Elective Project Report
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The impact of health insurance on health seeking behaviours in paediatric patients at Kisiizi Hospital, Uganda

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Background:[1]

Good health is never assured. Planning for ill-health by saving for the associated expenditure is virtually impossible in households where income is low, variable and where disposable income is non-existent[2]. The financial risk of illness is part of life for poorer families residing in southwest Uganda. The cost of transport, healthcare itself and associated ancillary costs have to be met, which is compounded by the indirect cost of loss of productivity and hands to help when family members fall sick. It is known that the cost of healthcare leads to patients avoiding or delaying care to avoid the expense[3]. Community based insurance schemes help to protect these households from unpredictable expenditure associated with healthcare by pooling resources and financial risk[2]. This is invaluable in countries with limited public provision of free healthcare, such as Uganda. Insurance also removes financial barriers to seeking timely medical care, therefore those without insurance often delay presentation until their condition has deteriorated significantly[4,5]. A study by Xu et. al found that the abolition of user-fees in Ugandan public hospitals in 2001 encouraged poorer patients to use health care when they were ill[5]. Irrespective of a household's income, insurance schemes work on the basis that all individuals in a community should be able to benefit equally from healthcare provision. This study looks at one specific community insurance scheme in rural Uganda.

An Introduction to Kisiizi Hospital, Uganda

Kisiizi town sits in southwestern Uganda, in the District of Rukungiri. Rukungiri District has a population of 300,800, over 90% of whom live in rural areas, many working as subsistence farmers[6]. Kisiizi lies 400km from the capital city Kampala, and the largest city in the sub-region is Kabale, which is 46km south of Kisiizi by dirt road. This rural town owes its existence to Kisiizi Hospital, which was founded in 1958 and is run by the Church of Uganda.

Kisiizi Hospital is a not-for-profit community hospital providing a wide range of services to patients travelling to the hospital from a large catchment area. This is largely owing to the fact that access to care and availability of high quality care is scarce in southwestern Uganda, and Kisiizi's reputation attracts patients from miles around. The hospital has 285 inpatient beds split across several wards, which include medical ward with separate HDU and isolation unit, surgical, maternity, SBCU, paediatrics, obstetrics and gynaecology and a new mental health ward. In addition to inpatient treatment, the hospital has an outpatient department, along with a rehabilitation unit and community outreach services. Kisiizi Hospital is associated with the Kisiizi Hospital Primary School, School of Nursing, Health Insurance Scheme and Kisiizi Power Ltd, a hydroelectric power plant supplying energy to the hospital and the local community.

Kisiizi is one of 55 hospitals in Uganda that is not government funded. It is a private not-for-profit hospital where patients are required to pay for their treatment. Although Kisiizi is a fee-paying hospital, those who are unable to pay for their care are not refused treatment. One of Kisiizi's greatest triumphs is that it has never closed its doors or turned away a patient since its opening in 1958. The fees collected from patients accounts for approximately 40% of the hospital expenses[7]. Other ventures that help to balance the books are the Good Samaritan Fund, the Kisiizi Insurance Scheme and charitable donations. Donations from overseas, friends of Kisiizi, the Kisiizi Falls Tourism and 25% of the Kisiizi Chapel collections all contribute to the Good Samaritan Fund, which is used to subsidise care for the poorest in the community who otherwise would not be able to afford care. The Fund also pays for 50% of the cost of mental health care and 50% of the cost of insulin required by diabetic patients.

The aim of the Kisiizi Insurance Scheme is to provide 'affordable access to quality care'. This not-for-profit scheme is the oldest scheme of its kind in Uganda, covering over 40,000 patients as far as 60km from Kisiizi Hospital[6]. Members join for 10,000-15,000UGX (4-6 US Dollars) per year in community 'groups', which may consist of women, orphans, Engozi groups[6] *(Local name for community initiated and based groups for responding to a specific need of transporting the sick to a health facility using a locally made stretcher)*, schools or credit and savings groups. The annual fee covers emergency care and management of acute

disease. Outpatient medications for chronic disease and outpatient treatment or prophylaxis lasting over 2 weeks are not covered by the insurance scheme, allowing premiums to be kept to a minimum. In addition to the annual charge, members pay a 2000UGX co-payment for outpatient attendance, 10,000UGX for admission to the Children's Ward and 60,000UGX for surgery if required.

