

# Adherence to guidelines on the use of amoxicillin for treatment of ambulatory pneumonia in children younger than 5 years, Colombia, 2017–2019

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## ABSTRACT

**Objectives.** To determine the level of adherence to clinical guidelines in prescribing amoxicillin to children younger than 5 years with pneumonia in outpatient settings in Colombia from 2017 to 2019, and assess the factors associated with adherence

**Methods.** This was a cross-sectional study of secondary data from the Colombian Integrated Social Protection Information System database. Adherence was defined as prescription of oral amoxicillin for bacterial and unspecified pneumonia and non-prescription for viral pneumonia. Variables examined included: age (< 1 year, 1–4 years) of child; sex; cause of pneumonia (bacterial, viral, unspecified); region (Andean, Amazonian, Pacific, Caribbean, Insular, Orinoquian); and payment mechanism (without prior authorization, capitation, direct payment, pay per case, pay for event).

**Results.** Of 215 925 cases of community-acquired pneumonia reported during 2017–2019, 64.8% were from the Andean region, 73.9% were bacterial pneumonia and 1.8% were viral pneumonia. Adherence to guidelines was observed in 5.8% of cases: this was highest for children diagnosed with viral (86.0%) compared with bacterial (2.0%) pneumonia. For children diagnosed with bacterial pneumonia, 9.4% were prescribed any antibiotic. A greater proportion of children covered by capitated payments (22.3%) were given treatment consistent with the guidelines compared with payment for event (1.3%).

**Conclusion.** In this first study from Colombia, adherence to guidelines for outpatient treatment of children with bacterial pneumonia was low and was better for viral pneumonia. Further qualitative studies are needed to explore the reasons for this lack of adherence and why bacterial pneumonia was the most commonly reported etiology.

## Keywords

Pneumonia; child; outpatients; amoxicillin; guideline adherence, Colombia.

Globally, acute respiratory infection is one of the leading causes of morbidity and mortality, especially among children younger than 5 years (1). About 15% of episodes of acute respiratory infection are lower respiratory infections (2). Of lower respiratory infections, bronchiolitis and pneumonia are the most frequent, leading to high morbidity and mortality (3). In 2019,

lower respiratory infections accounted for 3% of mortality in children younger than 5 years in high-income countries, while in South America they accounted for 6%, and in Colombia 10% (4).

Pneumonia causes more than 900 000 annual infant deaths worldwide (5). In 2019, pneumonia was responsible for 14% of all deaths in children younger than 5 years globally (6). The most

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common organisms responsible for pneumonia in children are respiratory viruses (60%), especially respiratory syncytial virus (30%), followed by bacteria (15%), with *Streptococcus pneumoniae* being the most common (5%) (7–9).

In Colombia, the Ministry of Health reports that about 450 children die annually from pneumonia (10). In 2014, the Ministry published its clinical practice guidelines on risk assessment and management of pneumonia in children younger than 5 years and bronchiolitis in children younger than 2 years (3). The aim was to improve the quality of care and optimize the use of resources by managing pneumonia at primary and secondary care levels, while rationalizing antibiotic use (3). The Ministry of Health clinical guidelines were in line with the 2014 World Health Organization (WHO) guidance for diagnosis and treatment of childhood pneumonia (11).

In children younger than 5 years with community-acquired pneumonia (CAP), not reported as viral pneumonia and managed in an outpatient setting (no hospitalization), the Ministry guidelines recommend empirical treatment with oral amoxicillin for 5 days as first-line therapy. Severe cases of pneumonia must be hospitalized or referred to a higher level of care (3). Following management guidelines is key to improving outcomes and guiding appropriate antibiotic use and antibiotic stewardship efforts countrywide. However, adherence to standardized clinical guidance has been recognized as challenging in many settings. Evidence suggests that, in general, compliance with guideline recommendations is limited, including guidelines for chronic diseases, mental health and communicable diseases (12–14). Non-adherence to guidelines on antibiotic decision-making may result in the irrational or inappropriate prescription of antibiotics, which is an important factor driving antimicrobial resistance (15).

Anecdotal evidence suggests antibiotics other than amoxicillin have been prescribed for non-severe CAP and for patients with a presumptive diagnosis of viral pneumonia in outpatient settings. In Colombia, it has been reported that in children younger than 5 years, 30% of *S. pneumoniae* isolates outside of the central nervous system are penicillin-resistant, which is partly related to antibiotic overuse (16).

