Chapter 3
A 24-Hour Walk Through Mulago National Referral Hospital, Uganda: What Kind of In-Patients Do You See?

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Abstract Mulago hospital is the final general National Referral Hospital (NRH) in Uganda, and having one such hospital is not unusual in many Low and Middle Income Countries. Mulago hospital, as the nation's referral facility has a bed capacity of 1,790 but frequently the number of inpatients exceeds the available beds, hence creating floor cases. Social demographic characteristics of patients and reasons for hospitalization are not well documented and the reasons for the hospital's congestion are not clear but may be related to the relative lack of other general hospital facilities in the city. The country is currently in the process of decongesting the hospital.

To better inform the decongestion process, a census of all inpatients in the NRH was carried out over 24 h starting early morning of 14th July, 2011. One hundred eighteen health workers, who were mostly nurses and midwives, were consecutively selected and trained for data collection. Some data collectors worked during the day and others during the night. The main tool used for data collection was a transcription form on which all data from the patient files were recorded. All data were entered in epidata v3 software and exported to STATA v10. Descriptive statistics involving population pyramid and cross-tabulations were used to present the profile of the in-patients.

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The total number of inpatients in Mulago national referral hospital was 1,763 at the time of the survey. The majority of the patients were female (60 %), youth (15–24 years) [40 %] or under-fives (<5 years) [18 %], from Kampala city and Wakiso district (64 %), had attained at least primary level of education (53 %) but were unemployed/low income earners (54 %). Of the patients seen, 29 % were admitted on the surgical ward, 25 % on obstetrics and gynecology ward, 20 % on the medical ward, 18 % on the pediatric ward, 5 % on the cancer institute and 1 % on the psychiatric ward. Very few inpatients (8, 0.5 %) were from outside the country. These results add more support for the need to decongest the national referral hospital e.g. by building other general hospital facilities in the city.

Keywords Mulago Hospital National Referral Hospital • In patient survey • Surgical ward • Obstetrics and gynecology ward • Medical wards • Pediatric ward • Cancer institute • Psychiatric ward

Introduction

Mulago Hospital was founded in 1913 by Albert Ruskin Cook [1] and it started as a Sexually Transmitted Disease and Trypanosomiasis treatment centre. The new and main part of the hospital was completed in 1962, at the time of the country's independence. It has 1,790 beds and runs on an annual budget of UShs 56.8 billion (US$22.7 million) [2] which is far below the amount required for full functioning. The government budgetary allocation to the health sector is, on average, 9.6 % of the total government budget [3] and Mulago hospital alone consumes approximately 12 % of it [2]. On a daily basis the hospital receives 6,000–7,000 outpatients and 2,000–3,000 inpatients per day (Executive Director Mulago Hospital, 21 May 2014, State of Mulago Hospital, Personal communication, Kampala). In terms of staffing, the hospital has 87 % of its approved posts (2,423/2,801) filled by the health workers [4]. The Hospital is a University teaching hospital and offers comprehensive specialist clinical services that include psychiatry, Ear, Nose and Throat (ENT), ophthalmology, higher level surgical and medical services, general medical services, pediatric and clinical support services (laboratory, medical imaging, pathology), as well as conducting health research [3]. Of note is that up to today (2014), the hospital has no geriatric medicine service, despite an increasing population of people aged 60 years and above. The Administration of the hospital runs through seven directorates namely: Medical, surgical, diagnostics, obstetrics and gynecology, pediatrics and child health, finance and administration, as well as Private patients services.

The patient demand for specialist services at most referral facilities in Africa greatly varies depending on whether a particular service is available at the health facility in their neighborhood. For instance, a study carried out at Muhimbili referral hospital in Tanzania found that of all the patients who presented at the referral facility, the (36.8 %) sought for surgical services, followed by obstetrics and gynecology

services (29.9 %), general medicine (18.9 %), pediatric and neonatal services (9.4). Only 3.5 % sought psychiatric services, while 1.5 % sought other services [5]. Some patients also presented to the referral facility simply because the facility was the one nearest to them, instead of visiting lower level facilities where their conditions could easily be managed. This contributes to unnecessary congestion and inappropriate use of referral facilities [5, 6].

