

Burden of clinical syndromes associated with pneumococcal disease in Ecuador: A 2019 perspective

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Background

- Pneumococcal disease (PD) continues to be a significant global concern, particularly among children and older adults, resulting in high morbidity and mortality rates¹
- In Ecuador, the 10-valent pneumococcal conjugate vaccine (PCV10) was introduced in the national immunization program (NIP) for infants in 2010. Since 2011, vaccination coverage has consistently exceeded 70%. However, older adults aged 65 and above are currently not included in the country's routine pneumococcal NIP⁴
- There is a lack of specific information regarding the burden of PD in all age groups including the non-target groups such as adults.²⁻⁴ Surveillance data from PCV10 countries in the region shows a high proportion of serotype 19 A (~30%) and serotype 3 (~11%) as the main causes of IPD.⁵
- This study aimed to estimate the burden of clinical syndromes associated with PD in Ecuador across all age groups in 2019

Methods

- A secondary analysis was conducted using the outpatient and inpatient databases obtained from the National Institute of Statistics and Census (INEC). Population covered by databases included all private and public healthcare services in the country. Clinical syndromes associated with PD, namely pneumonia, otitis media, and invasive disease (bacteremia, meningitis, and other invasive diseases), were identified using ICD-10 codes for 2019 (**Table 1**)
- The number of outpatient consultations and hospitalizations was extracted from databases. The in-hospital case fatality rates (CFR) and the outpatient and hospitalization incidence rates per 100,000 inhabitants with 95% confidence intervals (CI) were calculated. Age stratification was performed for all clinical syndromes, whereas for otitis media, the analysis was conducted only in children <1 year and 1 to 4 years. In Ecuador, the definition of older adults is individuals aged ≥65 years

Table 1. ICD-10 codes used for clinical syndromes associated with pneumococcal disease

Clinical syndromes associated with PD	ICD-10 codes
Pneumonia	J13, J15-J18
Bacteremia/sepsis	A40, A49
Meningitis	G00.1, G00.2, G00.8, G00.9, G03.9
Other invasive disease	M00.1, J86, J90, J91, B95.3

Results

- In 2019, a total of 92,104 cases of clinical syndromes associated with PD were reported in Ecuador, with 45,001 inpatient and 47,103 outpatient cases
- Pneumonia was the predominant syndrome, accounting for 82% of the cases. Among them, 52.5% received inpatient treatment. Of concern, 50% of inpatient pneumonia cases were observed in children <5 years of age, while a higher proportion of pneumonia cases in adults ≥65 years of age required hospitalization (62.7% compared to 52.2% for all ages) (**Table 2**). The CFR for inpatient pneumonia increased with age, peaking at 27% in adults ≥65 years of age (**Figure 1**)
- In children under 1 year of age, inpatient pneumonia had the highest incidence rate (2,309/100,000), followed by outpatient pneumonia (2,136/100,000) and outpatient otitis media (661/100,000) (**Tables 2 and 3**)
- In children aged 1 to 4 years, outpatient pneumonia had the highest incidence rate (907.1/100,000), followed by inpatient pneumonia (905/100,000) and outpatient otitis media (686/100,000) (**Tables 2 and 3**)
- Among those aged ≥65 years, the highest incidence rates were observed for inpatient pneumonia (877.5/100,000), followed by outpatient pneumonia (522.5/100,000) and bacteremia (109.3/100,000) (**Tables 2 and 3**)

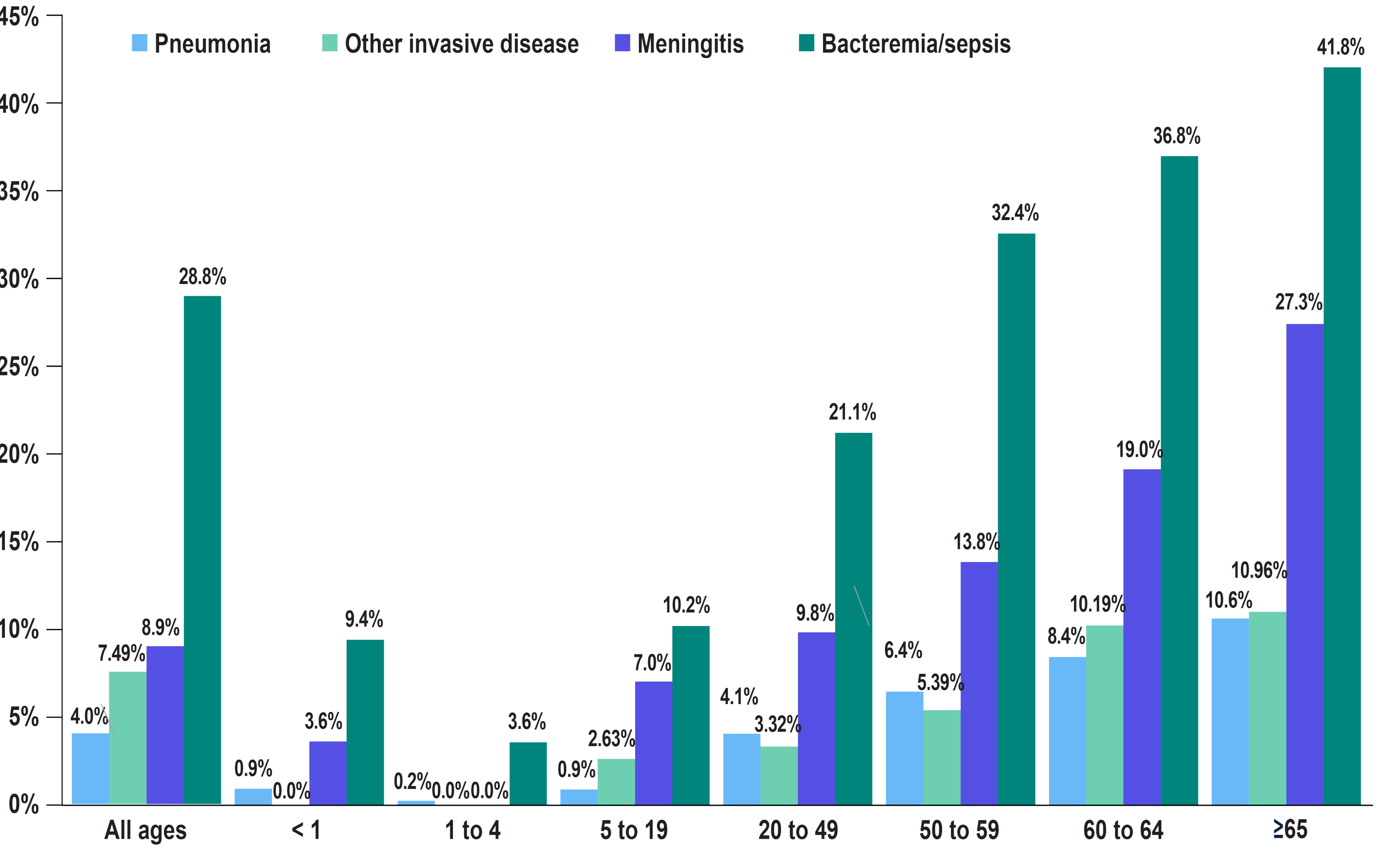
Table 2. Number of cases, outpatient and inpatient incidence rates per 100,000 inhabitants due to pneumonia and otitis media, Ecuador, 2019

Clinical syndromes	Outpatient		Inpatient	
	Frequency	Rate (95% CI)	Frequency	Rate (95% CI)
Pneumonia				
All ages	35,779	207.2 (207.0;207.4)	39,522	228.9 (228.7;229.0)
<1 year	7,088	2,136.4 (2,135.3;2,137.5)	7,663	2,309.7 (2,308.6;2,310.8)
1 - 4 y	12,065	907.1 (906.5;907.6)	12,041	905.2 (904.7;905.8)
5 - 19 y	4,188	96.7 (96.4;97.0)	3,898	78.5 (78.3;78.8)
20 - 49 y	3,506	44.3 (44.0;44.5)	2,515	34.5 (34.3;34.7)
50 - 59 y	1,475	97.4 (96.9;98.0)	1,334	88.1 (87.6;88.6)
60 - 64 y	850	148 (147.2;148.8)	976	169.9 (169.1;170.8)
≥65 y	6,607	522.5 (522.0;523.1)	11,095	877.5 (876.9;878.0)
Otitis media				
0 - 4 y	11,324	681.4 (680.9;681.9)	399	24.0 (23.5;24.5)
<1 y	2,194	661.3 (660.2;662.4)	119	35.9 (34.8; 36.9)
1 - 4 y	9,130	686.4 (685.9;686.9)	280	21.1 (20.5;21.6)

Table 3. Number of cases and inpatient incidence rates per 100,000 due to invasive pneumococcal disease, Ecuador, 2019

Clinical syndromes	Bacteremia		Meningitis		Other invasive disease	
	Frequency	Rate (95% CI)	Frequency	Rate (95% CI)	Frequency	Rate (95% CI)
All ages	3,203	18.5 (18.4;18.7)	436	2.5 (2.4;2.7)	1,441	8.3 (8.2;8.5)
<1 year	256	77.2 (76.1;78.2)	138	41.6 (40.5;42.7)	10	3.0 (1.9;4.1)
1 - 4 y	280	21.1 (20.5;21.6)	45	3.4 (2.9;3.9)	25	1.9 (1.3;2.4)
5 - 19 y	246	5 (4.7;5.2)	57	1.1 (0.9;1.4)	76	1.5 (1.3;1.8)
20 - 49 y	540	7.4 (7.2;7.6)	102	1.4 (1.2;1.6)	361	5.0 (4.7; 5.2)
50 - 59 y	287	19 (18.5;19.5)	29	1.9 (1.4;2.4)	204	13.5 (13.0;14.0)
60 - 64 y	212	36.9 (36.1;37.7)	21	3.7 (2.8;4.5)	108	18.8 (18.0;19.6)
≥65 y	1,382	109.3 (108.8;109.9)	44	3.5 (2.9;4.0)	657	52.0 (51.4;52.5)

Figure 1. In-hospital case fatality rates due to clinical syndromes associated with pneumococcal disease, Ecuador, 2019



Discussion and Conclusion

- The burden of clinical syndromes associated with PD was high in Ecuador in 2019, affecting mainly children under 5 years and adults ≥65 years of age
- Strengthening surveillance and immunization strategies by increasing vaccine coverage and expanding vaccination programs to older adults may reduce the burden of PD
- These findings can support decision makers to make informed choices regarding the expansion and optimization of pneumococcal vaccination programs to vaccines with broader serotype coverage, ultimately benefiting both children and older adults in terms of disease prevention and public health outcomes

Disclosures

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