Aims and Objectives:

The aim of this project is to identify whether health seeking behaviours differ between paediatric inpatients with and without insurance. The following questions will be addressed;

1. Do those without insurance delay seeking medical attention?
2. Are patients with insurance less critically ill at the time of admission than those without insurance?
3. Does the length of inpatient stay differ between patients with or without insurance?
4. If patients live further from the hospital, do they delay consultation?

It will be interesting to ascertain whether those who are insured seek medical assistance earlier in the natural history of disease and are therefore less severely ill at the time of admission. Furthermore, if this hypothesis is correct, one could assume that those who are insured benefit from earlier diagnosis and treatment and therefore speedier recovery, leading to shorter duration of admission.

Ethical Considerations

Permission to conduct this study was provided by Dr Ian Spillman, the Medical Superintendent at Kisiizi Hospital. Adequate measures were taken to ensure data was kept confidential and stored securely using encrypted files on personal computers. No paper records were removed from the hospital and each patient was anonymised by using their unique 'Stre@mline number', which linked the patient to their online records.

Method:

Data were drawn from 115 patients who were admitted to the paediatric ward at Kisiizi Hospital during April 2018. Data were collected using the online patient records system, 'Stre@mline' and written inpatient notes. Demographic data were recorded, including sex, age and area of residence. An impression of the severity of each patient's condition on

admission could be ascertained using their KEWS score on admission (Kisiizi Early Warning Score, see below), MUAC (Middle Upper Arm Circumference) and length of admission. Time between onset of symptoms and presentation to hospital was recorded with a view to gain an impression of whether insurance status would positively influence health-seeking behaviour. Finally, the cost of stay and insurance status were also recorded to calculate the financial benefit of having Kisiizi Insurance.

The Kisiizi Early Warning Score (KEWS) is measured at presentation and throughout the admission to identify deteriorating patients based on their vital signs.

	<1 YEAR						
Temperature (°C)	36.5-37.4	35-36.4	37.5-38.9	>39		<35	
Pulse	121-160	101-120	161-180	81-100	181-200	<80	>201
Respirations	31-55	26-30	55-70	20-25	71-80	<20	>80
Resp Distress	None (N)	Mild (M)		Severe (S) OR <93%			
SCORE	0	1		2		3	

	1-5 YEARS						
	36.5-37.4	35-36.4	37.5-38.9	>39		<35	
	76-130	66-75	131-160	56-65	161-180	<55	>180
	21-40	16-20	41-50	11-15	51-60	<10	>60
	None (N)	Mild (M)		Severe (S) OR <93%			
	0	1		2		3	

	6-12 YEARS						
Temperature(°C)	36.5-37.4	35-36.4	37.5-38.9	>39		<35	
Pulse	76-100	66-75	101-120	56-65	121-140	<55	>140
Respirations	18-30	14-17	31-40	10 -15	41-50	<10	>50
Resp Distress	None (N)	Mild (M)		Severe (S) OR <93%			
SCORE	0	1		2		3	

ADMISSION NUTRITION	DATE:
WEIGHT:	
HEIGHT:	
Z-SCORE:	
MUAC:	

Figure 1: Kisiizi Early Warning Score

Sample:

115 patients were admitted to the paediatric ward in April 2018, 72 of whom had insurance, leaving 43 who were uninsured. There were no exclusion criteria, all patients admitted in April were included. The sample included 56 boys and 59 girls ranging from 1 month to 12 years old. These patients presented with a variety of presenting complaints, the most common of which were cough (n=77), fever (n=55), vomiting (n=22), diarrhoea (n=21) and dyspnoea (n=21). Pneumonia was the most common diagnosis; 60 (52%) patients had pneumonia. Figure 4 displays all diagnoses, the most common of which were acute watery diarrhoea, enteric fever (typhoid), bronchiolitis, malnutrition and malaria.

