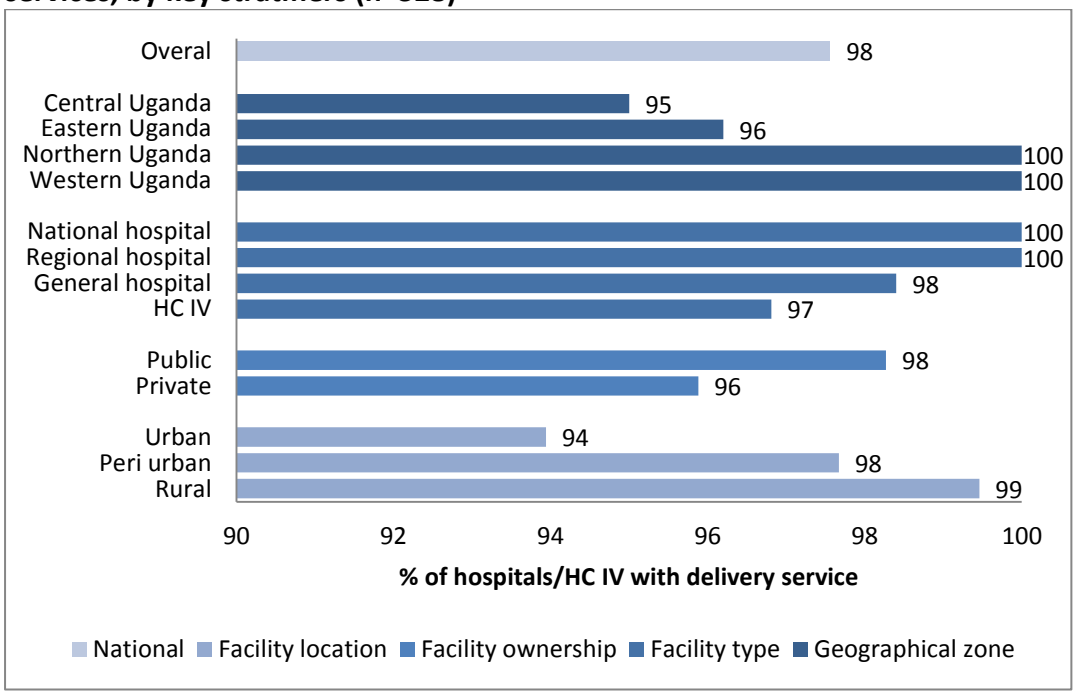
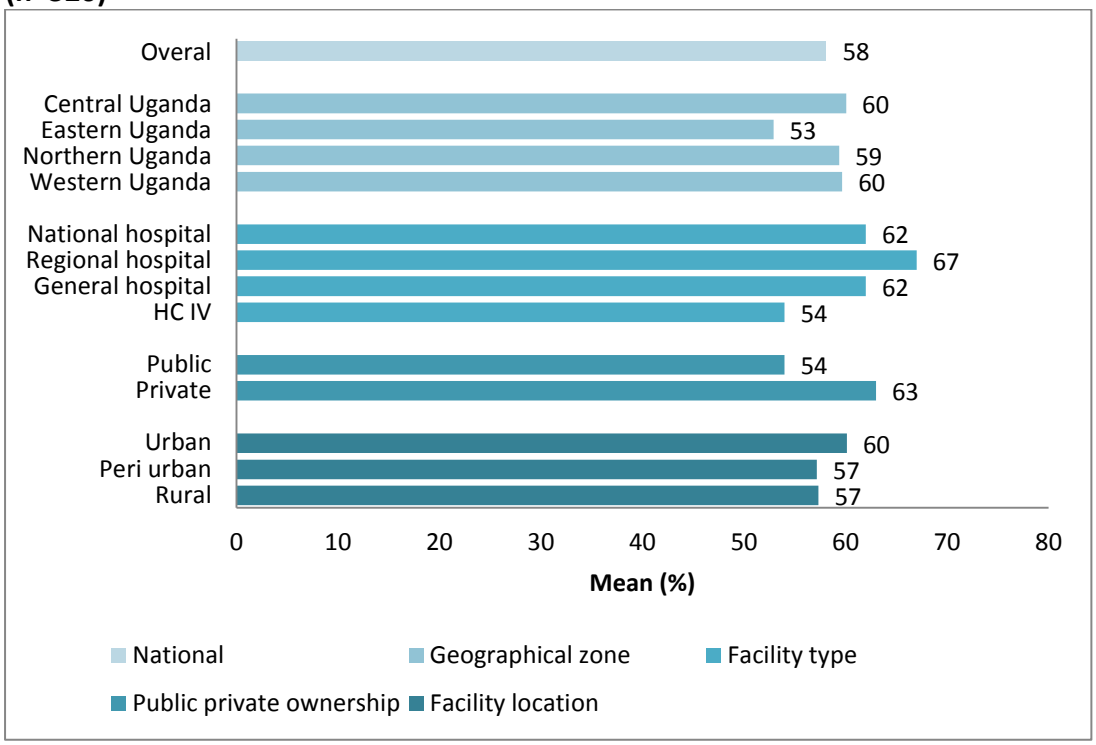


Figure 67: Mean availability of items for offering delivery services, by key stratifiers (n=320)



Capacity to offer delivery services

Capacity to offer delivery services was assessed based on the presence of 74 items. These included all the items presented on table 17 and in addition, it included items of interventions for managing complications, namely: parenteral administration of antibiotics,

parenteral administration of oxytocin, parenteral administration of anticonvulsants, assisted vaginal delivery, manual removal of placenta, removal of retained products of conception, neonatal resuscitation. First, responses were coded such that a score 1 represented the availability of the item and 0 non-availability of the item. For the 74 items, the maximum potential achievable score was 74 and the minimum was 0. The total score was then divided into about five equal parts and the scores recoded such a hospitals/HC IV that scored 15 or less was classified as having very poor capacity, 16-30 as having poor capacity, 31-45 as moderate capacity, 46-60 as having good capacity, and 61-74 as having very good capacity. The proportion of hospitals/HC IVs with very poor, poor, moderate, good and very good capacity was then calculated overall and then by geographical zone, facility type, public-private ownership, and urban-rural location.

Figure 68: Capacity to offer delivery care in hospitals & level IV primary care facilities in Uganda

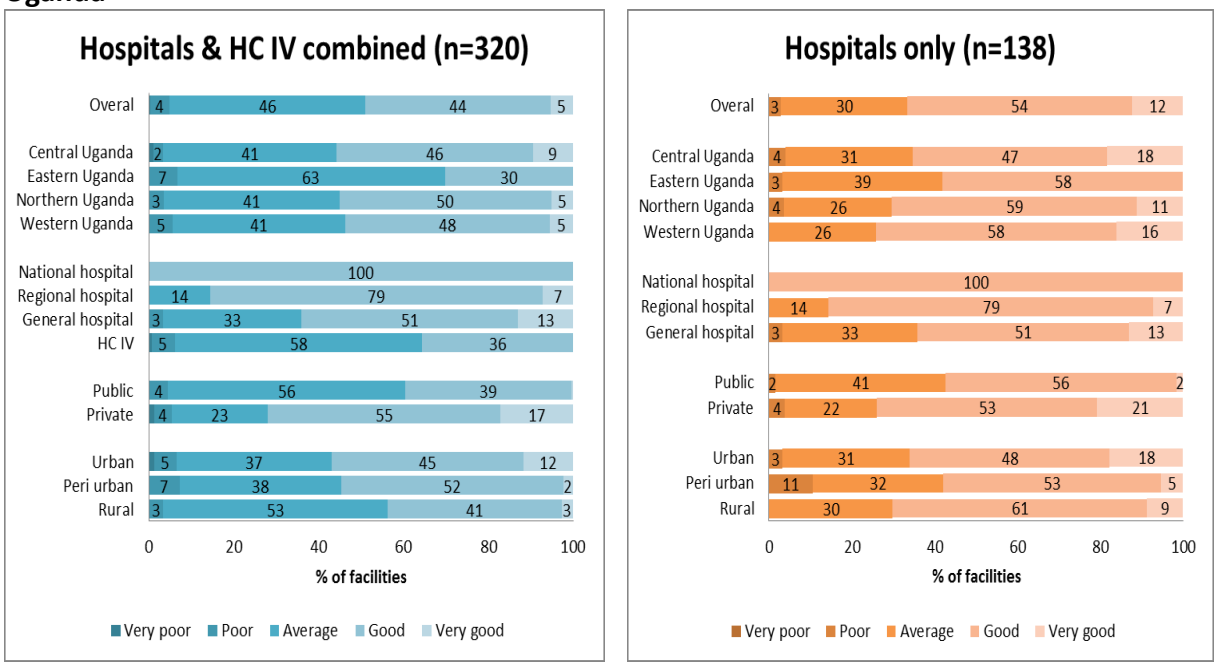


Figure 68 illustrates the capacity to offer delivery services in hospitals and level IV primary care facilities in Uganda. Capacity to offer delivery services was modest. Using the predefined criteria described above, none of the hospitals/HC IVs was classified as having very poor capacity and 4% were classified as having poor capacity. Only 5% were classified as having very good capacity and 44% and 46% were classified as having good and moderate capacity, respectively. Capacity to offer delivery care was slightly better when level IV primary care facilities were excluded from analysis, with 12% of the hospitals classified as having very good capacity and 54% as having good capacity. Only 3% were classified as having poor capacity while 30% were classified as having moderate.

Figure 69: % of hospitals/HC IVs with the indicated human resource for delivery care (n=320)

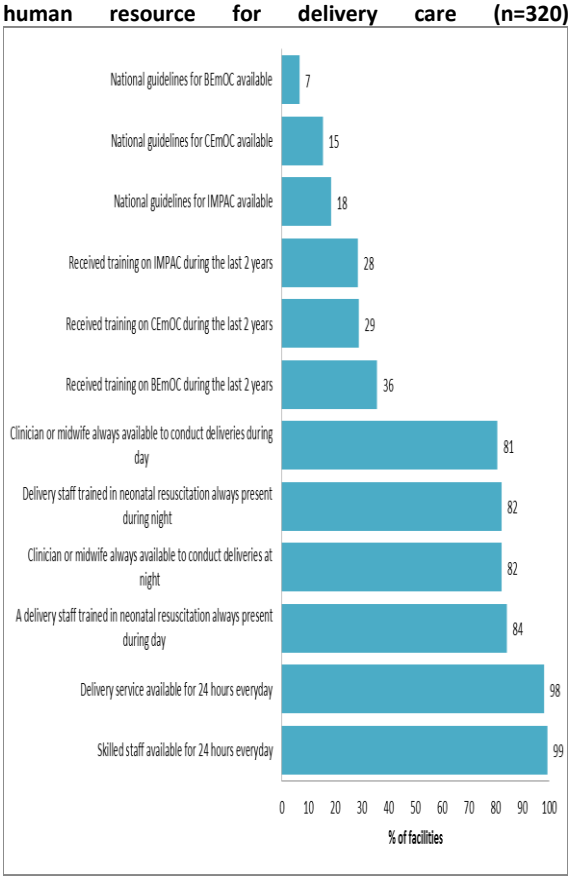


Figure 70: % of hospitals/HC IVs with the indicated medicine for delivery care (n=320)

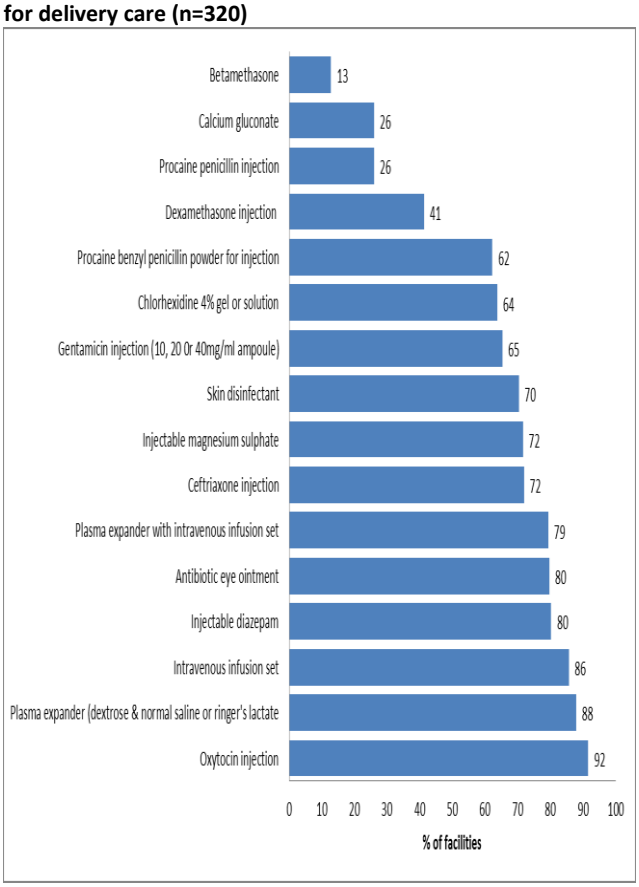


Figure 71: % of hospitals/HC IVs with the indicated equipment for delivery care (n=320)

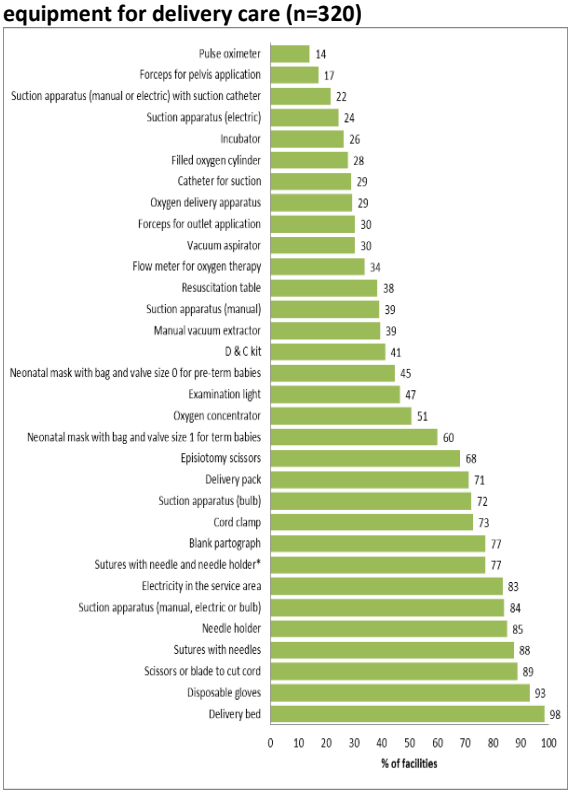


Figure 72: % of hospitals/HC IVs with the indicated item of infection prevention in delivery ward (n=320)

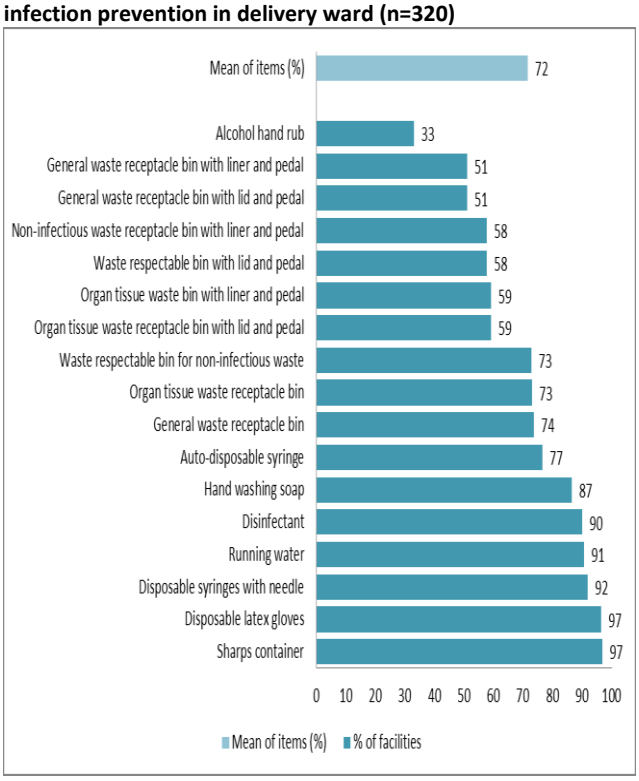


Figure 73: % of hospitals/HC IVs with the indicated intervention for prevention of complication during delivery care (n=320)

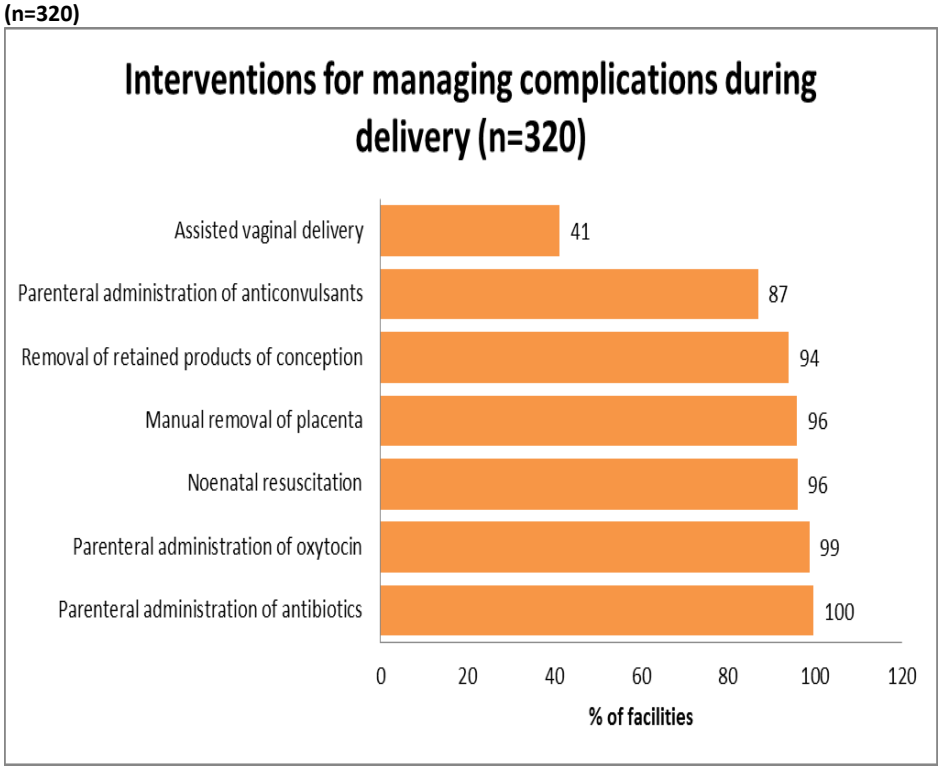
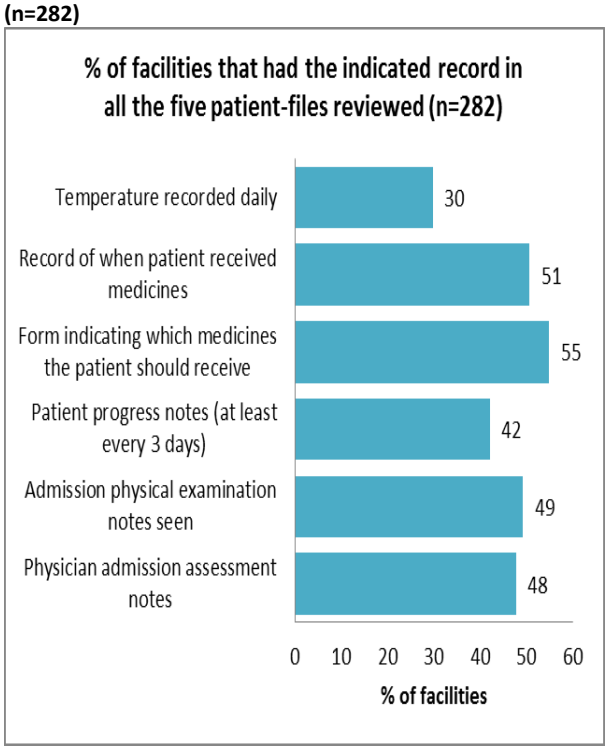
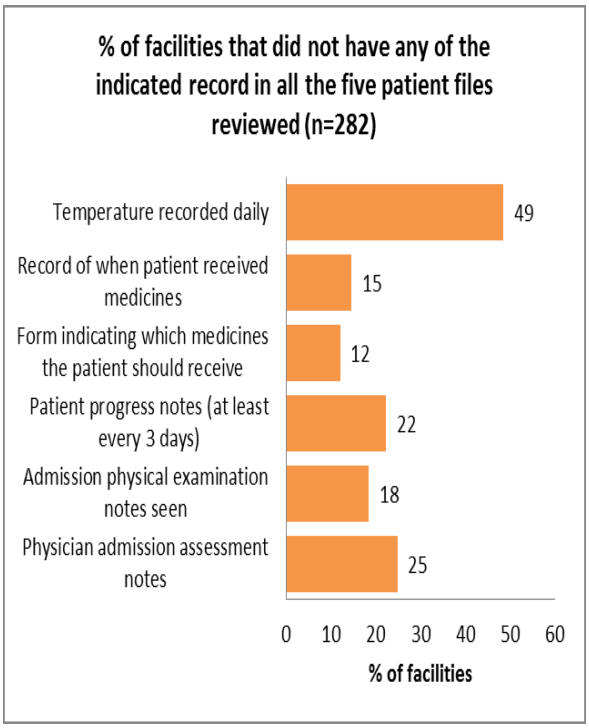


Figure 74: Percentage of hospitals that had or did not have record of key events in the patient-files in surgical ward (n=282)





2.11. Readiness to offer services on the adult inpatient surgical ward

Key findings:

- Many hospitals/HC IVs had patient-files that lacked records of key events in patient management; suggesting that there are important gaps and weaknesses in the care of patients in hospitals/HC IVs. For instance, in all the five files for surgical patients that were reviewed on the surgical ward in each hospital/HC IV:
  - Physician admission notes were available in all of them in only 48% of the hospitals/HC IVs and in none of them in up to 25% of the hospitals/HC IV
  - Physical examination notes were available in all of them in only 49% of the hospitals/HC IVs and in none of them in 18% of the hospitals/HC IVs
  - Patient progress notes were available in all of them in only 42% of the hospitals/HC IVs and in none of them in 22% of hospitals/HC IVs.
  - Records of which medicines the patient should receive were available in all of them in 55% of the hospitals/HC IVs and in none of them in 12% of the hospitals/HC IVs
  - Records of when patient received medicine was available in all of them in 51% of the hospitals/HC IVs and in none of them in 15% of the hospitals/HC IVs
  - Record of daily temperature measurement was available in all of them in only 30% of the hospitals/HC IV and in none of them in up to half (49%) of the hospitals/HC IV
- Eastern Uganda generally had a higher percentage of hospitals/HC IVs that did not have any record of the key events compared to other geographical zones
- Most of the hospitals/HC IVs had only a subset of the items. Of the 33 items that were considered to be particularly important for offering services on the inpatient adult surgical ward and that were enquired about:
  - None of the hospitals/HC IVs had all of them.
  - At least half of the items were available in about a third (31%) of the hospitals/HC IVs.
  - Some of the items such as defibrillator, electrocardiogram, cardiac monitor, ophthalmoscope and headlight were extremely rare. Sharps container was the only item that was almost universally available, followed by disposable latex gloves
  - On average, 14 of the 33 items (43%) were found in the hospitals/HC IVs. When level IV primary care facilities are excluded from analysis, slightly over half of the items (17 of 33 item or 52%) were found at the hospitals
- Capacity to offer services on the surgical ward was generally poor. Using predefined criteria, only 1% and 12% of the hospitals/HC IVs were classified as having very good and good capacity, respectively; almost half of the hospitals/HC IV were classified as having poor or very poor capacity

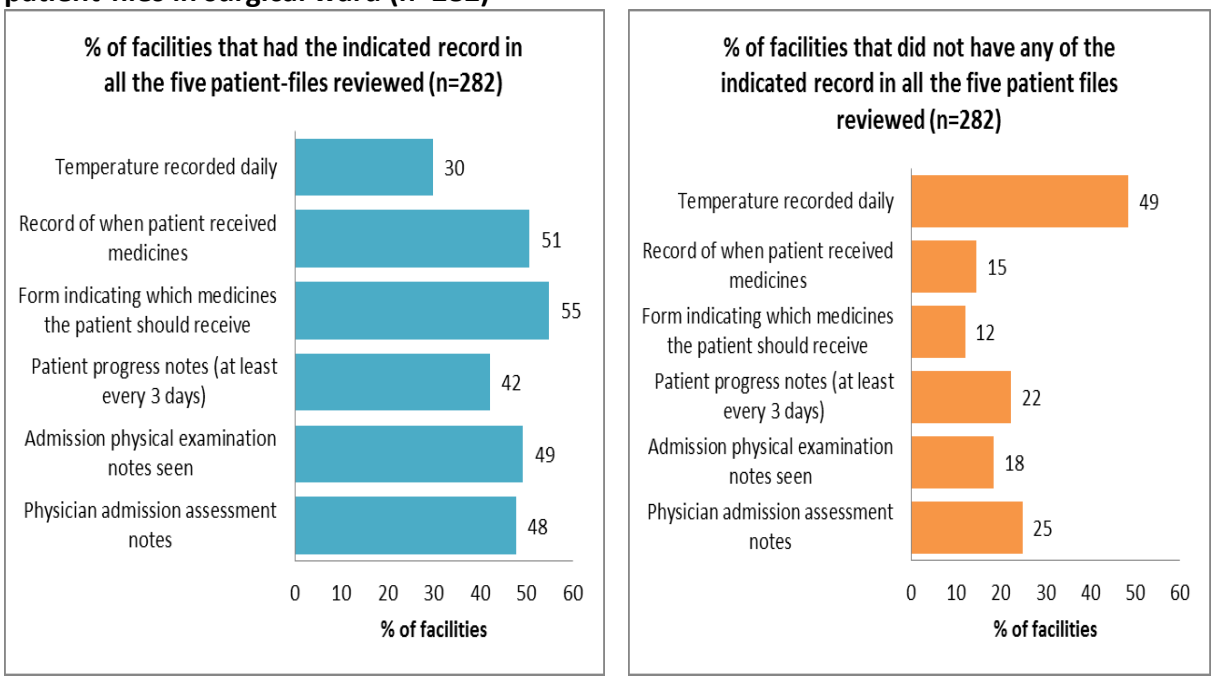
Practices regarding the care of patients on the adult inpatient surgical ward

Practices regarding care of patients was assessed based on the presence, in the patient-files, of records of key events in patient management. The assessment involved randomly picking, from each hospital/HC IV with a surgical ward, five patient files out of all the files for patients who were present on the surgical ward, and then checking the files for the presence of:

- Physician admission notes
- Record of physical examination
- Patient progress notes (at least every 3 days)
- Record of what medicines the patient is to receive
- Record of when the patient received the medicine
- Daily recording of temperature
- Record of laboratory results (recorded at least once) (this section was however excluded from analysis because not all patients admitted to the surgical ward will have an indication for a laboratory examination)

The percentage of hospitals/HC IVs that had none, one, two, three, four or five of the five patient-files with the each of the item was then calculated overall and then by geographical zone, facility type, public-private ownership, and urban-rural location. A major assumption during analysis was that each hospital/HC IV had five or more patients on the surgical ward. It is important to note that this records review did not ascertain the quality of the clinical notes or correctness of patient management.

Figure 75: Percentage of hospitals that had or did not have record of key events in the patient-files in surgical ward (n=282)



Many hospitals/HC IVs had patient-files that lacked records of key events in patient management (Figure 75) – suggesting that there are important gaps and weaknesses in the care of patients in hospitals/HC IVs. For instance, of the five files for surgical patients that were reviewed on the surgical ward, daily temperature measurement records were available in all of them in only 30% of the hospitals/HC IV and in none of them in up to half of the hospitals/HC IV. The temperature records were available in one of them in 5% of the hospitals/HC IVs, in two of them in 7 % of the hospitals/HC IV, in three of them in 7% of the hospitals/HC IV and in four of them in 3% of the hospitals/HC IV (Table 19).

Compared to the other geographical zones, Eastern Uganda generally had a higher percentage of hospitals/HC IVs that did not have any record of the key events. For instance, of the five files reviewed in Eastern Uganda, physician admission notes were unavailable in all of them in 57% of the hospitals/HC IVs compared to 4% in Northern Uganda, 15% in Western Uganda and 18% in Central Uganda; Patient progress notes were unavailable in all of them in 41% of the hospitals/HC IVs compared to 5% in Northern Uganda, 19% in Western Uganda and 20% in Central Uganda; and records of daily temperature measurement were unavailable in all of them in 76% of the hospitals/HC IVs compared to 26% in Northern Uganda, 41% in Western Uganda and 45% in Central Uganda (Table 18). Similarly, the percentage that lacked the records was higher among level IV primary care facilities compared to other levels, and higher in public than in private hospitals/HC IVs.

Table 19: Out of five admission files of patients randomly picked from the surgical ward of each hospital/HC IV; the % of hospitals/HC IV with the indicated record in the patient files (n=282)

	Northern Uganda (n=57)	Eastern Uganda (n=75)	Central Uganda (n=91)	Western Uganda (n=59))	National hospital (n=2)	Regional hospital (n=14)	General hospital (n=114)	Specialty hospital (n=2)	HC IV (n=150)	public (n=194)	Private (n=88)	Urban (n=89)	Peri-urban (n=35)	Rural (n=158)	National (n=282)
PHYSICIAN ADMISSION ASSESSMENT NOTES															
None seen	4	57	18	15	0	21	14	0	34	29	15	20	37	25	25
One seen	0	3	10	3	0	0	3	0	7	6	2	2	6	6	5
Two seen	9	4	10	8	0	0	4	0	12	6	11	8	9	8	8
Three seen	5	5	12	12	0	0	11	0	9	6	15	9	9	9	9
Four seen	5	4	11	2	0	0	7	0	6	6	6	7	0	7	6
Five seen	77	27	40	59	100	79	62	100	33	46	51	54	40	46	48
ADMISSION PHYSICAL EXAMINATION NOTES SEEN															
None seen	4	36	16	14	0	0	10	0	27	21	14	15	23	20	18
One seen	4	8	10	3	0	0	4	0	9	8	5	2	11	8	7
Two seen	7	8	10	10	0	0	3	0	15	9	9	9	6	9	9
Three seen	2	5	12	14	0	7	10	0	8	6	14	11	6	8	9
Four seen	5	8	13	3	50	7	7	0	9	9	7	10	6	8	8
Five seen	79	35	38	56	50	86	67	100	32	48	52	53	49	47	49
PATIENT PROGRESS NOTES															
None seen	5	41	20	19	0	0	12	0	33	26	14	19	37	21	22
One seen	0	7	5	5	0	0	3	0	7	5	3	0	6	7	5
Two seen	11	15	12	8	0	0	6	0	17	12	11	10	6	14	12
Three seen	4	12	13	12	0	14	11	0	10	8	16	11	11	10	11
Four seen	7	9	11	5	0	21	9	0	7	9	7	12	3	8	9
Five seen	74	16	38	51	100	64	59	100	26	39	49	47	37	41	42
FORM INDICATING WHICH MEDICINES THE PATIENT SHOULD RECEIVE															
None seen	4	8	16	19	0	0	4	0	20	13	9	7	20	13	12
One seen	2	8	7	8	0	0	4	0	9	8	3	3	6	8	6
Two seen	9	12	11	5	0	0	4	0	15	10	9	8	9	11	10
Three seen	2	9	13	8	0	0	11	0	9	6	16	11	9	8	9
Four seen	5	11	11	3	0	7	8	0	9	9	7	9	3	9	8
Five seen	79	52	42	56	100	93	71	100	38	55	56	62	54	51	55

| | Northern | Eastern | Central | Western | National | Regional | General | Specialty | HC IV | public | Private | Urban | Peri- | Rural | National |

	(n=57)	(n=75)	(n=91)	(n=59))	hospital (n=2)	hospital (n=14)	hospital (n=114)	hospital (n=2)	(n=150)	(n=194)	(n=88)	(n=89)	urban (n=35)	(n=158)	(n=282)
RECORD OF WHEN PATIENT RECEIVED MEDICINES															
None seen	4	16	16	20	0	0	8	0	21	17	9	10	26	15	15
One o seen	0	13	8	7	0	0	4	0	11	8	6	3	9	9	7
Two seen	11	8	10	5	0	0	2	0	15	9	8	7	3	11	9
Three seen	5	13	13	8	0	14	12	0	9	8	16	13	6	10	11
Four seen	4	13	10	3	0	0	8	0	9	9	7	8	9	8	8
Five seen	77	36	43	56	100	86	67	100	34	49	55	58	49	47	51
TEMPERATURE RECORDED DAILY															
None seen	26	76	45	41	0	29	28	50	67	61	20	36	63	53	49
One seen	2	4	8	5	0	14	7	0	3	5	6	6	6	4	5
Two seen	5	11	5	5	0	14	4	0	8	6	9	9	6	6	7
Three seen	4	4	10	8	0	0	10	0	5	5	11	9	6	6	7
Four seen	2	1	5	3	0	7	4	0	3	2	6	6	0	3	3
Five seen	61	4	26	37	100	36	47	50	15	22	48	35	20	29	30

The availability of items necessary for offering services on the surgical ward

Figure 76 illustrates the percentage of hospitals/HC IVs that had each of the items that were considered to be particularly important for offering services on the surgical ward and that were enquired about. The items were considered available if they were seen and confirmed by the interviewer to be in a working condition.

Most of the hospitals/HC IVs had only a subset of the items. Of the 33 items that were enquired about, none of the hospitals/HC IVs had all of them. At least half of the items were available in about a third (31%) of the hospitals/HC IVs. Some of the items such as defibrillator, electrocardiogram, cardiac monitor, ophthalmoscope and headlight were extremely rare. Sharps container was the only item that was almost universally available, followed by disposable latex gloves.

Figure 76 Percentage of hospitals/HC IVs that had the necessary items for offering services on the surgical ward (n=282)

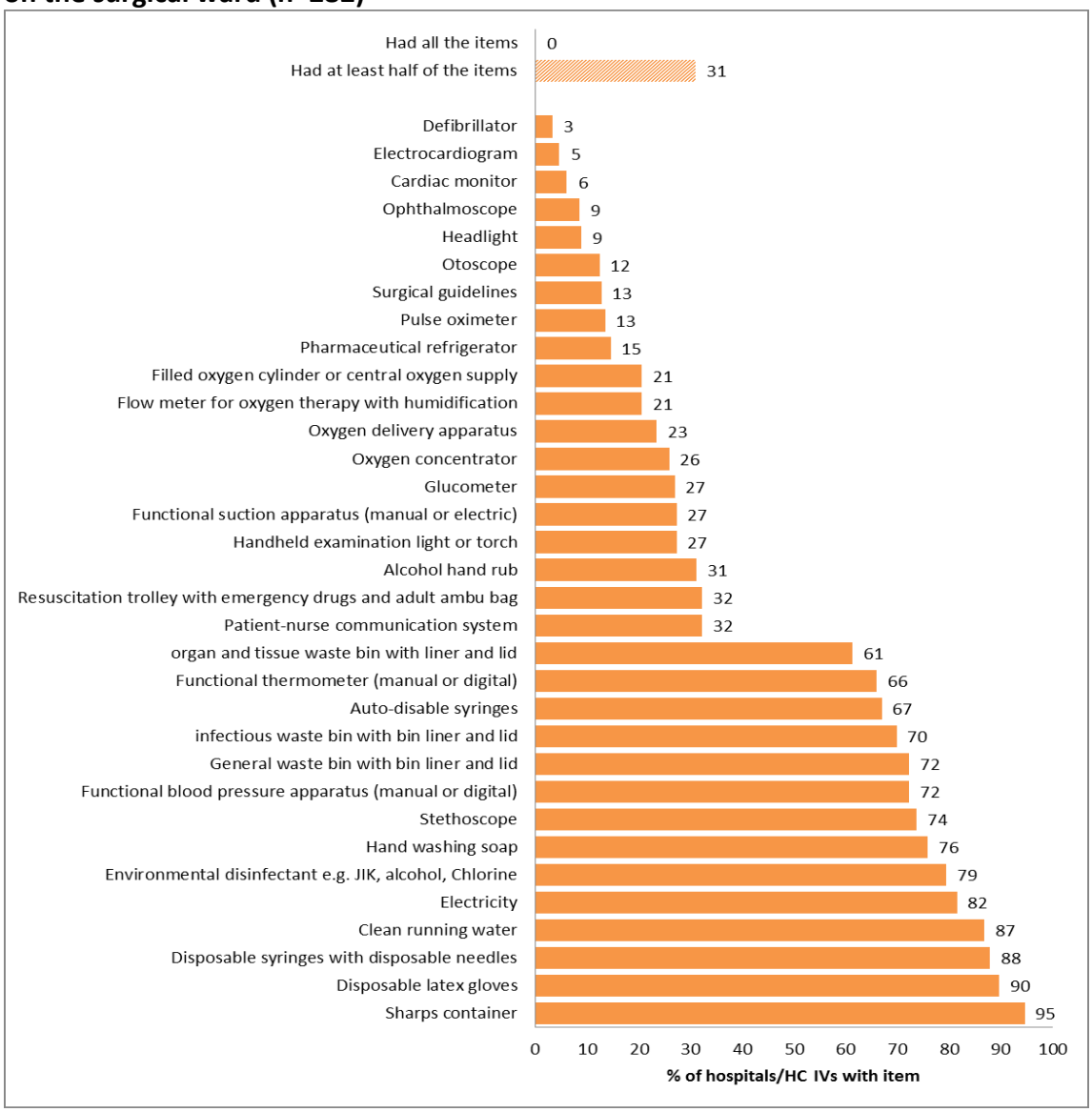
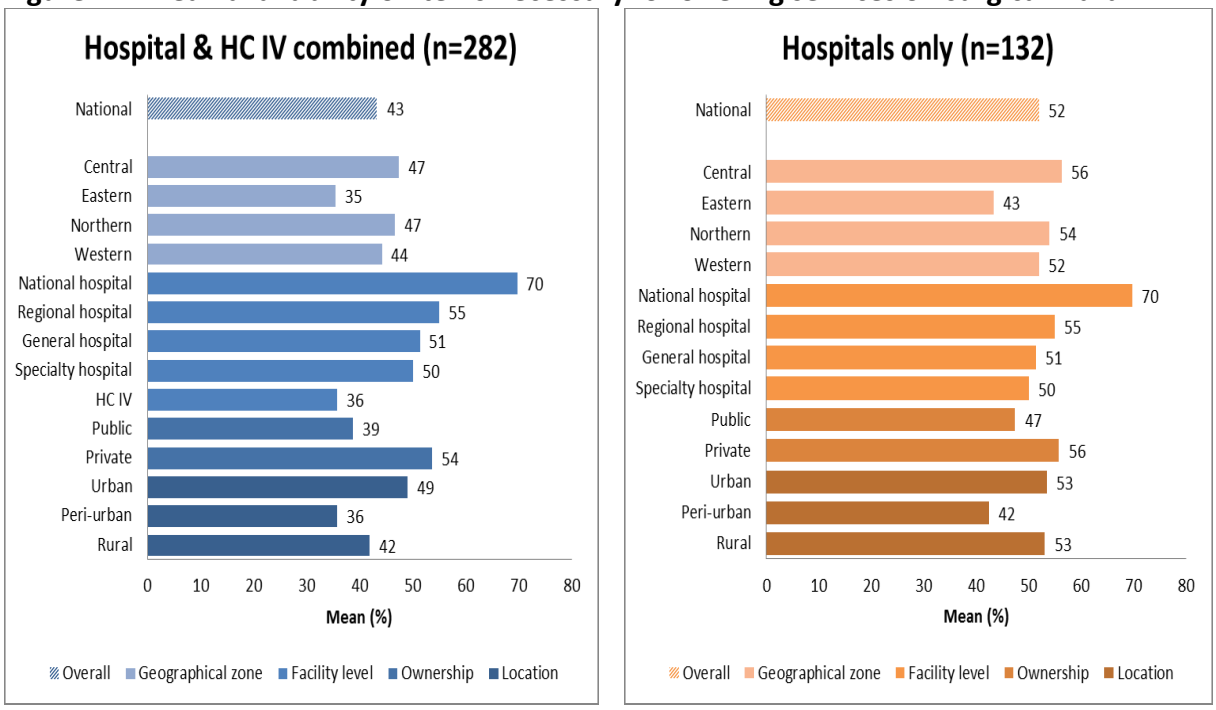


Figure 77 illustrates the mean availability of the items by geographical zone, facility type, public-private ownership, and urban-rural location. On average, 14 (43%) of the 33 items were found in the hospitals/HC IVs. When level IV primary care facilities are excluded from analysis, slightly over half of the items (17 of 33 item or 52%) were found at the hospitals.

