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Prevalence of respiratory tract infections and differences in antibiotic treatment in young adults in various countries – preliminary data from the multinational online survey

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ABSTRACT

Respiratory tract infections are the most common communicable diseases, which include pharyngitis, otitis media, rhinosinusitis, laryngitis, bronchitis and pneumonia. Although the majority of pathogenic agents responsible for these conditions are cosmopolitan, the differences in frequency and severity of these diseases associated with climate and living conditions may appear. The aim of the study is to assess if there are significant differences in frequency and severity of respiratory tract infections in different countries. A survey, consisting of 49 questions involving the frequency of respiratory tract infections, antibiotics' usage and demographic data was delivered to the users of a social network used to finding penfriends from abroad. Collected data was statistically analyzed and compared with climate conditions and economic indices in different countries. 462 respondents, aged 12-79 (mean age $25,15 \pm 9,43$, median 23) from 119 countries submitted their answers. First raw, preliminary data describe a prevalence of different types of respiratory tract infections and

commonness of antibiotic therapy. This initial report with preliminary results of the survey should be a first step towards determining the differences in frequency and severity of respiratory tract infections, as well as in antibiotic treatment. Data gained during the survey need further analysis.

Keywords: Respiratory tract infections, antibiotic therapy, communicable diseases

1. INTRODUCTION

Respiratory tract infections are the most common communicable diseases, which include pharyngitis, otitis media, rhinosinusitis, laryngitis, bronchitis and pneumonia. Although the majority of pathogenic agents (bacterial and viral) responsible for these conditions are cosmopolitan, the differences in frequency and severity of these diseases associated with climate and living conditions may appear.

2. THE AIM OF THE STUDY

The aim of the study is to assess if there are significant differences in frequency and severity of the most common respiratory tract infections (divided in general as pharyngitis, rhinosinusitis, otitis media, laryngitis, bronchitis and pneumonia) in different countries and to define the most popular antibiotic therapy patterns in countries divided into the groups depending on climate zone, continent, economic indices (among others: Gross Domestic Product measured by Purchasing Power Parity, Gross Domestic Product per capita), society features (among others: life expectancy at birth, sanitation facility access) and Human Development Index.

3. MATERIALS AND METHODS

A survey, consisting of 49 questions involving the frequency of respiratory tract infections, antibiotics' usage, demographic data (such as age, gender, the size of the place of residence) and general questions about living standard and access to clean water was delivered to the users of the Interpals.net - a social network used to finding penfriends from abroad. The survey was delivered to every individual by the researchers themselves through a private messages system; however, the data was collected anonymously through Google Forms.

This data was statistically analyzed and will be compared with climate conditions, economic indices and society features in different countries. The source of the all checked parameters was unique and taken from the CIA World Factbook, which provides information on the history, people, government, economy, energy, geography, communications, transportation, military, and transnational issues for 267 world entities.

The data concerning Human Development Index will be retrieved from the United Nations Development Program site.

4. PRELIMINARY RESULTS

The presented results are only preliminary raw data from the online survey, which has taken place in first half of 2017. Only general results are accessible right now.

462 respondents, aged 12-79 (mean age $25,15 \pm 9,43$, median 23) from 119 countries submitted their answers. Distribution of the gender of respondents was as follows:

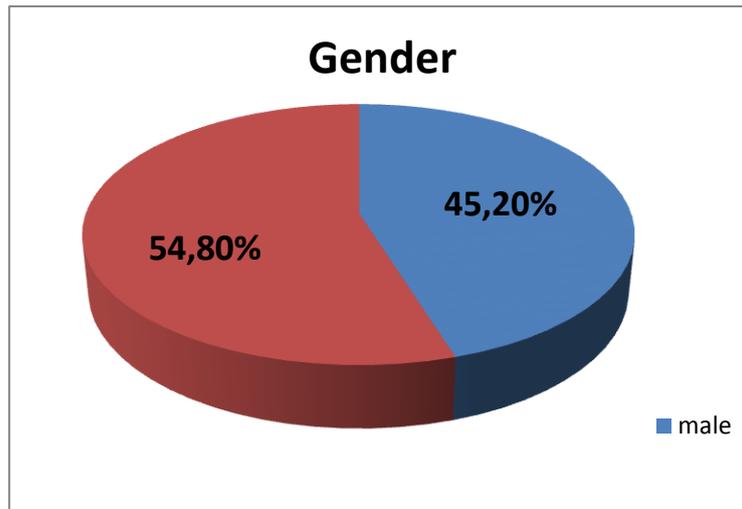


Figure 1. Gender distribution of the respondents.

The distribution of the place of residence was as follows:

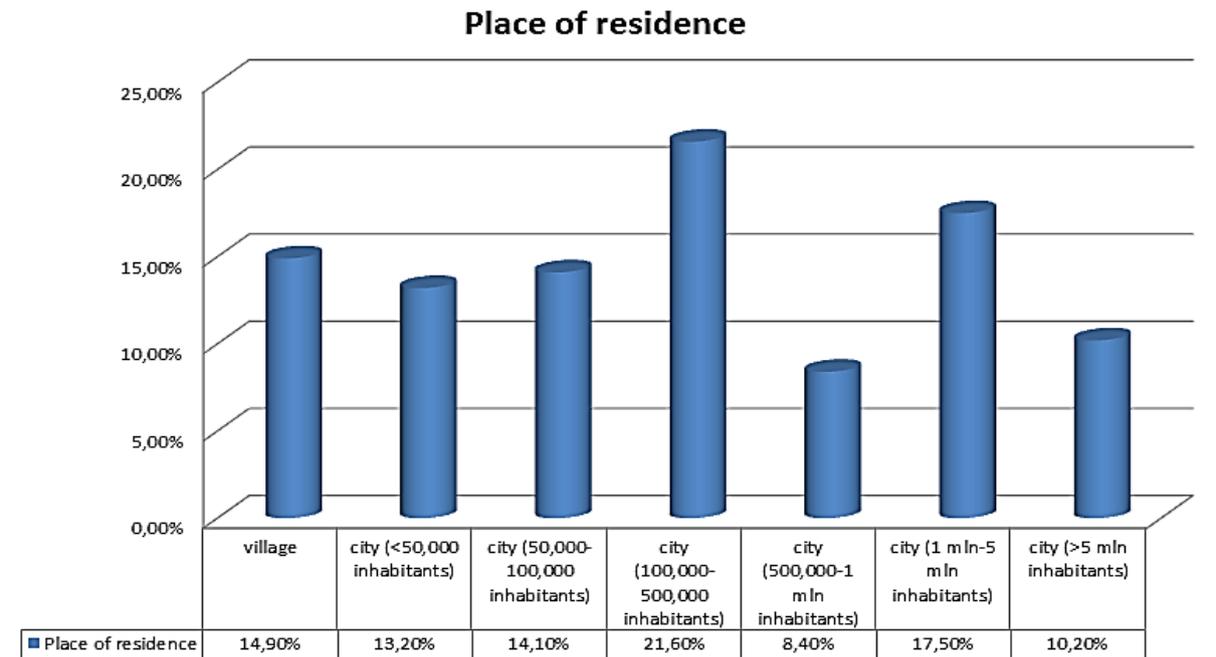


Figure 2. Distribution of the place of residence

4. 1. Pharyngitis frequency

Respondents were asked if they have suffered from pharyngitis (sore throat) during last 12 months prior to the survey and how often do they suffer from pharyngitis in a year.

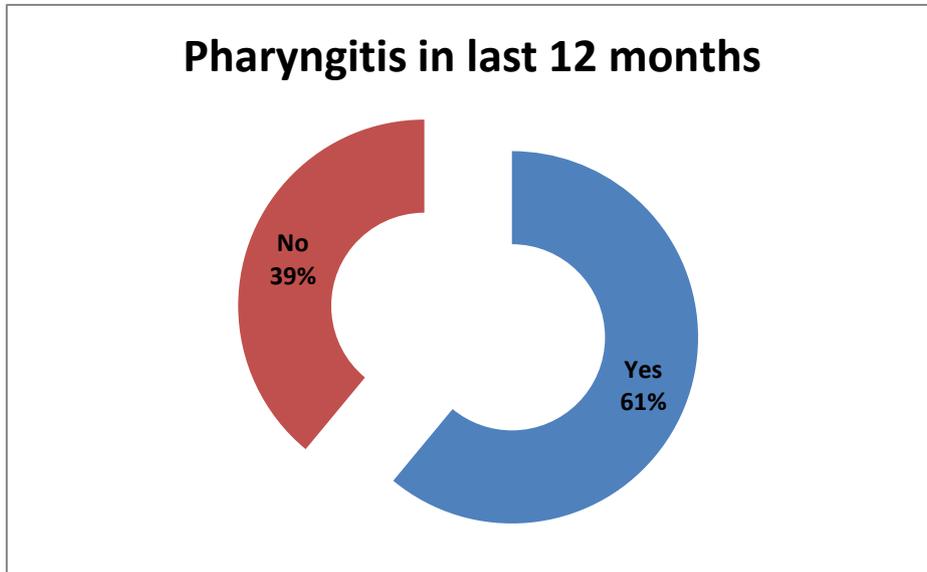


Figure 3. Pharyngitis prevalence among respondents during 12 months prior to the survey.

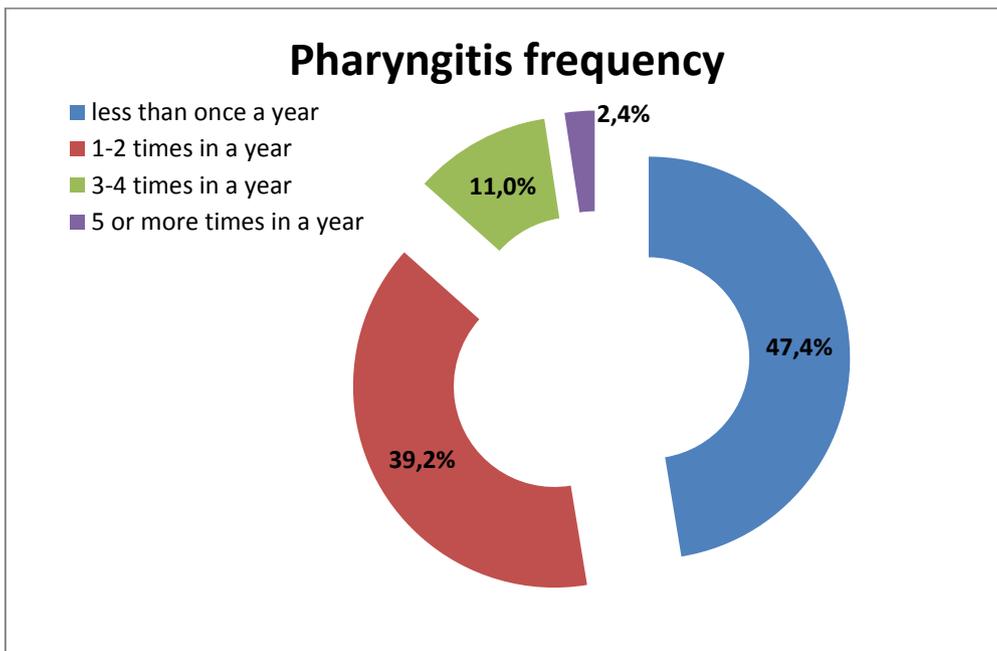


Figure 4. Pharyngitis frequency in a year.

4. 2. Otitis media frequency

Respondents were asked if they have suffered from otitis media (middle ear infection) during last 12 months prior to the survey and how often do they suffer from otitis media in a year.

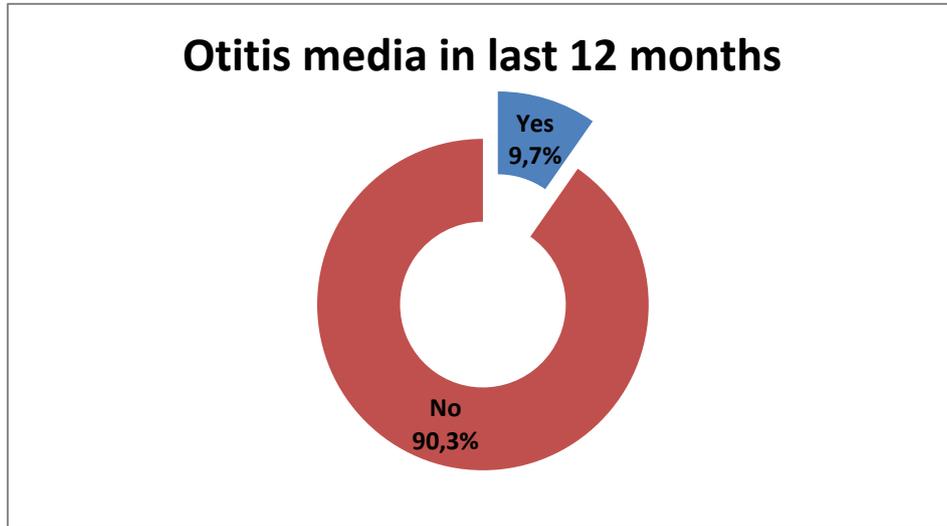


Figure 5. Otitis media prevalence among respondents during 12 months prior to the survey.

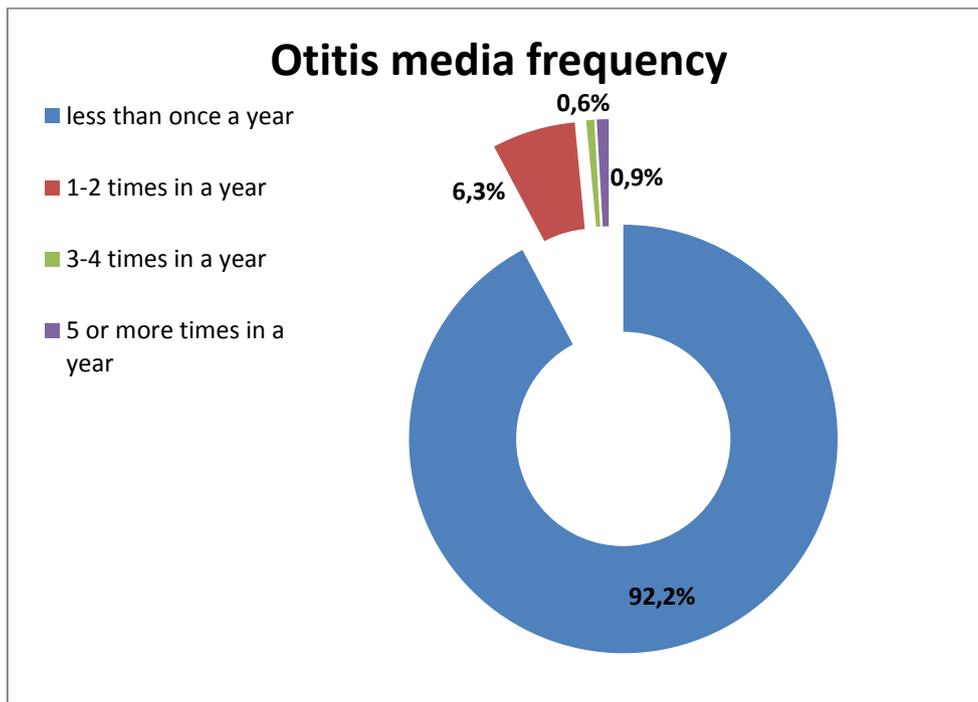


Figure 6. Otitis media frequency in a year.

4. 3. Rhinosinusitis frequency

Respondents were asked if they have suffered from rhinosinusitis (nose and sinus infection) during last 12 months prior to the survey and how often do they suffer from rhinosinusitis in a year.

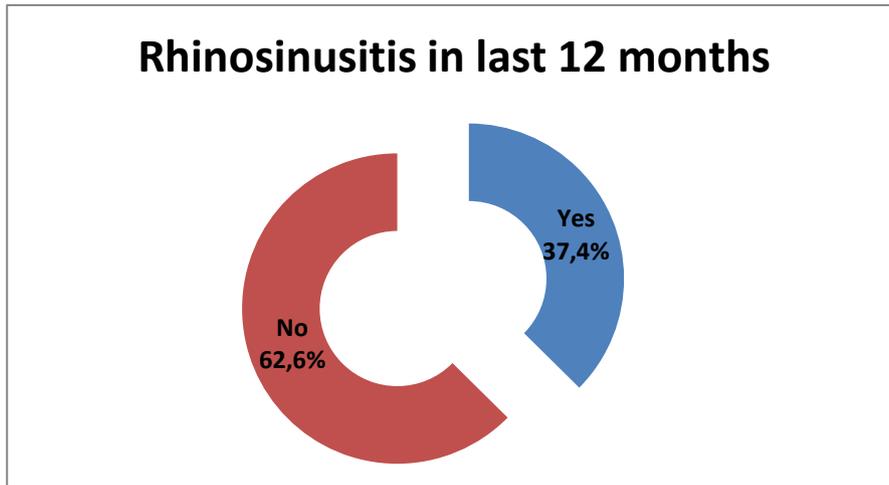


Figure 7. Rhinosinusitis prevalence among respondents during 12 months prior to the survey.

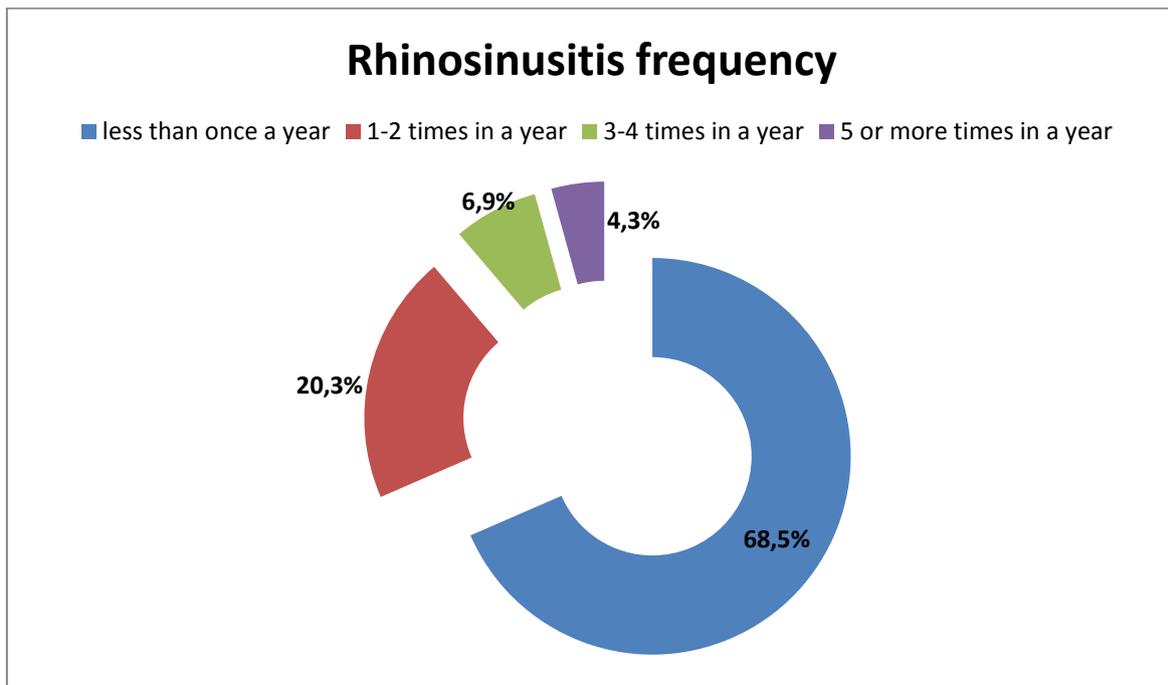


Figure 8. Rhinosinusitis frequency in a year.

4. 4. Laryngitis frequency

Respondents were asked if they have suffered from laryngitis (voice box infection) during last 12 months prior to the survey and how often do they suffer from laryngitis in a year.

