Dopad očkovania pneumokokovými konjugovanými vakcínami na populáciu - celosvetový prehľad

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Vysoké Tatry, 11. 10. 2012

- **Infekcie vyvolané baktériou *Streptococcus pneumoniae* sú hlavnou príčinou morbidity a mortality na celom svete.[1]**

- **Pneumokokové ochorenia zabíjajú ročne 1,6 milióna ľudí - vrátane 800 000 detí vo veku menej ako 5 rokov. Sú celosvetovo najčastejšou príčinou úmrtí, ktorým môžeme predchádzať vakcináciou.[2]**

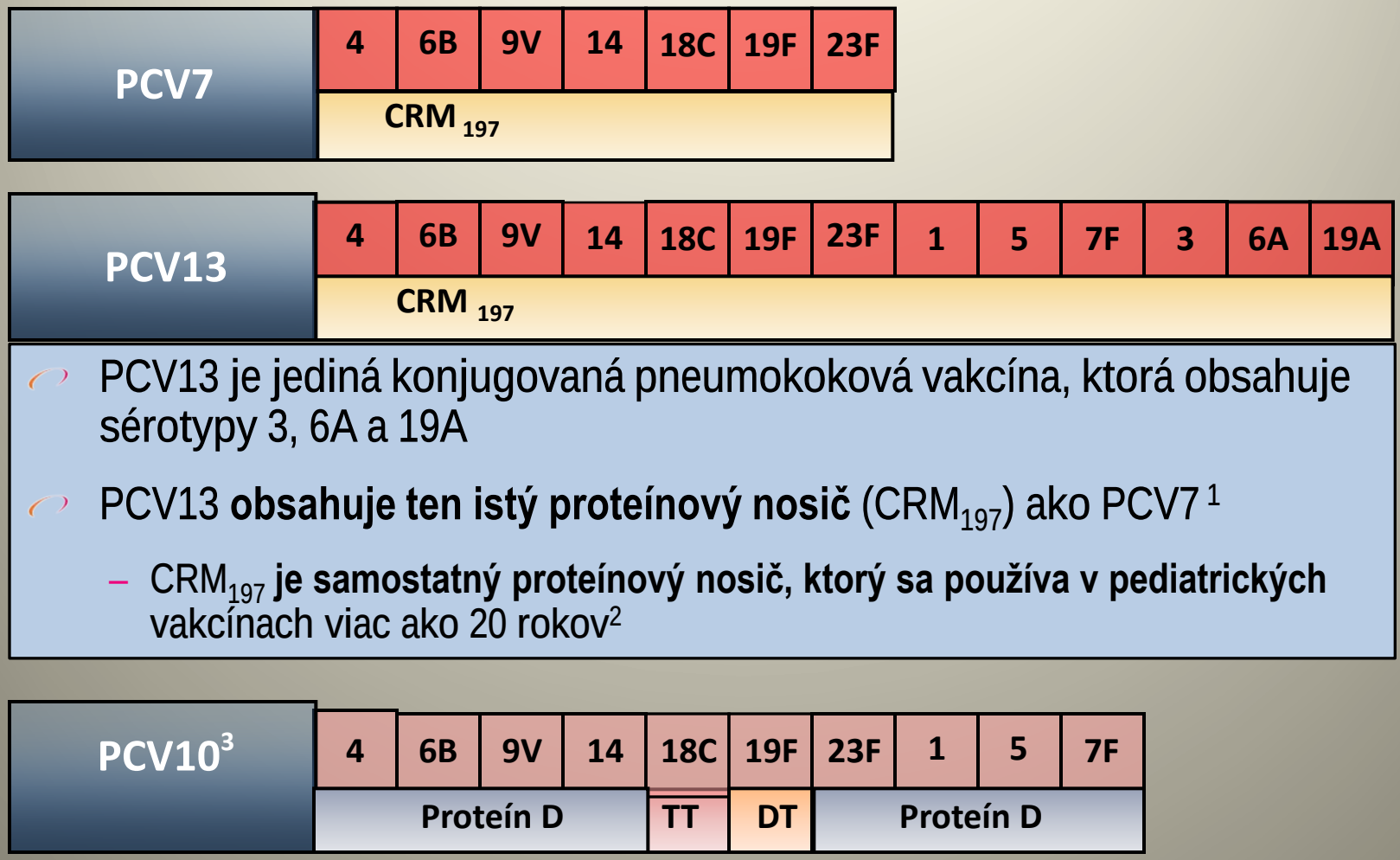
- **Jedným z najdôležitejších rizikových faktorov vzniku pneumokokových ochorení je vek. Najohrozenejšie sú deti mladšie ako 5 rokov a starší dospelí.[3]**

[1] World Health Organization. Fact Sheet N331 October 2011 Accessed April 5, 2012 from http://www.who.int/mediacentre/factsheets/fs331/en/index.html

[2]Sabine Pneumococcal Awareness Council of Experts (PACE) Call to Action. Accessed May 2, 2012 from http://www.sabin.org/advocacy-education/pace/call-to-action

[3] Centers for Disease Control and Prevention. Preventing PD among infants and young children: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *Morb Mortal Wkly Rep* 2000;49:1-35

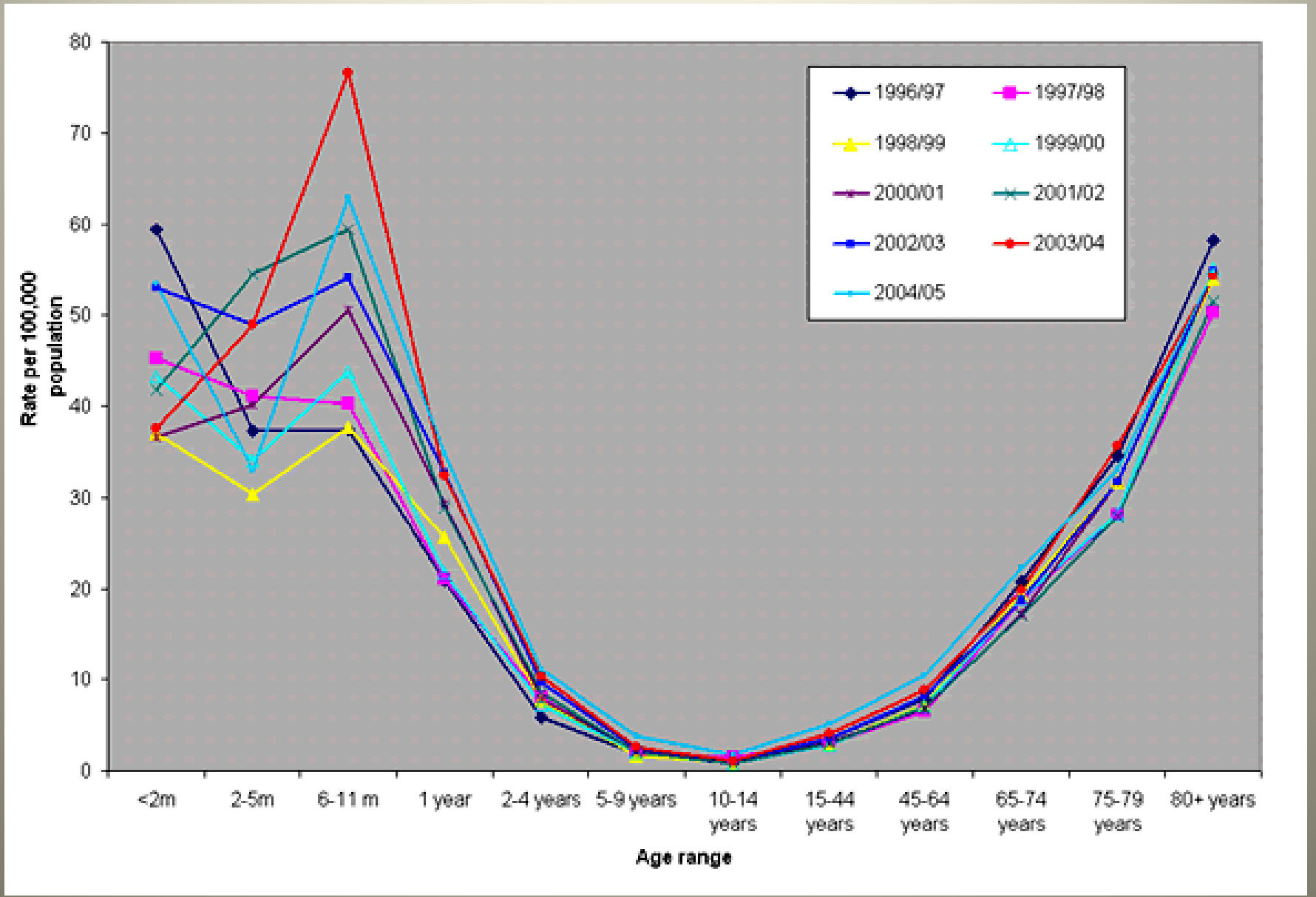
PCV13 stavia na vedeckých základoch PCV7



