Combating Antibiotic Resistance In Tropical Countries –Don’t Ignore Patent Medicine Vendors
A Rosamund, E Edwin, A Abubakar, B William

Citation

Abstract
OBJECTIVE: The World Health Organization (WHO) recently reemphasized the growing threat of antimicrobial resistance (including antibiotic resistance) partly due to inappropriate medicine use by healthcare providers. Patent medicine (PM) vendors are a large group of informal healthcare providers licensed to sell over-the-counter drugs but not antibiotics. This study investigated PM Vendor's treatment of sick children under 5 years in order to determine whether drugs they use may contribute to antibiotic resistance.

METHODS: Questionnaire interviews of 491 PM Vendors in Kaduna, Northern Nigeria, Africa.

RESULTS: Fever, diarrhea, measles, cough were the common illnesses treated. The proportion who used antibiotics varied with type of illness - 15.8% for fever, 77.3% diarrhea, 74.9% measles, 47.7% cough/catarrh and 39(57.4%) of 68 who treated pneumonia. Some 117 (23.8%) PM Vendors had training in western medicine (mainly in nursing) and most of them prescribed antibiotics more often than PM Vendors without such training (p<0.001). PM Vendors prescribed antibiotics because antibiotics were thought to be effective. Another reason for prescribing antibiotics even when not needed was to meet expectations of the parents. Thirty-seven percent of them used substandard doses.

CONCLUSION: PM Vendors used antibiotics inappropriately and this could contribute to antibiotic resistance. Training PM Vendors in appropriate management of illnesses using drugs they are allowed to sell could reduce antibiotic resistance. Training PM Vendors should be made a precondition for opening shops and reissuing licenses. Public enlightenment about appropriate use of antibiotics and research into prescription practices of other health providers is needed. Whether some PM Vendors should be allowed to sell a limited range of antibiotics, (similar to Accredited Drug Dispensing Outlets programs of Tanzania) for treatment of life-threatening conditions needs careful deliberation.

INTRODUCTION
The World Health Organization (WHO) has identified Antimicrobial Resistance (AMR) as one of the greatest threats to human health. On 2011 World Health Day, WHO spearheaded a campaign to once again urge governments, health professionals and civilians to take action to decrease the spread of AMR [1]. AMR refers to the resistance that microorganisms develop to drugs to which they were previously sensitive. AMR results in decreased effectiveness of drugs, greater treatment costs and increased patient morbidity and mortality [1, 2]. AMR threatens to undermine the effectiveness of various health programs and the achievement of the Millennium Development Goals and has even been described as a threat to global stability [1].

As antibiotics are one of the largest groups of antimicrobials used in regular practice, reducing antibiotic resistance is a vital component of combating AMR [1]. An important cause of development of bacterial resistance is inappropriate use of antibiotics by health providers which occurs when antibiotics are prescribed unnecessarily or in substandard doses [1-3]. Thus determining the pattern of antibiotic usage at local, community, and national levels is important in combating antibiotic resistance [1, 3, 4]. This information can then be compared to emerging resistance patterns and used to develop appropriate cost-effective strategies to improve antibiotic use and gain the political support needed to invest in these strategies. In developed countries, routine monitoring of medicine use is done through computerized recording of prescriptions and health insurance reports but many developing countries do not have such facilities [4]. Information about drug use in developing countries is obtained mainly from research done in public health facilities and academic institutions. Knowledge about antibiotic usage in the private sector (which provides the bulk of healthcare in several communities) is limited [1, 2, 4-6].
Private Healthcare providers in developing countries are made up of formal practitioners (i.e. qualified health workers working in private health facilities and pharmacies) and informal ones (patent medicine vendors, hawkers and traditional practitioners) [6-8]. Patent Medicine Vendors (PM Vendors) are patronized by great numbers of people in both rural and urban areas. Though they are not recognized as a part of the formal health system, parents consult them about childhood illnesses for which they give advice, prescribe and sell drugs [8]. They are licensed to sell patent and proprietary medicines (e.g. basic painkillers, antimalarials, vitamins, cold and cough remedies, antihelminthics, over-the-counter antiseptics) and are not licensed to sell antibiotics but are reported to do so (6-8). Determining how PM Vendors manage illness is important as drugs they prescribe may contribute to antibiotic resistance. The aim of this study was to investigate PM Vendors treatment of sick children less than five years in Kaduna city, Nigeria, specifically, to document their use (if any) of antibiotics. Such information could assist policy makers develop effective strategies to combat antibiotic resistance and improve healthcare delivery in areas where PM Vendors contribute to healthcare delivery.

