Salut/ Germans Trias i Pujol Hospital

Controvèrsies de la vacuna pneumocòccica conjugada Pn15, Pn20 ?

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Med Clin (Barc). 2011;137(1):17–19

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Editorial

El neumococo y el teatro de la Grecia clásica

Carlos Rodrigo Gonzalo de Liria

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La tragedia es una de las creaciones más brillantes del genio griego clásico y nos ofrece conflictos que, a pesar de su origen legendario o de lo extraordinario de sus situaciones, parten de pasiones humanas que pueden suscitarse a través de todos los tiempos. La lucha del hombre contra lo irremediable constituye la esencia de la tragedia clásica, que halla su culminación con los tres grandes trágicos: Esquilo, Sófocles y Eurípides[1]. Se dice que Esquilo mostró a los hombres con un perfil típico, como nos gustaría que fuesen, con predominio del influjo del destino; se le considera el padre del Teatro. Sófocles pintó a los hombres como debieran ser, de acuerdo con una visión convencional y determinista. Eurípides describió al ser humano en su realidad, alejado de la ortodoxia, con preferencia por puntos de vista no convencionales y un tanto escépticos; los personajes dejan de tener grandeza para tener humanidad, se rebelan contra el destino[1].

Decline in Invasive Pneumococcal Disease after 7-PCV

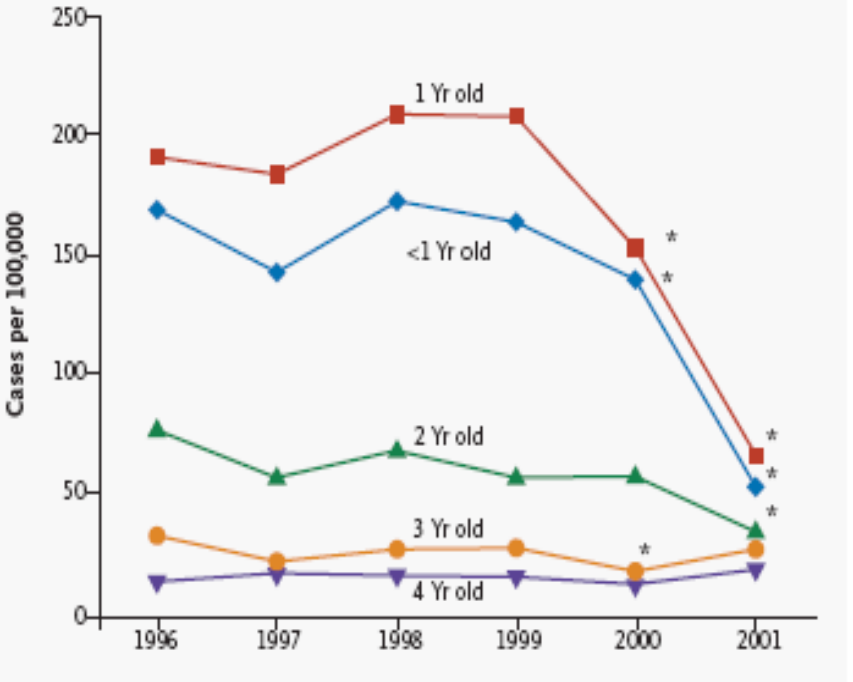


Figure 1. Rates of Invasive Pneumococcal Disease among Children under Five Years Old, According to Age and Year.

Data are from the Active Bacterial Core Surveillance from 1996 through 2001. The 1996 and 1997 rates do not include data from New York State. Asterisks indicate P<0.05 for comparisons of the rate in 2000 or 2001 with the combined rate for 1998 and 1999.

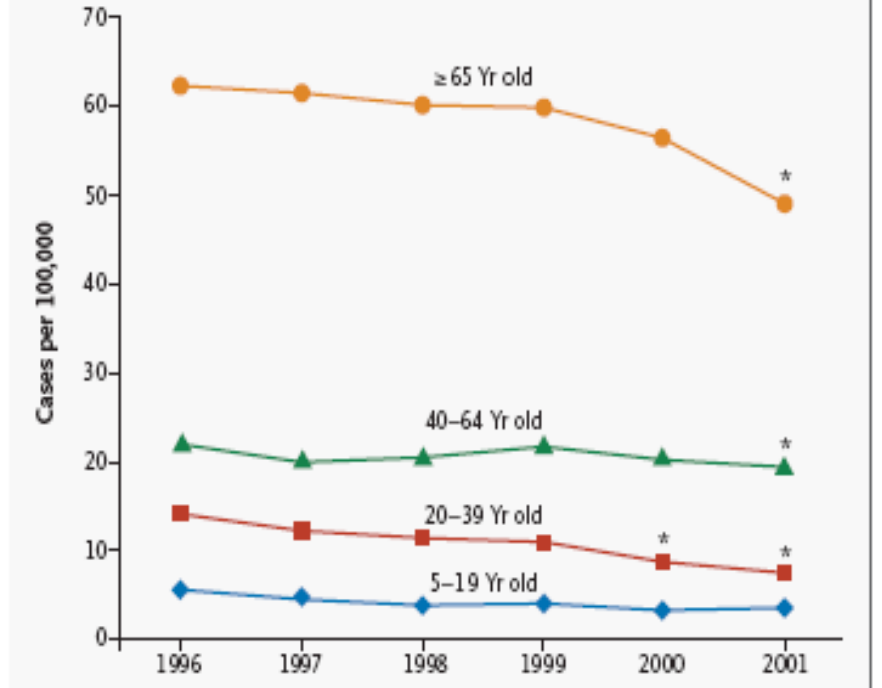


Figure 3. Rates of Invasive Pneumococcal Disease among Persons at Least Five Years Old, According to Age Group and Year.

Data are from the Active Bacterial Core Surveillance from 1996 through 2001. The 1996 and 1997 rates do not include data from New York State. Asterisks indicate P<0.05 for comparisons of the rate in 2000 or 2001 with the combined rate for 1998 and 1999.

Whitney C et al. NEJM (2003)

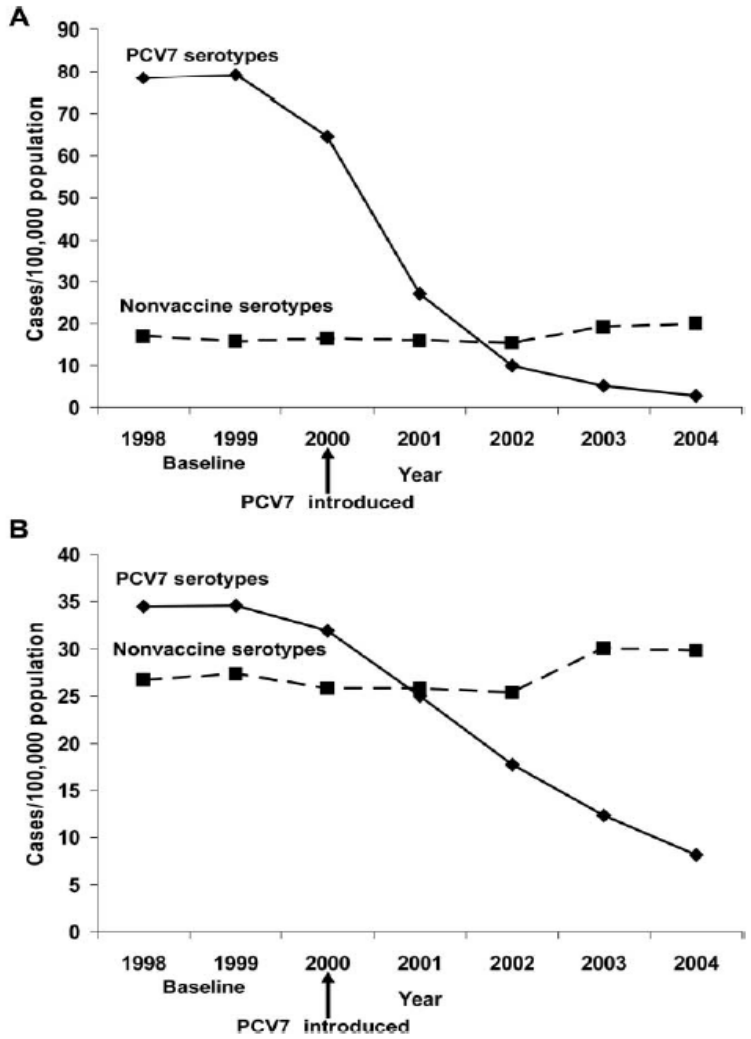


Figure 1. Rates of invasive pneumococcal disease among children aged <5 years *(A)* and adults aged ⩾65 years *(B)*, by serotype and year. The 7-valent pneumococcal conjugate vaccine (PCV7) includes serotypes 4, 6B, 9V, 14, 18C, 19F, and 23F.

Table 2. Hospitalization for invasive pneumococcal disease among children and older adults before (1998–1999) and after (2004) introduction of the 7-valent pneumococcal conjugate vaccine (PCV7).

	Total no. of hospitalizations		No. of hospitalizations/100,000 population		Relative risk	
Age, serotype	1998–1999	2004	1998–1999	2004	(95% CI)[a]	*P*
<5 years						
Overall	329	133	27.2	10.1	0.4 (0.3–0.5)	<.001
PCV7[b]	264	17	21.8	1.3	0.06 (0.04–0.10)	<.001
Nonvaccine	65	116	5.4	8.8	1.6 (1.3–2.1)	<.001
⩾65 years						
Overall	998	661	50.6	31.8	0.6 (0.6–0.7)	<.001
PCV7[b]	560	144	28.4	6.9	0.2 (0.2–0.3)	<.001
Nonvaccine	438	517	22.2	24.9	1.1 (1.0–1.3)	.04

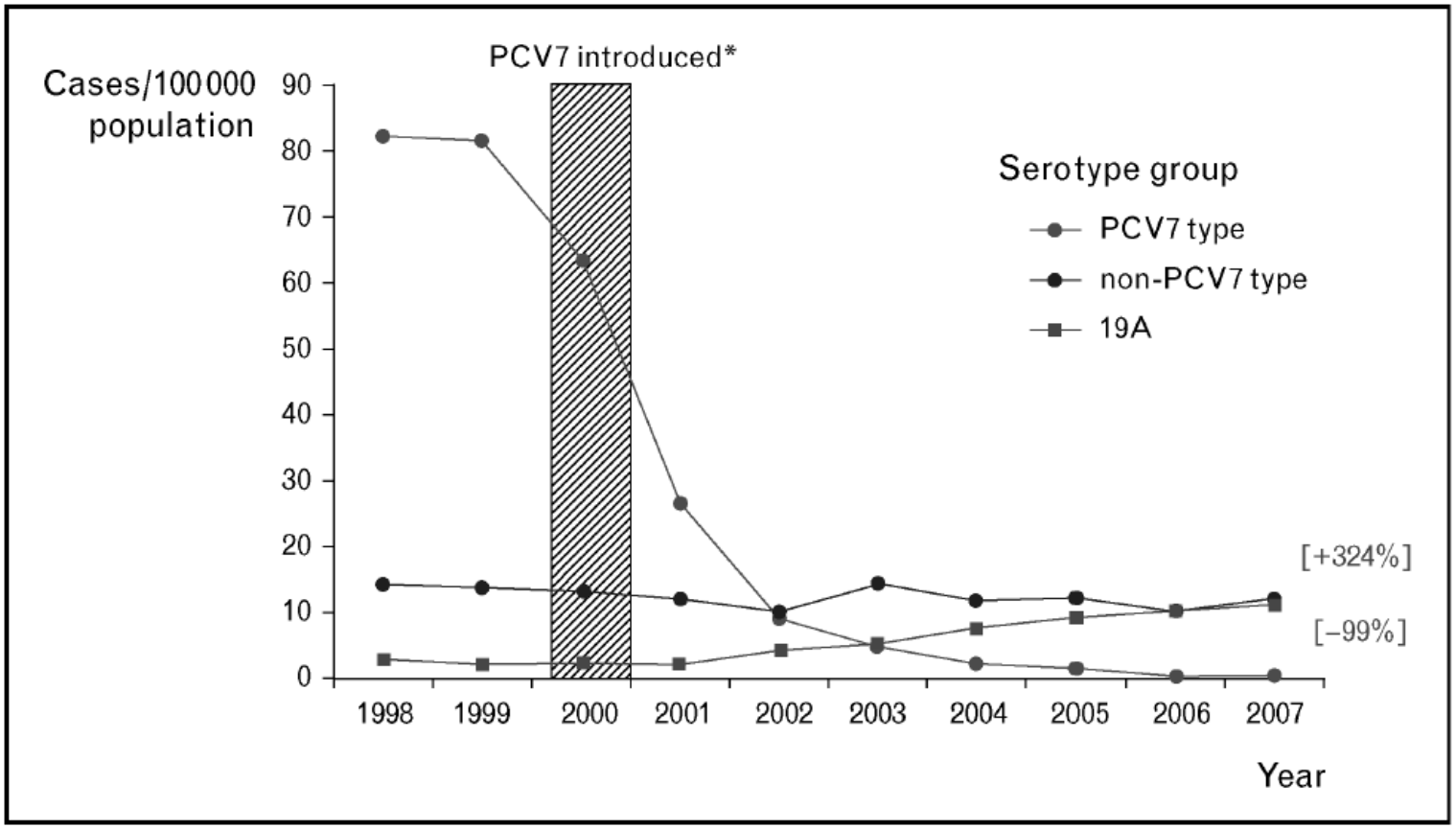
Note. Data for 1998–1999 are annual averages.

[a] Relative risks and CIs were calculated with the Mantel-Haenszel χ^2 test and the Fisher exact test.

[b] Serotypes 4, 6B, 9V, 14, 18C, 19F, and 23F are included in the 7-valent pneumococcal conjugate vaccine (PCV7).

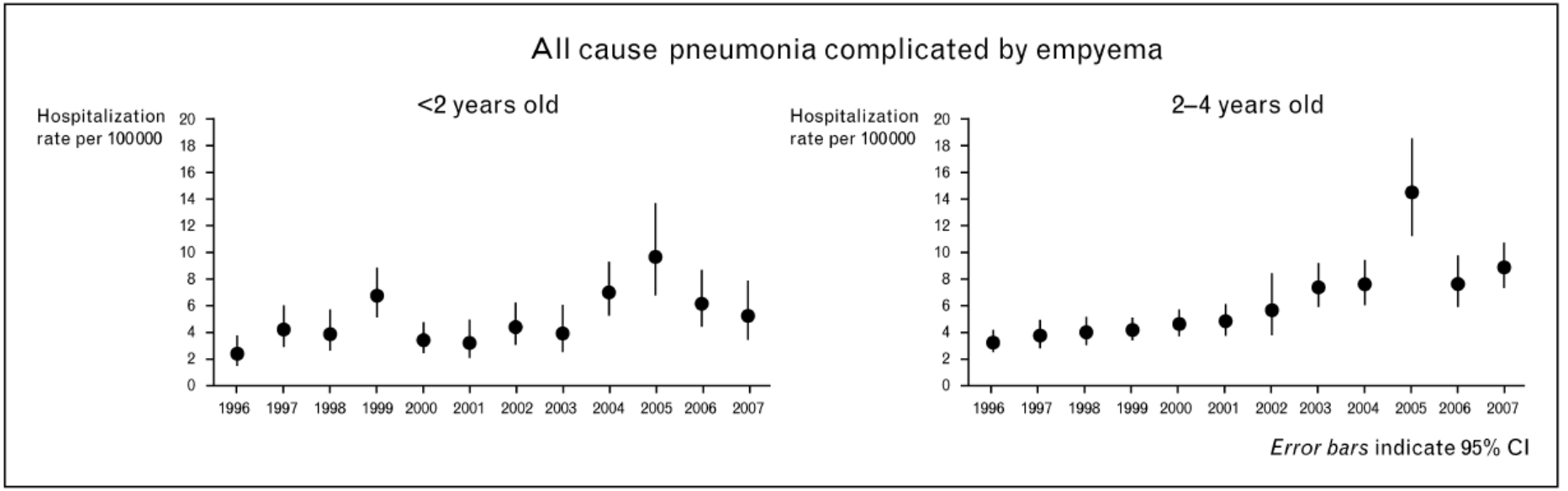
Hicks LA et al. JID 2007;196:1346

Changes in IPD incidence by serotype grouping in US children less than 5 years by year: two stories in one



Grijalva CG. Curr Op Pediatr 2011;23:98

Annual hospitalization rates for all cause pneumonia complicated by empyema among children aged less than 5 years, United States, 1996–2007



Grijalva CG. Curr Op Pediatr 2011;23:98

Vacuna conjugada heptavalente

Supuesta cobertura de serotipos causantes de enfermedad en España

- Niños de 2 meses a 2 años: 80-85%
- Niños de 2 a 5 años: 60%

Vacuna conjugada heptavalente

Cobertura real de serotipos causantes de enfermedad en España

- Niños de 2 meses a 2 años: 65-70%
- Niños de 2 a 5 años: 50%

Effectiveness of the 7-Valent Pneumococcal Conjugate Vaccine: A Population-Based Case-Control Study

Aurelio Barricarte,[1,2] Jesús Castilla,[1,2] Alberto Gil-Setas,[3] Luis Torroba,[4] José Antonio Navarro-Alonso,[5] Fátima Irisarri,[1] and Maite Arriazu[1]

[1]Instituto de Salud Pública de Navarra, [2]Universidad de Navarra, [3]Ambulatorio General Solchaga, and [4]Hospital Virgen del Camino, Pamplona, and [5]Consejería de Sanidad, Murcia, Spain

Background. The 7-valent pneumococcal conjugate vaccine (PCV7) has shown high efficacy in preventing invasive pneumococcal disease (IPD) caused by vaccine serotypes. We aimed to assess the overall effectiveness of PCV7 against IPD in Navarra, Spain.

Methods. All children aged <5 years who were diagnosed with IPD during the period 2001–2005 ($n = 85$) and 5 control subjects per case patient ($n = 425$), individually matched by birth date and birth hospital, were analyzed. Vaccination records were obtained from the regional immunization registry. Conditional logistic regression was used to estimate odds ratios.

Results. Eighteen case patients (21%) and 114 control subjects (27%) had received ⩾1 dose of PCV7. PCV7 serotypes were responsible for 34 (51%) of the cases in unvaccinated children. The overall effectiveness for case prevention was 31% (odds ratio, 0.69; 95% confidence interval, 0.37–1.27). In a separate analysis, vaccination with PCV7 was 88% effective in preventing IPD due to vaccine serotypes (odds ratio, 0.12; 95% confidence interval, 0.02–0.91) and was associated with a higher risk of IPD due to nonvaccine serogroups (odds ratio, 6.16; 95% confidence interval, 1.63–23.3).

Conclusions. These data reveal a higher risk of IPD caused by non-PCV7 serogroups among vaccinated children. Consequently, the overall effectiveness of PCV7 for IPD prevention may be greatly reduced.