Figure 77: Mean availability of items necessary for offering services on surgical ward



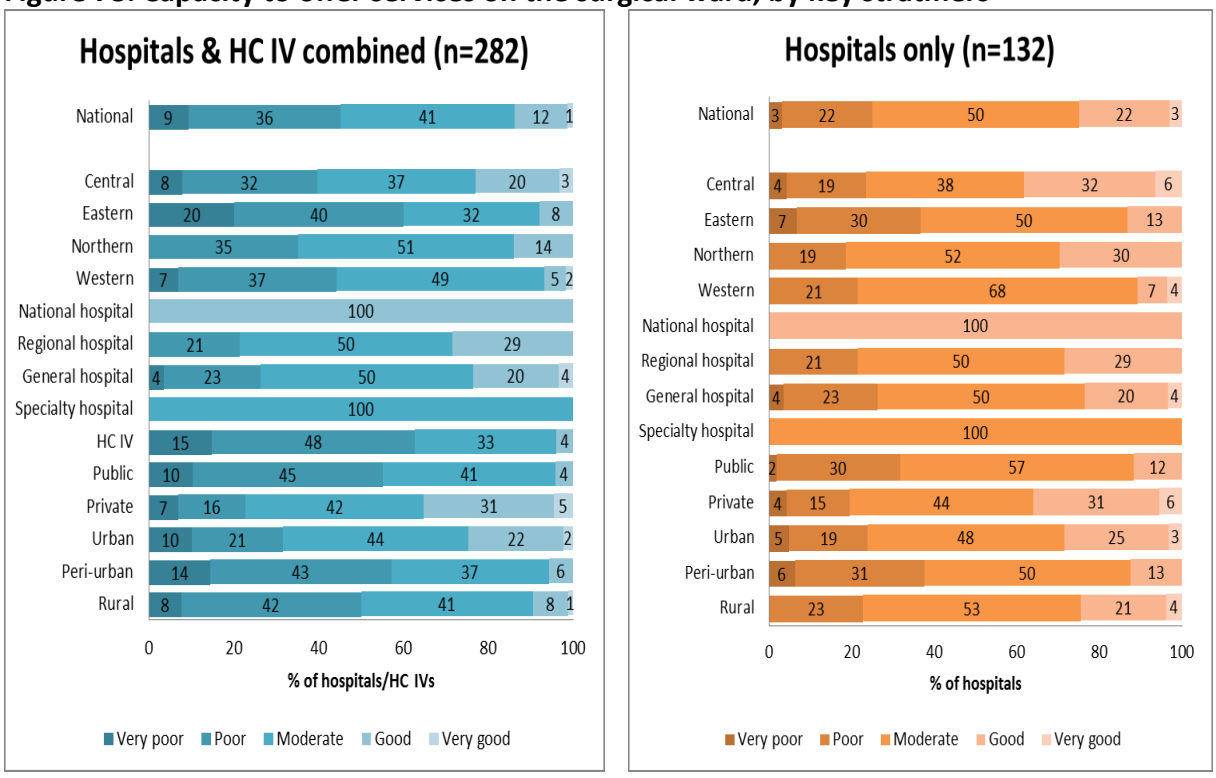
Differences by geographical zone were very small but the mean availability of the items in Eastern Uganda was lower than in the other geographical zones. Generally, the mean availability increased with increase in level of facility. More items were found in private than in public hospitals/HC IVs.

Capacity for offering services on the surgical ward

Capacity to offer services on the surgical ward was assessed based on the presence of the 33 items that were enquired about during the census (Figure 76). First, the items were coded such that a score 1 indicated the presence of a functional item, and 0 its absence. For the 33 items, the maximum potential achievable score was 33 and minimum was 0. Arbitrary cut-off points, based on high-level consultation with MoH and WHO, where then introduced. This involved dividing the total score into almost five equal parts and then recoding the scores such that a hospital/HC IV that scored 6 or less points was classified as having very poor capacity, 7-13 points as poor capacity, 14-20 points as moderate capacity, 21-27 points as good capacity, and 28-33 points as very good capacity. The percentage of hospitals with very poor, poor, moderate, good, or very good capacity was then calculated overall, and then by geographical zone, facility type, public-private ownership, and urban-rural location (Figure 78).

Generally, capacity to offer services on the surgical ward was poor. Using the predefined criteria described above, only 1% and 12% of the hospitals/HC IVs were classified as having very good and good capacity, respectively. Almost half of the hospitals/HC IV were classified as having poor or very poor capacity. There is slight improvement in the capacity when level IV primary care facilities are excluded from analysis, with a quarter of the hospitals classified as having good or very good capacity and also a quarter classified as having poor or very poor capacity. Zonal differences were quite wide with the capacity in Eastern Uganda being poorer than in the other geographical zones. The national referral hospital was classified as having very good capacity while specialty hospitals as having moderate capacity. Capacity was better in private than in public; and better in urban than in rural hospitals/HC IVs.

Figure 78: Capacity to offer services on the surgical ward, by key stratifiers



2.12. Readiness to offer services on the maternity (post-delivery) ward

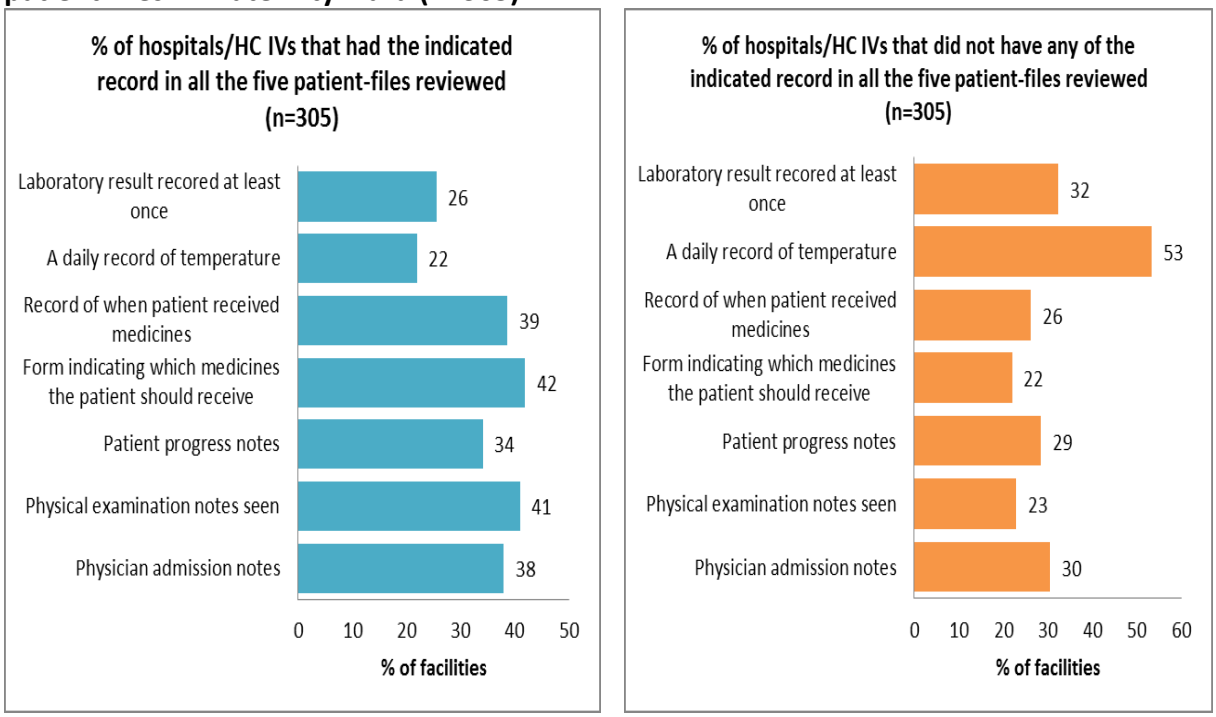
Key findings:

- As was the case with the records of care of patients on the inpatient surgical ward, many hospitals/HC IVs with a maternity ward had patient-files that lacked records of key events in patient management. This suggests that there are important gaps and weaknesses in the care of post-delivery mothers in hospitals/HC IVs in Uganda. In all the five files for post-delivery mothers that were reviewed:
  - Physician admission notes were available in all of them in only 38% of the hospitals/HC IVs and in none of them in up to 30% of the hospitals/HC IV.
  - Physical examination notes were available in all of them in only 41% of the hospitals/HC IVs and in none of them in 23% of the hospitals/HC IVs.
  - Patient progress notes were available in all of them in only 34% of the hospitals/HC IVs and in none of them in 29% of hospitals/HC IVs.
  - Records of which medicines the patient should receive were available in all of them in 42% of the hospitals/HC IVs and in none of them in 22% of the hospitals/HC IVs.
  - Records of when patient received medicine was available in all of them in 39% of the hospitals/HC IVs and in none of them in 26% of the hospitals/HC IVs.
  - Record of daily temperature measurement was available in all of them in only 22% of the hospitals/HC IV and in none of them in 53% of the hospitals/HC IV.
  - A record of a laboratory result recorded at least once was available in all of them in 26% of the hospitals/HC IVs and in none of them in a third (32%) of them.
- Eastern Uganda generally had a higher percentage of hospitals/HC IVs that did not have any record of the key events compared to other geographical zones.
- Most of the hospitals/HC IVs had only a subset of the items. Of the 33 items that were considered to be particularly important for offering services on the maternity ward and that enquired about:
  - Only 1% of the hospitals/HC IVs had all of them.
  - At least half of the items were available in a third (32%) of the hospitals/HC IVs.
  - Some of the items such as defibrillator, electrocardiogram, cardiac monitor, and ophthalmoscope were extremely rare. Sharps container was the most available item, with the great majority (91%) of the hospitals/HC IVs having it.
  - On average, only 14 of the 33 items (43%) were found in the hospitals/HC IVs. When level IV primary care facilities are excluded from analysis, just about half of the items (17 of 33 item or 48%) were found in the hospitals.
- Capacity to offer services on the maternity ward was generally poor. Using predefined criteria, only 2% and 11% of the hospitals/HC IVs were classified as having very good and good capacity, respectively. The rest were classified as having moderate (42%), poor (35%) and very poor capacity (10%).

Practices regarding the care of patients on maternity ward

Practices regarding care of patients was assessed based on the presence, in the patient-files, of records of key events in patient management. The assessment involved randomly picking, from each hospital/HC IV with a maternity ward, five patient files out of all the existing files for patients who were present on the maternity ward, and then checking the files for the presence of: physician admission notes, record of physical examination, patient progress notes (at least every 3 days), record of what medicines the patient is to receive, record of when the patient received the medicine, daily recording of temperature, record of laboratory results (recorded at least once). The percentage of hospitals/HC IVs that had none, one, two, three, four or five of the five patient-files with the each of the item was then calculated overall and then by geographical zone, facility type, public-private ownership, and urban-rural location. A major assumption during analysis was that each hospital/HC IV had five or more patients on the maternity ward. It is important to note that this records review did not ascertain the quality of the clinical notes or correctness of patient management.

Figure 79: Percentage of hospitals that had or did not have record of key events in the patient-files in maternity ward (n=305)



As was the case with the records of care of patients on the inpatient surgical ward, many hospitals/HC IVs with a maternity ward had patient-files that lacked records of key events in patient management. This suggests that there are important gaps and weaknesses in the care of post-delivery mothers in hospitals/HC IVs in Uganda. For instance, in all the five files for post-delivery mothers that were reviewed on the maternity ward in each hospital/HC IV: Physician admission notes were available in all of them in only 38% of the hospitals/HC IVs and in none of them in up to 30% of the hospitals/HC IV (Figure 79). The notes were

available in one of the files in 7% of the hospitals/HC IVs, in two of the five files in 10% of the hospitals/HC IVs, in three of the five and four of the five files in 9% and 6% of the hospitals and HC IVs, respectively (Table 19).

Compared to the other geographical zones, Eastern Uganda generally had a higher percentage of hospitals/HC IVs that did not have any record of the key events. For instance, of the five files reviewed in Eastern Uganda, physician admission notes were unavailable in all of them in up to 61% of the hospitals/HC IVs compared to 9% in Northern Uganda, 22% in Western Uganda and 29% in Central Uganda; Patient progress notes were unavailable in all of five files in 46% of the hospitals/HC IVs compared to 7% in Northern Uganda, 24% in Western Uganda and 32% in Central Uganda; and records of daily temperature measurement were unavailable in all of the five patient-files in 86% of the hospitals/HC IVs compared to 30% in Northern Uganda, 41% in Western Uganda and 55% in Central Uganda (Table 20). Similarly, the percentage that lacked the records was higher among level IV primary care facilities compared to other levels, and higher in public than in private hospitals/HC IVs.

Table 20 Out of five admission files of patients randomly picked from the surgical ward of each hospital/HC IV; the % of hospitals/HC IV with the indicated record in the patient files (n=305)

	Northern (n=57)	Eastern (n=71)	Central (n=91)	Western (n=86	National hospital (n=1)	Regional hospital (n=14)	General hospital (n=114)	Specialty hospital (n=1)	HC IV (n=175)	public (n=219)	Private (n=86)	Urban (n=85)	Peri-urban (n=40)	Rural (n=180)	National (n=305)
PHYSICIAN ADMISSION ASSESSMENT NOTES															
None seen	9	61	29	22	0	14	22	0	38	33	23	28	38	30	30
One seen	7	3	14	3	0	0	7	100	7	6	10	8	8	7	7
Two seem	7	10	10	13	0	7	10	0	11	10	10	9	8	11	10
Three seen	12	6	8	9	0	7	5	0	11	9	7	6	3	11	9
Four seen	4	4	5	8	0	0	4	0	7	6	5	6	0	7	6
Five seen	61	17	34	44	100	71	53	0	26	36	44	42	45	34	38
ADMISSION PHYSICAL EXAMINATION NOTES SEEN															
None seen	7	38	25	19	0	0	17	0	29	24	21	20	23	24	23
One seen	7	6	13	5	0	0	5	100	10	7	9	8	8	8	8
Two seem	9	7	12	13	0	0	11	0	11	11	10	9	10	11	10
Three seen	11	17	9	10	0	21	8	0	13	13	8	9	5	14	11
Four seen	7	8	3	7	0	0	2	0	10	7	3	6	5	7	6
Five seen	60	24	37	47	100	79	58	0	27	38	48	47	50	36	41
PATIENT PROGRESS NOTES															
None seen	7	46	32	24	0	7	17	0	38	31	22	25	33	29	29
One seen	9	13	13	7	0	7	10	100	11	11	10	12	8	11	10
Two seem	12	13	8	12	0	7	9	0	13	11	10	8	13	12	11
Three seen	11	17	7	9	0	7	9	0	12	11	8	7	10	12	10
Four seen	5	6	5	6	0	0	4	0	7	6	5	6	3	6	6
Five seen	56	6	35	42	100	71	52	0	19	30	44	42	35	30	34
FORM INDICATING WHICH MEDICINES THE PATIENT SHOULD RECEIVE															
None seen	5	24	29	24	0	0	12	0	30	24	17	16	20	25	22
One seen	7	14	11	9	0	0	9	100	12	10	13	12	13	9	10
Two seem	11	13	9	10	0	0	9	0	13	11	9	6	13	12	10
Three seen	12	8	8	9	0	7	6	0	11	9	9	5	0	13	9
Four seen	7	8	5	3	0	14	4	0	7	7	3	11	3	4	6
Five seen	58	32	38	43	100	79	61	0	27	40	48	51	53	36	42

	Northern (n=57)	Eastern (n=71)	Central (n=91)	Western (n=86	National hospital (n=1)	Regional hospital (n=14)	General hospital (n=114)	Specialty hospital (n=1)	HC IV (n=175)	public (n=219)	Private (n=86)	Urban (n=85)	Peri-urban (n=40)	Rural (n=180)	National (n=305)
RECORD OF WHEN PATIENT RECEIVED MEDICINES															
None seen	7	38	30	26	0	7	17	0	34	30	17	21	28	28	26
One seen	7	11	11	7	0	0	8	100	10	8	13	12	8	8	9
Two seem	9	11	11	12	0	0	10	0	13	11	10	7	13	12	11
Three seen	14	10	8	12	0	14	8	0	12	11	9	7	5	13	10
Four seen	7	6	3	3	0	0	2	0	7	5	3	5	3	5	5
Five seen	56	24	37	41	100	79	56	0	24	36	47	48	45	33	39
TEMPERATURE RECORDED DAILY															
None seen	30	86	55	41	0	36	42	0	63	62	31	45	58	57	53
One seen	5	3	12	6	0	7	7	100	6	5	10	9	5	6	7
Two seem	11	3	7	13	0	7	5	0	10	8	8	5	10	9	8
Three seen	7	6	4	9	0	7	5	0	7	7	6	7	3	7	7
Four seen	4	0	5	2	0	0	5	0	2	2	6	4	0	3	3
Five seen	44	3	16	29	100	43	35	0	11	16	38	31	25	17	22
LABORATORY RESULTS RECORDED AT LEAST ONCE															
None seen	12	39	40	33	0	21	24	0	39	34	28	26	40	34	32
One seen	7	17	13	9	0	14	11	100	12	11	13	15	10	11	12
Two seem	9	17	9	15	0	14	9	0	15	14	8	15	8	12	12
Three seen	18	8	9	10	0	14	11	0	11	12	8	6	10	13	11
Four seen	4	14	5	5	0	0	7	0	7	7	6	7	3	8	7
Five seen	51	4	24	28	100	36	39	0	15	21	37	31	30	22	26

The availability of items for offering services on the maternity (post-delivery) ward

Figure 80 illustrates the percentage of hospitals/HC IVs that had each of the items that were considered to be particularly important for offering services on the maternity ward and that were enquired about. The items were considered available if they were seen and confirmed by the interviewer to be in a working condition.

Most of the hospitals/HC IVs had only a subset of the items. For instance, of the 33 items that were enquired about, only 1% of the hospitals/HC IVs had all of them, and only about a third (32%) of the hospitals/HC IVs had at least half of the items. As was the case with the items on the surgical ward, some of the items such as defibrillator, electrocardiogram, cardiac monitor, and ophthalmoscope were extremely rare. Sharps container was the most commonly available item, with the great majority of the hospitals/HC IVs (91%) having the item.

Figure 80: Percentage of hospitals/HC IVs that had the indicated items on maternity ward (n=314)

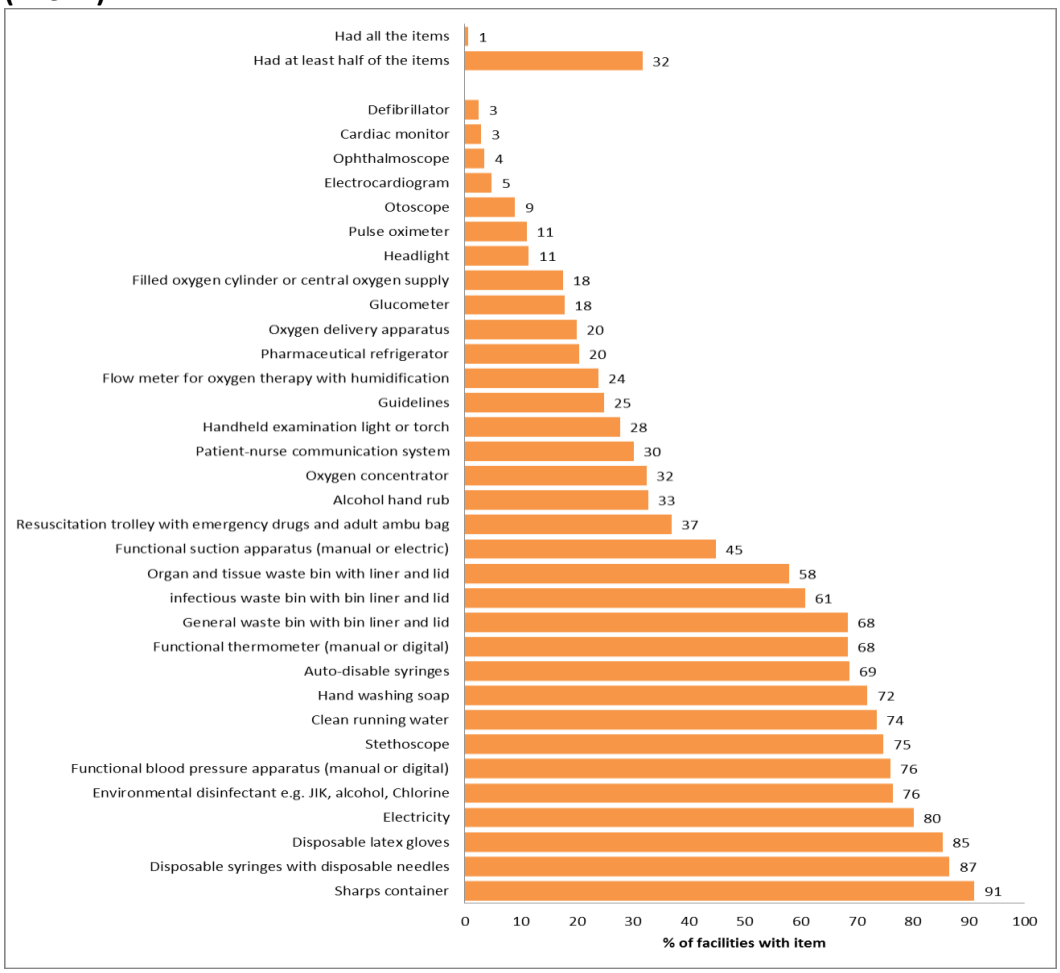
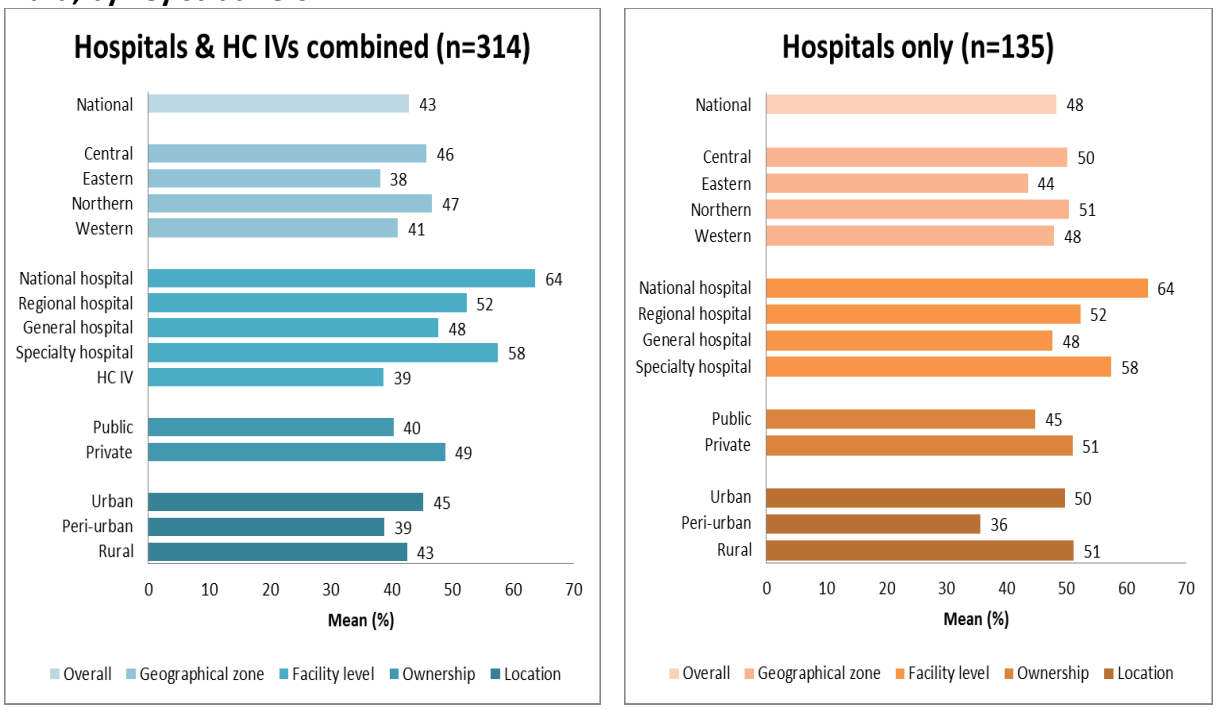


Figure 81 illustrates the mean availability of the items by geographical zone, facility type, public-private ownership, and urban-rural location. On average, only 14 of the 33 items

(43%) were found in the hospitals/HC IVs. When level IV primary care facilities are excluded from analysis, just about half of the items (17 of 33 item or 48%) were found in the hospitals.

Figure 81: Mean availability of the items necessary for offering services on maternity ward, by key stratifiers



Differences by geographical zone were small but the mean availability in Eastern Uganda was lower than in the other geographical zones. Generally, the mean availability increased with increase in level of facility. Public-private differences were fairly large, with private hospitals/HC IVshaving9% gap over public hospitals/HC IVs when level IV primary care facilities are included in the analysis, and 6% gap when level IV primary care facilities are excluded from analysis. Urban-rural differences were small.

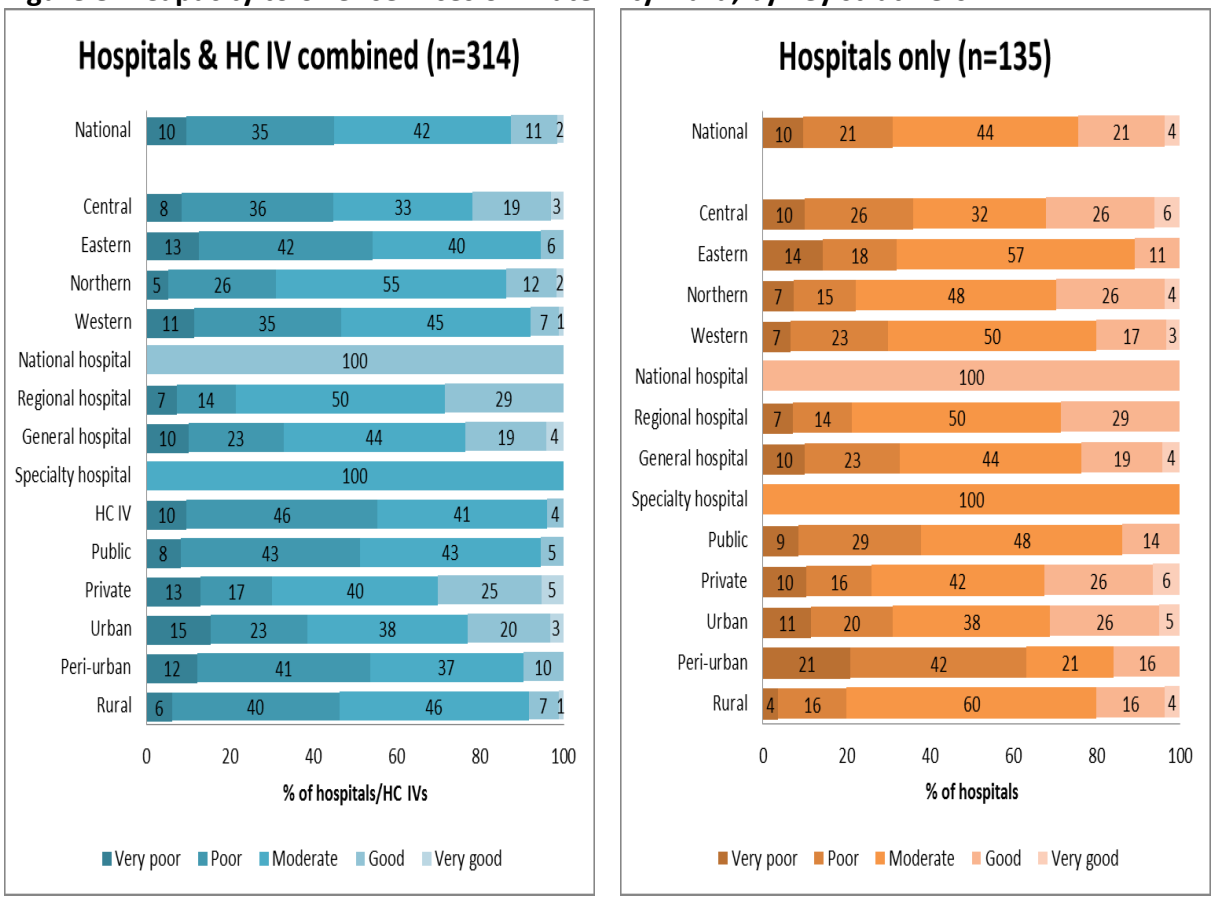
Capacity to provide services on the maternity ward

Capacity to offer services on the maternity ward was assessed based on the presence of the 33 items that were enquired about during the census (see Figure 80). First, the items were coded such that a score 1 indicated the presence of a functional item, and 0 its absence. For the 33 items, the maximum potential achievable score was 33 and minimum was 0. Arbitrary cut-off points, based on high-level consultation with MoH and WHO, were then introduced. This involved dividing the total score into almost five equal parts and then recoding the scores such that a hospital/HC IV that scored 6 or less points was classified as having very poor capacity, 7-13 points as poor capacity, 14-20 points as moderate capacity, 21-27 points as good capacity, and 28-33 points as very good capacity. The percentage of hospitals with very poor, poor, moderate, good, or very good capacity was then calculated

overall, and then by geographical zone, facility type, public-private ownership, and urban-rural location (Figure 82).

Generally, capacity to offer services on the maternity ward was poor. Using the predefined criteria described above, only 2% and 11% of the hospitals/HC IVs were classified as having very good and good capacity, respectively. When level IV primary care facilities are excluded from analysis, 4% and 21% of the hospitals were classified as having poor or very poor capacity, respectively.

Figure 82: Capacity to offer services on maternity ward, by key stratifiers



Zonal differences were quite wide, with the capacity in Eastern Uganda being poorer than in the other geographical zones. Capacity was better in national referral hospital than in other facility types. Similarly, capacity was better in private than in public hospitals/HC IVs and in urban than in rural hospitals/HC IVs.

2.13. Readiness to offer services on paediatric ward

Key findings:

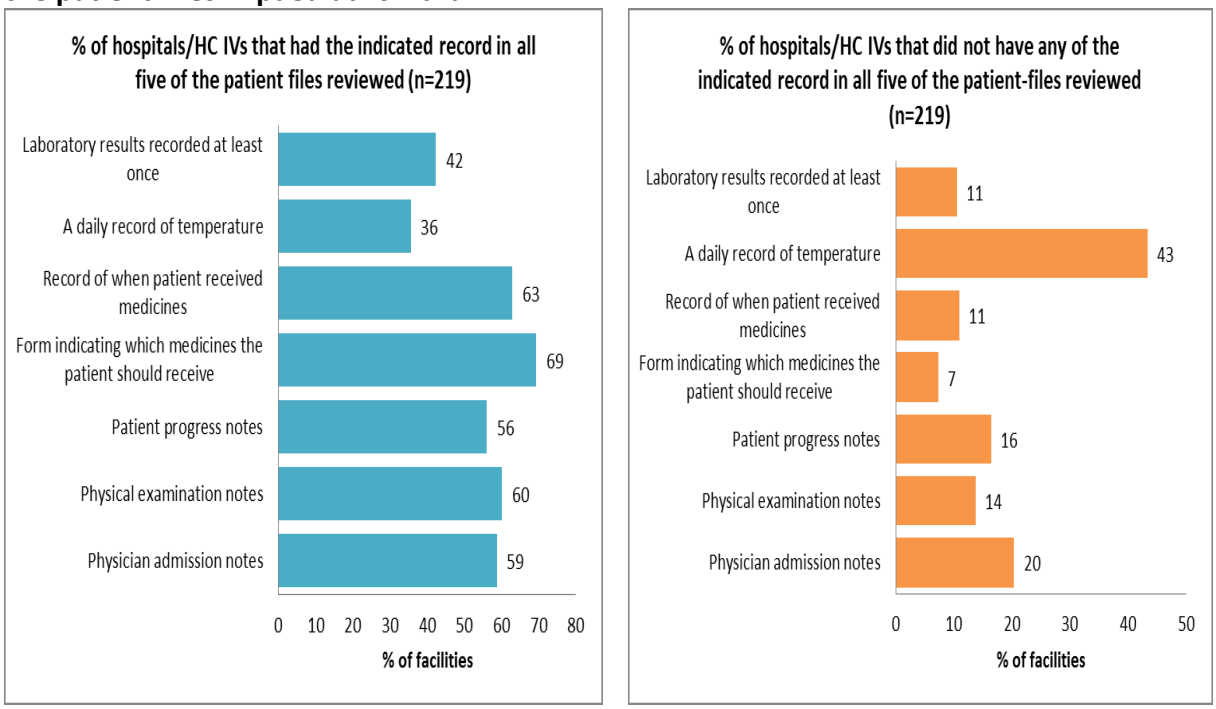
- As was the case with the records of care of patients on maternity and inpatient surgical wards, many hospitals/HC IVs with a paediatric ward had patient-files that lacked records of key events in patient management. In all the five files for children admitted to the paediatric ward that were reviewed in each hospital/HC IV:
  - Physician admission notes were available in all of them in only 59% of the hospitals/HC IVs and in none of them in up to 20% of the hospitals/HC IV.
  - Physical examination notes were available in all of them in only 60% of the hospitals/HC IVs and in none of them in 14% of the hospitals/HC IVs.
  - Patient progress notes were available in all of them in only 56% of the hospitals/HC IVs and in none of them in 16% of hospitals/HC IVs.
  - Records of which medicines the patient should receive were available in all of them in 69% of the hospitals/HC IVs and in none of them in 7% of them.
  - Records of when patient received medicine was available in all of them in 63% of the hospitals/HC IVs and in none of them in 11% of the hospitals/HC IVs.
  - Record of daily temperature measurement was available in all of them in only 36% of the hospitals/HC IV and in none of them in 43% of the hospitals/HC IVs.
  - A record of a laboratory result recorded at least once was available in all of them in 42% of the hospitals/HC IVs and in none in 11% of the hospitals/HC IVs.
- Eastern Uganda generally had a higher percentage of hospitals/HC IVs that did not have any record of the key events in the patient files compared to other geographical zones.
- Most of the hospitals/HC IVs had only a subset of the items. Of the 34 items that were considered particularly important for offering services on the paediatric ward and that were enquired about:
  - None of the hospitals/HC IVs had all of them.
  - At least half of the items were available in 28% of the hospitals/HC IVs.
  - Some of the items such as defibrillator, electrocardiogram, cardiac monitor, headlight, and ophthalmoscope were extremely rare. Sharps container was the most available item, with 81% of the hospitals/HC IVs having it, followed by disposable gloves (78%) and Disposable syringed with disposable needles (75%).
  - On average, only 14 of the 34 items (41%) were found in the hospitals/HC IVs. When level IV primary care facilities are excluded from analysis, 15 of 34 items (43%) were found in the hospitals.
- Capacity to offer services on the paediatric ward was generally poor. Using predefined criteria, only 4% and 15% of the hospitals/HC IVs were classified as having very good and good capacity, respectively. The rest were classified as having moderate (26%), poor (34%) and very poor capacity (22%).

Practices regarding the care of patients on paediatric ward

Practices regarding care of patients on the paediatric was assessed based on the presence, in the patient-files, of records of key events in patient management. The assessment involved randomly picking, from each hospital/HC IV with a paediatric ward, five patient-files out of all the existing files for patients who were present on the ward, and then checking the files for the presence of physician admission notes, record of physical examination, patient progress notes (at least every 3 days), record of what medicines the patient is to receive, record of when the patient received the medicine, daily recording of temperature, record of laboratory results (recorded at least once).

The percentage of hospitals/HC IVs that had none, one, two, three, four or five of the five patient-files with the each of the item was then calculated overall and then by geographical zone, facility type, public-private ownership, and urban-rural location. A major assumption during analysis was that each hospital/HC IV had five or more patients on the maternity ward. It is important to note that this records review did not ascertain the quality of the clinical notes or correctness of patient management.

