

## Knowledge, attitudes and practices about use of antibiotics among guardians visiting regional hospital, Guyana

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**Objective:** Antibiotic resistance is gaining a major concern globally as it places a great burden on the economy. Many factors lead to antibiotic resistance with misuse of antibiotics by patient's lack of knowledge, cultural misconceptions, and poor access to appropriate medical care. The objective of this study, therefore, serves to highlight the prevailing situation in Guyana, as it relates to parents/guardians knowledge, attitudes and practices related to antibiotic use. **Design and Methods:** The study was conducted at the East Bank Demerara Regional Hospital. Caregivers of children, under five years, were interviewed on their perceptions of antibiotics and various practices involving them. A questionnaire was used to collect the data from this structured interview. **Results:** Only 20% of the respondents had a good knowledge on antibiotic and 6.3% were aware of emerging drug resistance. Almost 86% felt that antibiotics are generally safe drugs. Surprisingly 75% stated that they did not allow their child to use the full dosage of antibiotics for illnesses in the past, and 46.9% admitted of buying antibiotics from pharmacies without visiting a doctor. Of these, 90% reported that it was not difficult to obtain antibiotics without a prescription. **Conclusions:** The level of knowledge on antibiotics among caregivers is very low. Significant inappropriate practices in this population include purchasing antibiotics directly from pharmacies, storing antibiotics at home, and not consuming the full dose of antibiotics. Therefore, health promotion and education is essential in combating this public health issue.

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### 1. Introduction

Antimicrobial resistance, according to the World Health Organization (WHO) is the "Resistance of a microorganism to an antimicrobial medicine to which it was previously sensitive. Resistant organisms (they include bacteria, viruses and some parasites) are able to withstand attack by antimicrobial medicines, such as antibiotics, antivirals, and antimalarial, so that standard treatments become ineffective and infections persist and may spread to others" (WHO, 2011).

*Streptococcus pneumoniae* is now the most common pathogen which causes bacteremia, bacterial meningitis, pneumonia and otitis media in children. This is now a major concern because of the rapid increase in drug-resistant strains of *S. pneumoniae* (Arnold et al., 2011). The indiscriminate use of antibiotics is a significant contributor to the growing problem of antibiotic resistance. The association of antibiotic use and resistance is multifaceted. Although unnecessary use is mostly considered, underuse, non-adherence to therapy and inadequate dosage are equally significant factors which may lead to resistance (Cars et al., 2005).

Antibiotic resistance is a serious cause for concern in any country as it places a great burden on the economy. Infections caused by resistant bacteria will require more effective and often expensive

antibiotics to treat them; while these infections that take longer to heal will result in more days a child is absent from school, or an adult from work (Panagakou et al., 2009).

Approximately more than 50% of the antibiotics purchased worldwide are done so in pharmacies and other sources, without a prescription, from a healthcare professional. This is especially prevalent in developing countries where there is often poor regulation regarding distribution of prescription drugs (Togoobaatar et al., 2010).

According to the WHO, in developing countries, "Less than 60% of children with acute diarrhea receive necessary oral rehydration therapy yet more than 40% receive unnecessary antibiotics" and "Only 50–70% of people with pneumonia are treated with appropriate antibiotics, yet up to 60% of people with viral upper respiratory tract infection receive antibiotics inappropriately" (WHO, 2010). There are many factors contributing to the misuse of antibiotics by patients worldwide. These include lack of knowledge, cultural misconceptions, and poor access to appropriate medical care, among others. In Guyana, however, there is very little documented information on this topic. However, there have been some of these studies in countries within the region with situations that are probably similar to that in Guyana.

One of the main driving forces towards antibiotic misuse seems to be simply the lack of knowledge among consumers. A study conducted by Parimi et al. in Trinidad and Tobago to determine caregivers' practices, knowledge and beliefs of antibiotics in pediatric upper respiratory tract infections, revealed that a significant proportion of these caregivers had incorrect notions regarding antibiotic use. Lower knowledge scores were associated with more patients demanding antibiotic prescriptions from doctors, and storing antibiotics at home (Parimi et al., 2011).