Barricarte A et al. CID 2007

Emergence of Invasive Pneumococcal Disease Caused by Nonvaccine Serotypes in the Era of 7-Valent Conjugate Vaccine

Carmen Muñoz-Almagro,[1] Iolanda Jordan,[2] Amadeo Gene,[1] Cristina Latorre,[1] Juan J. Garcia-Garcia,[2] and Roman Pallares[3]

Departments of [1]Microbiology and [2]Paediatrics and Intensive Care, Hospital Universitari Sant Joan de Deu, Esplugues, and [3]Infectious Diseases Service and Clinical Research Unit, Idibell, Ciberes, Bellvitge Hospital and University of Barcelona, Barcelona, Spain

(See the editorial commentary by Moore and Whitney on pages XXX–XX)

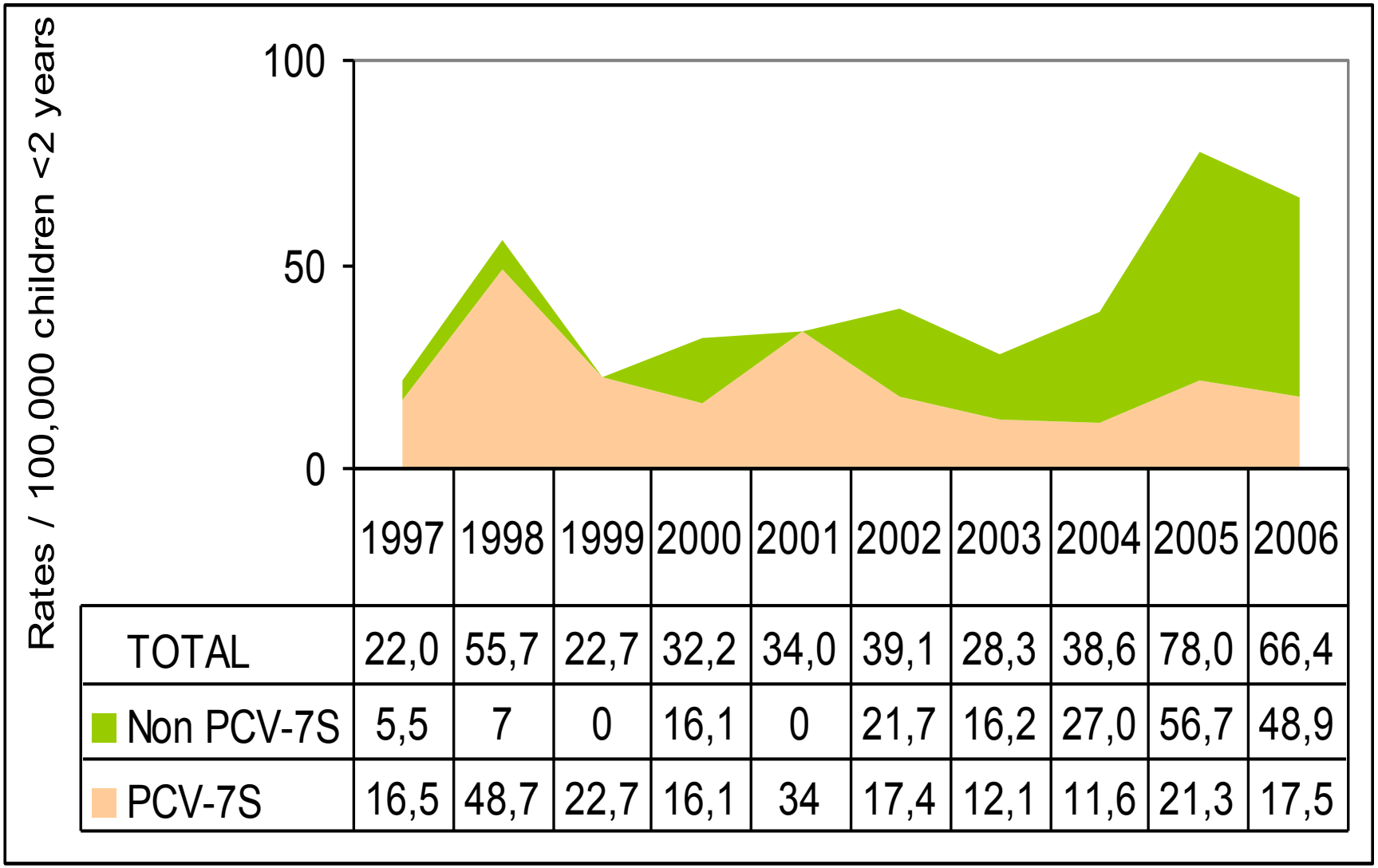
Background. Little is known about the epidemiology of invasive pneumococcal disease (IPD) after the introduction of 7-valent pneumococcal conjugate vaccine (PCV7) in Spain and other European countries.

Methods. We performed a 10-year prospective study including all children with culture-proven IPD admitted to Sant Joan de Deu Hospital, a children's center in the southern area of Barcelona, Catalonia, Spain. PCV7 was introduced in June 2001, and the current estimate of PCV7 coverage is 45%–50%.

Results. Comparing the prevaccine period (1997–2001) with the vaccine period (2002–2006), among children aged <2 years, the rate of IPD increased from 32.4 episodes per 100,000 population to 51.3 episodes per 100,000 population (an increase of 58%; 95% confidence interval, 2%–145%), and among children aged 2–4 years, the rate increased from 11.3 episodes per 100,000 population to 26.5 episodes per 100,000 population (an increase of 135%; 95% confidence interval, 31%–320%). At clinical presentation, the rate of pneumonia and/or empyema among children aged <5 years increased from 3.6 episodes per 100,000 population to 15.1 episodes per 100,000 population (an increase of 320%; 95% confidence interval, 98%–790%). These increased rates of IPD were caused by non-PCV7 serotypes, which represented 38% and 72% of infecting serotypes in the prevaccine and vaccine periods, respectively ($P < .001$). Penicillin resistance decreased from 48% in the prevaccine period to 27% in the vaccine period ($P = .005$). In the vaccine period, there was an emergence of previously established virulent clones of non-PCV7 serotypes 1 and 5. There was also an increase in the prevalence of serotypes 19A and 6A expressed with different clonal types, including Spain^{23F}-1 and Spain^{6B}-2.

Conclusions. Since the introduction of PCV7 for children, there has been an emergence of IPD caused by virulent clones of non-PCV7 serotypes that has been associated with significant clinical changes and a decrease in antibiotic resistance.

Muñoz-Almagro C et al. CID 2008; 46:174



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
TOTAL	22,0	55,7	22,7	32,2	34,0	39,1	28,3	38,6	78,0	66,4
Non PCV-7S	5,5	7	0	16,1	0	21,7	16,2	27,0	56,7	48,9
PCV-7S	16,5	48,7	22,7	16,1	34	17,4	12,1	11,6	21,3	17,5

Muñoz-Almagro C et al. CID 2008; 46:174

Germans Trias i Pujol Hospital

UAB Universitat Autònoma de Barcelona

ENFERMEDAD NEUMOCÓCICA: REEMPLAZO CON SEROTIPOS NO VACUNALES COMO CAUSANTES DE ENFERMEDAD PEDIÁTRICA TRAS LA INTRODUCCIÓN DE LA VACUNA CONJUGADA HEPTAVALENTE

Introducción:

❖ *Streptococcus pneumoniae* es una causa importante de enfermedad grave dentro de la población pediátrica, especialmente en los < 2 años

❖ 2001: se introduce en Europa la vacuna conjugada heptavalente. Contiene los siete serotipos responsables de alrededor del 75% de enfermedad neumocócica pediátrica (4, 6B, 9V, 14, 18C,19F y 23F)

❖ Desde entonces ha crecido la preocupación sobre el posible reemplazo con los serotipos no incluidos en la vacuna como causantes de enfermedad neumocócica invasora pediátrica (EIP)

Métodos:

❖ Se analizan los hemocultivos positivos para *S. pneumoniae* de los niños de 0 a 18 años atendidos en el Servicio de Pediatría de un Hospital General Universitario durante el periodo 2001-2005

❖ Se procede al serotipado de los neumococos aislados y se comparan los serotipos del periodo 2001-2004 frente a los de 2005, así como su sensibilidad a antibióticos

Resultados:

❖Conocemos el serotipo del 88% de los 40 *S. pneumoniae* aislados (58% son de niños <2 años)

❖De 2001 a 2004 se obtienen 23 hemocultivos positivos para neumococo. El 62% coresponde a serotipos incluidos en la vacuna y el 38% a no vacunales

❖Durante el año 2005 se aislan 17 cepas de neumococo, el 36% de las cuales corresponde a serotipos vacunales mientras que el 64% corresponde a serotipos no incluidos en la vacuna

❖Se objetiva un aumento significativo de los serotipos **1** y **6A**, responsables del 25 % de la EIP durante 2001-2004, y del 56% en 2005

ACTA PÆDIATRICA
NURTURING THE CHILD

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REGULAR ARTICLE

Increase in invasive nonvaccine pneumococcal serotypes at two hospitals in Barcelona: was replacement disease to blame?

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2.Laboratory of Clinical Microbiology, Hospital Germans Trias i Pujol, Barcelona, Spain
3.Department of Paediatrics, Hospital de Barcelona, Barcelona, Spain
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6.Department of Paediatrics, Hospital Germans Trias i Pujol, Barcelona, Spain

Aim: To describe an increase in the incidence of invasive pneumococcal disease (IPD) caused by serotypes not contained in the heptavalent pneumococcal conjugate vaccine (PCV7) in children in two hospitals in Barcelona with different vaccine uptake.

Methods: Cumulative incidences of IPD, vaccine and nonvaccine serotypes (NVSTs), and main clinical presentations before (1998–2001) and after vaccine introduction (2005–2008) were compared.

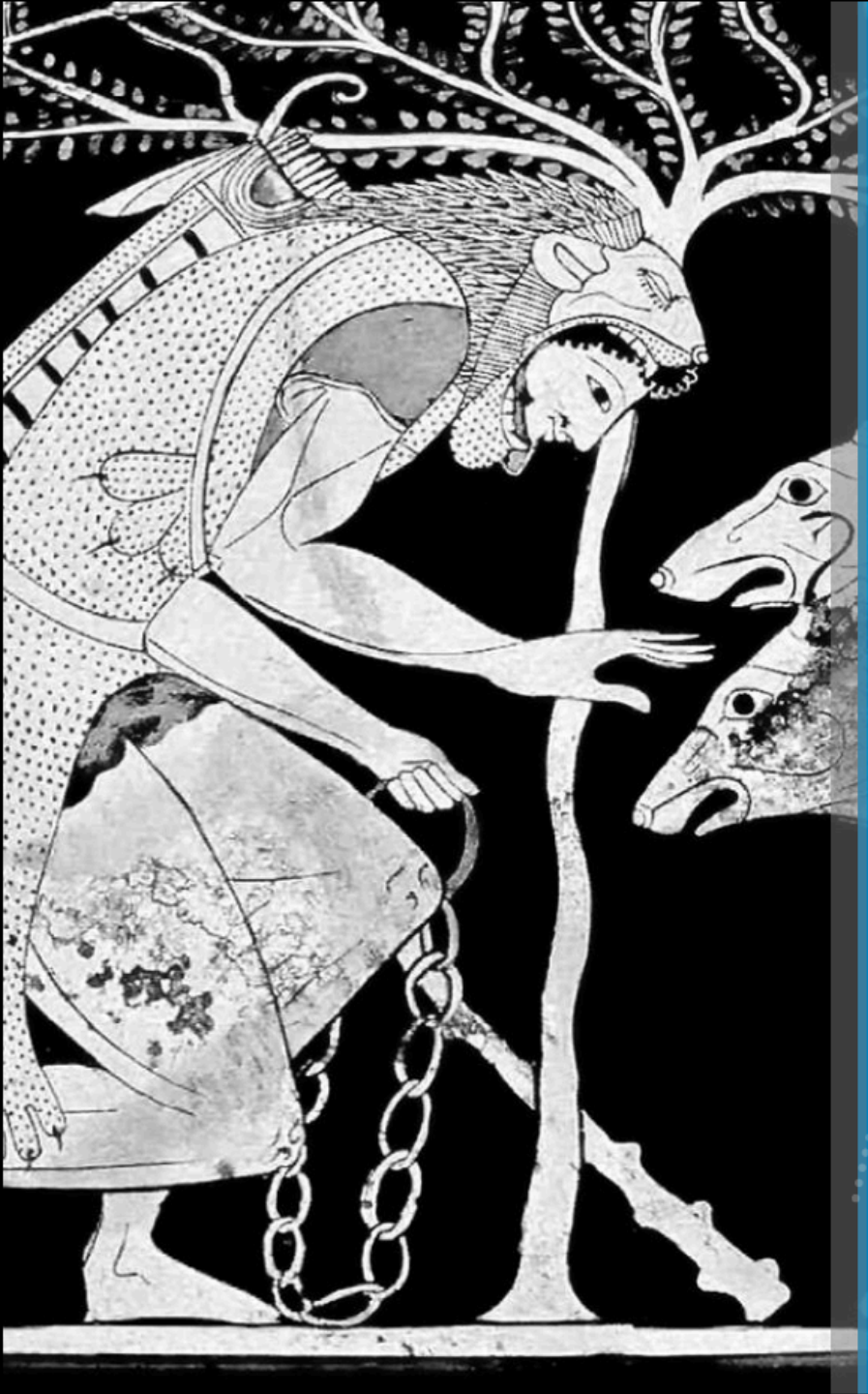
Results: The incidence of IPD in children aged <2 years at Hospital Germans Trias i Pujol covering a population in which PCV7 was not widely used showed a nonsignificant increase from 29.9 to 58.8 per 100 000 child-years between both periods. Following vaccine introduction, there was a 2.5-fold increase in IPD caused by NVSTs in children aged <5 years. Analysis of trends in the almost fully vaccinated population of Hospital de Barcelona revealed a nonsignificant reduction in IPD incidence in children aged <2 years from 63.1 to 26.0 per 100 000 child-years. NVSTs in children aged <5 years showed a nonsignificant 1.7-fold increase in the vaccine period at this centre.

Trends in incidence (no. of cases per 100 000 child-years) of vaccine serotypes, nonvaccine serotypes (NVSTs), occult bacteraemia and bacteraemic pneumonia in children <5 years of age

	HUGTiP		
	(n) prevac	(n) postvac	RR* (95% CI)
Vaccine serotypes	(8) 9.9	(14) 12.6	1.3 (0.5–3)
NVSTs	(7) 8.6	(24) 21.7	2.5 (1.1–5.8)
Occult bacteraemia	(6) 7.4	(10) 9.0	1.2 (0.4–3.3)
Bacteraemic pneumonia	(4) 4.9	(23) 20.8	4.2 (1.5–12.1)

	HB		
	(n) prevac	(n) posvac	RR (95% CI)
Vaccine serotypes	(20) 39.6	–	–
NVSTs	(7) 13.9	(16) 23.4	1.7 (0.7–4.1)
Occult bacteraemia	(12) 23.8	(2) 2.9	0.12 (0–0.6)
Bacteraemic pneumonia	(7) 13.9	(10) 14.6	1.1 (0.4–2.8)

prevac: prevaccine period incidence; postvac: vaccine period incidence; RR,Relative risk.
*Vaccine period vs. prevaccine period; 95% CI: 95% confidence interval.



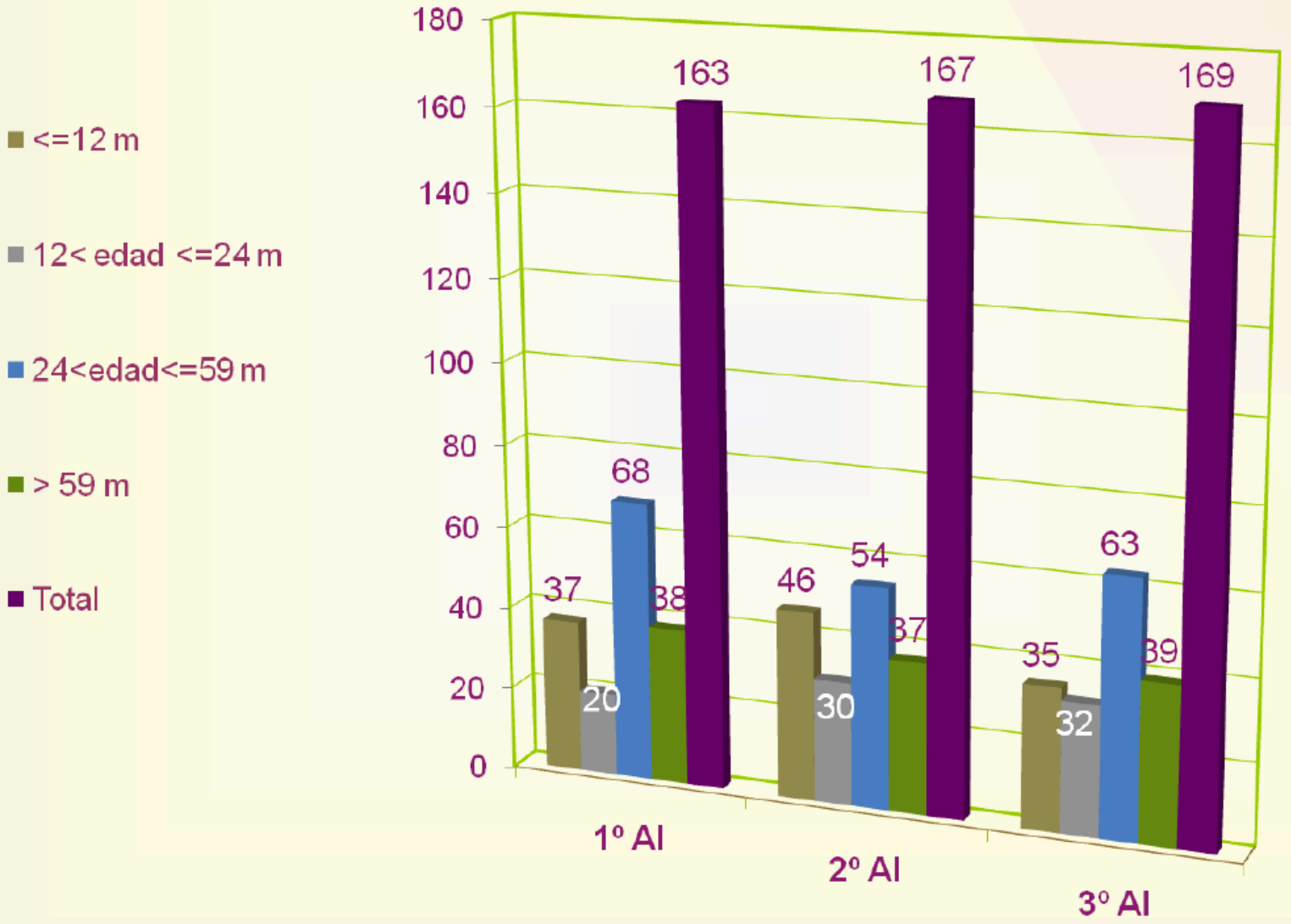
HERACLES

ENFERMEDAD INVASORA POR STREPTOCOCCUS PNEUMONIAE EN LA POBLACIÓN PEDIÁTRICA DE MADRID (Mayo 2007-Abril 2010)

Picazo J, Ruiz-Contreras J, Casado-Flores J, Negreira S, García-De Miguel MJ, Hernández-Sampelayo T, Méndez C y el Grupo de Estudio HERACLES

