

# SURVEILLANCE OF INVASIVE PNEUMOCOCCAL DISEASE IN THE CZECH REPUBLIC



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## Objectives

Pneumococcal disease has been in the focus of interest worldwide since the pneumococcal conjugate vaccine (PCV) became available. The international organizations such as the World Health Organisation, European Centre for Disease Control and Pneumococcal Awareness Council of Experts (PACE) motivate the countries to implement a nationwide surveillance programme for invasive pneumococcal disease (IPD) and to include PCV into the

national immunization programme (NIP) for infants. In the Czech Republic, PCV has been available since 2001 when the 7-valent vaccine (PCV-7) was registered, followed by the 10-valent vaccine (PCV-10) and 13-valent vaccine (PCV-13) in 2009. PCV will be included into the Czech NIP for infants in 2010. The aim of this project was to obtain information about the pre-vaccination IPD incidence and serotype distribution.

## Conclusions

- The incidence of IPD in the Czech Republic was comparable to the pre-vaccination data reported in other European countries.
- Active surveillance of IPD consistent with the European IPD surveillance has been implemented in the Czech Republic since 2008.
- Pneumococcal conjugate vaccine was included into the Czech national immunization programme for infants in January 2010.
- The IPD surveillance programme will continue to assess the efficacy of the nationwide immunization of infants with pneumococcal conjugate vaccine.

## Methods

A laboratory-based IPD surveillance programme was carried out in 2000 – 2006 and a pilot enhanced IPD surveillance programme followed in 2007. A nationwide IPD surveillance programme was implemented in January 2008. An IPD case was defined by the isolation of *S. pneumoniae* from blood, cerebrospinal fluid, or other normally sterile sites. Each isolate was identified by standard methods and *S. pneumoniae* isolates were serotyped by the Quellung reaction using serotype-specific antisera. In addition, 81 isolates of *S. pneumoniae* causing IPD in 2008 were characterized by multilocus sequence typing (MLST) (<http://spneumoniae.mlst.net/>).

## Results

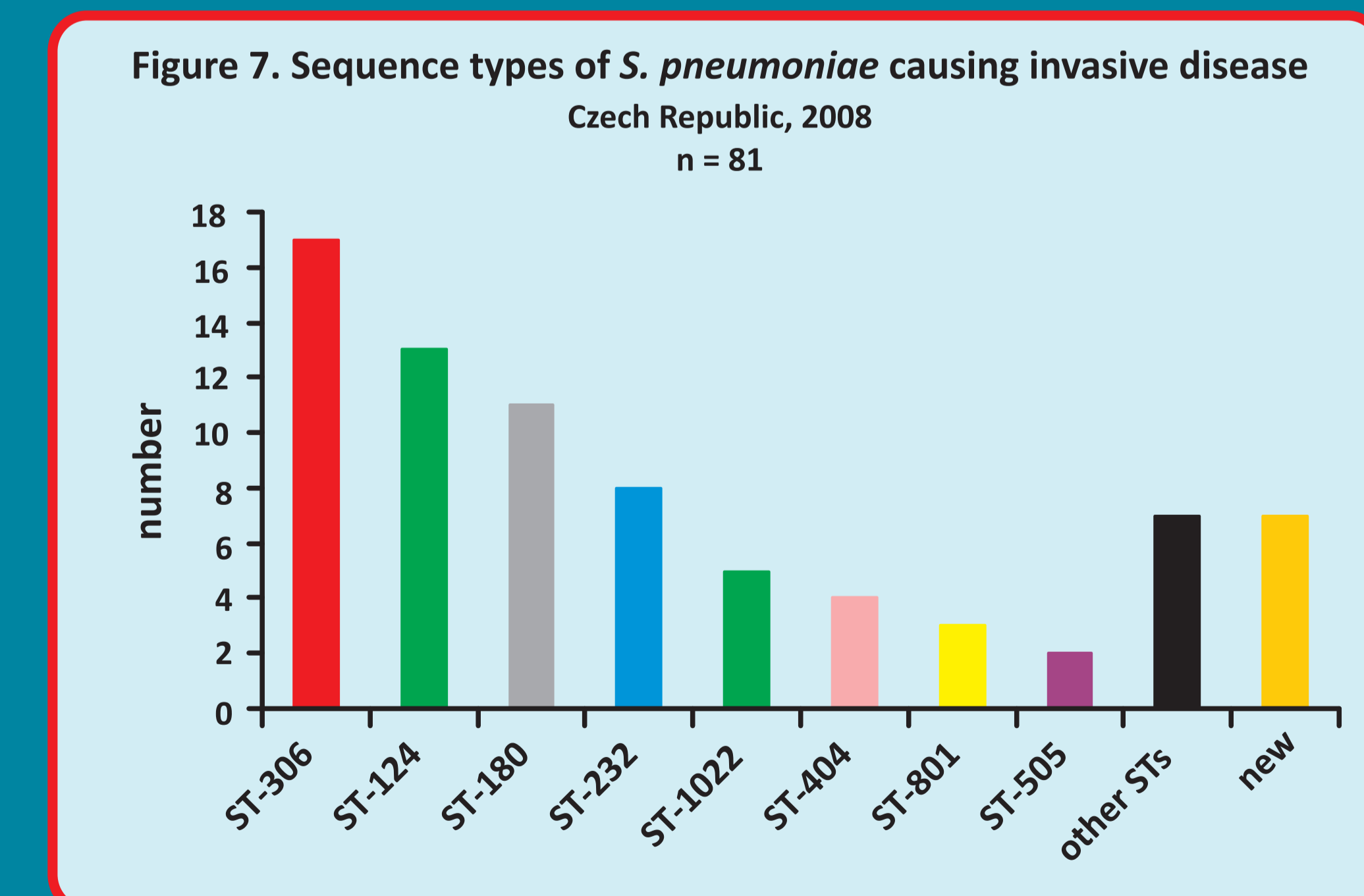
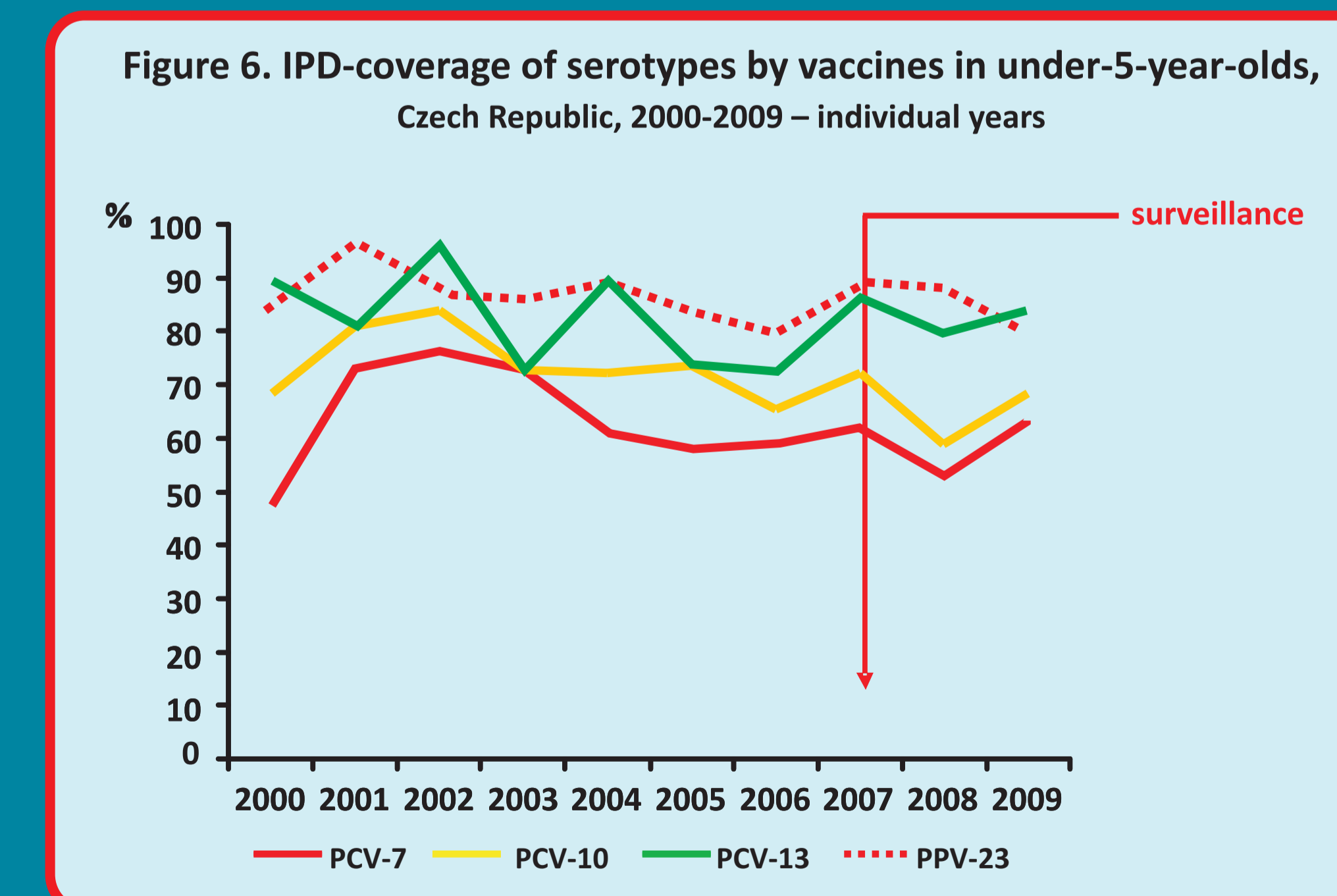
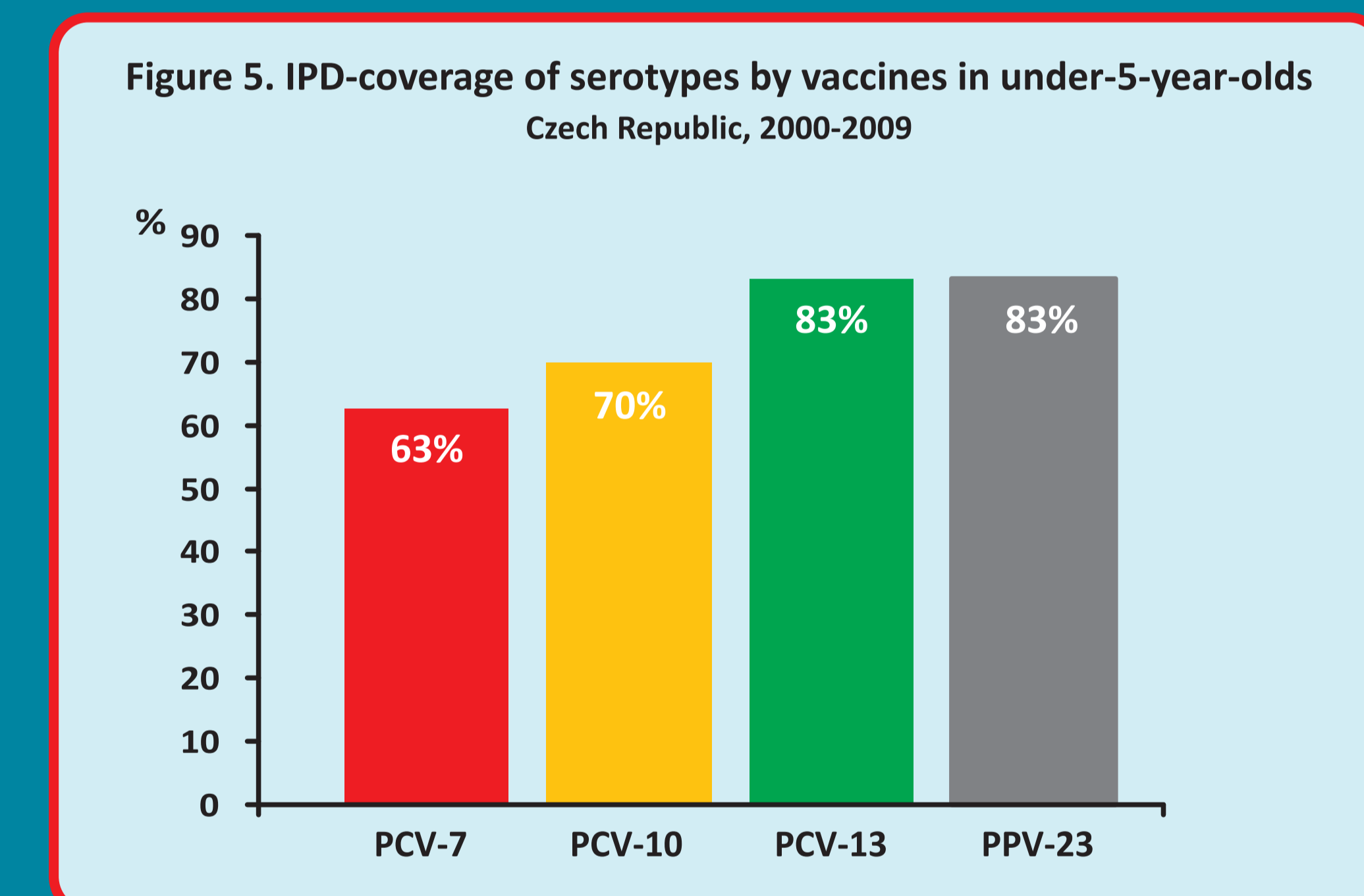
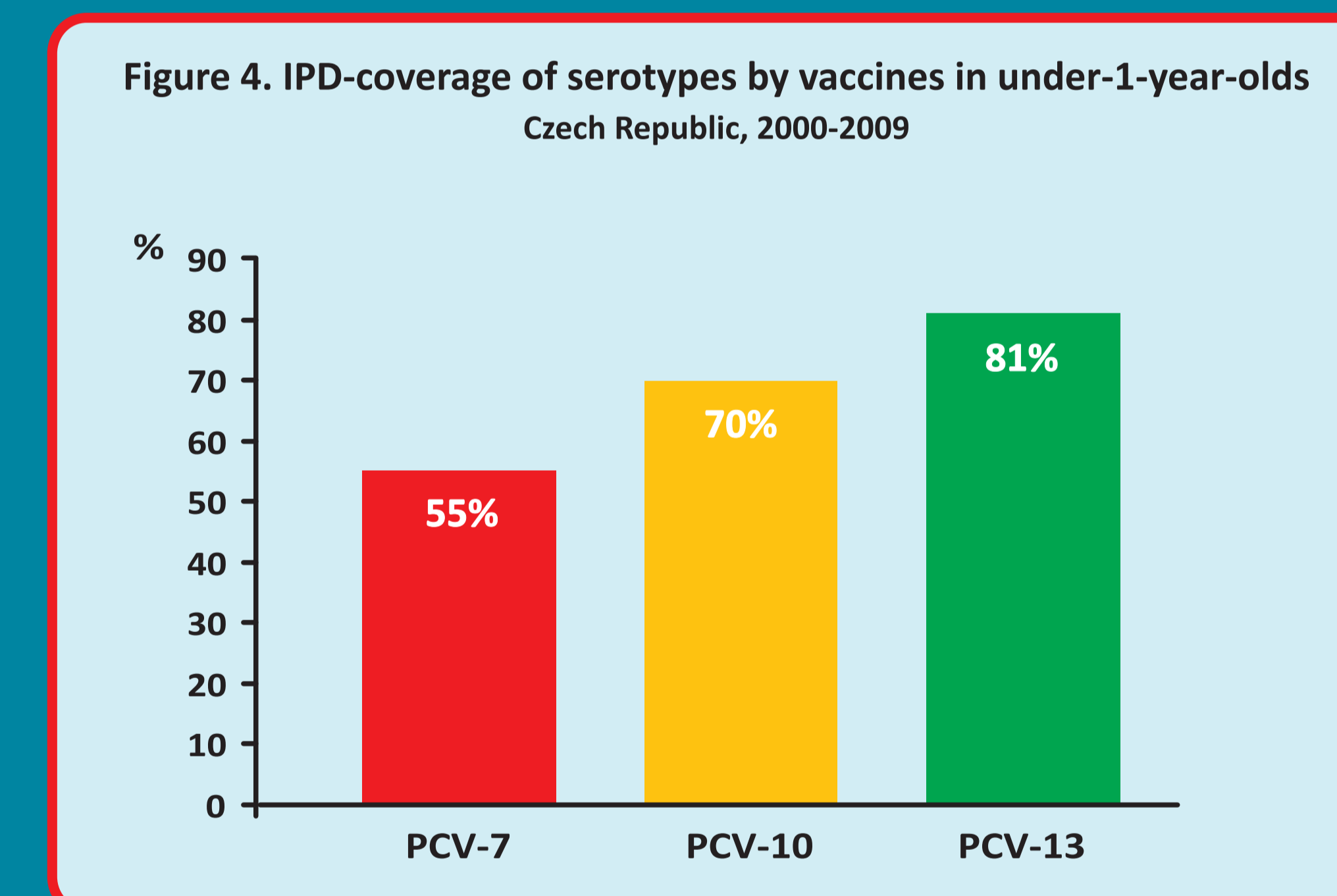
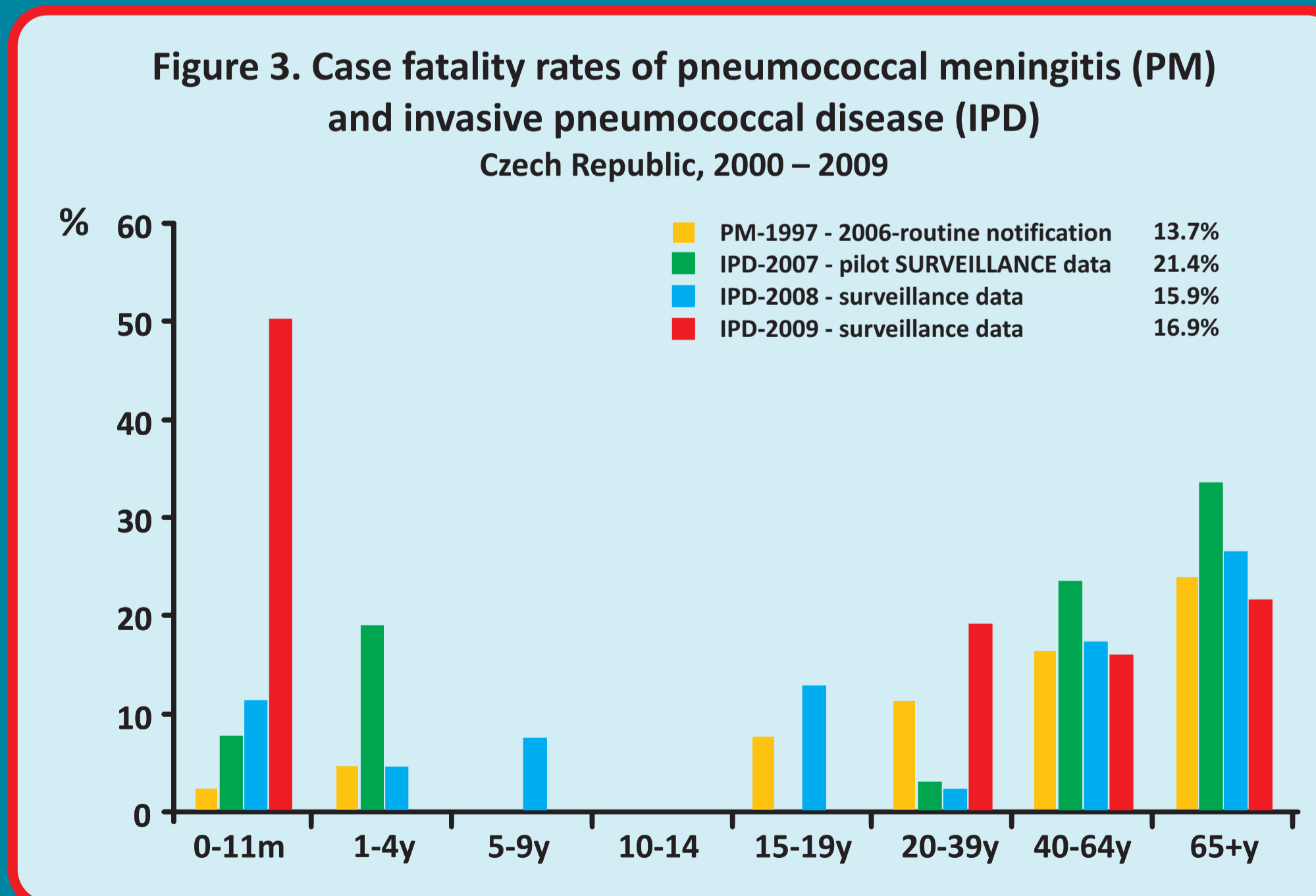
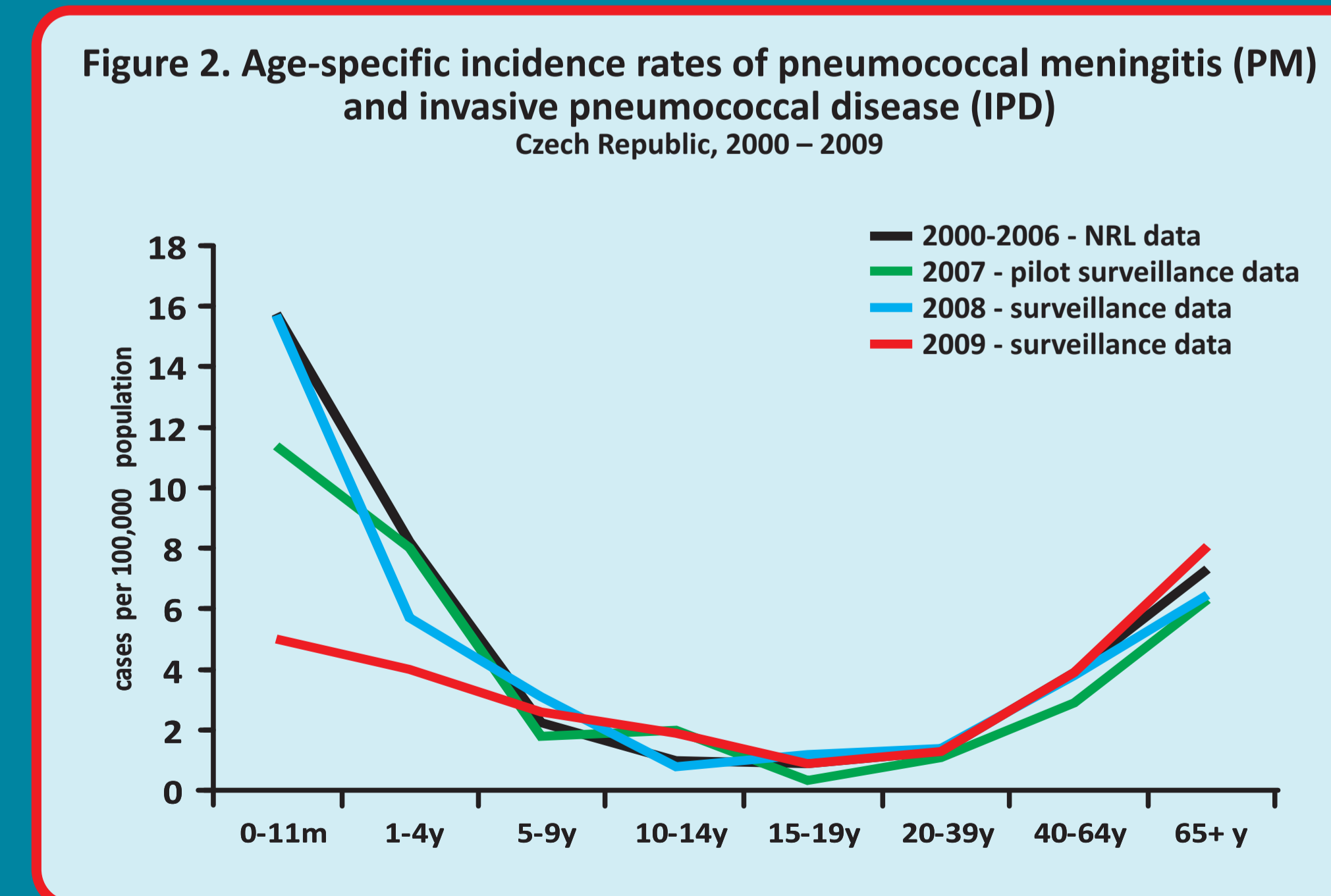
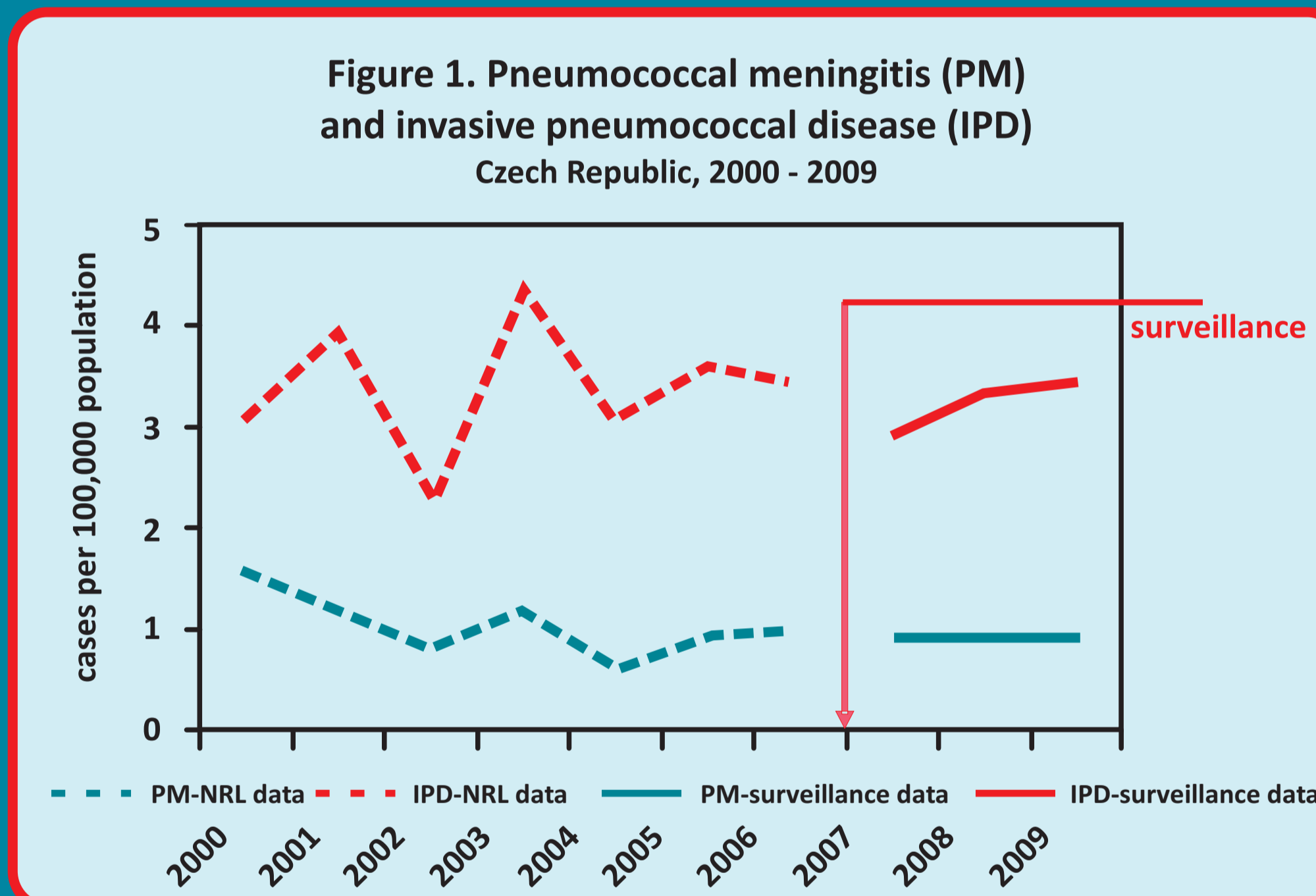
Based on the laboratory surveillance data, the IPD incidence rates varied from 2.3 to 4.3 per 100 000 population between 2000 and 2006. Based on the enhanced surveillance data, the incidence rates were 2.9 in 2007, 3.3 in 2008 and 3.4 in 2009 – **Table 1** and **Figure 1**. The age-specific IPD incidence rate was the highest in the <1 year-olds, reaching 15.7 per 100 000 according to the laboratory-based surveillance data and 16.6 per 100 000 according to the enhanced surveillance data – **Figure 2**. The age-specific case fatality rates were the highest in the youngest and oldest age groups – **Figure 3**.

In the period 2000-2008, the coverage by PCV-7 was 60 % in the under-1-year-olds and 62 % in the under-5-year-olds, the coverage by PCV-10 was 71 % in both age categories and the coverage by PCV-13 was 79 % and 82 %, respectively – **Figures 4 - 6**. The most frequent sequence type was ST-306, followed by ST-124 and ST-180 – **Figure 7**.

**Table 1. Invasive pneumococcal disease**  
Cases per 100,000 population, Czech Republic, 1997 – 2009

year	routin notification		NR data		surveillance	
	PM	IPD	PM	IPD	PM	IPD
1997	0.6	-	-	-	-	-
1998	0.4	-	-	-	-	-
1999	0.4	-	-	-	-	-
2000	0.6	-	1.6	3.1	-	-
2001	0.6	-	1.2	3.9	-	-
2002	0.6	-	0.8	2.3	-	-
2003	0.6	-	1.2	4.3	-	-
2004	0.5	-	0.6	3.1	-	-
2005	0.5	-	0.9	3.6	-	-
2006	0.6	-	1.0	3.4	-	-
2007	-	-	-	-	0.9	2.9
2008	-	-	-	-	0.9	3.3
2009	-	-	-	-	0.9	3.4

PM = pneumococcal meningitis IPD = invasive pneumococcal disease



Reference: Motlova J, Benes C, Kriz P.: Incidence of invasive pneumococcal disease in the Czech Republic and serotype coverage by vaccines, 1997-2006. *Epidemiol Infect.* 2009;137(4):562-9.

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