Monitoring adherence to Ministry of Health treatment guidelines for CAP is vital to achieving good outcomes, lower mortality, and decreased risk of antimicrobial resistance. The assessment of guideline adherence in clinical treatment can guide stewardship programs and assist with future interventions to support health care providers in Colombia (17). To date, no assessment of adherence to the Ministry of Health guidance has been made. Therefore, we aimed to: (i) determine the level of adherence to clinical guidelines in prescribing antibiotics in children younger than 5 years with CAP in outpatient settings in Colombia and the factors associated with adherence (age, sex, location, payer source of patients and etiology of pneumonia); and (ii) quantify the type of antibiotics used over time.

## METHODS

### Study design and data source

This was a cross-sectional study of secondary data extracted from the Integrated Social Protection Information System (SISPRO) of Colombia.

## National guidelines for management of CAP in young children

For children younger than 5 years with CAP in outpatient settings, the Ministry of Health guideline recommends that the child should be administered amoxicillin at 90 mg/kg a day (in three oral doses a day) for 5 days.

Severe pneumonia is defined as any child presenting with cough, fever, and rapid breathing, subcostal respiratory retraction, or oxygen saturation less than or equal to 94%. Children with these signs and symptoms should be hospitalized or referred to another institution for hospitalization (3).

## Health insurance benefits

In Colombia, a collective protection mechanism for the right to health has been established through an insurance scheme and a health benefits plan, financed by the capitation payment unit (18). Under the capitation payment unit, services of contributory and subsidized regimes are covered. The contributory regime covers people who make a monetary contribution to the system because they can pay, while the subsidized regime covers people who cannot pay. Under both regimes, the benefit plan is the same. Consultations, procedures, and medications defined for outpatient management in the clinical practice guide for pneumonia are covered in the health benefits plan (19).

## SISPRO

The SISPRO database in Colombia is one of the main sources of health information in the country. The database includes anonymized information on patient care, interventions, procedures, medications and costs of all health events reported: health events are coded in accordance with ICD-10 classifications (20). Since the year 2000, all hospitals have been required to make a full report of the services provided (21). Data entry into the SISPRO database is routinely validated.

SISPRO reports the following types of payment mechanisms between the insurer and the hospitals: (i) without prior authorization, when a patient receives a service before the type of agreement or amount is determined and paid; (ii) capitation, advance payment of a fixed sum for a set of activities; (iii) direct payment, when a patient receives a service within the insurer-owned hospital network; (iv) pay per case, amount of payment previously agreed for the care of a health condition; and (v) pay for event, an agreed retroactive payment for each service rendered (20).

## Study population

We included all children with CAP younger than 5 years reported in SISPRO in Colombia between 2017 and 2019, who had symptoms of non-severe pneumonia and were treated in outpatient facilities.

## Variables included

We extracted individual-level data from SISPRO. Variables included were: date of consultation; age (< 1 year, 1–4 years) of child; sex; ICD-10 codes of pneumonia (bacterial, viral, unspecified); region (Andean, Amazonian, Pacific, Caribbean, Insular,

Orinoquian); type of health facility (public, private, mixed), level of health facility (I, II, III); payment mechanism (without prior authorization, capitation, direct payment, pay per case, pay for event); amoxicillin prescription (yes, no); and use of amoxicillin with other antibiotics.

For this study, adherence to guidelines was defined as: (i) use of oral amoxicillin if the reported ICD-10 diagnosis was bacterial or pneumonia of unspecified origin; or (ii) use of oral amoxicillin–clavulanate (enzyme inhibitor) after prior use of amoxicillin alone if the reported ICD-10 diagnosis was bacterial or pneumonia of unspecified origin; and (iii) non-use of an antibiotic for pneumonia reported as being of viral etiology.

## Statistical analysis

Data were exported in Microsoft Excel 2010 (Microsoft, Redmond, WA, USA) and analyzed using Stata, version 15 (Stata Corporation, College Station, TX, USA). Characteristics of the study sample and antibiotic prescriptions were summarized using proportions and 95% confidence intervals (CI). Antibiotics used (other than amoxicillin) were described by the Anatomical Therapeutic Chemical (ATC) code and the WHO Access Watch Reserve (AWaRe) categories (22, 23).

