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# Profile of children with community-acquired pneumonia and home antimicrobial pharmacotherapy

## Perfil das crianças com pneumonia adquirida na comunidade e farmacoterapia antimicrobiana domiciliar

## Perfil de los niños con neumonía adquirida en la comunidad y tratamiento antimicrobiano domiciliario

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**ABSTRACT**

Introduction: Community-acquired pneumonia (CAP) is a significant cause of pediatric morbidity and mortality worldwide, and microbial resistance has been a considerable threat to global public health. Thus, the promotion of the rational use of antimicrobials is fundamental, since infections caused by resistant community bacteria are more complicated in terms of treatment and are associated with greater morbidity. In this context, the goal of the study was to evaluate the sociodemographic and clinical profile of children with pneumonia, as well as the hospitalizations and prescribed pharmacotherapy. Design: Descriptive and retrospective study conducted in a philanthropic hospital specializing in pediatrics. Data were collected from patients aged from 0 to 13 years who were hospitalized due to PAC from January 2014 to December 2017. Results: It was observed that 52.2% were from the municipality of Diamantina and 62.6% had already used antimicrobials before hospitalization. It has been shown that there was a decrease in the number of hospitalizations over the studied years, with a seasonal characteristic in the autumn-winter period. Implications: It is concluded that there is a need to review the strategies regarding the management and use of antimicrobials, contributing at the onset and during treatment according to clinical evolution, and minimizing the risk of resistance and treatment failure.

**DESCRIPTORS**

Bacterial Pneumonia. Antimicrobial Management. Clinical Protocols.

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## INTRODUCTION

Lower respiratory tract infections (LRTIs) are currently a growing concern among the scientific community due to high rates of prevalence and hospitalization, with community-acquired pneumonia (CAP) being the main cause of hospitalization in children under 5 years of age[1].

The difficulty in determining the responsible microorganism, combined with the urgency in initiating antibiotic treatment, makes empirical treatment approaches essentially adopted[2]. Nonetheless, there are international protocols and recommendations that, based on characteristics, incidence, and age-related etiology, suggest a treatment to be followed to ensure clinical success with the appropriate use of antimicrobials.

It is known that antibacterial drugs are among the most prescribed in hospital settings. Approximately one third of hospitalized patients receive antibacterial agents, either prophylactically or therapeutically, but many of these prescriptions are flawed regarding recommendation, dosage, route, or duration of use[3].

In recent years, there has been a progressive increase in bacterial resistance and practices not supported by literature. The implementation of treatment changes without clinical justification, combined with the use of inadequate doses or durations, are factors that contribute to this scenario[4]. Furthermore, the rise in bacterial resistance rates makes it more difficult to control hospital infections and results in higher costs for both health services and the hospitals themselves[5].

In this context, and knowing the challenge of adapting the treatment recommended by international guidelines for clinical practice, this paper evaluated the sociodemographic, clinical, and pharmacotherapeutic profile of pediatric patients admitted due to PAC in a reference macro-regional hospital, based on national recommendations, in order to encourage changes that help to ensure safety and successful treatment with the appropriate use of antibacterial agents.

The goal of this study is to evaluate the sociodemographic and clinical profile of children diagnosed with community-acquired pneumonia (CAP), admitted to a reference pediatric hospital in the Jequitinhonha Valley, between January 2014 and December 2017. The analysis covers the patterns of hospitalization regarding frequency, seasonality, and severity of cases, as well as the pharmacotherapy adopted, focusing on the antibacterial drugs prescribed in both the hospital and home settings.

## METHODS

This study followed a quantitative, retrospective, and descriptive model. The purpose of descriptive studies is to characterize the distribution of diseases or health problems according to variables such as time, space, and individual profiles. Accordingly, they evaluate how incidence or prevalence changes under certain conditions[6]. Therefore, this type of study aims to describe the distribution of an event in the population in quantitative terms, through records from the past up to the present via data retrieved from primary, secondary, or tertiary sources[7]. Thus, the descriptive study is an important tool used in the area of health, as it aims to identify at-risk groups, which can inform about the needs and characteristics of these groups, potentially resulting in preventive actions and measures.