A study of 5379 people in nine countries, describing patients' attitudes towards antibiotics showed that 87% of the respondents thought that antibiotics accelerate recovery from respiratory infections. Many of them believed that antibiotics should be prescribed for respiratory tract infections demonstrated by: sore throat (72%), fever (67%), earache (65%), bad cough (65%), thick catarrh (64%), and flu (64%) (Pechere, 2001). Another study based on consumer attitudes and use of antibiotics revealed that 47% of the respondents believed that by the time they are sick enough to visit the doctor because of a cold, they would expect a prescription for an antibiotic. In the same study, 58% of the respondents did not know of any health dangers associated with antibiotic use. These persons were found to have significantly less education and income (Eng et al., 2003).

Other predisposing factors to antibiotic misuse may be their ease of availability in pharmacies. Previous experience with antibiotics, which had relieved patients of their symptoms, can also lead to patients' expectations of antibiotic prescriptions for their current ailments. Parimi et al also suggested that a factor promoting indiscriminate antibiotics use may be that pharmacies readily sell them to consumers without being provided with a prescription (Parimi et al., 2004). Storage of antibiotics at home and self-medication with antibiotics, also seem to be problems based on some studies. They found that hoarding of antibiotics at home was associated with lesser knowledge of antibiotics (33%), but self-medication with antibiotics for URTI's was more common in patients with a high antibiotic knowledge score (32%). In Trinidad and Tobago, at least one-fifth of the population was found to keep antibiotics at home to be used in case of 'emergencies'.

Similarly, a study done in Mongolia by Togoobaatar et al. revealed that pharmacies were the primary source (86%) of antibiotics obtained without a prescription (Togoobaatar et al., 2010). This study also found that the patients used antibiotics because, based on past experiences, they felt that their knowledge about antibiotics was adequate. It was found that

independent predictor patients' desire for antibiotics was prior antibiotic use, in a study by Linder and Singer. Desire for antibiotics was also associated with the patient having used one or more courses of antibiotics per year (Linder et al., 2003).

This research was intended to outline the knowledge, attitudes and current practices of caregivers of children, with regard to the use of antibiotics for the treatment of upper respiratory tract infections. The results from this survey serve to provide a first view into the actual situation in Guyana, so as to direct the Authorities in taking the appropriate actions in the right areas to remedy this problem. From the data, the level of knowledge on appropriate antibiotic use and high levels of antibiotic misuse, will guide the relevant health officials in establishing education and prevention measures. This research hopes to provide a foundation for much more research in this area, among other populations, which is critical for a sufficiently comprehensive knowledge base.

The main objective of this research was to determine the level of knowledge of antibiotics among caregivers/guardians of children from 6 months to 5 years of age, as well as any preconceived ideas they may have regarding the topic. Secondly, to examine the extent of which inappropriate practices of these caregivers are carried out. Thirdly, to determine the prevalence of factors that contributes to inappropriate use of antibiotics.

## 2. Methodology

**Description of the Subjects:** A total of 700 guardians were randomly selected who visited Diamond Regional Hospital due to some illness. Inclusive criterion was usage of antibiotics for their child in the past.

**Study Design:** This was a cross-sectional study conducted to analyze the knowledge, attitudes and practices of guardians of children, regarding antibiotics and their proper usage. The study was conducted at the East Bank Demerara Regional Hospital (Diamond) for a period of 3 month. A structured questionnaire was used to interview the participants after explaining the reason of the study.

**Method of Measuring Each Variable:** The structured interview, accompanied by the questionnaire, was used to measure each variable in the study.