MATERIALS AND METHODS

STUDY AREA

Nigeria is the most populous country in Sub-Saharan Africa. As in many other developing countries, antibiotics are commonly used to treat illness and widespread antibiotic resistance has been recorded in the North [2, 6, 9]. Kaduna is an important city situated in northern Nigeria, located 250 kilometers from Abuja the country’s capital. At the time of the study, in the year 2003, its population was estimated to be a million comprising of people with different ethnic backgrounds living there. A lot of people work in the civil service, small scale businesses, textile plants, car assembly plants, and the oil refinery [10]. Kaduna is composed of 2 administrative areas - Kaduna North and Kaduna South local government areas which are made up of a mixture of residential and commercial areas. National household surveys revealed that a quarter of the population utilizes PM Vendors for healthcare. PM Vendors were licensed by government in the 1960s to help expand access of rural and underserved communities to basic medicines because there were not enough pharmacists [6]. They are expected to be over 21 years and have at least primary school education before their shops can be registered by the state government. They are issued with licenses which are expected to be renewed yearly [7, 8]. However PM Vendors who are not registered also operate openly from shops. Both registered and unregistered PM Vendors are members of the National Association of Patent and Propriety Medicine Dealers (NAPPMED) which has chapters all over the country. There are no accurate statistics about the numbers of PM Vendors but Kaduna had 220 registered shops. The study coincided with the period when the Task Force of the State Ministry of Health began its inspection of PM Vendor shops with a view to ensure that they complied with the state regulations.

STUDY DESIGN

This was a cross-sectional descriptive survey of all PM Vendors in one administrative area (Kaduna South LGA). PM Vendors operating in shops were interviewed because they are the ones most commonly used by mothers of sick children [9]. PM Vendors in shops were included whether or not their shops were registered and whether or not they were members of NAPPMED. Shops were located by signposts and word of mouth. Interviews were carried out using an interviewer-administered questionnaire (Appendix 1) which had been pretested and validated in an area similar to but far away from the study area. This questionnaire consisted of both open and closed ended questions. It included questions about the characteristics of the PM Vendors, the shop and the illness they commonly treated sick children for.

ETHICAL APPROVAL, INFORMED CONSENT AND ANONYMITY

The Scientific and Ethical committee of the Ahmadu Bello Teaching Hospital Zaria, Nigeria and the Institutional Review Board of Boston University, United States of America granted approval for the study. Informed consent was obtained from the State Chairman of NAPPMED, the owner of each shop and each individual enrolled in the study. In order to ensure confidentiality, no person or shop was identified by name.

DATA AND STATISTICAL ANALYSIS

Analysis was carried out using Epi Info™ version 6.04 (Centers for Disease Control and Prevention, Atlanta, USA). Variables analyzed included characteristics of PM Vendors, the shops, childhood illnesses seen, methods of treatment and any drugs used. Drugs were reclassified into pharmacological groups and recommended doses into correct dose, substandard (under-dose) and overdose. Frequency distributions of all variables were calculated and factors that could influence the behavior of PM Vendors compared in terms of proportions. Tests of significance were
done using chi-square and student t-test to detect statistically significant differences at the 95% confidence interval level (p<0.05).

RESULTS
CHARACTERISTICS OF PM VENDORS
A total of 491 PM Vendors were interviewed of whom 370 (75%) were shop owners, 63 (13.8%) apprentices, and 58 (11.8%) employees or relatives of the shop owner. Two-thirds were male, 457(93%) of them were above 21 years, and all were literate having received at least primary education. Of these 491 PM Vendors, 117 (23.8%) had received training in western medicine (mainly as nurses and nursing auxiliaries) and 63 (14.7%) worked in hospitals. Most of the PM Vendors (n=308, - 83.1%) were members of NAPPMED which they felt protected their interests and provided them with information.

CHILDHOOD ILLNESSES COMMONLY SEEN (FIG 1)
The most common illnesses seen were fever, respiratory tract infections (cough and catarrh), diarrhea and measles. The PM Vendors diagnosis was based on the mothers’ history, physical examination and their experience. Children were referred when they were seriously sick, or their condition did not improve after treatment.