This study was conducted in a philanthropic hospital in the countryside of the state of Minas Gerais, a reference in the areas of Gynecology/Obstetrics, Orthopedics/Traumatology; Pediatrics/Pediatric and Neonatal ICU for 32 municipalities in the macro-region of health. The aforementioned institution has 77 beds for hospitalization, of which 18 are designated for the pediatric ward and two are private rooms, with an occupancy rate of 36.8%. In terms of the type of the provided care, it corresponds to 95% of the Brazilian Unified Health System (SUS, as per its Portuguese acronym) and 5% between private and insurance plans.

The study was conducted with pediatric patients aged from 0 to 13 years who were hospitalized by means of SUS due to PAC from January 2014 to December 2017.

In order to collect data, a form was created to fill in the sociodemographic, clinical, and pharmacotherapeutic profile data extracted from the medical charts. The hospital where the study was conducted has prescriptions made both digitally and manually. After the patient is discharged, the medical chart is stored manually in the archive department. In this department, these documents are separated by month, by inpatient clinics, and by insurance plans.

Accordingly, the collection was carried out in the department sector only with the SUS records from

the pediatric clinic. Data were collected from the records that had the hospital admission authorization (AIH, as per its Portuguese acronym) filled in with the procedure 0303140151 (Treatment of Pneumonias or Influenza), resulting in 150 records found. Patients for whom the AIH form did not match what was recorded in the charts and those treated for influenza were excluded, totaling 138 charts in the period from January 2014 to December 2017.

In order to carry out the separation of mild and moderate PAC, the classification by length of hospitalization according to the Brazilian Society of Pulmonology and Tisiology was used8. This separation was necessary because the Institution did not have a risk identification protocol.

Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS), version 23.0. Finally, these data were displayed in tables and graphs containing both absolute and relative frequencies.

The project for this study was submitted to the evaluation of the Research Ethics Committee (REC) of the Federal University of Minas Gerais, receiving the Opinion nº 67174122.4.1001.5149.

## RESULTS

From January 2014 to December 2017, there were a total of 138 medical charts related to the hospitalization of children diagnosed with Pneumonia. In Table 1, it is possible to identify the sociodemographic and clinical characteristics of the patients. Of the 138 hospitalized children, 75 (54.3%) were males and all were aged between 0 and 13 years, with a higher prevalence of children between 7 months and 4 years of age (67.4%).

It was observed that 72 (52.2%) cases were from the municipality of Diamantina, and that 49 (35.5%) of the children had been hospitalized more than once. Of these, 56 (40.8%) were hospitalized due to pneumonia, and 86 (62.6%) had already used antimicrobials prior to hospitalization. When investigating the hospitalization outcomes, 75 (54.3%) of the cases had a hospitalization period of seven days or less, characterized as mild community-acquired pneumonia or short hospitalization. As for the clinical outcomes, there was a prevalence of four types of clinical similarity, of which 49 (35.5%) were classified as right/left Pneumonia or simply Pneumonia; 25 (18.1%) as Pneumonia with bronchospasm; 10 (7.3%) as bronchopneumonia and 09 (6.5%) as pleural effusion.

**Table 1**. Sociodemographic and clinical characterization of 138 pediatric patients hospitalized with PAC in a reference pediatric institution in the Jequitinhonha Valley between 2014 and 2017, Minas Gerais, Brazil.