Data Analysis:

Dependent variables were compared using t-tests. T-tests were repeated once controlling for possible confounding variables; these included, distance to hospital, age, sex and presenting complaint. Spearman's rank correlation coefficients were calculated to assess the strength of correlations between distance from hospital, duration of symptoms before admission and KEWS Score.

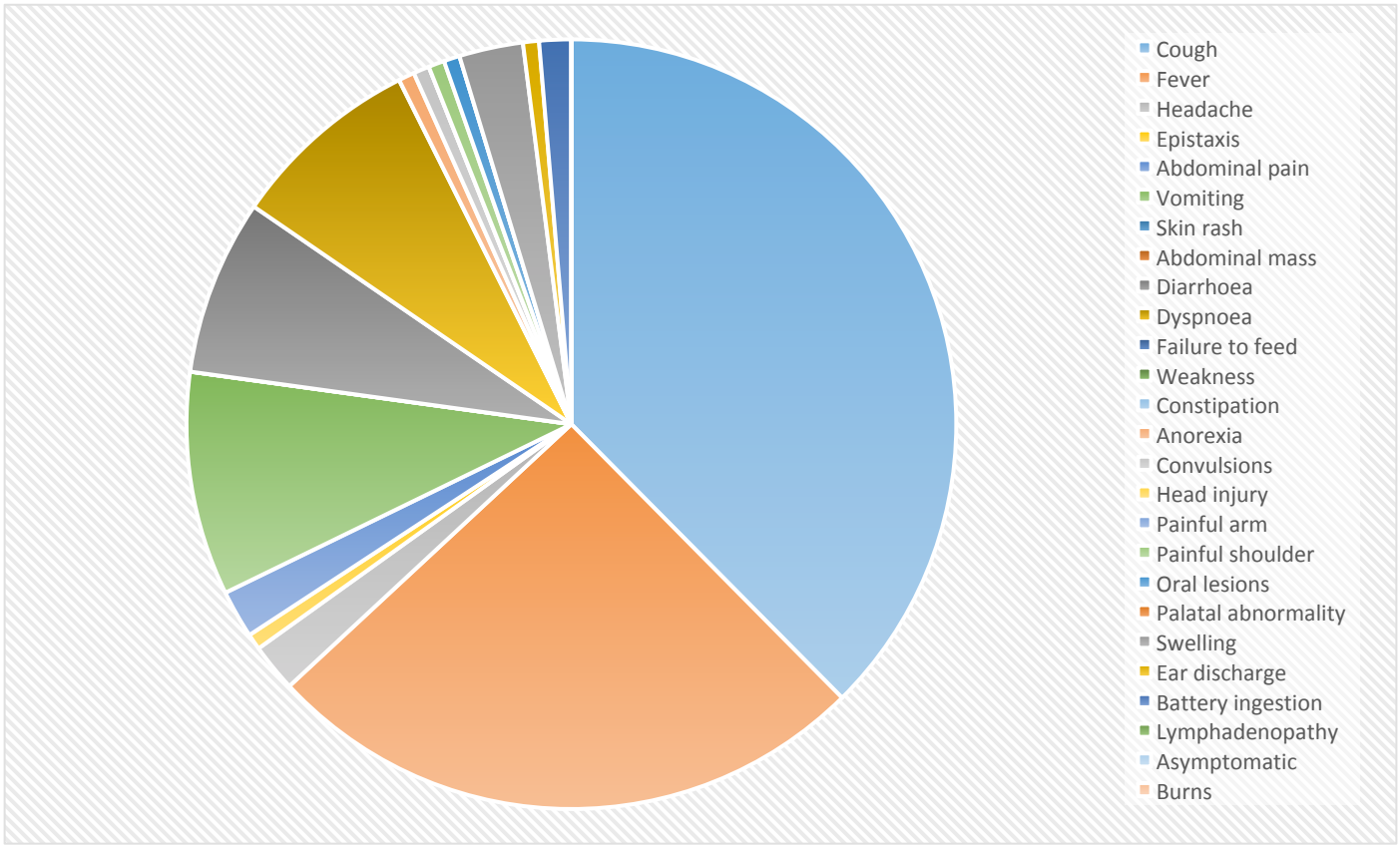

Figure 2: Presenting complaint of paediatric patients with insurance admitted in April 2018