Figure 83: Percentage of hospitals/HC IVs that had or did not have record of key events in the patient-files in paediatric ward



As was the case with the records of care of patients on maternity and inpatient surgical wards, many hospitals/HC IVs with a paediatric ward had patient-files that lacked records of key events in patient management. This suggests that there are important gaps and weaknesses in the care of children in paediatric wards in hospitals/HC IVs in Uganda. For instance, in all the five files for paediatric inpatients that were reviewed in each hospital/HC IV: Physician admission notes were available in all of them in only 60% of the hospitals/HC

IVs and in none of them in up to 20% of the hospitals/HC IV (Figure 83). The notes were available in one of the files in 4% of the hospitals/HC IVs, in two of the five files in 8% of the hospitals/HC IVs, in three of the five and four of the five files in 5% and 4% of the hospitals/HC IVs, respectively (Table 21).

As was the case with maternity and surgical inpatient wards, Eastern Uganda generally had a higher percentage of hospitals/HC IVs that did not have any record of the key events. For instance, of the five files reviewed in Eastern Uganda, physician admission notes were unavailable in all of them in up to 46% of the hospitals/HC IVs compared to 6% in Northern Uganda, 11% in Western Uganda and 16% in Central Uganda; Patient progress notes were unavailable in all of five files in 26% of the hospitals/HC IVs compared to 6% in Northern Uganda, 12% in Western Uganda and 19% in Central Uganda; and records of daily temperature measurement were unavailable in all of the five patient-files in 68% of the hospitals/HC IVs compared to 33% in Northern Uganda, 31% in Western Uganda and 39% in Central Uganda (Table 21). Similarly, the percentage that lacked the records was higher among level IV primary care facilities compared to other levels, and higher in public than in private hospitals/HC IVs.

Table 21 Out of five admission files of patients randomly picked from the surgical ward of each hospital/HC IV; the % of hospitals/HC IV with the indicated record in the patient files (n=219)

	Northern (n=49)	Eastern (n=57)	Central (n=64)	Western (n=49))	National hospital (n=2)	Regional hospital (n=14)	General hospital (n=104)	Specialty hospital (n=4)	HC IV (n=95)	public (n=144)	Private (n=75)	Urban (n=70)	Peri-urban (n=27)	Rural (n=122)	National (n=219)
PHYSICIAN ADMISSION ASSESSMENT NOTES															
None seen	6	46	16	11	0	7	17		26	23	16	19	26	20	20
One seen	0	2	7	6	0	0	4		4	4	4	5	4	3	4
Two seen	10	0	13	6	0	7	1		15	9	6	3	0	11	8
Three seen	2	4	7	9	0	0	4		7	6	4	0	4	8	5
Four seen	0	7	5	4	0	7	4		4	4	6	5	4	4	4
Five seen	82	41	52	64	100	79	70		43	56	64	68	63	53	59
ADMISSION PHYSICAL EXAMINATION NOTES SEEN															
None seen	4	21	16	12	0	0	14	0	16	14	13	14	15	13	14
One seen	0	5	6	2	0	0	5	0	3	3	5	4	4	3	4
Two seen	10	4	11	6	0	7	1	0	16	9	5	3	0	12	8
Three seen	4	9	8	10	0	0	7	0	11	9	5	6	4	10	8
Four seen	2	11	8	6	0	0	6	0	9	7	7	7	7	7	7
Five seen	80	51	52	63	100	93	67	100	45	58	64	66	70	55	60
PATIENT PROGRESS NOTES															
None seen	6	26	19	12	0	0	13	0	23	19	12	17	15	16	16
One seen	0	9	6	2	0	0	5	0	5	4	5	3	7	5	5
Two seen	10	7	9	4	0	14	3	0	13	8	7	6	0	11	8
Three seen	2	14	8	12	0	0	11	0	9	9	9	4	7	12	9
Four seen	0	14	5	4	0	0	5	0	8	6	5	6	4	7	6
Five seen	82	30	53	65	100	86	63	100	41	53	61	64	67	49	56
FORM INDICATING WHICH MEDICINES THE PATIENT SHOULD RECEIVE															
None seen	4	2	13	10	0	0	7	0	9	6	9	7	4	8	7
One seen	0	4	6	6	0	0	5	0	4	4	4	6	0	4	4
Two seen	8	2	11	4	0	0	1	0	14	7	5	1	0	11	6
Three seen	6	5	9	10	0	0	8	0	9	8	7	1	7	11	8
Four seen	0	12	3	4	0	7	6	0	4	3	8	4	7	5	5
Five seen	82	75	58	65	100	93	74	100	59	71	67	80	81	61	69

	Northern (n=49)	Eastern (n=57)	Central (n=64)	Western (n=49))	National hospital (n=2)	Regional hospital (n=14)	General hospital (n=104)	Specialty hospital (n=4)	HC IV (n=95)	public (n=144)	Private (n=75)	Urban (n=70)	Peri-urban (n=27)	Rural (n=122)	National (n=219)
RECORD OF WHEN PATIENT RECEIVED MEDICINES															
None seen	4	16	13	10	0	0	11	0	14	10	12	10	15	11	11
One seen	0	5	8	6	0	0	6	0	5	6	3	7	0	5	5
Two seen	8	2	11	4	0	0	1	0	14	7	5	3	0	10	6
Three seen	2	11	9	10	0	0	8	0	11	10	5	3	7	11	8
Four seen	2	14	5	4	0	7	7	0	6	5	9	4	7	7	6
Five seen	84	53	55	65	100	93	68	100	51	62	65	73	70	56	63
TEMPERATURE RECORDED DAILY															
None seen	33	68	39	31	0	21	29	0	65	58	16	33	56	47	43
One seen	0	4	8	2	0	14	4	0	2	3	4	6	4	2	4
Two seen	8	7	8	4	0	7	4	25	9	6	9	4	0	10	7
Three seen	2	12	5	10	0	0	12	0	4	8	7	4	4	10	7
Four seen	2	2	5	4	0	0	6	0	1	1	7	6	4	2	3
Five seen	55	7	36	49	100	57	46	75	18	24	57	47	33	30	36
LABORATORY RESULTS RECORDED AT LEAST ONCE															
None seen	6	5	17	12	0	0	11	25	12	9	13	11	7	11	11
One seen	2	9	9	4	0	14	5	0	7	7	5	9	0	7	6
Two see	12	14	16	14	0	7	8	0	23	17	8	9	7	19	14
Three seen	10	37	6	12	0	14	13	25	20	20	9	10	26	18	16
Four seen	2	18	11	8	0	14	13	0	7	10	11	11	15	8	10
Five seen	67	18	41	49	100	50	51	50	31	37	53	50	44	38	42

The availability of items necessary for offering services on paediatric ward

Figure 84 illustrates the percentage of hospitals/HC IVs that had each of the items that were considered to be particularly important for offering services on the paediatric ward and that were enquired about. The items were considered available if they were seen and confirmed by the interviewer to be in a working condition.

Most of the hospitals/HC IVs had only a subset of the items. For instance, of the 34 items that were enquired about, none of the hospitals/HC IVs had all of them, and only 28% of the hospitals/HC IVs had at least half of the items. As was the case with the items on maternity and surgical wards, some of the items such as defibrillator, electrocardiogram, cardiac monitor, headlight, and ophthalmoscope were extremely rare. Sharps container was the most commonly available item, with 81% of the hospitals/HC IVs having the item followed by disposable latex gloves (78%) and disposable syringe with disposable needles (75%).

Figure 84 Percentage of hospitals/HC IVs that had the indicated item on paediatric ward (n=260)

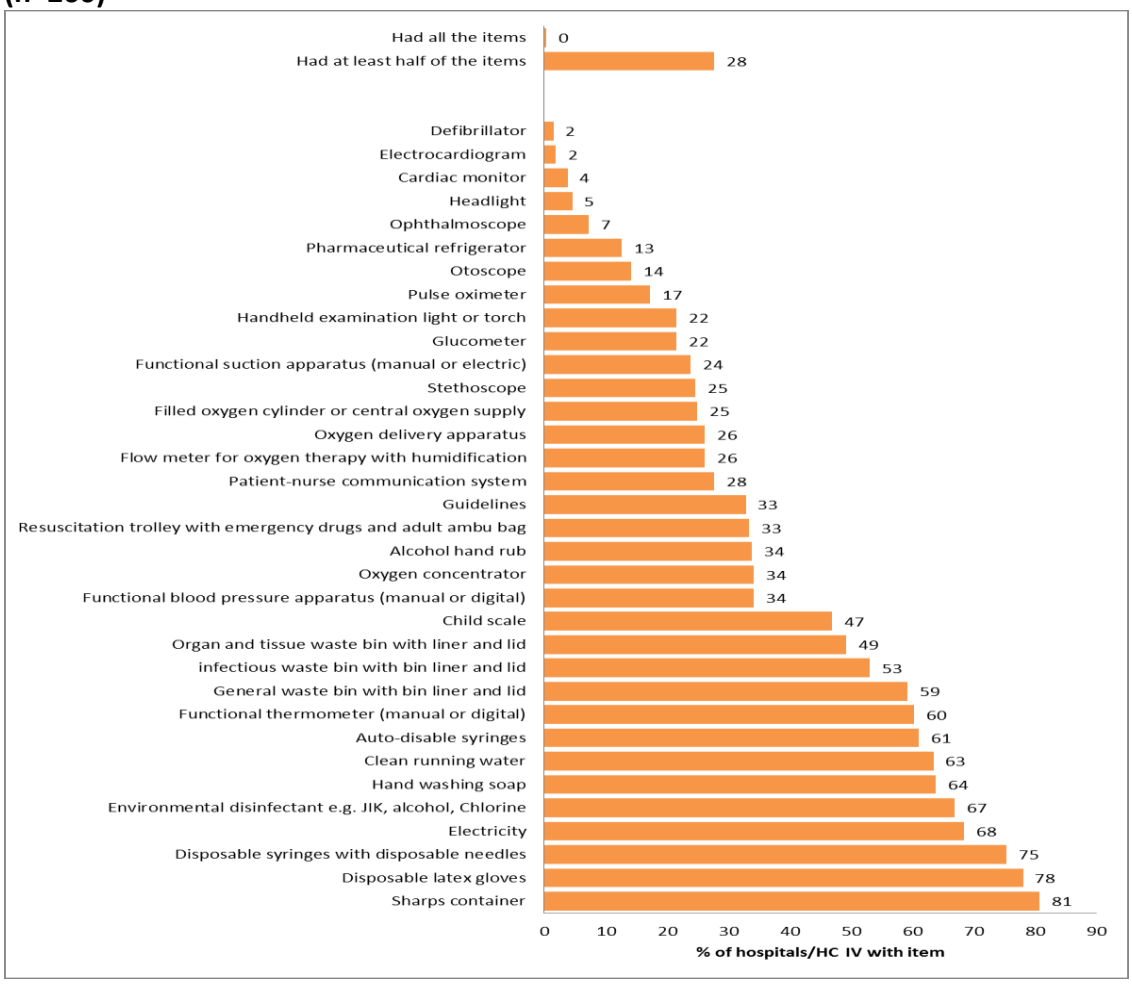
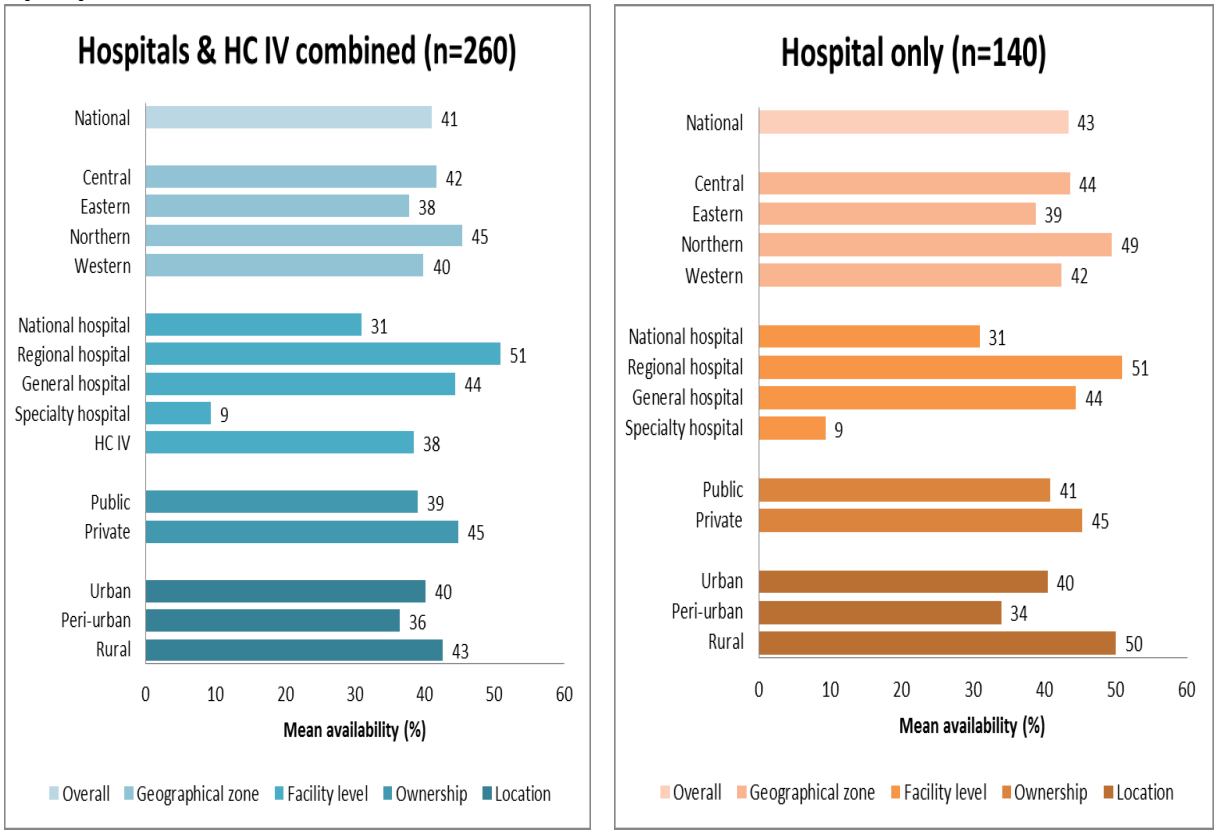


Figure 85 illustrates the mean availability of the items by geographical zone, facility type, public-private ownership, and urban-rural location. On average, only 14 of the 34 items

(41%) were found in the hospitals/HC IVs. When level IV primary care facilities are excluded from analysis, 15 (43%) of 34 were found in the hospitals.

Figure 85 Mean availability of the items necessary for offering services on paediatric ward, by key stratifiers



Zonal differences were small but the mean availability in Eastern Uganda was lower than in the other geographical zones. The mean availability in the specialty hospitals was lower than in the other facility types. The availability was better in private than in public hospitals/HC IVs, and better in rural than in urban hospitals/HC IVs.

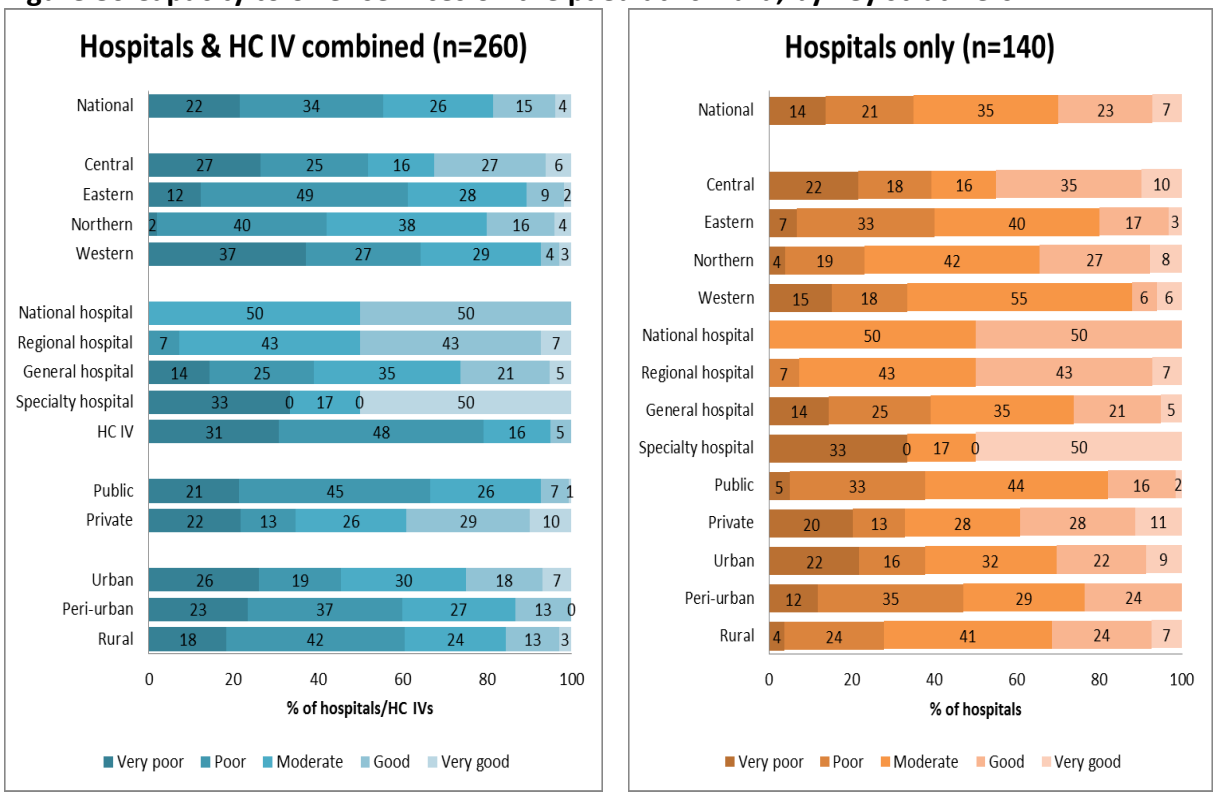
Capacity to offer services on the paediatric ward

Capacity to offer services on the paediatric ward was assessed based on the presence of the 34 items that were enquired about during the census (see Figure 84). First, the items were coded such that a score 1 indicated the presence of a functional item, and 0 its absence. For the 34 items, the maximum potential achievable score was 34 and minimum was 0. Arbitrary cut-off points, based on high-level consultation with MoH and WHO, where then introduced. This involved dividing the total score into five equal parts and then recoding the scores such that a hospital/HC IV that scored 6 or less points was classified as having very poor capacity, 7-13 points as poor capacity, 14-20 points as moderate capacity, 21-27 points as good capacity, and 28-34 points as very good capacity. The percentage of hospitals with very poor, poor, moderate, good, or very good capacity was then calculated overall, and

then by geographical zone, facility type, public-private ownership, and urban-rural location (Figure 86).

Generally, capacity to offer services on the paediatric ward was poor. Using the predefined criteria described above, only 4% and 15% of the hospitals/HC IVs were classified as having very good and good capacity, respectively. When level IV primary care facilities are excluded from analysis, 7% and 23% of the hospitals were classified as having poor or very poor capacity, respectively.

Figure 86 Capacity to offer services on the paediatric ward, by key stratifiers



Zonal differences were quite wide, with the capacity in Eastern Uganda being poorer than in the other geographical zones. Capacity in the national referral hospital was better than in the other facility types. Similarly, capacity was better in private than in public hospitals/HC IVs and in urban than in rural hospitals/HC IVs.

2.14. Readiness to offer blood transfusion services

Key findings:

- Capacity to offer safe blood transfusion services at hospitals/HC IVs was modest:
  - Although only 7% of the hospitals/HC IVs had all the items that are particularly important for offering blood transfusion services and that were enquired about during the census, at least half of the items were available in 74% of the hospitals/HC IVs
  - On average, four of the seven items that were enquired about were available in the hospitals/HC IVs and in working condition
  - Most of the hospitals/HC IV had a functioning refrigerator for storing blood (95%) and a blood transfusion record (93%). However, only 14% had staff that had received training during the two years that preceded the census
  - Using predefined criteria, 10% of the hospitals/HC IVs were classified as having very good capacity and 39% as having good capacity. A third were classified as having moderate capacity, and one in five classified as having poor or very poor capacity
  - Up to 16 districts had at least a hospital/HC IV that was classified as having very good capacity and 58 had a hospitals/HC IV classified as having good capacity to offer blood transfusion services

Readiness to offer blood transfusion services was assessed based on the presence of seven items that were considered to be particularly important for offering blood transfusions services and that were enquired about during the census, namely: a functioning refrigerator for storing blood, a thermometer in the refrigerator, blood transfusion guidelines, a temperature chart, a blood transfusion record book with records, a dedicated staff assigned to provide blood transfusion services, a staff that had received training on blood transfusion during the two years that preceded the census. Availability of the items was assessed among hospitals/HC IVs that indicated that they offered blood transfusions services.

Figure 87 illustrates the percentage of hospitals/HC IVs that had the items. Of the seven items that were enquired about, only 7% of the hospitals/HC IVs had all of them. At least half of the items were available in three quarters of the hospitals/HC IVs. A functioning fridge and a blood transfusion book with record were the most available. The least available item was staff that had received training on blood transfusion during the two years that preceded the survey.

Figure 87: Percentage of hospitals/HC IVs offering blood transfusion that had the indicated items (n=194)

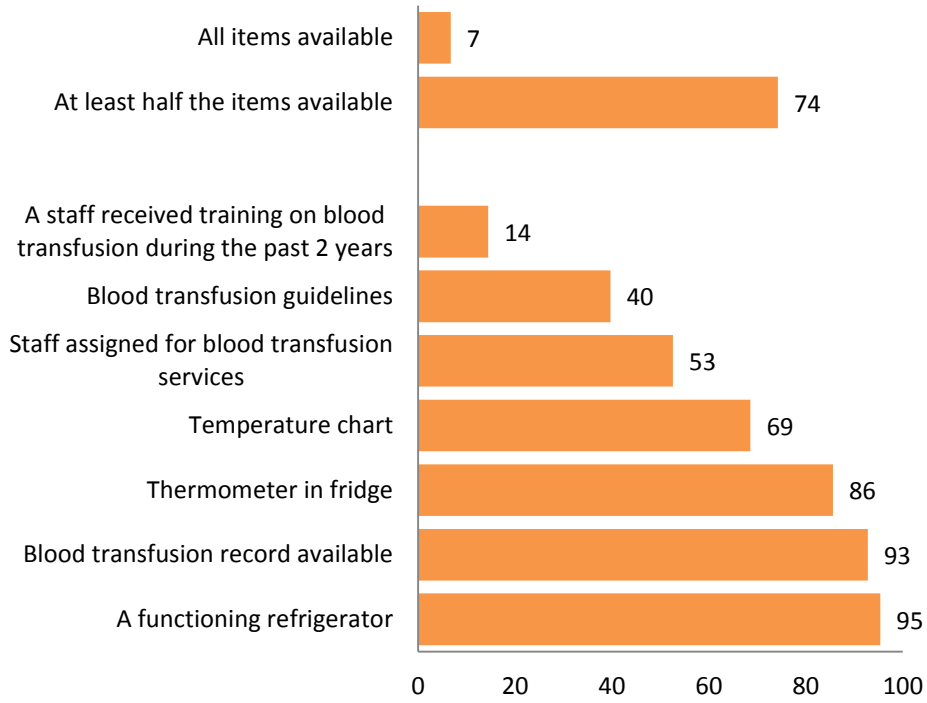


Figure 88 illustrates the mean availability of the items for offering blood transfusion services. On average, 4 of the 7 items (64%) were available in the hospitals/HC IVs. When level IV primary care facilities are excluded from analysis, 5 of the 7 items (66%) were available. Zonal differences in the mean availability were small but availability of the items in Western Uganda was better than elsewhere. The public-private and urban-rural differences were very small.

Figure 88: The mean availability of items necessary for offering blood transfusion, by key stratifiers

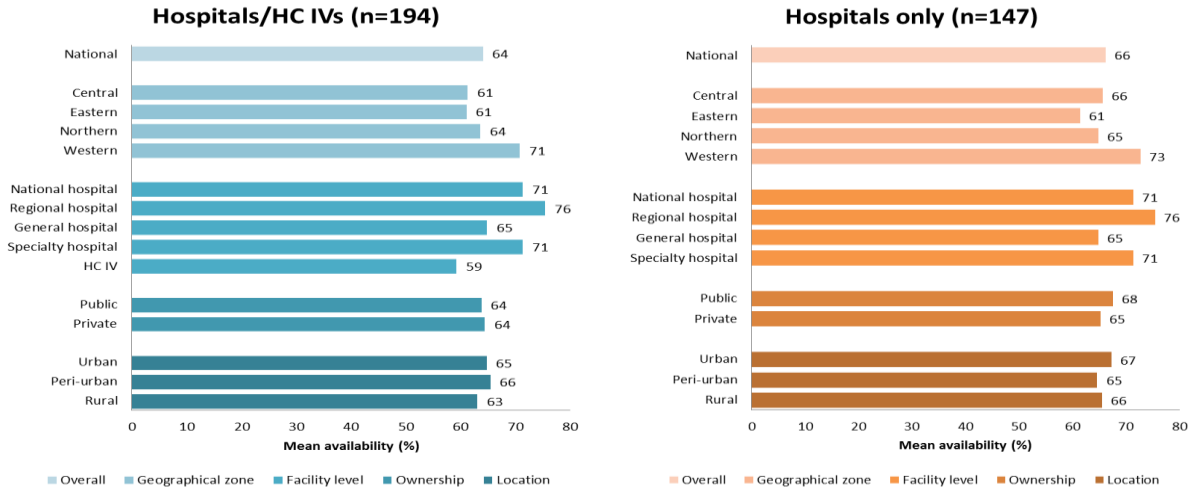
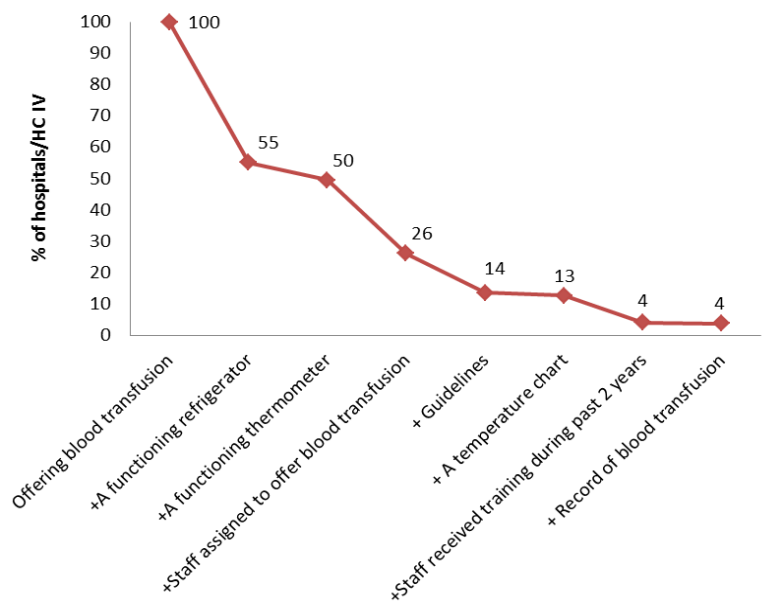


Figure 89 is a cascading graph of hospitals/HC IVs that offered services and had the items necessary for offering the services. Building of the cascading graph follows a logical pattern

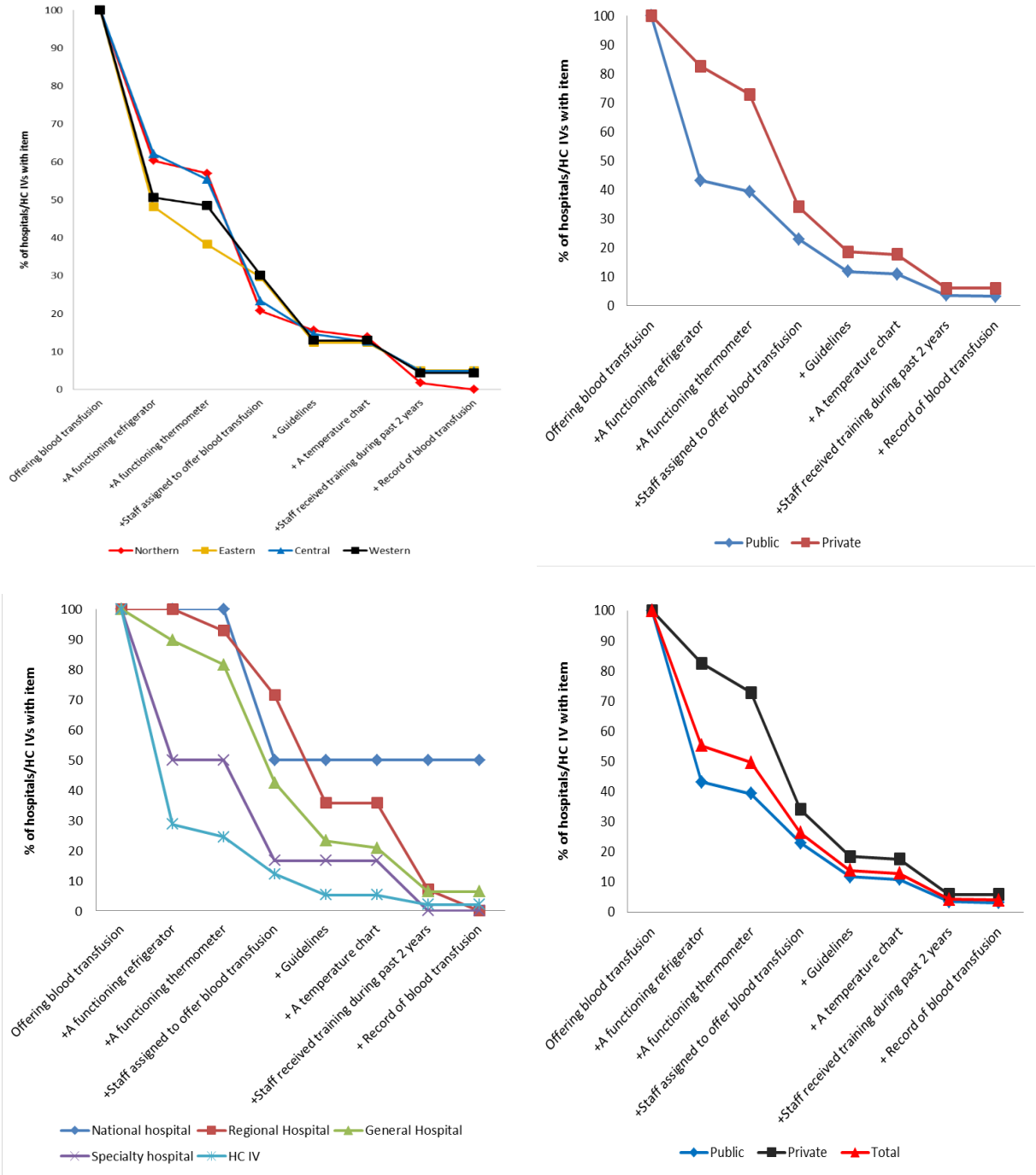
where items are added to the model one by one based on their importance for offering a service.

Figure 89 A cascading graph showing the percentage of hospitals/HC IVs offering blood transfusion and with the items (n=335)



In the figure, having a functioning refrigerator for storing blood was considered critically important for offering blood transfusion services and was therefore added first, followed by having a thermometer for monitoring the temperature of the refrigerator, then a dedicated staff assigned to offer blood transfusion services etc. As more items are added to the model, the percentage of hospitals/HC IVs that indicated they offered blood transfusion services and had the items reduces. The first major break in the cascade occurs quite early on when a functioning refrigerator was added to the model; meaning only 55% of the hospitals/HC IVs offered blood transfusion and had a functioning fridge. Adding a functioning thermometer further reduces the percentage to 50%; meaning that 50% of the hospitals/HC IVs offered blood transfusion services and had a fridge and a thermometer in the fridge. When the final item (record of blood transfusion) is added to the model the percentage offering blood transfusions and with the items reduced to 4%. Figure 90 shows the cascading graph by key stratifiers. The graphs general follow a similar pattern except for the national referral hospital where it levels off after adding a dedicated staff assigned to offer the services.

Figure 90: Cascading graph for blood transfusion by key stratifiers (n=335)



Capacity to offer safe blood transfusion services

Capacity to offer safe blood transfusion services was assessed based on the presence of items for offer offering blood transfusion services described above (see Figure 88). In addition, obtaining blood from a designated place such as a central or regional blood bank, not obtaining blood from any other source except from the designated places, and not using the refrigerator meant for storing blood for any other purpose were considered vital blood transfusion safety practices and therefore included in analysis of capacity to offer safe blood transfusions services. First, responses were coded such that a score 1 indicated the availability of an item or a practice that ensures safety of blood, and 0 indicating non-

availability of the item or a poor practice. For the eleven items that were enquired about during the census therefore, the maximum potential achievable score was 11 and minimum was 0. Cut-off points were then arbitrarily introduced by dividing the total score into about five equal parts and scores recoded such that a hospital/HC IV that received three or less points was classified as having very poor capacity, 4-5 as poor capacity, 6-7 as moderate capacity, 8-9 as good capacity and 10-11 as very good capacity. The proportion of hospitals/HC IVs that had very poor, poor, moderate, good, and very good capacity was then calculated overall and then by geographical zone, facility type, public-private ownership, and facility location

Figure 91: Capacity to offer safe blood transfusion services, by key stratifiers

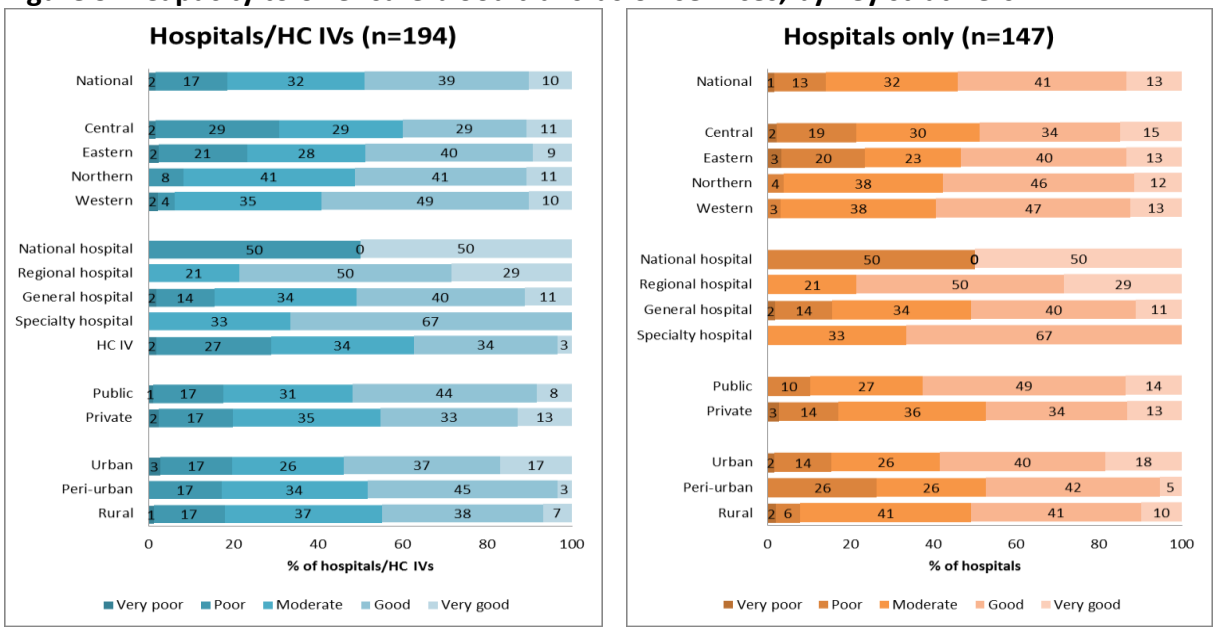


Figure 91 illustrates the capacity to offer safe blood transfusion services. Generally, capacity to offer safe blood transfusion services was modest. Using the predefined criteria described above, 10% of the hospitals/HC IVs were classified as having very good capacity and 39% as having good capacity. A third were classified as having moderate capacity, and one in five classified as having poor or very poor capacity. When level IV primary care facilities are excluded from analysis, just over half of the hospitals were classified as having good or very good capacity and 14% as having poor or very poor capacity. Generally, capacity in Western and Northern Uganda was poorer than in Eastern and Central Uganda.

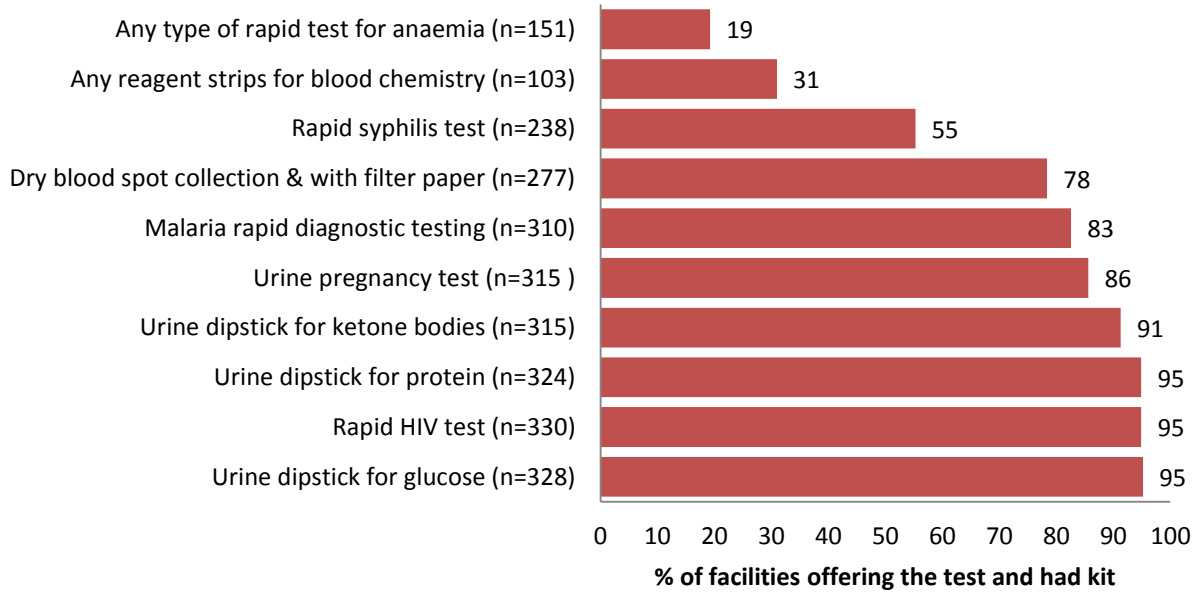
2.15. Readiness to offer laboratory services

Key findings:

- Almost all hospitals/HC IVs that reported offering rapid tests for HIV, urine glucose, and urine protein had the necessary kit for offering the service
- Hospitals had a subset of the items that were enquired about, with 35% of them having at least half of the items of equipment/kit. On average, 43% of the items of equipment were found in the hospitals/HC IVs
- Capacity to offer laboratory services in Uganda was modest. Using predefined criteria, only 36% of the hospitals/HC IVs were classified as having good or very good capacity to offer laboratory services. Slightly over half (53%) were classified as having moderate capacity and 11% were classified as having poor or very poor capacity.