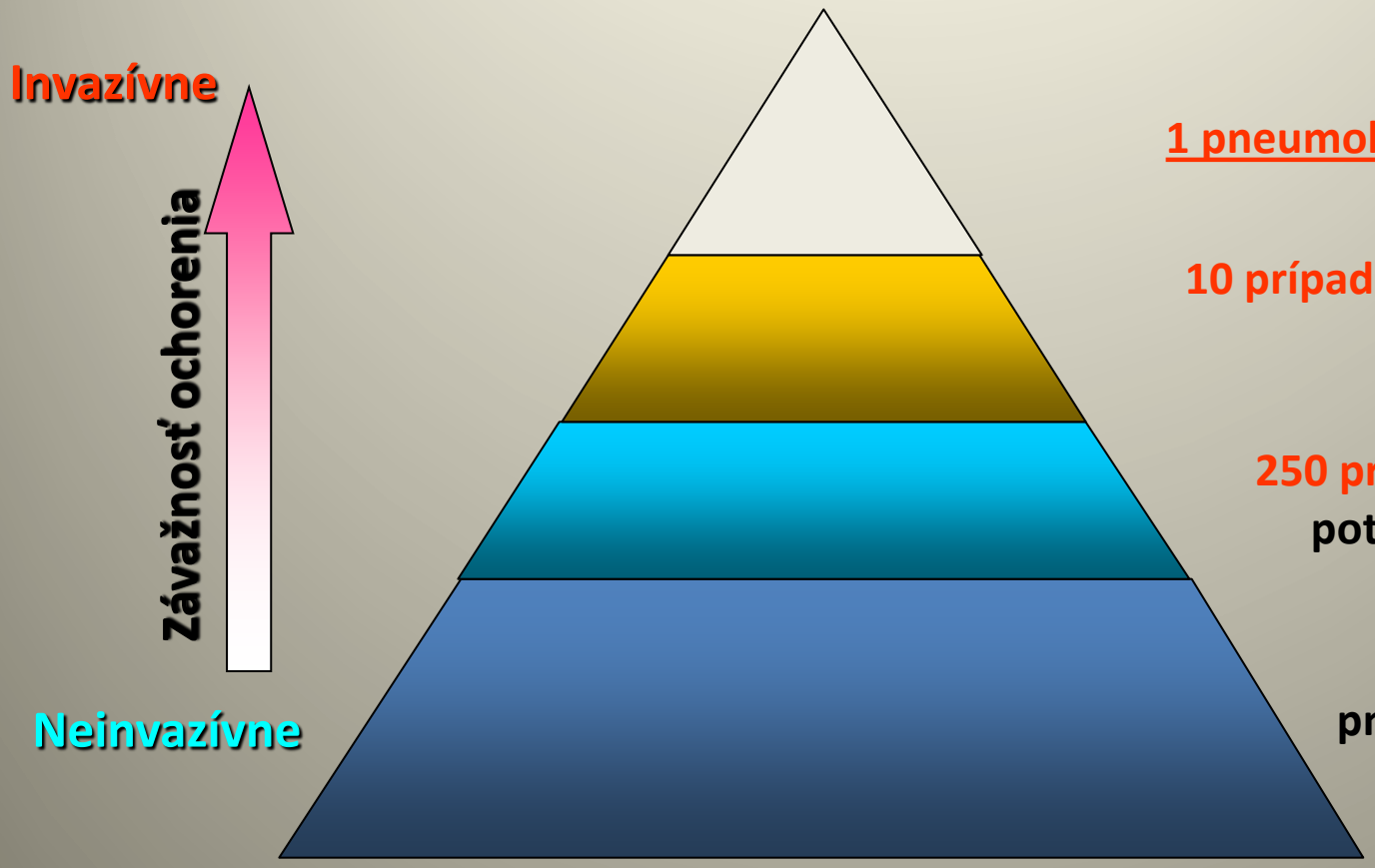
- PCV13 je jediná konjugovaná pneumokoková vakcína, ktorá obsahuje sérotypy 3, 6A a 19A
- PCV13 **obsahuje ten istý proteínový nosič** (CRM_{197}) ako PCV7 [1]
  - CRM_{197} **je samostatný proteínový nosič, ktorý sa používa v pediatrických** vakcínach viac ako 20 rokov[2]

1. Prevenar 13. Súhrn charakteristických vlastností lieku, Pfizer, 2011
2. CDC. *MMWR Morb Mortal Wkly Rep.* 1988;37:13-16.
3. Vesikari T, Wysocki J, Chevallier B, et al. Immunogenicity of the 10-valent pneumococcal nontypeable *Haem ophilus influenzae Protein D conjugate* vaccine (PHiD-CV) compared to the licensed 7vCRM vaccine. *Pediatr Infect Dis J. 2009;28:S66 –S76*

INCIDENCIA IPD - VEK, Anglicko a Wales



Pneumokoková pyramída
záťaž chorobou v detskom veku



Na každý prípad

1 pneumokokovej meningitídy pripadá približne:

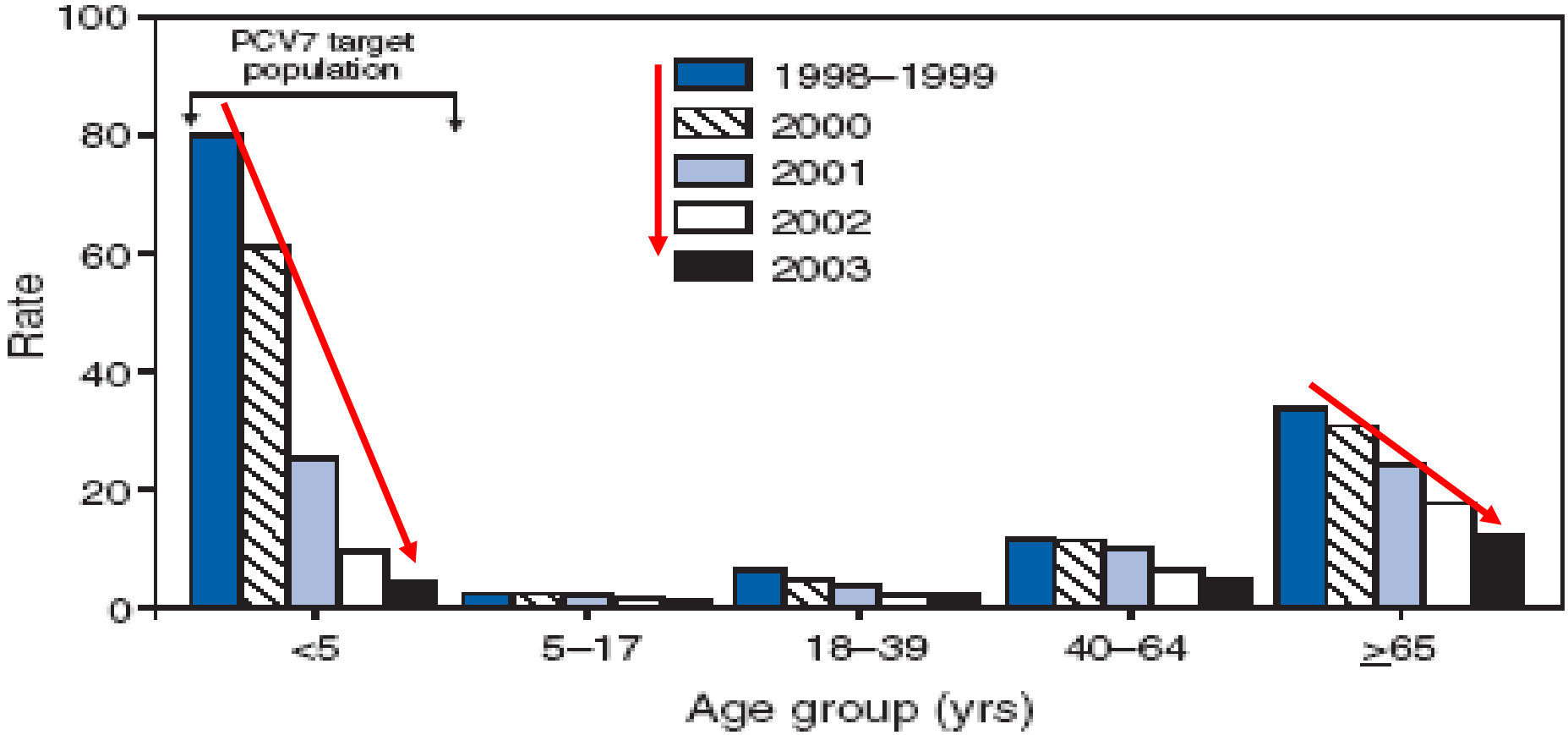
10 prípadov pneumokokovej bakterémie

250 prípadov rádiologicky potvrdenej pneumónie

3 500 prípadov pneumokokovej otitis media

Adapted from: Abramson JS, et al. Pediatrics 2000;106(2):362-6

FIGURE 1. Rate* of vaccine-type (VT) invasive pneumococcal disease (IPD) before and after introduction of pneumococcal conjugate vaccine (PCV7), by age group and year — Active Bacterial Core surveillance, United States, 1998–2003



* Per 100,000 population.
† For each age group, the decrease in VT IPD rate for 2003 compared with the 1998–1999 baseline is statistically significant ($p<0.05$).

