



Surveillance of invasive bacterial diseases (*N. meningitidis*, *H. influenzae*, *S. pneumoniae*) and evaluation of vaccine coverage in 7 Italian regions, 2008-2012.

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Ministero della Salute

Introduction

In Italy an enhanced surveillance system for meningitis caused by vaccine preventable disease due to *N. meningitidis*, *Haemophilus influenzae*, *S. pneumoniae* was introduced in 1994 to monitor the incidence of all meningitis and extended to all invasive diseases in 2007. In Italy, *H. Influenzae* conjugate vaccines were introduced in 1995. Since 2001 vaccination strategies have been demanded to the 21 Italian Regions in accordance with National Immunization Plan (NIP); the conjugate vaccines against *S. pneumoniae* and *N. meningitidis* C were introduced by Regions at different time and with different strategies. Since 2012 these conjugates vaccines have been included in the NIP for all the newborns.

The aim of this study was to evaluate the trend of the incidence and vaccine coverage for invasive bacterial disease (IBD) due to *N. meningitidis*, *H. influenzae*, *S. pneumoniae* in seven Italian Regions.

Methods

In Italy, all cases of invasive bacterial disease due to meningococcus, pneumococcus, and *H. influenzae* are routinely reported to the Istituto Superiore di Sanità, as recommended by the Ministry of Health. Epidemiological data are linked with microbiological results from local/regional laboratories and from national reference laboratories located at Istituto Superiore di Sanità. Both information are in a single database that it is used to provide feedback at national and international level. Vaccine coverage data, not available at national level, were provided by the Regional authorities. The analysis was restricted to a sample of 7 regions (Emilia Romagna, Friuli Venezia Giulia, Lombardia, P.A. Bolzano, P.A. Trento, Piemonte, and Veneto), representing 43% of the Italian population, because of some evidences of under-reporting in other Italian regions. Incidence data referred to 2008-2012 study period.

Meningococcus C

	2008	2009	2010	2011	2012
00-04	0.75	0.58	0.17	0.33	0.41
05-09	0.25	0.08	-	0.08	0.08
10-14	0.35	0.17	0.09	-	0.17
15-24	0.66	0.35	0.18	0.13	0.13
25-64	0.14	0.08	0.02	0.02	0.04
>64	0.07	0.02	-	0.04	0.04
TOTAL	0.22	0.12	0.04	0.05	0.07

Meningococcus B

	2008	2009	2010	2011	2012
00-04	1.66	1.91	1.49	1.49	1.08
05-09	0.51	0.34	0.51	0.67	0.25
10-14	0.35	0.69	0.17	0.09	0.09
15-24	0.35	0.88	0.22	0.57	0.22
25-64	0.06	0.09	0.08	0.08	0.05
>64	0.07	0.07	0.02	0.05	0.07
TOTAL	0.20	0.28	0.17	0.21	0.13

Pneumococcus

	2008	2009	2010	2011	2012
00-04	7.10	5.49	5.91	4.43	3.81
05-14	1.03	0.88	0.99	0.76	1.03
15-24	0.63	0.78	0.72	0.68	0.62
25-64	1.52	2.22	2.33	1.45	1.87
>64	5.29	6.12	7.00	6.48	7.58
TOTAL	2.25	2.64	2.89	2.36	2.77

Haemophilus influenzae

	2008	2009	2010	2011	2012
00-04	0.41	0.50	0.83	0.41	0.58
05-09	0.00	0.00	0.00	0.08	0.00
10-14	0.09	0.00	0.00	0.09	0.00
15-24	0.00	0.04	0.09	0.04	0.00
25-64	0.12	0.09	0.18	0.10	0.14
>64	0.40	0.40	0.45	0.33	0.51
TOTAL	0.18	0.16	0.25	0.16	0.22

Table 1: Incidence of Invasive bacterial diseases in all age groups in 7 Italian Regions. 2008-2012 (per 100,000 inhabitants)

Results

- The incidence of invasive disease due to meningococcus C for all age groups declined from 0.22 in 2008 to 0.07 per 100,000 in 2012. A similar decline was observed in 0-4 age group (from 0.7 per 100,000 in 2008 to 0.4 in 2012). Meningococcus B disease incidence varied in the study period; in particular, with regard to the age group 0-4, the incidence was 1.7, 1.91, and 1.08 per 100,000 in 2008, 2009, 2012, respectively. The average Meningococcal C coverage in the Regions under study was estimated around 72% at the 24th month for cohort 2009.
- The incidence of pneumococcal invasive disease, in the age group 0-4, declined from 7.1 per 100,000 in 2008 to 3.8 in 2012. In the age group > 64 years the incidence seems to be increasing. This might be due to a higher propensity to report pneumococcal invasive diseases in this age group in the last years.
- The incidence of invasive disease due to *H. influenzae* remained stably low; the incidence in all age groups was 0.18 per 100,000 in 2008 and 0.22 in 2012. A decrease in the cases due to the serotype b (from 17% to 10%) has been observed while the proportion of non-capsulated types increased from 70% to 75%.

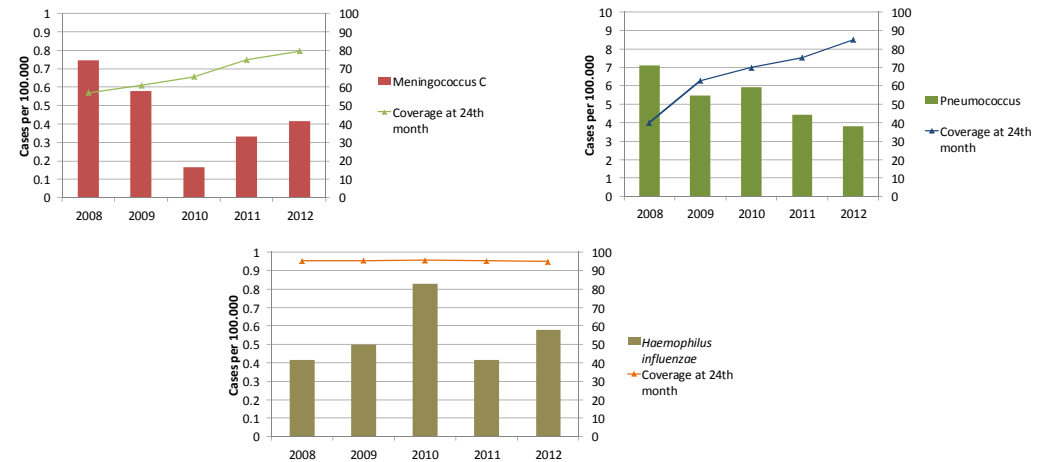


Figure 1: Incidence of Invasive bacterial diseases in 0-4 and vaccination coverage at 24th month. in seven Italian Regions. 2008-2012 (per 100,000 inhabitants)

Conclusion

- There is evidence that, in Italy, IBD incidence slightly declined in specific age groups targeted by immunization programme. A bigger impact is forecasted in the next two years due to an increase in vaccine coverage against meningococcus and pneumococcus.
- Serogroup C meningococci declines significantly in the 0-4 age group.
- For pneumococcus we observed a decrease of cases among children target of vaccination.
- The *H. influenzae* type b decrease appears to be associated with the universal vaccination program against this serotype whose coverage is as high as 95% because the use of hexavalent vaccine in Italy
- Improvement of the surveillance is needed to monitor the impact and the effectiveness of available and future vaccination strategies.