Readiness to offer laboratory services was assessed based on the presence of items such as functioning equipment, rapid test kits, guidelines, and staff that were considered to be particularly important for offering the services.

Figure 92: Among the hospitals/HC IVs that reported offering the indicated rapid diagnostic tests: the % with the rapid test kit



The availability of rapid test kits

Figure 92 shows the percentage of hospitals/HC IVs that indicated they offered a rapid test and had the necessary kit for offering the service. On the day of the census, almost all hospitals/HC IVs that reported offering rapid tests for HIV, urine glucose, and urine protein had the

necessary kit for offering the service. This, however, was not the case with the other rapid tests, particularly with rapid test for anaemia where only one in five hospitals/HC IVs that indicated they offered rapid test for anaemia had the necessary kit. Figure 93 gives a detailed breakdown of the percentage of hospitals/HC IVs that said they offered diagnostic tests and had the necessary kit, by geographical zone, facility type, public-private ownership, and urban-rural location.

Figure 93: Among hospitals/HC IVs offering the indicated rapid diagnostic tests: the percentage with the rapid test kit, by key stratifiers

	Malaria rapid diagnostic testing (n=310)	Rapid syphilis test (n=238)	Rapid HIV test (n=330)	Urine pregnancy test (n=315)	Urine dipstick for protein (n=324)	Urine dipstick for glucose (n=328)	Urine dipstick for ketone bodies (n=315)	Dry blood spot collection & with filter paper (n=277)	Any type of rapid test for anaemia (n=151)	Any reagent strips for blood chemistry (n=103)
Central	80	72	97	90	99	99	97	69	20	40
Eastern	83	48	94	78	90	91	83	73	16	19
Northern	91	45	95	95	97	97	93	84	29	47
Western	79	50	93	82	93	93	91	90	15	22
National ref hospital	50	50	100	100	50	50	50	100	50	50
Regional ref hospital	64	57	100	93	93	93	86	93	0	43
General hospital	82	74	98	90	97	98	94	69	24	48
Speciality hospital	100	75	75	50	100	100	75	50	0	0
HC IV	85	43	93	82	94	94	90	84	18	19
Public	83	45	95	82	95	95	91	85	17	25
Private	82	78	94	94	95	96	92	62	24	45
Urban	74	65	94	86	96	97	91	63	14	37
Peri-urban	77	56	100	77	95	93	93	91	28	37
Rural	89	49	94	88	94	95	91	84	20	26
National	**83**	**55**	**95**	**86**	**95**	**95**	**91**	**78**	**19**	**31**

The availability of laboratory equipment

Figure 94: % of hospitals with lab services that had the indicated equipment/ test kit (n=333)

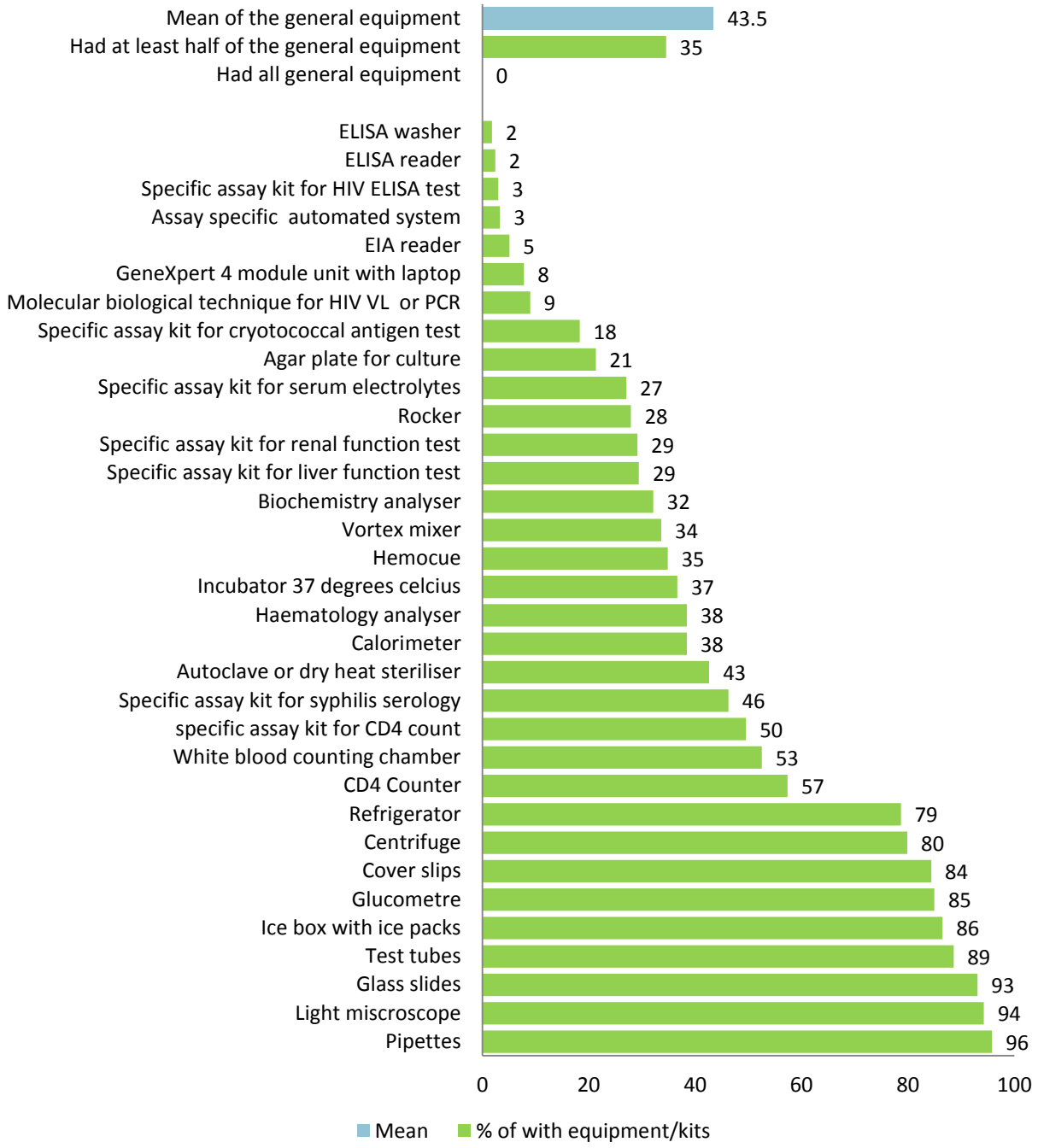


Figure 94 shows the availability of laboratory equipment in hospitals/HC IVs that reported offering laboratory services. The equipment were considered available if they were observed in the laboratory and confirmed to be in a working condition. Overall, none of the hospitals/HC IV

had all the items of equipment/kits that were enquired about, and just over a third (35%) had at least half of the items. Only 14 (43%) of the 33 items were available. Items such as ELISA washer, ELISA reader, and assay kit for HIV ELISA test were extremely rare. In contrast, the availability of pipettes, light microscope and Glass slides was almost universal. Figure 95 shows detailed disaggregation of availability of the items.

Figure 95: Among hospitals/HC IVs that reported offering laboratory services: The % with the indicated equipment or test kit

	Geographical zone				Facility type					Ownership		Facility location			
	Central	Eastern	Northern	Western	National ref hosp	Regional ref hosp	General hosp	Speciality hosp	HC IV	Public	Private	Urban	Peri-urban	Rural	National
Light miscroscope	95	89	93	99	50	93	97	100	93	93	97	95	93	94	**94**
Glass slides	96	93	84	96	50	93	97	100	91	91	99	95	88	93	**93**
Cover slips	89	81	84	82	50	93	90	100	80	78	98	88	81	83	**84**
Centrifuge	88	69	83	78	100	100	93	100	69	72	98	87	74	77	**80**
Test tubes	88	85	88	92	100	93	94	100	85	85	96	92	86	87	**89**
Pipettes	96	94	98	96	100	100	98	100	94	94	99	98	98	94	**96**
Incubator 37 degrees celcius	46	31	34	33	100	86	60	50	16	27	58	52	47	26	**37**
Agar plate for culture	24	14	21	26	50	50	36	50	9	13	41	33	21	15	**21**
Refrigerator	85	75	76	76	100	100	96	100	65	71	96	88	88	71	**79**
Autoclave or dry heat steriliser	58	40	24	40	100	64	61	75	28	33	65	57	37	36	**43**
Ice box with ice packs	88	79	93	87	50	100	95	100	80	83	95	89	93	83	**86**
Vortex mixer	40	25	36	33	50	86	55	50	15	29	44	46	37	26	**34**
Glucometre	89	78	79	90	100	79	92	100	80	80	97	92	86	81	85
Calorimeter	38	36	47	36	100	64	54	0	27	32	52	40	49	35	38
Hemocue	32	49	28	29	50	29	40	25	32	34	37	31	58	32	35
Specific assay kit for liver function test	40	20	24	29	100	64	59	50	6	17	57	49	26	19	29
Specific assay kit for renal function test	41	17	24	29	100	71	59	50	5	17	57	49	26	19	29
Specific assay kit for serum electrolytes	39	19	24	23	100	79	52	50	5	16	53	50	19	16	27
Biochemistry analyser	42	23	29	30	100	79	63	50	7	20	60	55	35	19	32
White blood counting chamber	50	52	69	46	50	79	70	100	38	44	72	65	56	45	53
Haematology analyser	48	31	41	33	100	100	66	50	14	27	64	68	33	23	38
ELISA washer	3	1	2	1	0	0	2	0	2	2	2	4	2	1	2
ELISA reader	3	2	2	2	0	0	3	0	2	2	3	5	2	1	2
Specific assay kit for HIV ELISA test	4	4	3	1	0	0	5	0	2	3	4	6	2	2	3
Molecular biology for HIV VL or PCR	13	7	14	3	50	7	8	25	9	10	7	6	5	12	9
Assay specific automated system	6	2	5	0	50	7	4	25	2	3	4	4	0	4	3
CD4 Counter	54	60	62	55	50	71	57	25	57	64	43	45	67	62	57
specific assay kit for CD4 count	44	51	55	51	50	57	52	25	48	53	41	38	65	53	50
Specific assay kit for syphilis serology	52	41	45	46	100	43	67	100	31	36	69	49	49	44	46
Rocker	31	25	21	32	50	36	50	75	12	20	47	40	30	20	28
GeneXpert 4 module unit with laptop	11	4	10	7	50	71	7	25	3	8	7	17	7	3	8
EIA reader	6	5	7	3	0	0	10	0	3	3	9	5	7	5	5
Assay kit for cryotococcal antigen test	34	4	17	14	100	57	33	25	5	13	30	31	14	12	18
Had all the equipment	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Had at least half of the equipment	**45**	**23**	**33**	**31**	**100**	**86**	**67**	**50**	**8**	**22**	**64**	**57**	**33**	**23**	**35**
Mean availability	**48**	**40**	**43**	**42**	**67**	**62**	**55**	**55**	**34**	**39**	**55**	**51**	**45**	**39**	**43**

The availability of laboratory reagents

Figure 96 shows the availability of reagents for specific tests. A number of the hospitals/HC IVs that reported offering specific tests lacked the necessary reagents. For instance, only 11% of the hospitals/HC IV that reported offering culture and sensitivity test had the media for offering the test. Among hospitals/HC IVs that indicated that they did blood grouping and cross-matching, 19% lacked grouping sera. Details of the availability of the reagents by key stratifiers are presented in figure 97.

Figure 96: Percentage of hospitals/HC IVs with reagents for offering the indicated laboratory tests

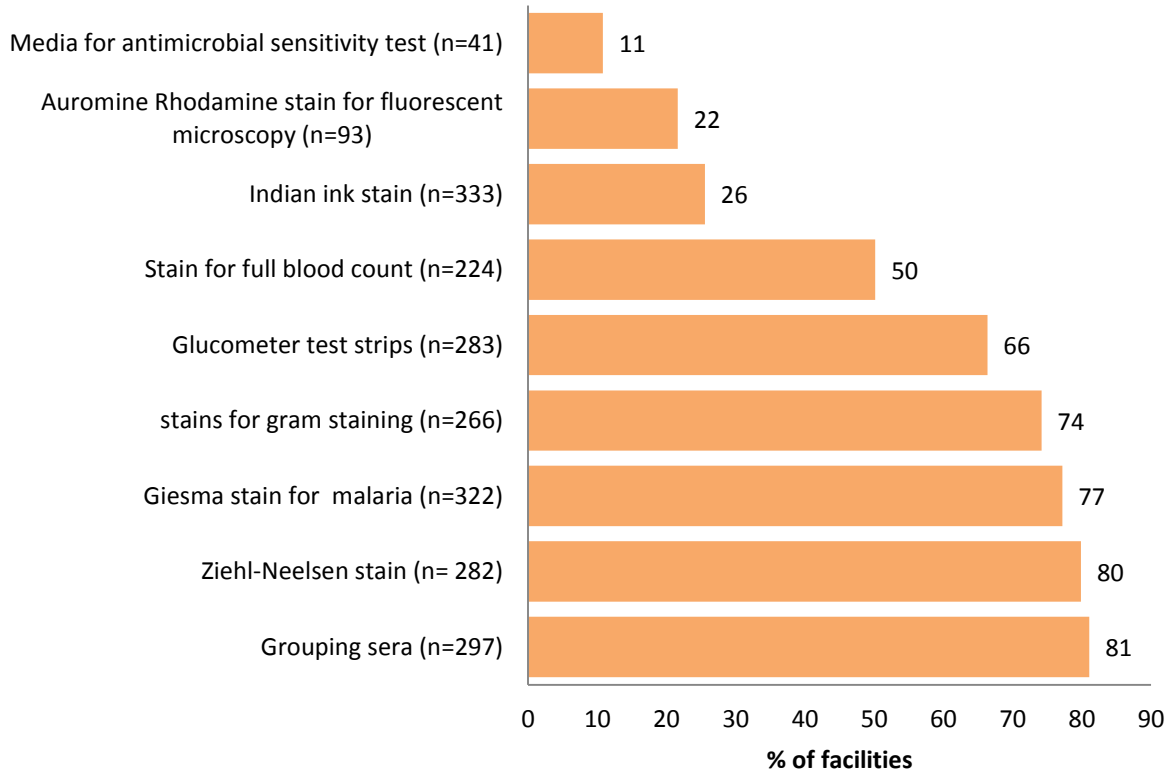


Figure 97: Percentage of hospitals/HC IVs with reagents for offering the indicated laboratory tests, by key stratifiers

	Indian ink stain (n=333)	stains for gram staining (n=266)	Media for antimicrobial sensitivity test (n=41)	Giesma stain for malaria (n=322)	Auromine Rhodamine stain for fluorescent microscopy (n=93)	Grouping sera (n=297)	Stain for full blood count (n=224)	Ziehl-Neelsen stain (n=282)	Glucometer test strips (n=283)
Geographical zone									
Central	28	73	14	74	22	85	45	78	75
Eastern	20	65	7	69	12	72	48	77	53
Northern	34	83	9	91	40	79	64	76	71
Western	22	78	12	79	18	86	49	87	65
Facility level									
National ref hosp	100	100	100	100	50	100	50	100	100
Regional ref hosp	71	100	50	93	50	100	79	79	64
General hosp	41	80	18	80	34	92	74	78	82
Speciality hosp	50	100	50	75	0	100	100	100	100
HC IV	11	68	1	74	11	72	31	80	55
Facility ownership									
Public	20	73	6	76	22	77	43	80	56
Private	38	77	22	79	20	91	66	79	91
Facility location									
Urban	33	84	22	80	22	94	62	75	77
Peri-urban	23	77	12	77	21	91	63	88	63
Rural	22	68	4	76	22	72	41	81	61
National	**26**	**74**	**11**	**77**	**22**	**81**	**50**	**80**	**66**

Infection prevention in the laboratory

Figure 98 shows the availability of items for infection prevention and control in laboratories in hospitals/HC IVs in Uganda. Of the 17 items that were considered to be particularly important for infection prevention and control in the laboratory and that were enquired about during the census survey, only 1% of the hospitals/HC IVs had all of them. On average, the hospitals/HC IVs had 11 of the 17 items (64%). The availability of a sharps container, disposable latex cloves and disinfectant was almost universal. Some of the items such as safety shower and eye wash were extremely rare. Details of the availability of items for infection prevention and control are presented on Figure 99.

Figure 98: The overall availability of items for infection prevention and control in the laboratory (n=333)

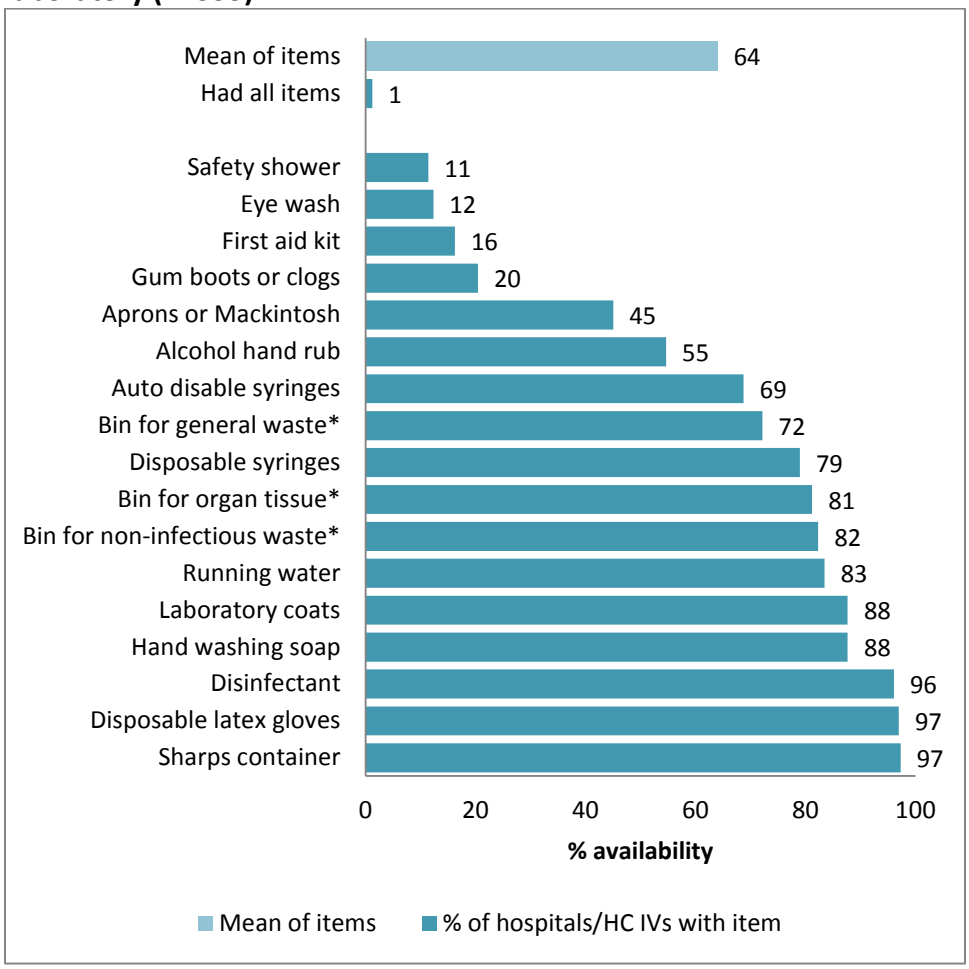


Figure 99: Among facilities that reported offering laboratory services, the % with the indicated items for infection prevention and control in the laboratory, by key stratifiers (n=333)

	Running water	Hand washing soap	Alcohol hand rub	Disposable latex gloves	Bin for non-infectious waste*	Bin for organ tissue*	Bin for general waste*	Sharps container	Disinfectant	Disposable syringes	Auto disable syringes	Gum boots or clogs	Aprons or Mackintosh	Laboratory coats	Eye wash	Safety shower	First aid kit	Had all items	Mean of items
Geographical zone																			
Northern	86	91	52	95	96	96	90	100	98	74	71	19	48	83	7	7	21	0	67
Eastern	73	80	47	98	86	86	78	99	93	74	47	17	48	88	11	6	11	1	61
Central	90	90	61	95	77	66	59	95	95	86	76	25	42	93	16	13	18	1	65
Western	84	89	57	100	75	78	66	97	99	78	78	20	43	85	13	17	16	2	64
Facility type																			
National hospital	100	100	100	100	50	100	100	100	100	100	50	0	0	100	100	50	100	0	79
Regional hospital	93	71	57	100	79	71	79	86	100	79	71	21	43	100	36	7	50	0	67
General hospital	94	96	64	97	82	75	71	98	97	86	82	28	52	90	19	21	23	2	69
Speciality hosp	100	100	75	100	67	67	75	100	75	100	75	0	50	100	25	25	50	0	70
HC IV	76	83	47	97	84	87	72	98	96	74	60	16	41	85	5	5	7	1	61
Facility ownership																			
Public	77	84	50	97	84	86	73	97	97	75	62	16	40	85	9	5	14	0	62
Private	99	97	65	96	76	65	68	97	95	88	85	30	56	93	21	27	22	3	69
Facility location																			
Urban	94	89	56	97	80	74	70	96	95	90	76	19	41	95	19	17	24	2	67
Peri-urban	77	91	60	98	82	87	84	100	98	91	67	14	40	86	2	5	12	2	64
Rural	79	86	53	97	84	84	70	97	96	70	65	23	48	84	11	10	13	1	63
National	**83**	**88**	**55**	**97**	**82**	**81**	**72**	**97**	**96**	**79**	**69**	**20**	**45**	**88**	**12**	**11**	**16**	**1**	**64**

* bin with liner and pedal

Capacity to offer laboratory services:

Capacity to offer laboratory services was assessed based on the presence of 76 items that were considered to be particularly important for offering laboratory services and that were enquired about (Table 22).

Table 22: List of items used for assessing capacity of hospitals/HC IVs to offer laboratory services

General items	36. Autoclave or dry heat steriliser
1. A dedicated laboratory area	37. Glucometer
2. Electricity	38. Calorimeter or haemoglobinometer
3. Computer for storing laboratory data	39. Hemocue
4. Standard procedure or guidelines for infection prevention and control	40. Specific assay kit for liver function tests
	41. Specific assay kit for renal function test
5. Procedure or guidelines for management and disposable of laboratory waste	42. Specific assay kit for serum electrolytes
	43. Biochemistry analyser
6. Procedure or guidelines for how long tests should be kept	44. Haematology analyser
	45. Elisa washer
7. Procedure or guidelines for routine maintenance of laboratory equipment	46. Elisa reader
	47. Specific assay kit for HIV antibody test
8. Systems for documenting specimen that are received & for recording results	48. Molecular biological technique for HIV viral load or polymerase chain reaction (PCR)
9. Systems for recording when test results are collected or sent	49. Icebox and icepacks
	50. Vortex mixer
10. Stock cards	51. White blood counting chamber
Laboratory tests:	52. Assay specific automated system
11. Blood glucose test	53. CD4 counter
12. Blood test for anaemia	54. Specific assay kit for CD4 count
13. Blood chemistry	55. Specific assay kit for syphilis serology
14. Full blood count	56. Rocker
15. Any blood test for HIV	57. GeneXpert 4 module unit with laptop
16. Test for syphilis	58. EIA reader
17. Blood grouping and cross-matching	59. Specific assay kit for cryptococcal antigen test
18. TB diagnostic test	
19. Hepatitis test	**Items for infection prevention and control**
20. Wet mount microscopy	60. Running water
21. Urine microscopy	61. Hand washing soap
22. Malaria smears	62. Alcohol hand rub
23. CSF/Body fluid counts	63. Disposable latex gloves
24. Cryptococcal antigen test	64. Non-infectious waste bin with liner and pedal
25. Gran stain	65. Organ tissue waste bin with liner and pedal
26. Culture and sensitivity	66. General waste bin with liner and pedal
Laboratory equipment and accessories & kits	67. Sharps container
27. Light microscope	68. Disinfectant
28. Glass slides	69. Disposable syringes with needle
29. Cover slips	70. Auto disable syringes
30. Centrifuge	71. Gum boots
31. Test tubes	72. Aprons or Mackintosh
32. Pipettes	73. Laboratory coats
33. Incubator 37^{o}C	74. Eye wash
34. Agar plate for culture	75. Safety shower
35. Refrigerator	76. First aid kit

First, the responses were coded such that a score "0" represented non-availability of the item and "1" its presence. For the 76 items, the maximum potential achievable score was 76

and minimum was 0. Cut-off points were then introduced by dividing the score into almost five equal parts and the scores recoded such that a facility that scored 15 or less points was categorised as having very poor capacity to offer laboratory services, 16 - 30 as poor, 31-45 as moderate, 46 - 60 as good, and 61-76 as very good capacity. The percentage of facilities with very poor, poor, moderate, good and very good capacity was then calculated overall and then by geographical zone, facility type, public-private ownership, and urban-rural location.

Table 23: The percentage of hospitals with very poor, poor, moderate, good and very good capacity to offer laboratory services (n=333

	Very poor	Poor	Moderate	Good	Very good
Geographical zone					
Central	1	9	51	30	9
Eastern	5	11	56	25	4
Northern	0	5	47	40	9
Western	0	10	58	26	7
Facility level					
National ref hospital	0	0	0	50	50
Regional ref hospital	0	0	7	64	29
General hospital	0	3	30	54	14
Speciality hospital	0	0	50	25	25
HC IV	3	14	73	11	0
Facility ownership					
Public	2	12	60	24	3
Private	1	3	37	43	17
Facility location					
Urban	1	6	41	39	13
Peri-urban	0	5	56	37	2
Rural	2	12	59	22	5
National	**2**	**9**	**53**	**29**	**7**

Using the predefined criteria, only 7% of the hospitals/HC IVs in Uganda were classified as having very good capacity and 29% as having good capacity (Table 23). Slightly over half (53%) were classified as having moderate capacity, and 2% and 9% were classified as having very poor and poor capacity, respectively. A major limitation of this assessment of capacity to offer laboratory services is the assumption that all facilities that indicated that they offered laboratory services offered all the services that were enquired about and therefore were expected to have the specific items for offering the services. As a matter of fact, some of the advanced tests and therefore items for offering the tests are not expected at general hospitals and level IV primary care facilities. Disaggregation of the capacity to offer laboratory services by facility level lends credence to this limitation, with all the national referral hospitals and 93% of regional referral hospitals classified as having good or very good capacity. The analysis however provides a very good assessment of the health of Uganda's laboratory services.

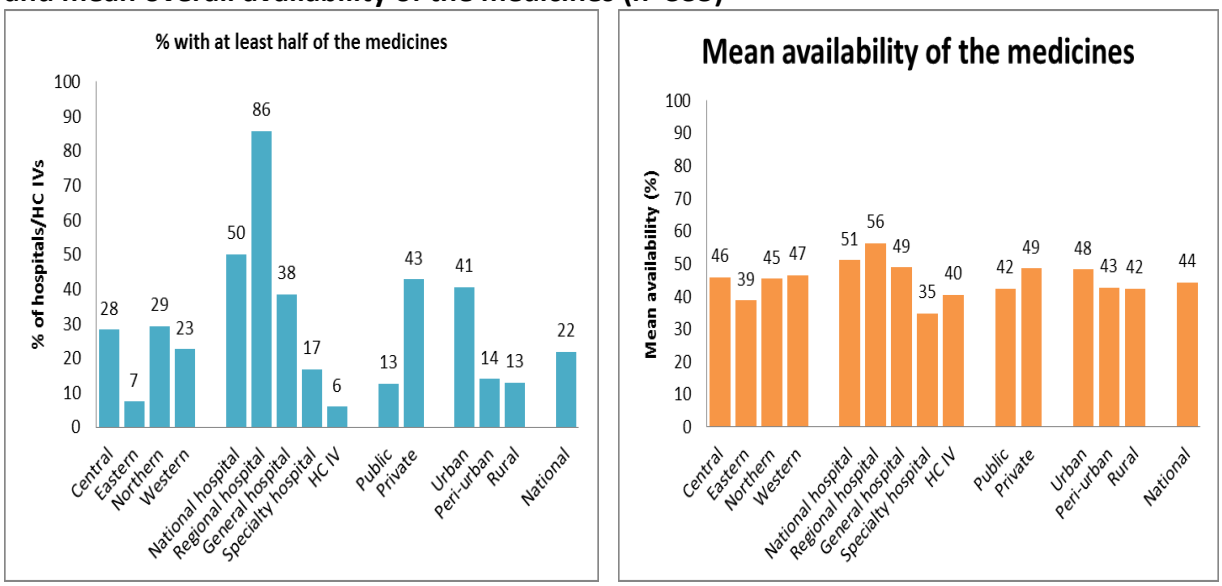
2.16. The availability of medicines

Assessment of the availability of medicines was based on the presence of 185 medicines that were considered to be particularly important for treating the common disease conditions in Uganda and that were therefore expected to be available in the hospitals and level HC IVs primary care facilities in Uganda. These included medicines for non-communicable diseases, medicines for neurological/mental health disorders, antibiotics, antifungals, antihelminths, antimalarial drugs, anti-TB drugs, antiretroviral drugs for prevention and treatment of HIV, priority life-saving medicines for mothers and children, anaesthetics and related medicines, intravenous fluids, family planning commodities, and other consumable commodities such as sutures, transfusion sets, IV cannula, skin disinfectants, gowns, delivery kits ("mama packs"), and masks. The SARA criterion considers medicines to be available if they are reported by the key informant and confirmed by the interviewer to be available. For this analysis however, medicines were considered available if they were reported available even if they were not seen by the interviewer.

Overall availability of the medicines

Generally, there was severe shortage of medicines in hospitals/HC IVs in Uganda. Of the 185 medicines that were considered particularly important for treating the common disease conditions in Uganda and that were enquired about during the census, none of the hospitals/HC IVs had all of them. Only one in five hospitals/HC IVs (22%) had at least half of the medicines, with Eastern Uganda having the lowest percentage; four times lower than Northern and Central Uganda (Figure 100).

Figure 100: Overall percentage of hospitals/HC IVs that had at least half of the medicines, and mean overall availability of the medicines (n=335)



There were wide differences between facility types in the percentage with at least half of the medicines; with the great majority of the regional referral hospitals having at least half

of the medicines compared to only 6% for level IV primary care facilities for instance. Similarly, the public-private and urban-rural differences were large; with the percentage of private and of urban hospitals/HC IVs with at least half of the medicines being threefold higher than public and rural hospitals/HC IVs, respectively. On average, only 81 of the 185 medicines (44%) were seen or reported available in the hospitals/HC IVs (Figure 100). Differences in the mean availability by geographical zone, facility type, public-private ownership and urban-rural location were generally small.

Table 24: Percentage of hospitals/HC IVs classified as having very low, low, moderate, high, or very high availability of medicines, by key stratifiers (n=335)

	Very low	Low	Moderate	High	Very high
Geographical zone					
Central	2	30	56	11	1
Eastern	2	57	40	1	0
Northern	3	26	64	7	0
Western	1	22	67	11	0
Facility type					
National hospital	0	50	0	50	0
Regional hospital	0	0	71	29	0
General hospital	1	22	62	14	1
Specialty hospital	17	67	0	17	0
HC IV	3	43	54	1	0
Facility ownership					
Public	2	36	59	3	0
Private	2	27	51	18	1
Facility location					
Urban	3	25	52	19	1
Peri-urban	0	40	58	2	0
Rural	2	37	59	3	0
National	**2**	**33**	**56**	**8**	**0**

Table 24 shows rating of the hospitals/HC IV on the availability of medicines. The rating was based on the presence of the 185 medicines that were enquired about during the census. First, all hospitals/HC IVs were assumed to offer services for which the medicines were enquired about. The responses were then coded such that a score 1 indicated that the medicine was seen or reported available, and 0 if it was reported to be unavailable. For the 185 medicines, the maximum potential achievable score was 185 and minimum was 0. Arbitrary cut-off points where then introduced by dividing the total score into about five equal parts. The scores were then recoded such that a hospital/HC IV that had 37 or less medicines was classified as having very low availability, 38-74 as low availability, 75-111 as moderate availability, 112-148 as high availability, and 148-185 as very high availability. The percentage of hospitals/HC IVs with very low, low, moderate, high, or very high availability was then calculated overall, and then by geographical zone, facility type, public-private ownership, and urban-rural location.

Using the predefined criteria, only one facility (0.3%), a private general hospital in an urban area in Central Uganda, was classified as having very high availability of the medicines, and 8% as having high availability. Availability of the medicines was classified as low or very low in 35% of the hospitals/HC IVs.

Compared to the other geographical zones, Eastern Uganda had a substantially higher percentage of hospitals/HC IVs classified as having low or very low availability (59%) and a lower percentage of hospitals/HC IVs classified as having high or very high availability of the medicines (1%). Possibly because they do not offer some of the services for which the medicines were enquired about, more specialty hospitals/HC IVs compared to other facility types were classified as having low or very low availability of the medicines that were enquired about. More private hospitals/HC IVs and hospitals/HC IVs located in urban areas were classified as having high or very high availability of the medicines than public and rural hospitals/HC IVs, respectively.

The availability of medicines for non-communicable diseases

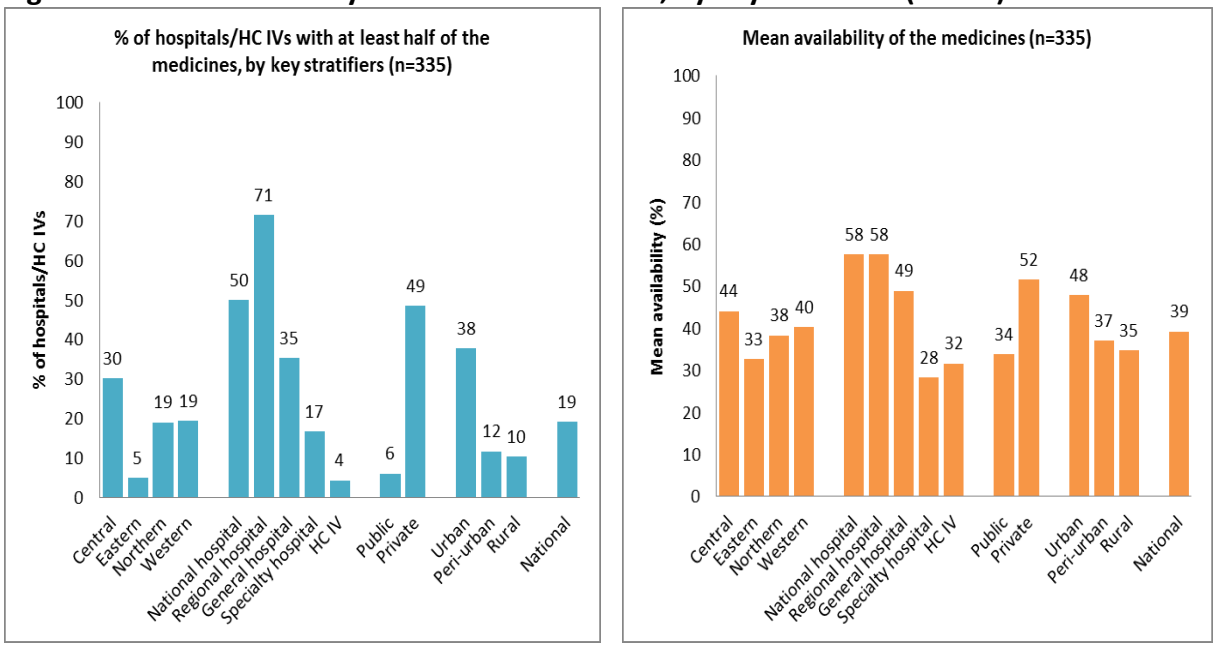
The availability of medicines for non-communicable diseases (NCDs) was assessed based on the presence of 20 medicines (Table 25).

Table 25: The list of medicines that were considered to be particularly important for treating non-communicable diseases and that were enquired about during the census

1. Furosemide injection	11. Salbutamol nebuliser solution
2. Furosemide tablet	12. Amlodipine tablet
3. Glibenclamide tablet	13. Digoxin injection
4. Metformin tablet	14. Simvastatin or other statin table
5. Omeprazole or Rabeprazole table	15. Enalapril tablet
6. Insulin injection	16. Warfarin tablet
7. Hydrochlorothiazide or Bendrofluazide tablet	17. Belcomethasone inhaler
8. Bisoprolol or carvedilol tablet	18. Glyceryl trinitrate sublingual tablet
9. Ephedrine injection	19. Isosorbide dinitrate sublingual tablet
10. Salbutamol inhaler	20. Acetylsalicylic acid (low dose)

The findings suggest a critical shortage of the medicines for NCDs. Of the 20 medicines that were considered to be particularly important for treating NCDs and that were enquired about during the census, none of the hospitals/HC IVs had all of them. At least half of the medicines were seen or reported available in only one in five hospitals/HC IVs (Figure 101).