The immediate catchment population of Mulago hospital is estimated at three million people (9.4 % of national population) in Kampala city and neighboring districts while the wider catchment population is the nation's estimated 35.4 million people [7]. At the current national population growth rate of 3.2 % and 5.6 % for Kampala city the catchment population is bound to increase considerably [7, 8]. The government and Kampala Capital City Authority (KCCA) have started implementing plans to decongest the hospital and already one large hospital has been constructed at Nagulu 4 km away from Mulago NRH. Information on the kind of patients which Mulago hospital admits is, however, very scanty yet it would guide on the nature and capacity needed for the new health infrastructural developments in the city and neighboring districts. This paper provides a socio-demographic description of the in-patients currently seen at the hospital.

Methods

A 24 h census of all in-patients at Mulago national referral hospital was carried out starting at 8 am of the 14th of July and ended at 8 am of 15th July 2010. The main objective of the census was to determine the prevalence of life limiting illnesses at the hospital but this paper re-analyses the data to focus on description of the patients. The main method of data collection was record review using a standardized transcription form on which all information from the patient file was recorded. All wards were visited. One hundred eighteen health workers, mostly nurses and midwives, were selected and trained for data collection. The data collectors worked in shifts. Information was collected on the patient's records and through observations. It included demographic and social characteristics, area of residence, attendants and date and time of admission. All data collected were entered in epidata V3 software whose data entry screen had been fitted with range and consistency checks. The data were exported to STATA V12 for analysis which involved basic frequency and cross-tabulations.

Results

General Description

Overall, there were 1,763 inpatients from the existing 40 wards in the hospital at the time of the survey giving a bed occupancy rate of 98.5 %. Of the 1,763 patients, 29 % were admitted on the surgical ward, 25.4 % to the obstetrics and Gynecology

ward, 20.2 % to the medical ward, 18 % to the pediatric ward, 5 % to the cancer institute, 1 % to both the psychiatric and heart institute (Fig. 3.1). The figure further shows that the commonest cause of admission among men were conditions that needed surgery while among women it was obstetrics and gynaecology (birthing) conditions. The next common cause of admission among males was paediatric related conditions while among females it was conditions that need surgery.

Figure 3.2 shows a population pyramid for patients in Mulago and the national population pyramid. While patients' age distribution is not expected to be the same distribution with the general population the figure is an important tool for description and discussion of in-patients. It is clear that under 5 s and women in middle ages were the most prevalent in-patients. Those aged 60 years and above were 10 % of the in-patients. Nationally the proportion aged 60 years and above is 2.5 % [9].

Table 3.1 shows general characteristics of the inpatients found in the hospital on the census day. Expectedly, close to a half (44 %) of the inpatients originated from Kampala city while 20 % come from Wakiso district which almost encircles Kampala. Other neighboring districts contribute 11 % while other districts contribute almost a quarter (24 %). Most of the in-patients were married (39 %) and this was more evident among women (44 %) than men (35 %). The number of divorced was 11 % and it was higher among women (14 %) than men (6 %). When the under 15 year olds and those missing information are deducted the proportion of the widowed/divorced becomes 15.5 %.

The most prevalence education attainment is primary level (36 %) and it was nearly the same for men and women. The next prevalent is secondary education. Education level was not applicable to 18 % of the inpatients because they were under 5 years old.