IPD

PCV7

Reduction of PCV7-IPD in children <2 years

GER

3 + 1

Introduced 2006

Reported cases of PCV7 serotype IPD in children

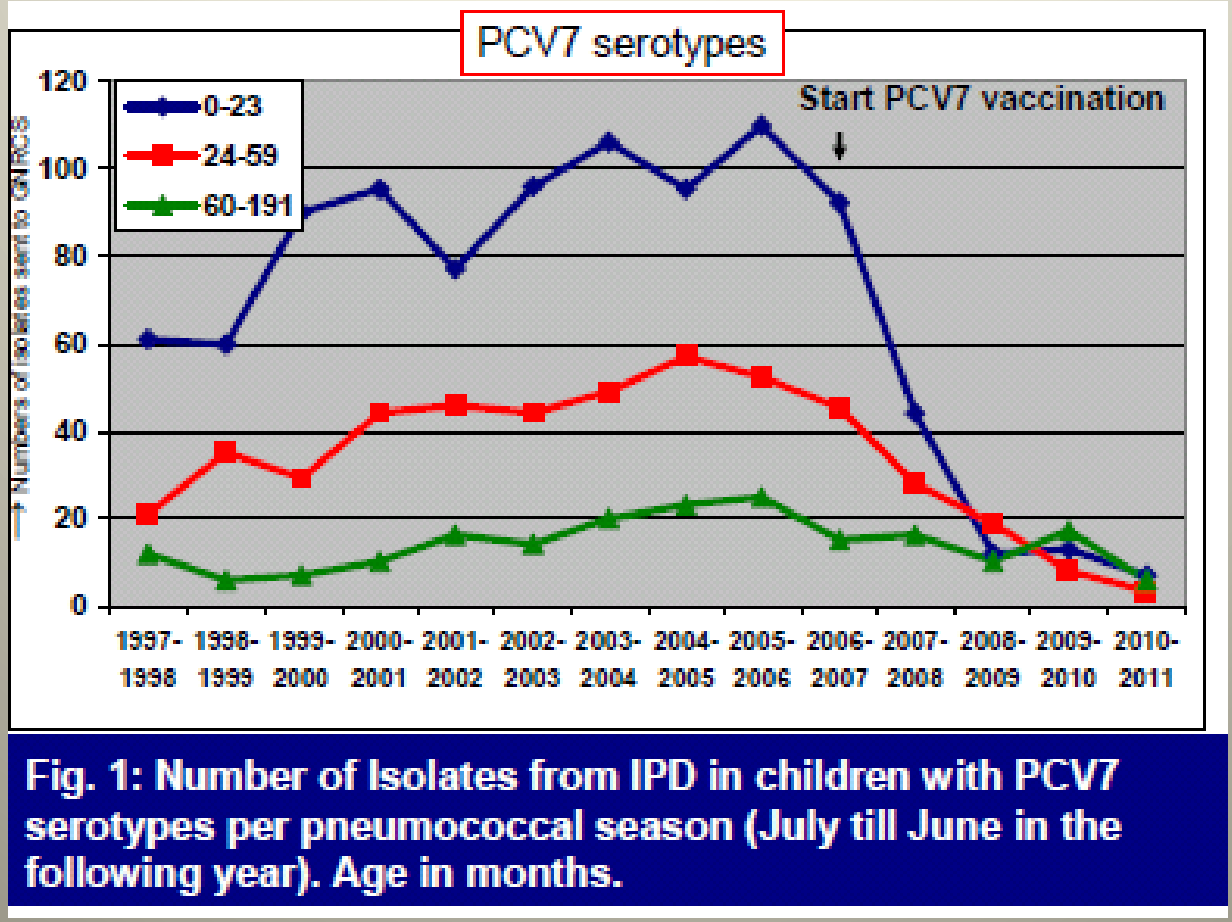


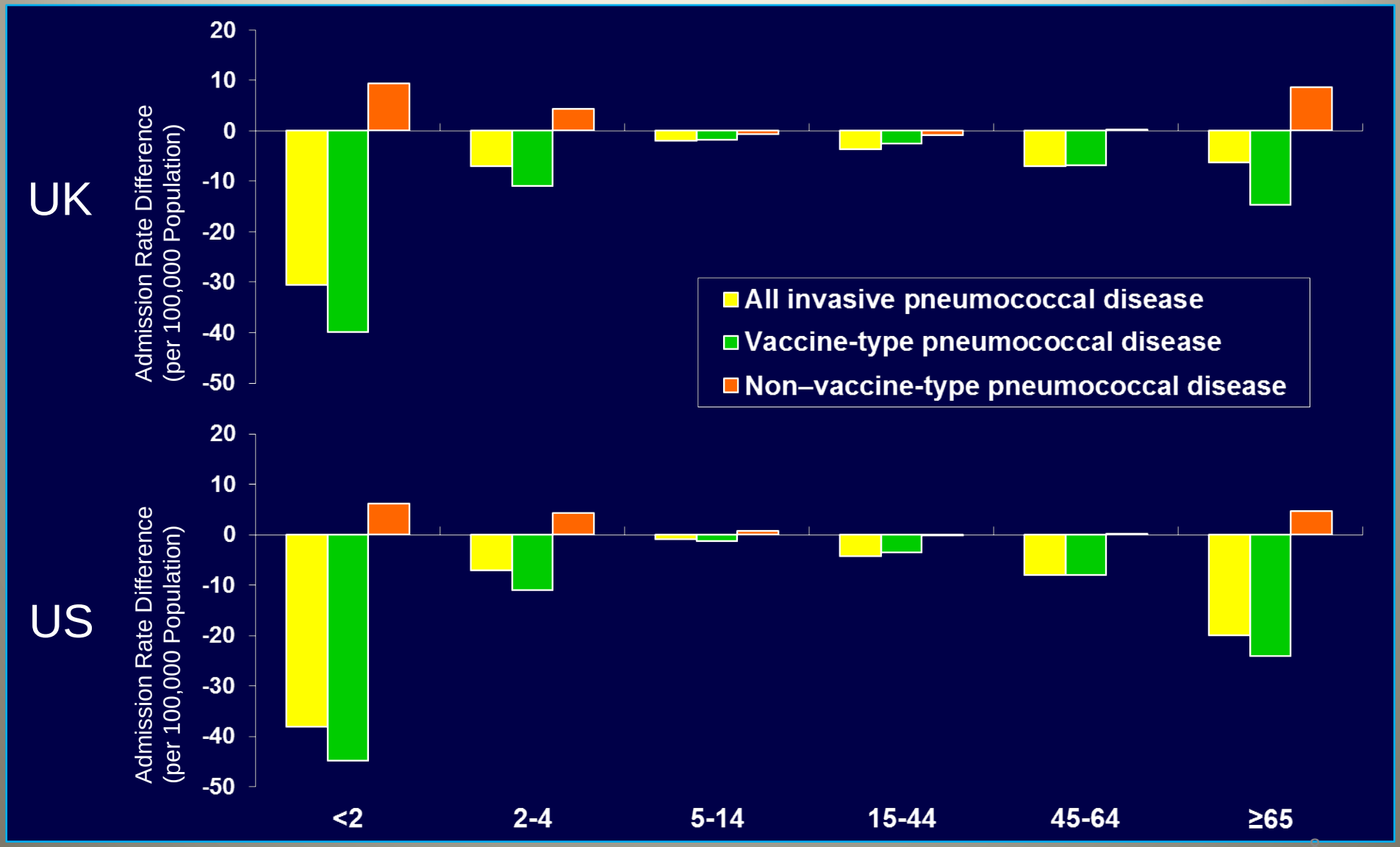
Fig. 1: Number of Isolates from IPD in children with PCV7 serotypes per pneumococcal season (July till June in the following year). Age in months.

Reduction of PCV7-IPD observed in vaccine-eligible age group

National observational study. Data taken from the German National Reference Center for Streptococci (GNRCS) from children <16 years of age with confirmed IPD between 1997 and 2009. Surveillance was passive and taken from diagnostic laboratories located nationwide.