03. DISTRIBUCIÓN DE CASOS (n) POR GRUPO DE EDAD Y PERIODO

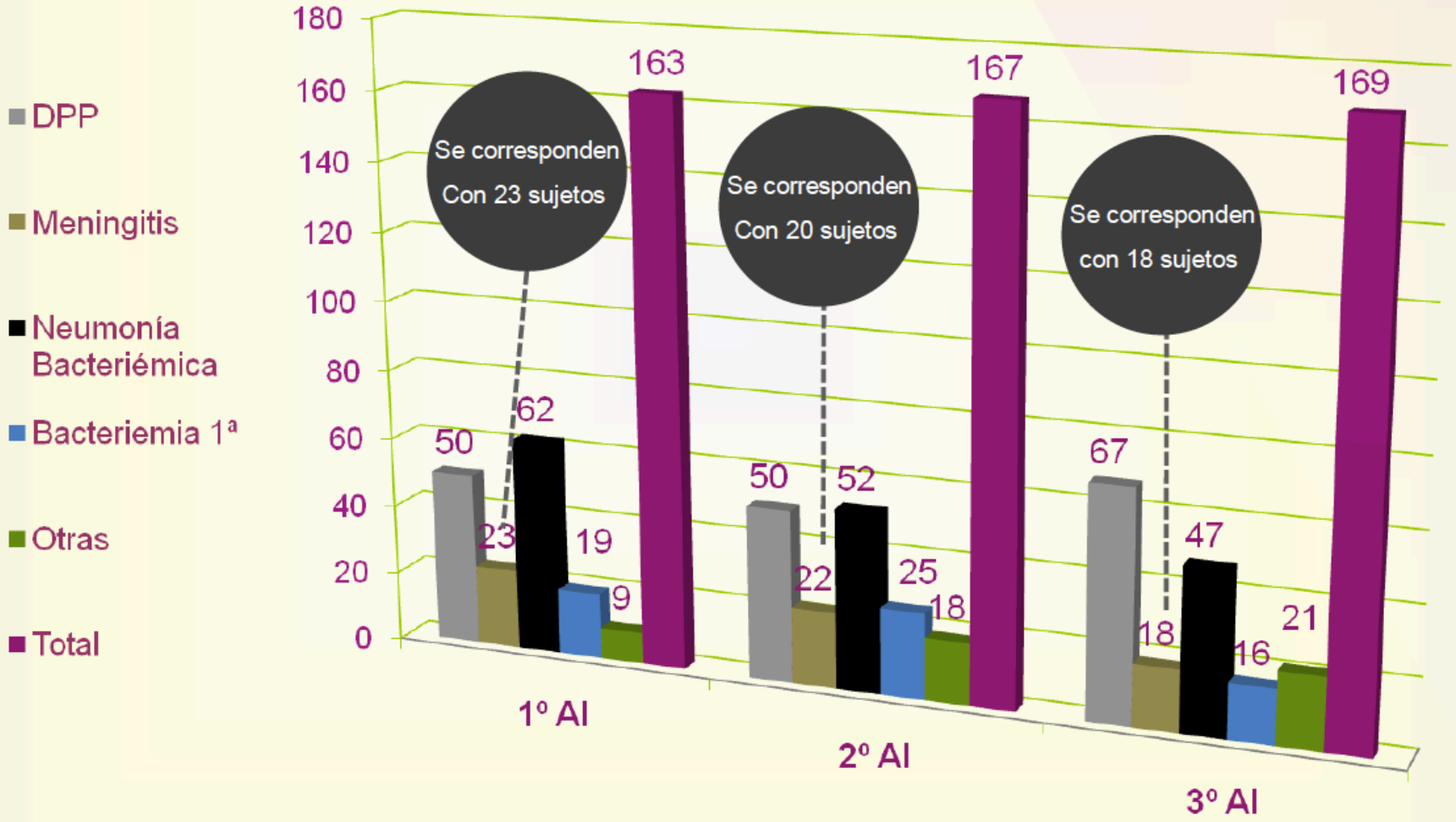
1ºAI: Mayo 2007-30 Abril 2008 • 2º AI: 1 Mayo 2008 – 30 Abril 2009 • 3ºAI: 1 Mayo 2009 – 30 Abril 2010



Cedido de Picazo J, en representación del Grupo de Estudio Heracles (3ª AI: datos no publicados)

11. DISTRIBUCIÓN DE CASOS (n) POR FORMA CLÍNICA Y PERIODO

1ºAI: Mayo 2007-30 Abril 2008 • 2º AI: 1 Mayo 2008 – 30 Abril 2009 • 3ºAI: 1 Mayo 2009 – 30 Abril 2010



Cedido de Picazo J, en representación del Grupo de Estudio Heracles (3ª AI: datos no publicados)

Streptococcus pneumoniae in western Europe: serotype distribution and incidence in children less than 2 years old

Tom Jefferson, Eliana Ferroni, Filippo Curtale, Paolo Giorgi Rossi, Piero Borgia

We did a systematic search and synthesis of evidence on the incidence of invasive pneumococcal disease, symptomatic disease, and circulating *Streptococcus pneumoniae* serotypes in western Europe. Using data from studies published between 1992 and 2005 we calculated a weighted mean invasive pneumococcal disease and pneumococcal meningitis incidence rate per 100 000 children aged 2 years or younger within 95% confidence intervals, together with the prevalence of *S pneumoniae* serotypes and resistance to penicillin. Invasive pneumococcal disease incidence was 27·03 cases per 100 000 children under 2 years (95% CI 2·85–33·43). Heptavalent conjugate vaccine serotypes account for 43·18–75·32% of isolates among people aged under 18 years of age. 11% of isolates in individuals aged under 18 years were penicillin resistant. The incidence of invasive pneumococcal disease appeared consistently lower in western European countries compared with studies from the USA. Thus the use of studies of vaccine effectiveness based on the US population may lead to an overestimation of the benefits of its introduction in Europe.

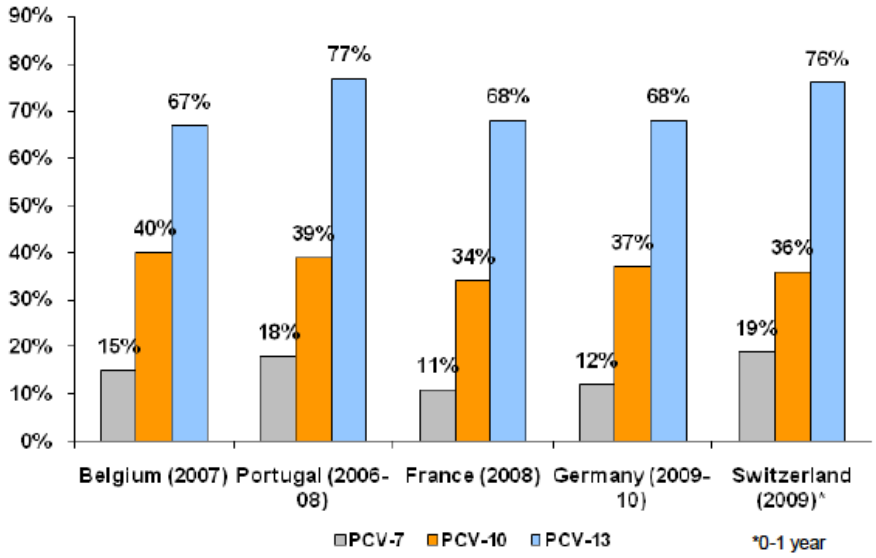
Lancet Infect Dis 2006; 6: 405–10

Cochrane Vaccines Field, Anguillara Sabazia, Rome, Italy (T Jefferson FFPHM); Istituto di Igiene, Università Cattolica del Sacro Cuore, Rome (E Ferroni MD); and Servizio Prevenzione e Formazione, Agenzia di Sanità Pubblica della Regione Lazio, Rome (F Curtale MD, P Giorgi Rossi MSc, P Borgia MD)

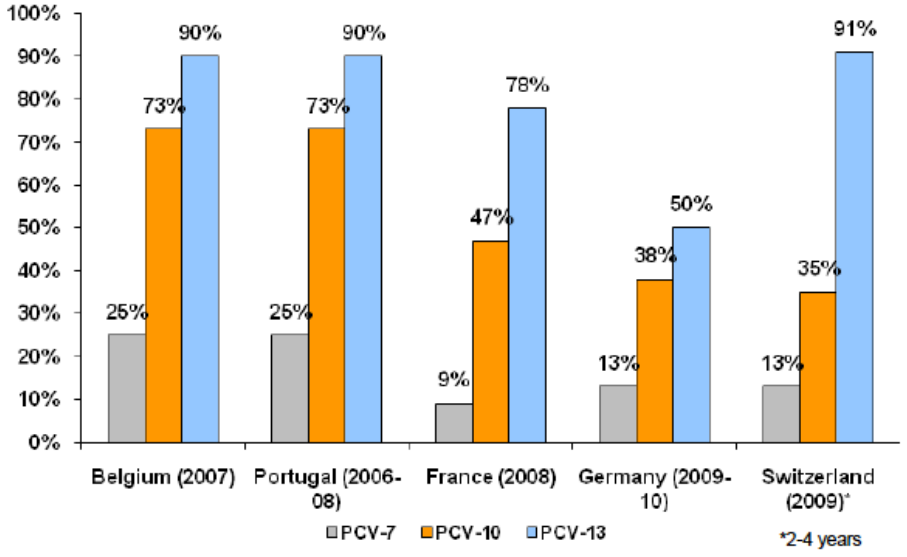
Correspondence to:

Jefferson T et. Lancet ID 2006

PCVs: cobertura según distribución de serotipos en niños menores de 5 años en Europa



Cobertura PCVs en niños de 0 a 2 años



Cobertura PCVs en niños entre 2 y 5 años

Surveillance de maladies infectieuses pédiatriques en Belgique année 2007
Aguiar et al. Vaccine 2010
CNRP Rapport d'activité 2009.
van der Linden et al. ICCAC 2010 poster presentation
Switzerland recommendation Nov 2010

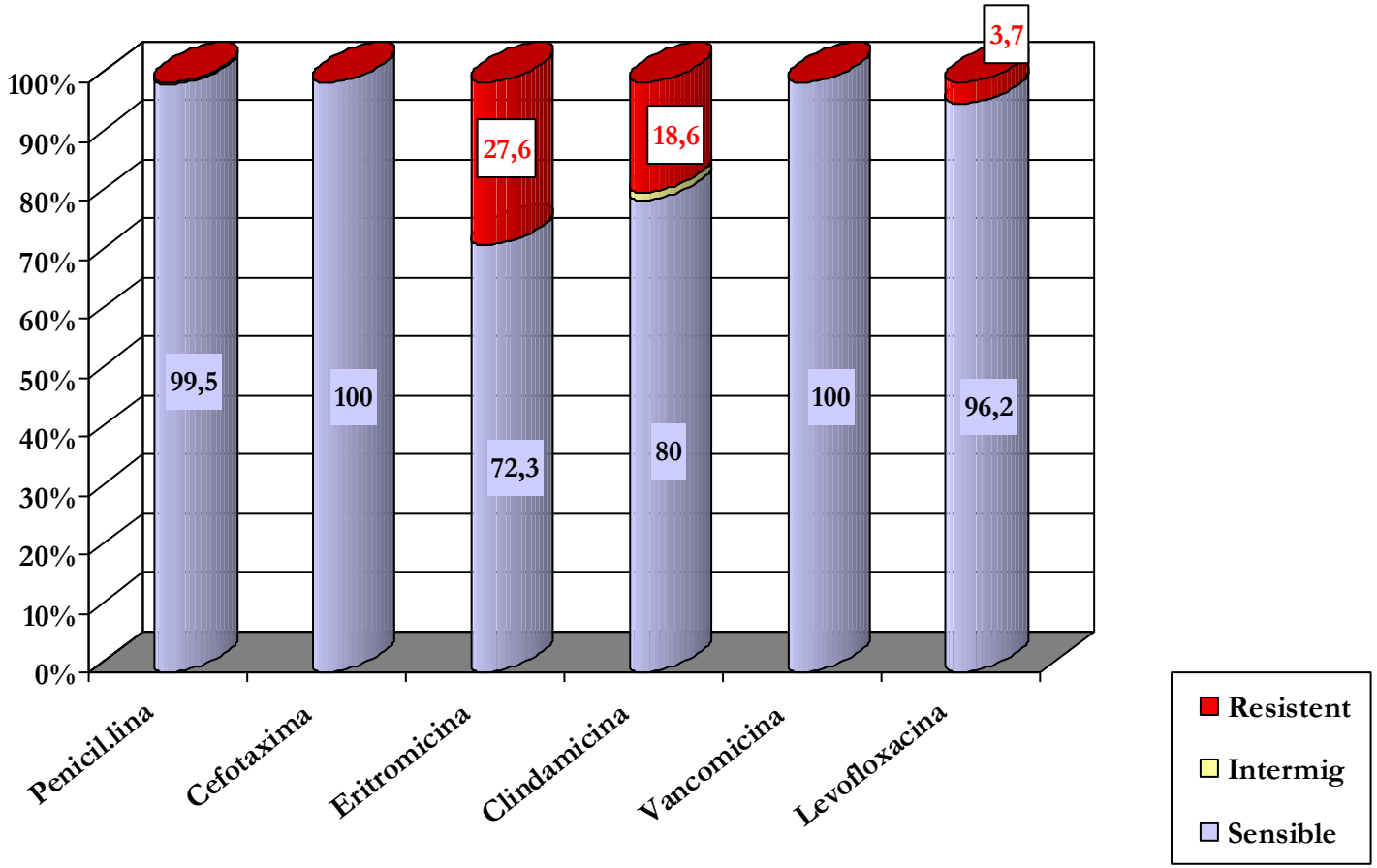
PNEUMOCOCCAL MENINGITIS IN FRENCH CHILDREN BEFORE AND AFTER THE INTRODUCTION OF PNEUMOCOCCAL CONJUGATE VACCINE

Corinne Levy, MD,† Emmanuelle Varon, MD,*‡ Edouard Bingen, PhD,*§ Aurélie Lécuyer, MD,*† Michel Boucherat, MD,† Robert Cohen, MD,*†¶ and The Bacterial Meningitis Study Group*

Abstract: In France, despite a high rate of pneumococcal conjugate vaccine coverage, the number of cases of pneumococcal meningitis in children did not decline significantly between 2001–2002 (n = 264) and 2007–2008 (n = 244). A decline was observed among children <2 years old (185 [70.1%] to 134 [54.9%] cases; $P = 0.0004$), but was counterbalanced by an increase among children ≥2 years old (79 [29.9%] to 110 [45.1%] cases). Mean age increased significantly, from 2.3 (median 0.8) to 3.8 (median 1.5) years. After pneumococcal conjugate vaccine 7 implementation, a wide diversity of serotypes implicated in pneumococcal meningitis was observed; serotypes 19A and 7F were the most frequent.

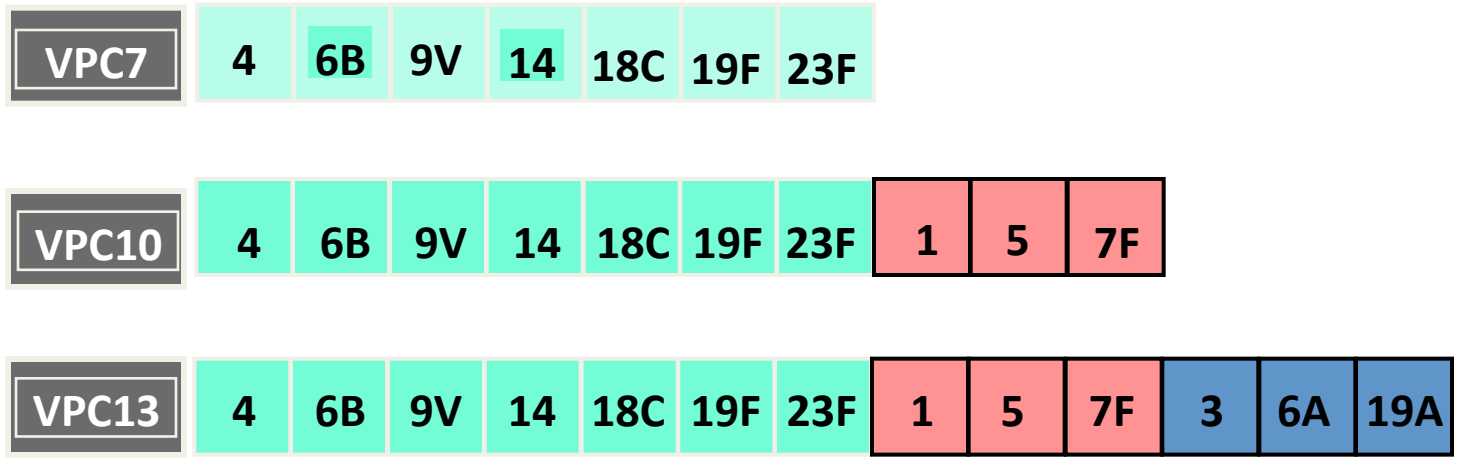
Hospital Universitari Germans Trias i Pujol, 2010

% Sensibilitat



N=217

Vacunes pneumocòccciques conjugades



Ple del Consell Interterritorial del Sistema Nacional de Salut.

Nota de premsa gener 2015

CALENDARIO DE VACUNACIÓN Y SALUD PÚBLICA

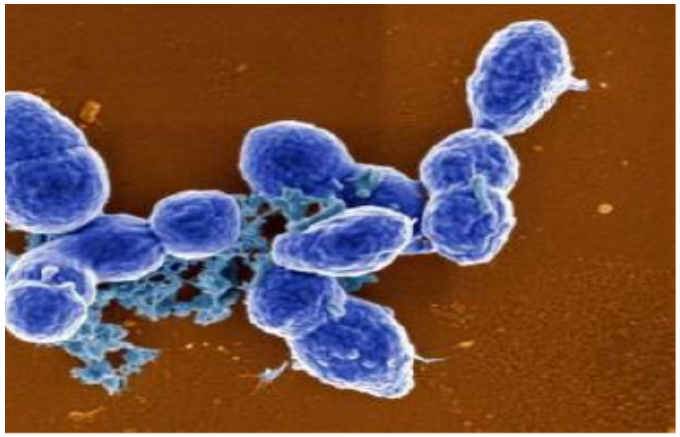
Otro de los principales acuerdos alcanzados es la actualización del Calendario Común de Vacunación Infantil del Sistema Nacional de Salud. Tras haber unificado las edades y las vacunas que se administran a todos los niños, con independencia de su Comunidad Autónoma, el calendario contará con una nueva vacuna, hasta final de 2016 la antineumocócica, que protege frente a la bacteria por neumococo, causante de varias infecciones, las denominadas formas invasoras, que son las más graves.

La vacuna se administrará en el primer año de vida en tres dosis: a los dos, los cuatro y los doce meses. Con su inclusión, a partir de 2016, se da respuesta a las recomendaciones de clínicos, epidemiólogos y pediatras.

Otra modificación del calendario de vacunación es el adelanto de la vacuna del virus de papiloma humano, que protege frente al cáncer de cuello de útero. Se administrará a las niñas de 12 años, en lugar de a los 14, como hasta ahora, para incorporar los últimos cambios en la ficha técnica y mejorar la cobertura de vacunación.

Con estas modificaciones, el calendario de vacunación, que garantiza una cobertura universal y es gratuito, será uno de los más completos de Europa.