To determine the association of factors with adherence to guidelines, we used a modified Poisson regression with robust variance estimates. Associations were assessed using adjusted prevalence ratios and 95% CIs. Variables with unadjusted (crude) *p*-values < 0.2 were included in the model. Collinearity analysis was performed between all potential predictors to determine which variables to include in the multivariable model. For the model development, the Caribbean region was grouped with the Insular region, and the Amazonian region with the Orinoquian region, based on the number of observations from these regions and their proximity to each other.

## Ethics

Ethics approval was obtained from the Review Committee of the National Institute of Health of Colombia (no 11/21, date 02/11/2021/), the Ethics Committee of the Pan American Health Organization (no 01/22, date 27/01/2022) and the Ethics Advisory Group of the International Union against Tuberculosis and Lung Diseases, Paris, France (no 09/21, date 02/09/2021). As this study used routinely collected secondary data, we requested a waiver of written informed consent and this was approved by the ethics committees.

## RESULTS

### Baseline characteristics

A total of 215 925 children younger than 5 years with CAP were included in the study; their baseline characteristics are shown in Table 1. The number of children diagnosed with pneumonia was similar in the 3 years of the study (32.1–34.3%). Children < 1 year of age made up 31.3% of the total and the sex distribution was similar overall. The Andean region reported the most cases (64.8%). The most common reported diagnosis was bacterial pneumonia (73.9%), and most cases were funded by a pay-for-event mechanism (73.2%). More than 90% of the cases had no information on the level of health facility and

**TABLE 1. Baseline characteristics of children younger than 5 years diagnosed with community-acquired pneumonia in outpatient services and reported in SISPRO, Colombia, 2017–2019**

Characteristic	n (%) (n = 215 925)
<b>Year</b>	
2017	69 397 (32.1)
2018	72 480 (33.6)
2019	74 048 (34.3)
<b>Age, in years</b>	
< 1	67 521 (31.3)
1–4	148 404 (68.7)
<b>Sex</b>	
Male	113 164 (52.4)
Female	102 758 (47.6)
Missing	3 (0.0)
<b>Region</b>	
Andean	139 871 (64.8)
Amazonian	334 (0.2)
Pacific	26 168 (12.1)
Caribbean	48 284 (22.4)
Insular	131 (0.1)
Orinoquian	1 138 (0.5)
<b>Etiology of pneumonia</b>	
Viral	3 869 (1.8)
Bacterial	159 612 (73.9)
Unspecified	52 444 (24.3)
<b>Payment mechanism</b>	
Pay for event	158 075 (73.2)
Capitation	40 021 (18.5)
Direct payment	5 808 (2.7)
Pay per case	6 317 (2.9)
Authorized	5 704 (2.6)
<b>Level of health facility</b>	
I	189 (0.1)
II	166 (0.1)
III	9 (0.0)
Missing	215 561 (99.8)
<b>Type of health facility</b>	
Private	69 689 (32.3)
Public	342 (0.2)
Mixed	101 (0.0)
Missing	145 793 (67.5)

SISPRO, Integrated Social Protection Information System.  
Source: Prepared by authors from the study results.

67.5% had no data on the type of health facility (public, private, or mixed), so these variables were excluded from the analyses. All cases belonged to the contributory regime.

### Use of antibiotics according to etiology of pneumonia

For children diagnosed with bacterial pneumonia, 90.6% were reported as not receiving antibiotic treatment (Table 2). Of those receiving antibiotics, 2.0% received amoxicillin alone. The remaining 7.4% received another antibiotic with or without amoxicillin. When the diagnosis was non-specific pneumonia,

**TABLE 2. Antibiotics used in the treatment of children younger than 5 years with community-acquired pneumonia in outpatient facilities as reported in SISPRO, by etiology of pneumonia, Colombia, 2017–19**

Etiology	n (%)					
	Amoxicillin	Amoxicillin–clavulanate	Amoxicillin + another antibiotic	Other antibiotic	No antibiotic	Total
Bacterial (73.9%) <sup>a</sup>	3 161 (2.0)	26 (0.0)	239 (0.1)	11 590 (7.3)	144 596 (90.6)	159 612 (100.0)
Unspecified (24.3%) <sup>a</sup>	5 933 (11.3)	21 (0.0)	391 (0.7)	15 576 (29.7)	30 523 (58.20)	52 444 (100.0)
Viral (1.8%) <sup>a</sup>	159 (4.1)	1 (0.0)	12 (0.3)	385 (10.0)	3 312 (85.6)	3 869 (100.0)

SISPRO, Integrated Social Protection Information System.