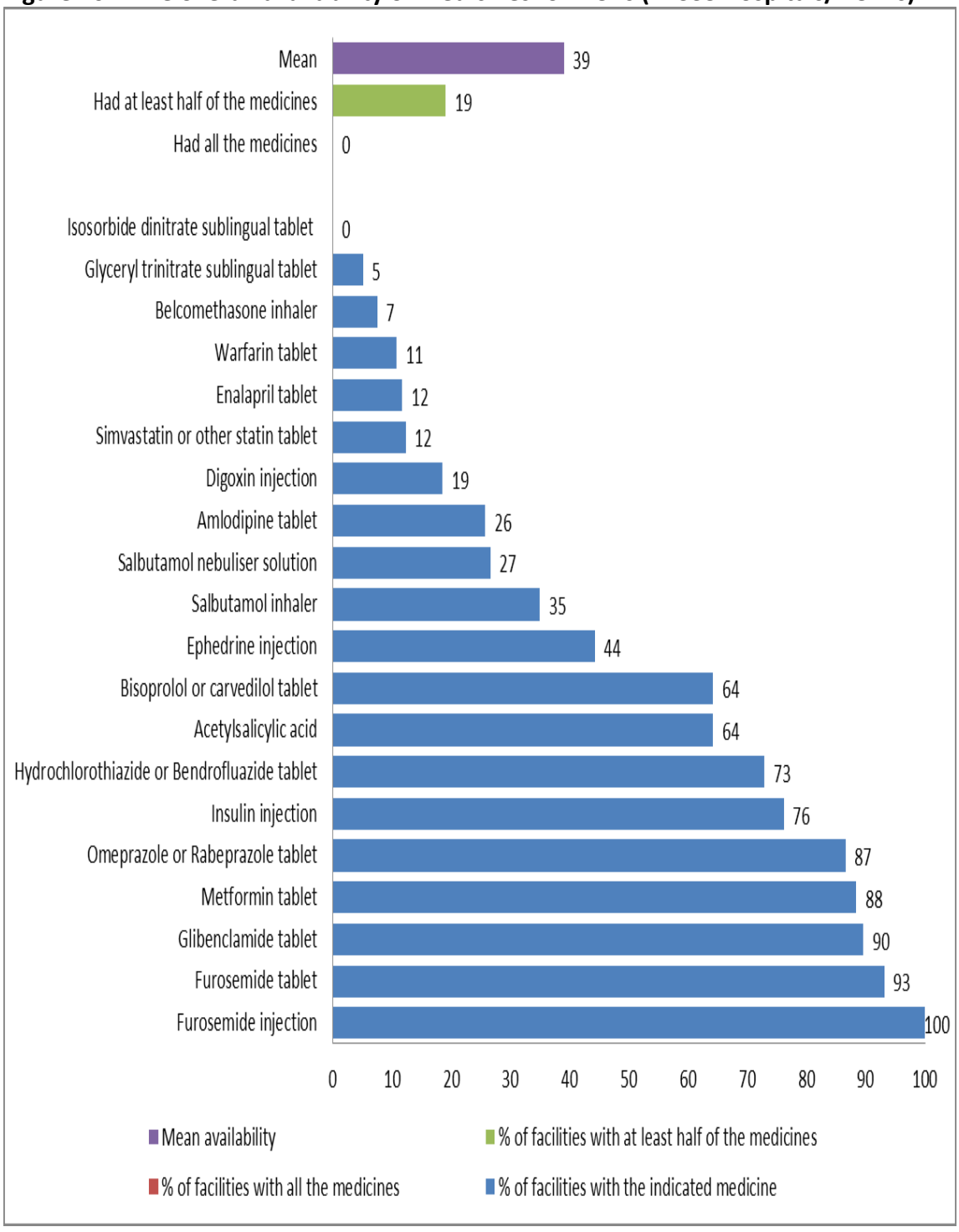
Figure 101: The availability of medicines for NCDs, by key stratifiers (n=335)



On average only 8 of the 20 medicines (39%) were seen or reported available in the hospitals/HC IVs, with the mean availability in Eastern Uganda being lower than in the other geographical zones. The public-private and urban-rural gaps in the mean availability of the medicines were quite wide, with the mean availability higher in private than public hospitals/HC IVs and higher in urban than rural hospitals/HC IVs.

Figure 102 illustrates the availability of each of the medicines that were enquired about during the census. Furosemide injection was the most available medicine for NCDs followed by Furosemide tablets and Glibenclamide tablets. None of the hospitals/HC IVs had isosorbide dinitrate sublingual tablet while glyceryl trinitrate sublingual tablet, beclomethasone inhaler, enalapril tablet, and simvastatin tablet were quite rare.

Figure 102: The overall availability of medicines for NCDs (n=335 hospitals/HC IVs)



The availability of medicines for mental and neurological illnesses

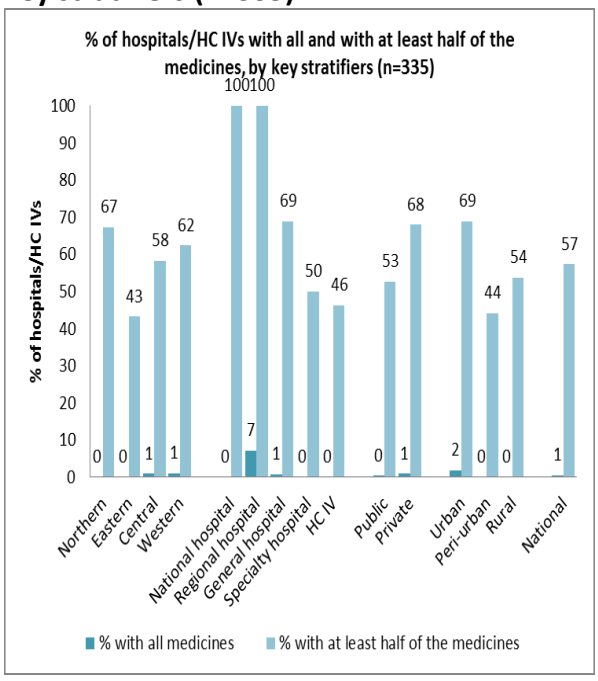
The availability of medicines for mental and neurological illnesses was assessed based on the presence of 13 medicines that were considered to be particularly important (Table 26).

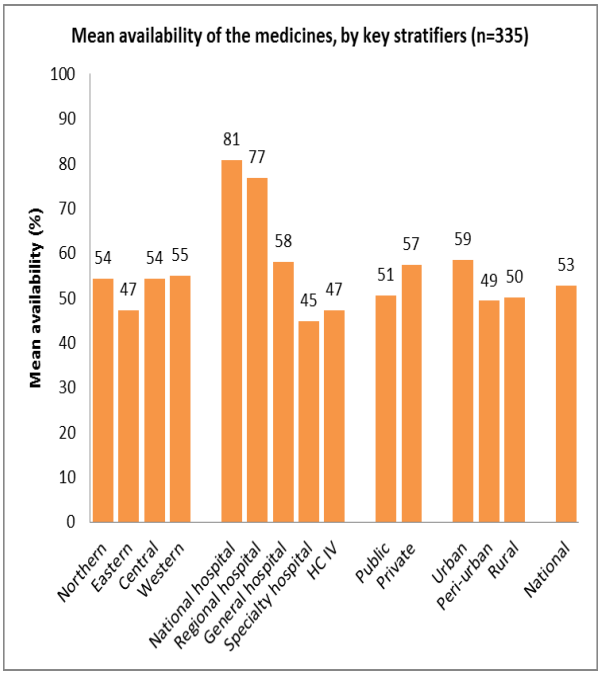
Table 26: List of medicines that were considered particularly important for treating mental and neurological illnesses and that were enquired about during the census

1. Diazepam injection	8. Phenobarbital tablet
2. Diazepam tablet	9. Clomipramine tablet/capsule
3. Amitriptyline tablet	10. Phenobarbital injection
4. Carbamazepine tablet	11. Fluoxetine tablet
5. Phenytoin tablet	12. Valproate sodium tablet
6. Chlorpromazine injection	13. Fluphenazine injection
7. Haloperidol injection	

Figure 103 illustrates the availability of medicines for treating mental and neurological disorders. Of the 13 medicines that were enquired about, only 1% of the hospitals/HC IVs in Uganda had all of them. At least half of the medicines were seen or reported available in 57% of the hospitals/HC IVs.

Figure 103: The availability of medicines for treating mental and neurological disorders, by key stratifiers (n=335)



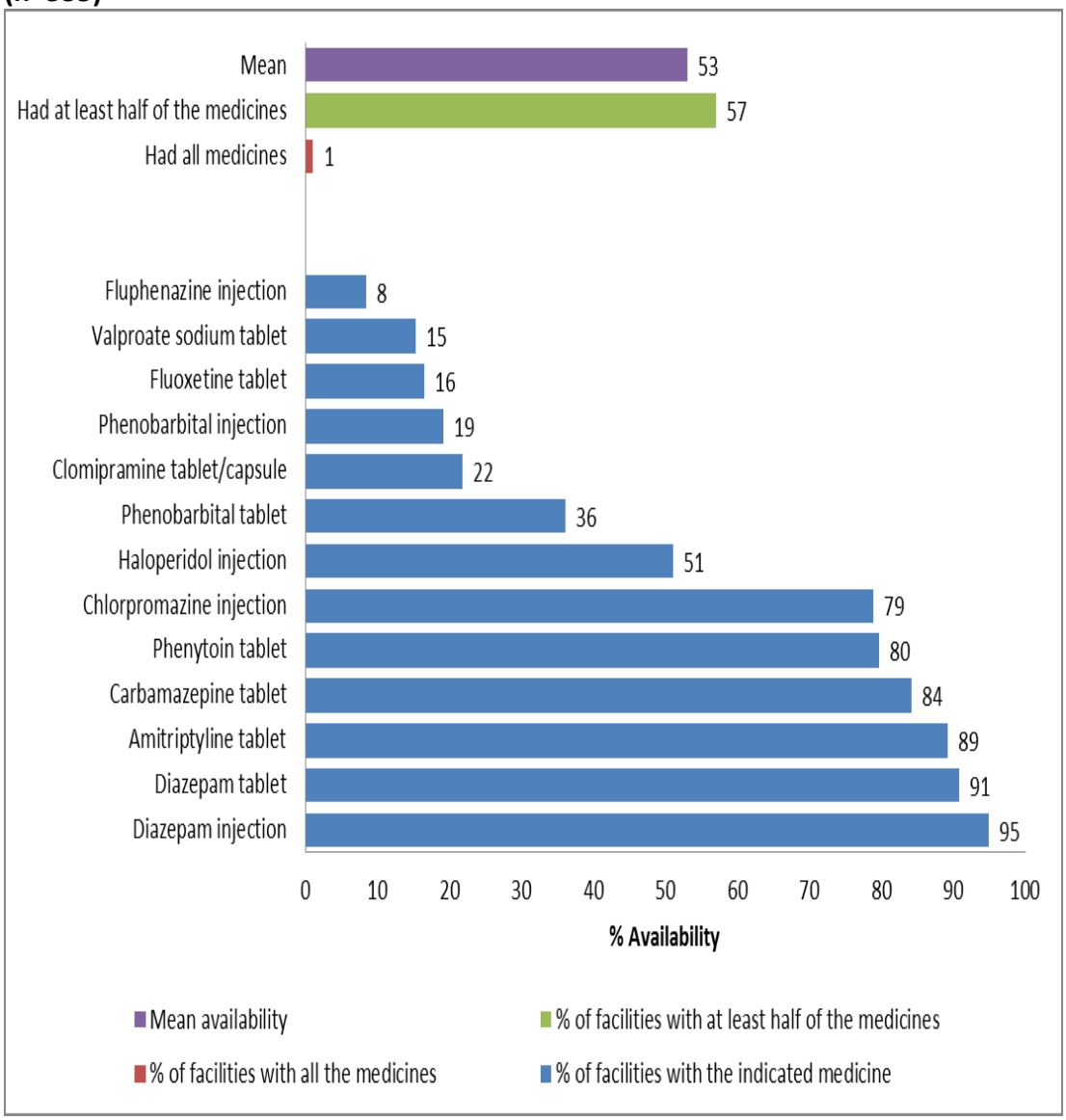


On average, only 7 of the 13 medicines (53%) were seen or reported available in Ugandan hospitals/HC IVs, with the mean availability in Eastern Uganda being lower than in the other geographical zones. The national referral hospitals had the highest mean availability, with 81% of the medicines for mental and neurological disorders seen or reported available followed by regional hospitals with slightly over three quarters of the medicines seen or reported available. Specialty hospitals had the lowest mean availability of the medicines and this could be because the care for mental and neurological disorders is not the primary

focus of some specialty hospitals such as the orthopaedic hospitals. The public-private and urban-rural differences in mean availability of the medicines for were fairly modest but the mean availability was higher in private than public hospitals/HC IVs and higher in urban than in rural hospitals/HC IVs.

Figure 104 shows the percentage of hospitals/HC IVs that had each of the medicines that were enquired about. Medicines such as diazepam and carbamazepine were almost universally available while Fluphenazine injection, sodium valproate tablets and fluoxetine tablets were rare.

Figure 104: The overall availability of medicines for mental and neurological illnesses (n=335)



The availability of medicines for infectious illnesses (non-TB and non-HIV)

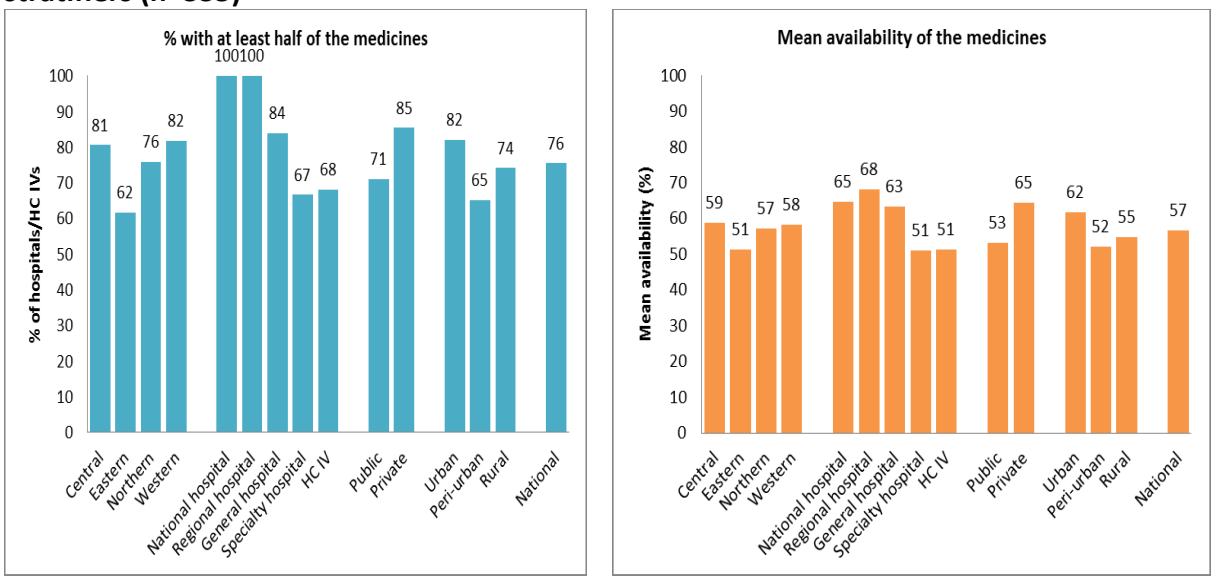
The availability of medicines for non-TB and non-HIV infectious illnesses was assessed based on the presence of 17 medicines that were considered particularly important for treating bacterial, helminth and fungal infections (Table 27).

Table 27: List of medicines that were considered particularly important for treating infectious illnesses (non-TB and non-HIV) and that were enquired about during the census

1. Albendazole or mebendazole tablet 2. Cotrimoxazole tablet 3. Benzylpenicillin injection 4. Amoxicillin tablet/capsule 5. Gentamycin injection 40mg/ml in 1ml or 2ml ampoules 6. Ceftriaxone injection 7. Metronidazole injection 8. Ciprofloxacin tablet 9. Vancomycin injection	10. Ampicillin injection 11. Amoxicillin suspension 12. Clindamycin injection 13. Gentamycin injection 20mg/ml in 1ml ampoules 14. Gentamycin injection 10mg/ml in 1ml ampoules 15. Amphotericin injection 16. Fluconazole or Flucytosine tablet 17. Fluconazole or flucytosine injection

Hospitals/HC IVs in Uganda had only a subset of the medicines for treating non-TB and non-HIV infectious illnesses. Of the 17 medicines that were enquired about during the census, none of the hospitals/HC IVs had all of them. However on average, three quarters of the hospitals/HC IVs had at least half of the medicines, with all the national and regional referral hospitals and two thirds of HC IV and specialty hospitals having at least half of the medicines (Figure 105).

Figure 105: Percentage of hospitals/HC IVs that had at least half of the medicines for treating non-TB and non-HIV infectious illnesses and mean of the medicines, by key stratifiers (n=335)

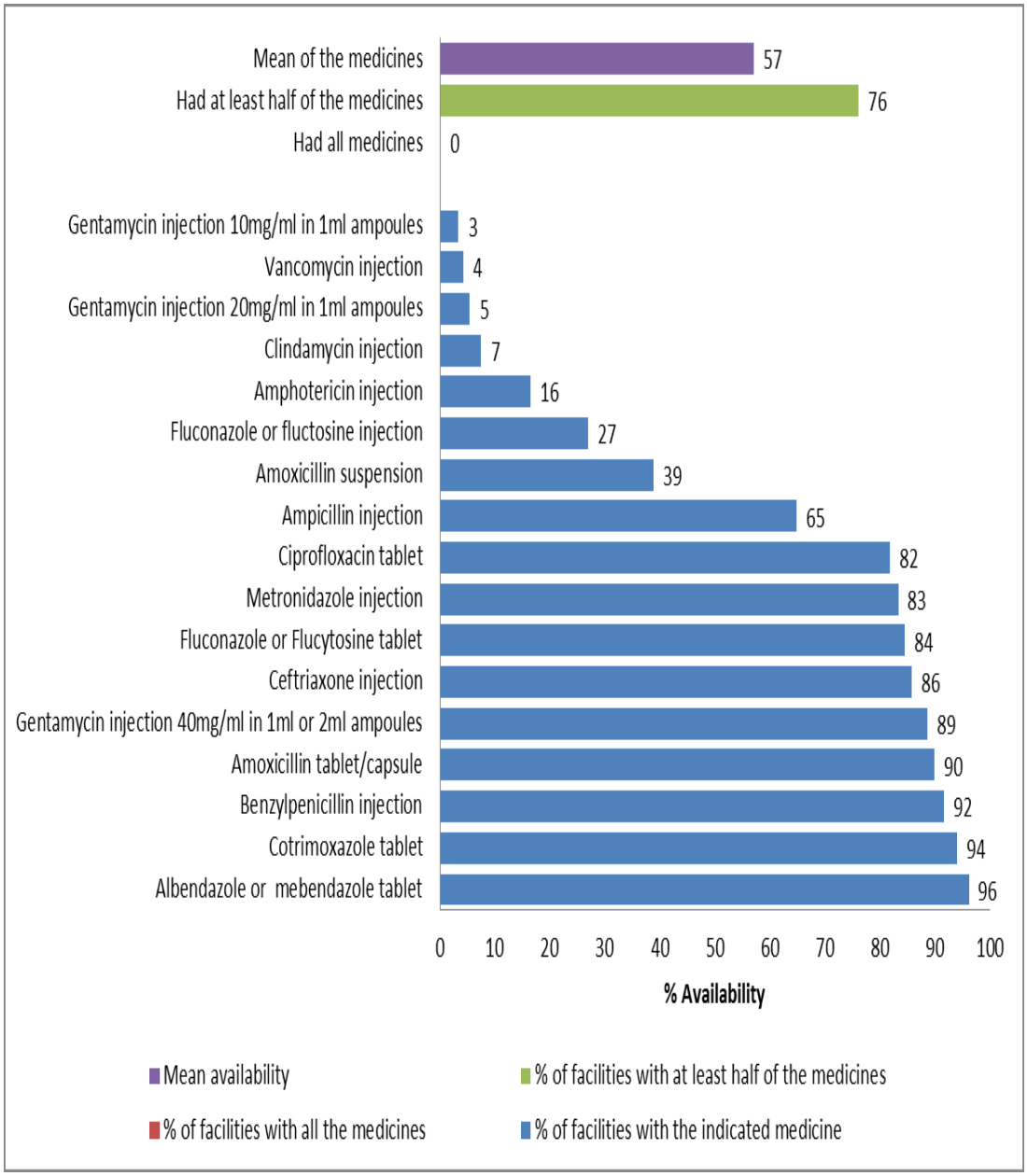


As is the case with the medicines for NCDs and mental/neurological disorders, the percentage of hospitals/HC IV with at least half of the medicines in Eastern Uganda was lower than in the other geographical zones, and higher in private and urban hospitals/HC IVs than public and rural hospitals/HC IVs, respectively. On average, 10 of the 17 medicines

(57%) were seen or reported available in the hospitals/HC IVs, with the mean availability similar across the geographical zones and across the national, regional and general hospitals but higher in private than in public hospitals/HC IVs and higher in urban than in rural hospitals/HC IVs.

Figure 106 shows the availability of individual medicines for non-TB and non-HIV infectious illnesses that were enquired about during the census. Albendazole or mebendazole was the most available medicine, followed by co-trimoxazole, benzyl penicillin and amoxicillin tablet/capsule. The least available medicine for infectious illnesses were gentamycin and clindamycin.

Figure 106: The overall availability of medicines for non-TB and non-HIV infectious illnesses



The availability of life-saving medicines for mothers

The availability of life-saving medicines for mothers was assessed based on the presence of 12 medicines that were considered particularly important for preventing and treating post-partum haemorrhage, pre-eclampsia and eclampsia, maternal sepsis, sexually transmitted infections and complications of pre-term birth (Table 28). Most of the medicines are on the list of medicines for women and children that was developed in 2011 and updated in 2012 by WHO, the United Nations Children's Fund and the United Nations Population Fund.

Table 28: List of priority medicines for women

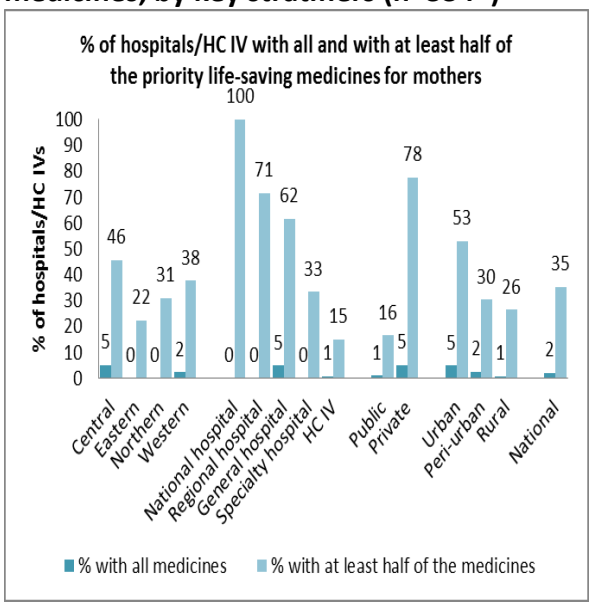
WHO Priority medicines for mothers	Priority medicines for mothers assessed during the census
1. Ampicillin powder for injection	1. Azithromycin tablet
2. Azithromycin cap/tab or oral liquid	2. Benzathine penicillin injection
3. Benzathine benzylpenicillin injection	3. Betamethasone injection
4. Betamethasone or Dexamethasone injectable	4. Calcium gluconate injection
5. Calcium gluconate injectable	5. Cefixime tablet
6. Cefixime cap/tab	6. Dexamethasone injection
7. Gentamicin injectable	7. Hydralazine injection
8. Magnesium sulfate injectable	8. Magnesium sulphate injection
9. Metronidazole injectable	9. Methyldopa tablet
10. Misoprostol capsule/tablet	10. Misoprostol tablet 200mcg
11. Oxytocin injectable	11. Nifedipine 10mg immediate release
12. Sodium chloride injectable solution	12. Oxytocin injection

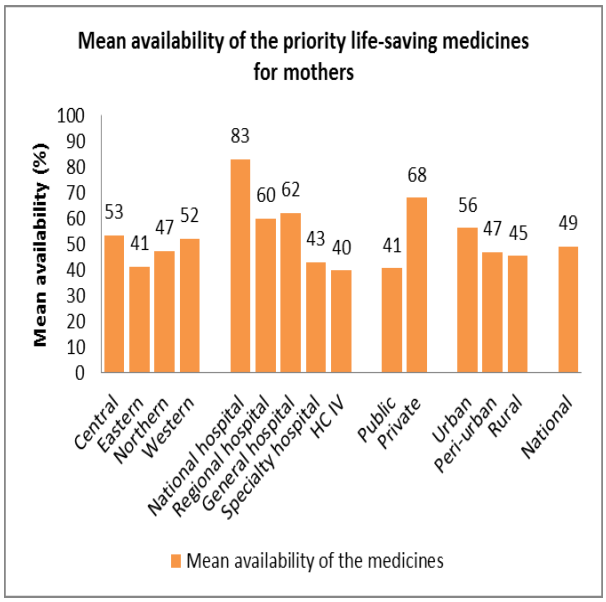
Due to the burden of disease and evidence of benefit to address the essential medicines needs for mothers and children, WHO, UNICEF and UNDP refer to these medicines as priority life-saving medicines. Oxytocin for instance is particularly important and is the preferred uterotonic for the prevention and management of postpartum haemorrhage. Misoprostol tablets are recommended when oxytocin is not available or cannot safely be used. Dexamethasone or betamethasone injections can improve foetal lung maturity in the case of preterm birth. Nifedipine immediate-release capsules are used to inhibit uterine contractions in preterm labour but the latest recommendations related to preterm labour recommend against use of tocolytics.

Given their importance, one would expect all hospitals/HC IVs to have all these priority life-saving medicines for mothers at all times. This however was not the case. Findings of the census rather suggest a severe shortage of most of the priority life-saving medicines for mothers in hospitals/HC IVs. For instance, of the 12 medicines that were enquired about during the census, only 2% of the hospitals/HC IVs had all of them, and only a third of the hospitals/HC IVs had at least half of the medicines (Figure 107).

On average, only about half of the medicines were seen or reported available. Zonal differences in the mean availability were fairly small but shortage of the medicines was more severe in Eastern than in the other geographical zones. The availability of the medicines was much better in private than in public hospitals/HC IVs and much better in urban than in rural hospitals/HC IVs (Figure 107).

Figure 107: Percentage of hospitals/HC IVs that had all and that had at least half of the medicines, by key stratifiers (n=334*)

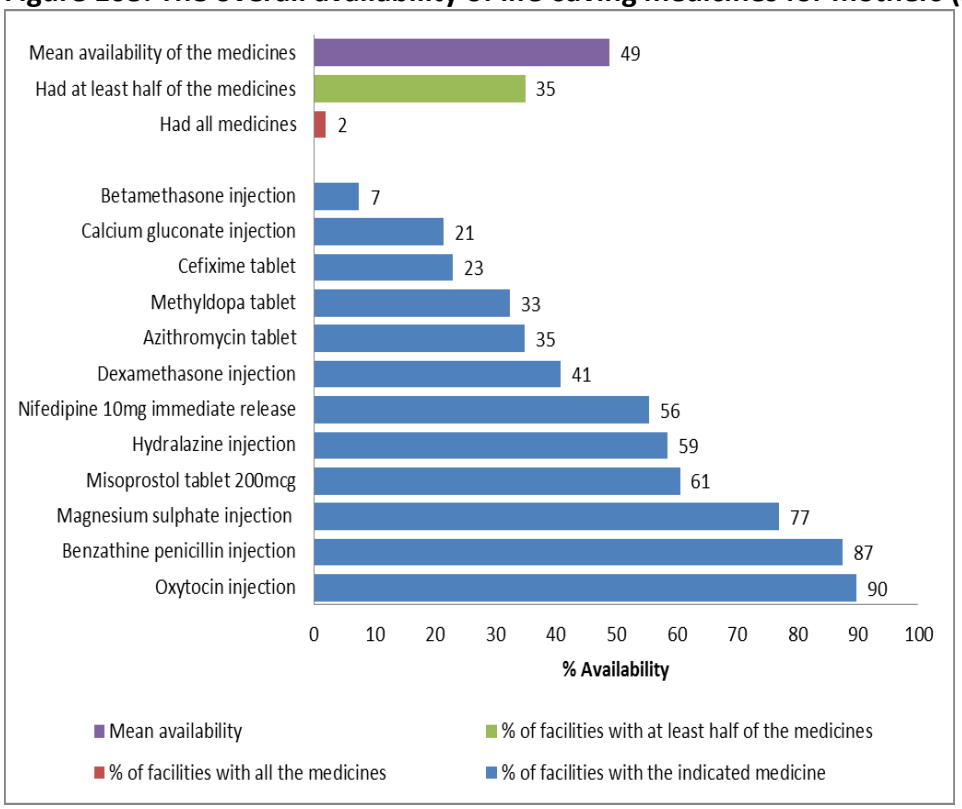




*The national psychiatric hospital excluded from analysis

Figure 103 shows the availability of the individual priority life-saving medicines for mothers. Oxytocin was the most commonly available priority life-saving medicine for mothers, with the medicine seen or reported available in 90% of the hospitals/HC IVs followed by Benzathine penicillin. Betamethasone injection was the least available medicine, with the medicine seen or reported available in only 7% of the hospitals/HC IVs.

Figure 108: The overall availability of life-saving medicines for mothers (n=335)



The availability of medicines for children

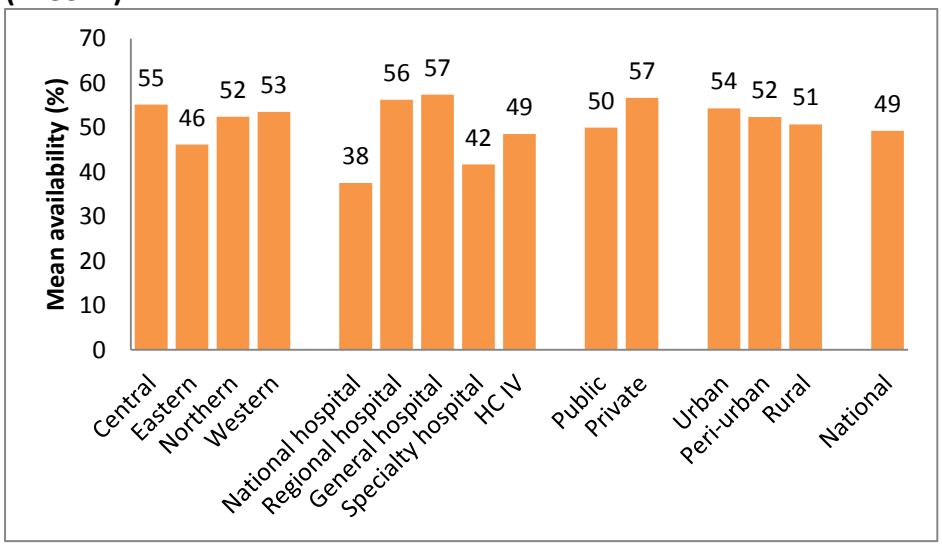
The availability of life-saving medicines for children was assessed based on the presence of 8 drugs (table 29). Of these, only four drugs Zinc sulphate, ORs, procaine benzyl penicillin, and Vitamin A are on the WHO priority list of life-saving medicines for children.

Table 29: List of priority life-saving medicines for children

WHO Priority medicines for children	Priority medicines for children assessed during the census
1. ACT	1. Antibiotic eye cream for newborn
2. Amoxicillin syrup/suspension	2. Caffeine citrate injection
3. Ampicillin powder for injection	3. Chlorhexidine 4% gel or solution
4. Artesunate rectal or injectable forms	4. Oral Rehydration Solution
5. Ceftriaxone powder for injection	5. Procaine benzyl penicillin injection
6. Gentamicin injectable	6. Vitamin A capsules
7. Morphine granule, injectable or cap/tab	7. Zinc sulphate syrup
8. Oral Rehydration Solution	8. Zinc sulphate tablet
9. Paracetamol syrup/suspension	
10. Procaine benzyl penicillin powder for injection	
11. Vitamin A capsules	
12. Zinc tablets	

As was the case with availability of medicines for mothers, findings of the census suggest a severe shortage of the essential medicines for children. Of the eight medicines that were enquired about during the census, none of the hospitals/HC IVs had all of them. On average, only four of the eight medicines were seen or reported to be available (Figure 109). Zonal differences were small but as was the case with the availability of medicines for NCDs, mental health, infectious illnesses, and for mothers, the mean availability of the medicines in Eastern Uganda was lower than in the other geographical zones. Surprisingly, the national referral hospital had the lowest mean availability of the medicines. The mean availability was higher in private than in public hospitals/HC IVs but similar in urban and rural areas.

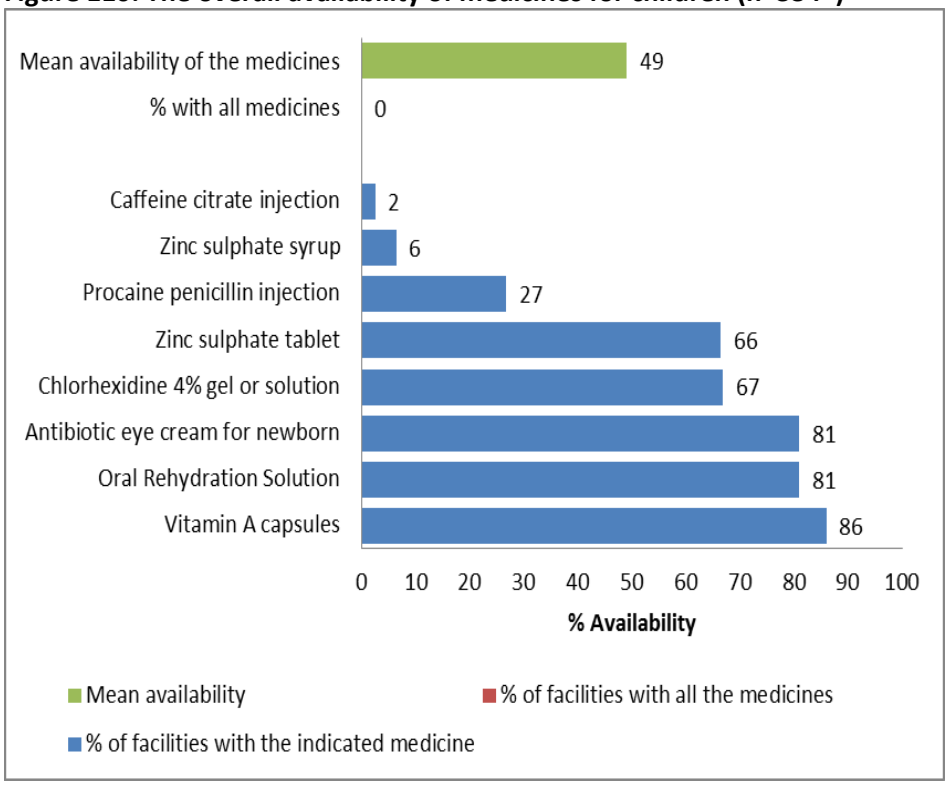
Figure 109: The mean availability of essential medicines for children, by key stratifiers (n=334*)



The national psychiatric hospital is excluded from analysis

Figure 110 shows the availability of the individual medicines. The most commonly available medicines for children were Vitamin A, ORS and antibiotic eye ointment. The least commonly available were caffeine citrate injection and zinc sulphate syrup.

Figure 110: The overall availability of medicines for children (n=334*)

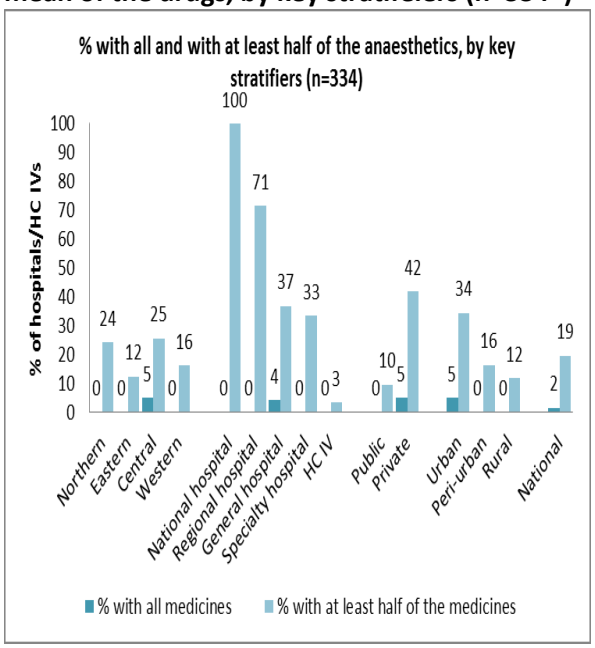


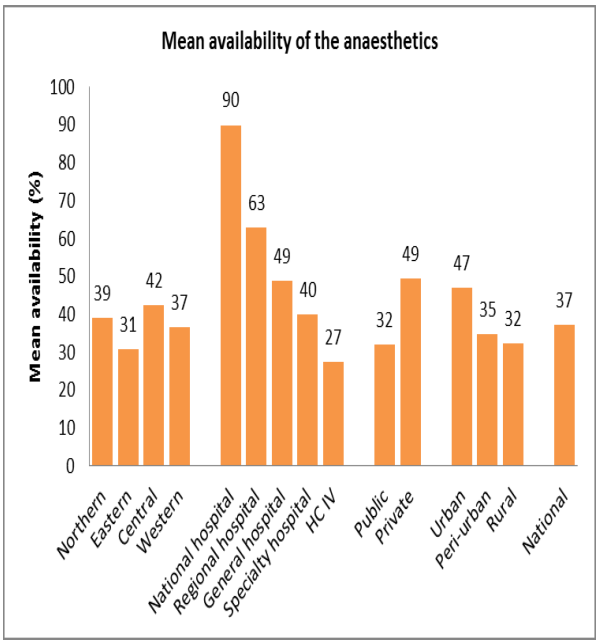
The national psychiatric hospital is excluded from analysis

The availability of anaesthetics and related drugs

The availability of anaesthetics was assessed based on the presence of 10 drugs, namely: Atracurium (besilate) injection, Bupivicaine injection, Halothane (liquid inhalant), Isoflurane or desflurane or sevoflurane (liquid inhalant), Ketamine injection, Lidocaine 2% injection, Lidocaine 5% heavy spinal injection, Midazolam injection, Nitrous oxide (gas), and Suxamethonium chloride injection.