Disponible en: https://www.msssi.gob.es/gabinete/notasPrensa.do?id=3526

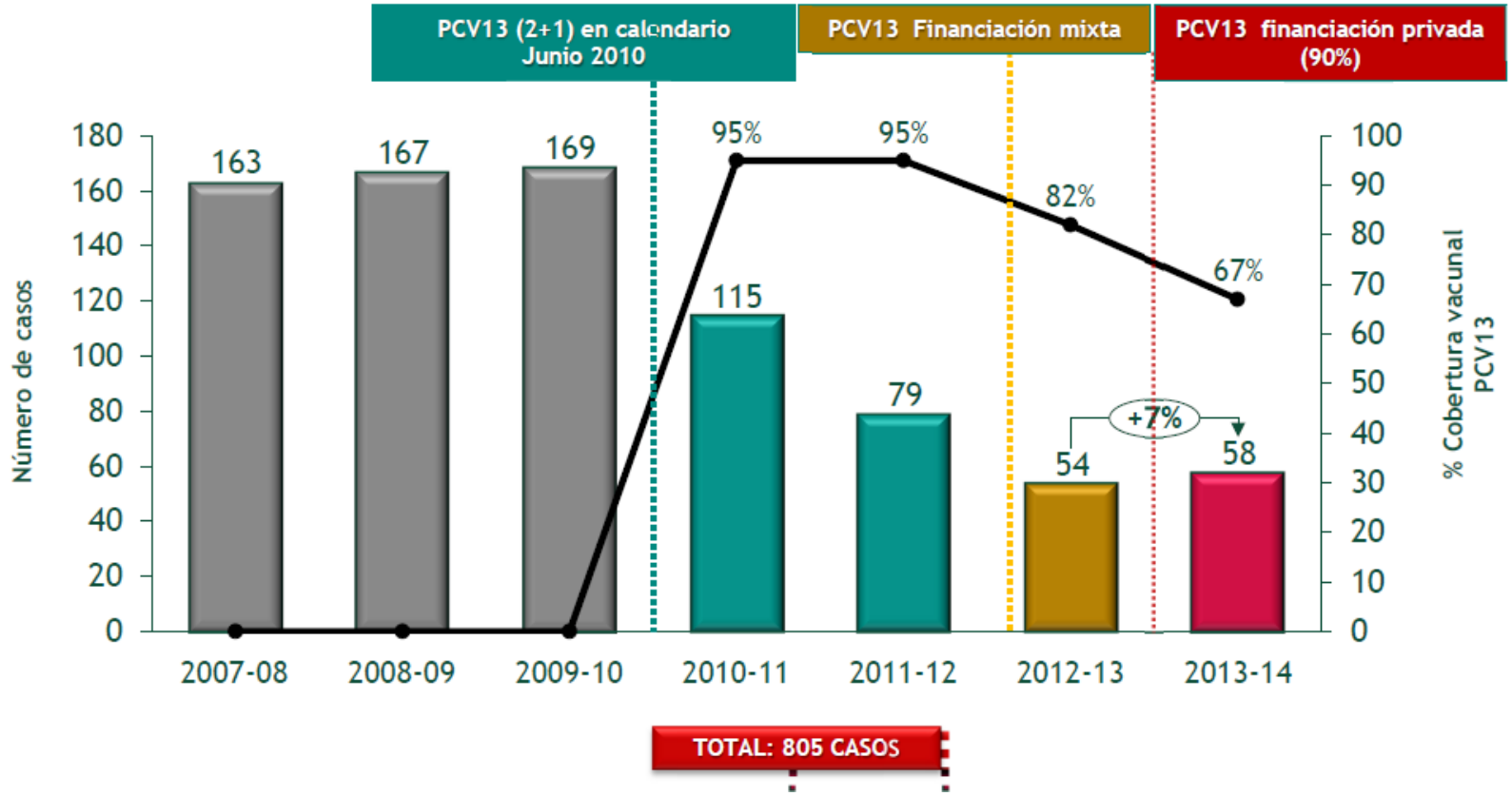


Lo observado vs lo esperado en la "ENI" 2 años después de la retirada de la vacunación de PCV13 del calendario en la Comunidad de Madrid

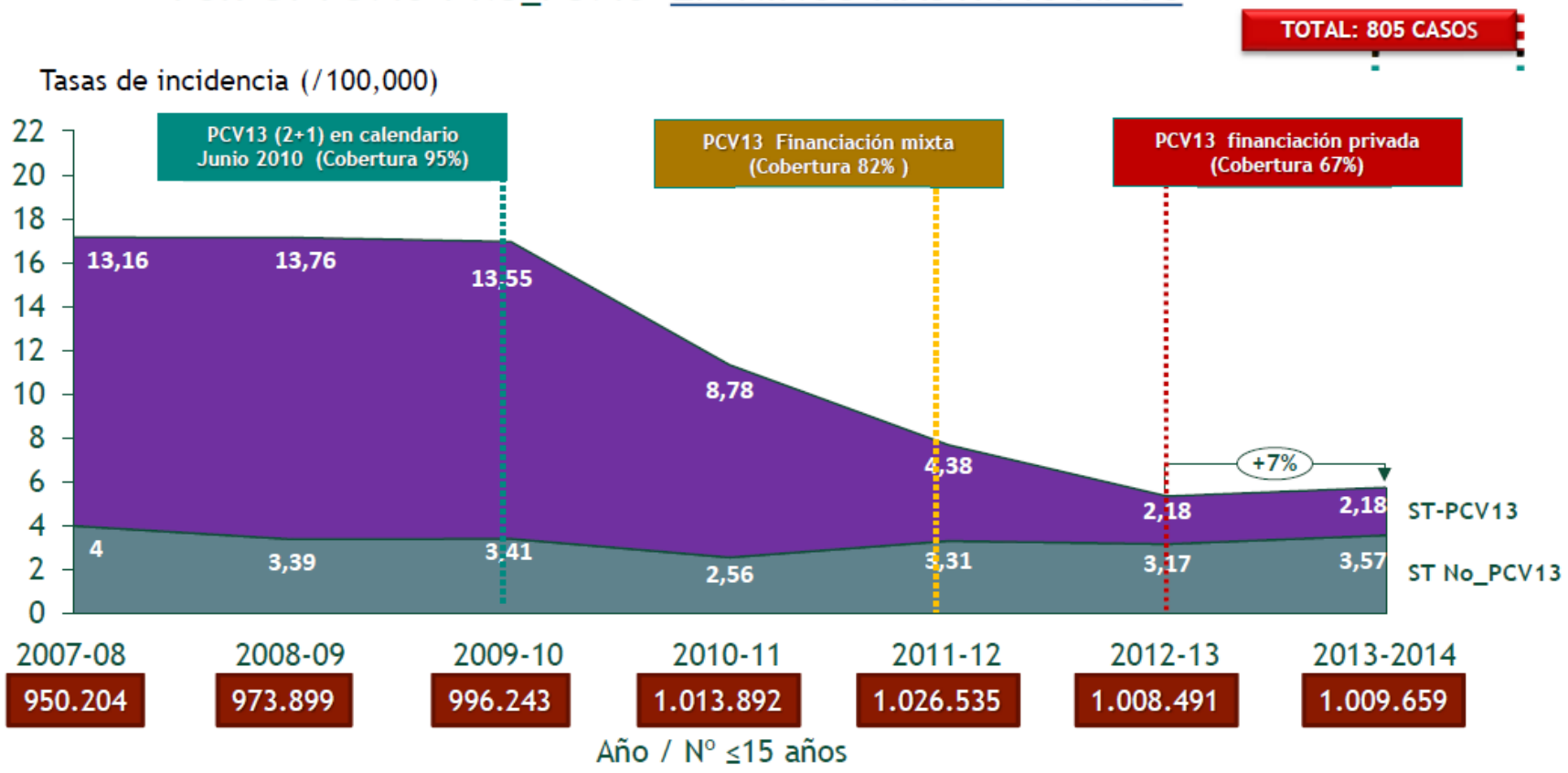
Juan J. Picazo
Hospital Clínico San Carlos. Madrid

Reunión de Expertos
Madrid
28 enero 2015

EVOLUCION EN EL NÚMERO DE CASOS 2007-2014 Y CORRELACIÓN CON LA COBERTURA VACUNAL PCV13 EN MENORES DE 2 AÑOS



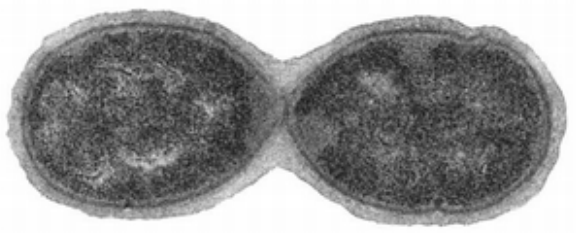
EVOLUCION EN LAS TASAS DE INCIDENCIA DE HOSPITALIZACIONES POR ENI POR ST-PCV13 Y NO_PCV13 EN NIÑOS HASTA 15 AÑOS



Benefits of the pneumococcal immunisation programme in children in the United Kingdom 2006-2014

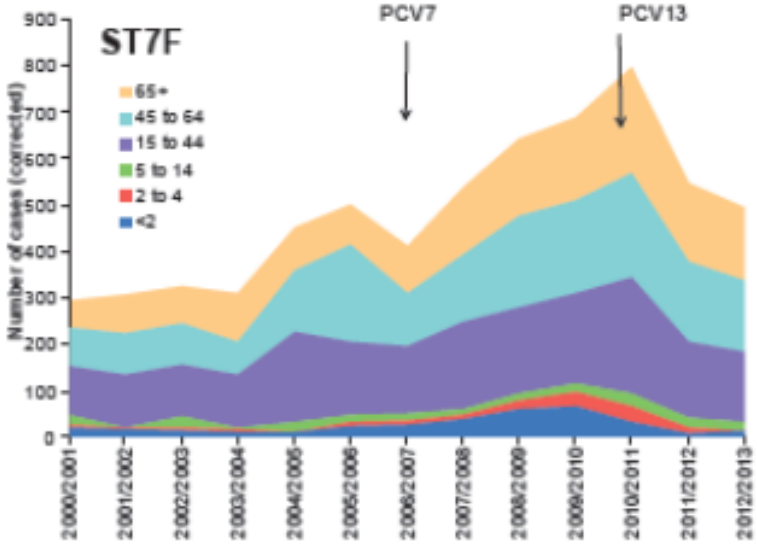
Professor Mary P E Slack

mpeslack@gmail.com

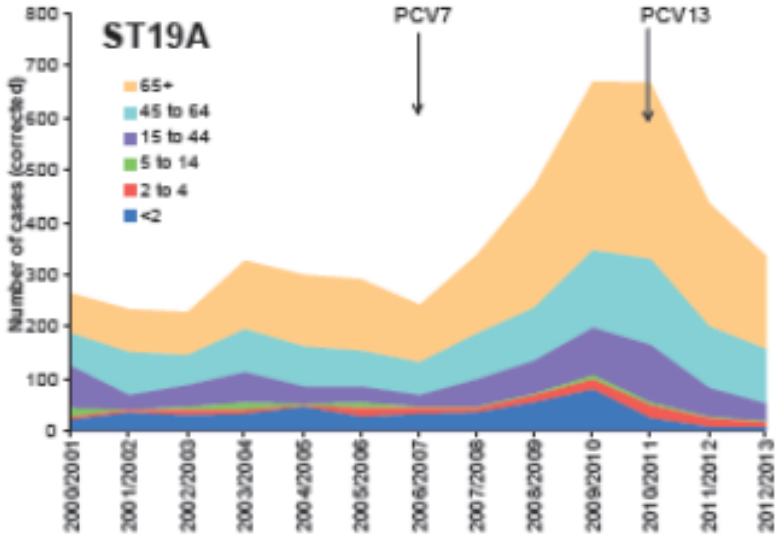


March 2015

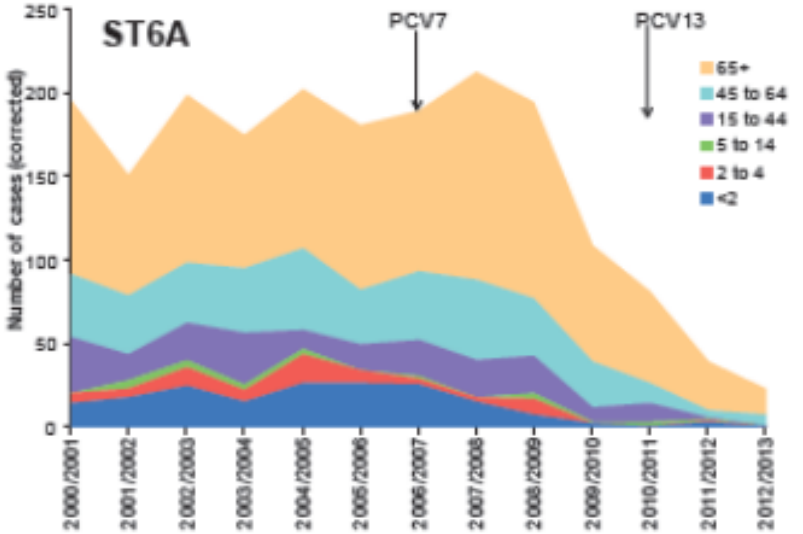
PCV13 serotypes showing a decrease (PHE data)



7F : Age 65 + years IRR : 0.92 (0.69-1.22)



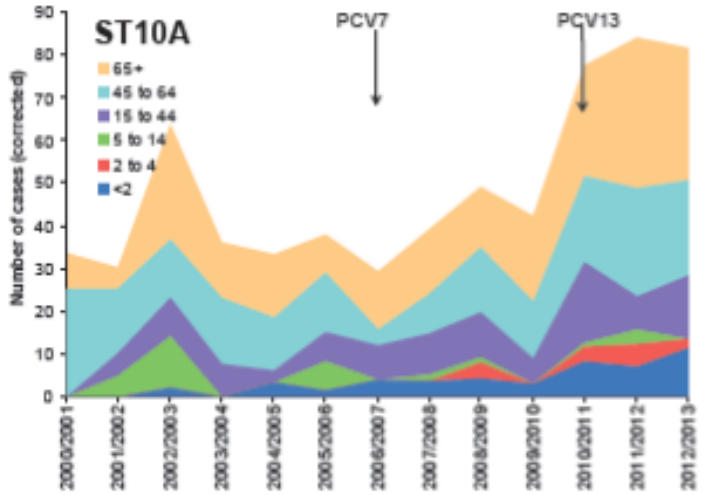
19A : Age 65 + years IRR : 0.64 (0.49-1.22)



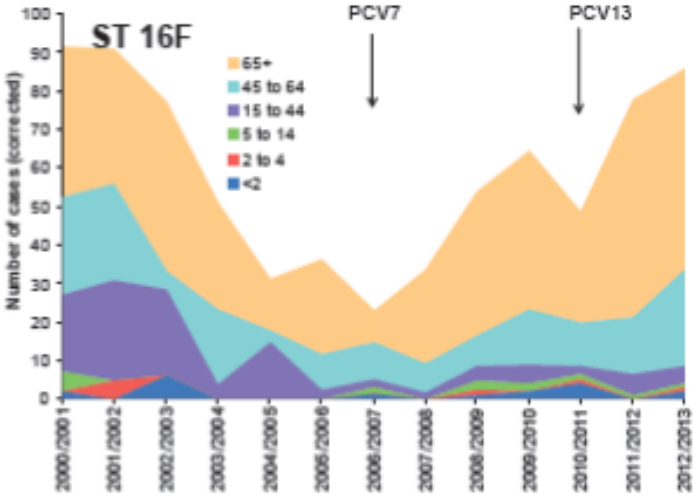
6A : Age 65 + years IRR : 0.17 (0.08.0.37)

Data from PHE enhanced surveillance of IPD in England and Wales

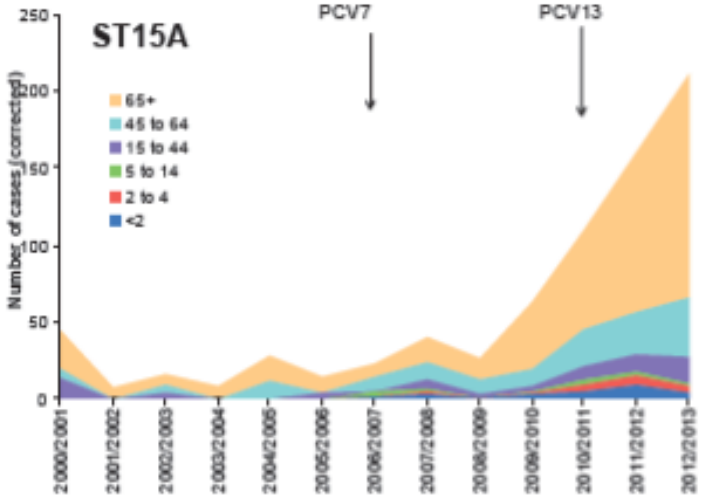
Non-PCV13 serotypes showing an increase (PHE data)



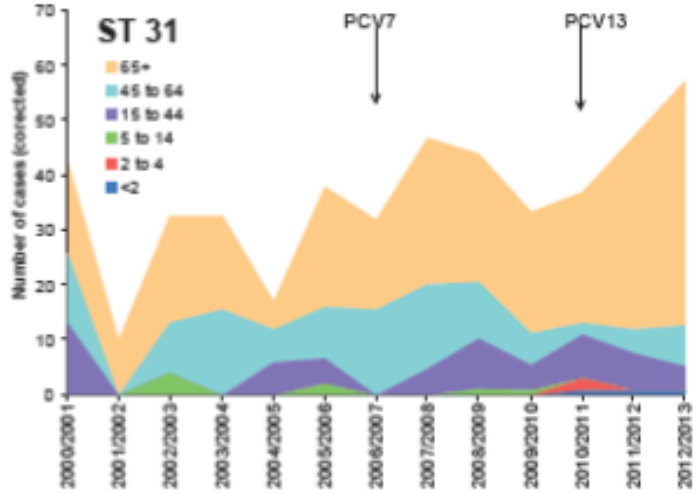
10A : Age 65 + years IRR : 1.81 (0.86-3.77)



16F : For age 65 + years IRR : 1.32 (.078-2.25)



15A : Age 65 + years IRR : 5.03 (3.11-7.92)



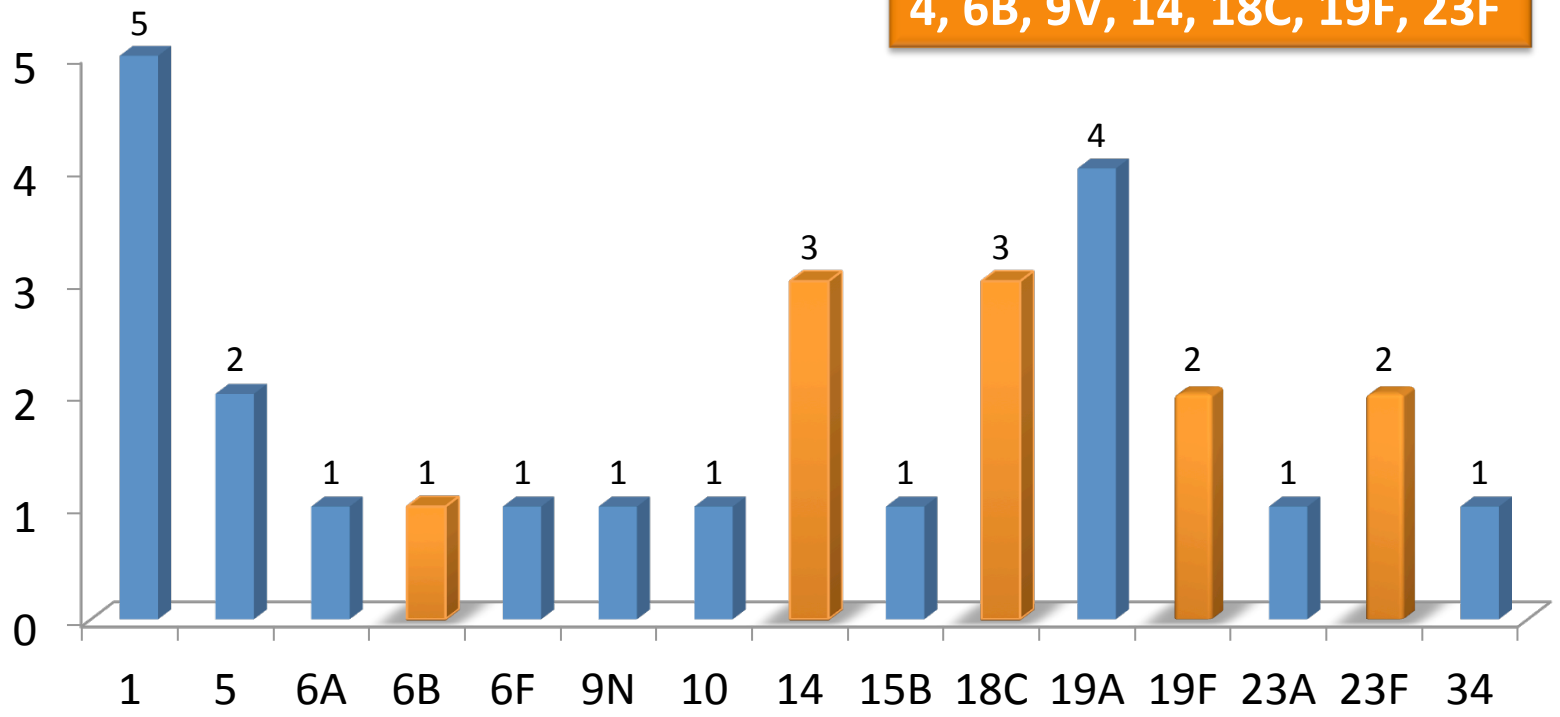
31 : For age 65 + years IRR : 1.95 (1.04-3.66)

Evolució dels serotips de pneumococ a l'Hospital Germans Trias (1995-2014)

Salut/ Germans Trias i Pujol Hospital

Freqüència de serotips en el període pre-VPC7v (1995-2001)