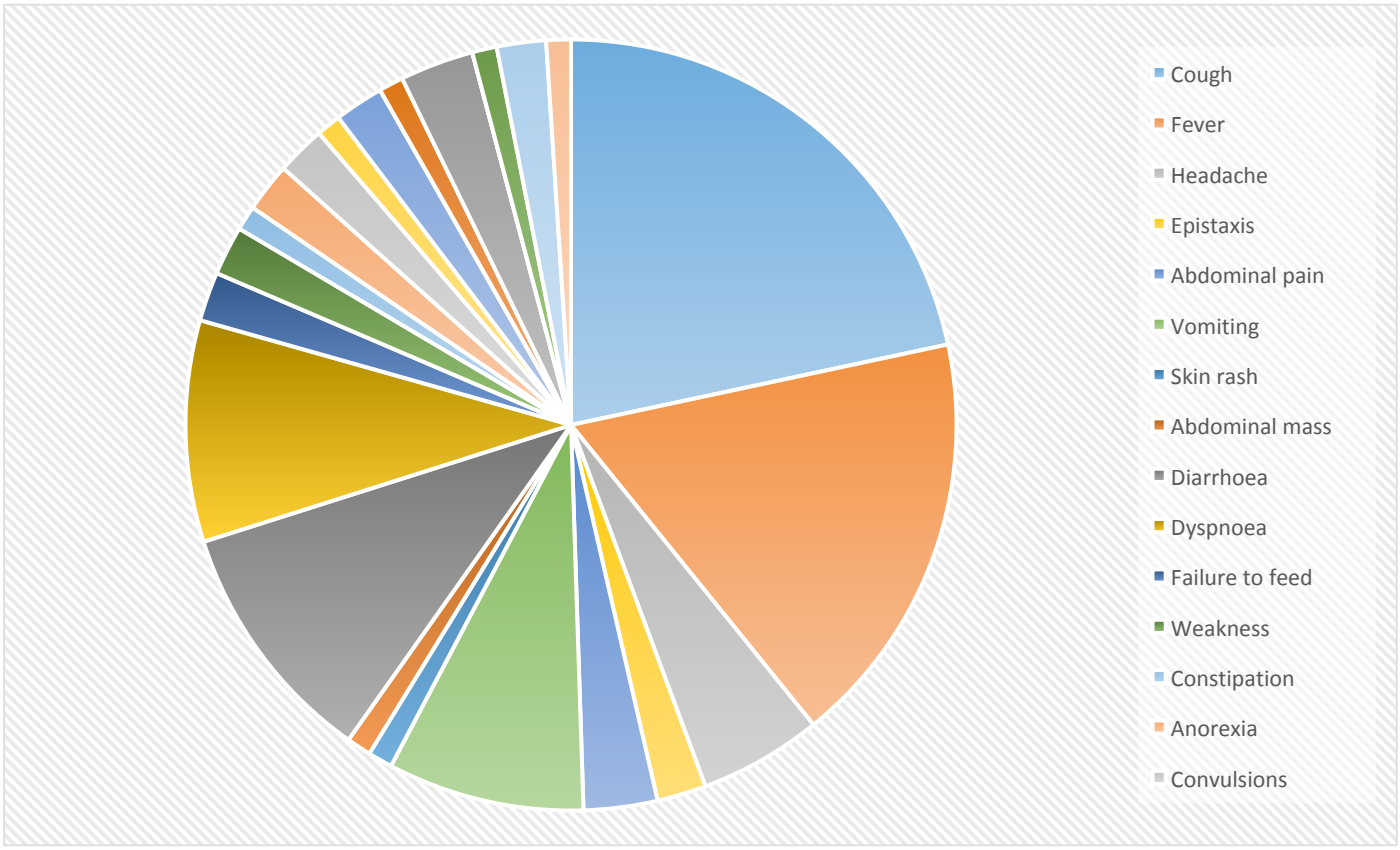

Figure 3: Presenting complaint of paediatric patients without insurance admitted in April 2018