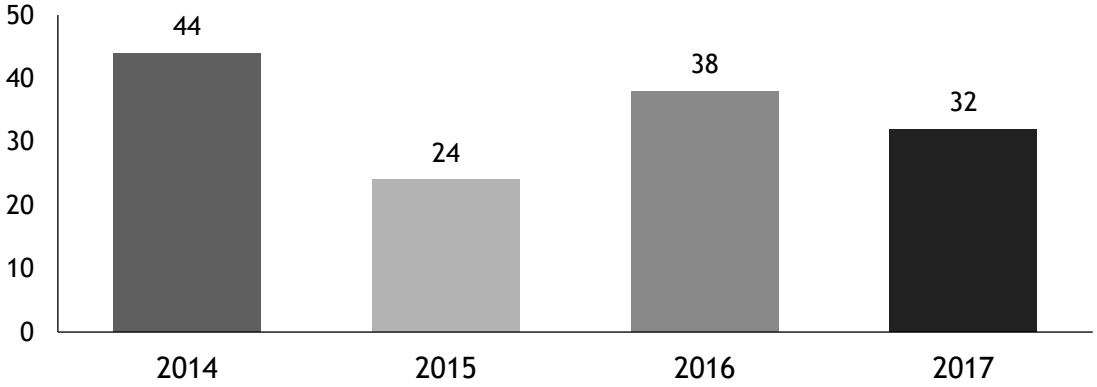
| VARIABLES | n | % |
|---|---|---|
| **Gender** | | |
| Male | 75 | 54.3 |
| Female | 63 | 45.7 |
| **Age** | | |
| 0-6 months | 13 | 9.4 |
| 7 months - 1 year | 51 | 37 |
| 2-4 years | 42 | 30.4 |
| 5-7 years | 17 | 12.3 |
| 8-10 years | 12 | 8.7 |
| 11-13 years | 3 | 2.2 |
| **Municipality** | | |
| Diamantina | 72 | 52.2 |
| Jequitinhonha Valley | 48 | 34.8 |
| Other Locations | 18 | 13 |
| **Medications prior to hospitalization** | | |
| Yes | 83 | 56.4 |
| Antimicrobials | 52 | 62.6 |
| **Previous hospitalizations** | | |
| Yes | 49 | 35.5 |
| Rehospitalization due to pneumonia | 20 | 40.8 |
| **Outcome by length of hospitalization** | | |
| Mild CAP (hospitalization < 7 days) | 75 | 54.3 |
| Moderate/severe CAP (hospitalization ≥ 7 days) | 63 | 45.7 |

| | | |
|---|---|---|
| **Clinical outcome (described in medical charts)** | | |
| Deaths due to pneumonia | 3 | 2.2 |
| Pneumonia with pleural effusion | 9 | 6.5 |
| Pneumonia with bronchospasm | 25 | 18.1 |
| Bronchopneumonia | 10 | 7.3 |
| Pneumonia/right/left | 49 | 35.5 |
| Not described | 42 | 30.4 |

**Source:** Research data, 2025.

Figure 1 displays the annual distribution of patients hospitalized due to Pneumonia over a four-year period. It was observed that there were higher numbers of hospitalizations due to pneumonia in the year 2014, followed by the year 2016.

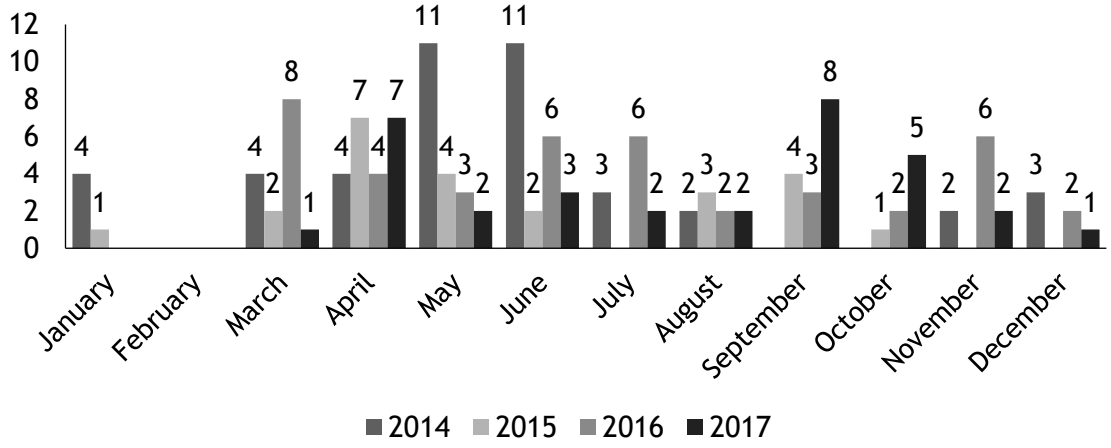
**Figure 1.** Annual distribution of 138 pediatric patients hospitalized due to PAC in a reference pediatric institution in the Jequitinhonha Valley between 2014 and 2017, Minas Gerais, Brazil.