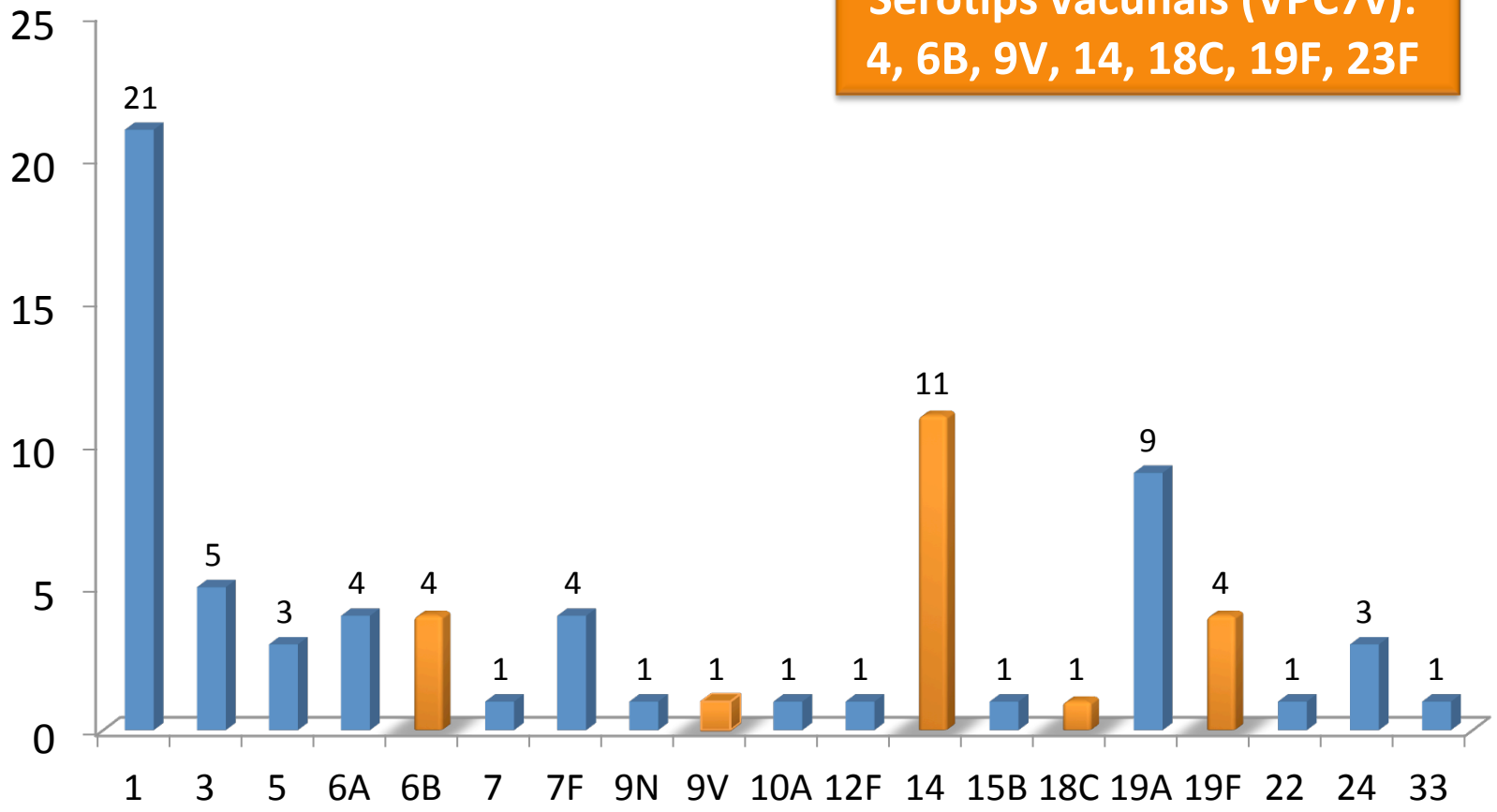
Serotips vacunals (VPC7v): 4, 6B, 9V, 14, 18C, 19F, 23F



Només el 55% dels serotips estan inclosos a la vacuna VPC7v

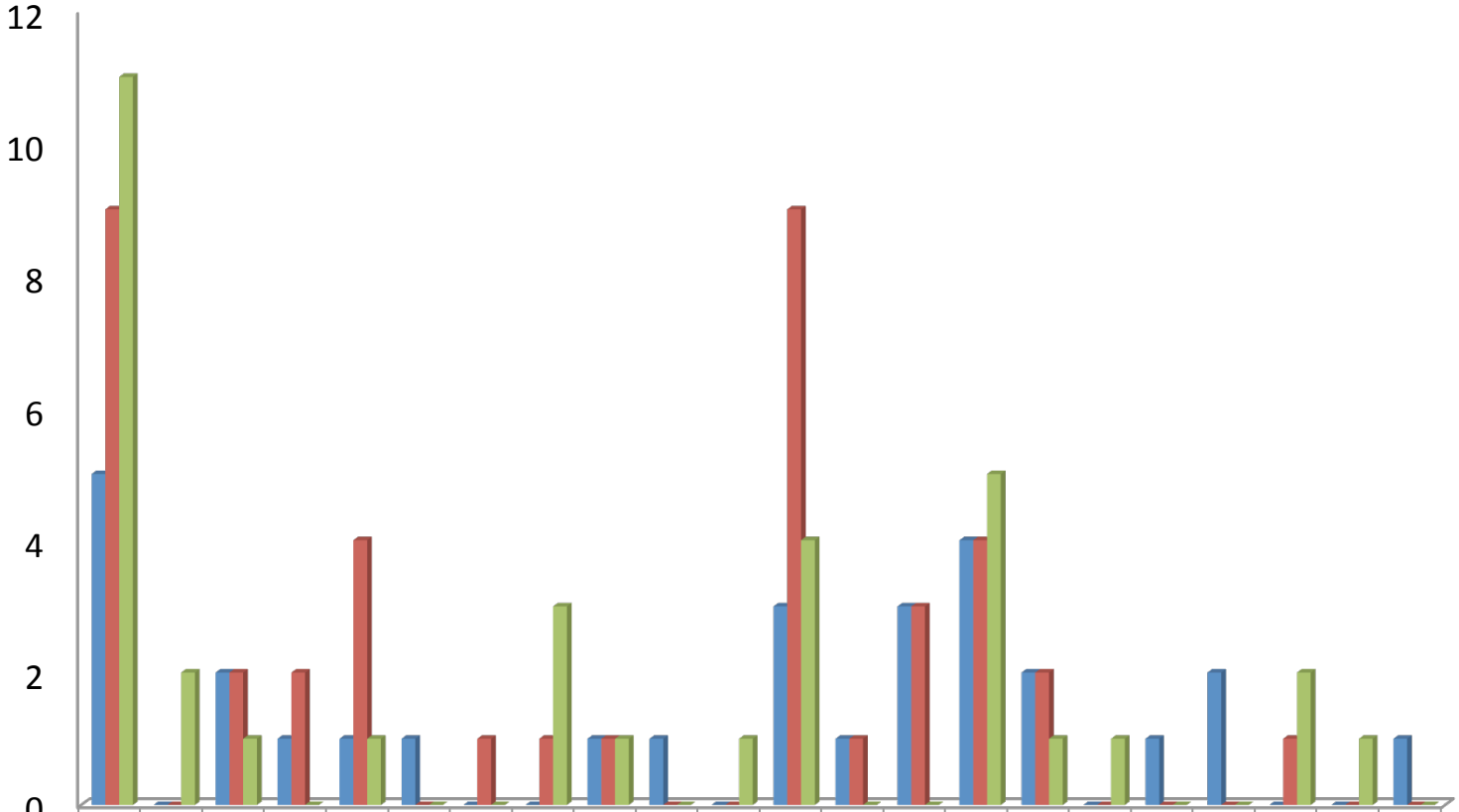
Freqüència de serotips en el període VPC7v (2002-2009)

Serotips vacunals (VPC7v): 4, 6B, 9V, 14, 18C, 19F, 23F



El 27% dels serotips estan inclosos a la vacuna VCN7v

Comparació període pre-VPC7v y període VPC7v



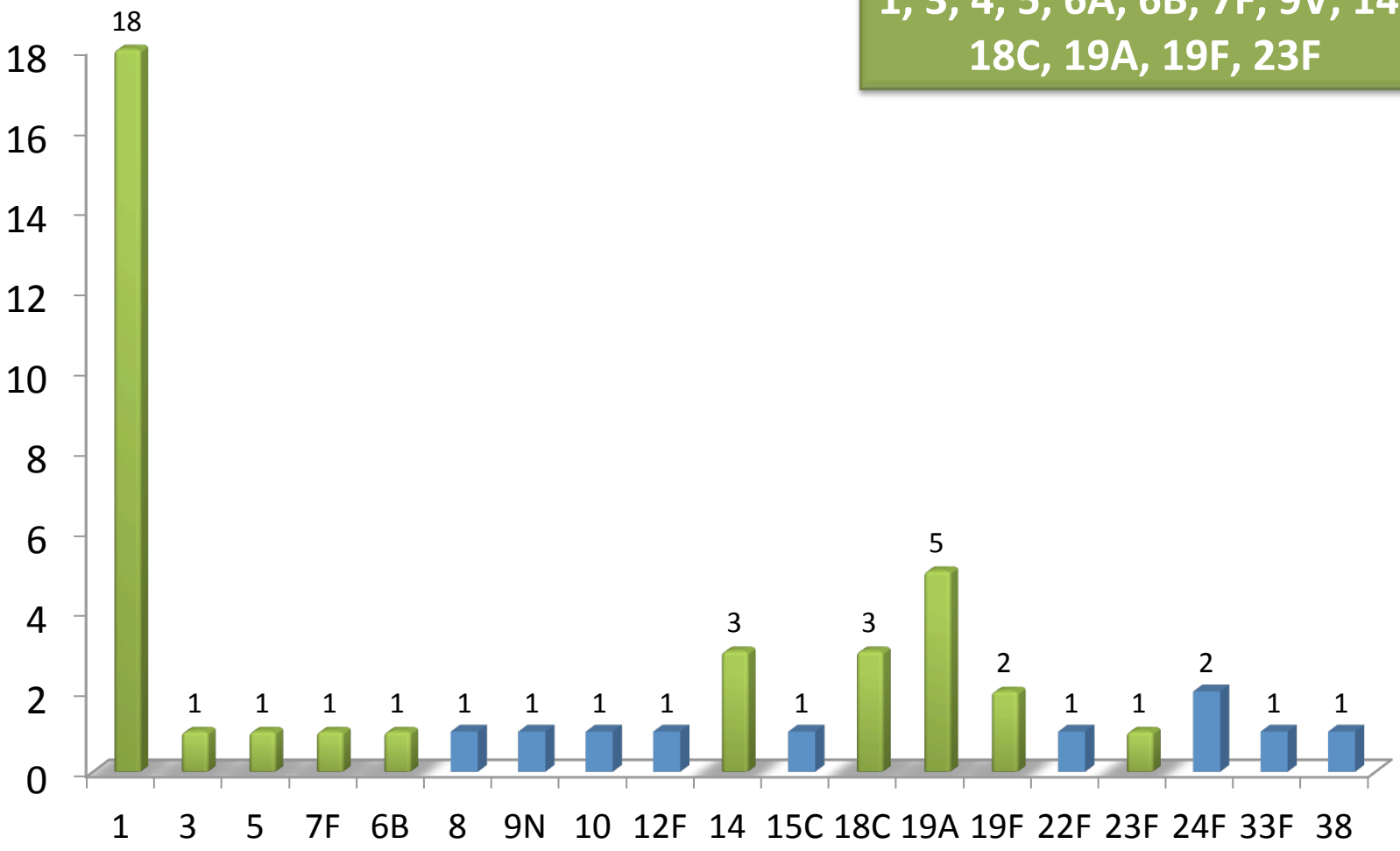
	1	3	5	6A	6B	6F	7	7F	9N	10	12F	14	15B	18C	19A	19F	22	23A	23F	24	33	34
1995-2001	5	0	2	1	1	1	0	0	1	1	0	3	1	3	4	2	0	1	2	0	0	1
2002-2006	9	0	2	2	4	0	1	1	1	0	0	9	1	3	4	2	0	0	0	1	0	0
2006-2009	11	2	1	0	1	0	0	3	1	0	1	4	0	0	5	1	1	0	0	2	1	0

Vacuna pneumocòccica conjugada 7-valent

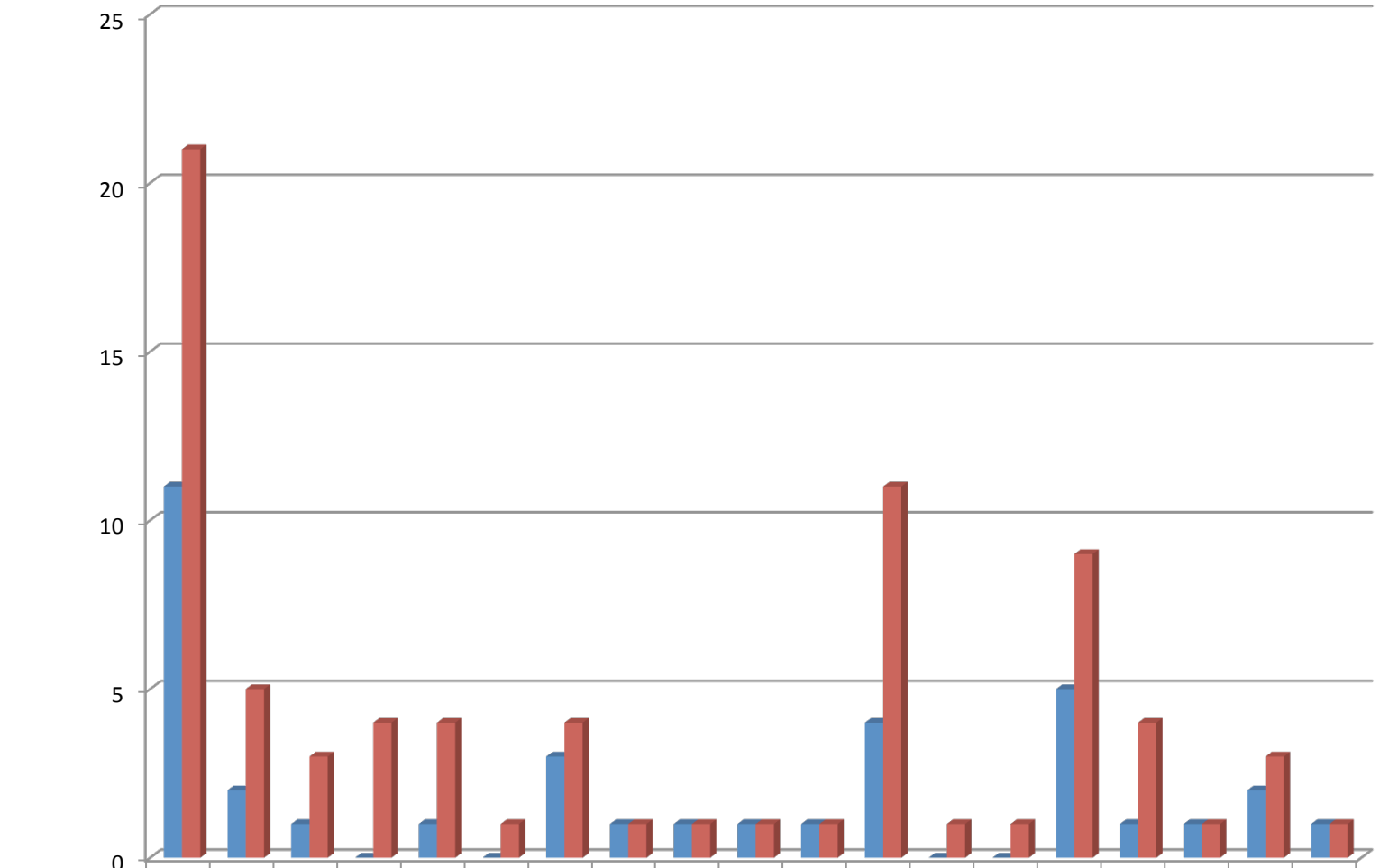
- Variació dels quadres clínics
  - Augment de la freqüència de:
    - EMPIEMES
    - PNEUMÒNIES BACTERIÈMIQUES
  - Serotips implicats en aquest ascens: 1, 19A, 3, 7F
  - Reducció de la freqüència de:
    - Bacteriemia pneumocòcica
  - Poca repercusió en la freqüència de meningitis

Freqüència de serotips en el període VPC13v (2011-2014)

Serotips vacunals (VPC13v): 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 23F



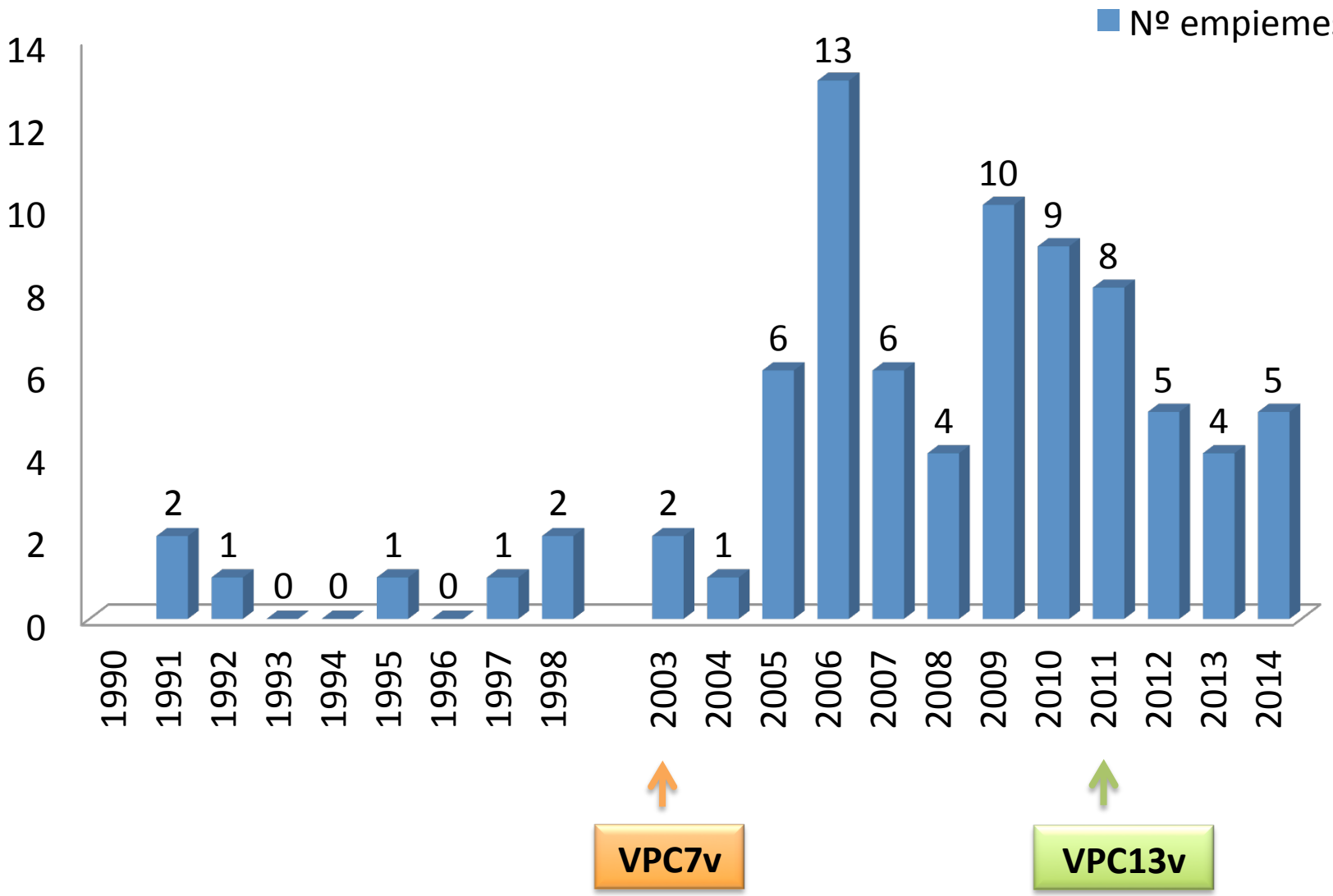
Comparació període VPC7v i període VPC13v



	1	3	5	6A	6B	7	7F	9N	9V	10A	12F	14	15B	15C	19A	19F	22	24	33
2006-2009	11	2	1	0	1	0	3	1	1	1	1	4	0	0	5	1	1	2	1
2011-2014	21	5	3	4	4	1	4	1	1	1	1	11	1	1	9	4	1	3	1