Figure 1
FIG 1: CHILDHOOD ILLNESSES SEEN BY PATENT MEDICINE VENDORS (PM Vendors)

TREATMENT OF ILLNESS (FIG 2)
PM Vendors used both drugs and non-drug treatments. They stated that drugs prescribed depended on the child’s age (89.2%), history and severity of illness (88%) and amount of money available for treatment (49.7%) and only (7.7%) were influenced by the caregiver’s wishes. When a child presented with more than one illness, the drugs usually prescribed for each illness were combined.

FEVER: Most of the PM Vendors (n= 482, - 98%) usually treated fever with antipyretics (paracetamol) and some with antimalarials. Only 76 (15.8%) used antibiotics (oral cotrimoxazole, amoxicillin and metronidazole). Non-drug treatment consisted of advice to tepid sponge children.

RESPIRATORY TRACT INFECTIONS: Of 478 (97.4%) PM Vendors who treated cough/catarrh, the majority used antitussives (cough mixtures, expectorants, and antihistamines) but 228 of them (47.7%) usually gave antibiotics. Some PM Vendors (n=68, - 13.9%) claimed to treat children with pneumonia and at least 57.4% of these (n= 39) used antibiotics. The antibiotics were oral cotrimoxazole, ampicillin-cloxacillin, ampicillin, erythromycin and 3 (4.4%) used penicillin injections for pneumonia. Non drug therapy was advice to keep children warm and avoid dust.

WATERY DIARRHEA: Most (n=337,- 77.3%) of the 436 PM Vendors who treated diarrhea administered antibiotics (metronidazole, cotrimoxazole) and many of these PM Vendors 319 (73.2%) also gave anti-diarrhea mixtures. Only 174 (39.9%) of these PM Vendors recommended Oral Rehydration Solution (ORS) and none of them gave zinc. Non-drug therapies were advice to avoid certain foods, reduction of the child’s temperature and avoidance of cold.

MEASLES: Of the PM Vendors 398 (81.1%) who treated measles, the majority of them (n=298,-74.9%) prescribed oral antibiotics (cotrimoxazole, ampicillin-cloxacillin, amoxicillin) and 123% used penicillin injections. Though 98 (32.9%) prescribed vitamins only one PM Vendor mentioned using vitamin A. Most of the PM Vendors who treated measles (n= 263, - 66.1%) used a topical preparation (calamine lotion).
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Figure 2
Fig. 2 Drugs used by Patent Medicine Vendors (PM Vendors) in treatment of common childhood illness

ANTIBIOTIC USAGE
Antibiotics were openly displayed in 45% of the PM Vendors shops. PM Vendors stated they used antibiotics because they felt they were effective, parents were familiar with them and expected them to be prescribed. When compared to the official monthly minimum wage of 70US Dollars, the cost of a course of antibiotics was cheap (between 0.5 to 2 US Dollars). However 22.9% to 37.1% of PM Vendors prescribed too small a dose of the various antibiotics. Overall a greater proportion of PM Vendors who had received training in western medicine used antibiotics than PM Vendors who had no such training (p=0.001).

PM VENDORS COMMENTS
PM Vendors complained they were harassed by government officials because of the types of drugs they sold. They felt they should be allowed to sell an expanded range of drugs as they were providing service to their communities. They were keen to have training in drug administration, injections and management of pediatric illnesses but many 298 (60.7%) stated they could only spare 1 or 2 days a week for training (preferably mornings or afternoons as evenings were their busiest times).

DISCUSSION
Many PM Vendors treated children with antibiotics inappropriately by prescribing antibiotics for illnesses that did not need them and using substandard doses. Watery diarrhea, upper respiratory tract infections (URTI) and measles are caused by viruses which do not respond to antibiotics, but which could be managed with non-drug therapies and drugs PMVs are allowed to sell. For example national and international guidelines stress the importance of giving Oral Rehydration Solution (ORS) to children with diarrhea to prevent or correct dehydration and forestall complications [11, 12]. Antibiotics are only indicated in the few cases where diarrhea is bloody. Similarly URTI usually improves with medication to relieve symptoms, while most episodes of measles can be safely treated on outpatient basis with antipyretics and oral vitamin A to prevent eye complications [12]. Some PM Vendors prescribed antibiotics for children with fever but national guidelines recommend antipyretics and antimalarial drugs for initial treatment of children with fever [13, 14]. The PM Vendors treatment of children with malaria is reported in another paper [15]. Inappropriate use of antibiotics by qualified and unqualified health providers occurs all over the world and contributes to development of antibiotic resistance [1, 2]. In this study, antibiotics were more often prescribed by PM Vendors who had received training in western medicine. This may reflect practices in hospitals where some of them worked as antibiotics are commonly prescribed in public health facilities as a blanket treatment because laboratory facilities to identify the organism responsible for illness are inadequate [2,6]. However continuing professional education of health workers has been shown to be one of the tools for combating antibiotic misuse [17, 18]. But PM Vendors are not formally recognized as health providers and so are not usually included in training programs. Many governments are reluctant to train them because this may be regarded as official recognition [8, 19]. However in those areas where PM Vendors are numerous, and provide treatment for priority diseases, it is increasingly being recognized with concern that the dispensing practices of PM Vendors must be improved [19-21]. A few ministries of health in Africa and Asia are supporting pilot projects to do so [22]. Researchers have demonstrated that training PM Vendors can result in improved prescription practices. For example in Uganda, training PM Vendors has resulted in a decrease in the use of unnecessary medications (including antibiotics) from 77% to 22% for treatment of diarrhea, pneumonia and malaria [16, 19, 22].

Training is not the only answer to combating antibiotic resistance. Other factors like parental expectations and the economic incentives of PM Vendors must be addressed. Educating parents about alternatives for relief of symptoms
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is important as parental expectations appeared to affect excess antibiotic usage. A nationwide public education campaign carried out in France led to reduction in antibiotic use [23] but in many countries in Africa and Asia this has been neglected.

Some PM Vendors claimed to have treated children for pneumonia. If this is true, antibiotics might have been lifesaving as pneumonia is a major cause of child mortality [24]. This raises the question- should some PM Vendors be allowed to use a limited range of antibiotics for initial treatment of certain conditions? Administration of antibiotics by unskilled workers is controversial but in India, village health workers and traditional birth attendants were trained to recognize and treat neonatal sepsis using antibiotics [25]. The program was found to be safe and effective but required supervision. Also the Accredited Drug Dispensing Outlets (ADDOs) program set up in Tanzania-trained and licensed PM Vendors (known as Duka La Dawa Muhimu) to dispense and sell an expanded range of drugs including some antibiotics [26]. The quality of drugs and services was maintained through record-keeping, mentoring and inspection. The program was a success and profitable to PM Vendors but it remains to be seen whether it can be successfully implemented in other countries.

LIMITATIONS

This study was limited in that it was unable to confirm whether the PM Vendors’ diagnosis of illness was not correct nor did it determine their actual treatment practices. Determination of these factors was outside the scope of the study. It is likely that more PM Vendors than what we recorded in this study prescribed antibiotics as some of them were cautious about admitting they sold antibiotics because the government task forces were threatening to close down shops for illegal activities. It was also not possible to determine whether other reasons influenced use of antibiotics (e.g. desire to make profit). However the data provides evidence to justify government investment in strategies to involve PM Vendors in the fight to combat antibiotic resistance. This is necessary because in several parts of the world, they continue to be patronized even in those areas where facilities in government run hospitals have been improved [8, 20].

CONCLUSION

Combating antibiotic illness requires coordinated national and international efforts and other measures such as improved diagnostic facilities, bacterial surveillance and research into prescription practices of other healthcare providers in various communities [1-4]. While these measures are being put in place, it is recommended that PM Vendors should be trained in appropriate management of childhood illnesses and the containment of antibiotic resistance. Training could be made a precondition for opening shops and re-issuance of licenses. Obtaining access to PM Vendors is best done through national PM Vendors associations (e.g. the National Association of Patent and Propriety Medicine Dealers). This study shows that many PM Vendors use antibiotics inappropriately. Thus strategies to combat antibiotic resistance should involve PM Vendors. This is necessary because the public keep ‘voting with their feet’ by continuing to patronize PM Vendors.