**Source:** Research data, 2025.

Figure 2 displays the monthly distribution for each year. A fall-winter seasonal profile was observed, with a higher number of hospitalizations occurring from March to August in the four analyzed years: 2014 with 35 hospitalizations (79.5%), 2015 with 18 hospitalizations (75%), 2016 with 29 hospitalizations (76.3%), and 2017 with 17 hospitalizations (53.1%).

**Figure 2.** Monthly distribution of admissions of the 138 pediatric patients hospitalized due to PAC in a reference pediatric institution in the Jequitinhonha Valley in the years 2014, 2015, 2016, and 2017, Minas Gerais, Brazil.




**Source:** Research data, 2025.

Regarding the antimicrobials used before hospital admission, Table 2 shows that 65.4% of prescribers changed the drug in use. Among the medications reported as home treatment, it was observed that oral

Amoxicillin was the most used (36.5%). When there was a change in medication, intravenous Amoxicillin + Clavulanate (34.7%) was the most used drug in the transition from home treatment to hospital treatment; however, it varied among seven prescribed concentrations.

**Table 2.** Profile of antimicrobials used as home treatment before hospital admission and post-admission of 52 patients hospitalized due to CAP in a reference pediatric institution in the Jequitinhonha Valley between 2014 and 2017, Minas Gerais.

| Medication | n | % |
|---|---|---|
| Medication maintenance | 18 | 34.6 |
| Medication change | 34 | 65.4 |
| **Before Hospital Admission** | | |
| Amoxicillin (oral) | 13 | 25 |
| Amoxicillin + Clavulanate (oral) | 10 | 19.3 |
| Azithromycin (oral) | 2 | 3.8 |
| Cephalothin (intravenous) | 1 | 1.9 |
| Penicillin (intravenous) | 1 | 1.9 |
| Gentamicin (intravenous) | 1 | 1.9 |
| Not described | 10 | 19.3 |
| Combination | 14 | 26.9 |
| **After Hospital Admission** | | |
| Ampicillin (intravenous) | 13 | 25 |
| Ceftriaxone (intravenous) | 6 | 11.5 |
| Amoxicillin + Clavulanate (intravenous) | 18 | 34.7 |
| Meropenem (intravenous) | 1 | 1.9 |
| Clindamycin (intravenous) | 1 | 1.9 |
| Amoxicillin (oral) | 1 | 1.9 |
| Combination | 12 | 23.1 |

**Source**: Research data, 2025.

## DISCUSSION

This study identified the standardization of treatment adopted in hospitalized pediatric patients in a reference pediatric institution in the Jequitinhonha Valley due to mild PAC and moderate/severe PAC, between 2014 and 2017, including pharmacotherapy and complementary tests, according to international guidelines and parameters.

The World Health Organization (WHO)[9] considers that Pneumonia and Bronchiolitis are the most important epidemiological components among acute respiratory infections in early childhood. It also states that Pneumonia is responsible for 15% of all deaths of children under 5 years of age, killing 808,694 children in 2017 worldwide.