<sup>a</sup> Percentage of cases (n = 215 925).

Source: Prepared by authors from the study results.

amoxicillin treatment alone was reported in 11.3% of cases. For children diagnosed with viral pneumonia, antibiotics were given in 14.4% of cases.

### Antibiotics other than amoxicillin

Among the 37 466 cases where antibiotics were reported as being used, 59.9% were of the beta-lactam and penicillin class, while 33.7% were macrolides, lincosamides or streptogramins (Table 3). The database showed that 1557 children were treated with more than one antibiotic and 1337 were prescribed antimicrobials classified in more than one ATC group. No children were reported as being treated with a reserve antibiotic from the WHO AWaRe classification, while 3.3% were treated with more than one antibiotic from the Access and Watch category.

### Factors associated with adherence to guidelines

Overall, adherence to guidelines was seen in the treatment of 5.8% of the cases (Table 4). A correlation matrix of all the independent variables did not indicate collinearity between the variables selected for the model. In the multivariable model, probability of adherence decreased in 2018 and 2019. As regards age group, adherence was 57% higher in the older (1–4 years old) versus younger children. Regarding region of residence, the Andean region has the largest population concentration of the entire country (56%) (24), but adherence was 13% lower in the Caribbean/Insular region by than the Andean region. Compared with cases with unspecified pneumonia, adherence to guidelines was 52% lower in cases of bacterial pneumonia, but 8.3 times higher in cases of viral pneumonia. With payment mechanisms, compared with authorized payment, adherence to guidelines was 2.4 times higher in cases using capitation. In contrast, adherence to guidelines was 74% lower in cases using payment per event, compared with authorized payment.

### Frequency of use of amoxicillin or another antibiotic

The frequency of use of amoxicillin (+/– clavulanate), clarithromycin or azithromycin by year for treating CAP in children younger than 5 years is shown in Figure 1. Over the three study years, a trend towards non-adherence to guidelines was seen. The use of broad-spectrum antibiotics (clarithromycin, azithromycin, and amoxicillin–clavulanate) increased over time.

**TABLE 3. Antibiotics, other than amoxicillin, used to treat children younger than 5 years diagnosed with community-acquired pneumonia in outpatient facilities, as reported in SISPRO, by classification system, Colombia, 2017–2019**

Classification	n (%)
Total	37 466 (100)
<b>ATC J01<sup>a</sup></b>	
Beta-lactam antibacterials, penicillins	22 28 (59.9)
Macrolides, lincosamides and streptogramins	12 634 (33.7)
Antibacterials more than one group	1 337 (3.6)
Other beta-lactam antibacterials	996 (2.7)
Sulfonamides and trimethoprim	59 (0.2)
Aminoglycosides antibacterials	9 (0.0)
Other antibacterials	2 (0.0)
Quinolone antibacterials	1 (0.0)
<b>AWaRe<sup>b</sup></b>	
Access	23 023 (61.4)
Watch	13 210 (35.3)
More than one Access and/or Watch antibiotic	1 233 (3.3)

SISPRO, Integrated Social Protection Information System; ATC, Anatomical Therapeutic Chemical; AWaRe, Access, Watch, Reserve.

<sup>a</sup> In the ATC system, the active substances are divided into different groups according to the organ or system on which they act and their therapeutic, pharmacological and chemical properties. J01 is the therapeutic subgroup of the ATC system: Antibacterials for systemic use.<sup>b</sup> In the AWaRe classification, antibiotics are classified into three groups, Access, Watch, and Reserve, taking into account their impact on antimicrobial resistance, to emphasize the importance of their appropriate use.

Source: Prepared by authors from the study results.

## DISCUSSION

In this study, we observed a low adherence to clinical guidelines for the management of children with CAP younger than 5 years in outpatient settings in Colombia. While about three quarters of the cases of pneumonia were reported to be of bacterial etiology, adherence to guidelines was better among children diagnosed with viral pneumonia. Capitated payment was associated with higher adherence to treatment guidelines.