The respondents' knowledge of antibiotics was assessed using two different methods. In the first method, points were awarded out of a total of 11, for each respondent, based on scores in three different areas: knowledge of what antibiotics were used for, being able to identify four antibiotics from a list of eight commonly used drugs (samples of which were provided on a chart for visual recognition), and

knowledge of dangers associated with antibiotic use. A score of 6 and above was considered high, while anything below 6 was considered low. In the second method, a general overview of the respondents' knowledge was obtained by calculating the percentages of respondents who achieved the various scores in each area. The attitudes of respondents to antibiotics and their uses were assessed using four statements/questions. The respondents stated whether they strongly agreed, agreed, disagreed or strongly disagreed to each statement. Percentages of respondents having each stated opinion were calculated.

For the "Practices", a number of inappropriate practices involving antibiotics were mentioned and the respondents stated whether or not they have engaged in these practices in the past. Percentages of caregivers engaging or refraining from each of these practices were calculated.

**Data Analysis:** The results of this study were facilitated through the use of descriptive data. All of the data analysis in this study was done using Microsoft Excel 2007.

**Ethical Considerations:** Before the interviews were conducted, each respondent was instructed to read and sign a consent form and was assured that their answers would remain strictly confidential.

### 3. Results

The sample size for this study was 700 caregivers at the East Bank Demerara Regional Hospital (Diamond). Forty (40) of these persons claimed to have never given antibiotics to their children before, and were therefore excluded from the study, along with twenty (20) others persons who declined to participate. The overall response rate was 91.4%.

**Demographics:** Of the 640 caregivers in this study, 81.3% were mothers of the children visiting the hospital, while 9.4% were fathers and the remaining 9.4% were some other relative or friend. 42.2% of the respondents only had one child under their care; while 48.4% were currently caring for 2 to 3 children and 9.4% had over 3 children. 4.7% of caregivers were under the age of 18, 25% were 18 to 25 years of age, 42.2% were from 26 to 30 years of age, 25% were from 30 to 45, and 3.1% were over the age of 45. In terms of education of the caregivers, 64.1% had completed Secondary school, 18.8% and 15.6% had completed only Primary school, and University respectively, while 1.6% reported to have had no formal education. 51.6% of the caregivers had jobs, while 14.1% were self-employed and 34.4% were unemployed or housewives. 64.1% of the caregivers also reported that their child had taken antibiotics within the past two months. Reasons for this recent antibiotic use were: URTI's (53.7%), other infections

as prescribed by a doctor (29.3%) and superficial injuries (17.1%).

**Knowledge:** Of the respondents in this study, only 20.3% showed a high Knowledge of Antibiotic. The percentages of caregivers who identified one, two, three, or no appropriate uses are shown below.

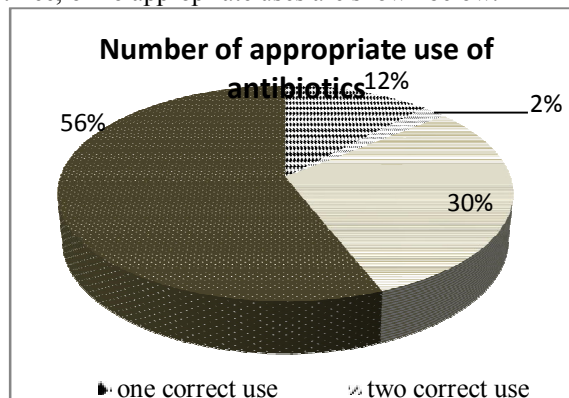


Fig 1. Pie chart showing the numbers of appropriate uses of antibiotics identified by caregivers.

Regarding misconceptions of antibiotic uses, 53.1% selected one inappropriate use, while 12.5% selected two inappropriate uses.