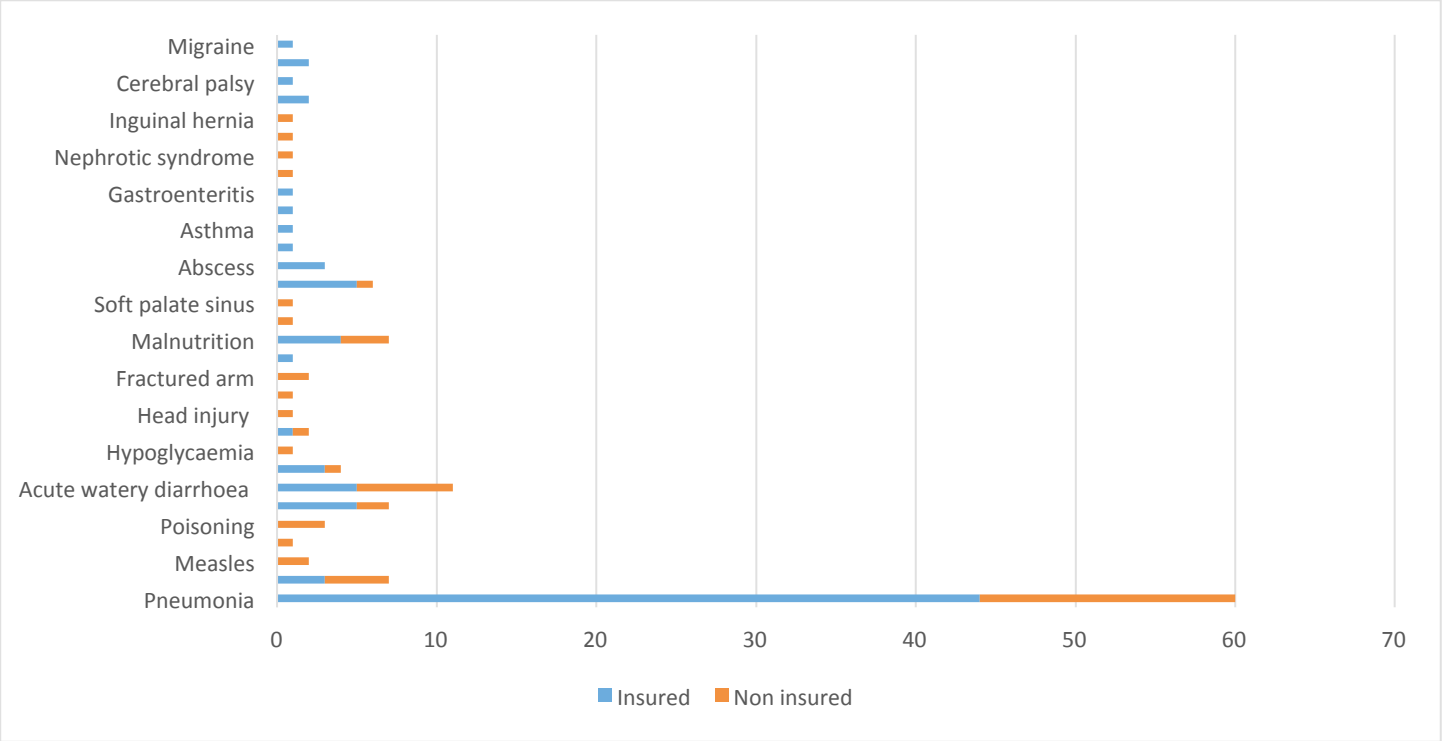

Figure 4: Diagnoses of paediatric inpatients, April 2018

Results:

Length of admission:

Children without insurance had a significantly longer admission than those that were insured. Insured children had a mean stay of 3.9 nights, whereas those without insurance stayed 5.4 nights on average; the difference between these two means is significant ($p=0.058$). When data was further grouped according to age, the difference between the insured and uninsured groups only remained significant in the 1-4 year old patients ($p=0.007$), whereas it was insignificant in patients <1 or ≥5 ($p=0.356$, $p=0.543$ respectively).