### Key findings

A high percentage of children were diagnosed with bacterial pneumonia by health care providers. It remains uncertain why providers would report a bacterial diagnosis more frequently than viral, given that around the world pneumonia is mainly caused by viral agents (7, 8). The choice of recording bacterial or unspecified pneumonia rather than viral pneumonia may

**TABLE 4. Factors associated with adherence to guidelines (use of amoxicillin only) for treatment of children younger than 5 years diagnosed with community-acquired pneumonia in outpatient facilities and reported in SISPRO, Colombia, 2017–2019**

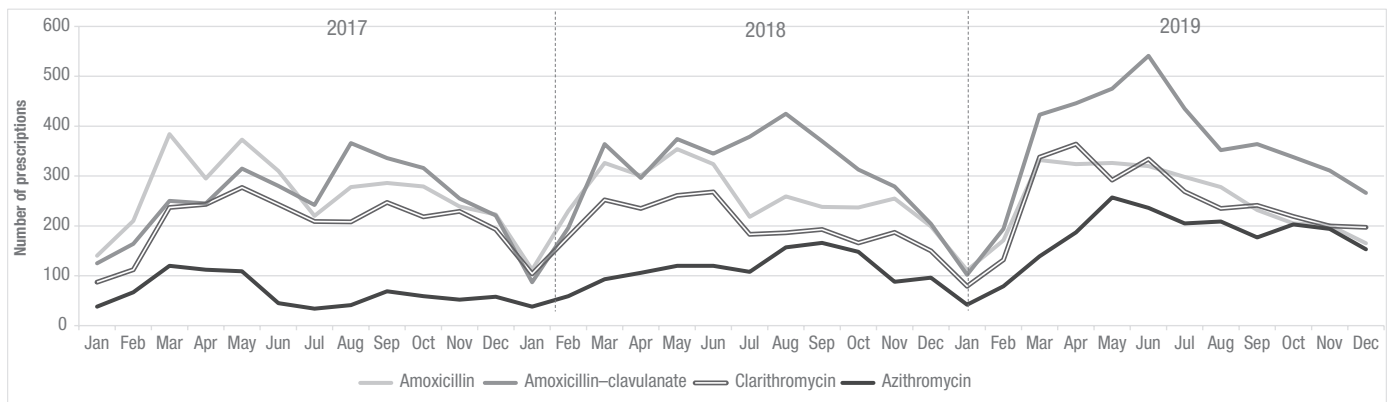
Variable	Total	Adherence to guidelines, n (%)	Prevalence ratio (95% CI)
<b>Overall</b>	<b>215 925</b>	<b>12 469 (5.8)</b>	<b>NA</b>
<b>Year</b>			
2017	69 397	4 040 (5.8)	Ref
2018	72 480	4 010 (5.5)	0.93 (0.89–0.96)
2019	74 048	4 419 (5.6)	0.92 (0.88–0.95)
<b>Age group, in years</b>			
< 1	67 521	1 278 (1.9)	Ref
1–4	148 404	11 191 (7.5)	1.57 (1.49–1.65)
<b>Sex<sup>a</sup></b>			
Male	113 164	6 582 (5.8)	Ref
Female	102 758	5 887 (5.7)	NA
<b>Region</b>			
Pacific	26 168	1 839 (7.0)	1.04 (0.99–1.09)
Andean	139 871	8 070 (5.8)	Ref
Caribbean/Insular	48 414	2 391 (4.9)	0.87 (0.83–0.91)
Orinoquian/Amazonian	1 472	169 (11.5)	0.93 (0.80–1.07)
<b>Etiology of pneumonia</b>			
Bacterial	159 612	3 187 (2.0)	0.48 (0.46–0.51)
Viral	3 869	3 327 (86.0)	8.27 (7.94–8.61)
Unspecified	52 444	5 955 (11.4)	Ref
<b>Payment mechanism</b>			
Authorized	5 704	795 (13.9)	Ref
Capitation	40 021	8 919 (22.3)	2.37 (2.37–2.57)
Direct payment	5 808	250 (4.3)	0.46 (0.46–0.57)
Pay per case	6 317	386 (6.1)	0.55 (0.55–0.63)
Payment for event	158 075	2 119 (1.3)	0.26 (0.26–0.30)

SISPRO, Integrated Social Protection Information System; CI, confidence interval; NA, not applicable; Ref, reference category.

<sup>a</sup> Data were missing for three cases.

Source: Prepared by authors from study results.

**FIGURE 1. Trends in prescription of amoxicillin and others antibiotics to children younger than 5 years diagnosed with community-acquired pneumonia in outpatient facilities as reported in SISPRO, Colombia, 2017–2019**



SISPRO, Integrated Social Protection Information System.