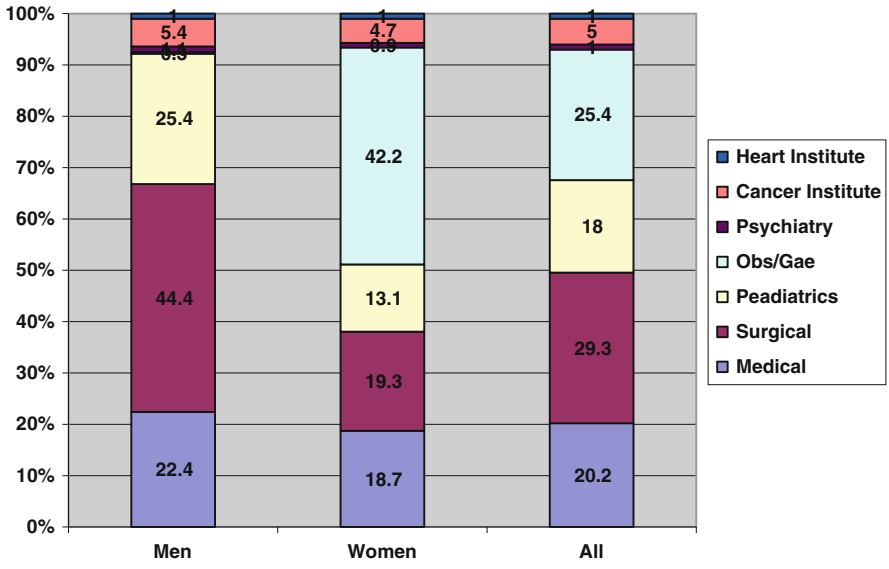

Fig. 3.1 Distribution of the in-patients by sex and ward

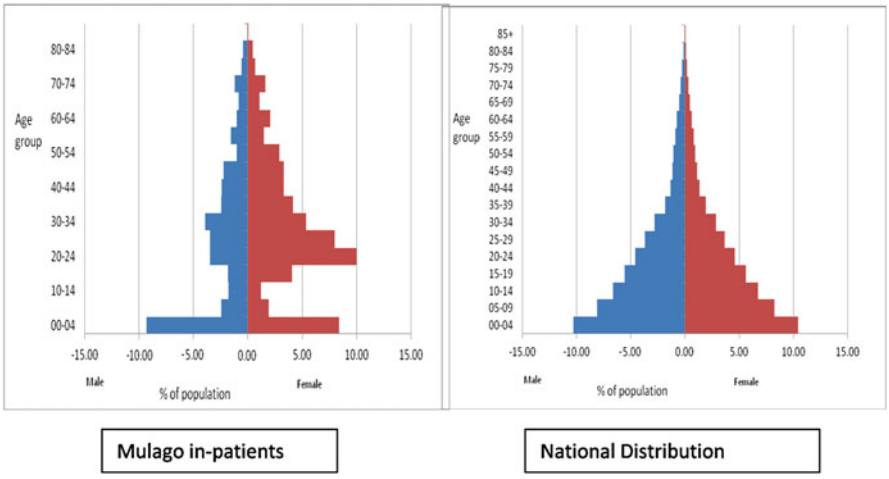

Fig. 3.2 Distribution of the inpatients by age and sex compared to the national distribution

The religious distribution of the in-patients reflected the country's picture in that all major religions were represented except that the level of representation differs. For example according to the 2001 national census Catholics were 41 % while Muslims were 15 %. During the study night at the NRH the Catholics were 33 % while Muslims were 22 %.

The occupation distribution showed high unemployment levels among these inpatients. Nearly a third (30 %) were not employed, 16 % were peasant farmers while those engaged in manual labour were nearly 9 %. Since manual labour and peasant farming are normally regarded as low paying employment this puts the prevalence of unemployed/low income inpatient at 54 %. When children under 15 those whose information is missing are left out the proportion of the unemployed/manual labour/peasant farmers rises to 74 %.

Ward Specific Descriptions

Table 3.2 shows the ward specific information. In this section the inpatients are described ward by ward.

Medical Wards

In the medical wards, females (57 %) were more than males (44 %) and it was dominated by people aged 25–55 years (60.2 %). The distribution by district shows most people were from either Kampala or Wakiso district (74 %). The majority were either married or single. Being from mainly urban area explains the relatively high proportion that had attained tertiary level education (12 %).