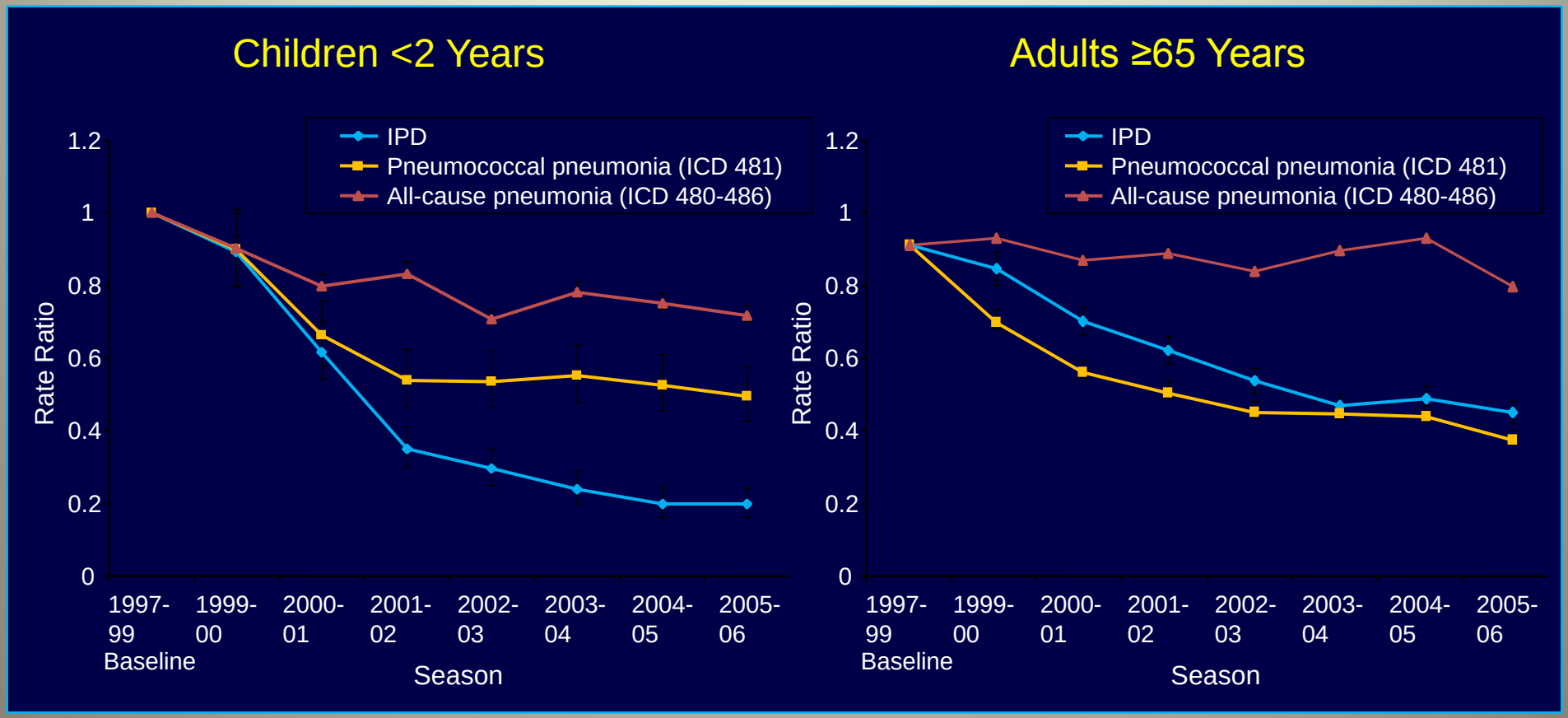
Van der Linden M *et al.* ICAAC Annual Meeting 2011. Presentation #G1-886.

Absolute Rate Changes in IPD at 4 Years Post PCV Introduction



Grijalva CG, et al. *Lancet Infect Dis.* 2011;11:724-726.

Observational Study of PCV7 Impact on IPD and Pneumococcal Pneumonia (US)



Simonsen L, et al. *MBio*. 2011;2:e00309-e00310.

NPC

PCV7

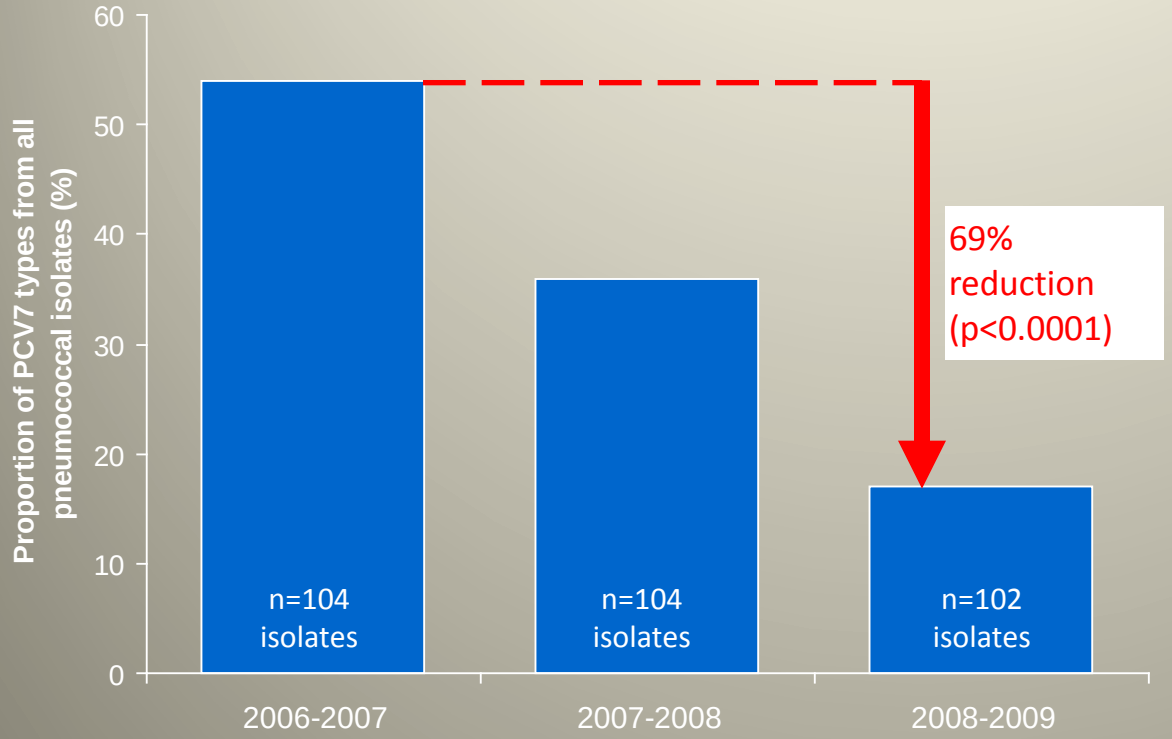
UK

2 + 1

NIP in 2006

Significant reduction of PCV7 serotype carriage in children <4 years

PCV7-type carriage rate in children <4 years (2006–2009)



