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Antibiotic use in acute respiratory infections in under-fives in Uganda: findings and implications

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ABSTRACT

Objectives: Self-medication with antibiotics among households is common in Uganda. However, there are limited studies evaluating self-purchasing of antibiotics for acute respiratory infections (ARI) in the under-fives. Consequently, the objective was to evaluate patterns of household self-medication with antibiotics in ARI among under-fives in Kampala.

Methods: Descriptive cross-sectional observational design. Care takers at households were selected from five divisions of Kampala using the WHO 30-cluster method and interviewed using a standardized questionnaire in June - July 2011.

Results: Out of the 200 households, most ARI cases 107 (53.5%; $p = 0.322$) were inappropriately managed. The prevalence of antibiotic use in ARI was 43% ($p < 0.001$). Amoxicillin 31.4% and cotrimoxazole (30%) were the most self-medicated antibiotics. Antibiotics use was associated with pneumonia symptoms and access to antibiotics.

Conclusions: Household use of antibiotics in ARIs among under-fives is suboptimal. There is an urgent need for guidelines on awareness to reduce self-medication of ARIs in Uganda.

KEY WORDS: Acute respiratory infections (ARI), antibiotics, under-fives, households, self-medication, Uganda

ACCEPTED MANUSCRIPT

1. INTRODUCTION

Acute respiratory infections (ARI) are a leading cause of mortality among the under-fives: with over 2 million children dying each year from ARI in sub-Saharan Africa [1-3]. In Uganda, the burden of ARI among under-fives is estimated at 18.3% with community acquired pneumonia accounting for 33% deaths from an ARI [4-6]. ARIs among under-fives are a major driver for the use of antibiotics among households and health facilities [7, 8]. This is a concern if inappropriate use increases antibiotic resistance and hence increases morbidity, mortality and cost of treatment [9 - 12]

Inequitable access by households to medical insurance and essential medicines including antibiotics remains a major bottleneck to public health in sub-Saharan Africa [13 -19], with impoverished households being the most disadvantaged to accessing quality healthcare [20 - 22]. This is made worse with increasing antibiotic resistance necessitating the use of newer antibiotics which are typically more specific and more targeted; however, are more expensive and with a higher level of adverse effects [12]. Indiscriminate self-purchasing of antibiotics can make the situation worse with over 50% of antibiotics used worldwide obtained without a medical prescription [23]. This is made worse in Uganda with most households having little confidence in the public health care system [13, 24, 25]. This is illustrated in Uganda by only 38% of mothers of under-fives engaging the public health care sector [17] with self-purchasing of antibiotics a common household practice in urban and rural Uganda [26 - 34]. Informal drug outlets in Kampala, a porous medicine supply chain and poor regulation further exacerbate household self-purchasing of antibiotics [29, 31].

Despite published studies demonstrating that household interventions have successfully reduced the burden of malaria in Uganda; the overlap of symptoms of ARI, malaria, fever and malaise propagates irrational antibiotic use [19, 22, 30, 35, 36]. As mentioned, this indiscriminate use of antibiotics is the main cause of antibiotic resistance and poor treatment outcomes is made worse in low and middle income countries by limited access to full antibiotic courses [7, 18, 35, 37-40]. Little is known about self-purchasing of antibiotics among households with young children in Uganda, which is a key target area for appropriately managing ARI. Consequently, the aim of this study was to investigate the prevalence and patterns of self-purchasing of antibiotics among households with young children in Kampala, the capital city of Uganda. The household level was chosen to provide a more accurate picture of current behaviours and their rationale rather than trying to interview family members in pharmacies where maybe less time for such surveys and confidentiality may be an issue especially in crowded pharmacies. The findings potentially used to suggest future interventions to all key stakeholders to improve the appropriate use of antibiotics.

2. MATERIALS AND METHODS

2.1 Design, setting and study population

We adopted a cross-sectional survey design to collect qualitative and quantitative data using a standardized questionnaire (**Appendix A**). A sample of 200 households was estimated using the Kish and Leslie formula (1965) [41].

The 200 households from the five divisions of Kampala city including Nakawa, Kampala central, Makindye, Kawempe and Rubaga were selected using the World Health Organization (WHO)-30 cluster method [42]. Care takers were included in the study if they had at least one child under the age of five years and gave informed consent for inclusion in the study. Care takers for the selected households were briefed on the study and only those that gave a written consent were interviewed by a team of five trained data collectors using a pre-tested and standardized questionnaire.

The questionnaire contained questions regarding: household sociodemographic characteristics, occurrence of the ARI in the past 4 weeks, type of ARI episode; antibiotic use for management of the ARI based on the WHO ATC/DDD classification; the treatment seeking behaviour and outcomes for the most recent ARI episode.

This study was conducted from the 11-June-2011 to 10-July-2011, a period that coincides with the peak of ARI in Uganda [43].

2.2 Methods

The sampling frame was based on household distribution in the Uganda Demographic and Health survey 2000 (UDHS, 2000). To assess for occurrence of ARI, we asked whether any of the children under-five had symptoms of common cold, cough, throat infection, or ear infection or pneumonia in the past four weeks. The local terms for; cough “kifuba, lubyamira”, and common cold “eminyila” were used. The nature of ARI was further investigated for by the data collectors. The main outcome variables of the study were; period prevalence of ARI; prevalence and patterns of antibiotic self-prescribing and factors associated with antibiotic self-purchase. We interviewed respondents on their perceived confidence to self-diagnose ARIs. Data were managed using Epidata v3.1 and exported to SPSSv21 for quantitative analysis. Group comparisons were made using chi-square and $\alpha = 0.05$ was considered as the level for denoting significance at the 95% confidence interval. Univariate and bivariate analysis was done using the Chi-square test (χ^2) for associations and the Pearson correlation was used to identify factors associated with appropriate management of the ARI. The appropriateness of treatment for the each ARI episode was evaluated against recommendations of the integrated management of childhood illnesses (Table 1) [44].