The pertinent literature shows that Pneumonia is common among patients in early childhood. When analyzing data from the United States between 1994 and 2007, Kronman[10] identified an increase in outpatient visits for children less than 5 years of age diagnosed with bacterial pneumonia, rising from 32.3 to 46.9 per 1000 inhabitants. A Brazilian study conducted in São Paulo, concerning the profile of hospital admissions due to respiratory diseases in children, revealed that Pneumonia, along with Influenza and other acute lower respiratory infections, constituted the main causes of hospital admission for children aged from 0 to 5 years[11]. A study conducted in 16 African and Asian countries found that Pneumonia was responsible for 17% of hospital morbidity in children less than 5 years of age[12]. Thus, studies that evaluate the diagnosis, progression, and treatment of this highly prevalent pathology in children can aid in the critical evaluation of practices, resulting in improvements in the provided care.

Regarding the sociodemographic data, this study showed that the majority of the hospitalized children were males and aged from 7 months to 4 years old (Table 1). Several studies described in the literature are in line with these results. A descriptive and ecological study on hospitalizations due to bacterial pneumonia in children and adolescents in the state of Paraná, between 2000 and 2011, revealed

a higher hospitalization rate in boys aged from 1 to 4 years old, reaching 59.74 cases per 10,000 inhabitants in 200313. Similar results are shown by Mara de Andrade[14], where of the 221 children hospitalized due to pneumonia, 42.9% were aged between 1 and 5 years old, with 52.5% being males. Holanda[15] found that 30% of the patients evaluated in his study were aged between 3 and 6 years old, with a predominance of males.

According to Hatisuka[13], the higher incidence of certain diseases in male children may be linked to susceptibility present already in the fetal and neonatal periods, which could contribute to the emergence of neurological complications, increased hospital mortality, and the development of later functional disabilities.

Regarding the number of hospitalizations per year, this paper revealed a lower number of admissions in the years 2015 and 2017 (Figure 1). Corrêa and colleagues[16] observed a decline in hospital admissions due to Pneumonia from 1990 to 2015. It is evident that advances in health care, increased access to medications and services, as well as government vaccination programs, have contributed to the improvement of hospitalization and mortality indicators due to PAC[16,17].

The relationship between respiratory diseases and the climate is well known, with the climate being responsible for the characteristic seasonal pattern of diseases such as Pneumonia, Bronchiolitis, and Influenza (flu). A possible explanation for this phenomenon is the transition from the high temperatures of summer to the first cooler periods of autumn, when the first cold fronts cause abrupt temperature changes over a short period[11,14]. In both studies[11,14], a seasonal pattern of hospitalizations is noted for the age group under 5 years of age, characterized by a peak in autumn, a plateau or smaller peak in winter, and a trough in summer. This result supports the findings of this investigation (Figure 2).

Regarding the use of medications in home settings, the results indicated that approximately half of the patients used medications before admission, with the majority consisting of antimicrobials, with Amoxicillin being the most used (Table 2). The stock of medications in households includes both drugs for minor illnesses and leftovers from prescribed treatments[18]. This prevalence has been shown in various regions of Brazil, such as Minas Gerais (93.5%)19, Rio Grande do Sul (91.6%)20, and Amazonas (91.1%)21.

A study conducted in the Jequitinhonha Valley investigated the stock of medications in households and identified a prevalence of 56.5%, highlighting Amoxicillin as the most present antibiotic agent, both when prescribed by physicians and through self-medication[22]. Among the various classes of medications, antimicrobials are always present in the accumulation of medications in households, as they are the most prescribed in primary health care units, as shown by Oliveira[23], who observed the presence of antibiotics in 94% of the pediatric prescriptions analyzed in his study, with Amoxicillin and Azithromycin being the most prescribed. In his study, Menezes[24] found that 41.8% of the prescriptions included antimicrobials, with Amoxicillin being the most used in all age groups (53.9%) and the combination of Sulfadiazine + Trimethoprim in second place (19.4%).

Regarding the choice of antimicrobial for home treatment, beta-lactams (Amoxicillin; Amoxicillin + Clavulanate) were the most commonly used therapeutic class. This result follows the guidelines of antibiotic therapy for acute outpatient Pneumonia from the Brazilian Society of Pediatrics[25] and the recommendations of the Brazilian Society of Pulmonology and Tisiology[8], as the initial outpatient treatment recommended for patients without comorbidities, without risk factors for resistance, without recent use of antimicrobials in the last three months, and without a history of allergy.