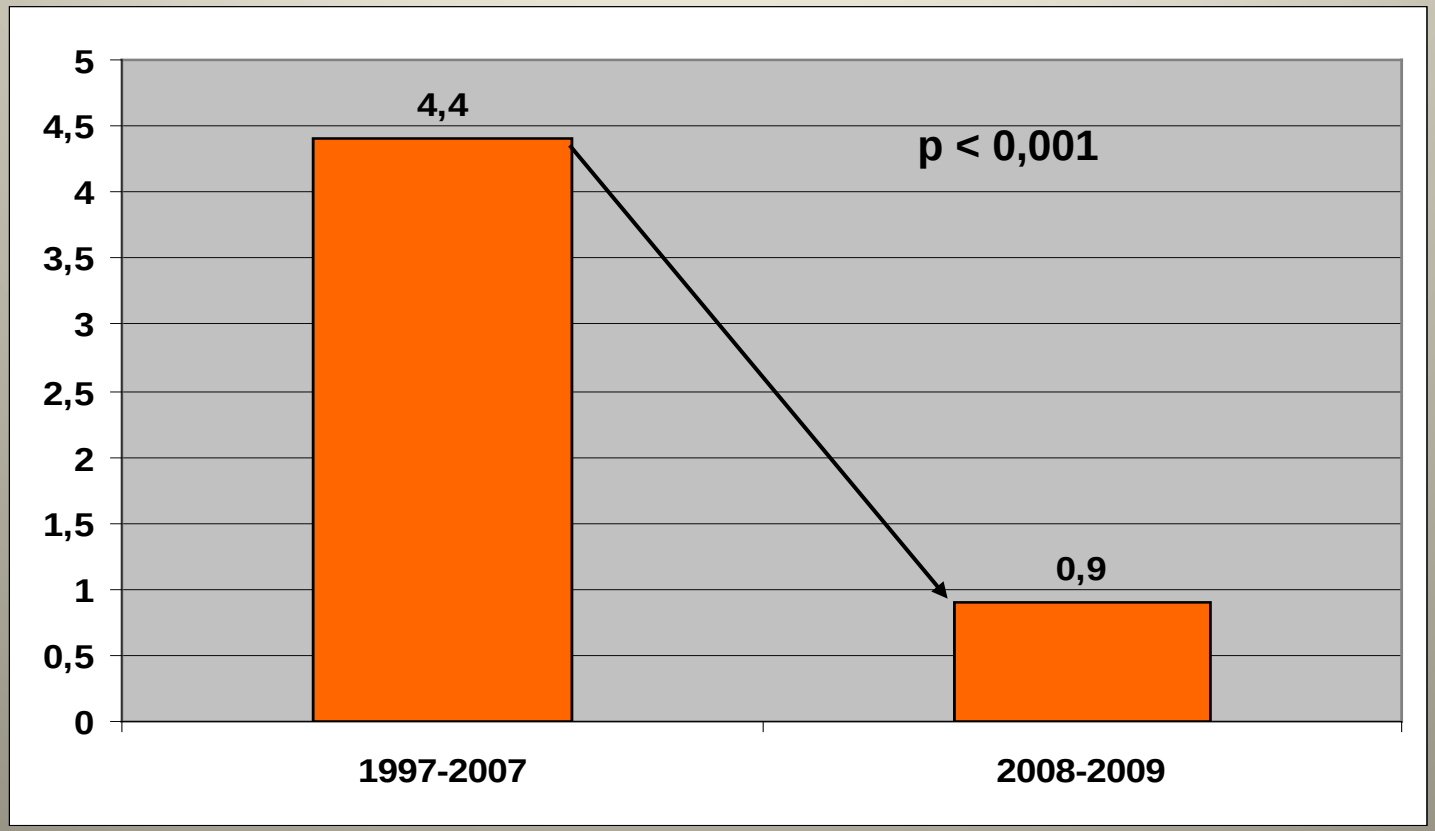
Adapted from Tocheva AS *et al.* 2011

- 69% reduction of PCV7-type carriage 3 years after introduction of universal vaccination with PCV7
- Increase of non-vaccine type carriage also observed
- Overall NPC remained unchanged

The study is part of an ongoing population-based cross-sectional analysis of NP pneumococcal carriage PCVs amongst children aged four years and under conducted at pediatric outpatients' clinics of a large teaching hospital in Southern England. Samples were collected between October and February in winters 2006/07, 2007/08 and 2008/09 taking advantage of the higher incidence of pneumococcal infections in winter

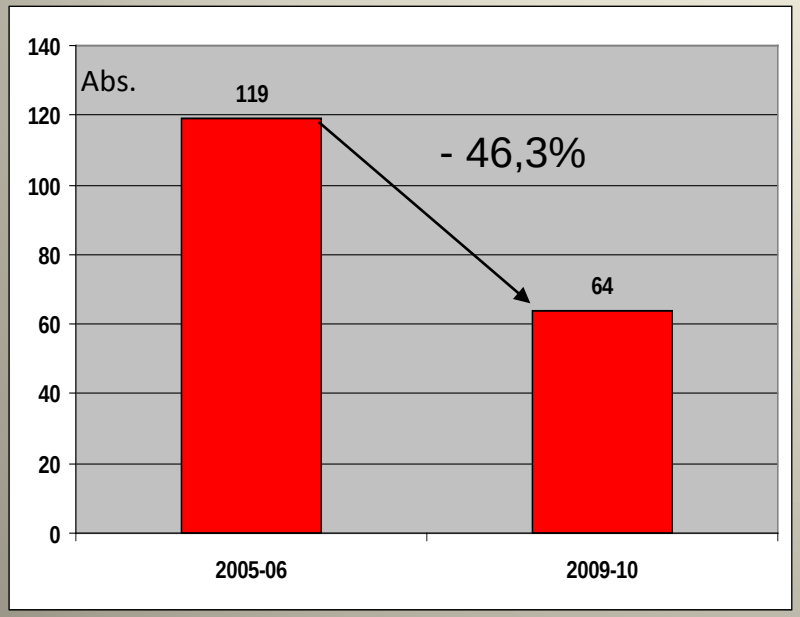
Tocheva AS *et al. Vaccine* 2011; 29: 4400–4.

CHOROBNOSŤ IPD (MENINGITIS & SEPSA)
PRED A PO PCV7 VAKCINÁCII
VEK : 0-roční, chorobnosť/100 000

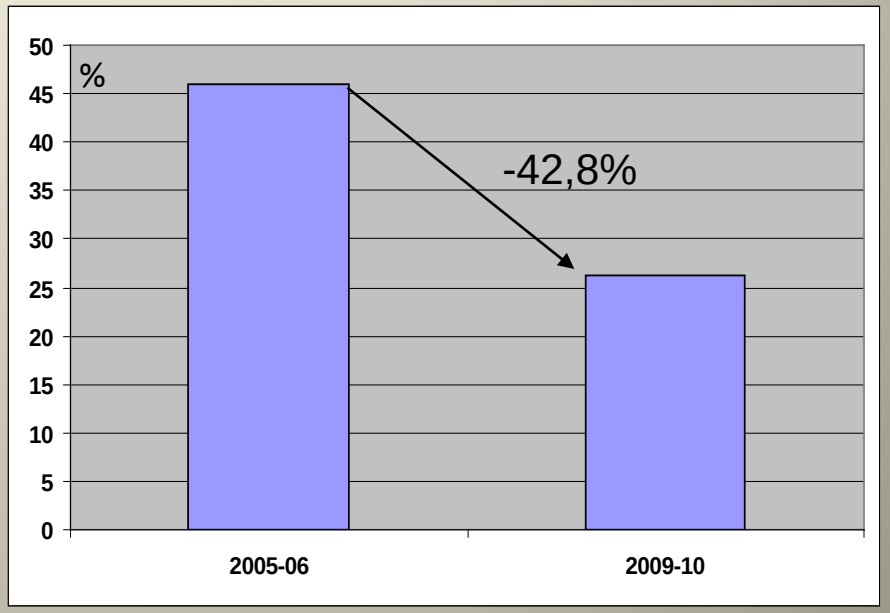


Zdroj: EPIS SR
M. Avdičová: Pediatria pre prax, Suppl. 2010

AKÚTNA OTITIS MEDIA PRED A PO ZAVEDENÍ PCV7
ORL klin. DFNsP BRATISLAVA



POČET AMBULANTNE LIEČENÝCH AOM U DETÍ DO DVOCH ROKOV



PERCENTO HOSPITALIZOVANÝCH DETÍ S AOM DO DVOCH ROKOV

J.Jakubíková, M. Mačaj: Pediatria pre prax Suppl. 2010

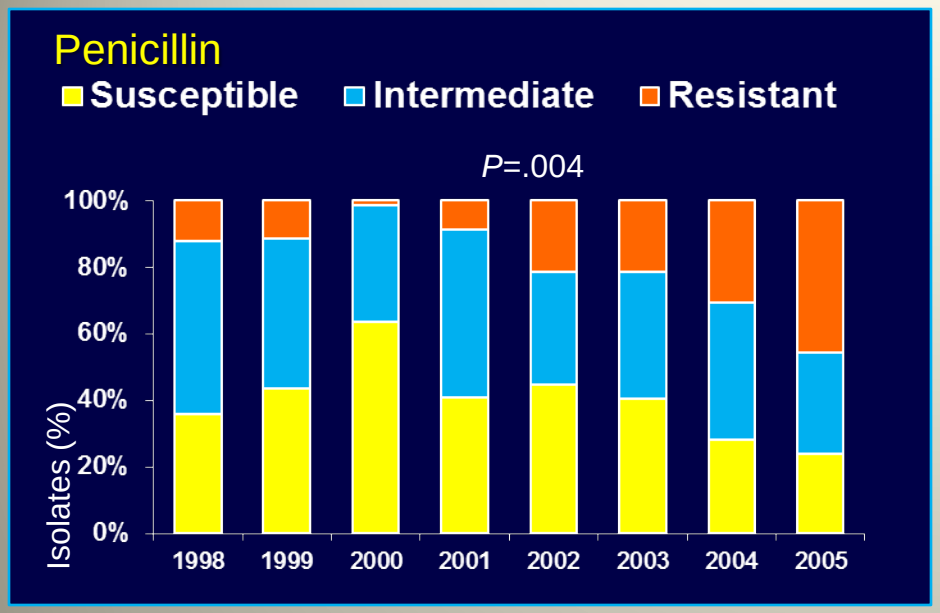
BoD

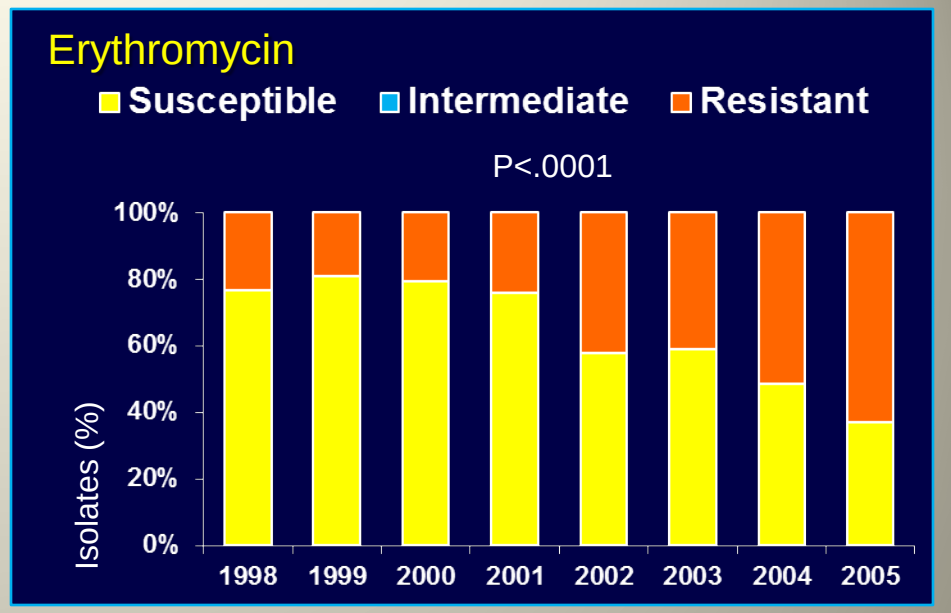
The additional 6 serotypes contained in PCV13 represent a marked clinical burden

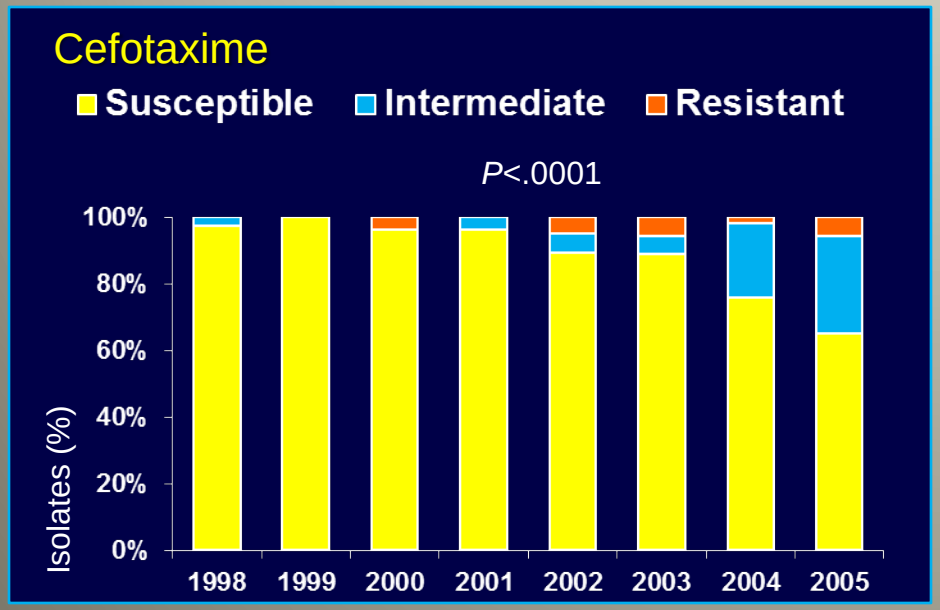
Serotype 1	Associated with AOM[1] and parapneumonic empyema[2,3]
Serotype 3	Associated with AOM[1] and parapneumonic empyema[2]
Serotype 5	Associated with AOM and IPD[1]
Serotype 6A	A leading serotype in NP carriage[4] **Multi-drug resistant[5]**
Serotype 7F	Associated with high case-fatality rate[6]
Serotype 19A	A leading serotype in AOM, [7,8] IPD[6] and parapneumonic empyema[2] **Multi-drug resistant[5]**

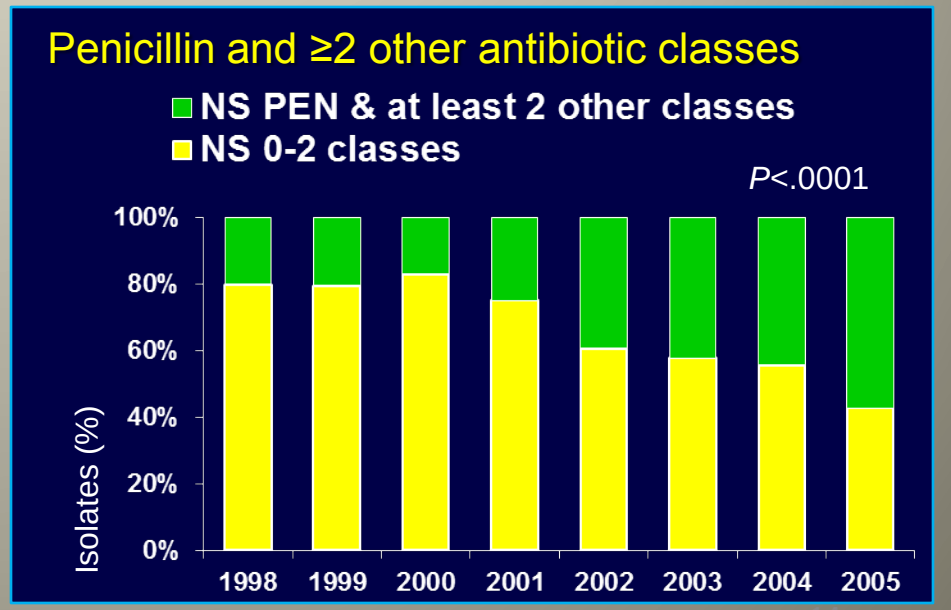
1. Shouval DS *et al. Pediatr Infect Dis J* 2006; 25(7): 602–7.
2. Le Monnier A *et al. Clin Infect Dis* 2006; 42: 1135–40.
3. Byington CL *et al. Pediatr Infect Dis* 2006; 25(3): 250–4.
4. Calbo E *et al. Clin Microbiol Infect Dis* 2006; 12: 867–72.
5. EARSS Annual Report, 2008. Accessed November 2011.
6. Ruckinger S *et al. Pediatr Infect Dis J* 2009; 28: 118–22.
7. Syriopoulou V *et al*. ESPID Annual Meeting 2010. Poster #420.
8. Dagan R *et al. J Infect Dis* 2009; 199: 776–85.

Sérotyp 19A







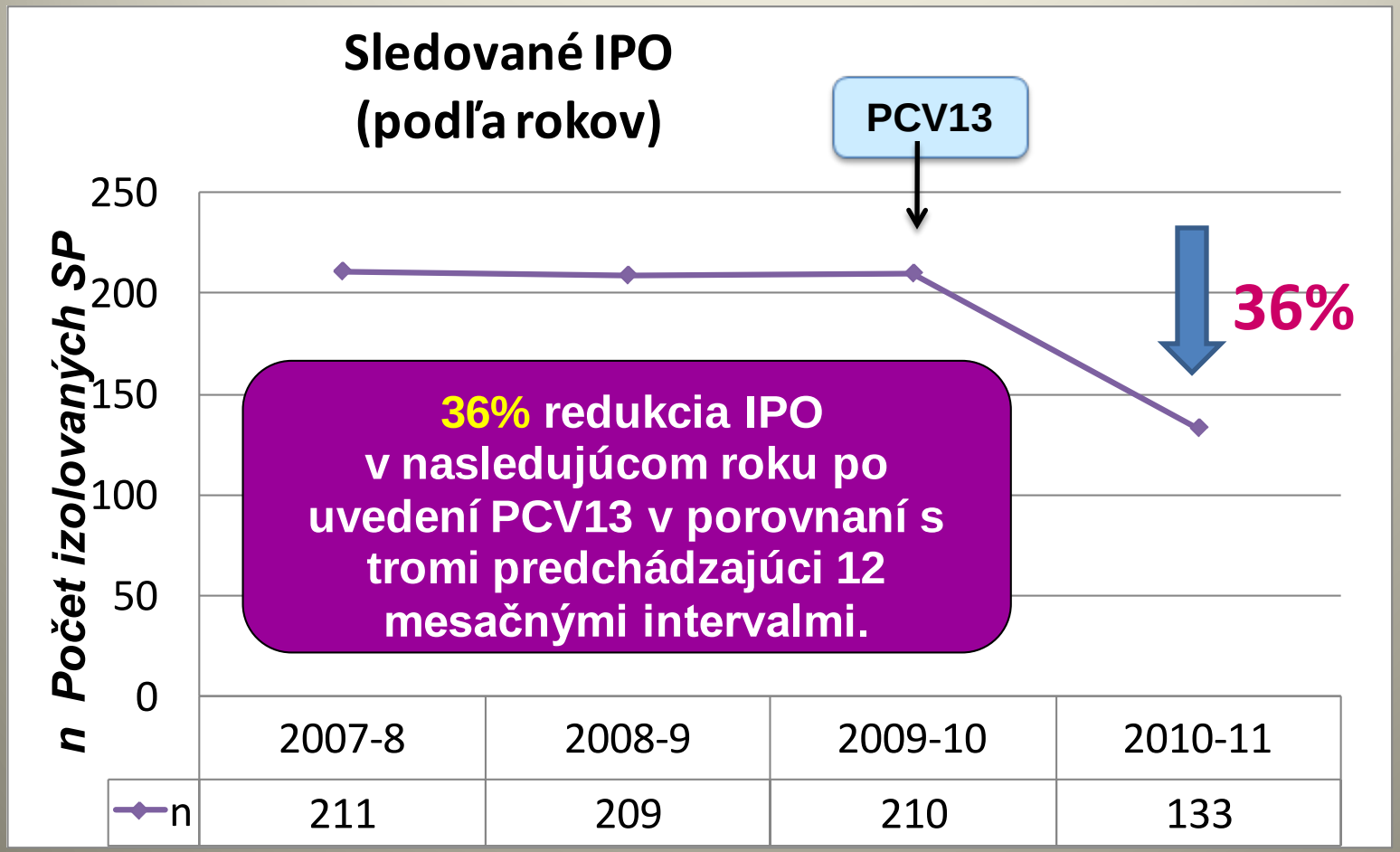


Moore MR, et al, *J Infect Dis*. 2008; 197(7):1016–1027.

Účinnosť PCV13 - IPO

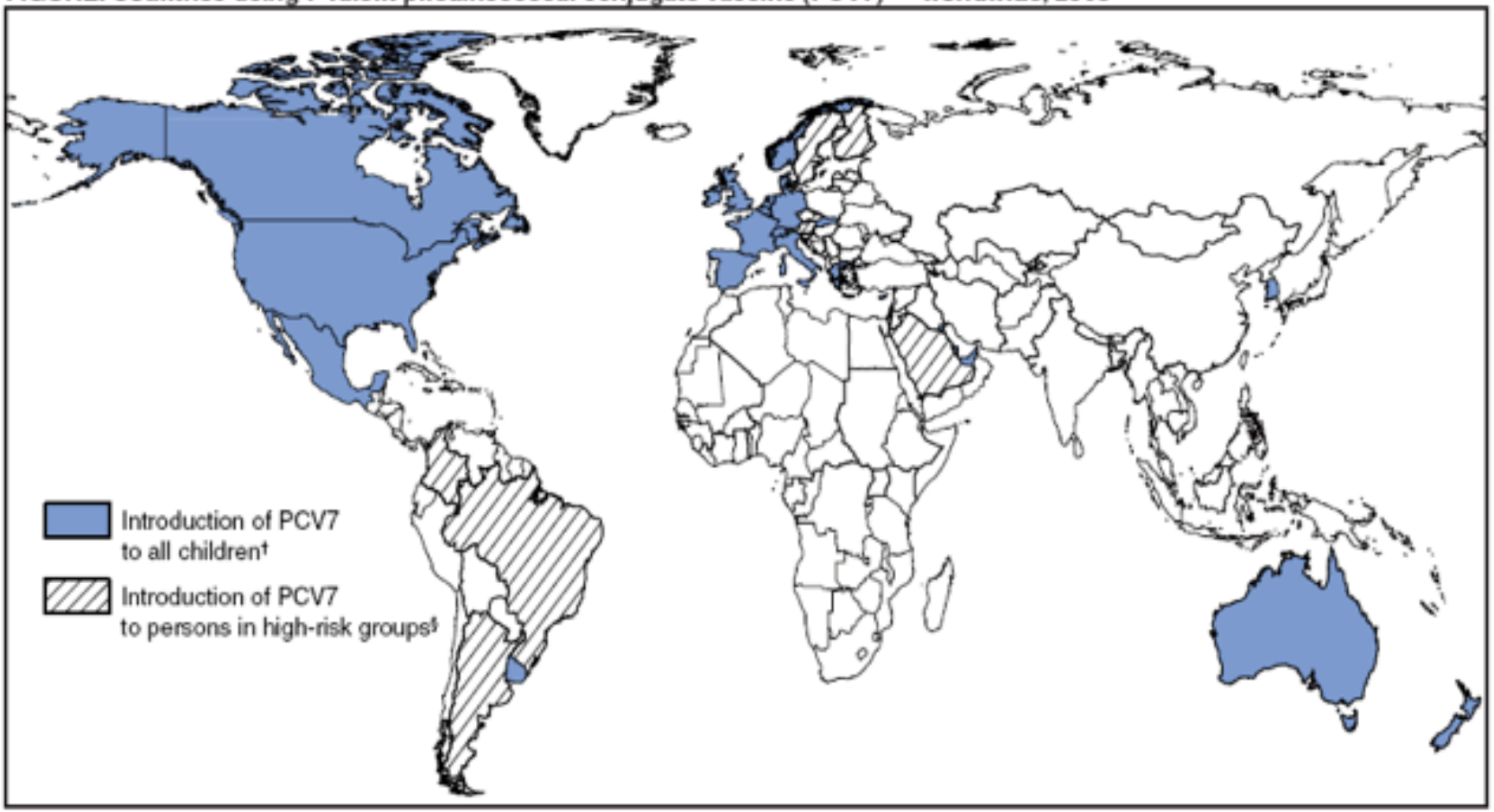
3+1

USA - 8 DETSKÝCH NEMOCNÍC



Kaplan SL, Barson WJ, Lin PH et al. Early trends for invasive pneumococcal infections in children following the introduction of the 13-valent pneumococcal vaccine. Presented at the 49th Annual Meeting of the Infectious Disease Society of America, Oct 20-23, 2011, Boston, MA

FIGURE. Countries using 7-valent pneumococcal conjugate vaccine (PCV7) — worldwide, 2008*



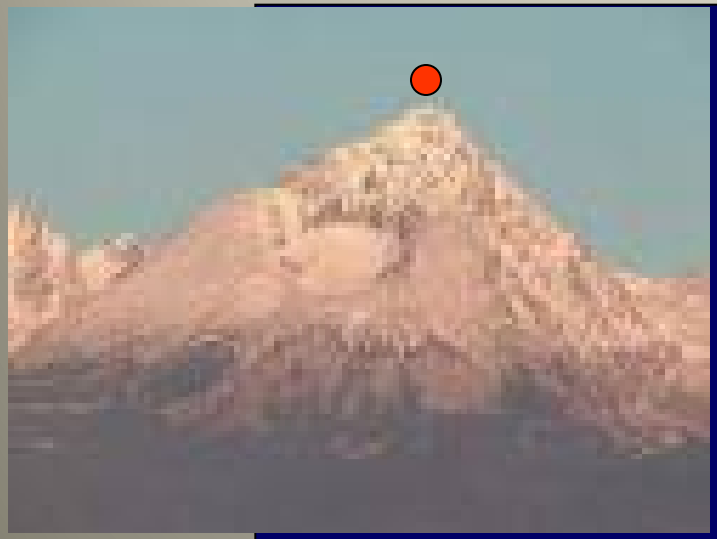
SOURCE: Database maintained by WHO, supplemented with data from other public and private sources, including the GAVI Alliance (formerly known as the Global Alliance for Vaccines and Immunizations), vaccine manufacturers, and country press releases.

* As of August 2008.

† Countries offering PCV7 to all children or having widespread use of PCV7 (i.e., with estimated national coverage >50%) (year of introduction) (n = 26): Australia (2005; high-risk 2001), Bahrain (2008; high-risk 2002), Belgium (2007; high-risk 2004), Canada (2002), Cyprus (2007; high-risk 2003), Denmark (2007), France (2006; high-risk 2003), Germany (2006; high-risk 2002), Greece (2006), Ireland (2008; high-risk 2002), Italy (2003), Kuwait (2006), Luxembourg (2005; high-risk 2003), Mexico (2008; high-risk 2006), Netherlands (2006), New Zealand (2008), Norway (2006; high-risk 2001), Qatar (2005), Slovakia (2008; high-risk 2003), South Korea (2003), Spain (2003), Switzerland (2006; high-risk 2001), United Arab Emirates (2007; high-risk 2004), United Kingdom (2006; high-risk 2001), United States (2000), and Uruguay (2008; high-risk 2006). Italy, South Korea, Spain, and United Arab Emirates have no national recommendation for coverage of all children but have widespread coverage with PCV7.

§ Countries offering coverage only to high-risk groups (e.g., persons who are human immunodeficiency virus [HIV] positive or other immunocompromised or chronically ill persons) (year of introduction) (n = 13): Argentina (2006), Austria (2002), Brazil (2004), Colombia (2007), Czech Republic (2006), Finland (2002), Israel (2004), Latvia (2006), Malta (2006), Micronesia (2007), Saudi Arabia (2006), Slovenia (2005), and Sweden (2005).