Table 3.1 Overall background characteristics of the in-patients by sex

Characteristics	Males	Female	All	Chi-sq test
Age group				
<5	163(23.2)	147(14.0)	310(17.6)	p<0.001
5–14	74(10.5)	55(5.2)	129(7.4)	
15–24	93(13.3)	246(23.4)	339(19.3)	
25–34	130(18.5)	234(22.2)	364(20.8)	
35–44	85(12.1)	131(12.5)	216(12.3)	
45–54	57(8.1)	109(10.4)	166(9.5)	
55+	100(14.3)	130(12.4)	230(13.1)	
District				
Wakiso	133(18.9)	220(20.8)	353(20.0)	p<0.001
Kampala	281(39.9)	501(47.4)	782(44.4)	
Neighboring districts	90(12.8)	101(9.6)	191(10.8)	
Other districts	199(28.2)	230(21.7)	429(24.3)	
Outside the country	2(0.3)	6(0.6)	8(0.5)	
Marital status				
Single	150(21.3)	183(17.3)	333(18.9)	p<0.001
Married	244(34.6)	438(41.4)	682(38.7)	
Divorced/widowed	41(5.8)	146(13.8)	187(10.6)	
Not applicable[a]	234(33.2)	202(19.1)	436(24.7)	
Missing information	36(5.1)	89(8.4)	125(7.1)	
Education				
None	64(9.1)	143(13.5)	207(11.7)	p<0.001
Primary	239(33.9)	381(36.0)	620(35.2)	
Secondary	149(21.1)	285(26.9)	434(24.6)	
Tertiary	69(9.8)	79(7.5)	148(8.4)	
Not applicable (<5 years)	162(23.0)	146(13.8)	308(17.5)	
Missing information	22(3.1)	24(2.3)	46(2.6)	
Religion				
Catholic	221(31.4)	357(33.7)	578(32.8)	P=0.178
Protestant	273(38.7)	366(34.6)	639(36.3)	
Moslem	154(21.8)	225(21.3)	379(21.5)	
Pentecostal	38 (5.4)	86(8.1)	124(7.0)	
Other Christian	15(2.1)	19(1.8)	34(1.9)	
Missing	4 (0.6)	5(0.5)	9(0.5)	
Occupation				
None	157(22.3)	367(34.7)	524(29.7)	p<0.001
Peasant farmer	106(15.0)	168(15.9)	274(15.5)	
Business	71(10.1)	113(10.7)	184(10.4)	
Manual labour	61(8.7)	91(8.6)	152(8.6)	
Formal employment	76(10.8)	76(7.2)	152(8.6)	
Not applicable[a]	208(29.5)	187(17.7)	395(22.4)	
Missing information	26(3.7)	56(5.3)	82(4.7)	
All	706(400.0)	1058(60.0)	1,763(100.0)	