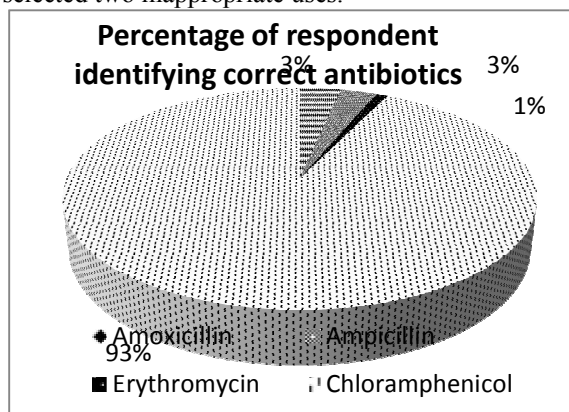


Fig 2. Pie chart showing percentages of respondents who correctly identified each antibiotic

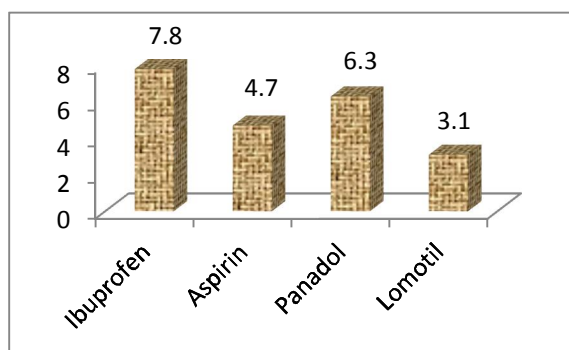


Fig 3. Bar chart showing percentages of caregivers who identified incorrect drugs as antibiotics.

Caregivers, who were aware of one, two, three, four or no dangers of antibiotic use, are shown below.

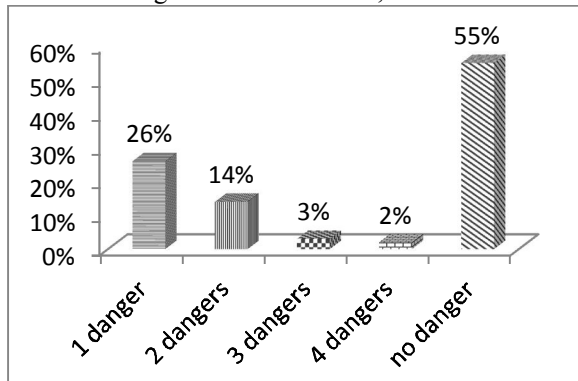


Fig. 4 Bar chart showing the percentage of respondents who were aware of dangers associated with antibiotic use.

The percentages of respondents who identified specific dangers are shown in the bar chart below.

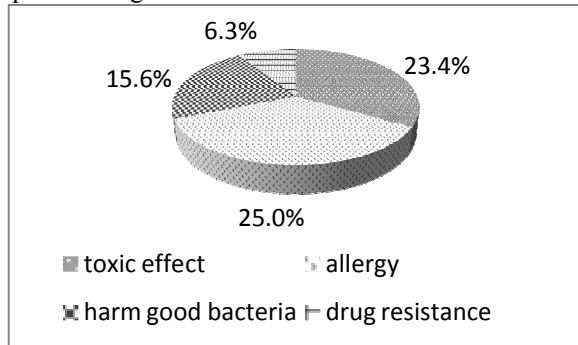


Fig 5. Pie chart showing percentages of caregivers who were aware of specific dangers associated with antibiotic use.

**Attitudes:** The respondents in this study stated the measure to which they agreed or disagreed with 4 different statements regarding antibiotic use.

These responses are tabulated below:

Table1. Attitudes of caregivers to antibiotic use

Statement	SA	A	D	SD
Should it be taken as soon as symptoms start?	18.8%	29.7%	48.4%	3.1%
Do they help recover faster from illness?	39.1%	46.9%	12.5%	1.6%
Do they prevent from serious illness?	42.2%	26.6%	31.3%	0.0%
Are they generally safe?	9.4%	76.6%	14.1%	0.0%

SA= Strongly Agree; A= Agree; D= Disagree, SD= Strongly Disagree

**Practices:** The interview addressed four inappropriate practices involving antibiotic usage. The table below shows the prevalence of each of these practices in the sample population.

Table 2. Percentages of caregivers, who engaged in inappropriate practices involving antibiotics.

