

# PER-SEROTYPE CLINICAL PRESENTATIONS OF INVASIVE PNEUMOCOCCAL DISEASE IN ADULTS IN SPAIN (2010-2013). THE ODIN STUDY

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## BACKGROUND AND AIMS

- Invasive pneumococcal disease (IPD) remains an important and severe health problem all over the world, affecting subjects of all ages and specially patients with underlying conditions, and it causes a significant morbidity, mortality and costs.
- *Streptococcus pneumoniae* (SP) serotypes may act as quasispecies and different associations with clinical presentations, outcome and antibiotic susceptibility has been proposed.
- Periodic reevaluation of IPD in a wide population sector representing a whole country is pertinent, in order to check the extension of the disease and the best targets for the implementation of new vaccines.
- This 3-year study aimed to analyze by serotype clinical presentations of IPD episodes and coverage by 13 valent pneumococcal conjugate vaccine (PCV13) in adults in Spain in order to guide future vaccination strategies.

## METHODS

- A prospective, active, hospital-based surveillance of culture-confirmed IPD cases in adults (≥18 years) was performed in 9 Spanish hospitals from August 2010 to June 2013. IPD was defined as presence of clinical signs/symptoms not attributable to any other cause simultaneously with growth of SP one or more normally sterile fluids.
- Major clinical presentations considered were: Uncomplicated pneumonia, complicated pneumonia, meningitis, non-focal bacteremia, peritonitis and others. The presence of pneumonia with parapneumonic pleural effusion, empyema, or multilobar infiltration was considered as complicated pneumonia.
- All pneumococcal isolates were sent to the reference laboratory (National Center of Microbiology) for serotyping by the Quellung reaction or dot blot assay. Serotypes 6A, 6B, 19A and 19F were identified by real-time PCR.

## RESULTS

- A total of 637 patients with an IPD episode were included in the three years study. Mean age was 63.05;17.10 years, with 74.4% patients ≥50 years, 49.1% ≥65 years and 31.1% ≥75 years of age. Males represented 60.0% of total patients.
- Figure 1 shows distribution of main clinical presentation of IPD episodes. A total of 140 out of 637 patients (21.9%) developed severe sepsis/septic shock: 14.6% of patients with uncomplicated pneumonia, 30.4% of patients with complicated pneumonia, 19.7% of patients with meningitis, 21.2% patients with non-focal bacteremia, 8.7% of patients with peritonitis and 23.7% of patients with other IPDs.
- Serotype distribution is presented for 633 episodes since 4 isolates were not recovered for serotyping. Table 1 shows main clinical presentation of IPD episodes by serotypes for PCV13+6C. Serotypes not included individually in the table accounted for 281 (44.3%) and belonged to 35 different serotypes. Figure 2 shows serotype distribution by clinical presentation of IPD episodes..

Figure 1. Distribution of main clinical presentations of IPD episodes (%). 2010-2013.