2.3 Ethical considerations

The study was registered as field study for Masters in Public Health of by the school of public health, Makerere University, Uganda. This included ethical approval. All the study respondents gave written informed consent prior to inclusion in the study. The respondents names were not requested or recorded anywhere hence we cannot associate the data to a particular

respondent in this study. No personally identifiable data such as names were requested or recorded.

3. RESULTS

3.1 Social demographic characteristics of respondents at the households

The survey completion rate was 99.5% (199/200). One questionnaire was excluded due to incomplete data on age of a child at one household. Most household respondents were mothers (46.2%); lived in semi-urban settlements (45.5%); and attained at least secondary education (68%). The difference in the male and female respondents was not significant ($p = 0.258$) (Table 2).

3.2 Period prevalence of ARI among household with under-fives in Kampala-Uganda

Respiratory tract infections (RTIs) commonly occur among under-fives in households in Kampala-Uganda. The common cold (99.5%) and coughs (81.9%) are the most prevalent upper respiratory tract infections among households with under-fives who had an ARI during the past 4 weeks. Pneumonia (9%) was the most occurring lower respiratory tract infection (Figure 1).

3.3 Patterns of self-medication with antibiotics for ARI among household with under-fives

The period prevalence of antibiotic use for ARI in under-fives at households in Kampala-Uganda was 43% (86/199) households. Out of the 86 households that self-prescribed, purchased and used an antibiotic, a quarter 26% (22/86) used at least two antibiotic medicines (Figure 2). Penicillins (43%) and sulphonamides (40%) were the most self-prescribed classes of antibiotics for treating ARIs among the under-fives at households in Kampala (Figure 3).

Most households that self-prescribed antibiotics for ARI for under-fives used mono therapy with either Amoxicillin (ATC J01 C) or Cotrimoxazole (ATC J01E) or two antibiotics were taken together that had a combination with penicillins (ATC J01R). Most households that self-prescribed dual antibiotic regimens for the children under 5 also used a combination of amoxicillin and cotrimoxazole 19% (16/85). Some households also used antibiotics with safety concerns in children including gentamicin 3.5 % (3/85) and chloramphenicol 2 % (2/85) (Figure

A1 in the Appendix). Whilst most households used oral antibiotics, there was also parenteral use.

Antibiotics were mostly used for common colds among young children when taken 41.9 % (13/31) with 18/ 31 young children no taking antibiotics; common colds with coughs 45.5% (40/88); common cold, sinusitis and cough 61% (11/18); common cold, cough and throat infection 50% (9/18) and common cold cough with sinusitis and pneumonia at 100% for both children with this combination of symptoms (Figure A2).

3.4 Factors associated with the use of self-prescribed antibiotics

The use of self-prescribed antibiotics in the management of ARI among households with under-fives was significantly ($p < 0.05$) associated with the location of the household; level of education of the guardian / parents; confidence to self-diagnose ARIs; treatment seeking behaviour; source or access to antibiotics and the prior ability to treat ARI appropriately (Table 3).

4. DISCUSSION

Our study has shown that over two out of every five households in Kampala-Uganda (43%) self-prescribe antibiotics for ARI episodes among under-fives (Figure 2). Some households use two antibiotics, parenteral forms and contraindicated antibiotics for ARIs in under-fives (Figures 2 & Figure 4). Our findings are similar to other studies among developing countries, which estimated self-medication with antibiotics between 8– 87 of patients [17]. A systematic review of 36 studies reports a similar prevalence of 38.8% to that of our findings of self-medication among households and 50% prevalence for respiratory infections [45]. Household surveys in Trinidad and Tobago [46] and Sudan [3] also reported higher rates of 68% (288/450) and 73.9% respectively of self-medication. However, a study in Indonesia found a lower period prevalence of self-medication with antibiotics (7.3%) [47]. The majority of these studies though whilst they assessed antibiotic use in households, this was not specific to under-fives and/ or acute RTIs. In addition, a number were conducted in rural settings where the use of left-over antibiotics is more common [28].

The common cold and or cough were the most common ARIs among the under-fives at households in Kampala, with the period prevalence for pneumonia symptoms at 9% (Figure 1). Similarly surveys in Uganda [5, 6, 28] and sub-Saharan countries [34] have also reported a high

burden of ARI at households and public health facilities. Studies in Kenya have associated the high prevalence of ARI (69.7%) among the under-fives as a driver for household overuse of antibiotics [48]. High rates of self-purchasing are exacerbated if there is a belief among households that antibiotics can cure any illness as seen for instance with household surveys in China [22] and Trinidad and Tobago [46].

