

	Item No	Recommendation
Title and abstract	1	(a) Title: REASONS WHY PATIENTS BYPASS LOWER LEVEL PUBLIC FACILITIES: A CROSS SECTIONAL STUDY FROM UGANDA Title, page 1 Abstract, page (b) Abstract Background: The quality of services in Uganda at higher level health facilities are usually affected negatively by congestion when patients bypass care from their primary care health facilities (PCHF). The reason behind this bypass phenomenon in Uganda is limited. This study was conducted among patients receiving care at Lira Regional Referral Hospital in northern Uganda to identify reasons why patients bypass their PCHF. Methods: We performed a descriptive cross-sectional study between 29/12/2014 & 30/1/2015, 484 respondents attending the outpatient department were recruited by systematic random sampling. Four focus group discussions (FGDs) each involving 10 participants were conducted. Quantitative data was collected using a validated questionnaire, entered, analysed by Epidata Entry 3.1 and SPSS 18 versions respectively. Descriptive statistics and chi square test for differences in the study population were used. For qualitative data, thematic analysis of transcripts was done. Codes and categories were developed and interrogated following an iterative process based on grounded theory. Results: The majority (80.4%) of respondents (71.7% females, mean age 18-35 years, SD 0.85) bypassed their PCHF. Factors associated with bypass were: marital status, distance travelled of >10 km and tertiary education. FGDs reported lack of trust in the health care providers, lack of medicines and diagnostic equipment. Conclusions: Poor quality of health services at PCHF encourages seeking care from higher-level facilities. Utilization of PCHF is limited due to poor infrastructure, shortage of medicines and human resource. Improvement of these issues will support PCHF which in turn can help reverse bypass phenomenon.
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported No information was available about the situation on bypass in Lira RRH. Therefore, the aim of this study was to answer the questions as to the frequency patients bypass lower public health facilities to seek care at the Lira RRH and the underlying reasons why in case this occurs. The findings and evidence generated will inform policy making and implementation of an effective health referral system in order to reverse

this situation.

Background, page 5

Objectives	3	State specific objectives, including any prespecified hypotheses No information was available about the situation on bypass in Lira RRH. Therefore, the aim of this study was to answer the questions as to the frequency patients bypass lower public health facilities to seek care at the Lira RRH and the underlying reasons why in case this occurs. The findings and evidence generated will inform policy making and implementation of an effective health referral system in order to reverse this situation. Background, page 4
Methods		
Study design	4	Present key elements of study design early in the paper We performed both a quantitative and a qualitative cross-sectional descriptive study. The quantitative part was to determine the frequency of bypassing lower level public health facilities and to describe the factors associated with this bypass .The quantitative part was complemented by a qualitative study with focus group discussions to identify the reasons for patients' bypass. The sample size of 484 for the quantitative part was determined by use of Kramer Greenhouse formula. Methods, study design, page 5
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection The study was carried out in Lira RRH (LRRH) in northern Uganda about 370 km away from the Capital City Kampala. We performed a descriptive cross-sectional study between 29/12/2014 & 30/1/2015, 484 respondents attending the outpatient department were recruited by systematic random sampling. The catchment area for LRRH comprises of eight districts in the Lango sub region according to the Health management information system of the Ministry of Health as of 2013/2014. LRRH has nine medical doctors, the doctor to patient ratio is 1:80, a bed capacity of 415, an average annual inpatient admission of 18,000, and an annual average outpatient department (OPD) attendance of 200,000 patients. The OPD is open from Monday to Friday during working hours. The OPD is the reception/entry point where most patients receive health services in the hospital. Methods, setting, pages 5-6
Participants	6	<i>(a) Cohort study</i>—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up <i>Case-control study</i>—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls Cross-sectional study—Give the eligibility criteria, and the sources and methods of selection of participants We included all patients coming from more than a 5 km radius of LRRH catchment area and were aware of any available public health

care facility within the LRRH catchment area. Patients with unsound mind and those who refused to consent were excluded.

Section: Quantitative data collection, pages 6-7

(b) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed

Case-control study—For matched studies, give matching criteria and the number of controls per case

Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable Independent variables The variables included social demographic characteristics such as age, sex, gender, occupation, religion, level of education and distance from health facility, state of lower level facilities and complexity of illness. Dependent variable Bypassing lower health facilities or self –referral Variables, Page 8
Data sources/ measurement	8*	Section: Quantitative data collection, page 6
Bias	9	Patients who participated in the study had stickers put on their files to avoid interviewing a person more than once. Quantitative data collection, Page 7
Study size	10	Explain how the study size was arrived at A daily adult patients' attendance register in the OPD was used. A total of 484 adults attending the adult OPD were sampled using systematic random sampling with a sampling interval of 9. A random start on each day was got by giving 9 pieces of paper numbered 1 to 9 to a person who was not part of the study to choose. Each day every 9th patient attending the OPD was included until the daily required number of 22 was reached. The process was repeated daily for 22 days till the sample size of 484 was obtained. Quantitative data collection, page 7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why Data was collected using a validated structured questionnaire after obtaining a written informed consent of the participants. An interviewer-administered questionnaire was administered to the respondents under the guidance of a research assistant who first explained the purpose of the study and answered any question(s) raised. Three research assistants conducted the interviews. Health providers were not included in the interviews. Interviews were conducted as soon as the respondents were registered

before being seen by the health care providers available. Data was collected from adult patients 18 years and above seeking healthcare at LRRH OPD