Practices	%
Antibiotics without prescriptions	46.9
Not completing the full course	75.0
Storage at home	62.5
Sharing of antibiotics	12.5

A total of 46.9% reported to have bought antibiotics for their children from pharmacies, and bypassed the visit to the doctor. These caregivers reported various reasons for doing so as displayed in the pie chart below:

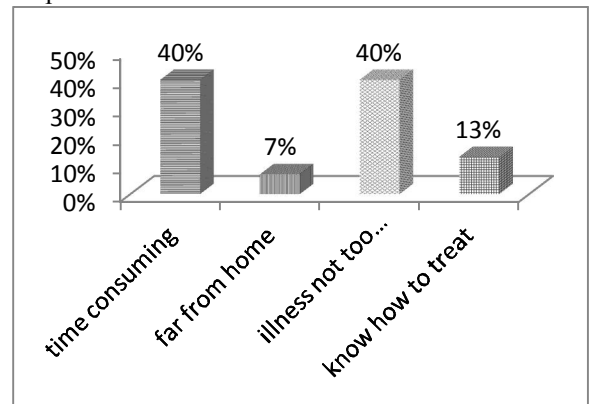


Fig 8. Caregivers bypassing doctors visit for their child in the past.

Of the persons who stated that they received antibiotics for their child from the pharmacy, 90% claimed that they did not encounter any difficulties in obtaining these drugs without providing a prescription. Of the 340 respondents, who claimed to have received their antibiotics in the past via a prescription from a doctor, 38% stated that the doctor discussed antibiotics and their proper uses with them.

#### 4. Discussion

The results of this study provided much valuable insight into the situation in Guyana, regarding improper antibiotic use among consumers.

When asked about any desired treatment options, the largest group of respondents (37.5%) stated that they would like a diagnosis and/or any appropriate treatment for the child under their care. This data reflects that of similar studies which demonstrate that caregivers usually take their children to the doctor with preformed expectations for treatment. This is especially true of expectations for antibiotics.

Vinker et al. noted that 24% of parents, whose children visited the doctor presenting with URTI symptoms, expected antibiotics for the treatment of their child's illness. Expectations for antibiotics were also found to be associated with previous treatment of

URTI's with antibiotics (Vinker et al., 2003). Solberg et al found that about 44% of adult patients wanted antibiotic from 0-2 days of having a URTI and 60% wanted antibiotics if the duration of illness was over 5 days. Meanwhile, about 30% of parents of children with URTI symptoms wanted antibiotics from the beginning of their illness [Solberg et al, 2000].

The assessment of caregivers' knowledge of antibiotics, by the methods used in this study, reveals that the level of knowledge is very low, and cause for concern. Only about one-fifth of the sample population attained a high Antibiotic Knowledge Score (AKS) from being assessed in the three different areas. When asked about the uses of antibiotics, only 2% of the respondents identified all three uses stated, while 56% recognized only one correct use, and 12% did not state any correct uses. In the same vein, 53% of respondents selected one incorrect use of antibiotics, which was most often "colds and flu". Many of those who made this statement did not believe that antibiotics should be used for "viral diseases", which leads one to the conclusion that the population does not recognize that colds and the flu are mostly viral diseases. There may be a correlation between this misperception and the practice of doctors who prescribe antibiotics for illnesses that may be viral in etiology. This practice has been examined and it was found that the key determinants of such prescribing by doctors include: precaution in case the viral infection leads to a secondary bacterial infection, doctors' perceptions that the patient expects the doctor visit to culminate into an antibiotics prescription, and sometimes, suspected bacterial disease (Vinker et al., 2003).

The overall AKS was low in 80% of respondents. This is a very significant finding, as it shows how limited this population's general knowledge of antibiotics is. While this result is very much important, however, it is even more crucial to identify the caregivers' knowledge in specific areas, in order to identify appropriate interventions, if needed. In terms of identification of specific common antibiotics, the respondents' knowledge was unimpressive. Only 6% identified all 4 antibiotics, while the majority (41%) only identified one antibiotic. As a patient or caregiver it is important to recognize antibiotics, it is more important not to confuse other drugs as being antibiotic in nature.