After hospitalization, it was observed that the prescribers changed the antimicrobial for the majority of patients. The medication chosen for the continuation of hospital treatment was Amoxicillin + Clavulanate, but used in seven concentrations, four of which were outside the dosages established by guidelines. According to the Brazilian Society of Pediatrics[25] and the recommendations of the Brazilian Society of Pulmonology and Tisiology[8], beta-lactams associated with beta-lactamase inhibitors may be prescribed as a second therapeutic alternative and administered orally or parenterally, applying the usual doses of 50 to 100 mg/kg/day.

Accordingly, the work of the multiprofessional team, including the clinical pharmacist, must be reinforced to ensure all necessary information for successful home treatment. For patients who required hospitalization, there is a need for standardization of clinical conducts in order to ensure not only the right medication but also the dosages actually recommended for PAC, ensuring more appropriate use of antimicrobials in the hospital setting.

The absence of standardized institutional protocols for the treatment of PAC was a determining

factor for the heterogeneity observed in the prescription of antimicrobials during hospitalization. The variability in concentrations and dosages of Amoxicillin + Clavulanate, with some of them outside the ranges recommended by the main national guidelines, highlights the need for clear local guidelines that can guide more uniform and safer clinical practices. This institutional gap may compromise therapeutic effectiveness, stimulate the emergence of bacterial resistance, and hinder the monitoring of clinical outcomes.

Despite the relevance of the findings, this study has some limitations that should be considered in the interpretation of the results. The study was conducted in a single reference institution in the Jequitinhonha Valley, which limits the generalization of the results to other regions with different epidemiological and structural profiles.

The absence of post-discharge follow-up also makes it impossible to evaluate the long-term therapeutic efficacy and adherence to the prescribed treatment. Multicenter studies with prospective methodology and larger samples are recommended to deepen the understanding of the management of CAP in children and to validate the conclusions exposed here.

There is still a limitation regarding the analyzed period (2014 to 2017), which may not fully reflect current clinical practices, especially considering recent advances in therapeutic guidelines, epidemiological surveillance, and public health policies. Nonetheless, the collected data provides a valuable baseline for comparison with more recent periods, contributing to the understanding of the evolution in the management of the pediatric CAP and serving as support for planning improvement actions in terms of care.

Furthermore, this analyzed period represents a relevant time frame to evaluate the impact of public policies, such as the strengthening of the Brazilian National Immunization Program and changes in the therapeutic guidelines in force at the time. Such data provide a solid foundation for identifying care patterns and proposing improvements still relevant to the current scenario.

## CONCLUSION

According to the results found, there was a prevalence of male children under 5 years of age residing in Diamantina who used medications in home settings. This study showed a decrease in the number of hospitalizations over the studied years, with a seasonal pattern revealing higher rates during the autumn-winter period. The study indicated the predominance of antimicrobials, mainly Amoxicillin, in the use of medications prior to hospital admission.

## REFERENCES

1. WORLD HEALTH ORGANIZATION: Children aged < 5 years with ARI symptoms who took antibiotic treatment (%) [Internet]. Genebra: WHO [Acessado 20 de Jan de 2020]. Disponível em: <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/children-aged-5-years-with-ari-symptoms-who-took-antibiotic-treatment-(-)>.