Figure 111: Percentage of facilities with all and with at least half of the anaesthetic drugs and mean of the drugs, by key stratifeiers (n=334*)





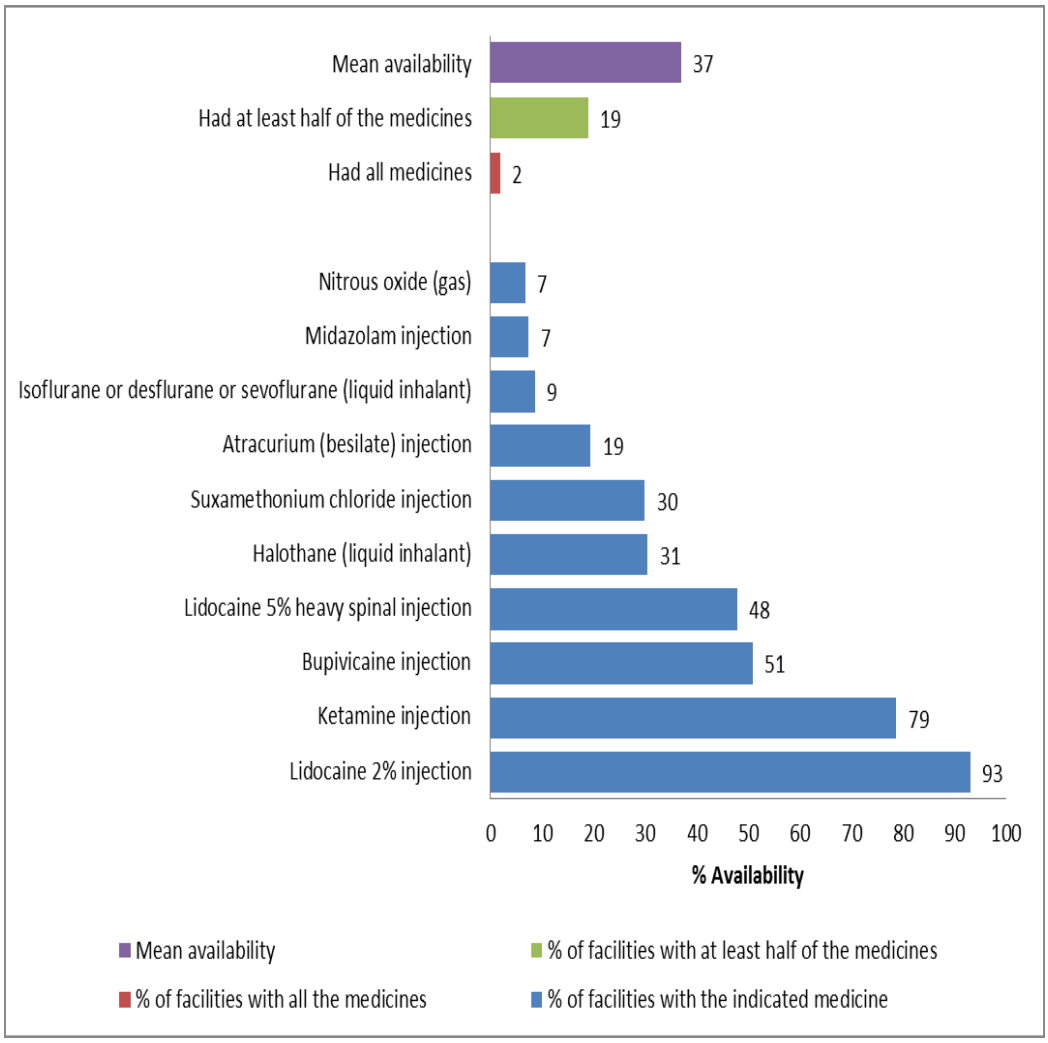
*The national psychiatric hospital excluded from analysis

Generally, there was a severe shortage of the anaesthetic drugs. Of the 10 anaesthetic drugs that were enquired about during the census, only 2% of the hospitals/HC IVs had all of them and 19% had at least half of the medicines (Figure 111).

On average, only four of the ten anaesthetic drugs (37%) were seen or reported available. Zonal differences in the mean availability of the anaesthetic drugs were small but the mean availability in Eastern Uganda was lower than in the other geographical zones. The national referral hospital had the highest mean availability (90%) while level IV primary care facilities had the lowest mean availability. There was a fairly wide public-private gap, with the mean availability in the private hospitals/HC IVs being 17% points higher than in public hospitals/HC IVs. Urban-rural gap was also fairly wide, with the mean availability in urban areas being 15% points higher than in rural areas.

Figure 112 shows the availability of the individual anaesthetics drugs. Lidocaine 2% was the most available anaesthetic drug, with the drug seen or reported available in 93% of the hospitals/HC IVs followed by ketamine injection (79%). The least available anaesthetic drugs were nitrous oxide (7%), midazolam injection (7%) and Isoflurane or desflurane or sevoflurane (liquid inhalant) (9%).

Figure 112: The overall availability of the individual anaesthetic drugs (n=334*)

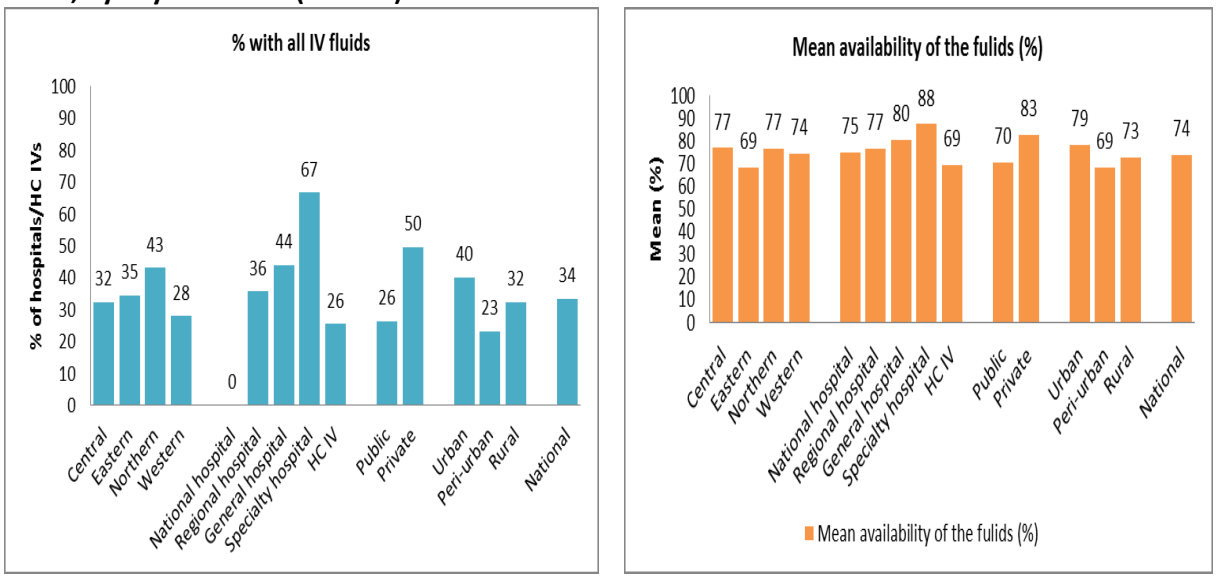


*The national psychiatric hospital excluded from analysis

Intravenous Fluids

The availability of IV fluids was assessed based on the presence of sodium lactate, normal saline, dextrose 5% and water, and dextrose 5% and normal saline. On average, a third of the hospitals/HC IVs had all the IV fluids that were enquired about, and about three quarters of the fluids were seen or reported available (Figure 113).

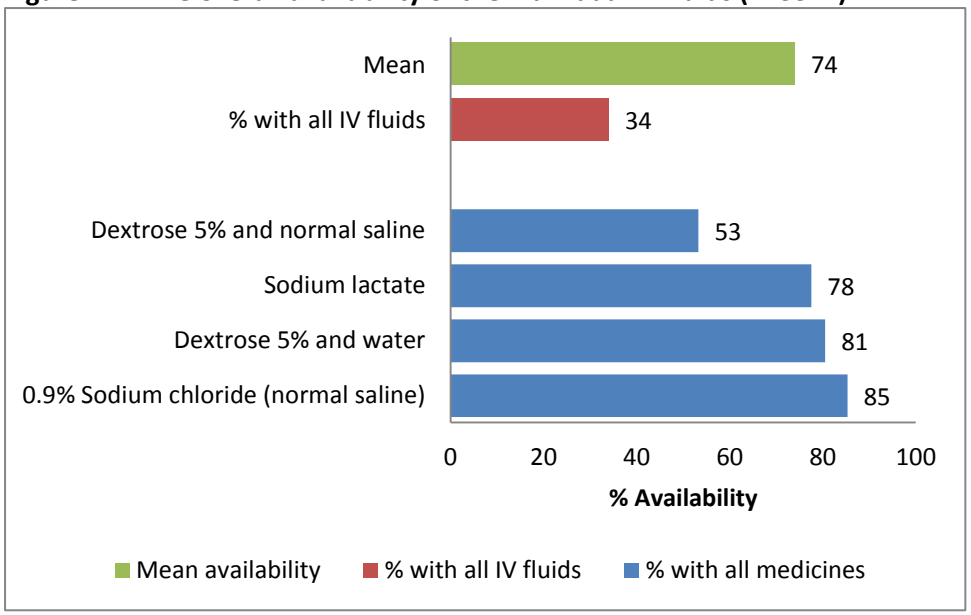
Figure 113: The percentage of hospitals/HC IVs with all the fluids and the mean availability of the fluids, by key stratifiers (n=334*)



*The national psychiatric hospital excluded from analysis

Figure 114 shows the availability of the individual IV fluids. Normal saline was the most available while dextrose combined with normal saline was the least available IV fluid seen or reported available.

Figure 114: The overall availability of the individual IV fluids (n=334*)

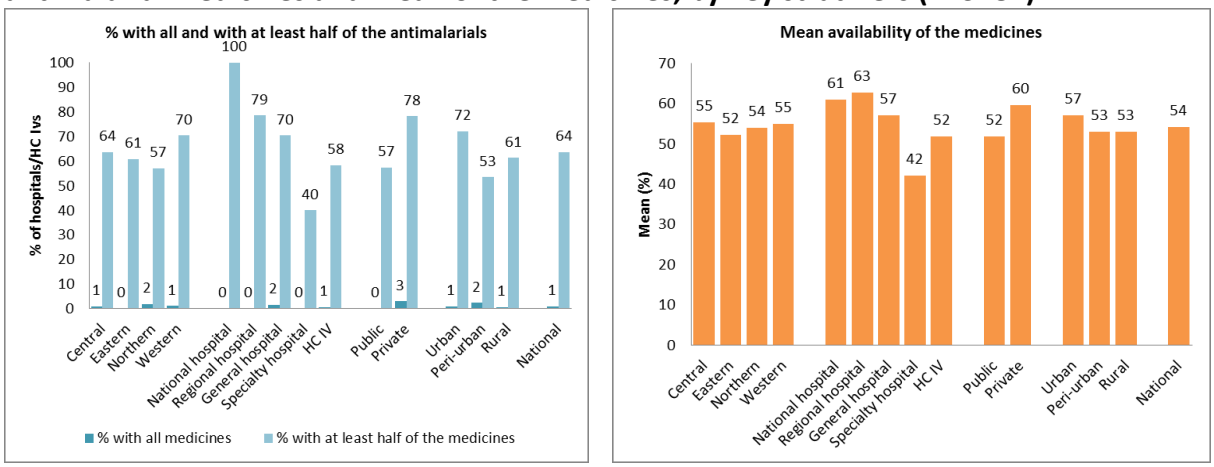


**The national psychiatric hospital excluded from analysis*

The availability of antimalarial drugs

The availability of antimalarial drugs was assessed based on the presence of artemisinin combination therapy, artemisinin monotherapy, artesunate suppository or injection, sulfadoxine-pyrimethamine, insecticide treated bed nets for distribution, chloroquine (oral), quinine (oral), primaquine (oral), and other antimalarial drugs. Figure 115 illustrates the availability of the drugs. Of the 9 drugs that were considered to be particularly important and that were enquired about during the census, only 1% of the hospitals/HC IVs had all of them. At least half of the drugs were available in 64% of the hospitals/HC IVs. On average, five of the nine drugs were seen or reported available, with the mean similar across geographical zones and between urban and rural areas. The drugs were slightly more available in private than public hospitals/HC IVs.

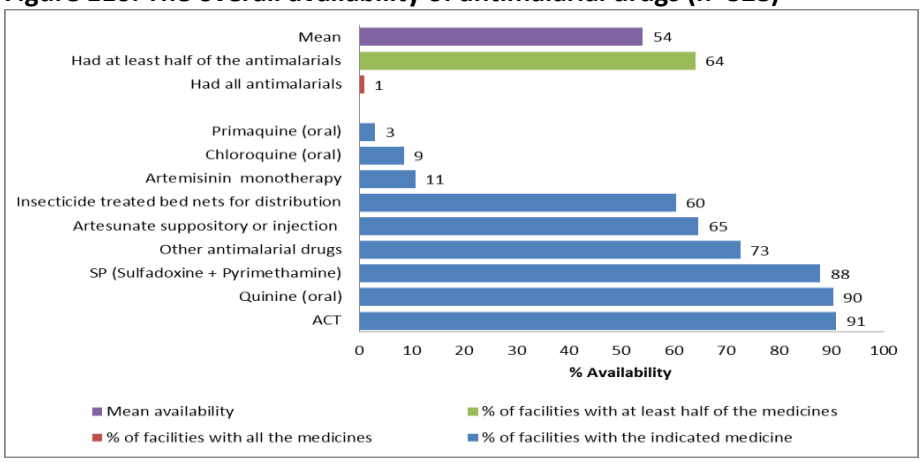
Figure 115: Percentage of hospitals/HC IVs with all and with at least half of the antimalarial medicines and mean of the medicines, by key stratifiers (n=328*)



**Estimated only among facilities that indicated that they offered malaria services*

Figure 116 shows availability of the specific antimalarial drugs. Artemisinin combination therapy was the most commonly available medicine followed by oral quinine and Sulfadoxine-Pyrimethamine. Oral primaquine and oral chloroquine were the least available.

Figure 116: The overall availability of antimalarial drugs (n=328)

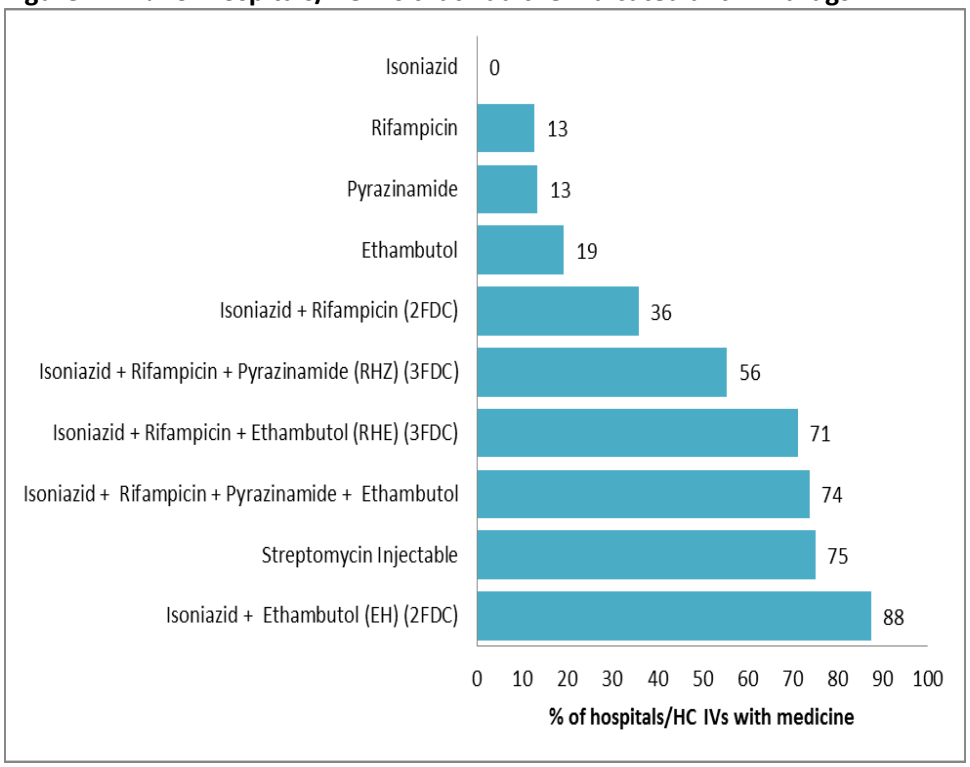


**Estimated only among facilities that indicated they offered malaria services*

The availability of anti-TB drugs

Figure 117 shows the availability of anti-TB drugs. Isoniazid mini-pills were unavailable in all hospitals and level IV primary care facilities. This is possibly because most of the isoniazid is in a combination therapy. Rifampicin and pyrazinamide mini-pills were available in 13% of the hospitals/HC IVs. Isoniazid-ethambutol combination therapy was the most available, with the medicine reported available or seen in the great majority (88%) of the hospitals/HC IVs.

Figure 117: % of hospitals/HC IVs that had the indicated anti-TB drugs



The availability of antiretroviral drugs

Assessment of the availability of antiretroviral drugs (ARVs) for prevention and treatment of HIV was based on the presence of 37 ARVs that were considered particularly important and expected at the hospitals/HC IVs (Table 30).

Table 30: List of antiretroviral medicines for prevention and treatment of HIV that were enquired about during the census

1. Efavirenz (EFV)	20. Efavirenz (EFV) syrup
2. Zidovudine + Lamivudine + Nevirapine	21. Tenofovir + Emtricitabine
3. Nevirapine (NVP) tablet	22. Zidovudine + Lamivudine + Abacavir
4. Zidovudine + Lamivudine	23. Tenofovir + Emtricitabine + Efavirenz
5. Tenofovir + Lamivudine + Efavirenz	24. Atazanavir
6. Tenofovir + Lamivudine	25. Lopinavir
7. Lopinavir+ritonavir	26. Stavudine + Lamivudine + Nevirapine
8. Nevirapine (NVP) syrup	27. Ritonavir
9. Atazanavir+ritonavir	28. Zidovudine syrup
10. Lamivudine + Abacavir	29. Stavudine + Lamivudine
11. Abacavir (ABC)	30. Emtricitabine (FTC)
12. Zidovudine tablet	31. Lamivudine syrup
13. Lamivudine (3TC)	32. Stavudine 30 or 40
14. Tenofovir Disoproxil Fumarate (TDF)	33. Didanosine (DDI)
15. Stavudine syrup	34. Darunavir
16. Indinavir	35. Enfuvirtide (T-20)
17. Saquinavir	36. Delavirdine (DLV)
18. Fosamprenavir	37. Nelfinavir
19. Tipranavir	

None of the hospitals/HC IVs that indicated that they offered antiretroviral treatment services had all the 37 ARVs that were enquired about during the census. Only 4% of the hospitals/HC IVs had at least half of the 37 ARVs (Figure 118). All specialty hospitals/HC IVs had at least half of the ARVs compared to only 0-6% for the other facility types. On average, slightly under a third of the ARVs (31%) was seen or reported available, with the mean availability similar across the geographical zones and similar between public-private and urban-rural hospitals/HC IVs (Figure 118).

Figure 118: The availability of antiretroviral drugs, by key stratifiers (n=252)

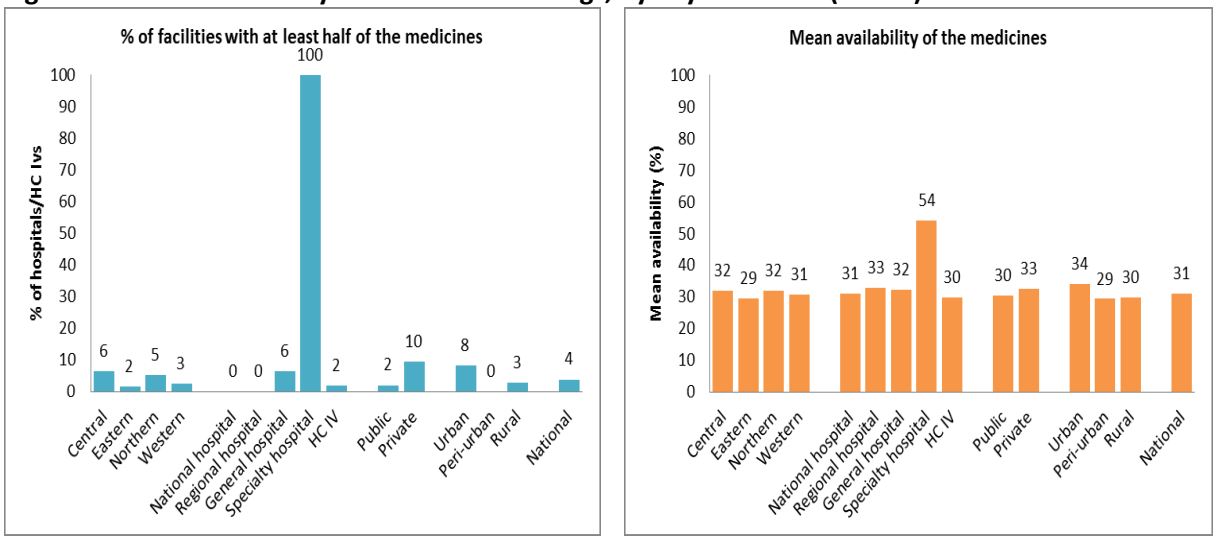
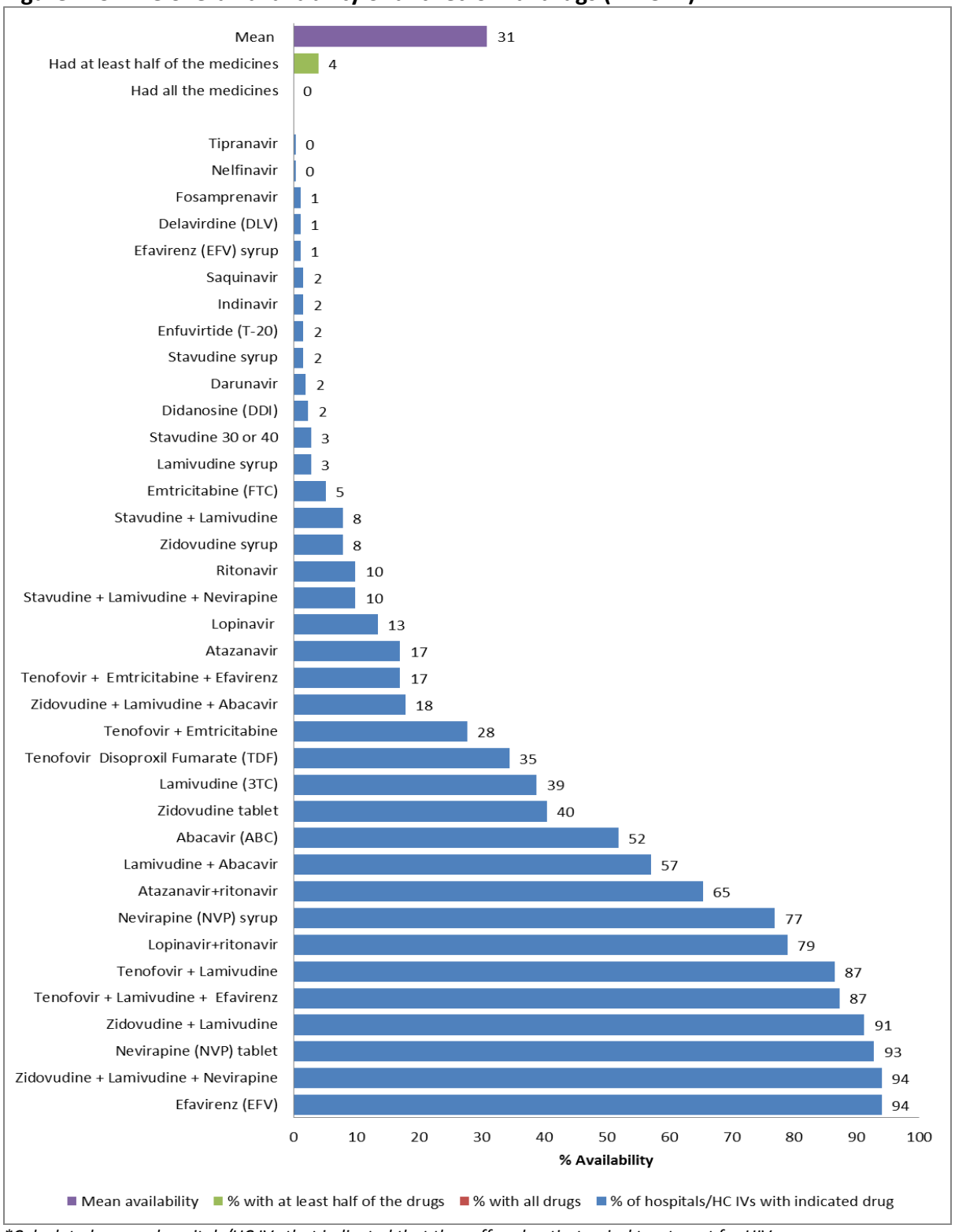


Figure 119 shows the availability of the individual ARVs that were enquired about during the census. Findings show that some of the ARVs were almost universally available while others, most especially protease inhibitors, were extremely rare or unavailable.

Figure 119: The overall availability of antiretroviral drugs (n=252*)



**Calculated among hospitals/HC IVs that indicated that they offered antiretroviral treatment for HIV*

The availability of family planning commodities

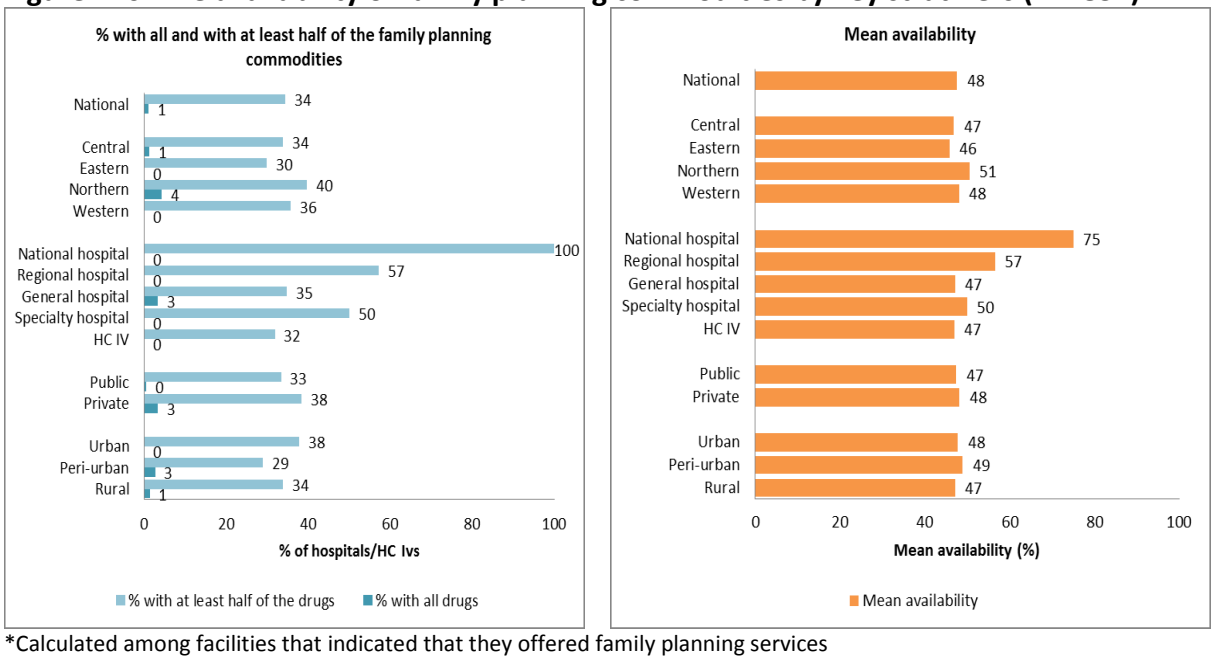
Assessment of the availability of family planning commodities was based on the presence of 12 items of medicines that were considered important for offering family planning services (Table 31).

Table 31: List of family planning commodities that were enquired about during the census

1. Combined estrogen progesterone oral contraceptive pills 2. Progestin-only contraceptive pills 3. Combined estrogen progesterone injectable contraceptives 4. Progestin-only injectable contraceptives 5. Male condoms 6. Female condoms 7. Intrauterine contraceptive device (IUCD)	8. Levonorgestrel implant 9. Etonogestrel implant 10. Levonorgestrel tablet (emergency contraceptive) 11. Ulipristal acetate tablet (emergency contraceptive) 12. Mifepristone tablet (emergency contraceptive)

The findings suggest a severe shortage of family planning commodities in hospitals/HC IVs in Uganda. Of the 12 family planning commodities that were enquired about during the census, only 1% of the hospitals/HC IVs that indicated that they offered family planning services had all of them, and only a third of the hospitals/HC IVs had at least half of the family planning commodities (Figure 120). On average, the hospitals/HC IVs had just about half of the family planning commodities that were enquired about, with the mean availability similar across the geographical zones, and similar between public and private and urban and rural hospitals/HC IVs (Figure 120). The national hospital had the highest mean availability of the family planning commodities, with three quarters of the commodities seen or reported available. HC IV and general hospitals had the lowest mean availability with only about half of the commodities seen or reported available (Figure 120).

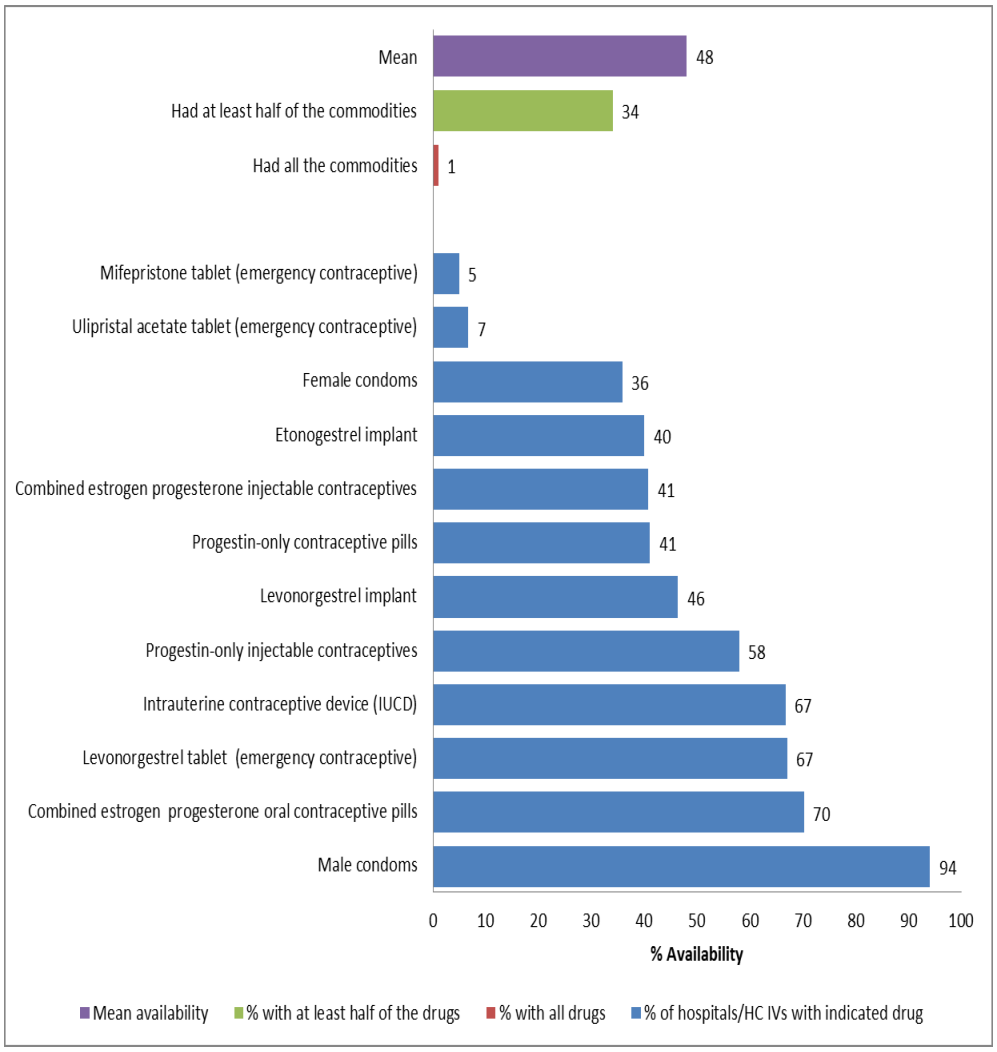
Figure 120: The availability of family planning commodities by key stratifiers (n=285*)



*Calculated among facilities that indicated that they offered family planning services

Figure 121 shows the availability of the individual family planning commodities that were enquired about during the census. Male condoms were the most available family planning commodity, with the item seen or reported available in 94% of the hospitals/HC IVs, followed by combined oestrogen-progesterone oral contraceptive pills (70%). The emergency contraceptives, Mifepristone tablet and Ulipristal acetate tablet, were the least available family planning commodities, with the items seen or reported available in only 5% and 7% of the hospitals/HC IVs, respectively.

Figure 121: The availability of family planning commodities (n=285*)

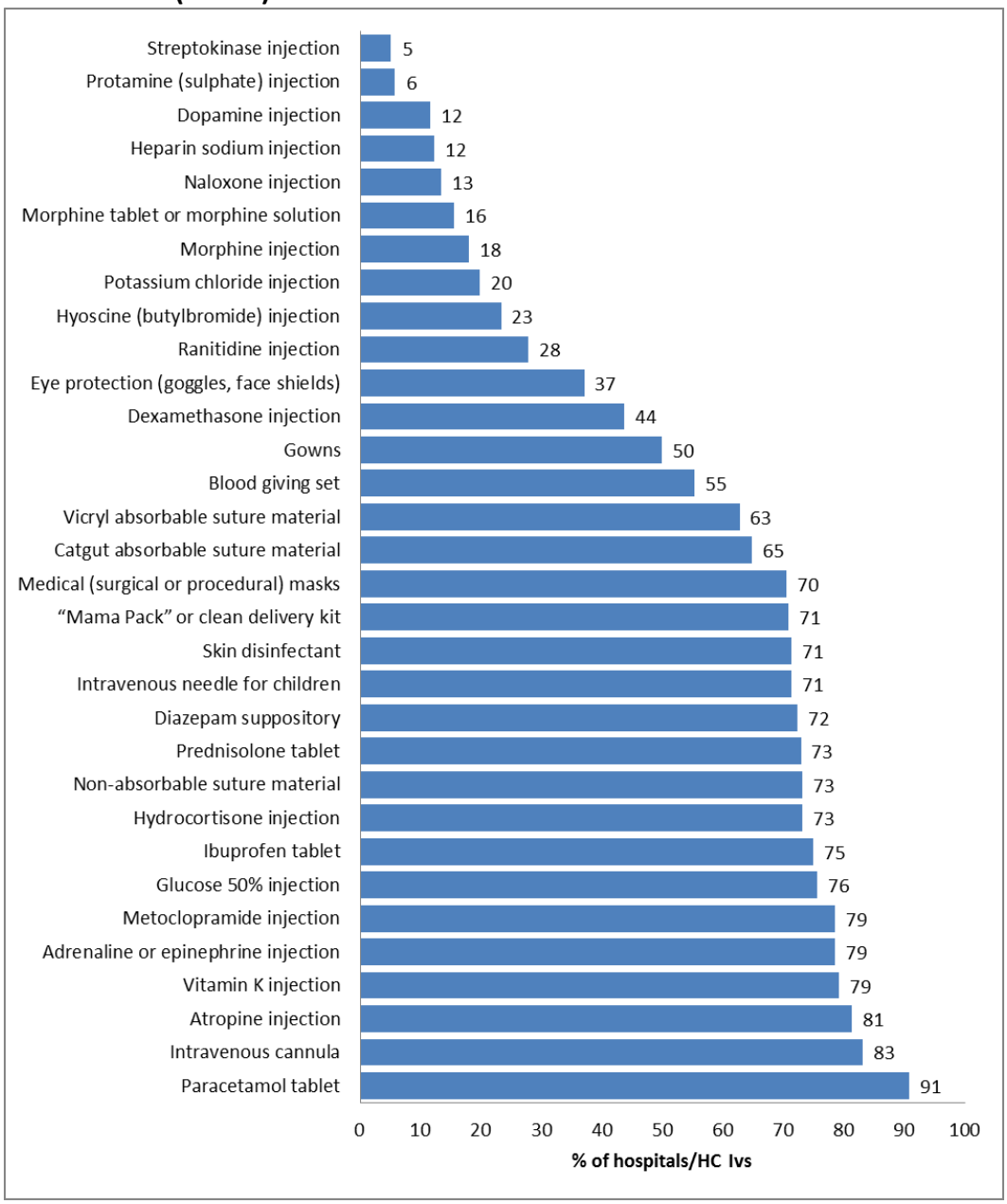


*Calculated among facilities that indicated that they offered family planning services

The availability of other medicines and commodities

Figure 122 shows the availability of the other medicines and commodities that were enquired about during the census. Some of the medicines and commodities such as paracetamol, atropine and IV cannula were available in the great majority of the hospitals/HC IVs while items such as streptokinase and protamine (sulphate) injection were extremely rare.