Quantitative data collection, page 6

Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding (b) Describe any methods used to examine subgroups and interactions (c) Explain how missing data were addressed (d) <i>Cohort study</i>—If applicable, explain how loss to follow-up was addressed <i>Case-control study</i>—If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i>—If applicable, describe analytical methods taking account of sampling strategy A total of 484 adults attending the adult OPD were sampled using systematic random sampling with a sampling interval of 9. Quantitative data collection, page 6 (e) Describe any sensitivity analyses: N/A
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Continued on next page

Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed Table 1 summarizes the socio demographic characteristics of the study population. A total of 481/484 participants were interviewed from the adult OPD at LRRH giving a response rate of 99.4% Section: socio-demographic characteristics, page 9 (b) Give reasons for non-participation at each stage: N/A (c) Consider use of a flow diagram: N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders Table 1 summarizes the socio demographic characteristics of the study population. A total of 481/484 participants were interviewed from the adult OPD at LRRH giving a response rate of 99.4%.The mean age of participants was 26.5 year and standard deviation 0.85. The majority 347 (72.1%) of the respondents were female, 134 (27.9%) were male. Two hundred and sixty (53.7%) of respondents were aged between 18- 35 years. One hundred and ninety six (40.5%) of the participants had attained primary education, majority being Christians 457(94.4%) and 323(67.2%) were married and 158(32.8%) were single. The socio demographic characteristics of the 40 participants in the FGDs were similar to the quantitative survey except the age distribution of 18-45 years. Section: results, table 1, page 9 (b) Indicate number of participants with missing data for each variable of interest (c) <i>Cohort study</i>—Summarise follow-up time (eg, average and total amount)
Outcome data	15*	<i>Cohort study</i>—Report numbers of outcome events or summary measures over time <i>Case-control study</i>—Report numbers in each exposure category, or summary measures of exposure <i>Cross-sectional study</i>—Report numbers of outcome events or summary measures In the quantitative study, 387 (80.4%) participants bypassed lower public health facilities and 94(19.6%) did not bypass i.e. they were officially referred. Section: Bypass of lower level public health facility, page 10
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included Data was summarized into means, median and frequency. The results were presented in tables. Logistic regression was performed to examine the strength of the associations between bypassing the lower health facility and potential predictors. For measuring the relationship between variables, the chi square

test (χ^2) and the odds ratios at 95% confidence intervals were computed.

Associations between categorical variables were tested using the chi-squared test with reports of the corresponding p-values set at less than or equal 0.05.

Percentages were computed. The odds ratio and the corresponding 95% confidence intervals (95% CI) used to summarize the strength of association between logistic regression test. The outcome measure was the bypass of lower level public health care facility.

Section: Data analysis, page 8

(b) Report category boundaries when continuous variables were categorized: N/A

(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period: N/A

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses: N/A
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Discussion

Key results	18	Summarise key results with reference to study objectives According to our study 80.4% of the participants visiting the OPD of the LRRH bypassed the lower public health facilities. The main characteristics of these patients were marital status, attained tertiary education and had to travel > 10 km. Reasons to bypass the lower health care facilities were lack of trust in the health care workers, lack of drugs and lack of diagnostic equipment and tests. Section: discussion, page 13
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Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias
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Strength and limitations of the study

The study was carried out in a general OPD at LRRH; therefore the findings could not be generalized for the whole of Uganda. In addition, patients attending specialized units such as Ophthalmology, Orthopedic and Ear Nose and Throat were not included in the study. The participants were interviewed by nurses in uniform that could have led to bias in the responses

Section: discussion, page 15

Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence Bypassing and the reasons why are not only a problem in low and middle- income countries. In addition to recent studies in Mozambique and Tanzania, Ghana and India also in Florida and Switzerland bypassing was described. The reasons why patients seeking care at higher level facilities were in all studies better quality of service, better access to advanced technology and competence of the staff,
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despite the distance they have to travel
Section: Discussion, interpretation page 16

Generalisability	21	Discuss the generalisability (external validity) of the study results LRRH comprised eight districts in the Lango sub region and received referrals from these districts. We performed quantitative and qualitative study with very limited drop out giving strength to the validity of the study for the Lira area. Section: discussion, page 15
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Other information

Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based There was no funding. The present article is based on the master's dissertation of the corresponding author.
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*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.