



Update on pneumococcal surveillance in Lebanon

Surveillance for invasive pneumococcal disease (IPD) continues with the participation of 78 Hospitals all over Lebanon. Thanks to the hard work of all the physicians, microbiologists, and technicians who have made an effort to contribute to LIPSP. Since the beginning of the year 2012, we have collected a total of 30 *Streptococcus Pneumonia* samples. The total samples since the beginning of the study in 2005 is **286**. The results will be presented in detail in this newsletter. To the right is the hospital contribution list for the 286 samples that were handed in since the beginning of this surveillance program.

We would like to thank all the hospitals that are contributing to LIPSP. We would also like to extend our thanks to the Ministry of Health for its cooperation and support.

71	AUBMC	Dr George Araj
32	Makassed	Dr Tamima Jisr
29	RHUH	Dr Rita Feghali
19	Haykal	Dr Gilbert Kara Yacoub
18	Nini	Dr Munzer Hamzeh
13	Monla	Dr Ricardo Sarraf
13	Rizk	Dr Jacques Mokhbat
8	Sacre Coeur	Dr Antoine Haddad
6	St. Joseph Doura	Dr. Raymond Rohban
6	Centre Hospitalier du Nord	Dr. Salam Samad
6	Sahel	Dr. Wassim Serhal
6	Hammoud	Dr Mohammad Zaatari
3	Islamic Tripoli	Dr. Malak Naboulsi
3	Talchiha Zahle	Dr. Naziha Makhlof
3	St. Georges	Dr. Ziad Daoud
2	Ain w Zein	Dr. Rami Caracalla
2	Arz	Dr. Hiam Matta
2	Riyak	Dr. Salam Monzer
2	St. Charles	Dr. Tony Faddoul
2	St. Louis	Dr. Antoine Abi Nasr
1	Notre Dame de la paix	Dr. Ghaith Makhoul
1	El Hayat	Dr. Antoine Zablit
1	El Youssef Medical Center	Dr. Hadi el Amin
1	Hopital Notre Dame de Secours	Dr. Georges Abdel Nour
1	Najjar	Dr. Nadim Azar
1	Notre Dame du Liban	Dr. Farida Saadeh
1	Rahal	Dr. Mohamed Abdallah
1	Al Rassoul Al Aazam	Dr. Ibrahim Ahmad
1	Rayan	Dr. Mohamad Abdallah
1	Bahman	Dr. Mohammad Haidar
1	Middle East Institute of Health	Dr. Edmond Abboud

Demographics

- The age distribution of the **286** collected samples are distributed as follows:

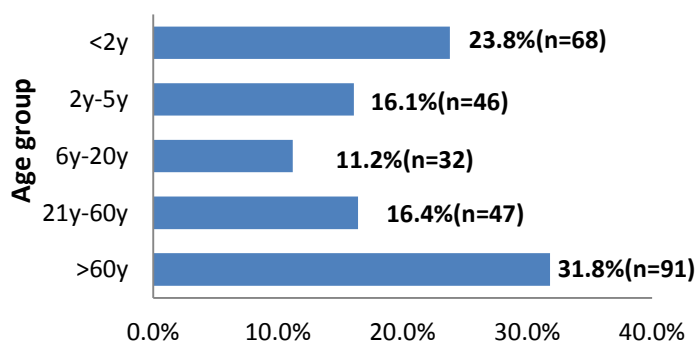
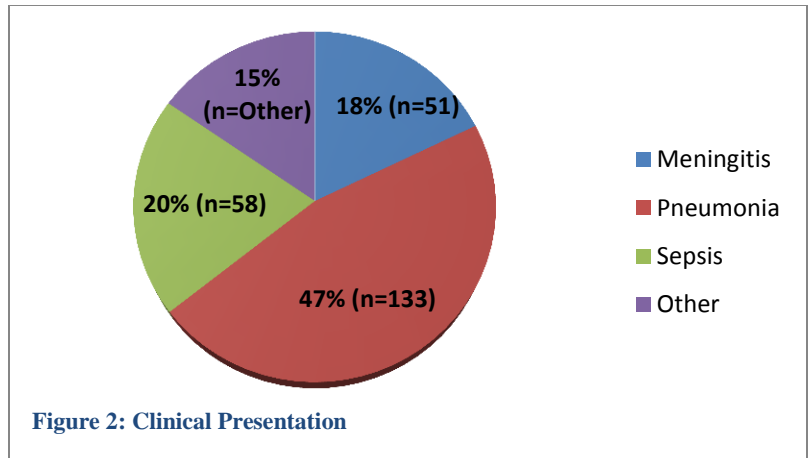


Figure 1: Age Distribution

- Males constituted **54.9%** of the patients (**n=157**).
- Mortality was **12.2%**: highest in adults above 60 years (**57.1%**), followed by children younger than 2 years (**20%**).
- The clinical presentations are summarized in Figure 2.