The most worrying aspect of the respondents knowledge was the very high percentage who had no knowledge of any dangers related to antibiotic use (55%). Therefore, the need is great for more public awareness on these dangers so that consumers can fully appreciate the necessity of using antibiotics correctly. As can be seen from the results, the majority of caregivers perceive antibiotics to be "safe drugs". A

relatively high percentage of respondents admitted to buying antibiotics directly from the pharmacy, without first consulting with a doctor. While this is an issue that needs to be addressed, particularly as it relates to the ease of availability of these drugs in pharmacies, it is not uncommon: various other studies report this same problem, in areas where such inappropriate dispensing is prohibited by law. An alarming 90% of respondents in this study, who claimed to have obtained their antibiotics from the pharmacy, also stated that no problems were encountered at the pharmacy in buying these drugs.

It was similarly reported by Pechere, that 32% of persons, interviewed in 9 different countries, used antibiotics obtained directly from the pharmacy, for respiratory infections. The respondents, who bought antibiotics from pharmacies, cited different reasons for doing so. The leading reasons (40% each) were that doctor visits are too time-consuming and that a doctor visit was unnecessary in the past because the illness was not very serious. The time factor is very much evident upon observing patients waiting for attention at the hospital and whether or not caregivers stated this as their main reason for bypassing a doctor visit in the past, most of the respondents voiced their complaints about the situation at the hospital. However, only a small number (7%) claimed that the hospital was too far from home, so this does not seem to be a major problem. Point to note, that a number of caregivers believe that they can diagnose their children's illnesses by themselves, as 13% stated that they forewent a doctor visit in the past because their child had the same illness before and they "knew how to treat it". Of the remaining caregivers who did choose to go to the doctor in the past, only 38% stated that the doctor had a discussion with them regarding the antibiotics and their uses.

Another problem, revealed by the results of this study, is that many caregivers (62.5%) engage in the practice of "hoarding" or storage of antibiotics at home. They stated various reasons for this practice, such as keeping antibiotics on-hand in case of emergencies, and keeping leftover antibiotics for future use. It is sometimes acceptable to keep antibiotics and use them in the same manner as previously instructed by a doctor, for example, in the case of recurrent urinary tract infections. Nevertheless, these are rare exceptions and most of the use of antibiotics purchased without consulting a doctor, are done so for self-diagnosed illnesses. In one small study by Caeser and Wurtz, it was found that 25% of people had saved and stored leftover antibiotics from a previous prescription, half of these had taken, or would have taken these antibiotics for future illnesses, and some even admitted that they had shared or would

share them with friends or family members (Caeser et al., 2000).

In the present study, the percentage of persons who saved and/or stored antibiotics at home is much more. This difference may be due to less knowledge of antibiotics here in Guyana; so the respondents may have been much more honest on this point, because they feel it is acceptable and even beneficial to keep antibiotics at home. An exceptionally high percentage of caregivers (75%) in this study, reported that, in the past, their child did not use the full course of antibiotics, but used these drugs until they felt relief from their symptoms, and many of them seemed to think that this was acceptable. About 64% of caregivers stated that their child had taken antibiotics within the past two months. Reasons for this were varied but the most common reason (53.7%) was for URTI's. From the results obtained in this study, it was determined that the level of knowledge regarding antibiotics is significantly low among caregivers on the East Bank of Demerara. There are also very prevalent misconceptions about antibiotic use in this population, some of which may stem from the lack of knowledge and education in this area.

Inappropriate practices which are significant in this population are purchasing of antibiotics from pharmacies without obtaining prescriptions, storage of new and leftover antibiotics at home, not consuming the full prescribed dosage of antibiotics for illnesses, and using antibiotics for URTI's, which are most likely viral in etiology. Ease of availability of antibiotics in pharmacies, without prescriptions, seems to be a significant factor which may promote misuse of antibiotics. Availability of health care does seem to be an issue with this population, but only in terms of how long one needs to wait for medical attention. Nevertheless, it is also determined as a factor promoting misuse of antibiotics, because it is less time-consuming to obtain these drugs at a pharmacy.