KEWS Score on Admission:

Children with insurance had significantly higher KEWS scores on admission than those without insurance ($p=0.0007$). The mean KEWS Score for insured patients was 3.594 (3) in comparison to the mean score for those without insurance, which was 2.233 (2). The difference in KEWS Scores was insignificant between the insured and uninsured groups in patients below the age of 1, and those above the age of 5. The difference in KEWS Scores was significant in patients between the ages of 1 and 4.

Age group	Mean (median) KEWS Score, insured patients	Mean (median) KEWS Score, uninsured patients	p-value
<1	3.565 (4)	2.571 (2.5)	0.087
≥1≤4	3.735 (3)	1.950 (1)	**0.007**
≥5	3.300 (3)	2.333 (2)	0.352

Figure 5: t-test to compare KEWS Scores of insured and uninsured patients grouped into specific age ranges

There is a strongly positive correlation between distance from the hospital and KEWS Score *(Spearman's rank correlation coefficient 0.896)*. This suggests that patients who live further from the hospital have more concerning vital signs on admission than those who live closer to the hospital.

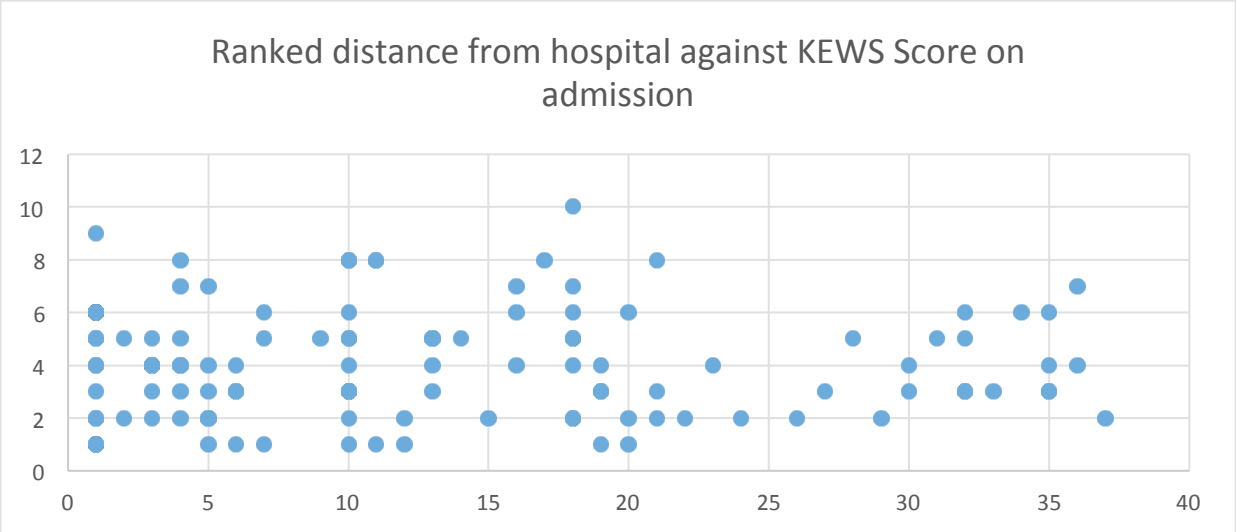

Figure 6: Ranked data (not raw data) corresponding to distance from hospital (km) against KEWS Score of all patients

Duration of symptoms:

Duration of symptoms refers to the number of days after onset of symptoms that the patient presents to the hospital. There was no significant difference in duration of symptoms at the time of admission between the insured and non-insured groups (p=0.12). It was acknowledged that symptoms vary in severity and tolerability, which could affect the urgency with which the patient presented to hospital. Therefore, patients were grouped according to their presenting complaint to account for this confounding variable. There was

still no significant difference in mean duration of symptoms between the insured and uninsured groups.