Figure 122: The overall percentage of hospitals/HC IVs with the indicated medicines and commodities (n=335)



3. Health system

- Governance
- Health workforce
- Finances

3.1. Hospital/HC IV governance and management

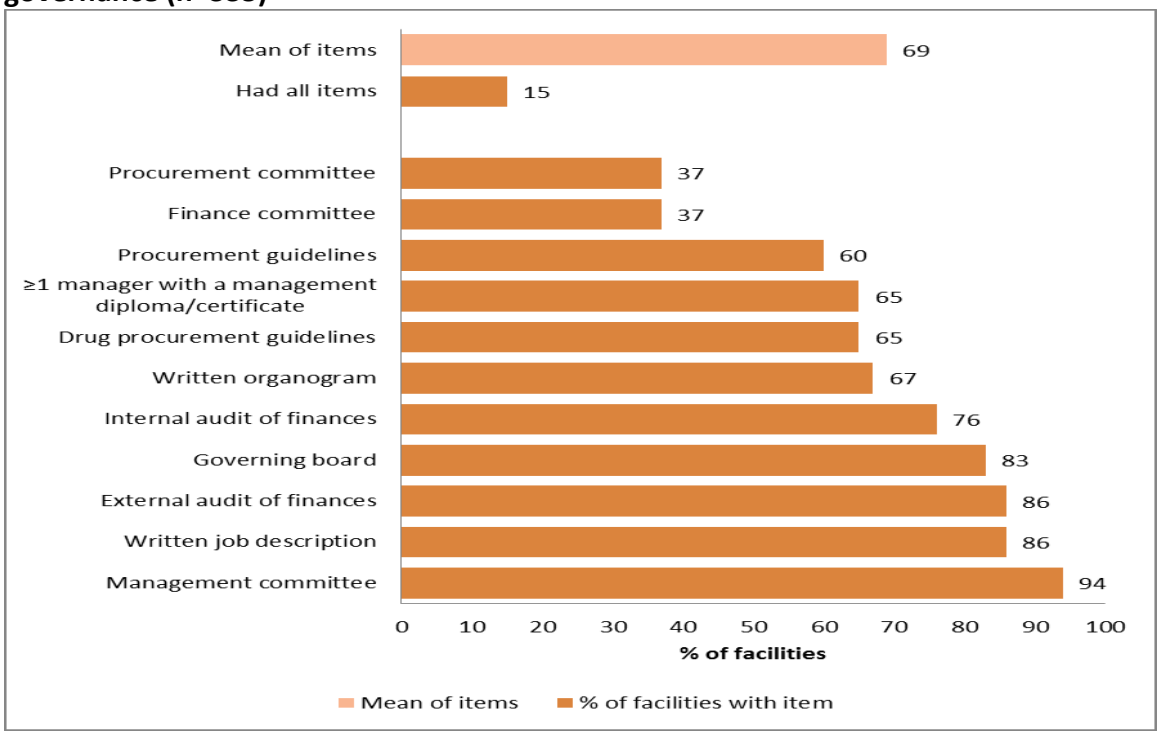
Key findings:

- Most hospitals/HC IVs had only a subset of systems/structures for governance/ management.
  - Of the 11 governance/management systems/structures that were enquired about, only 15% of the hospitals/HC IVs reported the availability of all of them
  - On average, the hospitals/HC IVs reported the availability of two thirds (69%) of the systems/structures
  - The availability of a hospitals/HC IV management committee (94%) was the most commonly reported governance/management system/structure. The least reported governance/management system/structure was a finance committee (37%) and procurement committee (37%).
- Capacity for governance/management of the hospitals/HC IVs was fairly modest
  - Using predefined criteria, 28% of the hospitals/HC IV were classified as having very good capacity and 29% as having good capacity. The rest of the hospitals/HC IVs were classified as having moderate (23%), poor (10%) and very poor capacity (9%).
  - The capacity was better when level IV primary care facilities were excluded from analysis, with 55% of the hospitals classified as having very good capacity and 28% as having good capacity. Only 2% and 5% were classified as having very poor and poor capacity, respectively.

Assessment of systems/structures for governance/management of hospitals/HC IVs was based on the presence of eleven items, namely: a governing board, a management committee, a finance committee, a procurement committee, a drug procurement committee, procurement guidelines, at least one manager/leader with a diploma or certificate in management, a written organogram that details reporting mechanisms/relationships, written job descriptions, an external audit of finances, and an internal audit of finances.

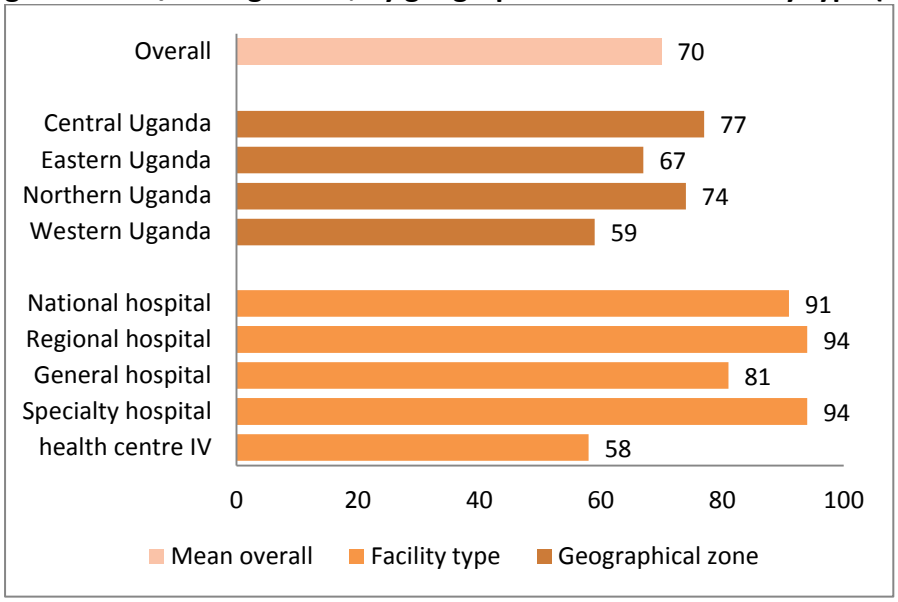
Figure 123 shows the availability of governance/management systems, structures and practices. Most of the hospitals/HC IV reported the availability of only a subset of the systems/structures for governance/management. Of the 11 items that were enquired about during the census, only 15% of the hospitals/HC IV reported the availability of all of them. On average, the hospitals/HC IVs reported the availability of two thirds (69%) of the governance/management systems/structures. Procurement and finance committee were the least available, with 37% of the hospitals/HC IVs reporting their availability. The availability of a hospital/HC IV management committee was the most commonly reported (94%).

Figure 123: Percentage of hospitals/HC IVs with structures and systems for good governance (n=335)



The availability of the governance/management systems/structures in Central Uganda was higher compared to the other geographical zones, with hospitals/HC IVs in Central Uganda having 77% of the systems/structures (Figure 124). National, regional and specialty hospitals reported the availability of most of the systems/structures while level IV primary care facilities reported the availability of only 58% of the systems/structures. Details of the specific items by geographical zone and facility type are presented in Figure 126.

Figure 124: The availability of systems, structures and practices essential for good governance/management, by geographical zone and facility type (n=335)



Capacity for hospital/HC IV governance and management

Capacity for governance/management of the hospitals/HC IVs was fairly modest. Using predefined criteria, 28% of the hospitals/HC IV were classified as having very good capacity and 29% as having good capacity (Figure 125). The rest of the hospitals/HC IVs were classified as having moderate (23%), poor (10%) and very poor capacity (9%).

As has been with capacity to offer other services, the capacity for governance/management was better when level IV primary care facilities are excluded from analysis, with 55% of the hospitals classified as having very good capacity and 28% as having good capacity. Only 2% and 5% were classified as having very poor and poor capacity, respectively.

Figure 125: Capacity for governance/management in hospitals and level IV primary care facilities

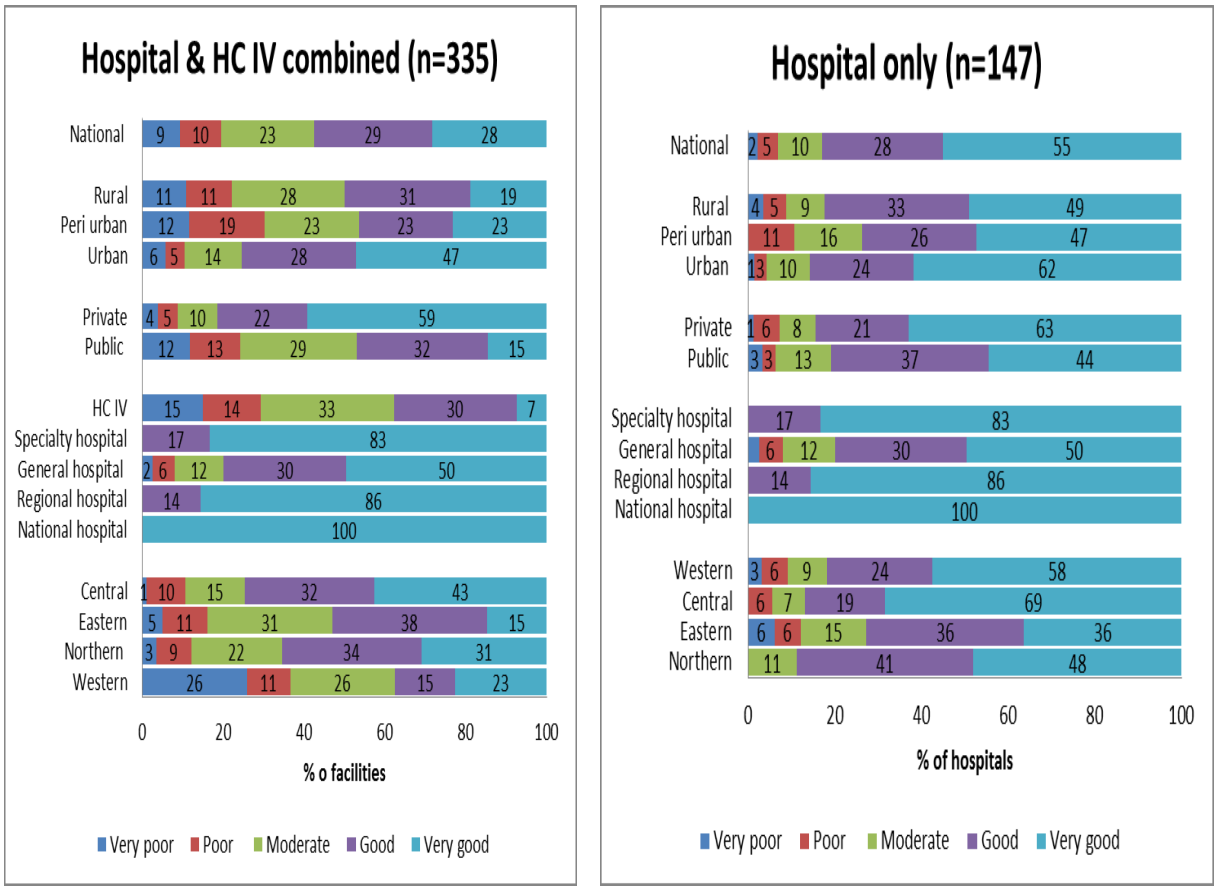


Figure 126: Percentage of Hospitals/HC IVs that indicated that they had the indicated systems/structures for governance/management, by geographical zone and facility type (n=335)

	Geographical zone				Facility type					
	Central	Eastern	Northern	Western	National hospital	Regional hospital	General hospital	Specialty hospital	health centre IV	Overall
≥1 manager with a management diploma/certificate	76	63	66	56	100	93	86	100	48	65
Drug procurement guidelines	76	68	76	44	50	100	74	100	56	65
External audit of finances	90	86	79	86	100	100	90	100	83	86
Finance committee	50	15	52	33	100	79	54	83	21	37
Governing board	84	91	88	72	50	93	92	100	76	83
Internal audit of finances	85	82	85	57	100	100	82	50	71	76
Management committee	100	86	97	96	100	100	97	100	92	94
Procurement committee	50	26	47	28	100	93	60	100	15	37
Procurement guidelines	69	70	59	41	100	100	77	100	44	60
Written job description	92	86	97	73	100	93	96	100	79	86
Written organogram	78	62	72	58	100	86	86	100	52	67
Had all essential items	**21**	**5**	**17**	**16**	**0**	**57**	**26**	**50**	**4**	**15**
Mean	**77**	**67**	**74**	**59**	**91**	**94**	**81**	**94**	**58**	**70**

3.2. Staffing levels at hospitals

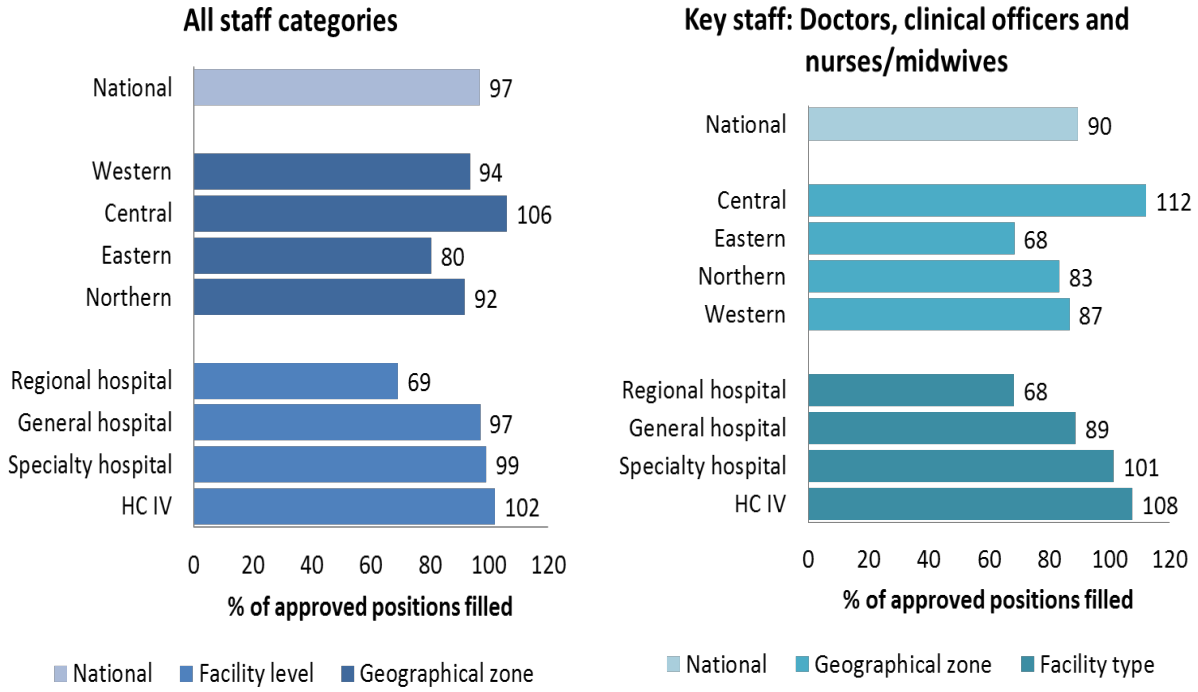
Key findings:

- The target for Uganda is to have all of the approved staff positions filled. This target was nearly met:
  - 97% of the approved positions for all staff categories were filled
  - Level IV primary care facilities had considerably more staff than the target recommended by the government
  - Distribution of the approved positions that were filled was fairly even between Northern Uganda (92%) and Western Uganda (94%)
  - Central Uganda had more staff than approved positions
  - Four district, Abim, Bugiri, Buliisa and Kyankwanzi did not have a medical doctor
- There is no national target for the density of key staff (doctors, clinical officers and nurses and midwives) in Uganda. The WHO recommends a minimum threshold of 23 doctors, nurses and midwives per 10,000 population for delivering essential maternal and child health services. However, whether this threshold applies for each of the key staff category is not clear; but ideally there should be more nurses than clinical officers and more clinical officers than doctors in a hospital or HC IV.
  - There were 1,503 doctors, 1223 clinical officers, and 8453 nurses/midwives in hospitals/HC IVs. This represents, in hospitals/HC IV, 0.43 doctors, 0.35 clinical officers and 2.43 nurses/midwives per 10,000 population or one doctor for 23,191 people, one clinical officer for 28,501 people, and one nurse/midwife for 4,124 people.

Staffing norms were (asked and) based on the respondents knowledge. Given the varied understanding and knowledge by respondents of the staffing norms for the different levels of care, this is an area of future improvement in the Census tools. In future surveys, respondents' will only be asked the actual numbers of different cadres at their health facility, which will then be compared with known staffing norms for that given level.

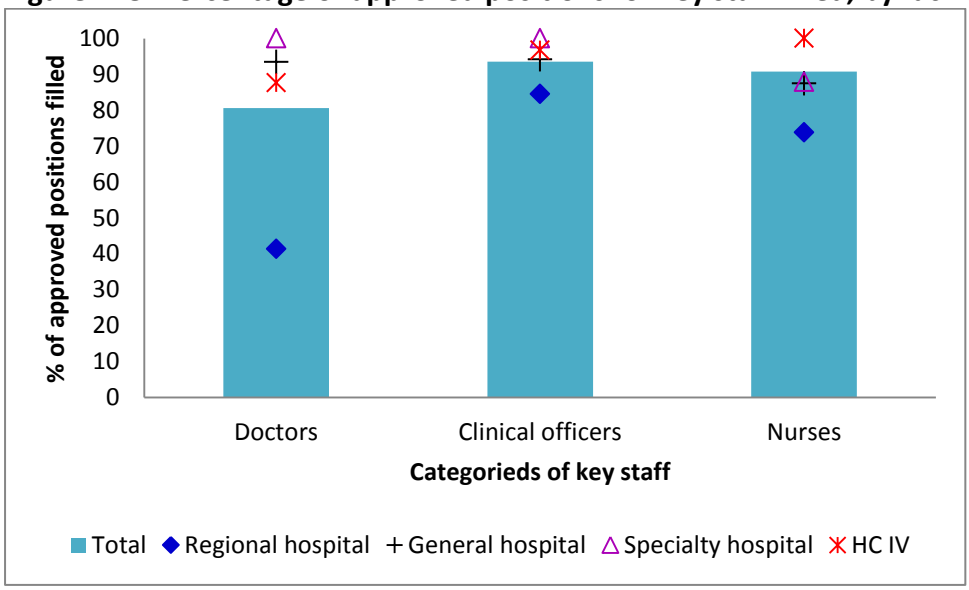
Figure 127 shows the staffing levels by geographical zone and facility type. On average, nearly all (97%) approved staff positions were filled. Level IV primary care facilities had on average more staff than the approved positions. Regional hospitals had on average two thirds of the approved positions filled. General and specialty hospitals had 97% and 99% of approved positions filled, respectively. National hospitals were excluded from analysis due to incomplete data. Distribution of the approved posts was similar between Northern (92%) and Western Uganda (94%). Eastern Uganda had 80% of the approved posts filled while Central Uganda had more health workers than the approved positions.

Figure 127: % of approved positions filled, by geographical zone and facility type



Considering positions for key staff i.e. doctors, clinical officers, and nurse and midwifes (Figure 128), 94% of the approved positions for clinical officers, 91% for nurses and midwifes, and 81% for doctors was filled. Regional hospitals had 41% of approved doctor positions filled. Specialist hospitals had more doctors and clinical officers than the approved positions. Similarly, Level IV primary care facilities had more nurses than the approved positions.

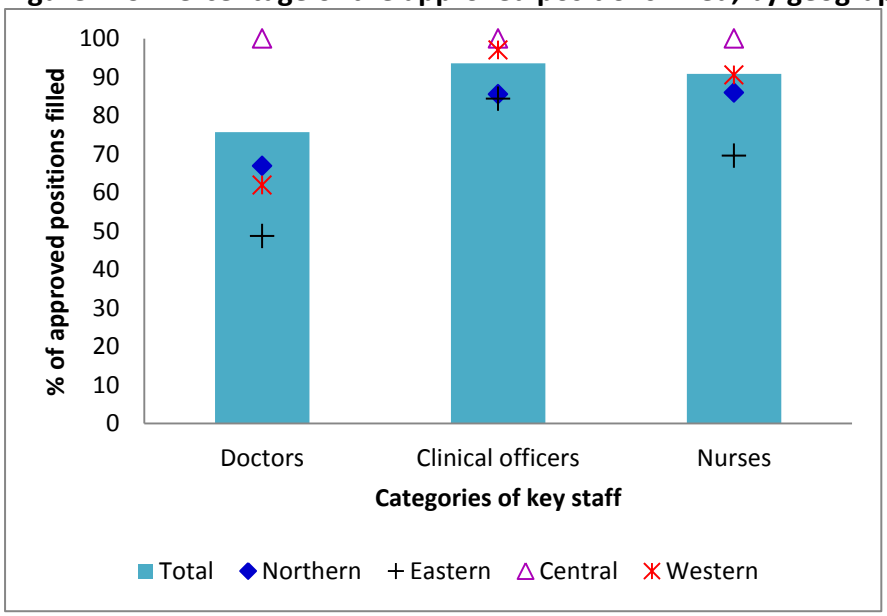
Figure 128: Percentage of approved positions for key staff filled, by facility type



There were fairly large gaps between the geographical zones in the percentage of approved positions filled (Figure 129), with Central Uganda having more staff than the approved

position for all the key staff categories. Eastern Uganda had the least percentage of approved positions filled for all the key staff categories.

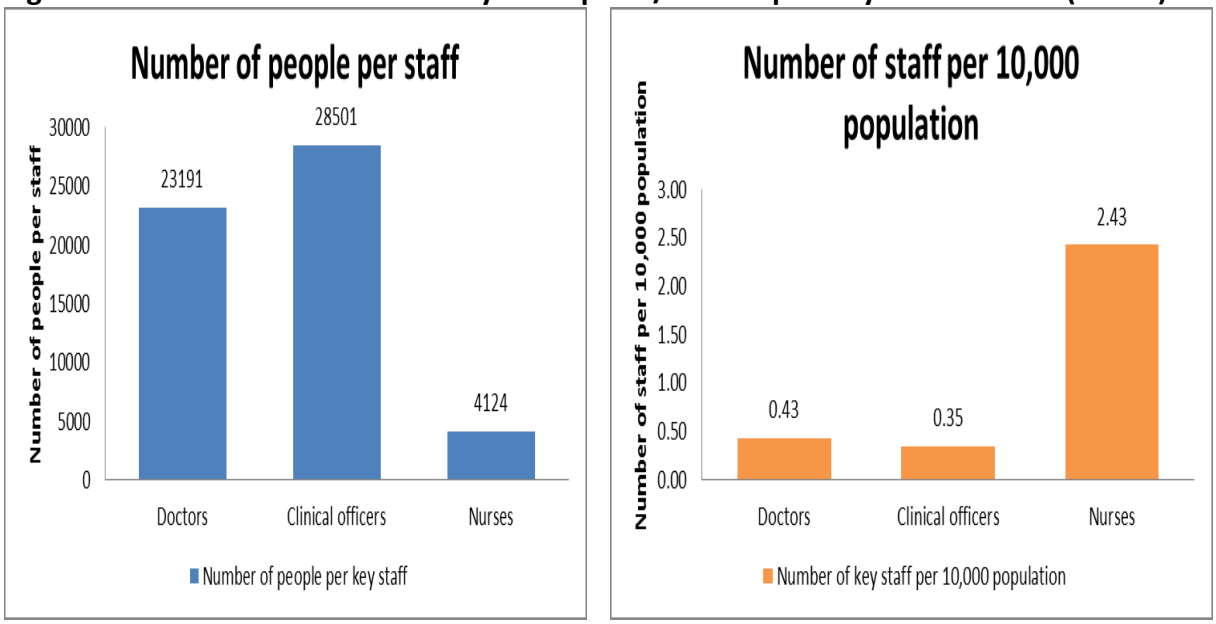
Figure 129: Percentage of the approved positions filled, by geographical Zone



Density of key staff in hospitals/level IV primary care facilities

There were 1,503 doctors, 1223 clinical officers, and 8453 nurses/midwives in hospitals/HC IVs. This represents 0.43 doctors, 0.35 clinical officers and 2.43 nurses/midwives per 10,000 population or one doctor for 23,191 people, one clinical officer for 28,501 people, and one nurse/midwife for 4,124 people (Figure 130). There was no medical doctor in four districts: Abim, Bugiri, Buliisa and Kyankwanzi.

Figure 130: Health workforce density in hospitals/level IV primary care facilities (n=333)



National referral hospitals excluded from analysis due to incomplete data

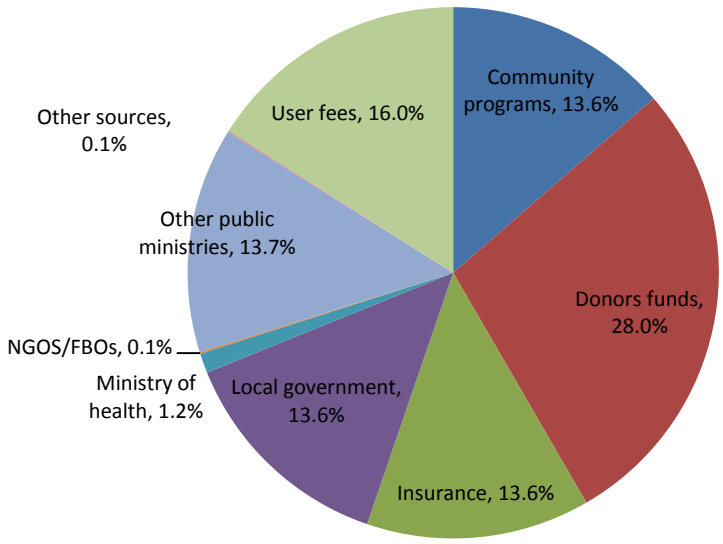
3.3. Health care financing

The aim of this section was to examine:

1) Funds received: How much funds were allocated to the hospitals/HC IVs, and how does that compare with the funding level required to provide at least e.g. the minimum health care package (if such standards exist at all)
2) Funding gap: How much of the budgeted funds were received, and benchmark against the funding level required to provide at least the minimum health care package
3) Timeliness of the release of funds i.e. were the funds released timely as planned? This dimension is currently not captured in the questionnaire
4) Sources of funds: Of the total funds received, what proportion was from government, NGOs, user fees, donations etc. For funds received from the government, benchmarking against the proportion of funds that was meant to be received from the government
5) Expenditure: What proportion of the funds was spent on drugs, maintenance of buildings etc., and what are the likely implications were.

Data were incomplete for analysis of most of these objectives. Figure 131 shows the sources of funding for hospitals and level IV primary care facilities. Overall, donor contributions accounted for the biggest share of funding for hospitals and level IV primary care facilities (28%) followed by user fees (16%).

Figure 131: Sources of funding for hospitals and level IV primary care facilities



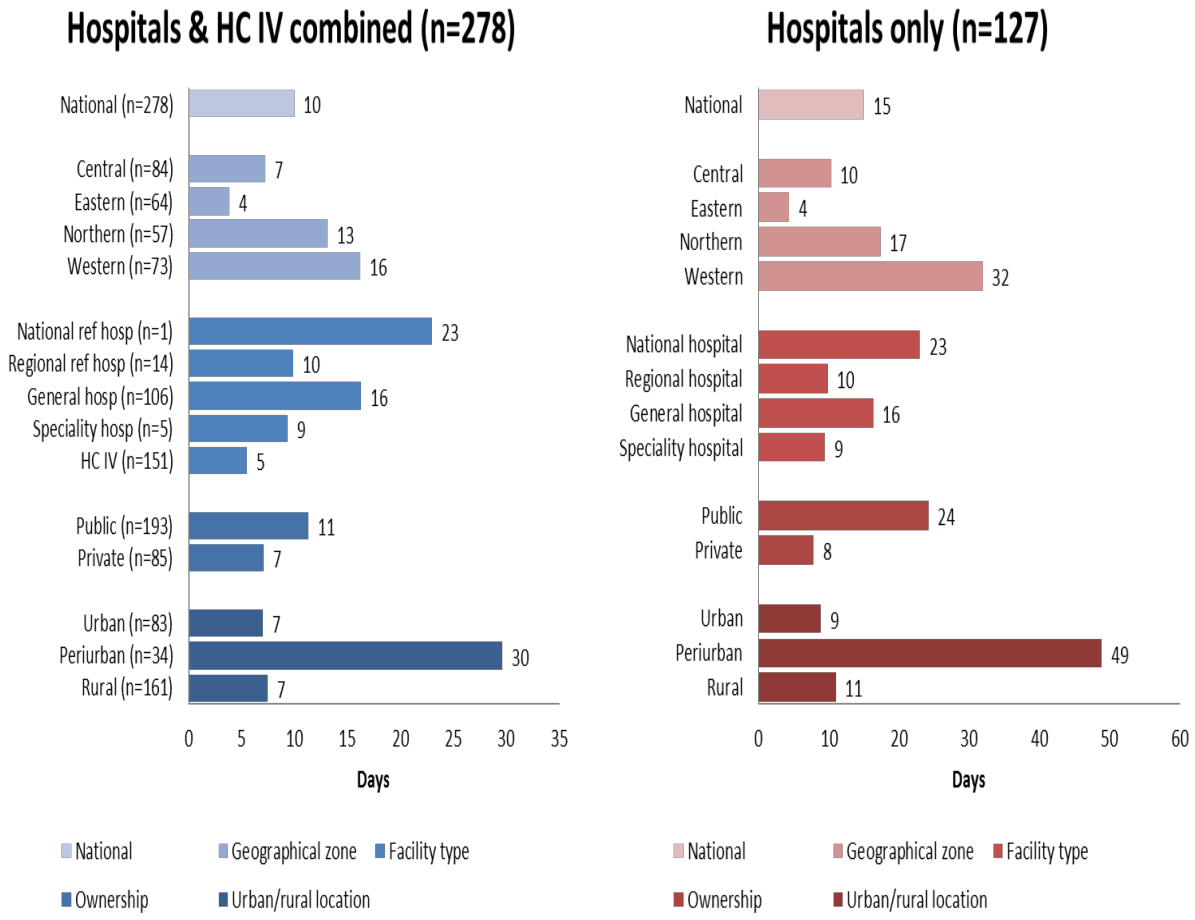
4. Efficiency

- Bed occupancy rate (data unusable)
- Average length of stay

4.1 Average length of stay

Length of stay refers to a single episode of hospitalization. The average length of stay was calculated by dividing the sum of inpatient days by the number of patient discharges during the year that preceded the census. Length of hospital stay is also a quality metric. Figure 133 shows the average length of stay in hospitals and level IV primary care facilities. The average length of stay in the hospitals and level IV primary care facilities was 10 days with a median of 4 days. When level IV primary care facilities are excluded from analysis, the average length of stay in the hospitals was 15 days with a median of 4.2 days. Patients were more likely to stay longer in hospitals in Western Uganda than in the other geographical zones. As would be expected, national hospitals had a longer average length of stay than the other facilities. National hospitals in Uganda mostly manage chronic and complicated cases that are often referred by lower level facilities. Data were not available to calculate the major contributors to the hospitals/HC IV stays.

Figure 132: The average length of stay in hospitals and level IV primary care facilities



4.2 Bed occupancy rate

Bed occupancy refers to the number of hospital beds occupied by patients. It is expressed as a percentage to give a bed occupancy rate. Bed occupancy rate is a measure of demand for hospital beds and hence used to gauge balance between demands for health care and number of beds. Calculation of bed occupancy rate was based on the actual number of beds and actual number of patients who spent the census night on the ward.

Figure 133: Bed occupancy on the paediatric ward on day of the census

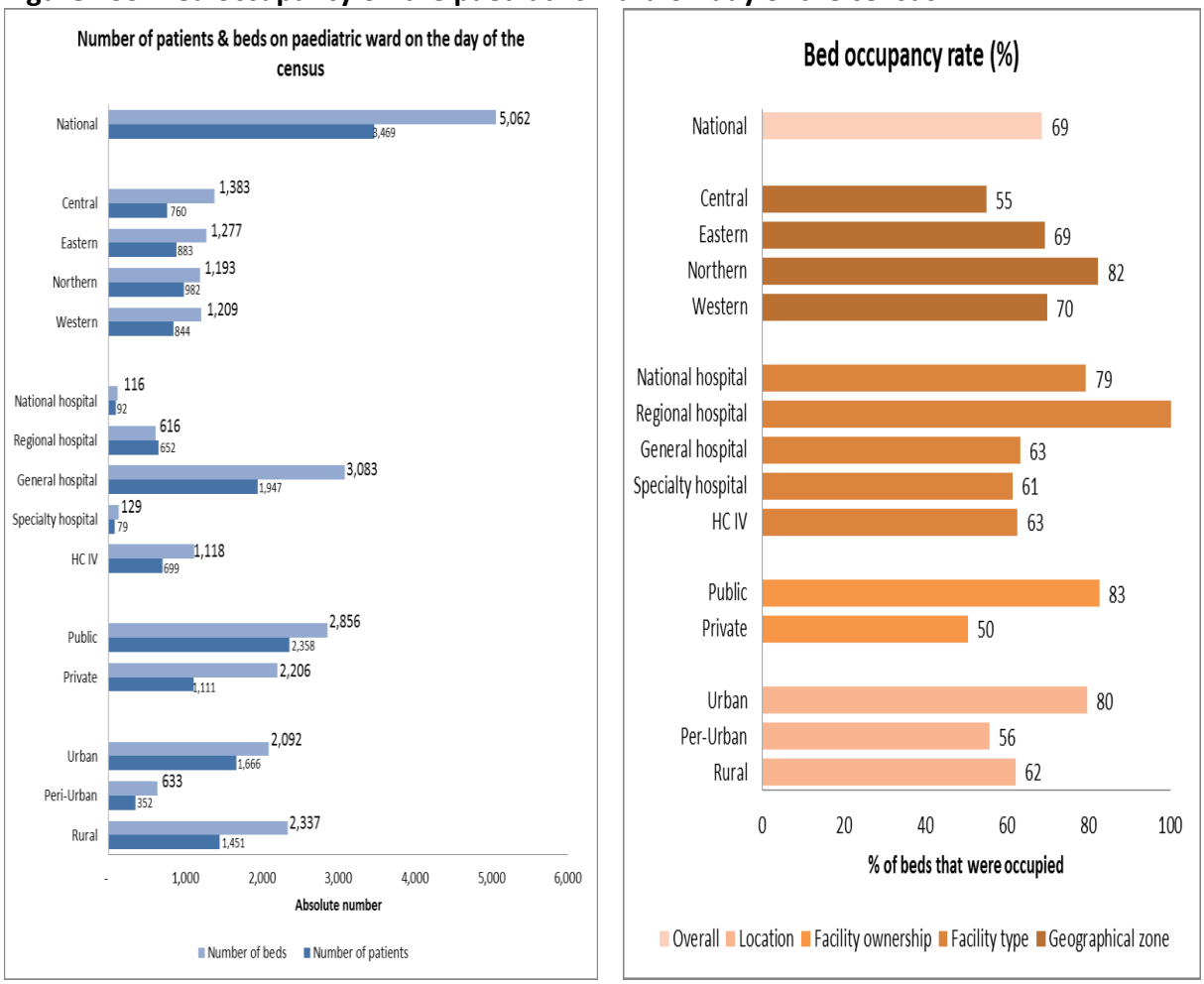


Figure 133 shows the bed occupancy on paediatric ward on the day of the census. There were more than enough beds for paediatric patients in all the hospitals/HC IVs. There is however a great possibility of undercounting/underreporting of the number of paediatric patients, especially in the national and regional hospitals. For instance it is highly unlikely that there were only 92 children admitted to the paediatric ward at the national referral hospitals on the day of the census.

Figure 134: Bed occupancy rate the post-delivery ward on the day of the census

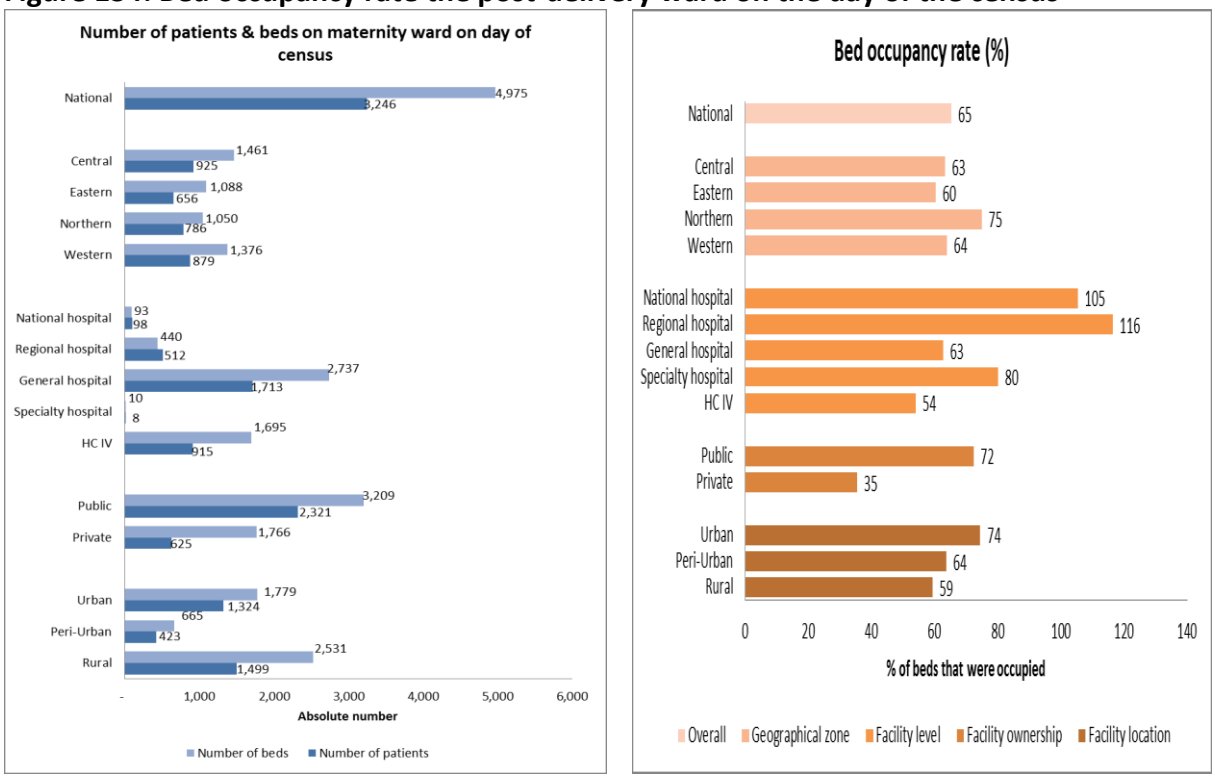


Figure 134 shows the bed occupancy on the post-delivery (maternity) ward on the day of the census. At the national and regional referral hospital hospitals, there were fewer beds than the maternity patients – suggesting that some of the patients spent the day of the census on the hospital floor which is a common site in a number of hospitals across Uganda.