Freqüència empiemes pneumocòcics

Germans Trias i Pujol Hospital



ELSEVIER

Enfermedades Infecciosas y Microbiología Clínica

www.elsevier.es/eimc

Editorial Carlos Rodrigo, Maria Méndez

Impact of pneumococcal vaccination on clinical forms of invasive *Streptococcus pneumoniae* infection in pediatrics population

This study contributes to confirm the variable impact that immunization with the heptavalent pneumococcal conjugate vaccine has had in different populations. In the pediatric population of Catalonia, although the total number of invasive infections was reduced at the expense of the less serious entity (occult bacteremia), the most severe form (meningitis) was little changed and the number of severe pneumonias increased greatly. And, in general, this has ended up being the evolution in all places, reason why the initial heptavalent vaccine has been replaced by the 10-valent vaccine (where they do not have much presence of serotype 19A) or more usually the 13-valent (the one chosen in Spain). These, until now, have come to correct the situation by containing the main serotypes responsible for the serious forms that emerged during the heptavalent vaccine time.[20]

Epidemiologia de la malaltia pneumocòccica invasiva a Catalunya: informe 2017-2018

Sistema de notificació microbiològica de Catalunya (SNMC)

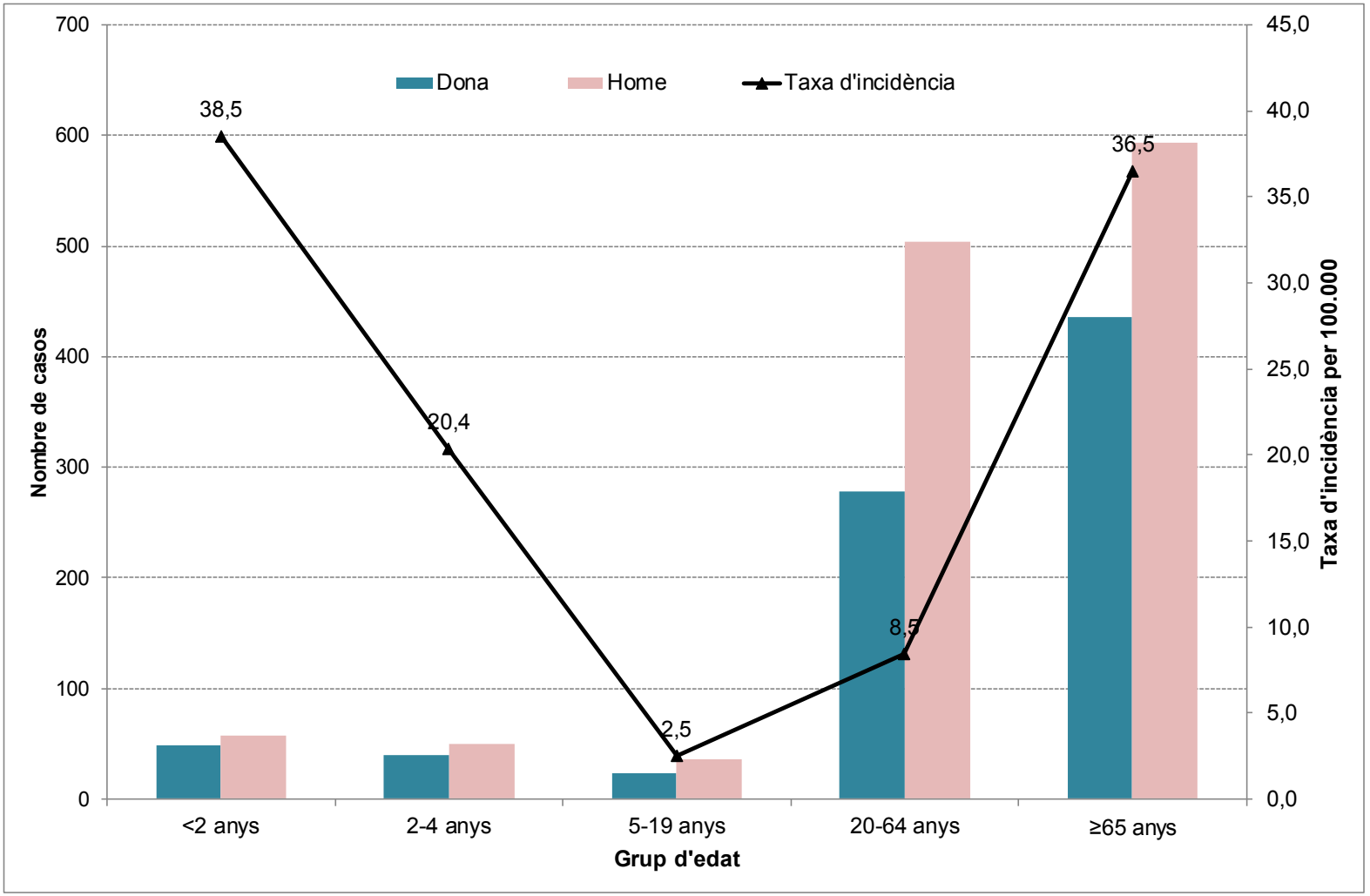
Sub-direcció General de Vigilància i Resposta a Emergències de Salut Pública

15 d'octubre de 2020

Generalitat de Catalunya
Departament de Salut

S/Sistema de Salut de Catalunya

Figura 1. Incidència d'MPI segons el grup d'edat i sexe. Catalunya, 2017-2018



Font: Sistema de notificació microbiològica de Catalunya. Sub-direcció General de Vigilància i Resposta a Emergències de Salut Pública. Agència de Salut Pública de Catalunya.

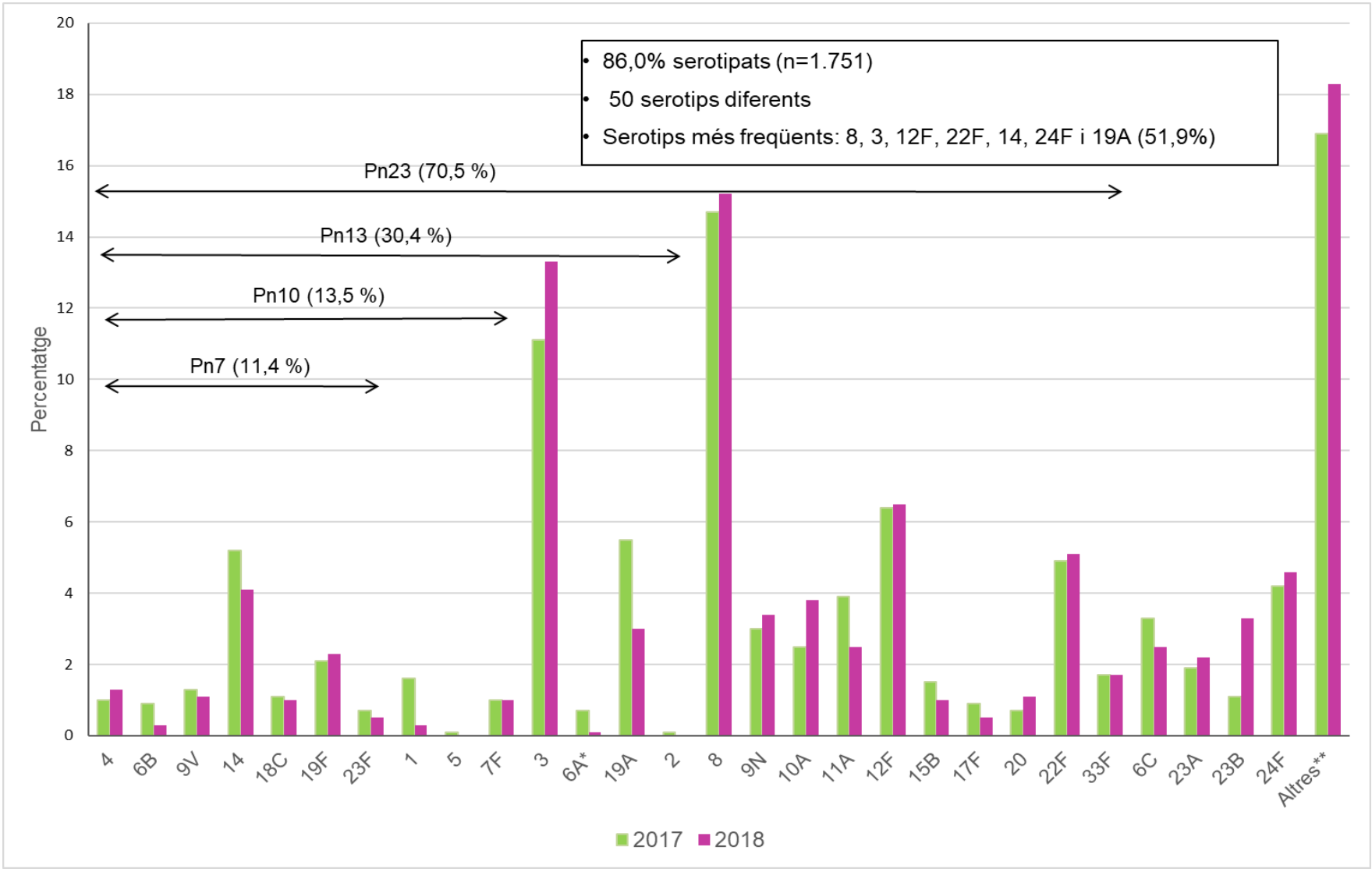
Taula 1. Incidència de Malaltia pneumocòccica invasiva per grups d'edat i anys. Catalunya, 2014-2018

Grup d'edat	2014 Nre.	2014 Taxa*	2015 Nre.	2015 Taxa*	2016 Nre.	2016 Taxa*	2017 Nre.	2017 Taxa*	2018 Nre.	2018 Taxa*
<5a	97	**24,5**	117	**30,6**	103	**27,8**	93	**25,6**	103	**29,1**
<2a	51	**34,6**	65	**45,8**	56	**39,6**	55	**39,4**	51	**37,6**
2-4a	46	**18,5**	52	**21,6**	47	**20,5**	38	**17,0**	52	**23,8**
5-19a	26	**2,3**	37	**3,2**	37	**3,2**	31	**2,6**	28	**2,3**
20-64a	318	**6,8**	348	**7,5**	329	**7,1**	391	**8,5**	391	**8,4**
≥65a	388	**29,0**	449	**33,0**	448	**32,5**	496	**35,5**	534	**37,6**
Total	829	**11,0**	951	**12,7**	917	**12,2**	1.011	**13,4**	1.056	**13,9**

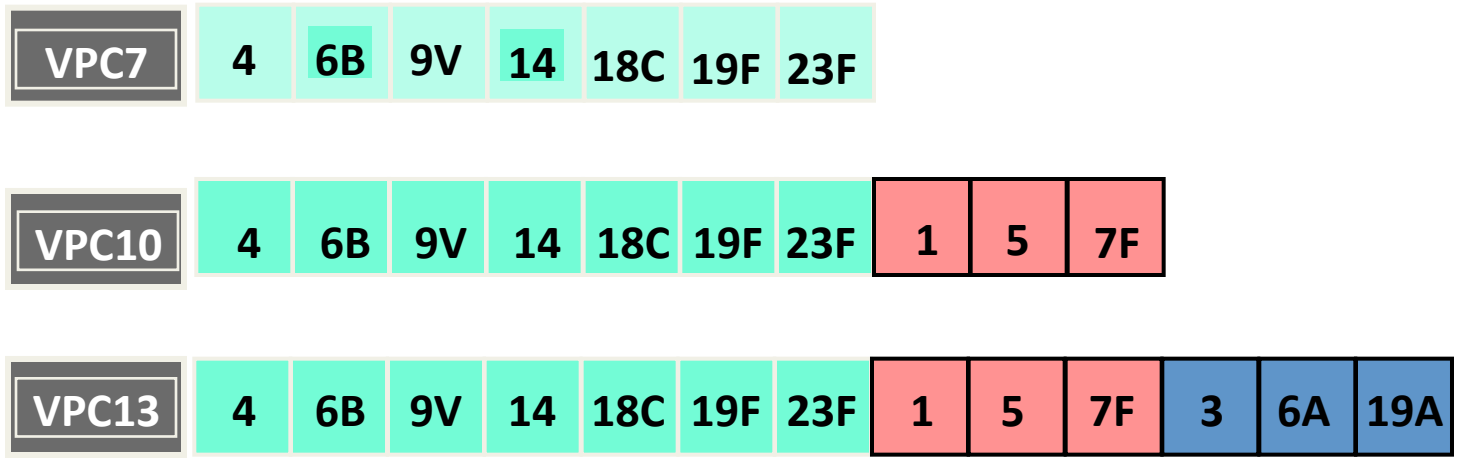
Font: Sistema de notificació microbiològica de Catalunya. Sub-direcció General de Vigilància i Resposta a Emergències de Salut Pública. Agència de Salut Pública de Catalunya.

Nre.: nombre de casos

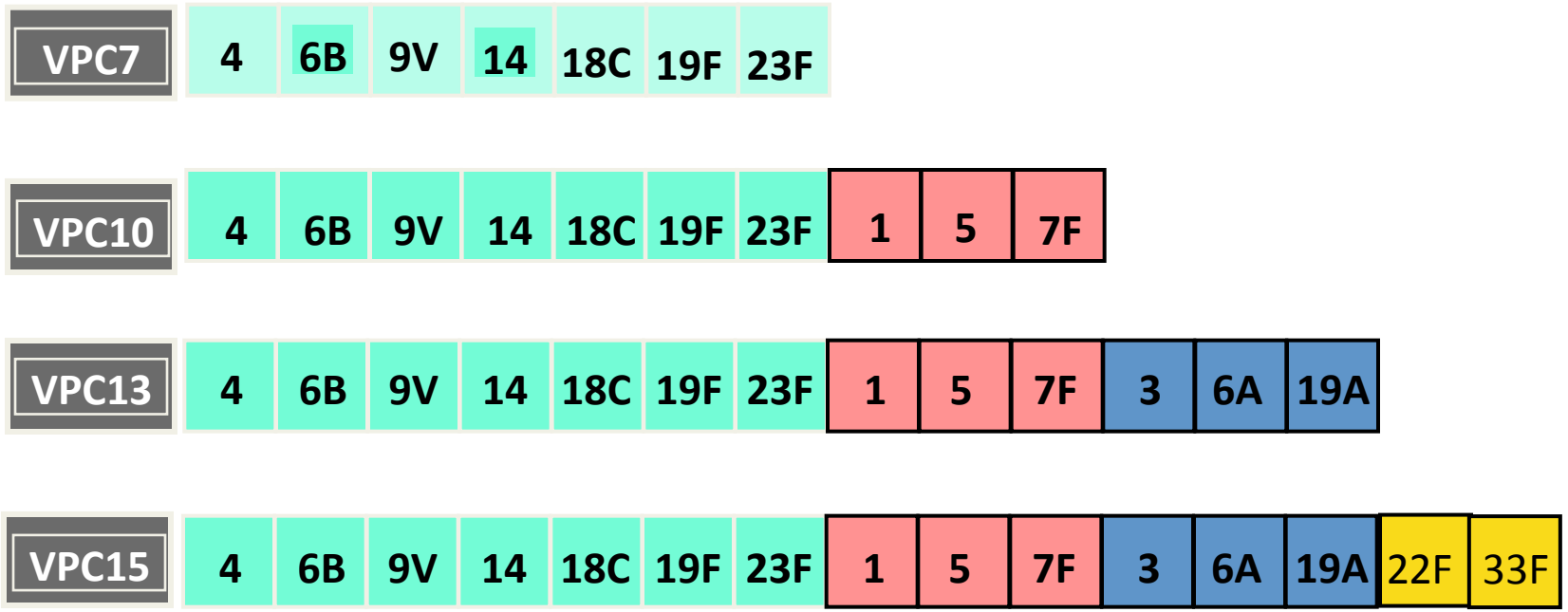
* Taxa per 100.000 persones/any.


• 86,0% serotipats (n=1.751)
• 50 serotips diferents
• Serotips més freqüents: 8, 3, 12F, 22F, 14, 24F i 19A (51,9%)
Pn23 (70,5 %)
Pn13 (30,4 %)
Pn10 (13,5 %)
Pn7 (11,4 %)
Percentatge
0
2
4
6
8
10
12
14
16
18
20
4
6B
9V
14
18C
19F
23F
1
5
7F
3
6A*
19A
2
8
9N
10A
11A
12F
15B
17F
20
22F
33F
6C
23A
23B
24F
Altres**
2017
2018

Vacunes pneumocòccciques conjugades



Vacunes pneumocòccciques conjugades



Vaccine 34 (2016) 2527–2530

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Brief report

Invasive *Streptococcus pneumoniae* in Canada, 2011–2014: Characterization of new candidate 15-valent pneumococcal conjugate vaccine serotypes 22F and 33F

Alyssa R. Golden[a,*], Heather J. Adam[a,b], George G. Zhanel[a], the Canadian Antimicrobial Resistance Alliance (CARA)

Serotype 22F isolates were highly clonal (ST433), with two isolates showing high relatedness to MDR international clone Sweden^{15A}-25 (ST63). Conversely, serotype 33F showed greater antimicrobial resistance, greater genetic diversity and a higher proportion of MDR isolates (8.8%, 14/160). The prevalence of serotype 33F increased significantly during 2011–2014 ($p = 0.005$).

frontiers in Microbiology

ORIGINAL RESEARCH
published: 27 February 2020
doi: 10.3389/fmicb.2020.00309

Clinical Relevance and Molecular Pathogenesis of the Emerging Serotypes 22F and 33F of *Streptococcus pneumoniae* in Spain

Julio Sempere[1], Sara de Miguel[2], Fernando González-Camacho[1], José Yuste[1,3] and Mirian Domenech[1]**

The use of clinical isolates of different origin, demonstrated that pediatric isolates of serotypes 22F and 33F formed better biofilms than adult isolates and this was statistically significant. Overall, the emergence of additional serotypes, especially 22F, could be associated to an enhanced ability to divert the host immune response that markedly increased in a biofilm state. Our findings demonstrate that pediatric isolates of 22F and 33F, that form better biofilm than isolates from adults, could have an advantage to colonize the nasopharynx of children and therefore, be important in carriage and subsequent dissemination to the elderly.

Vaccine 36 (2018) 6883–6891

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Safety and immunogenicity of 15-valent pneumococcal conjugate vaccine (PCV15) in healthy infants ☆

David Greenberg [a], Patricia A. Hoover [b], Timo Vesikari [c], Christopher Peltier [d], David C. Hurley [e], Richard D. McFetridge [b], Michael Dallas [b], Jonathan Hartzel [b], Rocio D. Marchese [b], Beth-Ann G. Coller [b], Jon E. Stek [b], Chitrananda Abeygunawardana [b], Michael A. Winters [b], John E. MacNair [b], Narahari S. Pujar [b], Luwy Musey [b,*]

Results: Safety profiles were comparable across vaccination groups. At postdose-3, both PCV15 formulations were non-inferior to PCV13 for 10 of 13 shared serotypes but failed non-inferiority for 3 serotypes (6A, 6B, and 19A) based on proportion of subjects achieving IgG GMC $\geq$0.35 μg/mL. Adjuvanted PCV15 and nonadjuvanted PCV15 were non-inferior to PCV13 for 11 and 8 shared serotypes, respectively, based on postdose 3 comparisons of GMC ratios. PCV15 induced higher antibodies to serotypes 3, 22F, and 33F than PCV13.

Conclusions: PCV15 displayed acceptable safety profile and induced IgG and OPA to all 15 vaccine serotypes at levels comparable to PCV13 for 10 of 13 shared serotypes.