Source: Prepared by authors from study results.

have something to do with biases in doctors’ classification, mistakes with the providers’ reporting, or difficulties at different levels and types of health facility of which we are unaware (25). Challenges in capturing data reported by health providers have been a long-standing problem which is increasing with the greater complexity of medical care (26, 27).

Adherence to clinical guidance was low and there were no previous studies on the management of ambulatory CAP in Latin America with which to compare our findings. However, our results are similar to a study in hospitalized CAP cases in Poland (28). Poor adherence to similar guidelines has been reported in Brazil (26% adherence), while higher adherence has

been reported in Pakistan and Lebanon (> 50%) (29–31). In fact, antibiotics have shown limited benefits in children younger than 5 years with non-severe pneumonia diagnosed as per WHO criteria (32).

We found greater adherence to guidelines in cases with capitated insurance rather than cases covered through payment per event. This finding may be due to the strict auditing and follow-up processes carried out by insurers in the hospitals with which they have the capitation payment mechanism. Similar findings have been reported within the Colombian health system (33). Non-capitated services have different operational and financial rules, which could generate a disparity in care for people with similar health conditions.

## Strengths

The main strength of this study was that we had direct access to 3 years of SISPRO data, which included diagnostic and treatment information of CAP in children younger than 5 years, for the entire country. This limits the introduction of selection bias, as the data set was countrywide. In addition, we followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines (34).

## Limitations

The main limitation of this study was that the SISPRO databases had incomplete information on variables such as level and type of health facility which are relevant for analyzing diagnosis and antibiotic treatment in relation to different regions of the country. Having this information would assist in future targeted interventions to improve adherence to guidelines.

Another limitation to consider when analyzing our results is that no information was available on comorbidities or vaccination history of the children that could explain the change in antibiotics for the management of non-severe pneumonia. This aspect could be analyzed in other investigations that compile institutional data, medical records and patient cohorts. Finally, as accurate coding of diagnoses is needed for analysis, any shortcomings in the reliability and validity of the SISPRO database could have affected our findings.

## Recommendations

First, a rapid qualitative operational research study is needed to examine why providers are diagnosing bacterial CAP more frequently than viral CAP; whether this is because of a wrong clinical diagnosis, unawareness of the diagnostic classification for pneumonia, or incorrect information management by providers. Second, the reason why few data were submitted on level and type of health facility should be assessed to assist decision-makers using the information in SISPRO. Third, health care providers are not closely involved in the review, management and evaluation of information systems and data collection processes. In addition, they do not routinely receive feedback on clinical data quality and monitoring results. Urgent attention is needed to raise awareness of health care providers of the importance of good-quality health data and engage them in the data collection process.

Finally, based on these findings, the need to update the 2014 Colombian pneumonia guideline and include follow-up

and adherence mechanisms should be assessed. In addition, an evidence-based educational intervention should be developed for health care providers and managers with a focus on improving adherence to guidelines and data collection on the diagnosis and treatment of CAP. Subsequently, it may be necessary to enhance training activities for clinicians so that they have a better understanding of data reporting and the implications for decision-making. Such measures have the potential to improve health outcomes, save costs and reduce the risk of exacerbation of antimicrobial resistance.

## Conclusion

This study found low adherence to guidelines for the management of CAP in children younger than 5 years in outpatient settings in Colombia. Further qualitative systematic studies are required to explore the reasons for this situation, why bacterial pneumonia was the most common etiology reported, and why antibiotics were not prescribed more frequently for bacterial pneumonia. As no previous studies on adherence in Colombia are available, our findings provide baseline data and could help promote improvements in data collection and management for the Colombian health information systems on diagnosis, treatment, monitoring and quality of care.

**Author contributions.** LMA, BO, HDS, JTT, CMC, JR, KH and MS contributed to the conception and design of the study. LMA, BO, JT, and CMC collected the data. LMA, MS, HDS, JKE, and JR did the data analysis and interpretation. LMA, BO, HDS, JT, CMC, JR, KH, and MS drafted the manuscript. LMA, BO, HDS, JKE, JR, and MS contributed to the critical review and revision of the manuscript. All authors reviewed and approved the final version.

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## Adherencia a las directrices sobre el uso de amoxicilina para el tratamiento ambulatorio de la neumonía en menores de 5 años, Colombia, 2017-2019

### RESUMEN

**Objetivos.** Determinar el nivel de adherencia a las directrices clínicas al momento de prescribir amoxicilina a menores de 5 años con neumonía en entornos de atención ambulatoria en Colombia entre el 2017 y el 2019, así como evaluar los factores asociados con la adherencia.