Serotype Distribution and Vaccine Coverage

The most prevalent serotypes/serogroups were: 19F, 6, 3, 14, and 19A. Serotype distribution is summarized in Figure 3.

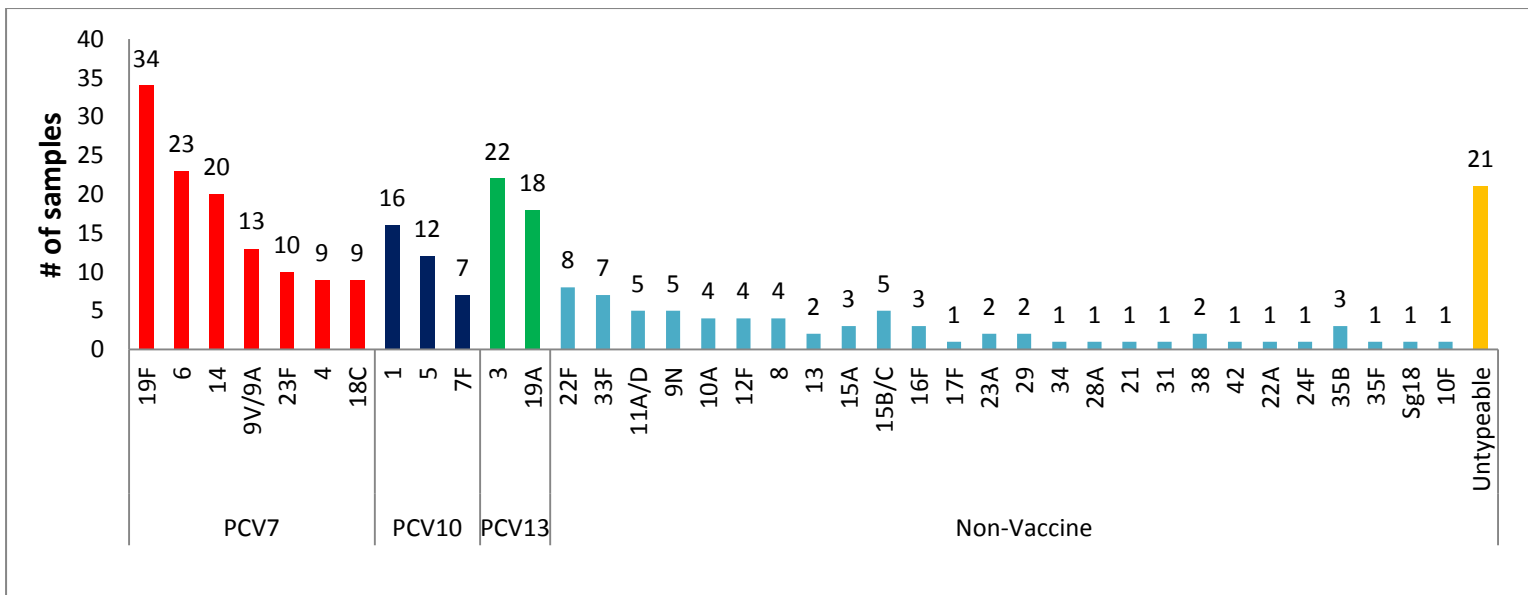


Figure 3: Serotype distribution of IPD cases by vaccine coverage

- When all age-groups were considered together, vaccine coverage was: **41.3%** (n=118) for PCV7, **53.5%** (n=153) for PCV10 and **67.5%** (n=193) for PCV13.
- Vaccine coverage per each age group is represented in *Figure 4*.

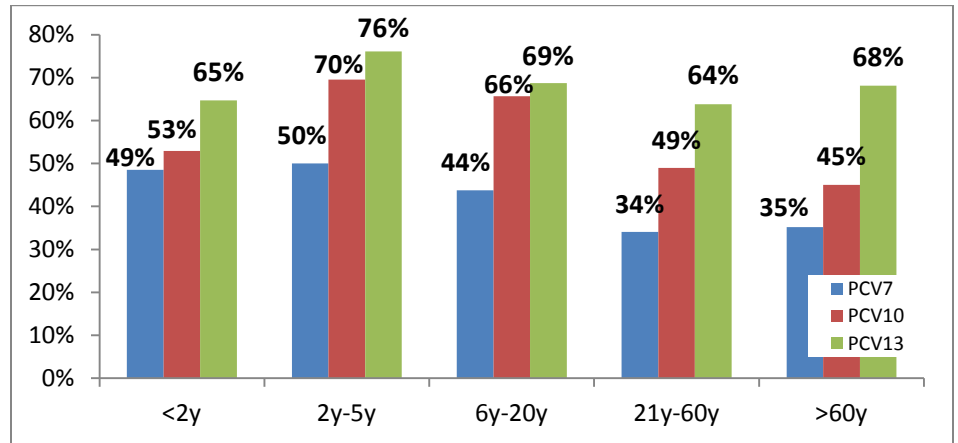


Figure 4: Vaccine coverage by age group

Antimicrobial Susceptibilities

Using the latest CLSI breakpoints which differentiate between meningeal and non-meningeal isolates:

- Susceptibility to Penicillin G was 76.2% (n=218).
- Susceptibility to Ceftriaxone 83.2% (n=238).
- Susceptibility to Erythromycin was 66.1% (n=189).
- Susceptibility was 99.5% to Levofloxacin and 100% to Vancomycin in the tested isolates

Statistics by Age Group

The clinical presentation in each age group is summarized in *Figure 5*.

Susceptibility by age group is described in *Table 1*.

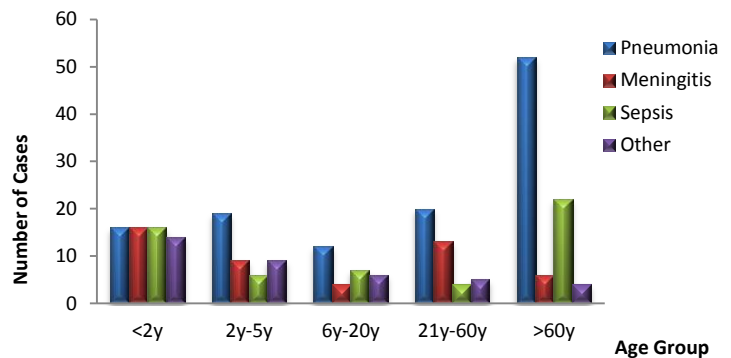


Figure 5: Clinical Presentation by Age Group

Table 1: Susceptibilities by Age Group

Age Group	Penicillin Non-Susceptibility	Ceftriaxone Non-Susceptibility	Erythromycin Resistance
< 2 years	29.1% (16)	18.3% (11)	40.7% (24)
2-5 years	13.2% (5)	12.8% (5)	30.8% (12)
6-20 years	3.4% (1)	3.4% (1)	24.1% (7)
21-60 years	23.7% (9)	12.8% (5)	21.1% (8)
> 60 years	13.4% (11)	13.1% (11)	26.2% (22)

- ✚ The most prevalent invasive serotypes in our study are those found in the commercially available conjugated pneumococcal vaccines. This may be a consequence of the low number of vaccinated children in Lebanon, which in turn emphasizes the importance of implementing the conjugated pneumococcal vaccines in the routine immunization schedule on the national level.
- ✚ The higher rates of antimicrobial resistance described in our study, in comparison to developed countries, are probably due to the unrestricted over-the-counter use of antibiotics in Lebanon, necessitating more control over antibiotic intake.
- ✚ Continuing the current surveillance study would help assess the on-going changes in epidemiology of IPD, serotype prevalence, and antibiotic resistance in Lebanon.

References

1. WHO. *International travel and health; Pneumococcal Disease*. World Health Organization 2012; Available from: <http://www.who.int/ith/diseases/pneumococcal/en/>
2. Albrich WC, Baughman W, Schmotzer B, Farley MM. Changing characteristics of invasive pneumococcal disease in Metropolitan Atlanta, Georgia, after introduction of a 7-valent pneumococcal conjugate vaccine (1997-2004). *Clin Infect Dis* 2007; 44:1569.

Our Future Plans

- ✚ *Streptococcus pneumoniae* is the most prevalent cause of community-acquired pneumonia (CAP) leading to hospitalization.
- ✚ The use of conventional blood cultures for diagnosis may give false negative results (low sensitivity) attributable to the low prevalence of bacteremia in pneumococcal CAP, and to the prior use of antibiotics.
- ✚ We are starting a research protocol using Real Time-Polymerase Chain Reaction molecular diagnostic approach on blood samples taken from patients with symptoms and clinical workup suggestive of community-acquired pneumonia to prospectively assess the sensitivity of Real Time- PCR in detecting CAP and to determine by Multiplex PCR Serotype Deduction the pneumococcal serotypes that are responsible for pneumococcal CAP and are circulating in Lebanon.
- ✚ Data generated from this study will allow us to improve our molecular diagnostic testing and provide in the future a more rapid identification of bacteremic pneumonia, thus enhancing the diagnosis and optimizing the antimicrobial choice.

Thank you

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