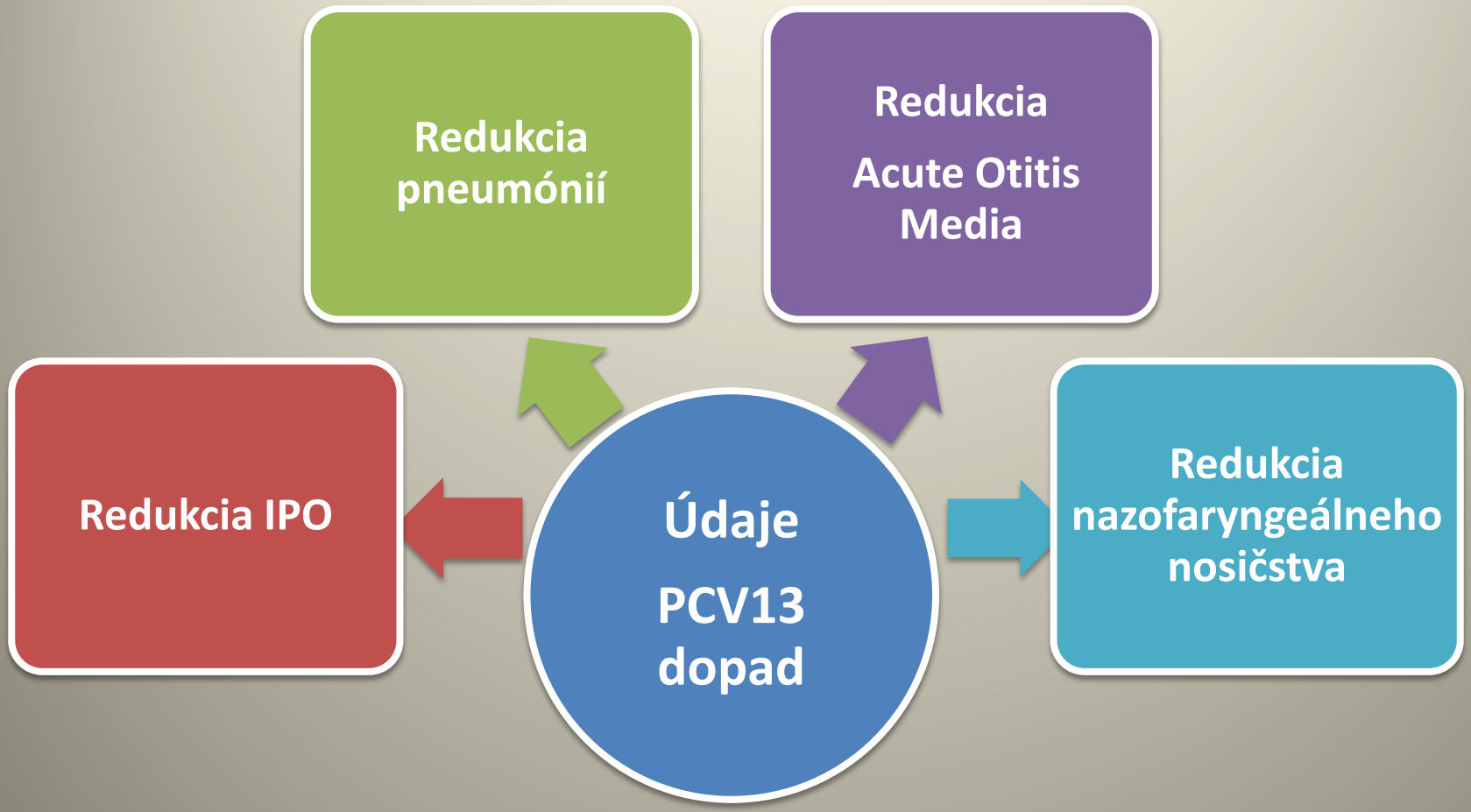
PRVÉ SKÚSENOSTI A DOPAD POVINNÉHO CELOPLOŠNÉHO OČKOVANIA PROTI PNEUMOKOKOM NA SLOVENSKU



S. DLUHOLUCKÝ (DFN BB)
P. ŠIMURKA (FN TN)
M. AVDIČOVÁ (RÚVZ BB)
H. HUPKOVÁ (FF-UK BA)
J. JAKUBÍKOVÁ (DFN BA)

Český vakcinologický kongres, Hradec Králové, 2010

Účinnosť PCV13



Už v krátkom čase po uvedení PCV13 do NIP na celom svete sa podarilo zdokumentovať účinnosť vakcíny pre všetky klinické formy (IPO, pneumónia, otitis media a nasofaryngeálne nosičstvo) pri použití v schéme 3+1 a 2+1.

NRC - národné referenčné centrum

MZ SR zriadilo

NRC pre pneumokokové nákazy

so sídlom

v B. Bystrici s účinnosťou

od 1. januára 2011

Výročná správa za rok 2011

Spolu: 41 vzoriek

u 37 vzoriek zistený kmeň

3: 8

19A: 7

6A: 1

Tab. 1: Kmene *S. pneumoniae* izolované zo sterilných tekutín, 01.01.2011-31.01.2011

Por. číslo	Meno (iniciály)	Rodné číslo (vek)	Dátum prijatia	Laboratórium	Materiál	Sérotyp
1				NsP Zvolen	hemokultúra	19A
2		27 r.		NsP Zvolen	hemokultúra	18C
3	F.O.	1 r.		Aliatros Prešov	hemokultúra	6B
4	P.G.	2 r.	20.10.2010	Avilab Košice	hemokultúra	nevyrástol
5	M.G.	1 r.	15.11.2010	Avilab Košice	hemokultúra	14
6	CH.J.	67 r.	16.05.2010	NsP Zvolen	hemokultúra	3
7	K.L.	6 r.	28.12.2010	MFN Martin	Likvor	6B
8	F.P.	55 r.	06.05.2011	Aliatros Prešov	hemokultúra	nevyrástol
9	G.M.	72 r.	05.01.2011	NsP Zvolen	hemokultúra	3
10	H.Ľ.	55 r.	12.01.2011	OKM Trenčín	hemokultúra	19A
11	S.V.	69 r.	27.01.2011	NsP Zvolen	hemokultúra	15 C
12	H.I.	24 r.	23.02.2011	FNLP Košice	hemokultúra	3
13	G. J.	52 r.	23.02.2011	NsP OKM Poprad	hemokultúra	19C
14	K.J.	58 r.	04.03.2011	OKM Trenčín	Likvor	14
15	Š.K.	69 r.	16.03.2011	FN Nitra	Likvor	15A
16	P.V.	53 r.	16.03.2011	FN Nitra	Likvor	3
17	K.M.	77 r.	15.04.2011	UNB Bratislava	hemokultúra	6A
18	P. J.	30 r.	27.06.2011	NsP OKM Poprad	hemokultúra	19A
19	F.M.	68 r.	11.08.2011	NsP Lučenec	hemokultúra	14
20	B.A.	88 r.	14.09.2011	UNB Bratislava	hemokultúra	19C
21	J.M.	10 mes.	01.04.2011	Avilab Košice	hemokultúra	35B
22	Č.M.	52 r.	05.10.2011	K-MLAB Lučenec	Likvor	3
23	S.R.	32 r.	25.02.2011	OKM Bojnice	Pleur. punktát	4
24	M.F.	1 r.	31.05.2011	Avilab Košice	Laváž. tekutina	18F
25	T.E.	9 r.	25.06.2011	Avilab Košice	Laváž	3
26	S.Č.	4 mes.	25.10.2011	Aliatros Prešov	hemokultúra	14
27	J.D.	32 r.	10.11.2011	NsP Zvolen	hemokultúra	15B
28			10.11.2011	Avilab Košice	Pohrud.tekutina	19F
29			10.11.2011	Avilab Košice	Pľúca	9L
30	B.K.	1 r.	10.11.2011	Avilab Košice	Laváž. tekutina	Nerastie
31	A.D.	84 r.	16.11.2011	OKM Zvolen	hemokultúra	3
32	K.M.	74 r.	06.07.2011	OKM Trenčín	Likvor	19A
33	V. P.	37 r.	11.11.2011	NsP OKM Poprad	hemokultúra	6B
34	Ľ.M.	60 r.	06.12.2011	OKM Bojnice	hemokultúra	19A
35	Ľ.M.	60 r.	06.12.2011	OKM Bojnice	Ster z kanyly	19A
36	S.B.	60 r.	06.12.2011	Avilab Košice	BAL	3
37	S.K.	2 r.	06.12.2011	Avilab Košice	BAL	19A
38	D.B.	1 r.	06.12.2011	Avilab Košice	BAL	19F
39	J.T.	2 r.	13.12.2011	Aliatros Prešov	Hemokultúra	OPT -; neaglutinuje
40	M.H.	11 r.	13.12.2011	Avilab Košice	Pľúca	6B
41	D.B.	5 mes.	13.12.2011	Avilab Košice	BAL	19F

Závery

- **PCV7 významne znížila:**
  - výskyt invazívnych pneumokokových ochorení (IPO) sérotypov PCV7
  - pneumokokových a celkovo zápalov pľúc
  - pneumokokových a celkovo akútnych zápalov stredného ucha
- **Prvé dôkazy pozitívneho účinku PCV13 na:**
  - **celkovú incidenciu IPO** u očkovaných vekových skupín
  - IPO vyvolaných **6 pridanými sérotypmi** (1,3, 5, 6A, 7F and 19A)
  - **19A and 7F IPO**
  - **nazofaryngeálne nosičstvo sérotypov prítomných v PCV13, hlavne 19A and 7F**
- **Tieto skoré dôkazy vyžadujú potvrdenie ďalším kontinuálnym sledovaním**

Ďakujem za pozornosť!