**Métodos.** Este fue un estudio transversal de datos secundarios de la base de datos del Sistema Integral de Información de la Protección Social de Colombia. La adherencia se definió como la prescripción de amoxicilina por vía oral para las neumonías bacterianas y no especificadas, y la ausencia de prescripción para las neumonías virales. Las variables examinadas incluyeron: edad (< 1 año, 1 a 4 años); sexo; causa de la neumonía (bacteriana, viral, no especificada); región (andina, amazónica, Pacífico, Caribe, insular, Orinoco); y mecanismo de pago (sin autorización previa, capitación, pago directo, pago por caso, pago por evento).

**Resultados.** De 215 925 casos de neumonía adquirida en la comunidad notificados durante el período 2017-2019, el 64,8% correspondieron a la región andina, el 73,9% a neumonía bacteriana y el 1,8% a neumonía viral. Se observó la adherencia a las directrices en el 5,8% de los casos: esta cifra fue más alta para la población infantil diagnosticada con neumonía viral (86,0%) que para la diagnosticada con neumonía bacteriana (2,0%). En el caso de la población infantil diagnosticada con neumonía bacteriana, al 9,4% se le recetó algún antibiótico. La proporción de población infantil cubierta por pagos capitados (22,3%) que recibió un tratamiento en consonancia con las directrices fue mayor que la de la población cubierta por pagos por evento (1,3%).

**Conclusión.** En este primer estudio de Colombia, la adherencia a las directrices sobre el tratamiento ambulatorio de la población infantil con neumonía bacteriana fue bajo, en tanto que resultó superior en el caso de la neumonía viral. Se necesitan más estudios cualitativos para indagar sobre los motivos de esta falta de adherencia y las razones por las cuales la neumonía bacteriana fue la etiología notificada con mayor frecuencia.

### Palabras clave

Neumonía; niño; pacientes ambulatorios; amoxicilina; adhesión a directriz; Colombia.



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## Adesão às diretrizes sobre uso de amoxicilina para tratamento de pneumonia ambulatorial em crianças menores de 5 anos, Colômbia, 2017-2019

### RESUMO

**Objetivos.** Determinar o nível de adesão às diretrizes clínicas para prescrição de amoxicilina em regime ambulatorial para crianças menores de 5 anos com pneumonia na Colômbia, de 2017 a 2019, e avaliar os fatores associados à adesão.

**Métodos.** Estudo transversal de dados secundários do banco de dados do Sistema Integrado de Informação sobre Proteção Social da Colômbia. Definiu-se adesão como prescrição de amoxicilina oral para pneumonia bacteriana e não especificada, e não prescrição para pneumonia viral. As variáveis examinadas incluíram: idade da criança (< 1 ano, 1–4 anos), sexo, etiologia da pneumonia (bacteriana, viral, não especificada), região (Andina, Amazônica, Pacífica, Caribenha, Insular, Orinoco) e mecanismo de pagamento (sem autorização prévia, capitação, pagamento direto, *pay-per-case*, *pay-for-event*).

**Resultados.** Dos 215.925 casos de pneumonia adquirida na comunidade notificados nos anos 2017-2019, 64,8% ocorreram na região Andina, 73,9% foram pneumonia bacteriana e 1,8% foram pneumonia viral. A adesão às diretrizes foi observada em 5,8% dos casos. Foi maior para crianças com diagnóstico de pneumonia viral (86,0%) em comparação com pneumonia bacteriana (2,0%). Para as crianças com diagnóstico de pneumonia bacteriana, 9,4% receberam algum antibiótico. Uma proporção maior de crianças cobertas por pagamentos capitados (22,3%) recebeu tratamento compatível com as diretrizes, contra apenas 1,3% no esquema de *pay-for-event*.

**Conclusão.** Neste primeiro estudo da Colômbia, a adesão às diretrizes para tratamento ambulatorial de crianças com pneumonia bacteriana foi baixa, sendo melhor para pneumonia viral. Mais estudos qualitativos são necessários para explorar as razões dessa falta de adesão e por qual motivo a pneumonia bacteriana foi a etiologia mais comumente notificada.

**Palavras-chave** Pneumonia; criança; pacientes ambulatoriais; amoxicilina; fidelidade a diretrizes; Colômbia.

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