Amoxicillin (ATC J01C) and or cotrimoxazole (ATC J01E) alone or in combination are the most self-prescribed (86%) ATC classes of antibiotics for ARI at households in Kampala-Uganda (Figure A1). Studies conducted in Indonesia, Kenya and Sudan have also reported self-prescribing of penicillins among households [46-49], cotrimoxazole [46] and macrolides. This is perhaps not surprising as these classes of antibiotics are the most recommended for the management of ARI among guidelines when an antibiotic is indicated [50, 51]. They are also inexpensive, commonly prescribed by clinicians and can easily be recognized by their colors; in addition, the most accessible left-over medicines at households and drug outlets [28, 29, 31, 45].

Other studies have also reported high rates of self-prescribing with broad spectrum antibiotics. In China, the rate of amoxicillin and cotrimoxazole was 79% of all self-purchasing antibiotics [39] and amoxicillin at 77% of all self-purchasing antibiotics in Indonesia [47].

Some households used injectable antibiotics in our study. However, these should be used cautiously and can be contraindicated in patients under-five. There are also concerns with the use of chloramphenicol, gentamicin and ceftriaxone. These are the most commonly prescribed parenteral antibiotics for severe respiratory infections [50] in Uganda and can also be obtained over the counter in drug outlets in Uganda [29]. This is a cause for concern

Our findings showed that a common cold with or without a cough appears to be the main driver of self-prescribed antibiotics for ARI among under-fives at households in Kampala (Figure A2). Households are less likely to initiate antibiotics if the common cold and cough (CCC) symptoms present with symptoms of sinusitis, otitis media and pneumonia. This shows that households are more likely to seek formal health care when the symptoms of the ARI are judged to be severe or of a chronic nature. This correlates with a survey conducted in rural China and developing countries which showed that antibiotics were 42% more likely to be initiated if the child had a cough and/or common cold [22, 26, 47]. Another survey also showed care givers are 40% more likely to self-purchase and/or initiate antibiotics in young children if symptoms present with a fever and difficulty in breathing or consult the formal health care system [36]. Other studies in the United States undertaken among prescribers in clinical settings also showed that 44% of prescribers are likely to initiate antibiotics if ARIs present with symptoms such as Pharyngitis, coughs and common cold [7, 8, 35]. The treatment of fevers

has been over emphasized by community based programmes in Uganda, which may well have influenced household behaviors for the management of ARI [4, 5].

Interestingly in our study, household self-prescribing of antibiotics for ARI among under-fives was associated with the location of the household; the level of education of the care taker, prior experience with using antibiotics; and the perceived ability to assess the severity of ARI (Table 3). A study in Trinidad and Tobago, Sudan and Uganda also associated good knowledge on antibiotics and high educations level with self- prescribing of antibiotics [3, 46, 52] and some authors have linked this practice to the socioeconomic status of the household [25] and access to antibiotics. In a multinational survey on antibiotic treatment among 39 countries, several from Africa depicted poor health seeking behaviors for ARIs among mothers of under-fives that ranged from 41-86%. Seeking care by mothers in Uganda was at 38% from the public sector [17]. Our study also showed that households living in urban locations have a significantly higher likelihood of treating ARI with antibiotics than rural settings (Table 3). Other studies conducted in Uganda showed that pharmacies, drug shops and clinics dispense whatever medicines the client requests [29]. In Indonesia, the main source of self-purchased antibiotics was from private drug outlets and or leftovers [17,47]. It has been estimated by Mosites et al. [17] that 51% of cases of acute lower respiratory infections in Uganda are prescribed an antibiotic by physicians. In China, one third of patients/caregivers used left over antibiotics that they obtained them from the health facilities for a second time, mainly to manage fever and breathing problems [22]. In our study, majority (70.5%) of the caretakers initiate remedies at households for ARI (Table 3); this is higher than findings in Cambodia where only 45% of care givers initiate therapy with a medicine or other approach at home before seeking health care for fevers/ malaria and majority seek care in the private sector [19, 52]. Studies have also associated self-prescribing of antibiotics with the level of confidence in assessing the need for an antibiotic in children [22, 40, 53]. This was also seen in to some extent in our study with a lower use of self-prescribed antibiotics among those not confident at self-diagnosis of an ARI (31/ 96). There was also low use of self-prescribed antibiotics among cares confident of self-diagnosing an ARI (Table 3).

5. CONCLUSIONS AND RECOMMENDATIONS

Households in Kampala-Uganda have a high burden of ARIs, particularly the common cold and cough syndrome. Self-prescribing of antibiotics at households for ARI in under-fives is high. As a result, it can be seen that households inappropriately use antibiotics for the management of ARI in children under 5. This is particularly the case for common colds and cough. Many factors

drive household use of antibiotics. These include the level of education of the caretaker, confidence in prescribing by parent, left over antibiotics and access to medicines through private drug outlets such as drug shops, clinics and pharmacies.

There is an urgent need for both household and community based interventions and approaches to promote awareness on the safe use of antibiotics in ARI among the under-fives. Caretakers of under-fives should be sensitized of the danger signs of ARI and the consequences of using self-purchased antibiotics for predominantly viral infections. The Government of Uganda should empower and strengthen community drug outlets in the screening and the provision of quality care and treatment for ARI among the under-fives.

Whilst not researched here, there should also be increased access to essential medicines including antibiotics where this is a concern. This can potentially be made feasible through a community based insurance scheme where under-fives can access affordable health care and treatment. Such communities should regularly be supported by a community doctor and/or health worker that follows up the households within a specified catchment area. Studies have demonstrated that communities or patients with a designated family doctor/health worker tend to comply with antibiotics and advice [53].

6. LIMITATIONS

The study adopted a cross-sectional design that collected mainly quantitative data. There could be intrinsic household related factors that drive antibiotic self-purchase for management of ARI among under-fives. Future studies should adopt a qualitative study design to better explain the determinants of antibiotic self-prescribing at households.

7. Key issues

- A high incidence of ARI among under-fives is an important driving factor for antibiotic use at households with irrational self-prescribing of antibiotics for under-fives a common practice in Uganda. This is a concern with the overuse of antibiotics a major contributor to antibiotic resistance
- Inappropriate antibiotic choices, i.e. the wrong antibiotic, wrong dosage forms and wrong also poses safety concerns among the under-five population
- Broad-spectrum antibiotics of the ATC classes J01C and ATC J01E are the most accessible and used antibiotics, and may aggravate antibiotic resistance
- The porous antibiotic supply chain at the community level enhances unregulated access to antibiotics by households and impact on behaviours for quality care.

- Educational and other campaigns among key stakeholder groups are essential to reduce inappropriate self-purchasing of antibiotics particularly in children
- Guidelines for use and access to antibiotics at households should be developed. The implementation and regulation of such guidelines should be evaluated
- The need for community based antibiotic stewardship programmes is essential among all stakeholder groups in ambulatory care including community drug outlets
- There is need for an integrated approach to increase access to free and quality health care at a community level particularly for high risk populations such as under-fives

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Declaration of interest

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Figures

Figure 1: Household burden of ARIs among the under-fives in Kampala Uganda

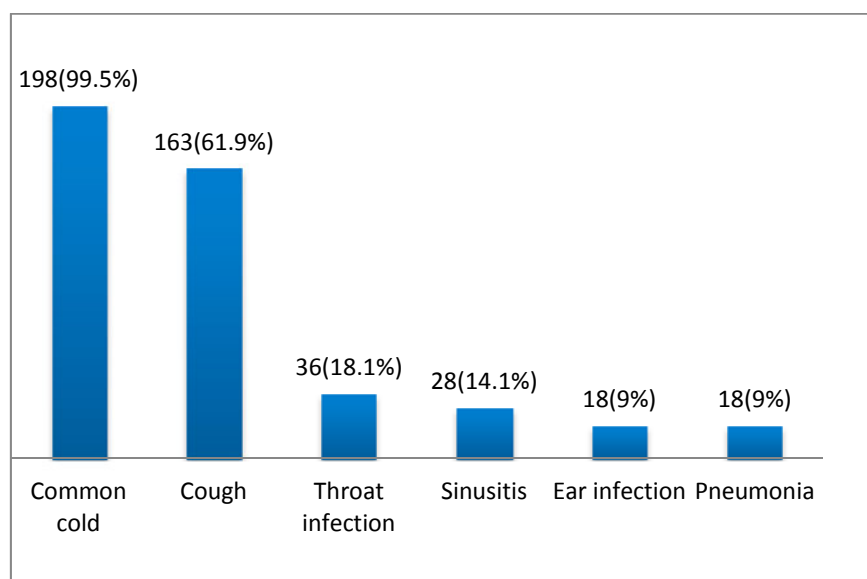


Figure 2: Prevalence of self-medication of under-fives with antibiotics with standard error

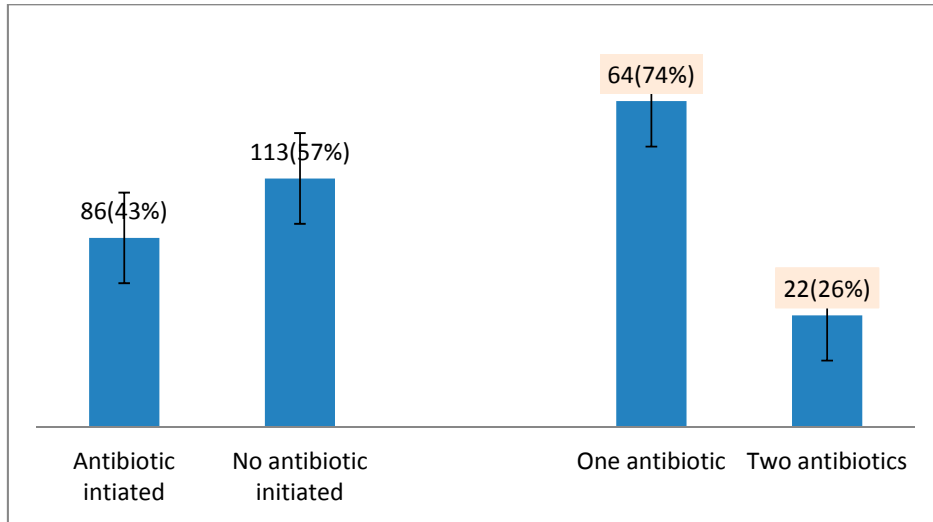
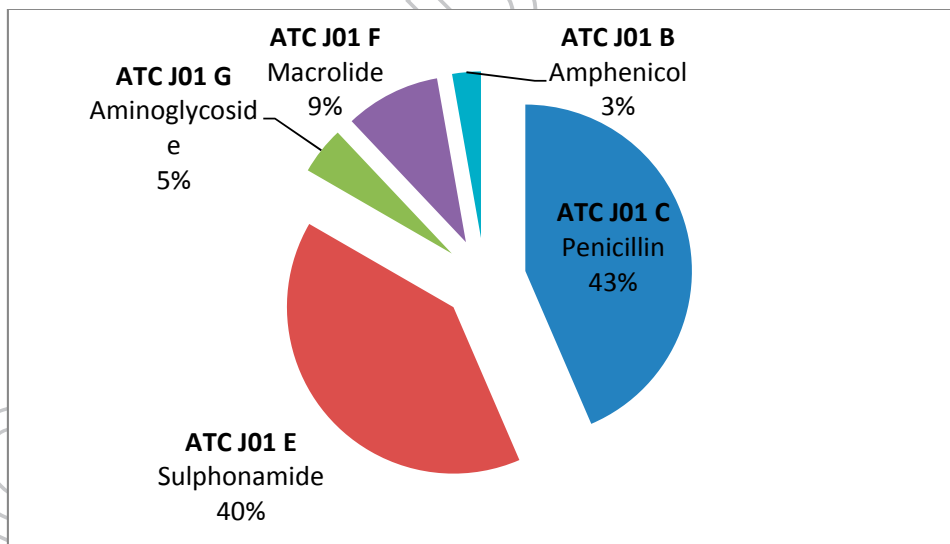


Figure 3: ATC-Classes of antibiotics used in self-medication of ARI in under- fives in Kampala



List of tables

Table 1: WHO recommended treatment of ARI in children*

Symptoms of ARI	Diagnosis	Treatment of choice (WHO IMCI, 2005).
Any general danger sign or Chest in drawing. Stridor in calm child.	Severe Pneumonia Or Very Severe Disease	Give first dose of an appropriate antibiotic. Refer URGENTLY to hospital
Fast breathing	Pneumonia	Give an appropriate oral antibiotic for 5 days. PNEUMONIA ► Soothe the throat and relieve the cough with a safe remedy. Advise mother when to return immediately. Follow-up in 2 days.
No signs of pneumonia or very severe disease.	No Pneumonia: Cough or Cold	If coughing more than 30 days, refer for assessment. <ul style="list-style-type: none"> • Soothe the throat and relieve the cough with a safe remedy. • Advise mother when to return immediately. • Follow-up in 5 days if not improving
Difficulty in swallowing and inflamed throat	Pharyngitis	soothe the throat or relieve a cough, use a safe remedy
Tender swelling behind the ear.	Mastoiditis	Give first dose of an appropriate antibiotic. Give first dose of paracetamol for pain. Refer URGENTLY to hospital.
Pus is seen draining from the ear and discharge is reported for less than 14 days, Ear pain.	Acute Ear Infection	Give an oral antibiotic for 5 days. Give paracetamol for pain. Dry the ear by wicking. Follow-up in 5 days.
No ear pain and no pus seen draining from the ear.	No Ear Infection	No additional treatment.

*Adopted from the WHO (2005) *Integrated management of childhood illnesses*

Table 2: Social demographic characteristics of interviewees at the households (n = 199)

Demographic Characteristic	Frequency (%)	χ^2	<i>p</i> -value
Care taker			
Mother	92 (46.2)	42.945	0.000
Father	84(42.2)		
Guardian	23(11.5)		
Sex of respondent			
Male	92(46)	1.280	0.258
Female	108(54)		
Location of household			
Urban	83(41.5)	29.116	0.000
Rural	25(12.5)		
Semi-urban	91 (45.5)		
Education level			
No education	14(7)	90.52	0.000
Primary	19(9.5)		
Secondary	80(40)		
Tertiary	87(43.5)		

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Table 3: Factors associated with the use of self-prescribed antibiotics

Characteristic	Self-prescribed antibiotic used		χ^2	<i>p-value</i>
	Yes	No		
Location of household				
Rural	7	18	6.874	0.032
Semi-urban	34	57		
Urban	44	39		
Level of education				
No education	2	12	15.808	0.001
Primary level	3	16		
Secondary level	33	47		
Tertiary level	48	39		
Confidence to self-diagnose ARI				
Not confident(1)	31	65	12.089	0.007
Not sure(2)	52	42		
Confident(3)	1	5		
Very confident(4)	2	2		
ARI treatment behaviour				
No treatment initiated	0	1	26.068	0.000
Homemade remedies	2	14		
Use herbal medicines	1	14		
Medicine left overs	45	64		
Seek medical care	38	21		
Antimalarial prescribed				
Yes	5	20	7.455	0.114
No	81	94		
Non medication therapies used				
Yes	9	43	24.372	0.000
No	77	71		
Prior ARI appropriately treated				
Yes	3	90	112.199	0.000
No	86	24		
Source of remedies for ARI				
Hospital remnants	4	9	27.008	0.000
Health center remnants	1	3		
Clinic (Private)	37	28		
Pharmacy	24	25		
Drug Shop	20	23		
Herbalists	-	21		
Open Market	-	5		

Appendices

Figure A1 - Self-prescribed antibiotic regimens for treatment of ARI in under- fives in Kampala

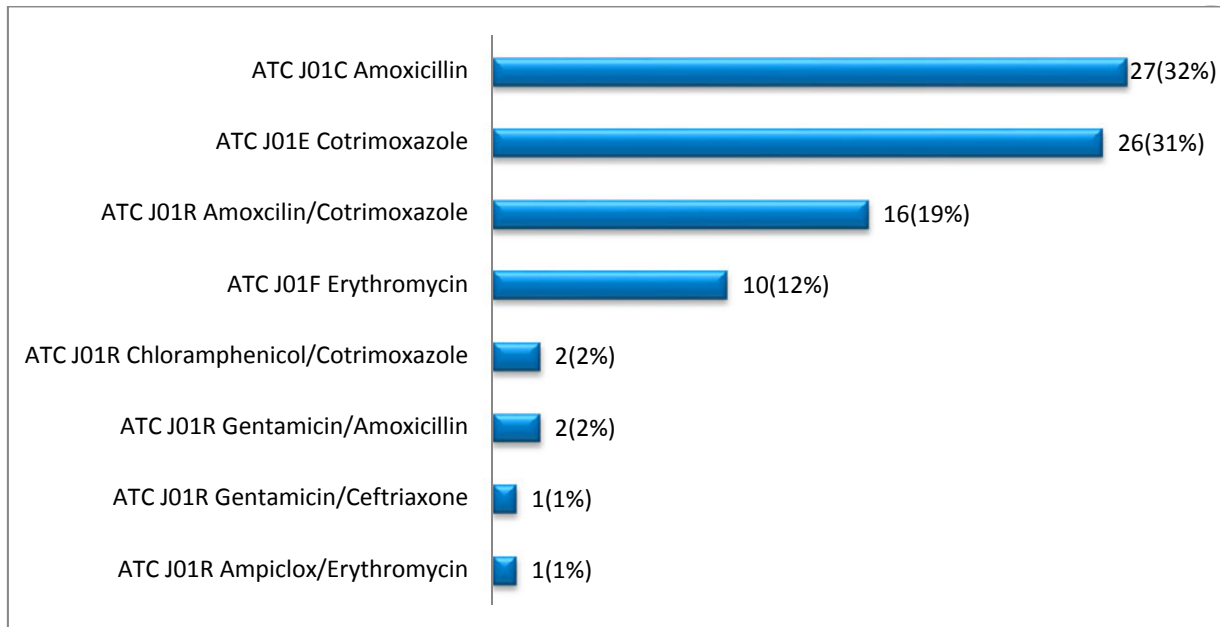
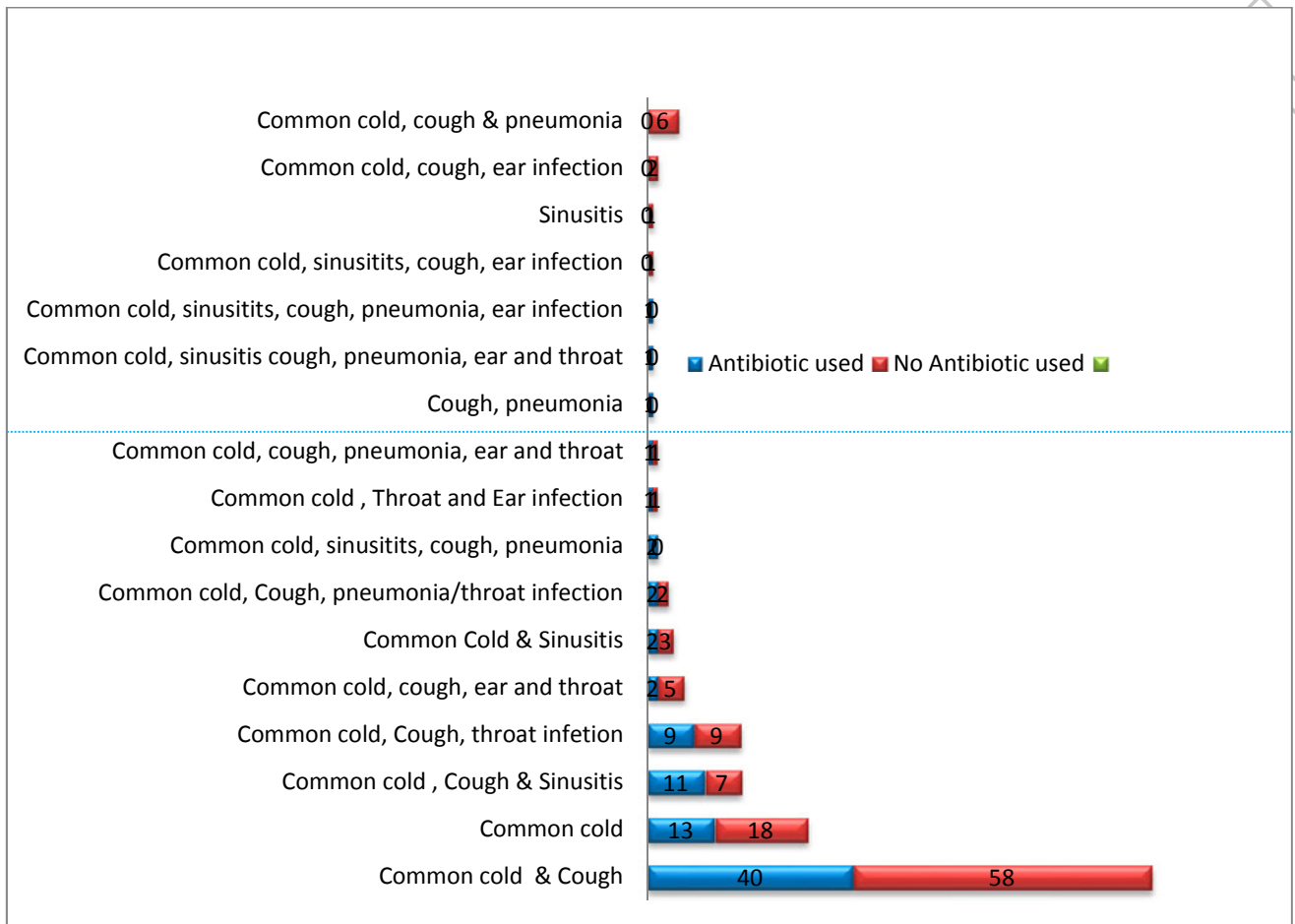


Figure A2: Symptomatic antibiotic self-prescribing for ARI in under-fives in Kampala, Uganda



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Interview guide questionnaire

Title: Assessment of home based Management practices of acute respiratory infections among parents of the < 5 years children in Kampala, Uganda

Introduction and Purpose:

Hello. My name isand I would like to ask you a few questions as part of an assessment conducted by one MPH officer, Kagoya Harriet Rachel. The purpose of this exercise is to assess the home based Management practices of acute respiratory infections (ARIs) among parents of the < 5 years children in Kampala, Uganda.

Consent form

Procedures:

I will ask you a few questions about home based management of acute respiratory infections. Your genuine responses will be greatly appreciated. Your participation is absolutely voluntary and there is no penalty for refusing to take part.

Confidentiality:

If you accept to participate in the interview, I will ask you questions privately without the presence of anyone else and in a place where our discussion cannot be overheard. All information that I record will be kept strictly confidential; your name will not be used and you will not be identified in any way.

Risks/discomfort and Benefits:

There is no serious risk to you if you agree to participate in this interview activity. Some of the questions may be sensitive for instance, your family information. I want to assure you that all information collected will be kept confidential. This study will help health care givers better understand how parents and other care givers respond to and manage ARI among children below 5 years of age. We will use this information to identify the home based practices for responding to ARIs and identify strategies for improving the management of ARI for children's better health, reduction in morbidity and mortality.

Persons to contact:

Do you have any questions you would like to ask about the purpose and procedure of this interview? (Take questions if any). I will also be available to take any questions that you may have at the end of this interview.

May I proceed with the interview? Yes _____ No _____

The interviewer's signature below verifies that informed consent has been verbally obtained

Name of Interviewer _____ Sign _____ Date ____/06/2011

Please Contact me for any further questions

Harriet Rachel Kagoya Kibuule

Mobile: +264 816 873 619

Email: kharietrachel@yahoo.com, h.kagoya@sfh.na.org

Dennis Mutekanga

+256 779 100 383

Email: mutekangadenis@yahoo.com

Interviewer: Please Tick or fill in the required information as per instruction. *Do not read responses unless the directions indicate.*

Questions

Serial No. _____	101) Date of interview ____/____/____ DD/MM/YYYY	102) Division (1) <input type="checkbox"/> Nakawa (2) <input type="checkbox"/> Kawempe (3) <input type="checkbox"/> Rubaga (4) <input type="checkbox"/> Kampala central (5) <input type="checkbox"/> Makindye	103) Initials of data Collector's name: _____
Family & respondent Demographics	104). Role of Respondent (1) <input type="checkbox"/> Mother (2) <input type="checkbox"/> Father (3) <input type="checkbox"/> Other specify _____	105). Sex of Respondent (1) <input type="checkbox"/> Male (2) <input type="checkbox"/> Female	106). Age of respondent: _____ years

	<p>107). Residence of respondent</p> <p>(1) <input type="checkbox"/> Urban</p> <p>(2) <input type="checkbox"/> Rural</p> <p>(3) <input type="checkbox"/> Semi-urban</p>	<p>108). Respondent's highest level of education</p> <p>(1) <input type="checkbox"/> No education</p> <p>(2) <input type="checkbox"/> Primary education</p> <p>(3) <input type="checkbox"/> Secondary education</p> <p>(4) <input type="checkbox"/> Tertiary education</p>	<p>109). Respondent's employment status</p> <p>(1) <input type="checkbox"/> Formal employment</p> <p>(2) <input type="checkbox"/> Casual employment</p> <p>(3) <input type="checkbox"/> Self employed</p> <p>(4) <input type="checkbox"/> Unemployed</p>
	<p>110). Family Size:</p> <p>_____ Total</p> <p>_____ Adults</p> <p>_____ Children</p>	<p>111). Number of children (1) < 3 months: _____</p> <p>(2) 4-12 months: _____</p> <p>(3) 1-3 years: _____</p> <p>(4) 3-5 years: _____</p>	<p>112). How many of < 5 yrs have <u>completed</u> immunization?</p> <p>_____</p>
<p>113). Are children of school going age Schooling?</p> <p>(1) <input type="checkbox"/> YES</p> <p>(2) <input type="checkbox"/> NO</p>	<p>114). If Yes, state Number of Children < 5 years going to School</p> <p>_____ kids</p>	<p>115). Type of School</p> <p>(1) <input type="checkbox"/> Public</p> <p>(2) <input type="checkbox"/> Private</p> <p>(3) <input type="checkbox"/> Both Private & Public</p>	<p>116). Location of School</p> <p>(1) <input type="checkbox"/> Urban (2) <input type="checkbox"/> Rural</p> <p>(3) <input type="checkbox"/> Semi-urban</p>
<p>117). Have any of your children <5 years suffered from ARI?</p> <p><i>(Explain what ARIs are and give all the symptoms)</i></p> <p>(1) <input type="checkbox"/> Yes</p> <p>(2) <input type="checkbox"/> No</p> <p>(3) <input type="checkbox"/> I don't know</p>	<p>Symptoms of ARI</p> <ul style="list-style-type: none"> ➤ Flu/ Common cold ➤ Ear infections ➤ Nose Congestion ➤ Throat infections ➤ Cough infections ➤ Breathing Sounds ➤ Breathing fast ➤ Others 	<p>118). Type of ARI suffered</p> <p>(1) <input type="checkbox"/> Common Cold</p> <p>(2) <input type="checkbox"/> Sinusitis</p> <p>(3) <input type="checkbox"/> Flu</p> <p>(4) <input type="checkbox"/> Cough</p> <p>(5) <input type="checkbox"/> Pneumonia</p> <p>(6) <input type="checkbox"/> Ear infections</p>	<p>119). When did they / she/he (kids <5 yrs) last suffer from ARI?</p> <p>1) <input type="checkbox"/> 0-2 weeks ago</p> <p>2) <input type="checkbox"/> 2-4 weeks ago</p> <p>3) <input type="checkbox"/> > 4 weeks ago</p> <p>4) <input type="checkbox"/> I don't remember</p>

		(7) <input type="checkbox"/> Throat Infections	
120). How frequent do kids in your family suffer ARI/ year? (1) <input type="checkbox"/> (1) Every month (2) <input type="checkbox"/> (2) Every 2 nd or 3 rd month (3) <input type="checkbox"/> (3) Twice in a year (4) <input type="checkbox"/> (4) Rarely (once in a year)	121). What is the Common Duration of symptoms? (1) <input type="checkbox"/> 1-3 days (2) <input type="checkbox"/> 4-7 days (3) <input type="checkbox"/> more than 7 days	122). How soon did /do you <u>NOTICE</u> any of the symptoms? (1) <input type="checkbox"/> less than 1 day (2) <input type="checkbox"/> 1-3 days (3) <input type="checkbox"/> 3-5 days (4) <input type="checkbox"/> more than 5 days	123). How soon did / do you <u>RESPOND</u> e.g. giving 1 st treatment? (1) <input type="checkbox"/> Same day after seeing signs (2) <input type="checkbox"/> Within < 3 days (3) <input type="checkbox"/> 3-5 days (4) <input type="checkbox"/> About 7 days (5) <input type="checkbox"/> More than 7 days
124). What is your <u>IMMEDIATE</u> / <u>1st response at HOME?</u> (1) <input type="checkbox"/> None / ignored symptoms (2) <input type="checkbox"/> Give Home made Remedies (2) <input type="checkbox"/> Treat with herbs made <u>AT HOME</u> (3) <input type="checkbox"/> Treat with herbs locally purchased (4) <input type="checkbox"/> Gave medicines (tablets & syrup) (5) <input type="checkbox"/> Take to Clinic/Hospital (5) <input type="checkbox"/> Others: _____ –	125). List the common medicines or Remedies Used at home for quick treatment of ARIs: 1. _____ 2. _____ 3. _____ 4. _____ 5. _____	126). Where did/ do you purchase /get drugs for child(ren) treatment? (1) <input type="checkbox"/> Hospital (2) <input type="checkbox"/> Health Centre (3) <input type="checkbox"/> Clinics (4) <input type="checkbox"/> Pharmacy (5) <input type="checkbox"/> Drug shop (6) <input type="checkbox"/> Other (<i>specify</i>) _____	
Perceived effectiveness of home based treatment	127). Was treatment effective? (1) <input type="checkbox"/> Yes (2) <input type="checkbox"/> No (3) Not sure	128). If Yes, how long did it take the child(ren) to recover from the symptoms being treated? (1) <input type="checkbox"/> Les than 3 days (2) <input type="checkbox"/> 3 – 5 days (3) <input type="checkbox"/> Within one week (4) More than a week (7 days)	
Decision to seek professional health care	129). After initial treatment at home, did you take the	130). If Yes, how soon did you take the child(ren) to health facility?	131). At the health facility, was child admitted?

services	child(ren) to a health facility? (1) <input type="checkbox"/> Yes (2) <input type="checkbox"/> No	(1) <input type="checkbox"/> Same day after giving initial treatment (2) <input type="checkbox"/> Within 3 days (3) <input type="checkbox"/> 3-5 days (4) <input type="checkbox"/> After one week (7 days)	(1) <input type="checkbox"/> Yes (2) <input type="checkbox"/> No (3) <input type="checkbox"/> Don't remember
132). How confident do you feel when managing the last ARI episode? (1) <input type="checkbox"/> Not confident (2) <input type="checkbox"/> Not sure (3) <input type="checkbox"/> Somewhat confident (4) Very confident			
133). What would you have done differently if the symptoms re-occur? 1. _____ 2. _____ 3. _____		134). Do you feel you have the necessary knowledge and skill to handle ARI at home? (1) <input type="checkbox"/> Yes (2) <input type="checkbox"/> No (3) <input type="checkbox"/> Not sure	
135). What would you recommend the government or ministry of health should do to improve home based management of ARIs? 1. _____ 2. _____ 3. _____			
136). What determines that you will take the child to hospital or not? _____ _____ _____ _____	137). How do you tell that the child is severely ill and needs to be taken to Hospital _____ _____ _____ _____		

Thank you very much for your participation!

Reminder to interviewer: check that all questions are responded to.

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