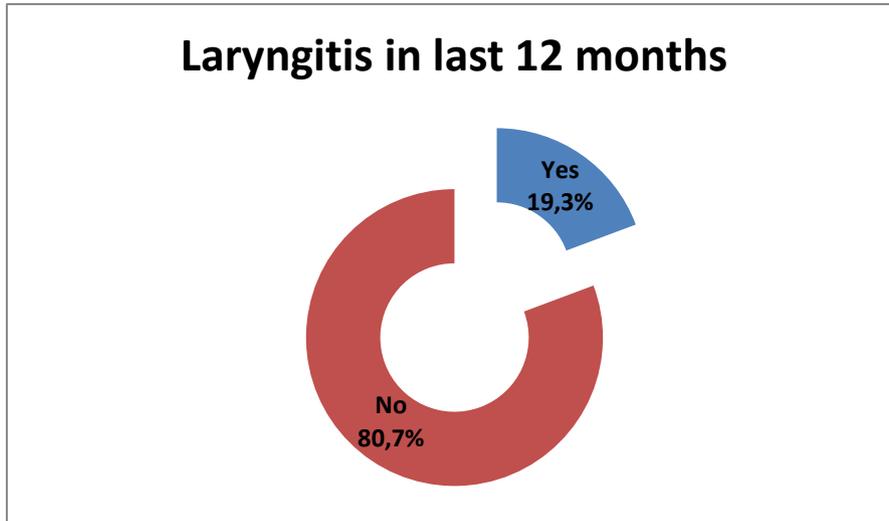


Figure 9. Laryngitis prevalence among respondents during 12 months prior to the survey.

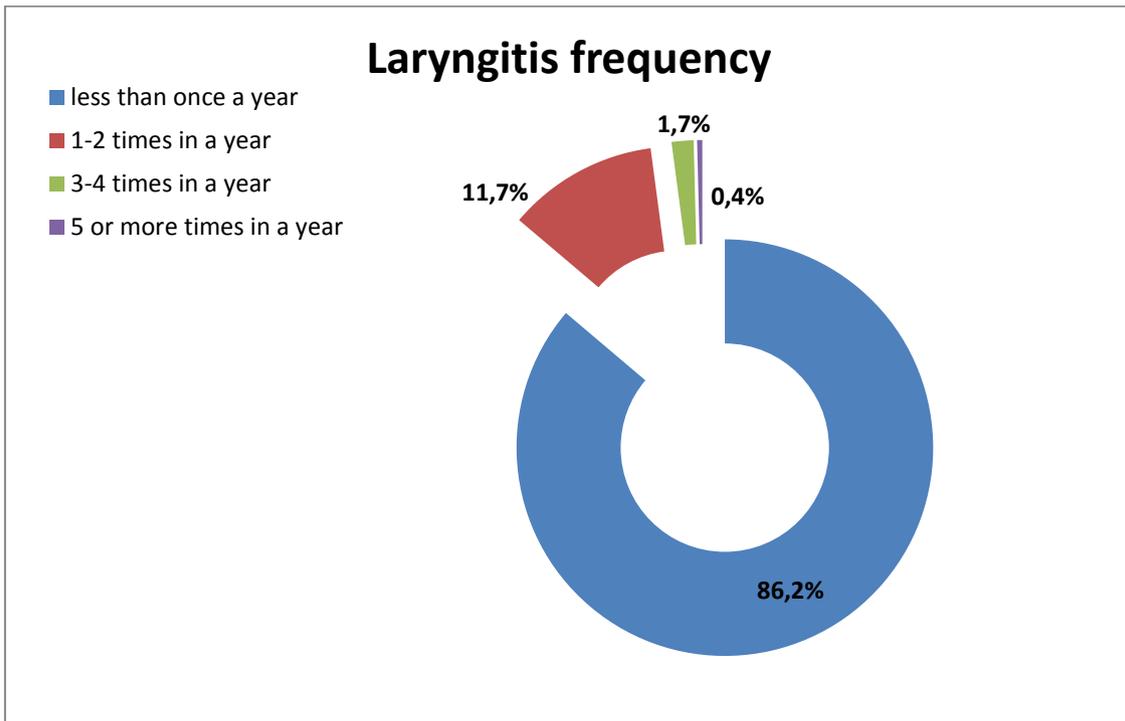


Figure 10. Laryngitis frequency in a year.

4. 5. Bronchitis frequency

Respondents were asked if they have suffered from bronchitis (chest infection) during last 12 months prior to the survey and how often do they suffer from bronchitis in a year.

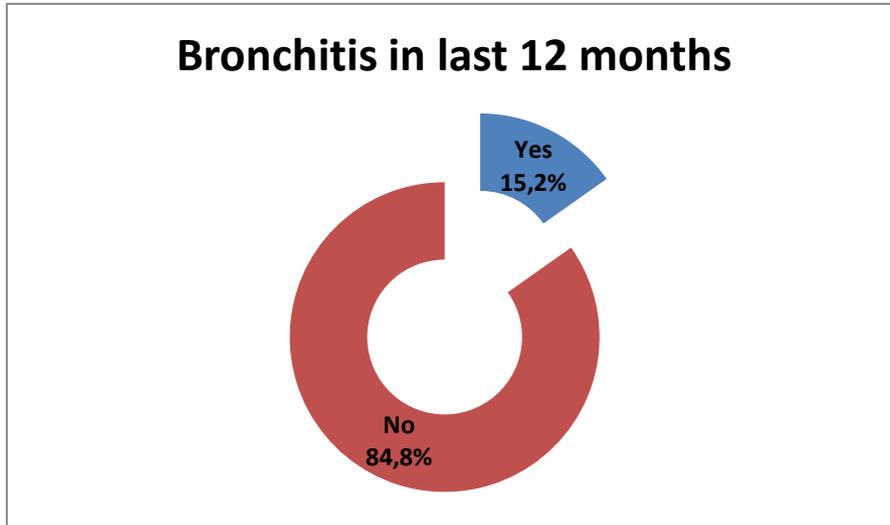


Figure 11. Bronchitis prevalence among respondents during 12 months prior to the survey.