2. Bahlis LF, Diogo LP, Kuchenbecker R de S, Fuchs SC. Clinical, epidemiological, and etiological profile of inpatients with community-acquired pneumonia in a public hospital in the interior of Brazil. Jornal Brasileiro de Pneumologia [Internet]. 2018 Aug;44(4):261–6. Available from: http://dx.doi.org/10.1590/s1806-37562017000000434

3. Vieira PN, Vicentino Vieira SL. USO IRRACIONAL E RESISTÊNCIA A ANTIMICROBIANOS EM HOSPITAIS. Arquivos de Ciências da Saúde da UNIPAR [Internet]. 2018 Feb 19;21(3). Available from: http://dx.doi.org/10.25110/arqsaude.v21i3.2017.6130

4. Loureiro RJ, Roque F, Teixeira Rodrigues A, Herdeiro MT, Ramalheira E. O uso de antibióticos e as resistências bacterianas: breves notas sobre a sua evolução. Revista Portuguesa de Saúde Pública [Internet]. 2016 Jan;34(1):77–84. Available from: http://dx.doi.org/10.1016/j.rpsp.2015.11.003

5. Outterson K. Working Groups On Antimicrobial Resistance. New Business Models for Sustainable

Antibiotics. London: Chatham House; 2014;1(1):2-29.

6. Lima-Costa MF, Barreto SM. Tipos de estudos epidemiológicos: conceitos básicos e aplicações na área do envelhecimento. Epidemiologia e Serviços de Saúde [Internet]. 2003 Dec;12(4). Available from: http://dx.doi.org/10.5123/s1679-49742003000400003

7. Martins JT, Ribeiro RP, Bobroff MCC, Marziale MHP, Robazzi MLDC da C. Pesquisa epidemiológica da saúde do trabalhador: uma reflexão teórica. Semina: Ciências Biológicas e da Saúde [Internet]. 2014 Jun 17;35(1):163. Available from: http://dx.doi.org/10.5433/1679-0367.2014v35n1p163

8. Corrêa RA, Costa AN, Lundgren F, Michelim L, et al. 2018 recommendations for the management of community acquired pneumonia. J Bras Pneumol. 2018;44(5):405-423

9. WORLD HEALTH ORGANIZATION: Pneumonia [Internet]. Genebra: WHO; 2019. [Acessado 10 de Jan de 2020]. Disponível em: <https://www.who.int/en/news-room/fact-sheets/detail/pneumonia>.

10. Kronman MP, Hersh AL, Feng R, Huang Y-S, Lee GE, Shah SS. Ambulatory Visit Rates and Antibiotic Prescribing for Children With Pneumonia, 1994–2007. Pediatrics [Internet]. 2011 Mar 1;127(3):411–8. Available from: http://dx.doi.org/10.1542/peds.2010-2008

11. Natali RM de T, Santos DSPS dos, Fonseca AMC da, Filomeno GC de M, Figueiredo AHA, Terrivel PM, et al. Perfil de internações hospitalares por doenças respiratórias em crianças e adolescentes da cidade de São Paulo, 2000-2004. Revista Paulista de Pediatria [Internet]. 2011 Dec;29(4):584–90. Available from: http://dx.doi.org/10.1590/s0103-05822011000400018

12. Hershey CL, Doocy S, Anderson J, Haskew C, Spiegel P, Moss WJ. Incidence and risk factors for malaria, pneumonia and diarrhea in children under 5 in UNHCR refugee camps: A retrospective study. Conflict and Health [Internet]. 2011 Oct 26;5(1). Available from: http://dx.doi.org/10.1186/1752-1505-5-24

13. Hatisuka MF de B, Arruda GO de, Fernandes CAM, Marcon SS. Análise da tendência das taxas de internações por pneumonia bacteriana em crianças e adolescentes. Acta Paulista de Enfermagem [Internet]. 2015 Aug;28(4):294–300. Available from: http://dx.doi.org/10.1590/1982-0194201500051

14. Mara de Andrade S. Fatores sociodemográficos, perinatais e ambientais relacionados à causas de internação anterior de crianças hospitalizadas por pneumonia. Available from: http://dx.doi.org/10.47749/t/unicamp.2016.974980

15. De Holanda LA, Medeiros NT. Perfil Clínico-Epidemiológico dos Casos de Pneumonia em Crianças e Idosos do Município de Quixadá – Ceará. Revista de Fisioterapia & Saúde Funcional. 2012;1(1):35-41.