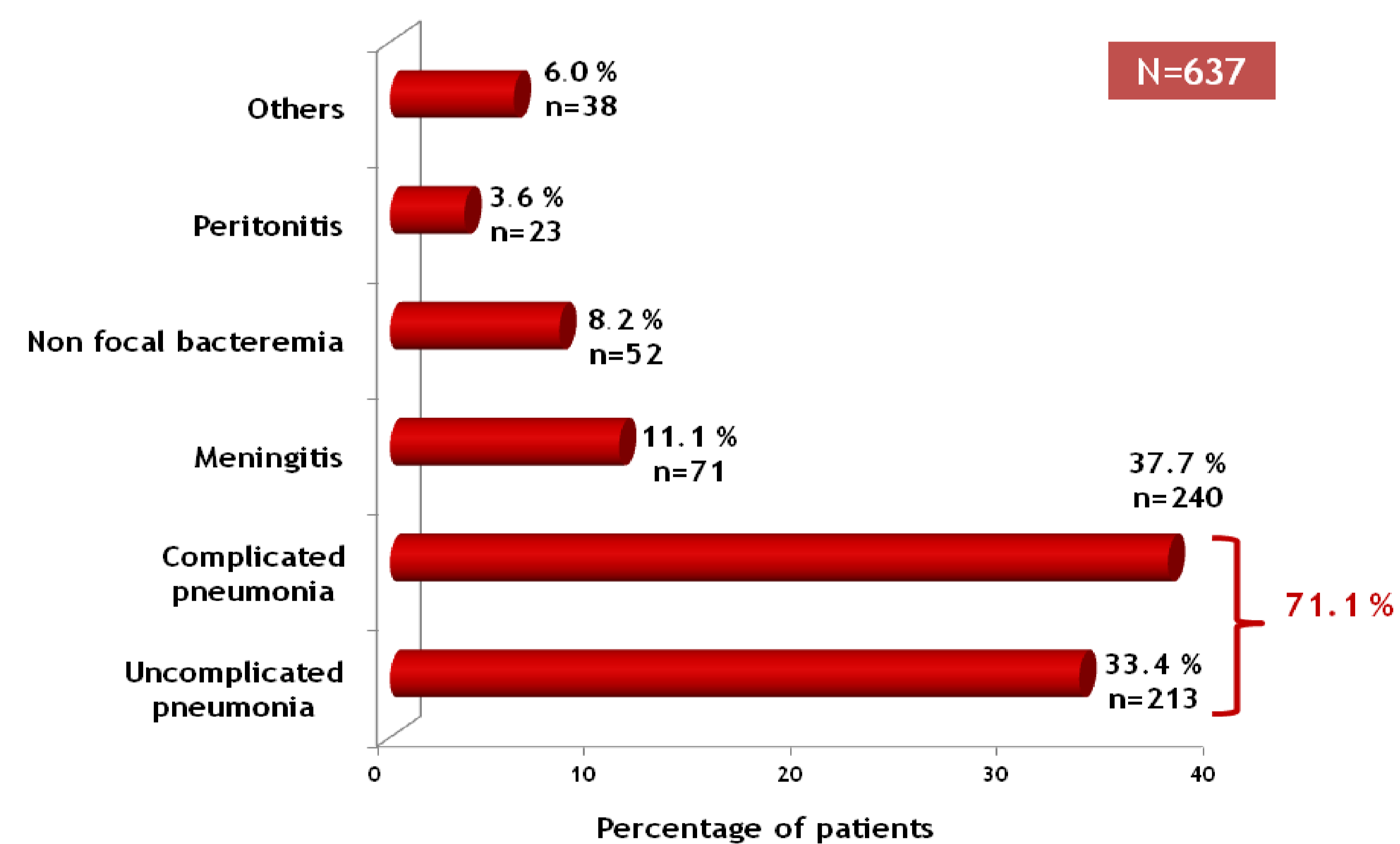
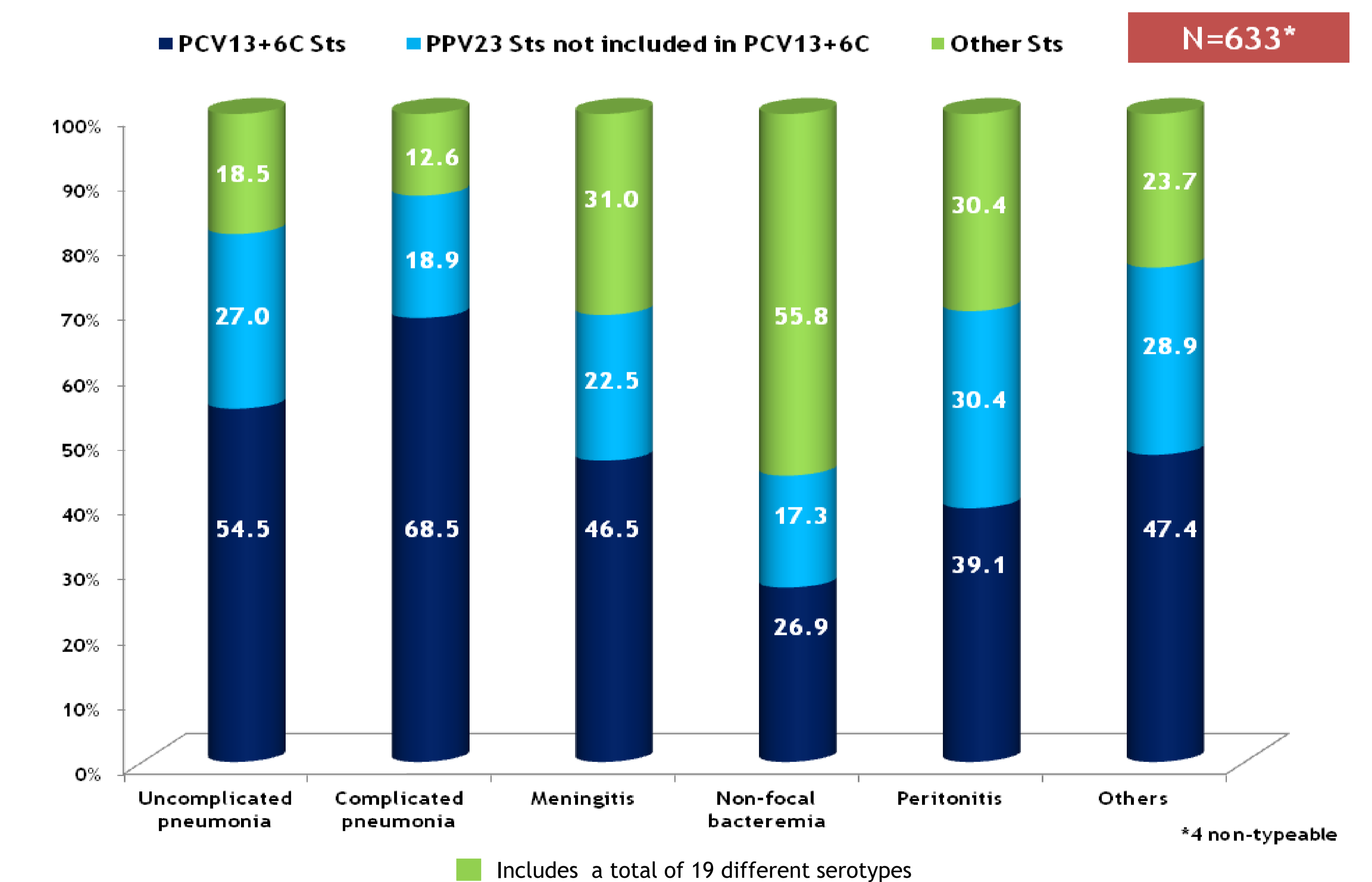


Table 1. IPD clinical presentations [n(%)] by serotypes for PCV13 + 6C serotypes. 2010-2013

	Total	Uncomplicated pneumonia	Complicated pneumonia	Meningitis	Non-focal bacteremia	Peritonitis	Others
<b>Total IPD</b>	<b>633</b>	<b>211</b>	<b>238</b>	<b>71</b>	<b>52</b>	<b>23</b>	<b>38</b>
1	33 (5.2)	8 (3.8)	21 (8.8)	1 (1.4)	2 (3.8)	0 (0.0)	1 (2.6)
3	76 (12.0)	24 (11.4)	41 (17.2)	6 (8.5)	2 (3.8)	1 (4.3)	2 (5.3)
4	18 (2.8)	4 (1.9)	12 (5.0)	2 (2.8)	0 (0.0)	0 (0.0)	0 (0.0)
5	1 (0.2)	0 (0.0)	1 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
6A	6 (0.9)	2 (0.9)	1 (0.4)	1 (1.4)	0 (0.0)	1 (4.3)	1 (2.6)
6B	4 (0.6)	1 (0.5)	2 (0.8)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.6)
6C	32 (5.1)	10 (4.7)	9 (3.8)	5 (7.0)	7 (13.5)	1 (4.3)	0 (0.0)
7F	48 (7.6)	18 (8.5)	24 (10.1)	2 (2.8)	0 (0.0)	2 (8.7)	2 (5.3)
9V	11 (1.7)	4 (1.9)	6 (2.5)	0 (0.0)	1 (1.9)	0 (0.0)	0 (0.0)
14	31 (4.9)	16 (7.6)	10 (4.2)	0 (0.0)	0 (0.0)	2 (8.7)	3 (7.9)
18C	7 (1.1)	1 (0.5)	3 (1.3)	2 (2.8)	1 (1.9)	0 (0.0)	0 (0.0)
19A	59 (9.3)	21 (10.0)	28 (11.8)	5 (7.0)	1 (1.9)	1 (4.3)	3 (7.9)
19F	19 (3.0)	4 (1.9)	4 (1.7)	6 (8.5)	0 (0.0)	1 (4.3)	4 (10.5)
23F	7 (1.1)	2 (0.9)	1 (0.4)	3 (4.2)	0 (0.0)	0 (0.0)	1 (2.6)
<b>Total PCV13 + 6C</b>	<b>352 (55.6)</b>	<b>115 (54.5)</b>	<b>163 (68.5)</b>	<b>33 (46.5)</b>	<b>14 (26.9)</b>	<b>9 (39.1)</b>	<b>18 (47.4)</b>

Figure 2. Serotypes distribution (%) by clinical presentation of IPD episodes. 2010-2013



## CONCLUSIONS

- Invasive pneumonia was the most frequent clinical presentation, accounting for 71.1% of total episodes of IPD. Up to 85.5% of episodes caused by serotype 3 and 83.1% of episodes caused by serotype 19A were invasive pneumonia.
- Coverage of PCV13 + 6C was 55.6% in global, and 61.9% for invasive pneumonia

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