[a] Mostly under 15 years

Table 3.2 Socio-demographic characteristics by major ward category

Characteristics	Medical	Surgical	Paed-iatrics	Obstetrics/ gynacol	Psychiatry	Cancer institute	Heart institute	All
Sex								
Male	158(44.4)	313(60.5)	179(56.3)	00	8(44.4)	38(43.2)	7(38.9)	705(40.0)
Female	198(55.6)	204(39.5)	139(43.7)	446(99.6)	10(55.6)	50(56.8)	11(61.1)	1058(60.0)
Age group								
<5	0(0.0)	47(9.2)	254(79.9)	0(0.0)	0(0.0)	2(2.3)	2(11.1)	310(17.7)
5–14	8(2.2)	42(8.2)	64(20.1)	3(0.7)	1(5.6)	16(18.2)	1(5.6)	129(7.5)
15–24	63(18.0)	83(16.2)	0(0.0)	175(39.1)	8(44.4)	9(10.2)	1(5.6)	339(19.3)
25–34	89(25.4)	115(22.4)	0(0.0)	145(32.4)	4(22.2)	9(10.2)	1(5.6)	364(20.8)
35–44	80(22.8)	64(12.5)	0(0.0)	58(13.0)	1(5.6)	11(12.5)	2(11.1)	216(12.3)
45–54	47(13.4)	57(11.1)	0(0.0)	36(8.0)	3(16.7)	18(20.5)	5(27.8)	166(9.5)
55+	64(18.2)	105(20.5)	0(0.0)	31(6.9)	1(5.6)	23(26.1)	6(33.3)	230(13.1)
District								
Wakiso	72(20.2)	80(15.5)	65(20.4)	123(27.5)	4(22.2)	6(6.8)	3(16.7)	353(20.0)
Kampala	191(53.7)	173(33.5)	182(57.2)	216(48.2)	7(38.9)	8(9.1)	5(27.8)	782(44.4)
Neighboring districts	34(9.6)	72(13.9)	35(11.0)	39(8.7)	3(16.7)	7(8.0)	1(5.6)	191(10.8)
Other districts	57(16.0)	188(36.4)	36(11.3)	68(15.2)	4(22.2)	67(76.1)	9(50.0)	429(24.3)
Other country	2(0.6)	4(0.8)	0(0.0)	2(0.5)	0(0.0)	0(0.0)	0(0.0)	8(0.5)
Marital status								
Single	104(29.1)	126(24.4)	7(2.2)	72(16.1)	10(55.6)	11(12.5)	4(22.2)	333(18.9)
Married	157(44.1)	204(39.5)	0(0.0)	278(62.1)	2(11.1)	32(36.4)	8(44.4)	682(38.7)
Divorced/widowed	64(18.0)	55(10.6)	0(0.0)	42(9.4)	3(16.7)	19(21.6)	4(22.2)	187(10.6)
Not applicable[a]	9(2.5)	85(16.4)	311(97.8)	10(2.2)	1(5.6)	18(20.5)	2(11.1)	436(24.7)
Missing information	22(6.2)	47(9.1)	0(0.0)	46(10.3)	2(11.1)	8(9.1)	0(0.0)	125(7.1)

(continued)

Table 3.2 (continued)

Characteristics	Medical	Surgical	Paed-iatrics	Obstetrics/ gynacol	Psychiatry	Cancer institute	Heart institute	All
Education								
None	45(12.6)	77(14.9)	19(6.0)	45(10.0)	0(0.0)	19(21.6)	2(11.1)	207(11.7)
Primary	151(42.4)	201(38.9)	42(13.2)	179(40.0)	4(22.2)	36(40.9)	7(38.9)	620(35.2)
Secondary	100(28.1)	127(24.6)	1(0.3)	177(39.5)	9(50.0)	15(17.1)	5(27.8)	434(24.6)
Tertiary	42(11.8)	54(10.4)	0(0.0)	37(8.3)	3(16.7)	10(11.4)	2(11.1)	148(8.4)
NA (<5years)	4(1.1)	46(8.9)	253(79.6)	1(0.2)	0(0.0)	2(2.3)	2(11.1)	308(17.5)
Missing information	14(3.9)	12(2.3)	3(0.9)	9(2.0)	2(11.1)	6(6.8)	0(0.0)	46(2.6)
Occupation								
None	120(33.7)	150(29.0)	5(1.6)	211(47.0)	11(61.1)	20(22.7)	7(38.9)	524(29.7)
Peasant farmer	61(17.1)	116(22.4)	0(0.0)	51(11.4)	1(5.6)	41(46.6)	4(22.2)	274(15.5)
Business	60(16.9)	61(11.8)	0(0.0)	53(11.8)	2(11.1)	5(5.7)	3(16.7)	184(10.4)
Manual labour	50(14.0)	40(7.7)	1(0.3)	58(13.0)	2(11.1)	0(0.0)	1(5.6)	152(8.6)
Formal employment	38(10.7)	64(12.4)	0(0.0)	39(8.7)	2(11.1)	8(9.1)	1(5.6)	152(8.6)
Not applicable[a]	4(1.1)	63(12.2)	312(98.1)	3(0.7)	0(0.0)	11(12.5)	2(11.1)	395(22.4)
Missing information	23(6.5)	23(4.5)	0(0.0)	33(7.4)	0(0.0)	3(3.4)	0(0.0)	82(4.7)
Median length of stay+	6(2–12)	11(4–29)	3(1–6)	3(1–7)	–	17(2–108)	1(1–1)	4(2–12)
All	356(100.0)	517(100.0)	318(0.0)	448(100.0)	18(100.0)	88(100.0)	18(100.0)	1763(100.0)

[a]Mostly under 15 years+presented as median number of days (25th–75th percentile)

The proportion categorized as unemployed/low income earners was 65 % but when the under 15 year olds and whose information is missing are excluded, this becomes 70 %. The median number of days patients had stayed in the hospital was 6.

Surgical Wards

The surgical wards were dominated by males (61 %) and like the medical wards people aged 25–55 years were the dominant majority with only a fifth of the inpatients being aged 55 years and above. Unlike the medical wards, the highest proportion of the inpatients on the surgical wards were from other upcountry districts (36 %). Two fifth of the inpatients were married and 35 % had attained at least primary education. Over 59 % were unemployed or had low income employment and this proportion becomes 71 % after removing the under 15 year olds and those whose information was not given. Inpatients on the surgical wards stayed for a median of 11 days in the hospital.

Paediatrics Wards

The paediatric ward was dominated by male children (56.3 %) mostly aged under 5 years (80 %). They were mainly from Wakiso and Kampala (78 %). The ward had the least proportion of inpatients referred from upcountry (11 %). Occupation, marital status and education are not applicable to the in-patients. Inpatients on the ward had on stayed for a median of 3 days.

Obstetrics and Gynecology Wards

A high percentage of these (76 %) were aged 15–34 years and were mainly from Wakiso and Kampala (76 %). They were mainly married (62 %) with a sizable proportion having attained at least secondary education (48 %). Notably, the ward had the second highest proportion of inpatients unemployed (47 %) and (71 %) can be classified as unemployed/low income earners. The median number of days inpatients had stayed at the hospital was 3.

Psychiatry Ward

There were few psychiatry in-patients (18) and a higher proportion were women. They were inpatients from different age groups which were almost equally distributed. Of the adult psychiatric inpatients, over 39 % were from Kampala with referrals from districts neighboring Kampala and Wakiso district being 17 % and those from upcountry districts being 23 %. More than a half (56 %) were single and 67 %

had attained at least secondary school education and 60 % were unemployed. Data on length of stay were not available for the inpatients on the ward. There were no special psycho-geriatric beds but six children's beds.

Cancer Institute

The cancer institute was dominated by women (57 %) and people aged over 34 years (59 %) and they were mainly referrals from districts outside Kampala and the upcountry districts (76 %). Twenty eight percent had attained secondary level education. Thirty six percent were married while more than a fifth (22 %) were widowed or divorced. Thirty nine percent had attained primary level education while 28 % had attained secondary level. Thirty nine percent did not have a job while 67 % can be classified as belonging to the unemployed/low income group. The median number of days inpatients had stayed on the ward was 17.

Heart Institute

In the Heart Institute there were few (18) in-patients who were mainly females (61 %) and aged 45+ (61 %). A half of these had been referred from other districts beyond Kampala and surrounding districts. They were mainly married (44 %) or single (22 %). Thirty nine percent had attained secondary level education and the same proportion was unemployed. Fifty percent can be classified as unemployed/low income earners. Only five patients had information on length of stay and the median was 1 day.

Discussion

The results from this short study have shown that most inpatients in Mulago national referral hospital are female (60 %), youth (15–34) [40 %] or very young (<5) [18 %], from Kampala city (44 %) or Wakiso district (20 %), married (39 %) or single (19 %), had attained at least primary level of education (53 %), and were unemployed/low income earner (54 %). However, there were variations in profiles of inpatients by kind of ward. Of the 1,763 patients, 29 % were admitted on the surgical ward, 25.4 % to the obstetrics and Gynecology ward, 20.2 % to the medical ward, 18 % to the pediatric ward, 5 % to the cancer institute, 1 % to both the psychiatric and heart institute. Among males the commonest causes were surgical (44 %) and pediatrics (25 %) while among females they were obstetrics and gynecology related conditions (29 %) and those that need surgical services (19 %). Very few (eight) inpatients were from outside the country.

The results above have some similarity with those found in Bangladesh. A study by Begum et al. found that 53 % of those in lowest income quintile accounted for

53 % of use of public health services [10]. The users were also more likely to be uneducated. Also the distribution of the inpatients by ward is similar to that found in Muhimbili National referral hospital in Tanzania where they also found that inpatients mostly sought surgical services (37 %) followed by obstetrics and gynaecology services (30 %) and (19 %) paediatric services [5]. It is highly likely these referral cases came from areas where there was a deficit in provision of surgical and medical services and so they sought out for these services at the referral facilities.

The fact that the commonest cause of admission among men were conditions that needed surgery could imply that male medical conditions were appropriately managed at the lower level facilities while among women it was obstetrics and gynaecology conditions, indicating a challenge in provision of obstetric and gynecological conditions at those lower facilities. This is more so in Kampala and Wakiso districts as the majority (76 %) of inpatients on the Obstetrics and Gynecology wards were from these districts.

Most of the inpatients originated from Kampala city and Wakiso district (which surrounds Kampala). This could reflect a deficiency of primary health care facilities in these districts, and so patients were forced to visit a referral hospital despite the fact that they could have been handled at lower level facilities. It could also mean that Mulago is the nearest health facility to them and so it was easier for them to visit Mulago other than other facilities.

The high proportion of the unemployed/low income earners among the inpatients could indicate that the utilization of this facility is mainly by lower level socioeconomic status who may not afford to seek for the expensive private health facility services. It also suggests the government should continue offering free services at the facility since the majority of the patients were low income earners and of low education status.

The surgical ward had the highest proportion of the inpatients from other districts (36 %). This may imply that there is still a limitation in the management of surgical cases in these districts and thus requiring scaling up of surgical services in upcountry facilities. The fact that the paediatric ward had the least proportion of inpatients referred from upcountry could indicate adequate capacity to handle pediatric cases upcountry.

Although the Cancer and the Heart institutes had the least number of in patients (5 % and <1 %, respectively), most of these were patients from districts outside Kampala. This goes to show the challenge of managing cancer and heart condition at peripheral health facilities. In most cases the difficulties is compounded by inadequate diagnostic equipment and a lack of highly specialized personnel at the peripheral health facilities to manage these conditions, hence the need to seek for services at Mulago hospital. Psychiatric cases were also few indicating poor utilization of psychiatric services at general hospitals as is common elsewhere in Africa. The absence of geriatric services at Mulago hospital was a glaring omission which could explain old age degenerative disorders are poorly reflected in the hospitals statistics.

Conclusion

Most of the inpatients had low level of education (primary) regardless of sex, with high levels of unemployment.

The under 5 s and women in the age bracket of 25–55 constituted the biggest majority of the in-patients. Those aged 60 years and above were 10 % of the in-patients.

Most inpatients originate from Kampala and Wakiso districts and most were on the surgical wards, obstetrics and gynecology wards, medical wards and the pediatric wards. The commonest conditions responsible for causing admission were surgical amongst men and obstetric and gynaecological amongst the women.

There was a conspicuous absence of geriatric services despite 10 % of the inpatients being above 60 years old.

Recommendations

The results add more support for the current efforts to decongest the national referral hospital. More resources should be sought to build other hospitals in the city, Wakiso district and surrounding districts to decongest the National referral hospitals. The new facilities should focus more on obstetrics and gynecology, surgical and paediatrics services. There is also a need for a geriatric medicine department.

The standard of Mulago National referral hospital needs to be raised so that it appeals for all categories of the population of the country including the middle and high income groups. That way, it will attract more resources from within and outside the country.

This study could have been more easily carried out using hospital records if they were computerized. We recommend that the government looks for funding to computerize all medical records of the hospital. This will reduce expenditure on monitoring and evaluation of the services in the hospital.

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