Figure 135: Bed occupancy rate on adult surgical inpatient ward on the day of the census

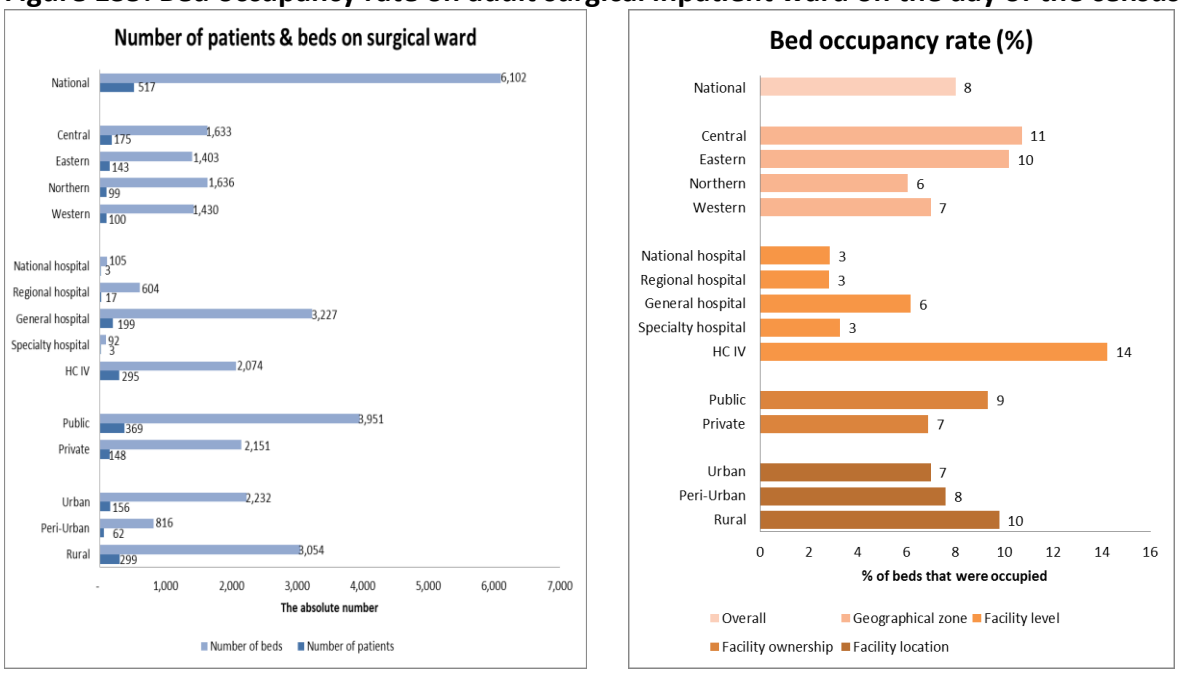


Figure 135 shows the bed occupancy on the adult surgical inpatient ward. As was the case with the paediatric ward, there were more beds than the number of patients on the surgical ward. In total, there were only 517 patients for 6,102 beds; representing an average bed occupancy rate of only 8%. There is however a great possibility of gross undercounting/underreporting of the number of patients on the surgical ward in most of the hospitals/HC IVs.

Conclusion

There were important gaps and weaknesses in the availability of services and in the capacity to offer the services – implying that there is important room for improvement. Although the target for facility density was met or even surpassed, most hospitals/HC IVs offered only a subset of the services that were enquired about. This means patients still faced enormous challenges accessing services in Uganda. Patients were particularly unlikely to find most of the specialty and almost all the advanced diagnostic and treatment services. Further compromising access to the services was the fact that capacity to offer the services was very limited in the hospitals/HC IVs, with many of the hospitals/HC IVs lacking the necessary items and systems/structures for offering the services. It is therefore important for the government of Uganda to increase and scale up the range of services delivered through hospitals/HC IVs, particularly the range of specialty and advanced diagnosed and treatment services. This would enable patients to be treated closer to their homes and reduce the cost of accessing health care for them. For effective delivery of the services, the government should also ensure the availability of items that are necessary for delivering the services such as equipment, guidelines and drugs.

Annexes

Annex 1: Hospital Census Field Team (Field Supervisors and Data Collectors)

TEAM ONE

EDWINA ATUSINGWIZE
Lubega Akiim
Akoli Stella
Mwesigye Stephen
Emmanuel Kinyera

TEAM TWO

MATIRU DRABO
Janate Ndugu
Ainembabazi Christine
Ojok Regan
Achire Nelson

TEAM THREE

ADELAINE KARAMANI
Jovin Etima
Barbara Kemigisha
Odongo David
Julius Nampurira

TEAM FOUR

Byamukama Benson
Bwikize Abel Bakahula
Tumushabe Hope
Sylivia Asiimwe
Adrawa Henry

TEAM FIVE

BENON KWESIGA
Nakigudde Esther
Ssepuya Steven
Innocent Mpurirwe
Bonniventure Duhirwe

TEAM SEVEN

Grace Nyakojo
Susan Karungi
Timothy Muhereza
Grace Tumusime
Maxima Tibwita

TEAM SIX

Bukoma Patrick
Arikosi Charles
Simon Bakabulindi
Nagayi Gloria
Rukundo Lydia

TEAM EIGHT

Regina Nyamishana
Billbest Bakizese
Faith Kamusinga
Gloria Agaba
Nyeko Francis

TEAM NINE

Warren Aryeija
Susan Mutesi
Vicy Ninsima
Tumushabe Hope
Sewankambo Paul

TEAM TEN

Mutegeki David
Bridget Birungi
Patience Birungi
Kyalisima Rosette
Mukibi Julius

TEAM ELEVEN

Twinomujuni Edgar
Nabasa Everlyn
Nalumansi Esther
John Bosco Ariakiliho
Ishebo Jackson

TEAM TWELVE

Kyaligonza Steven
Ssonko Mark
Sekyanzi Bob
Peace Mbabazi
Akuruti Stella

TEAM THIRTEEN

Ebat JB
Aboke Margaret
Ayebazibwe Rose
Rita Rukundo
Philomer Mayengo

TEAM FOURTEEN

Namugaya Faith
Mushana Mwebaze
Nangoli Salim
Byarugaba Justus
Twinomugisha Benedict

TEAM FIFTEEN

Omjong Patrick
Aidah Kwagala
Chakagondua Evalin
Anna Taaka
Paul Oryema

Annex 2: Clusters of districts by region

TEAM ONE			
DISTRICT	**Regional Referral Hospital**	**No. of GH**	**No. of HCIV**
Arua	1	2	4
Maracha		1	0
Nebbi		2	1
Zomba		1	0
Koboko		0	1
Yumbe		1	1
Moyo		1	1
Adjumani		1	1
TOTAL		**9**	**9**

TEAM EIGHT			
District	**Regional Referral Hospital**	**No. of GH**	**No. of HCIV**
Hoima	1	0	2
Balisa		1	1
Kirandigo		1	0
Masindi		1	4
Kyankuwanzi		0	1
Kibale		1	4
TOTAL		**4**	**12**

TEAM TWO	Regional Referral Hospital	No. of GH	No. of HCIV
Gulu	1	3	2
Nwoya		1	0
Amuru		0	1
Pader		0	2
Kitgum		2	1
Lamwo		0	2
Agago		1	0
TOTAL		**7**	**8**

TEAM NINE	Regional Referral Hospital	No. of GH	No. of HCIV
Mubende	1	0	2
Kiboga		1	1
Nakaseke		2	2
Nakasongola		1	3
Luwero		1	4
Mityana		1	4
Kyegegwa		0	1
TOTAL		**6**	**17**

TEAM THREE	Regional Referral Hospital	No. of GH	No. of HCIV
Lira	1	0	3
Apac		1	1
Oyam		1	1
Dokolo		0	1
Amolatar		1	1
Kole		0	1
Alebtong		0	1
Otuke		0	1
TOTAL		**3**	**10**

TEAM TEN	Regional Referral Hospital	No. of GH	No. of HCIV
FortPortal	1	3	3
Kyenjojo		1	1
Kamwenge		0	2
Ntoroko		0	1
Bundibiguyo		1	3
Kasese		3	4
TOTAL		**8**	**14**

TEAM FOUR	Regional Referral Hospital	No. of GH	No. of HCIV
Moroto	1	1	0
Kabongo		1	1
Kotido		0	1
Abim		1	0
Nakapiripirit		0	2
Napak		1	1
Amudat		1	0
Total		**5**	**5**

TEAM ELEVEN	Regional Referral Hospital	No. of GH	No. of HCIV
Masaka	1	1	2
Kalungu		1	4
Bukomasimbi		0	3
Sembabule		1	2
Lyantonde		1	0
Rakai		2	1
Kalangala		0	2
Lwengo		0	3
TOTAL		**6**	**17**

TEAM FIVE	Regional Referral Hospital	No. of GH	No. of HCIV
Soroti	1	1	2
Amuria		0	2
Kaberamaido		1	1
Serere		0	2
Ngora		1	1
Katakwi		1	1
Kumi		2	2
Bukedia		0	1
Pallisa		2	1
Total		**8**	**13**

TEAM TWELVE	Regional Referral Hospital	No. of GH	No. of HCIV
Mbarara	1	7	4
Kiruhura		1	2
Ibanda		1	2
Isingiro		0	4
Sheema		1	2
Rubirizi		0	1
Bushenyi		3	2
Mitoma		0	1
Buhweju		1	1
TOTAL		**14**	**19**

TEAM SIX	Regional Referral Hospital	No. of GH	No. of HCIV
Mbale	1	2	4
Bulambuli		0	2
Kween		0	1
Bukwo		1	1
Kapachorwa		1	0
Sironko		0	2
Budada		1	0
Manafwa		0	3
Budaka		1	1
Butaleja		2	1
Kibuku		0	1
Tororo		4	3
Busia		2	1
Total		**14**	**20**

TEAM THIRTEEN	Regional Referral Hospital	No. of GH	No. of HCIV
Kabale	1	1	7
Kisoro		2	3
Ntugamu		1	3
Kanungu		2	2
Rukungiri		2	5
TOTAL		**8**	**20**

TEAM SEVEN	Regional Referral Hospital	No. of GH	No. of HCIV
Jinja	1	3	5
Buyende		0	1
Kalilo		0	1
Kamuli		2	2
Kayunga		1	2
Namutumba		0	1
Luukaya		0	1
Iganga		1	2
Bugiri		1	1
Namayingo		0	1
Mayuge		1	2
Total		**9**	**19**

TEAM FOURTEEN	Regional Referral Hospital	No. of GH	No. of HCIV
Gomba	0	0	1
Butambala		1	0
Mpigi		1	1
Wakiso		5	7
Mukono		2	2
Buikwe		5	0
Buvuma		0	1
TOTAL		**14**	**12**

Annex 3: Tables of results

Table 3.1: List of districts that did not have a hospital

Central Uganda		Eastern Uganda		Northern Uganda		Western Uganda	
District	Population	District	Population	District	Population	District	Population
Lwengo	275,450	Manafwa	352,864	Kole	241,878	Isingiro	492,116
Kyankwanzi	214,057	Buyende	320,468	Alebtong	225,327	Kamwenge	421,470
Gomba	160,075	Serere	283,630	Koboko	208,163	Kyegegwa	277,379
Bukomansim	151,075	Amuria	270,601	Amuru	190,516	Mitooma	185,519
Buvuma	89,960	Namutumba	253,260	Pader	183,723	Rubirizi	129,283
Kalangala	53,406	Sironko	246,636	Dokolo	182,579	Buliisa	113,569
		Luuka	241,453	Kotido	178,909	Ntoroko	66,422
		Kaliro	236,927	Nakapiripirit	169,691		
		Namayingo	223,229	Lamwo	134,050		
		Kibuku	202,630	Otuke	105,617		
		Bukedea	188,918				
		Bulambuli	177,322				
		Kween	95,623				

Table 3.2: Availability of Trained Heath Workers for 24 Hour Emergency Services by Cadre

Cadre	National Referral Hospital n (% of 2)	Regional Referral Hospital n (% of 14)	General Hospital n (% of 125)	Specialty Hospital n (% of 6)	HCIV n (% 188)	Total n (% of 335)
1. Specialist	1(50.0)	4(28.6)	33(26.4)	3(50.0)	8(4.3)	49(14.6)
2. Medical officer	1(50.0)	9(64.3)	91(72.8)	5(83.33)	94(50.0)	200(59.7)
3. Clinical Officer	1(50.0)	11(78.6)	86(68.8)	5(83.3)	134(71.3)	237(70.7)
4. Professional nurse/ midwife	1(50.0)	12(85.7)	95(76.0)	3(50.0)	118(62.8)	229(68.4)
5. Professional nurse	1(50.0)	14(100.0)	116(92.8)	4(66.67)	167(88.8)	302(90.1)
6. Professional midwife	1(50.0)	10(71.4)	102(81.6)	1(16.7)	160(85.11)	273(81.5)
7. Laboratory staff	1(50.0)	6(42.9)	89(71.2)	4(66.7)	111(59.0)	211(63.0)
8. Blood bank staff	1(50.0)	8(57.1)	50(40.0)	3(50.0)	23(12.2)	85(25.4)
9. Radiographer	1(50.0)	6(42.9)	44(35.2)	3(50.0)	8(4.3)	62(18.5)
10. Anaesthetist	1(50.0)	9(64.3)	72(57.6)	2(33.3)	53(28.2)	137(40.9)
11. Ambulance driver	1(50.0)	11(78.6)	92(73.6)	4(66.7)	97(51.6)	205(61.2)
12. Other trained staff	1(50.0)	4(28.6)	40(32.0)	1(16.7)	38(20.2)	84(25.1)

Table 3.3: % availability of Electricity, 24-hour dispensing pharmacy and essential lifesaving drugs

	Facility Type					Total
Electricity	General H	HCIV	National	Regional	Speciality H	
Peri-Urban	13(10.5)	13(7.3)	0(0.0)	0(0.0)	0(0.0)	26(8.1)
Rural	50(40.3)	77(43.5)	0(0.0)	0(0.0)	0(0.0)	127(39.6)
Urban	45(36.3)	29(16.4)	1(100.0)	13(92.9)	5(100.0)	93(29.0)
24-hour dispensing pharmacy for emergency services						
Peri-Urban	14(11.3)	12(6.8)	0(0.0)	0(0.0)	0(0.0)	26(8.1)
Rural	42(33.9)	80(45.2)	0(0.0)	0(0.0)	0(0.0)	122(38.0)
Urban	38(30.6)	18(10.2)	1(100.0)	9(64.3)	3(60.0)	69(21.5)
Essential lifesaving drugs kept in one location						
Peri-Urban	17(13.7)	17(9.6)	0(0.0)	0(0.0)	0(0.0)	34(10.6)
Rural	52(41.9)	95(53.7)%	0(0.0)	0(0.0)	0(0.0)	147(45.8)
Urban	44(35.5)	30(16.9)	1(100.0)	13(92.9)	5(100.0)	93(29.0)

Table 3.4: General Equipment that is functioning

General Equipment functioning	National Referral Hospital n (% of 2)	Regional Referral Hospital n (% of 14)	General Hospital n (% of 125)	Specialty Hospital n (% of 6)	HCIV n (% 188)	Total n (% of 335)
Stretcher functioning	1(50.0)	10(71.4)	97(77.6)	3(50.0)	94(50.0)	205(61.2)
Wheel chair	1(50.0)	89(57.1)	95(76.0)	5(83.3)	93(49.5)	202(60.3)
Adult weighing scale	1(50.0)	6(42.9)	104(83.2)	5(83.3)	147(78.2)	263(78.5)
Infant weighing-100g	1(50.0)	4(28.6)	51(40.8)	2(33.3)	83(44.1)	140(41.8)
Child weighing scale-250g	1(50.0)	3(21.4)	66(52.8)	2(33.3)	93(49.5)	164(49.0)
Thermometer (mercury manual)	1(50.0)	5(35.7)	54(43.2)	1(16.7)	77(41.0)	138(41.2)
Thermometer(electronic or digital)	1(50.0)	7(50.0)	93(74.4)	4(66.7)	93(49.5)	197(58.8)
Stethoscope	1(50.0)	12(85.7)	114(91.2)	5(83.3)	159(84.6)	291(86.9)
Blood pressure apparatus	1(50.0)	11(78.6)	103(82.4)	1(16.7)	136(72.3)	252(75.2)
Blood pressure apparatus (digital)	1(50.0)	10(71.4)	55(44.0)	5(83.3)	53(28.2)	124(37.0)
Examination light that can be aimed (flashlight acceptable)	1(50.0)	7(50.0)	80(64.0)	5(83.3)	51(27.1)	143(42.7)
Otoscope	1(50.0)	4(28.6)	60(48.0)	2(33.3)	43(22.9)	110(32.8)
Opthalmoscope	1(50.0)	1(7.1)	43(34.4)	4(66.7)	31(16.5)	80(23.9)
Ultrasound	1(50.0)	1(7.1)	53(42.4)	2(33.3)	39(20.7)	95(28.4)
Micronebulizer	1(50.0)	7(50.0)	45(36.0)	2(33.3)	10(5.3)	65(19.4)
Doppler	1(50.0)	0	23(18.4)	1(16.7)	6(3.2)	30(9.0)

Table 3.5: Equipment for Emergency Respiratory Support

Equipment For Emergency Respiratory Support	National Referral Hospital n (% of 2)	Regional Referral Hospital n (% of 14)	General Hospital n (% of 125)	Specialty Hospital n (% of 6)	HCIV n (% 188)	Total n (% of 335)
Ventilator	1 (50.0)	5(35.7)	39(31.2)	3(50.0)	25(13.3)	73(21.8)
Suction apparatus (manual)	1(50.0)	6(42.9)	44(35.2)		56(29.8)	107(31.9)
Suction apparatus (electronic)	1(50.0)	10(71.4)	45(36.0)	2(33.3)	37(19.7)	95(28.4)
Cricothyroidotomy set						
Chest tubes and insertion set	1(50.0)	4(28.6)	33(26.4)	1(16.7)	24(12.8)	63(18.8)
Oropharyngeal airway-adult	1(50.0)	10(71.4)	50(40.0)	1(16.7)	43(22.9)	105(31.3)
Oropharyngeal airway-paediatric	1(50.0)	8(57.1)	38(30.4)	2(33.3)	30(16.0)	79(23.6)
Endotracheal tube-uncuffed sizes 3.0 to 5.0	1(50.0)	4(28.6)	39(31.2)	1(16.7)	26(13.8)	71(21.2)
Endotracheal tube-cuffed sizes 5.5 to 9.0	1(50.0)	6(42.9)	40(32.0)	1(16.7)	28(14.9)	76(22.7)
Self-inflating bag and mask- adult(ambu bag)	1(50.0)	10(71.4)	69(55.2)	1(16.7)	55(29.3)	136(40.6)
Self-inflating bag and mask- paediatric (ambu bag)	0	7(50.0)	56(44.8)	2(33.3)	45(23.9)	110(32.8)
Neonatal bag and mask with valve size 1 for term babies (for new-born resuscitation)	1(50.0)	4(28.6)	41(32.8)	2(33.3)	32(17.0)	80(23.9)
Pulse oximeter	1(50.0)	7(50.0)	56(44.8)	4(66.7)	23(12.2)	91(27.2)
Oxygen concentrator	0	11(78.6)	64(51.2)	2(33.3)	33(17.6)	110(32.8)
Flow meter for oxygen therapy (with humidification)	0	11(78.6)	51(40.8)	2(33.3)	26(13.8)	90(26.9)
Oxygen delivery apparatus (cylinder head and key connecting tubes and mask/nasal prongs)	0	11(78.6)	59(47.2)	2(33.3)	28(14.9)	100(29.9)
Filled oxygen cylinder or functioning central oxygen supply	1(50.0)	8(57.1)	51(40.8)	2(33.3)	24(12.8)	86(25.7)

Table 3.6: Health Care waste management

Disposal of sharps	National Referral Hospital (% of 2)	Regional Referral Hospital n(% of 14)	General Hospital n(% of 125)	Specialty Hospital n(% of 6)	HIV n(% of 187)	Total n(% of 334)
1. Burn incinerator- 2-chamber industrial (800-1000+ºc)	2(100)	5(35.71)	19(15.2)	1(16.67)	11(5.88)	38(11.38)
2. Burn incinerator- 1-chamber drum/brick	0(0.00)	3(21.43)	54(43.2)	4(66.67)	36(19.25)	97(29.04)
3. Open burning- flat ground- no protection	0(0.00)	1(7.14)	7(5.6)	0(0.00)	46(24.6)	54(16.17)
4. Open burning- pit or protected ground	0(0.00)	2(14.29)	18(14.4)	0(0)	72(38.5)	92(27.54)
5. Dump without burning- open pit - no protection	0(0.00)	0(0.00)	0(0.00)	0(0.00)	9(4.81)	10(2.99)
6. Dump without burning- protected ground or pit	0(0.00)	1(7.14)	1(0.8)	0(0.00)	2(1.07)	4(1.2)
7. Remove offsite- stored in covered container	0(0.00)	0(0.00)	15(12)	1(16.67)	7(3.74)	23(6.89)
8. Remove offsite- stored in other protected environment	0(0.00)	1(7.14)	7(5.6)	0(0.00)	0(0.00)	8(2.4)
9. Other forms of disposals of waste	0(0.00)	0(0.00)	4(3.2)	0(0.00)	2(1.07)	6(1.8)
Observe sharps waste disposal site and note condition						
10. No waste visible	0(0)	4(28.57)	62(49.6)	3(50)	74(39.57)	143(42.81)
11. Waste visible but protected area	2(100)	7(50)	37(29.6)	2(33.33)	41(21.93)	89(26.65)
12. Waste visible, not protected	0(0.00)	2(14.29)	19(15.2)	1(16.67)	68(36.36)	90(26.95)
13. Waste site not inspected	0(0.00)	1(7.14)	7(5.6)	0(0.00)	4(2.14)	12(3.59)
Disposal of medical waste						
14. Same as for sharp items	2(100)	1(7.14)	14(11.2)	1(16.67)	13(6.95)	31(9.28)
15. Burn incinerator- 2-chamber industrial (800-1000+ºc)	0(0.00)	1(7.14)	12(9.6)	0(0.00)	5(2.67)	18(5.39)
16. Burn incinerator- 1-chamber drum/brick	0(0.00)	3(21.43)	37(29.6)	3(50)	18(9.63)	61(18.26)
17. Open burning- flat ground- no protection	0(0.00)	4(28.57)	8(6.4)	1(16.67)	48(25.67)	61(18.26)
18. Open burning- pit or protected ground	0(0.00)	3(21.43)	29(23.2)	0(0.00)	77(41.18)	109(32.63)
19. Dump without burning- open pit - no protection	0(0.00)	1(7.14)	2(1.6)	0(0.00)	11(5.88)	14(4.19)

Disposal of sharps	National Referral Hospital (% of 2)	Regional Referral Hospital n(% of 14)	General Hospital n(% of 125)	Specialty Hospital n(% of 6)	HIV n(% of 187)	Total n(% of 334)
20. Remove offsite- stored in covered container	0(0.00)	0(0.00)	14(11.2)	1(16.67)	6(3.21)	21(6.29)
21. Remove offsite- stored in other protected environment	0(0.00)	1(7.14)	6(4.8)	0(0.00)	2(1.07)	9(2.69)
22. Remove offsite- store unprotected	0(0.00)	0(0.00)	1(0.8)	0(0.00)	2(1.07)	3(0.9)
23. Other forms of medical waste disposal	0(0.00)	0(0.00)	2(1.6)	0(0.00)	0(0.00)	2(0.6)
Observe medical waste disposal site and note condition						
24. Waste visible	1(50)	2(14.29)	62(49.6)	2(33.33)	67(35.83)	134(40.12)
25. Waste visible but protected area	1(50)	7(50)	38(30.4)	2(33.33)	36(19.25)	84(25.15)
26. Waste visible, not protected	0(0.00)	4(28.57)	18(14.4)	2(33.33)	78(41.71)	102(30.54)
27. Waste site not inspected	0(0.00)	1(7.14)	7(5.6)	0(0.00)	6(3.21)	14(4.19)
28. Incinerator functioning	2(100)	8(100)	69(90.79)	5(100)	42(87.5)	126(90.65)
29. Fuel available for incinerator	2(100)	6(75)	60(86.96)	3(60)	35(83.33)	106(84.13)
30. Routine maintenance schedule for the incinerator	0(0)	6(75)	59(77.63)	2(40)	25(52.08)	92(66.19)
31. Guidelines on health care waste management	0(0)	2(14.29)	47(37.6)	1(16.67)	53(28.34)	103(30.84)
32. Staff trained health care waste management	0(0)	8(57.14)	79(63.2)	4(66.67)	93(49.73)	184(55.09)

Table 3.7: Facility support systems

Human resources services	National Referral Hospital (% of 2)	Regional Referral Hospital n(% of 14)	General Hospital n(% of 125)	Specialty Hospital n(% of 6)	HIV n(% of 187)	Total n(% of 334)
1. Available, managed by facility staff	2(100)	14(100)	93(74.4)	5(83.33)	82(43.85)	196(58.68)
2. Available, managed by external contractor or externally cont.	0(0)	0(0)	1(0.8)	0(0)	0(0)	1(0.3)
3. Available, managed by higher level affiliated management out	0(0)	0(0)	16(12.8)	0(0)	54(28.88)	70(20.96)
4. Not available	0(0)	0(0)	15(12)	1(16.67)	51(27.27)	67(20.06)
FINANCE/ACCOUNTING SERVICES						
5. Available, managed by facility staff	2(100)	14(100)	111(88.8)	6(100)	127(67.91)	260(77.84)
6. Available, managed by external contractor or externally cont.	0(0)	0(0)	1(0.8)	0(0)	1(0.53)	2(0.6)
7. Available, managed by higher level affiliated management out	0(0)	0(0)	11(8.8)	0(0)	33(17.65)	44(13.17)
8. Not available	0(0)	0(0)	2(1.6)	0(0)	26(13.9)	28(8.38)
SOCIAL SERVICES						
9. Available, managed by facility staff	2(100)	10(71.43)	83(66.4)	3(50)	58(31.02)	156(46.71)
10. Available, managed by external contractor or externally cont.	0(0)	1(7.14)	0(0)	0(0)	3(1.6)	4(1.2)
11. Available, managed by higher level affiliated management out	0(0)	0(0)	4(3.2)	0(0)	8(4.28)	12(3.59)
12. Not available	0(0)	3(21.43)	38(30.4)	3(50)	118(63.1)	162(48.5)

Table 3.8: Staff transportation services and staff housing/hostel services

	National Referral Hospital (% of 2)	Regional Referral Hospital n(% of 14)	General Hospital n(% of 125)	Specialty Hospital n(% of 6)	HIV n(% of 187)	Total n(% of 334)
STAFF TRANSPORTATION SERVICES						
1. Available, managed by facility staff	2(100)	8(57.14)	48(38.4)	2(33.33)	23(12.3)	83(24.85)
2. Available, managed by external contractor or externally cont.	0(0)	0(0)	2(1.6)	1(16.67)	1(0.53)	4(1.2)
3. Available, managed by higher level affiliated management out	0(0)	0(0)	2(1.6)	0(0)	4(2.14)	6(1.8)
4. Not available	0(0)	6(42.86)	73(58.4)	3(50)	159(85.03)	241(72.16)
5. Facility motor pool/vehicle management services						
6. Available, managed by facility staff	2(100)	11(78.57)	69(55.2)	2(33.33)	56(29.95)	140(41.92)
7. Available, managed by external contractor or externally cont.	0(0)	1(7.14)	6(4.8)	2(33.33)	2(1.07)	11(3.29)
8. Available, managed by higher level affiliated management out	0(0)	0(0)	5(4)	0(0)	19(10.16)	24(7.19)
9. Not available	0(0)	2(14.29)	45(36)	2(33.33)	110(58.82)	159(47.6)
STAFF HOUSING/HOSTEL SERVICES						
10. Available, managed by facility staff	2(100)	11(78.57)	79(63.2)	1(16.67)	118(63.1)	211(63.17)
11. Available, managed by external contractor or externally cont.	0(0)	0(0)	2(1.6)	1(16.67)	3(1.6)	6(1.8)
12. Available, managed by higher level affiliated management out	0(0)	0(0)	3(2.4)	0(0)	19(10.16)	22(6.59)
13. Not available	0(0)	3(21.43)	41(32.8)	4(66.67)	47(25.13)	95(28.44)

Table 3.9: Percentage of facilities with the indicated HMIS staffing

Staffing	Managing Authority							Total %
	Ministry of Health n(%)	Local Government n(%)	Military/Police/National Guard/Prisons n(%)	University n(%)	Ngo/Not-For-Profit n(%)	Mission/Faith-Based n(%)	Private Health Practitioner n(%)	(I)
Full-time HMIS designated staff	53(98.15)	159(95.21)	5(83.33)	0(0.00)	12(92.31)	55(96.49)	16(48.48)	300(90.63)
Total number of inpatient facilities	54(100.00)	167(100.00)	6(100.00)	1(100.0)	13(100.00)	57(100.00)	32(100.00)	330(100.00)
Qualification of HMIS in-charge								
Health information officer/data manager	28(51.85)	85(50.90)	4(66.67)	0(0.00)	8(61.54)	31(54.39)	4(12.50)	160(48.48)
Other technical staff with data training	13(24.07)	64(38.32)	1(16.67)	0(0.00)	3(23.08)	17(29.82)	5(15.63)	103(31.21)
Other non-technical staff with data training	11(20.37)	5(2.99)	0(0.00)	0(0.00)	0(0.00)	2(3.51)	4(12.50)	22(6.67)
Other technical staff with no data training	0(0.00)	1(0.60)	0(0.00)	1(100.00)	1(7.69)	1(1.75)	2(6(6.25)	6(1.82)
Other non-technical staff with no data training	0(0.00)	4(2.40)	0(0.00)	0(0.00)	0(0.00)	2(3.51)	2(6.25)	8(2.42)
No HMIS in charge	0(0.00)	1(0.60)	0(0.00)	0(0.00)	1(7.69)	1(1.75)	9(28.13)	12(3.64)
Median number full-time HMIS staff	47	155	5	0	11	54	15	287

Staffing	Managing Authority							Total %
	Ministry of Health n(%)	Local Government n(%)	Military/Police/National Guard/Prisons n(%)	University n(%)	Ngo/Not-For-Profit n(%)	Mission/Faith-Based n(%)	Private Health Practitioner n(%)	(I)
Health information officers training								
Statistics degree	10(18.52)	9(5.42)	0(0.00)	0(0.00)	4(33.33)	14(25.00)	3(13.04)	40(12.58)
Diploma	13(24.07)	42(25.30)	0(0.00)	0(0.00)	2(16.67)	14(25.00)	3(13.04)	74(23.27)
Short-term course	15(27.78)	66(39.76)	3(50.00)	1(100.00)	4(33.33)	11(19.64)	5(21.74)	105(33.02)
In-service training	1(1.85)	7(4.22)	0(0.00)	0(0.00)	0(0.005)	6(10.71)	1(4.35)	15(4.72)
No formal training	15(27.78)	42(25.30)	3(50.00)	0(0.00)	2(16.67)	11(19.64)	11(47.83)	84(26.42)
Medical records clerk								
Statistics degree	2(3.70)	2(1.20)	0(0.00)	0(0.00)	3(25.00)	4(7.14)	1(4.35)	12(3.77)
Diploma	9(16.67)	20(12.05)	1(16.67)	0(0.00)	1(8.33)	11(19.64)	3(13.04)	45(14.15)
Short-term course	23(42.59)	55(33.13)	3(50.00)	0(0.00)	2(16.67)	14(25.00)	6(26.09)	103(32.39)
In-service training	6(11.11)	11(6.63)	0(0)	0(0)	1(8.33)	9(16.07)	0(0)	27(8.49)
No formal training	14(25.93)	78(46.99)	2(33.33)	1(100)	5(41.67)	18(32.14)	13(56.52)	131(41.19)

Table 3.10: Percentage of facilities with reporting norms

Reporting norms	Managing authority							Total
	Ministry of Health n(%)	Local Government n(%)	Military/Police/ National Guard/Prisons n(%)	University n(%)	NGO/not-for-profit n(%)	Mission/ Faith-based n(%)	Private Health Practitioner n(%)	n(%)
Submits reports externally	52(96.3)	167(100)	6(100)	1(100)	12(92.31)	56(98.25)	25(78.13)	319(96.67)
Location where external HMIS reports are submitted								
Central MOH	47(90.38)	107(64.07)	4(66.67)	0(0)	11(91.67)	42(75)	11(44)	222(69.59)
District Health Office	48(92.31)	164(98.2)	6(100)	1(100)	12(100)	55(98.21)	21(84)	307(96.24)
Specific programs	40(76.92)	121(72.46)	3(50)	0(0)	10(83.33)	41(73.21)	15(60)	230(72.1)
Donors or implementing partners	36(69.23)	106(63.47)	2(33.33)	0(0)	9(75)	41(73.21)	7(28)	201(63.01)
Non-governmental managing authorities	7(13.46)	36(21.56)	2(33.33)	0(0)	8(66.67)	34(60.71)	5(20)	92(28.84)
Most frequency timing for submitting any reports externally								
Weekly	5(9.62)	28(16.77)	0(0)	0(0)	2(16.67)	7(12.5)	2(8)	44(13.79)
Monthly	47(90.38)	136(81.44)	6(100)	0(0)	9(75)	46(82.14)	20(80)	264(82.76)
Quarterly	0(0)	0(0)	0(0)	0(0)	0(0)	2(3.57)	1(4)	3(0.94)
Annually	0(0)	3(1.8)	0(0)	0(0)	1(8.33)	0(0)	0(0)	4(1.25)
Never	0(0)	0(0)	0(0)	1(100)	0(0)	1(1.79)	2(8)	4(1.25)
Evidence observed most recent summary statistics report submitted within the due date	47(92.16)	137(82.53)	5(83.33)	8(80)	49(89.09)	15(65.22)	261(83.92)	47(92.16)
Number of inpatient facilities submitting reports externally	52(100)	167(100)	6(100)	1(100)	12(100)	56(100)	25(100)	319(100)

Table 3.11: Percentage of facilities with the indicated HMIS reporting norms

Norms	Managing authority							Total %
	Ministry of health n(%)	local government n(%)t	Military/ Police/ National Guard/Prisons n(%)	University n(%)	NGO/not-for-Profit n(%)	Mission/ Faith-based n(%)	Private Health Practitioner n(%)	(l)
Compulsory submission of morbidity statistics for admissions	49(92.45)	139(89.1)	6(100)	1(100)	12(92.31)	54(98.18)	20(64.52)	281(89.21)
ICD codes used for morbidity statistics	3(6)	1(0.66)	0(0)	0(0.00)	1(9.09)	4(7.14)	1(4.76)	10(3.41)
Cancer statistics								
Facility offers cancer services and reports separately on cancer	5(9.26)	14(8.38)	0(0.00)	0(0.00)	3(23.08)	13(22.81)	5(15.15)	40(12.08)
Facility offers cancer services but does not report separately on cancer	5(100)	6(42.86)	0(0.00)	0(0.00)	1(33.33)	7(53.85)	3(60)	22(55)
Facility offers no cancer services	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	1(7.69)	0(0)	1(2.5)
Any deaths reported to authorities outside hospital	46(85.19)	152(91.02)	4(66.67)	0(0)	10(76.92)	50(87.72)	15(46.88)	277(83.94)
Information on deaths submitted external to facility								
Number of deaths	46(100)	150(98.68)	4(100)	0(0.00)	10(100)	50(100)	14(93.33)	274(98.92)
Cause of death	42(91.3)	140(92.11)	4(100)	0(0.00)	9(90)	50(100)	14(93.33)	259(93.5)
Age of deceased	33(71.74)	108(71.05)	4(100)	0(0.00)	8(80)	43(86)	12(80)	208(75.09)
Individual death cases	31(67.39)	101(66.45)	4(100)	0(0.00)	5(50)	36(72)	10(66.67)	187(67.51)
Death certificate form used								
International medical certificate of death used for all deaths	14(25.93)	28(16.77)	2(33.33)	0(0.00)	1(7.69)	14(24.56)	4(12.5)	63(19.09)

MOH/Government death certificate used	20(50)	50(35.97)	0(0)	0(0)	6(50)	15(34.88)	4(14.29)	95(35.58)
No death certificate form routinely used	15(37.5)	63(45.32)	2(50)	1(100)	1(8.33)	6(13.95)	5(17.86)	93(34.83)
ICD coding and cause of death								
ICD coding used for cause of death	4(7.41)	2(1.2)	0(0.00)	0(0.00)	0(0.00)	6(10.53)	1(3.13)	13(3.94)
Trained person coding cause of death with ICD	4(100)	2(100)	0(0.00)	0(0.00)	0(0.00)	5(83.33)	1(100)	12(92.31)

Table 3.12: Percentage of facilities with the indicated data quality systems

Quality systems	Managing authority							Total
	Ministry of Health n(%)	local government n(%)	Military/Police /National Guard/Pris	University n(%)	NGO/not-for-profit n(%)	mission/ faith-based n(%)	Private Health Practitioner n(%)	
Facility has routine and systematic process for data quality checking	33(61.11)	104(62.28)	4(66.67)	0(0.00)	10(76.92)	44(77.19)	14(43.75)	209(63.33)
Written policy or guidelines for data quality checks observed	11(33.33)	52(50)	2(50)	0(0.00)	3(30)	16(36.36)	3(21.43)	87(41.63)
Routine data quality check processes								
Double check addition or transcribing within unit	26(78.79)	86(82.69)	4(100)	0(0.00)	8(80)	37(84.09)	12(85.71)	173(82.78)
Double check addition or transcribing from outside unit	21(63.64)	61(58.65)	2(50)	0(0.00)	9(90)	28(63.64)	10(71.43)	131(62.68)
Any consistency checks of summarized data	26(78.79)	75(72.12)	3(75)	0(0.00)	9(90)	37(84.09)	10(71.43)	160(76.56)
Supervisor checks registers for completeness	27(81.82)	93(89.42)	3(75)	0(0.00)	9(90)	41(93.18)	13(92.86)	186(89)
Any staff trained I completing client data and reporting forms	27(81.82)	70(67.31)	1(25)	0(0.00)	6(60)	35(79.55)	11(78.57)	150(71.77)
Any data quality checks by persons external to facility	17(51.52)	65(62.5)	3(75)	0(0.00)	6(60)	29(65.91)	7(50)	127(60.77)
Written documentation of data quality check results	11(33.33)	64(61.54)	1(25)	0(0)	7(70)	27(61.36)	8(57.14)	118(56.46)
Frequency that data quality checks are documented								
Monthly	5(45.45)	27(42.19)	1(100)	0(0.00)	3(42.86)	11(40.74)	3(37.5)	50(42.37)
Every 2-3 months	4(36.36)	22(34.38)	0(0)	0(0.00)	3(42.86)	9(33.33)	1(12.5)	39(33.05)
Every 6-12 months	0(0.00)	3(4.69)	0(0.00)	0(0.00)	0(0.00)	2(7.41)	0(0)	5(4.24)
No set times	2(18.18)	12(18.75)	0(0.00)	0(0.00)	1(14.29)	5(18.52)	4(50)	24(20.34)

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