Therefore, measures must be put in place to increase public awareness of antibiotics and their proper usage. Educational programs, directed at all prospective consumers of antibiotics, should be implemented. Also doctors should be instructed to alert all patients to the proper use and possible dangers of antibiotics when prescribing these drugs. If patients and caregivers of patients understand the necessity of using antibiotics correctly, they are much more likely to adopt these necessary practices.

Also strict regulations should be enforced, which prohibit pharmacies from dispensing antibiotics as over-the-counter drugs. A proper prescription from a

doctor must be received before any person is allowed to purchase antibiotics from the pharmacy.

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#### References

1. World Health Organization, 2010, Fact Sheets – Antimicrobial Resistance, Accessed: February 4, 2011.
2. Arnold S, Allen U, Al-Zahrani M, Tan D, Wang E. Antibiotic Prescribing by Pediatricians for Respiratory Tract Infection in Children. *Clinical Infectious Diseases* [serial online]. August 1999; 29(2):312. Accessed March 11, 2011.
3. Cars O, Nordberg P. Antibiotic resistance – The faceless threat. *International Journal of Risk & Safety in Medicine* [serial online]. July 2005; 17(3/4):103-110. Accessed: July 14, 2011.
4. Togoobaatar G, Ikeda N, Shibuya K, et al. Survey of non-prescribed use of antibiotics for children in an urban community in Mongolia. *Bulletin of the World Health Organization* [serial online]. December 2010; 88(12):930-936. Accessed February 13, 2011.
5. Parimi N, Pereira L, Prabhakar P. Caregivers' practices, knowledge and beliefs of antibiotics in pediatric upper respiratory tract infections in Trinidad and Tobago: a cross-sectional study. *BMC Family Practice* [serial online]. January 2004; 5:28-8. Accessed May 20, 2011.
6. Pechere J. Patients' Interviews and Misuse of Antibiotics. *Clinical Infectious Diseases* [serial online]. September 16, 2001; 33:S170. Accessed May 19, 2011.
7. Eng J, Marcus R, Besser R, et al. Consumer Attitudes and Use of Antibiotics. *Emerging Infectious Diseases* [serial online]. September 2003; 9(9):1128-1135. Accessed April 12, 2011.
8. Linder J, Singer D. Desire for antibiotics and antibiotic prescribing for adults with upper respiratory tract infections. *Journal Of General Internal Medicine* [serial online]. October 2003;18(10):795-801. Accessed June 13, 2011.
9. World Health Organization, 2010, Fact Sheets – Medicines: rational use of medicines. Accessed June 25, 2011.
10. Panagakou S, Theodoridou M, Hadjichristodoulou C, et al. Development and assessment of a questionnaire for a descriptive cross-sectional study concerning parents' knowledge, attitudes and practises in antibiotic use in Greece. *BMC Infectious Diseases* [serial online]. May 4, 2009; 9:52. Accessed June 24, 2011.
11. Vinker S, Ron A, Kitai E. The knowledge and expectations of parents about the role of antibiotic treatment in upper respiratory tract infection -- a survey among parents attending the primary physician with their sick child. *BMC Family Practice* [serial online]. January 2003;4:20-6. Accessed July 08, 2011.
12. Solberg L, Braun B, Fowles J, Kind E, Anderson R, Healey M. Care-Seeking Behavior for Upper Respiratory Infections. *Journal of Family Practice* [serial online]. October 2000; 49(10):915. Accessed July 10, 2011.
13. Caeser S, Wurtz R. "Leftover" Antibiotics in the Medicine Cabinet. *Annals of Internal Medicine* [serial online]. July 4, 2000;133(1):74. Accessed July 13, 2011.