Presenting complaint	Mean (median) duration of symptoms, insured patients	Mean (median) duration of symptoms, uninsured patients	p-value
Cough	4.566 (3)	7.810 (3)	0.117
Vomiting	4.286 (3)	4.110 (3)	0.895
Fever	4.800 (3)	4.940 (3)	0.921
Diarrhoea	4.417 (5)	5.400 (3)	0.607
Dyspnoea	4.083 (2.5)	5.625 (3)	0.515

Figure 7: t-test comparing mean duration of symptoms (number of days) on admission for each presenting complaint between insured and non-insured patients

To account for age as a potential confounding variable, patients were grouped accordingly. However, the difference between the duration of symptoms in insured and uninsured groups remained insignificant.

Age range	Mean (median) duration of symptoms, insured patients	Mean (median) duration of symptoms, uninsured patients	p-value
<1	8.348 (3)	9.286 (4.5)	0.899
≥1≤4	5.083 (3)	4.650 (3)	0.783
≥5	2.364 (2)	40.778 (3)	0.101

Figure 8: t-test comparing mean duration of symptoms of insured and uninsured patients of specific ages

Insurance status did not advance or delay the timing of presentation at hospital, even when potential confounders such as age or presenting complaint were accounted for. However, there was a strongly positive correlation between the distance that a patient lived from the hospital and the duration of symptoms at the time of admission *(Spearman's rank correlation coefficient = 0.905).*

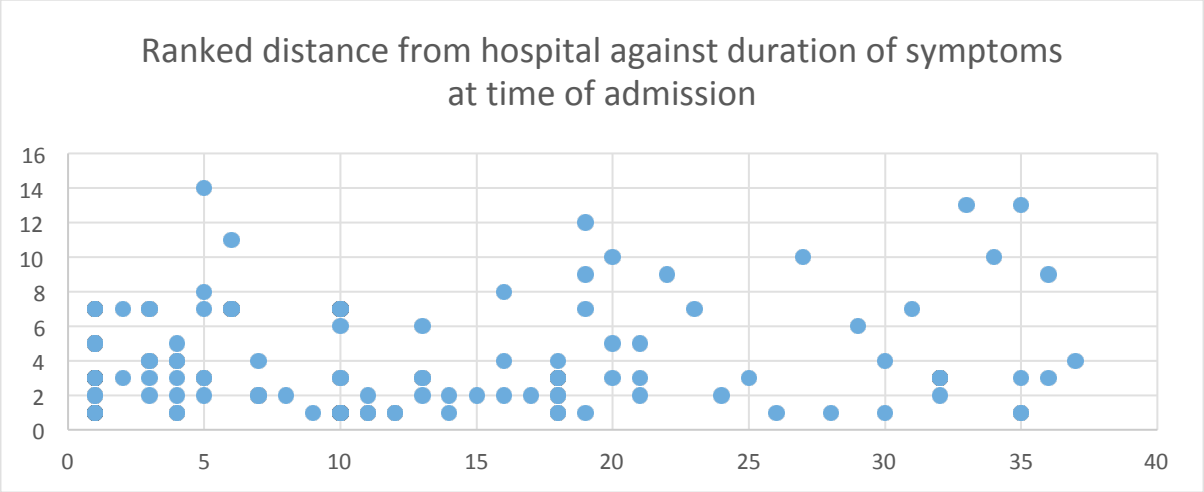

Figure 9: Ranked data (not raw data) corresponding to distance from hospital (km) against duration of symptoms (days) of all patients

When patients were grouped according to the distance that they lived from the hospital, the duration of symptoms at time of admission was not significantly different between insured and uninsured patients. It can be said that regardless of the distance from the hospital, there is no difference between the two groups in terms of time taken to seek medical attention.

Distance from hospital (km)	**Mean (median) duration of symptoms, insured patients**	**Mean (median) duration of symptoms, uninsured patients**	**P-value**
0-10	4.404 (3)	16.867 (3)	0.098
>10-20	2.750 (2)	10.500 (5)	0.055
>20	17.889 (3)	13.571 (3.5)	0.771

Figure 10: t-test comparing mean duration of symptoms (days) of insured and uninsured patients who live specific distances from the hospital

Mid Upper Arm Circumference (MUAC):

There was no significant difference between the insured and non-insured groups. MUAC is a measure of nutritional status of the child. Lower MUAC correlates with increased mortality in hospitalized children[8]. The lack of difference in MUAC between the groups removed this as a confounding variable which could contribute to any other differences observed between the groups.