RELATED PAPER


Figure 3

Appendix 1: QUESTIONNAIRE FOR PATENT MEDICINE VENDORS

A. INTRODUCTION

Good day (Sir/Madam) I am ____ from AER TEACHING HOSPITAL, KAGENA. I am here to discuss with you about common illnesses among small children in this community and the type of product and services you offer during illness. I want to assure you that whatever discussion we have here will remain confidential. Your input will assist us design a program to improve the knowledge of Patms about illness in children. Please if you agree to continue with the interview, you will need to sign/thumbprint/stamp our consent form. (Note: Interviewer should get consent form signed or stamped.

B. GENERAL INFORMATION

(Complete the following sections. Please tick boxes where necessary)

1. STATUS: □ Owner □ Apprentice □ Other (Specify) __________

2. AGE ________ 3. ETHNIC GROUP ____ 4. SEX: □ Male □ Female

5. EDUCATION: □ Primary □ Secondary □ Post-Secondary □ Other (Specify) __________

6. RELIGION: □ Christian □ Muslim □ Other

7. Please tell me what it was that got you interested in taking up the work of patent medicine selling? (Write what they say)

8. Have you ever received training or are you still undergoing training as a patent medicine seller? ( □ Yes □ No) go to question 10

9. If yes how many years training? __________

10. Do you have any other kind of training? ( □ Yes □ No) go to question 12

11. If yes please tell me what kind of training it is __________

12. Do you also work in another place apart from here? ( □ Yes □ No)

13. If yes, what other kind of work is it that you do? __________
### Figure 4

14. Apart from you, how many people work in this shop? __________

15. What are all the different things you do for sick children? (In column 1, tick all the options mentioned spontaneously/off head. Encourage respondent by asking, "Any other ideas?" After respondent finishes, return to item ticked "No" and ask directly, "Do you..."

<table>
<thead>
<tr>
<th>Action</th>
<th>Column 1: Spontaneous/off head</th>
<th>Column 2: If they did not mention off head ask directly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell drug</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Give injection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Try to find out what is wrong with the child</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Give advice about how to use drug</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Prescribe drug treatment</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Give intravenous fluids (drip)</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

16. In the past 2 days, how many customers have you personally served? __________

17. Among those customers you served in the past 2 days, how many came to buy something or get help for a child under 5 years of age?

18. When people come to buy something or get help for a child under 5 years of age, what problems and complaints do they usually come with? (Write out what they say)

19. What of newborn babies, do people ever bring them to you? | Yes | No |

20. If yes, what problems or complaints do they come with?

### Figure 5

21. How often do you see children with the following conditions? (Interviewer to read out conditions one by one)

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>VERY OFTEN</th>
<th>OFTEN</th>
<th>OCCASIONALLY</th>
<th>NEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td></td>
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<tr>
<td>Malaria</td>
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<tr>
<td>Cough</td>
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<tr>
<td>Cataract</td>
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<tr>
<td>Pneumonia</td>
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<tr>
<td>Diarrhea</td>
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<tr>
<td>Measles</td>
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<tr>
<td>Convulsions</td>
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</tr>
<tr>
<td>Newborn baby with jaundice</td>
<td>Yes</td>
<td>No</td>
<td></td>
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</tr>
</tbody>
</table>

22. How do you find out or decide if a child younger than 5 years of age has the following illnesses?

<table>
<thead>
<tr>
<th>Illness</th>
<th>Narrative (write what they say here first and then tick code to the right)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
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<td>Malaria</td>
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<td>Cough</td>
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<td>Cataract</td>
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<td>Pneumonia</td>
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<td>Diarrhea</td>
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<td>Measles</td>
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<td>Convulsions</td>
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<td></td>
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<tr>
<td>Newborn baby with jaundice</td>
<td>Yes</td>
<td>No</td>
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</tbody>
</table>
### Figure 6

**Coding Narrative**
- A = from what mother/carer says
- B = I look, touch, or examine the child
- C = I read a prescription sheet
- D = I read a lab report
- E = I use my experience
- F = I use a book
- G = Other
- H = don't know

**FILL IN THE CODES AFTER THE INTERVIEW IS OVER.**

23. What are the common medicines that you recommend for the following illnesses and symptoms FOR CHILDREN? (Write down what they say and then encourage respondents by asking: Is there any other medicine that you use for this illness?)