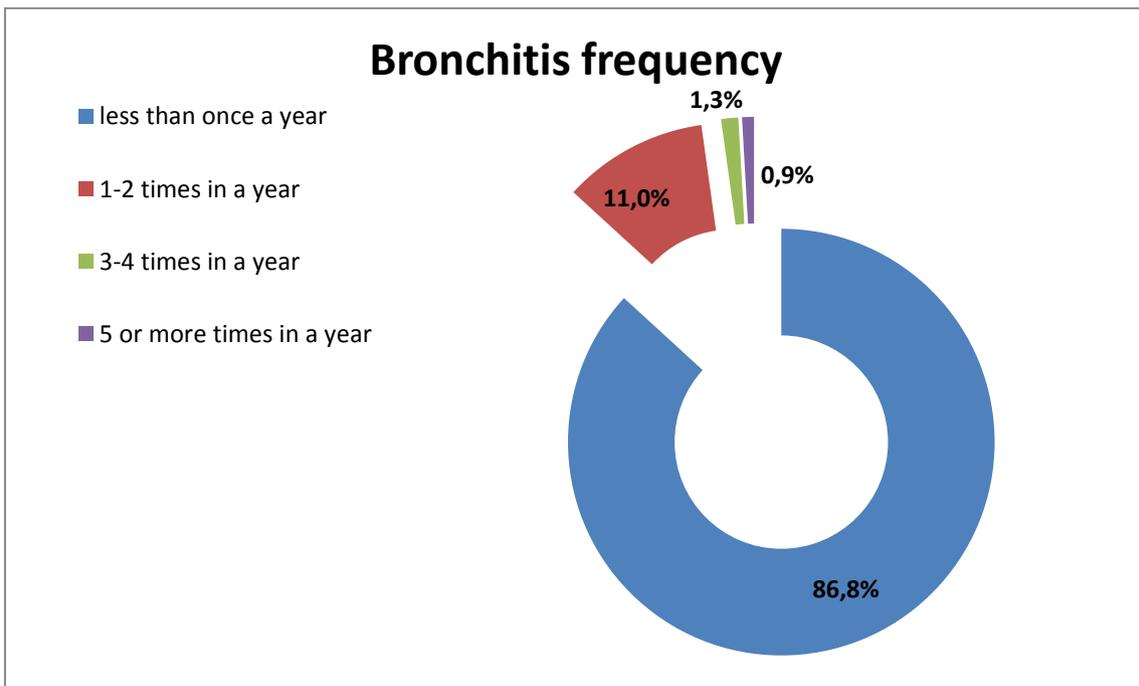


Figure 12. Bronchitis frequency in a year.

4. 6. Pneumonia frequency

Respondents were asked if they have suffered from pneumonia (lungs' infection) during last 12 months prior to the survey and how often do they suffer from pneumonia in a year.

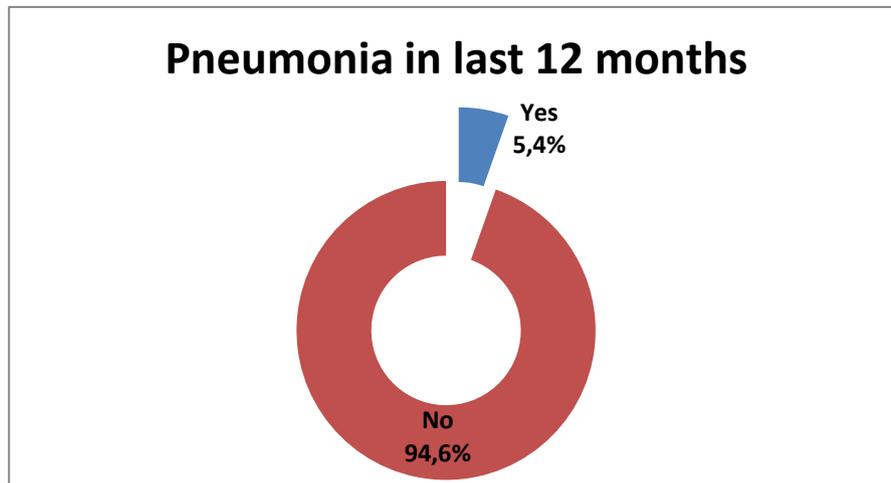


Figure 13. Pneumonia prevalence among respondents during 12 months prior to the survey.