Cost of stay:

In children aged 1-4, the cost of stay was significantly cheaper for those that were insured in comparison to those that did not have insurance. The mean cost of stay for an insured child was 74845UGx, which was significantly less than those without insurance, whose average cost of stay was 131,108UGx (p=0.008). This is equivalent to £15.45 and £27.05 respectively *(reference value: £1 equivalent to 4847.90UGx[9]).*

Discussion:

Affordability of care: not the only determinant of good access to care

This study revealed that despite the financial advantage that insurance offers, insurance status did not significantly alter health behaviour. A study investigating health seeking behaviour in childhood illness in a resource poor setting in Nigeria found that increasing cost of care lead to a reduction in utilization of health services[10]. If the patients in this study were to mirror this behaviour, one would expect insured patients to utilise healthcare more readily at the onset of symptoms, rather than delay treatment. However, this study found that insurance did not reduce the interval between onset of symptoms and care-seeking.

Other factors were considered that may influence their decision to attend hospital. The proximity of the patients' place of residence to the hospital strongly correlated with the duration of symptoms at the time of admission. Lacking the ability to travel to the hospital may negate insured patients' extra incentive to attend hospital early to receive free care. Dror and Jacquier are in agreement with this study; writing that rural habitat is one factor that can exclude populations in low to middle income countries from health services[3]. The ancillary costs associated with healthcare, such as transport to the hospital, can put a 'free' service out of reach for those who cannot afford to get to the hospital to receive the treatment. This study echoed other literature which shows that living close to a hospital facilitates early utilization of services[10].

Education as an important variable:

The literature recognises the importance of health education to improve identification of severe childhood illness and encourage timely presentation to hospital[10]. Even in the presence of free services, it is known that the decision to attend hospital is influenced by

socio-economic status, perceived severity of illness, availability of home treatment, perceived aetiology and cultural norms[11]. Parental perceptions of the severity and cause of childhood illness was not included as an independent variable in this study. Regardless of how attractive a free service may be, the decision to attend hospital lies with the parent.

Sufficient understanding of the financial benefit of insurance?

Patient and providers' will have limited experience with health insurance schemes whereby communities pay upfront for a deferred benefit. If the concept of pooling resources and distilling financial risk is not understood, the financial barrier to healthcare will not be removed.

Conclusion:

There are several dimensions to good access to healthcare. This includes affordability, availability, acceptability and accessibility. In this study we have addressed whether increasing the affordability of healthcare improves access to care. The simple fact that the majority of patients presenting in one month were insured could suggest that having insurance encourages patients to access healthcare. However, this could just reflect the ratio of insured: uninsured patients within the local population. The results of this study do not suggest that those with insurance display more positive health seeking behaviours than those without insurance. The degree of accessibility in terms of geographical proximity to the hospital did correlate with the time of presentation and severity of illness at presentation. This could be explored further by looking at why those who live further present later; the affordability of travel or the availability of transport could influence the decision to come to hospital. Availability and acceptability of healthcare were not explored in this study, but on review of the literature, improving health education seems to be central in improving access to care[12]. Health education would not only include better identification of severe illness, but also education of the benefits of insurance schemes and how pooling individual resources will improve access for the whole community.

Limitations of the study:

The results of this study did not support the hypothesis that insurance encourages positive health seeking behaviours such as early presentation at the onset of symptoms. However,

certain limitations of this particularly study should be acknowledged that may have reduced the reliability of the results. The sample of this study was small. In addition, the study was conducted over a one month. Owing to the electronic patient records system at Kisiizi Hospital, this study could be easily replicated at a later date.

Secondly, it is assumed that later presentation has negative consequences for the patient such as an increased length of admission and poorer outcomes. However, it was not possible to assess the appropriateness of timing of presentation to health care.

Further research:

This study should be repeated over several months to increase the sample size and improve the reliability of the results. The results of this study made steps to rule out insurance as a factor that significantly changes health seeking behaviour, therefore further research should be done to explore other factors such as parental education levels and understanding of the insurance scheme itself.

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Word count: 3300

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