HUMAN VACCINES & IMMUNOTHERAPEUTICS
2019, VOL. 15, NO. 3, 540–548
https://doi.org/10.1080/21645515.2018.1532250

Taylor & Francis
Taylor & Francis Group

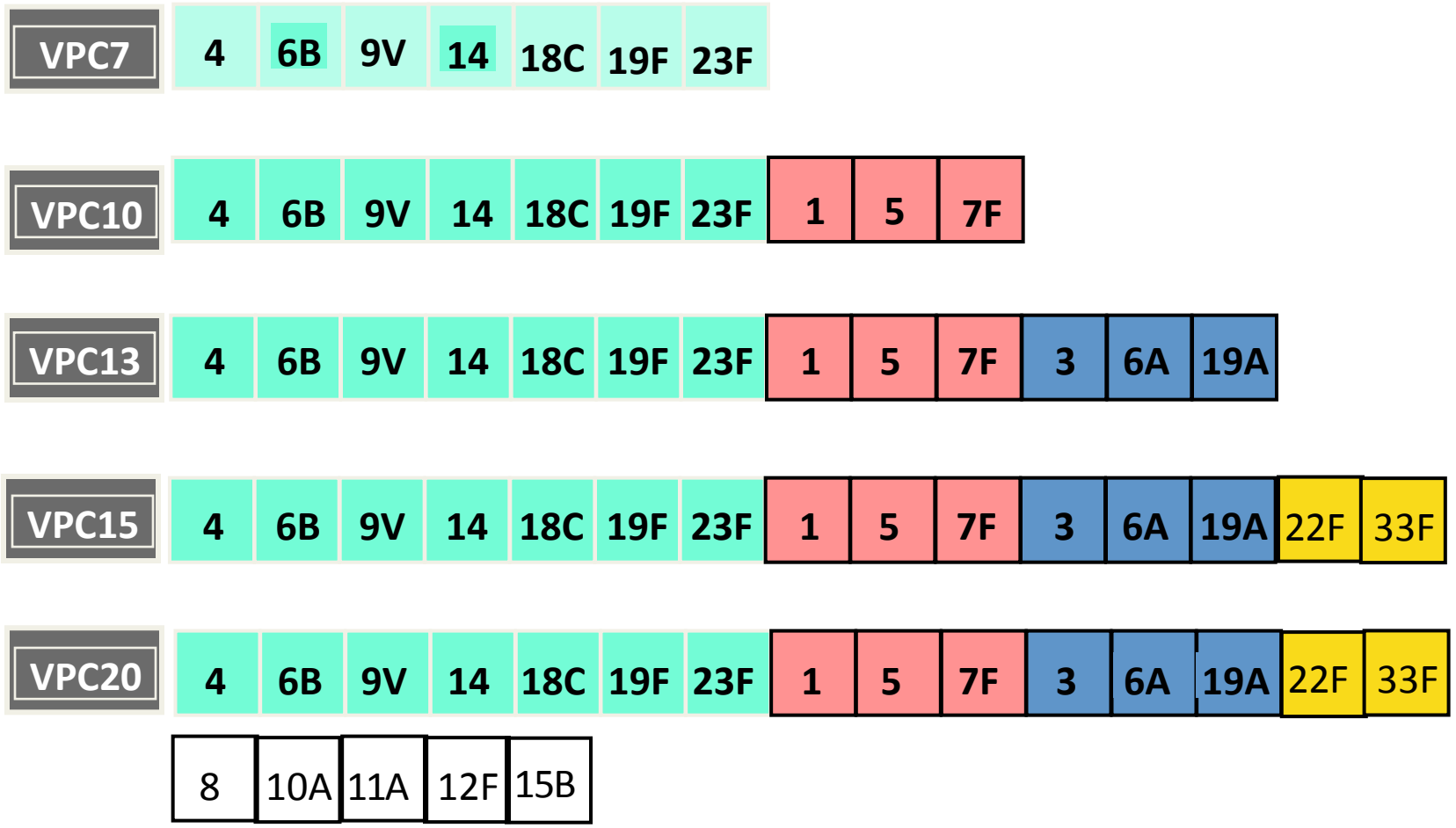
RESEARCH PAPER

Safety and immunogenicity of 15-valent pneumococcal conjugate vaccine compared to 13-valent pneumococcal conjugate vaccine in adults ≥65 years of age previously vaccinated with 23-valent pneumococcal polysaccharide vaccine

James T. Peterson[a], Helen L. Stacey [b], John E. MacNair[c], Jianing Li[c], Jonathan S. Hartzel[c], Tina M. Sterling[c], Patrice Benner[c], Gretchen M. Tamms[c], and Luwy K. Musey[c]

Results: Safety profiles were comparable between PCV15 and PCV13 recipients. Following vaccination, serotype-specific antibody responses for the 13 shared serotypes were generally comparable between recipients of PCV15 and PCV13 for IgG GMCs, OPA GMTs, and geometric mean fold rises (GMFRs) and percentages of subjects with ≥ 4-fold-rise from baseline for both IgG and OPA. Recipients of PCV15 had numerically higher antibody responses than PCV13 for two serotypes unique to PCV15 (22F, 33F).
Conclusion: PCV15 was generally well tolerated and induced high levels of IgG and OPA antibodies to all 15 serotypes included in the vaccine when given as a single dose to adults ≥ 65 years of age previously vaccinated with PPV23.

Vacunes pneumocòccciques conjugades



Vaccine 39 (2021) 5428–5435

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

A phase 3, randomized, double-blind study to evaluate the immunogenicity and safety of 3 lots of 20-valent pneumococcal conjugate vaccine in pneumococcal vaccine-naive adults 18 through 49 years of age

Nicola P. Klein [a], Paula Peyrani [b], Kari Yacisin [c,*], Nicole Caldwell [c], Xia Xu [c], Ingrid L. Scully [d], Daniel A. Scott [c], Kathrin U. Jansen [d], William C. Gruber [d], Wendy Watson [c]

Results: Equivalence in immune responses (OPA geometric mean titers) for all 20 vaccine serotypes was demonstrated across the 3 PCV20 lots. Robust responses, assessed by OPA geometric mean fold rises, percentage of participants achieving ≥4-fold rises, and percentage of participants with OPA titers ≥lower limit of quantitation, were observed after PCV20. Reported rates of local reactions, systemic events, and AEs were similar between the pooled PCV20 lots and PCV13; most events were mild or moderate. Reported rates of SAEs and NDCMCs were low and similar between the PCV20 and PCV13 groups.

Conclusions: Three different lots of PCV20 demonstrated robust and consistent immunogenicity. The safety and tolerability of PCV20 was acceptable and similar to that of PCV13. (Clinicaltrials.gov: NCT03828617).

Clinical Infectious Diseases

MAJOR ARTICLE

IDSA
Infectious Diseases Society of America

Safety, Tolerability, and Immunogenicity of a 20-Valent Pneumococcal Conjugate Vaccine (PCV20) in Adults 60 to 64 Years of Age

Donald Hurley,[1] Carl Griffin,[2] Mariano Young Jr,[3] Daniel A. Scott,[3] Michael W. Pride,[4] Ingrid L. Scully,[4] John Ginis,[3] Joseph Severs,[4] Kathrin U. Jansen,[4] William C. Gruber,[4] and Wendy Watson[3]

Results. Local reaction and systemic event rates were similar after vaccination with PCV20 or PCV13; no serious vaccine-related AEs were reported. In the PCV20 group, functional immune responses as measured by OPA were robust for all 20 serotypes included in the vaccine, with geometric mean fold rises from baseline ranging from 6.0 to 113.4.

Conclusions. PCV20 was well tolerated in adults 60 to 64 years of age, with a safety profile consistent with historical experience of PCVs in this age group. Substantial OPA responses were elicited against all serotypes. Results demonstrate the potential for PCV20 to expand pneumococcal disease protection.

Clinical Infectious Diseases

MAJOR ARTICLE 2020

IDSA Infectious Diseases Society of America

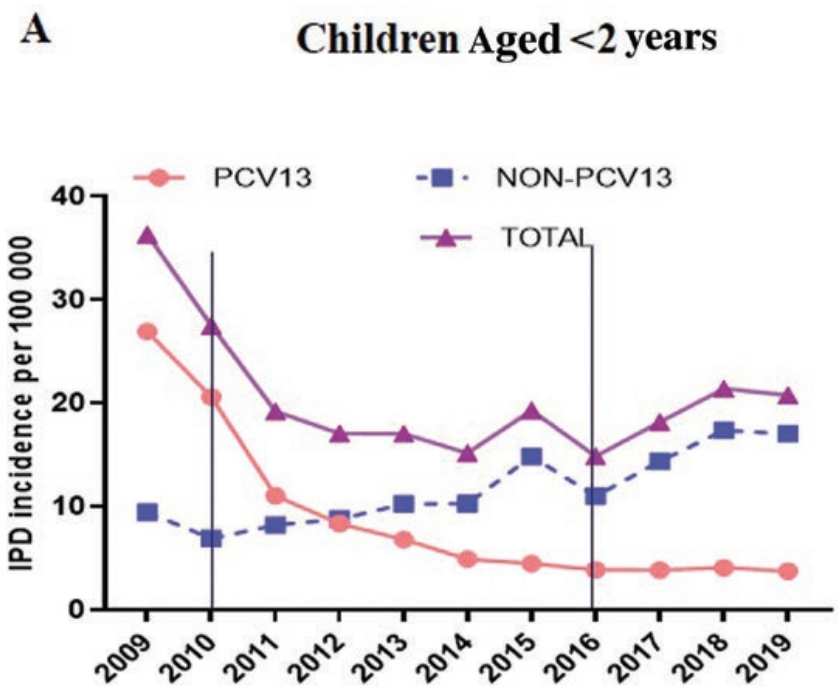
Nationwide Trends of Invasive Pneumococcal Disease in Spain From 2009 Through 2019 in Children and Adults During the Pneumococcal Conjugate Vaccine Era

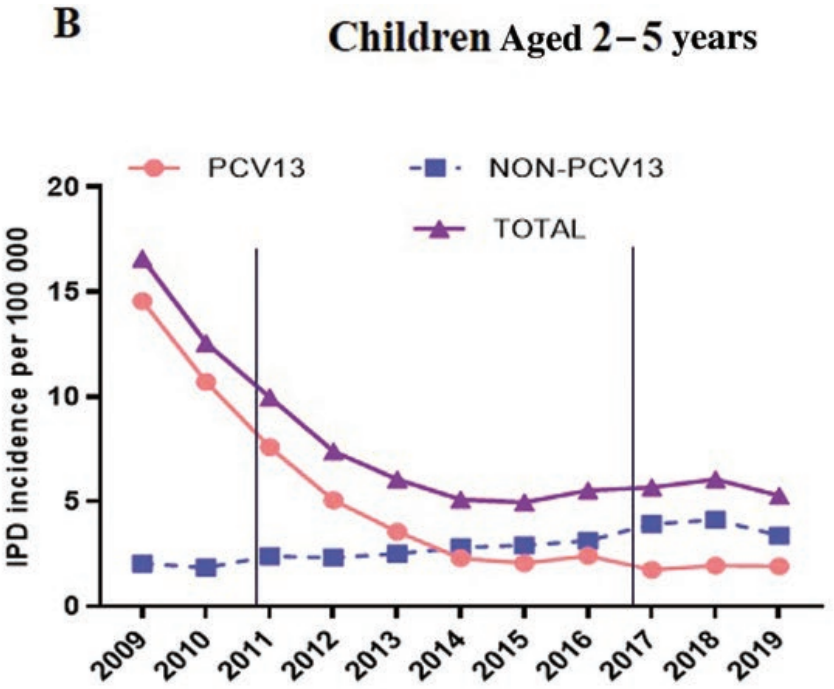
Sara de Miguel,[1,2,a] Mirian Domenech,[1,a] Fernando González-Camacho,[1] Julio Sempere,[1] Dolores Vicioso,[1] Juan Carlos Sanz,[3,4] Luis García Comas,[2] Carmen Ardanuy,[5,6] Asunción Fenoll,[1] and Jose Yuste[1,6]

Results. The overall reductions in IPD cases by PCV13 serotypes in children and adults were 88% and 59%, respectively, during 2009–2019, with a constant increase in serotype 8 in adults since 2015. IPD cases by additional serotypes covered by PPV23 increased from 20% in 2009 to 52% in 2019. In children, serotype 24F was the most frequent in 2019, whereas serotypes 3 and 8 accounted for 36% of IPD cases in adults. Introduction of PCV13 or PPV23 in the adult calendar of certain Spanish regions reduced the IPD cases by PCV13 serotypes by up to 25% and 11%, respectively, showing a decrease of serotype 3 when PCV13 was used.

Conclusions. Use of PCV13 in children has affected the epidemiology, reducing the burden of IPD in children but also in adults by herd protection; however, the increase in serotype 8 in adults is worrisome. Vaccination with PCV13 in adults seems to control IPD cases by PCV13 serotypes including serotype 3.

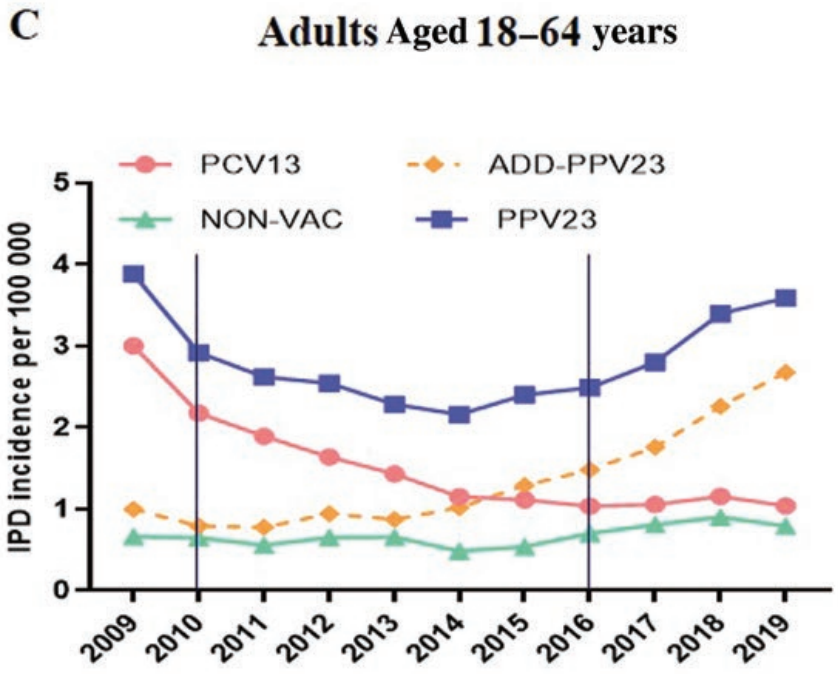
Trends of IPD in Spain in pediatric population

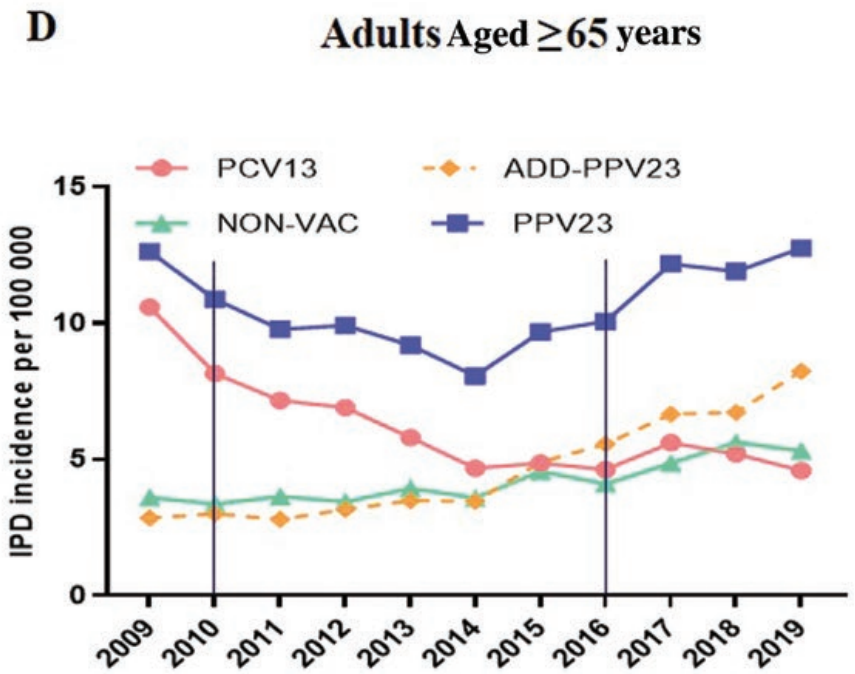




de Miguel S, et al. Clin Infect Dis 2020

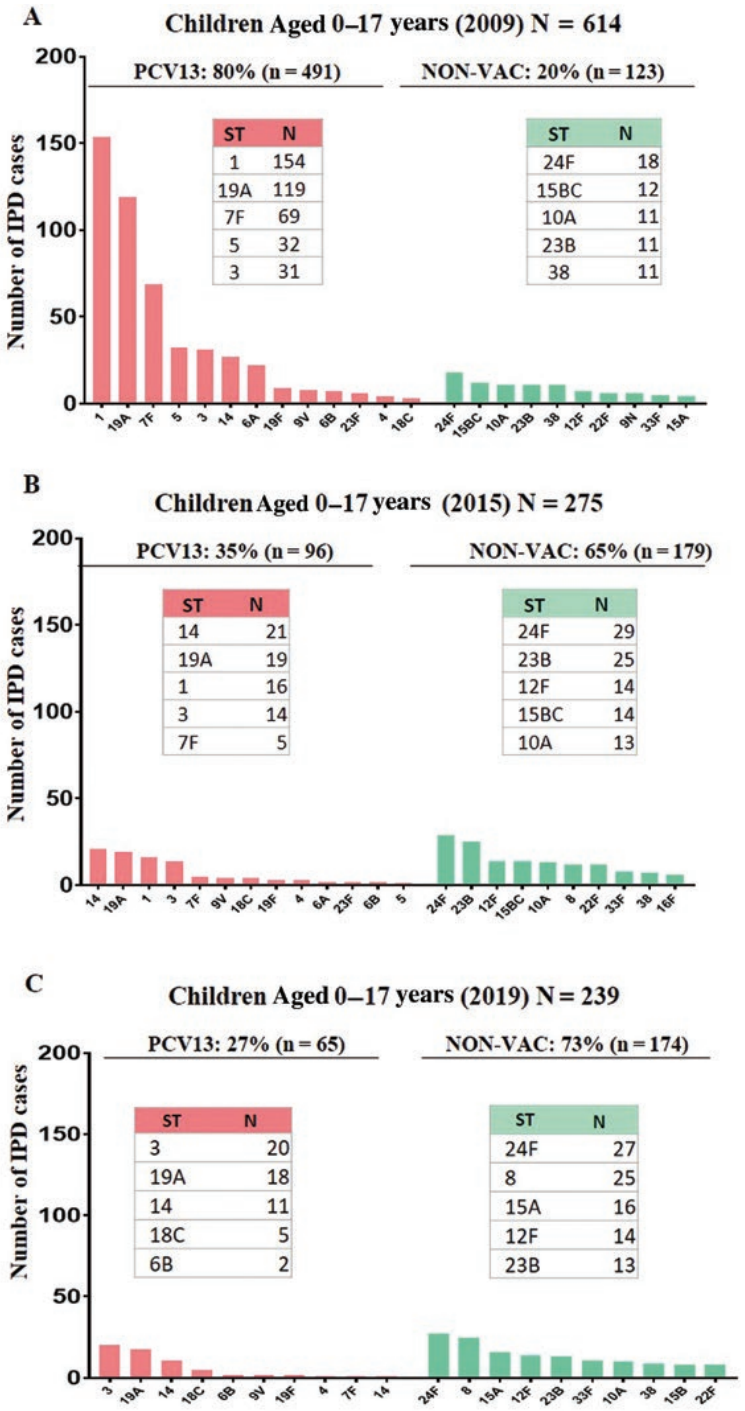
Trends of IPD in Spain in adult population