<table>
<thead>
<tr>
<th>Illness/symptom</th>
<th>Name of medicine</th>
<th>Given as</th>
<th>Amount or dose</th>
<th>How many times a day</th>
<th>For how many days</th>
<th>Other Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Syrup</td>
<td>Tablet</td>
<td>Injection</td>
<td></td>
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<tr>
<td>Fever</td>
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<tr>
<td>Malaria</td>
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<td>Cough</td>
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<td>Diarrhoea</td>
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<tr>
<td>Newborn baby</td>
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<tr>
<td>Jaundice</td>
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</tbody>
</table>

### Figure 7

24. Besides selling the medicines you have mentioned above, what other things do you do for a child who has the following illnesses (interviewer to read out the illness/symptoms to respondent)

<table>
<thead>
<tr>
<th>Illness/Symptom</th>
<th>Other Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td></td>
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<tr>
<td>Malaria</td>
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<td>Cough</td>
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<td>Diarrhoea</td>
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<tr>
<td>Newborn baby</td>
<td></td>
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<tr>
<td>Jaundice</td>
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</tr>
</tbody>
</table>

25. How important are the following things (factors) in helping you to decide what medicine or services you give to a customer? (Interviewer to read out factors to the respondent)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Not Certain</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>What the mother says is wrong with the child</td>
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<tr>
<td>How much money the mother has for treating the child</td>
<td></td>
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<tr>
<td>The things the mother asks you to do for her child</td>
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<tr>
<td>Any other? (Specify)</td>
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</tbody>
</table>
Combating Antibiotic Resistance in Tropical Countries – Don’t Ignore Patent Medicine Vendors

Figure 8

25. a. Do you refer customers to the hospital/clinic/doctor?  
   [ ] Yes [ ] No  (If No, go to question 27)  
26. Did you treat the child before you referred him/her?  
   [ ] Yes [ ] No  (If No go to question 26)  
27. a. How long did you treat him/her?  
   [ ] Yes [ ] No  (If No go to question 27)  
28. What was the reason for the referral?  

27. Do you refer customers to the hospital/clinic/doctor?  
   [ ] Yes [ ] No  (If No go to question 27)  
28. How many such prescription sheets have you seen in the past one week?  
29. How many of these prescriptions sheets were for children under five years old?  

28. How well do you understand what is written on a prescription sheet?  
   [ ] Very well [ ] Somewhat [ ] Cannot understand at all  
29. What are the problems you have in understanding what is written on a prescription sheet?  

30. Please tell me what the following things found on prescription sheet mean? (Show the following table to the respondent and write out his answer in the space provided. Code the response later.)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p.o.</td>
<td></td>
<td></td>
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<tr>
<td>Tab</td>
<td></td>
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<tr>
<td>Pm</td>
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<tr>
<td>q.d.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>q.d.s.</td>
<td></td>
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<tr>
<td>Syn</td>
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<tr>
<td>i</td>
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<td>h.s.</td>
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<tr>
<td>iv</td>
<td></td>
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<tr>
<td>i.v.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i.m.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

31. What are the problem(s) you have in carrying out your duties?  
32. What do you think are the solutions to those problems? (Write what they say)  
33. a. Do you think you need training to help you in your work?  
   [ ] Yes [ ] No [ ] Not certain  (If No or Not certain, go to question 34)  
34. If you do, what areas would you like for the training to cover?  
35. How long should such training last?  
36. What days of the week are you free to attend training?  
37. What times of the day are you free to attend such training?  

34. Apart from medicines what else do you sell in your shop? (Tick as many as possible)
   [ ] Baby food [ ] Baby pampers  
   [ ] Provisions [ ] Syringes & needles [ ] Drips  
   [ ] Disinfectant [ ] Cosmetics [ ] Toiletries  
   [ ] Dressings [ ] Drinks [ ] Other (Specify)  

35. What days of the week does this shop open?  
36. What times of the day does this shop open and close?  

37. What type of License does this shop have?  
   [ ] A [ ] B [ ] C  
   (I None [ ] Patent Medicine (PFM) [ ] Don’t Know  
   (If none, go to No 39)  
38. Does any doctor/nurse attend to your customers here?  
   [ ] Yes [ ] No  
39. Have you heard about an association of patent medicine sellers in this area?  
   [ ] Yes [ ] No [ ] Not certain


and Nutrition Group. 2006.
www.globalhealthcommunication.org
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