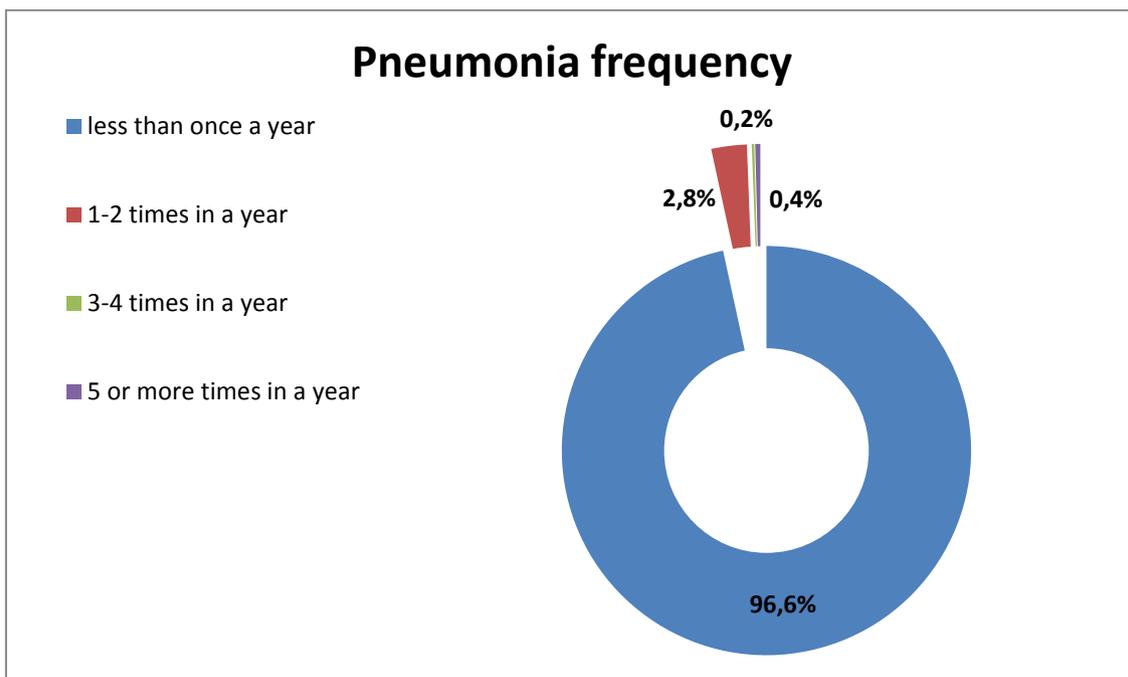


Figure 14. Pneumonia frequency in a year.

4. 7. General usage of antibiotics

The respondents were asked of the frequency of antibiotics usage in every kind of respiratory tract infection. However, these data are still under analysis. Here we depict the general usage of antibiotics in a year.

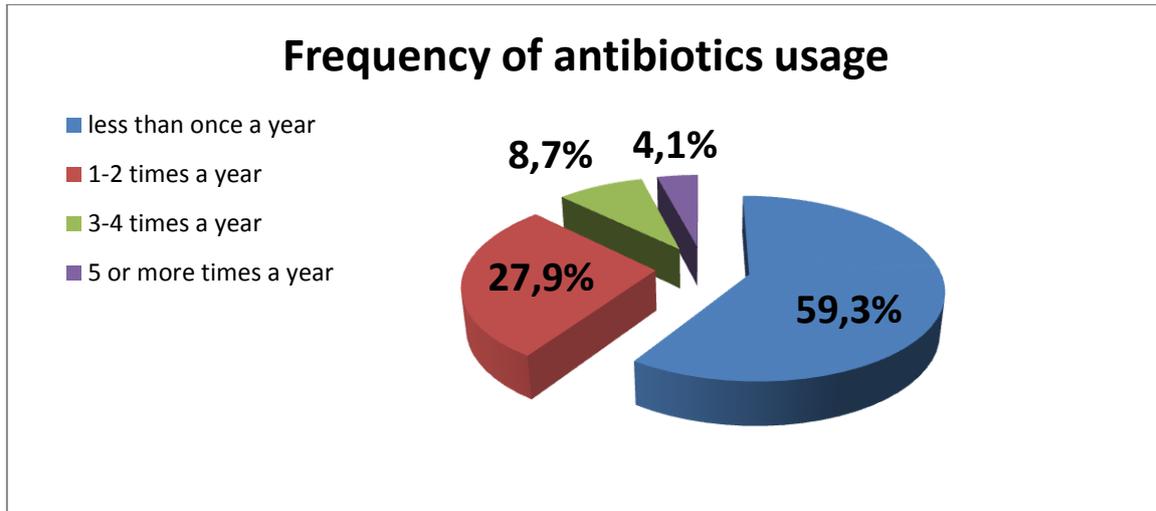


Figure 15. Frequency of antibiotics usage among the respondents.

4. 8. Living standard and access to clean water

The respondents were asked to subjectively determine their living standard and access to clean water. The results are as follows:

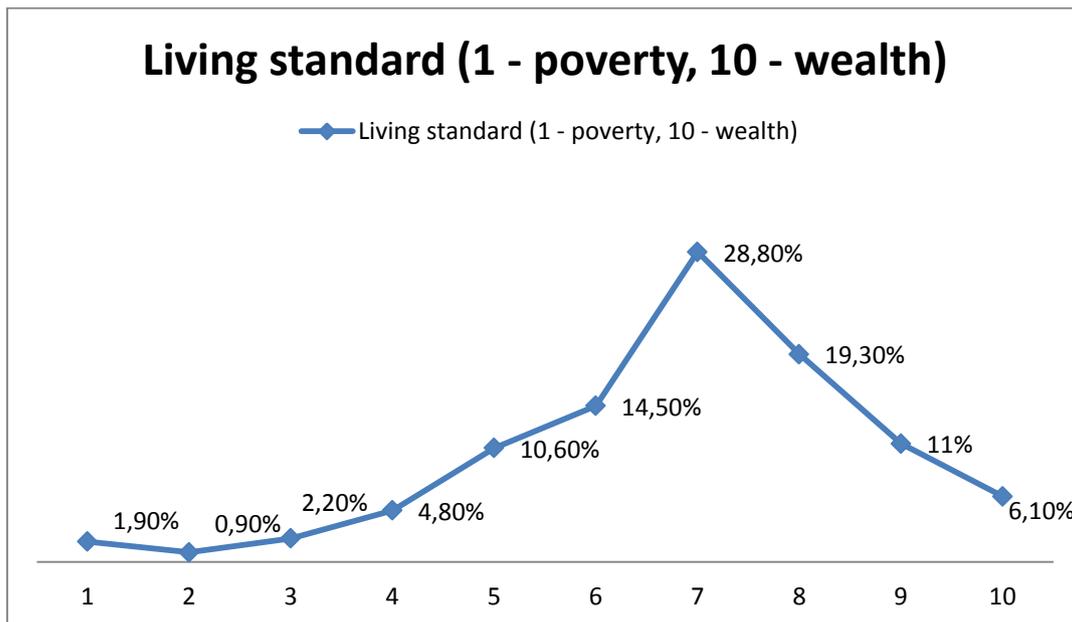


Figure 16. Subjective self-evaluation of the living standards of respondents.

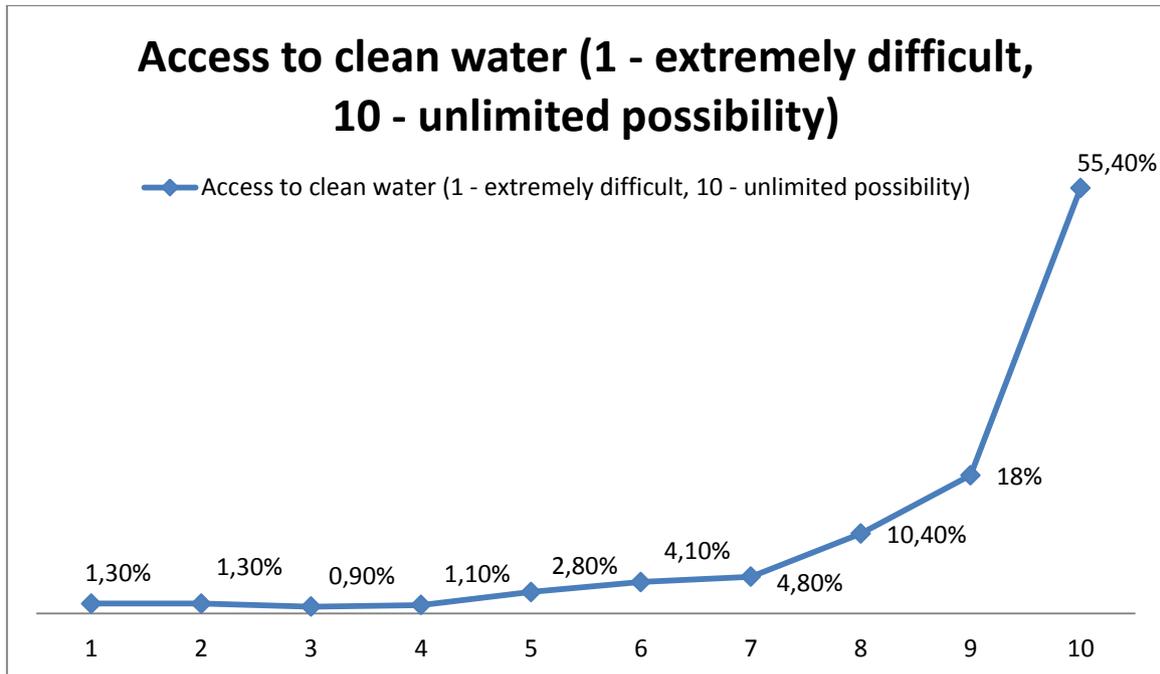


Figure 17. Subjective self-evaluation of the access to clean water of respondents.

Collected data on living standards and access to clean water will be compared to the frequency of each respiratory tract infection and it will be determine if a statistically significant correlation exists.

5. CONCLUSIONS

- The most frequent respiratory tract infection is pharyngitis, whereas the least frequent is pneumonia.
- More than a half of respondents experience pharyngitis at least once a year.
- Rhinosinusitis is the second most frequent respiratory tract infection, with about 1/3 of respondents experiencing it at least once a year, what comes in line with literature data [1].
- Otitis media seems to be a rather rare condition. Only 7,8% of respondents admit to suffer from it at least once in a year. Also literature data concerning otitis media in children shows, that the condition is diagnosed in 7,1% of children [2].
- Respondents admitted more frequent laryngitis episodes (19,3% in last 12 months), than it is documented in the literature (3,5%). The difference requires further analysis [3].
- 15,2% of respondents experienced bronchitis in last 12 months. Despite the younger average age in our study (25,15 years old) in comparison to literature data (43,2 years old), the results are similar in both groups (14,1% in literature cohort) [4].
- Every 3 in 4 respondents use antibiotic treatment at least once a year.

- Most respondents define their living standards as at least average (>5/10).
- Most respondents have good access to clean water.
- The collected preliminary data require further analysis including the differentiation between countries, regions of the world, climate conditions, economic and social indices.

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