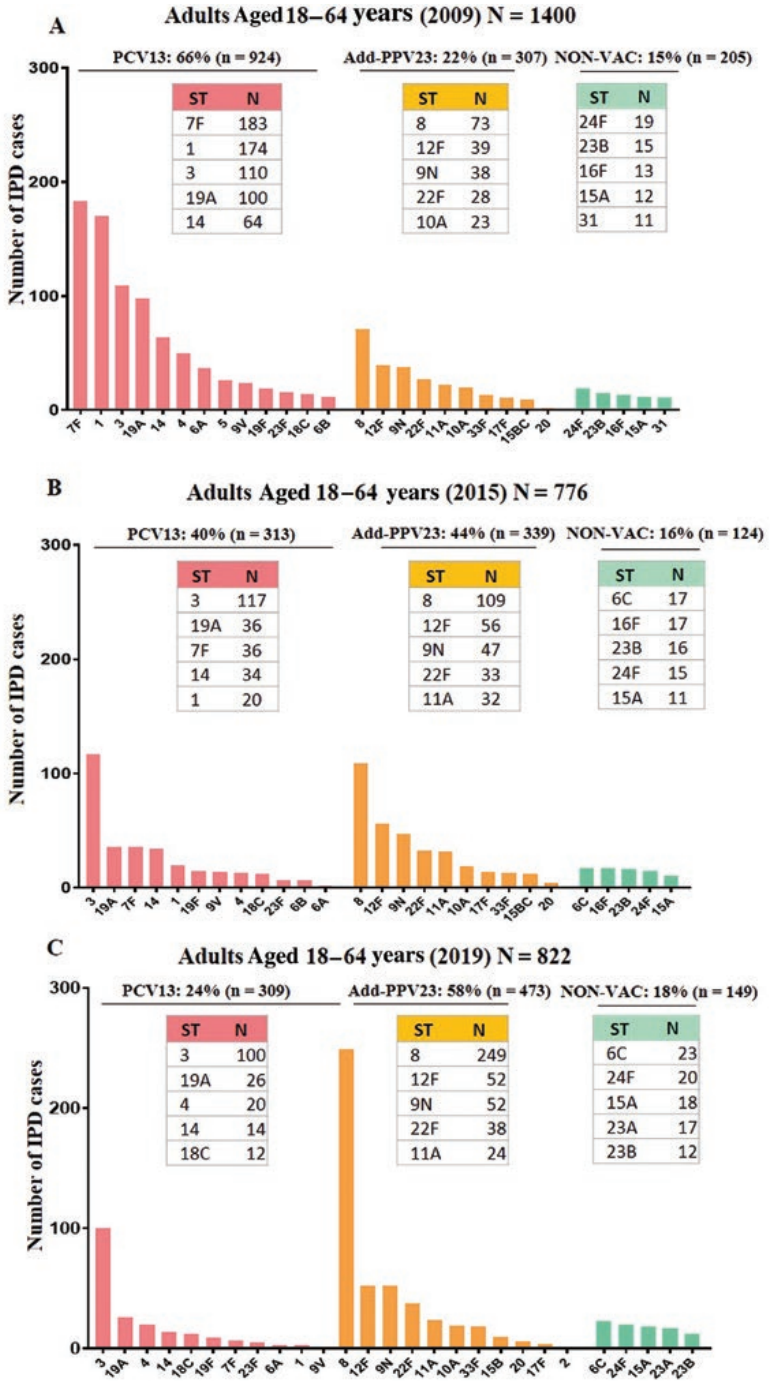
de Miguel S, et al. Clin Infect Dis 2020

Serotypes causing IPD in the pediatric population aged 0–17 years



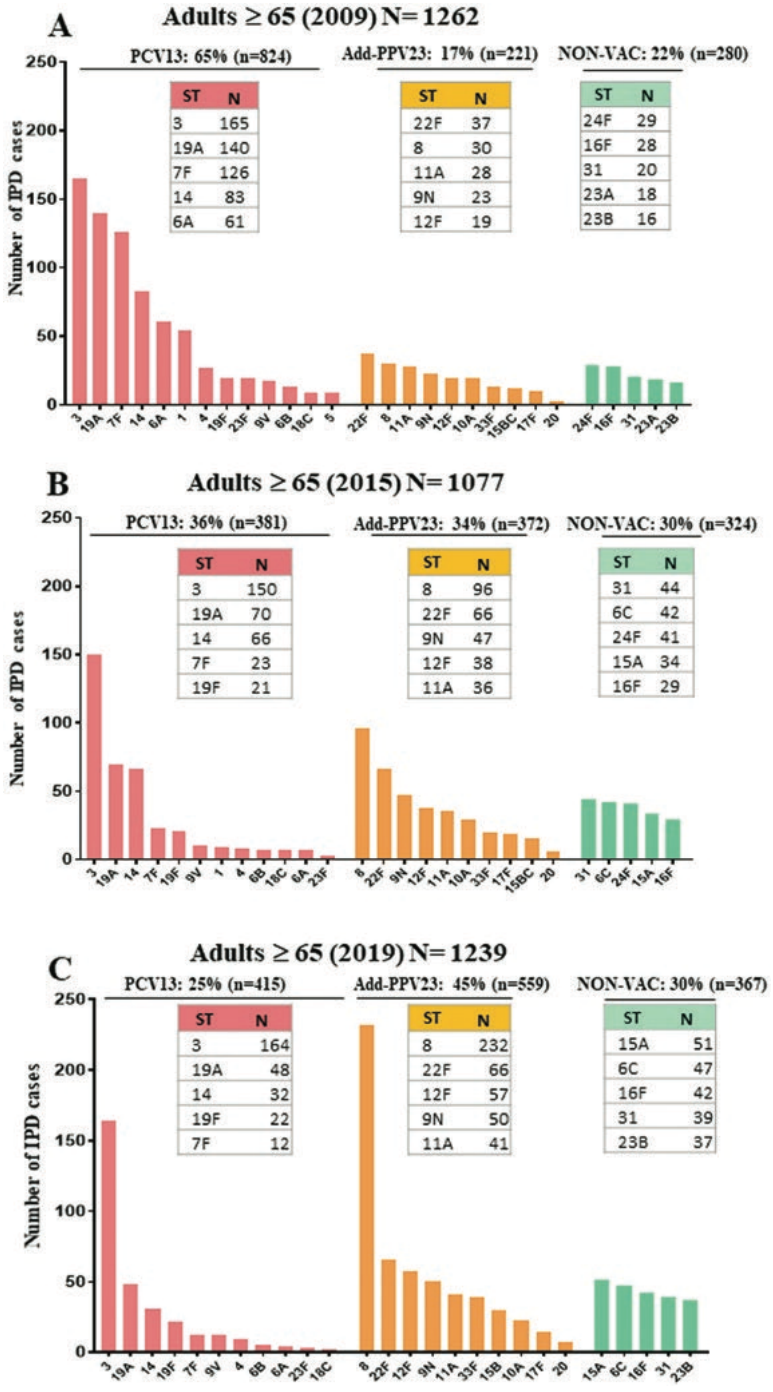
Pink bars represent IPD cases by serotypes included in PCV13. Green bars indicate the 10 most frequent nonvaccine serotypes causing IPD in years 2009 (*A*), 2015 (*B*), and 2019 (*C*). Tables include the number and percent of IPD cases by the 5 most frequent serotypes in each group.

Serotypes causing IPD in adults aged 18–64 years



Pink bars represent IPD cases by serotypes included in PCV13. Orange bars indicate additional sero- types included in PPV23. Green bars represent the 5 most frequent serotypes not included in any pneumococcal vaccine. IPD in years 2009 (*A*), 2015 (*B*), and 2019 (*C*). Tables include the number and percent of IPD cases by the 5 most frequent serotypes in each group.

Serotypes causing IPD in adults aged ≥65 years



Pink bars represent IPD cases by serotypes included in PCV13. Orange bars indicate additional sero- types included in PPV23. Green bars represent the 5 most frequent serotypes not included in any pneumococcal vaccine. IPD in years 2009 (*A*), 2015 (*B*), and 2019 (*C*). Tables include the number and percent of IPD cases by the 5 most frequent sero- types in each group.

Most Prevalent Serotypes to Cause Invasive Pneumococcal Disease in the Pediatric Population by Age Group During the Last Epidemiological Year (2019) in Spain

	Children Aged <2 Years		Children Aged 2–5 Years	
Serotype	n	%	n	%
24F	18	14.52	6	9.23
8	14	11.29	4	6.15
3	11	8.87	4	6.15
33F	11	8.87	0	0
15A	9	7.26	5	7.69
38	6	4.84	2	3.08
10A	6	4.84	1	1.54
19A	6	4.84	10	15.38
16F	5	4.03	0	0
15B	5	4.03	3	4.62
23B	5	4.03	4	6.15
12F	5	4.03	7	10.77
9N	5	4.03	0	0
22F	4	3.23	4	6.159
35B	2	1.61	2	3.08
11A	2	1.61	1	1.549
23A	2	1.61	2	3.08
9V	1	0.81	0	0
14	1	0.81	6	9.23
7B	1	0.81	0	0
Other	5	4.03	4	6.15
Total	124		65	

Serotips de neumococ predominants en pediatria

Serotips	Espanya (189)	H. Germans Trias (56)
24F	24	8
8	18	11
19A	16	1
3	15	3
15A	14	1
12F	12	7
33F	11	1
23B	9	4
22F	8	3
38	8	3
15B	8	0
1	0	6
19F	0	3

Serotips de neumococ predominants en pediatria

Serotipus	Espanya (189)	H. Germans Trias (56)
24F	24	8
8 (20v, 23v)	18	11
19A (13v...)	16	1
3 (13v...)	15	3
15A	14	1
12F (20v, 23v)	12	7
33F (15v, 20v, 23v)	11	1
23B	9	4
22F (15v, 20v, 23v)	8	3
38	8	3
15B (20v, 23v)	8	0
1	0	6
19F (7v...)	0	3

Serotips predominants en pediatria a l'Hospital Germans Trias

• En vacuna	últims 3 anys
- 13 valent: 27% (15/56)	18% (6/34)
- 15 valent: 32% (18/56)	24% (6/34)
- 20 valent: 64% (36/54)	62% (21/34)

- En meningitis (4): 12F(2), 8, 16F, 24F
- En bacteriemia primària (12): 24F(4), 12F(3), 3, 10A, 22F, 35F, 38

Most Prevalent Serotypes to Cause Invasive Pneumococcal Disease in the Adult Population by Age Group During the Last Epidemiological Year (2019) in Spain

	Adults Aged ≥65 Years		Adults Aged 18–64 Years	
Serotype	n	%	n	%
8	232	18.72	249	30.29
3	164	13.24	100	12.17
22F	66	5.33	38	4.62
12F	57	4.60	52	6.33
15A	51	4.12	18	2.19
9N	50	4.04	52	6.33
19A	48	3.87	26	3.16
6C	47	3.79	23	2.80
16F	42	3.39	9	1.09
11A	41	3.31	24	2.92
31	39	3.15	11	1.34
33F	39	3.15	18	2.19
23B	37	2.99	12	1.46
23A	34	2.74	17	2.07
14	32	2.58	14	1.70
15B	30	2.42	10	1.22
10A	23	1.86	19	2.31
24F	23	1.86	20	2.43
19F	22	1.78	9	1.09
35F	20	1.61	5	0.61
Other	142	11.46	78	9.49
Total	1239		822	

Serotips de neumococ predominants en adults

Serotips	Espanya (2061)	H. Germans Trias (186)
8	481	42
3	264	22
12F	109	16
22F	107	14
9N	102	8
19A	74	12
6C	70	6
15A	69	5
11A	65	12
31	50	39
14	46	24
24F	46	21

Serotips de neumococ predominants en adults

Serotipus	Espanya (2061)	H. Germans Trias (186)
8 (20v, 23v)	481	42
3 (13v...)	264	22
12F (20v, 23v)	109	16
22F (15v, 20v, 23v)	107	14
9N (23v)	102	8
19A (13v...)	74	12
6C	70	6
15A	69	5
11A (20v, 23v)	65	12
31	50	39
14 (7v...)	46	24
24F	46	21

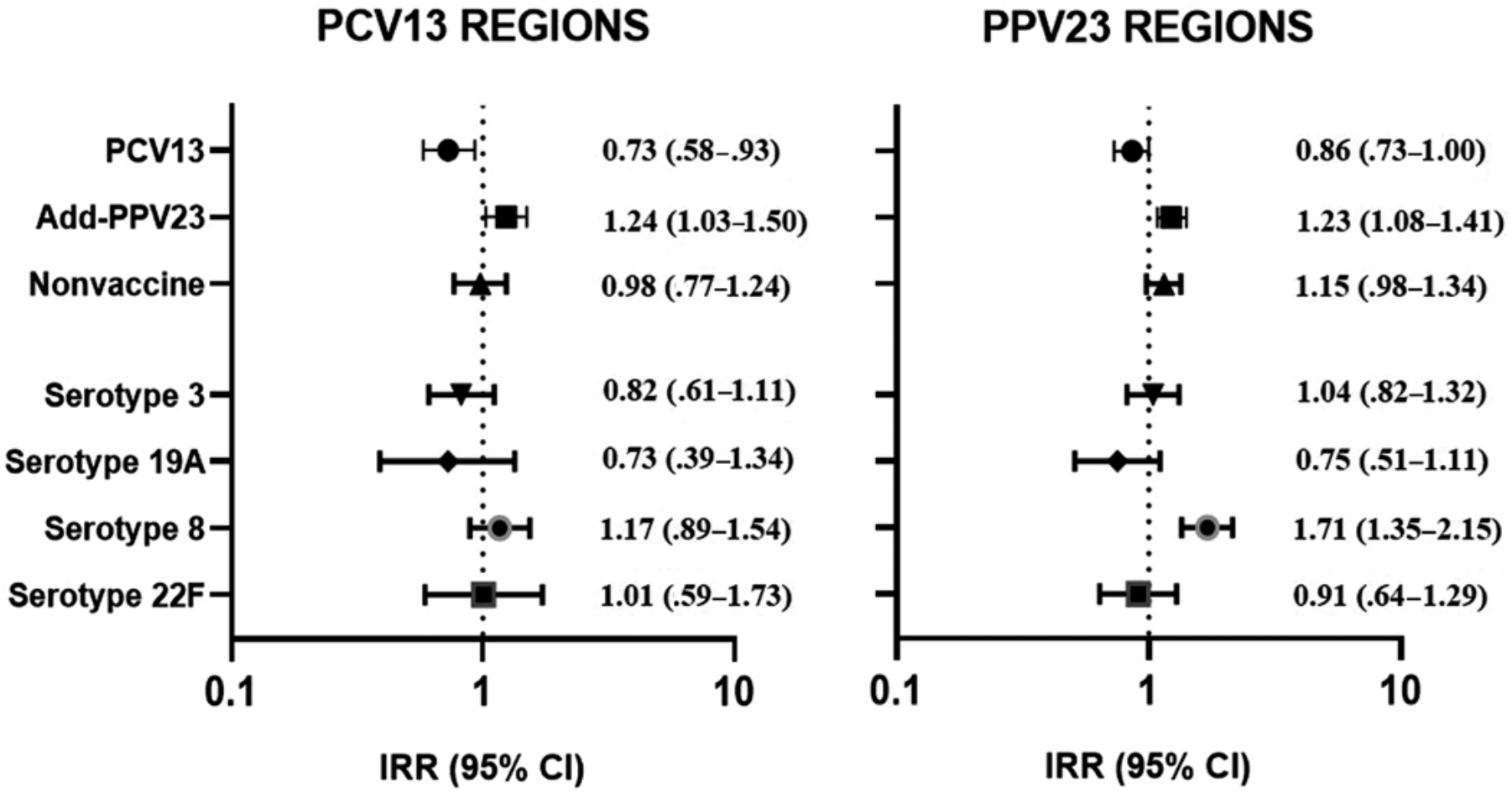
Serotips predominants en adults a l'Hospital Germans Trias

• En vacuna	últims 3 anys
- 13 valent: 28% (84/299)	28% (40/144)
- 15 valent: 34% (101/299)	35% (50/144)
- 20 valent: 61% (181/299)	68% (98/144)

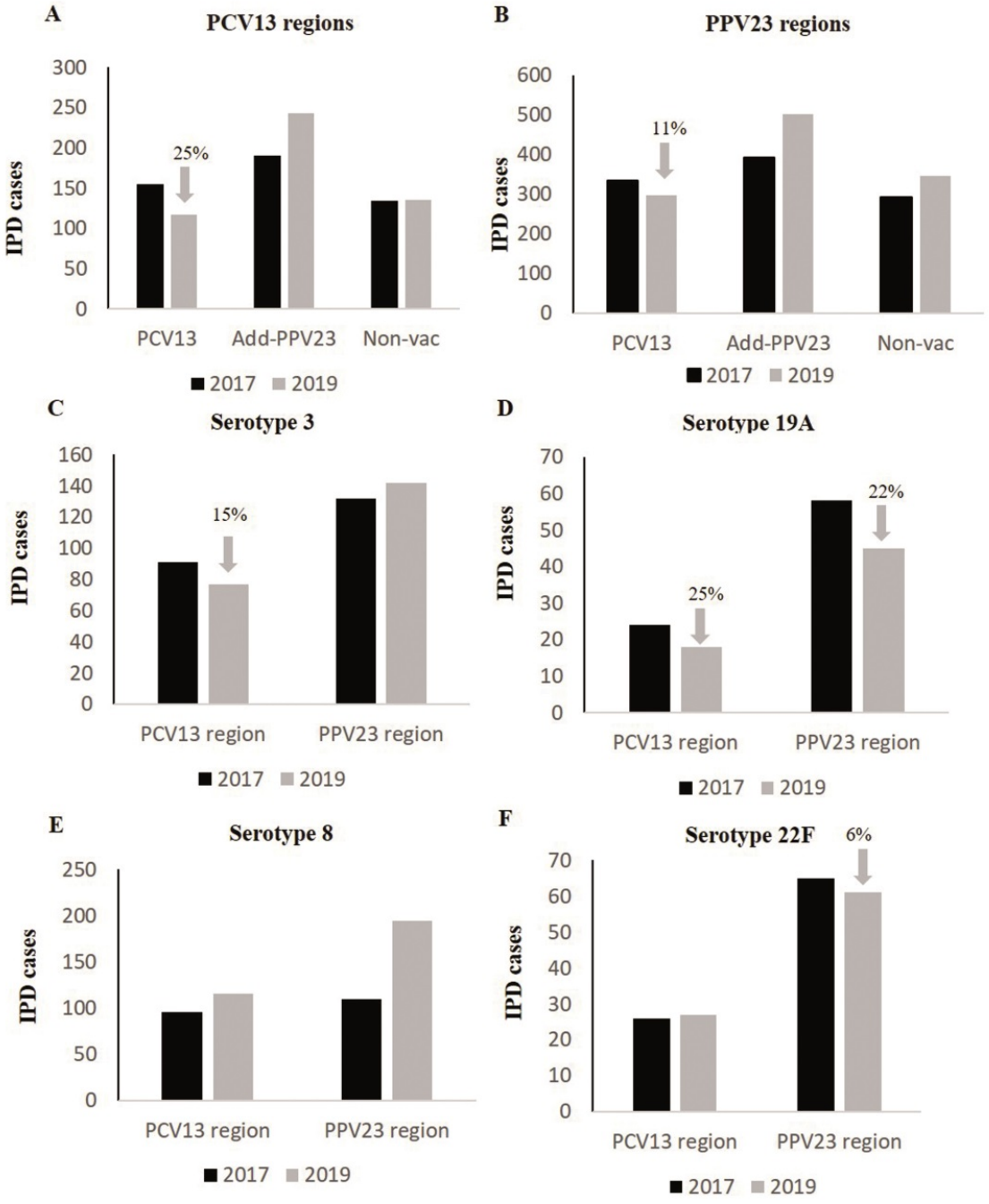
- En meningitis (25): 13 ST vacuna (6 solo en 20v) y 12 ST no vacuna
- En bacteriemia primària (13): 5 ST vacuna (todos solo en 20v)

Figure S1: Map of Spain divided by regions. We show Spanish regions using PCV13 for immunocompetent adults in grey color and regions using PPV23 for immunocompetent adults in white color at the year 2019.

Comparison of invasive pneumococcal disease cases in adults aged ≥65 years between Spanish regions that used PCV13 vaccine and regions that used PPV23 vaccine in the adult immunization calendar for the period 2017 vs 2019



Comparison of IPD cases in adults ≥ 65 years between Spanish regions using PCV13 vaccine and regions using PPV23 vaccine in the adults immunization calendar for the period 2017-2019



Fraction of disease attributable to current and future vaccines based on epidemiological data from 2019