16. Corrêa R de A, José BP de S, Malta DC, Passos VM de A, França EB, Teixeira RA, et al. Carga de doença por infecções do trato respiratório inferior no Brasil, 1990 a 2015: estimativas do estudo Global Burden of Disease 2015. Revista Brasileira de Epidemiologia [Internet]. 2017 May;20(suppl 1):171–81. Available from: http://dx.doi.org/10.1590/1980-5497201700050014

17. Bedran RM, De Andrade CR, Ibiapina CC, Fonseca MTM, Alvim CG, Bedran MBM. Pneumonias adquiridas na comunidade na infância e adolescência. Revista Médica de Minas Gerais. 2012;22(1):40-47

18. Beckhauser GC, Valgas C, Galato D. Perfil do estoque domiciliar de medicamentos em residências com crianças. Revista de Ciências Farmacêuticas Básica e Aplicada. 2012;33(4):583-589.

19. Ribeiro MA, Heineck I. Estoque domiciliar de medicamentos na comunidade ibiaense acompanhada pelo Programa Saúde da Família, em Ibiá-MG, Brasil. Saúde e Sociedade [Internet]. 2010 Sep;19(3):653–63. Available from: http://dx.doi.org/10.1590/s0104-12902010000300016

20. Bueno CS, Weber D, Oliveira KR. Farmácia caseira e descarte de medicamentos no bairro Luiz Fogliatto do município de Ijuí – RS. Revista de Ciências Farmacêuticas Básica e Aplicada. 2009;30(2):75-82.

21. Lucas ACS, da Costa HTS, Parente RCP, Rodrigues BM. Estoque domiciliar e consumo de medicamentos entre residentes no bairro de Aparecida, Manaus- Amazonas. Rev Bras Farm [periódico na Internet]. 2014 [acesso em 2019 Dez 20];95(3):867-888. Disponível em: http://www.rbfarma.org.br/files/645---Estoquedomiciliar-e-consumo-de-medicamentos-entre--residentes-no-bairro-de-Aparecida,- Manaus.pdf

22. Cruz MJB, Azevedo AB, Bodevan EC, Araújo LU, Santos DF. Estoque doméstico e uso de medicamentos por crianças no Vale do Jequitinhonha, Minas Gerais, Brasil. Saúde em Debate [Internet]. 2017 Sep;41(114):836–47. Available from: http://dx.doi.org/10.1590/0103-1104201711413

23. Oliveira K, Destefani S. Perfil da prescrição e dispensação de antibióticos para crianças em uma Unidade Básica de Saúde (UBS) no município de Ijuí – RS. Revista de Ciências Farmacêuticas Básica e Aplicada. 2011;32(3):395-401.

24. Menezes APS, Domingues MR, Baisch ALM. Compreensão das prescrições pediátricas de antimicrobianos em Unidades de Saúde em um município do sul do Brasil. Revista Brasileira de Epidemiologia [Internet]. 2009 Sep;12(3):478–89. Available from: http://dx.doi.org/10.1590/s1415-790x2009000300016

25. Camargos PAM, Riedi CA, Kiertsman B et al. Pneumonia adquirida na Comunidade na Infância [Internet]. 2018. Brasil: Sociedade Brasileira de Pediatria [Acessado 20 de Jan de 2020]. Disponível em: <https://www.sbp.com.br/fileadmin/user_upload/Pneumologia_-_20981d-DC_-_Pneumonia_adquirida_na_comunidade-ok.pdf>.

## ARTICLE SOURCE

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## AUTHOR CONTRIBUTIONS

Study conception or design: Medeiros HSL, Costa JM, Andrade RA. Data collection: Medeiros HSL, Pádua CAM. Contributed to the analysis and/or interpretation of data: Medeiros HSL, Souza GC. Article writing or critical review: Souza GC, Costa JM, Carvalho Junior AD. Final approval of the version to be published: Costa JM, Andrade RA, Carvalho Junior AD, Souza GC.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest.