

**TECHNICAL
VIRAL HEPATITIS PREVENTION BOARD MEETING
Milan, Italy, November 17-18, 2011**

***EPIDEMIOLOGY OF ACUTE HEPATITIS B
NINETEEN YEARS AFTER THE
INTRODUCTION OF UNIVERSAL
VACCINATION IN PREADOLESCENTS
IN CATALONIA, SPAIN***

***Angela Dominguez, Gloria Carmona, Inma Crespo, Nuria Soldevila,
Joan Batalla, Luis Urbiztondo, Manel Oviedo and Luis Salleras***



Department of Health
Generalitat of Catalonia





Departament of Health
Generalitat of Catalonia



BACKGROUND

Prevaccination era → Hepatitis B: a major problem



Departament of Health
Generalitat of Catalonia



RECOMMENDATIONS FOR HEPATITIS B VACCINATION IN CATALONIA

1984 → Vaccination of risk groups



Departament of Health
Generalitat of Catalonia



HEPATITIS B: RISK GROUPS RECOMMENDED FOR VACCINATION (1984)

- ✓ Newborns of HBsAg-positive mothers
- ✓ Healthcare workers
- ✓ Developmentally disabled persons in long-term facilities
- ✓ Hemodialysis patients
- ✓ Men who have sex with men
- ✓ Promiscuous heterosexuals
- ✓ Household contacts and sexual partners of HBsAg(+)
- ✓ Injection-drug users
- ✓ Incarcerated persons
- ✓ Travelers to HBV-endemic regions
- ✓ Patients with chronic liver diseases
- ✓ Patients in transplant programs
- ✓ Persons with HIV infection



BACKGROUND

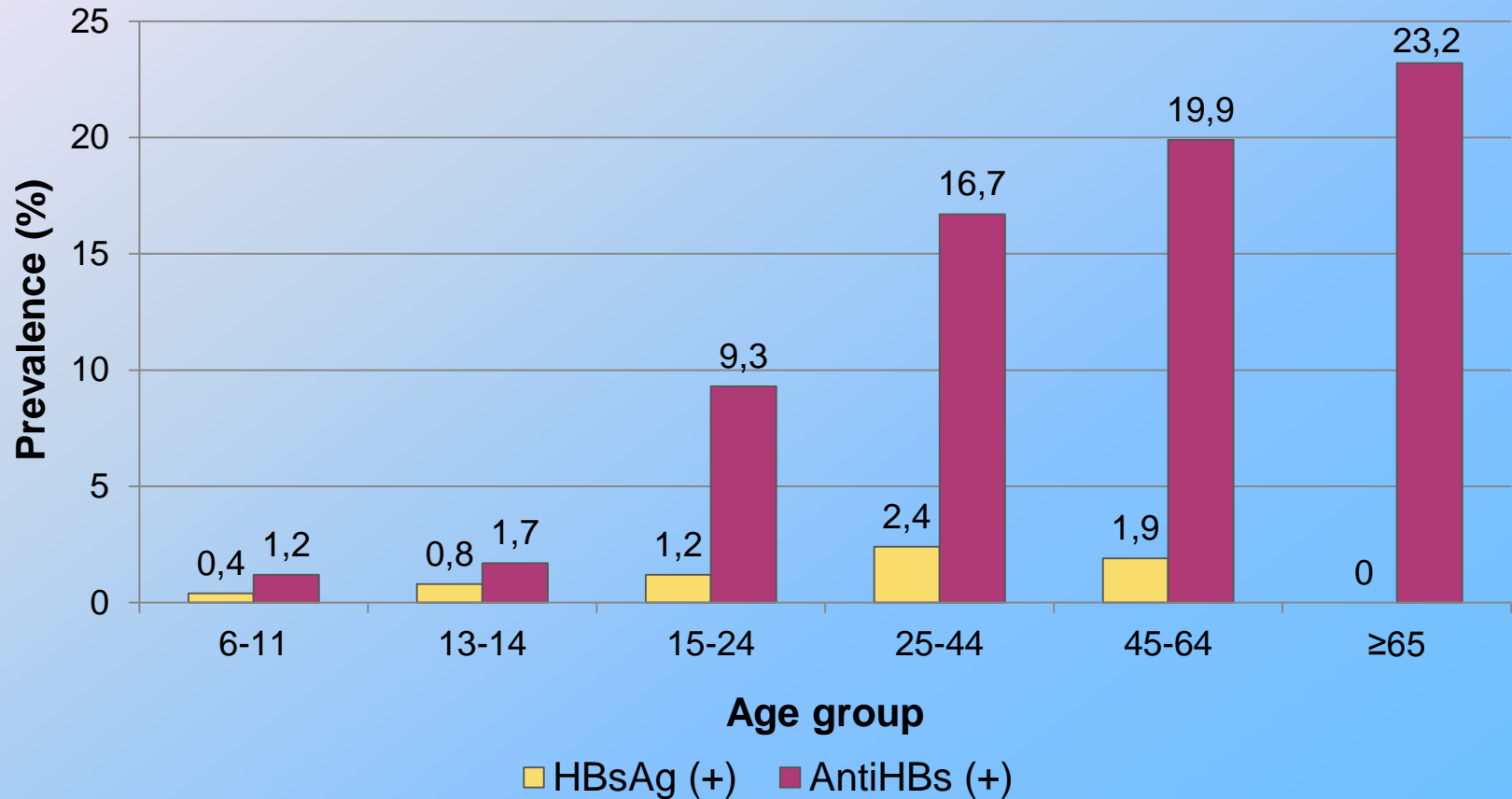
Prevaccination era → Hepatitis B a major problem

End of the 1980s → No reliable data on incidence of hepatitis B (all cases of viral hepatitis reported jointly)

→ 1% of population:
chronic HBsAg carriers
(intermediate pattern)



Prevalence of markers of infection in a representative sample of the population. Catalonia, 1989



Salleras et al. *Eur J Epidemiol* 1992; 8:640-646



Departament of Health
Generalitat of Catalonia



RECOMMENDATIONS FOR HEPATITIS B VACCINATION IN CATALONIA

1984 → Vaccination of risk groups

1990 → Advisory Committee on Immunizations of Department of Health recommended universal vaccination of preadolescents



RATIONALE FOR HEPATITIS B UNIVERSAL VACCINATION OF PREADOLESCENTS

- ✓ Limited impact of selective vaccination of risk groups
- ✓ Immediate impact of universal vaccination on clinical cases
- ✓ Potential of mass vaccination to eliminate the disease
- ✓ Well-established vaccination program in schools



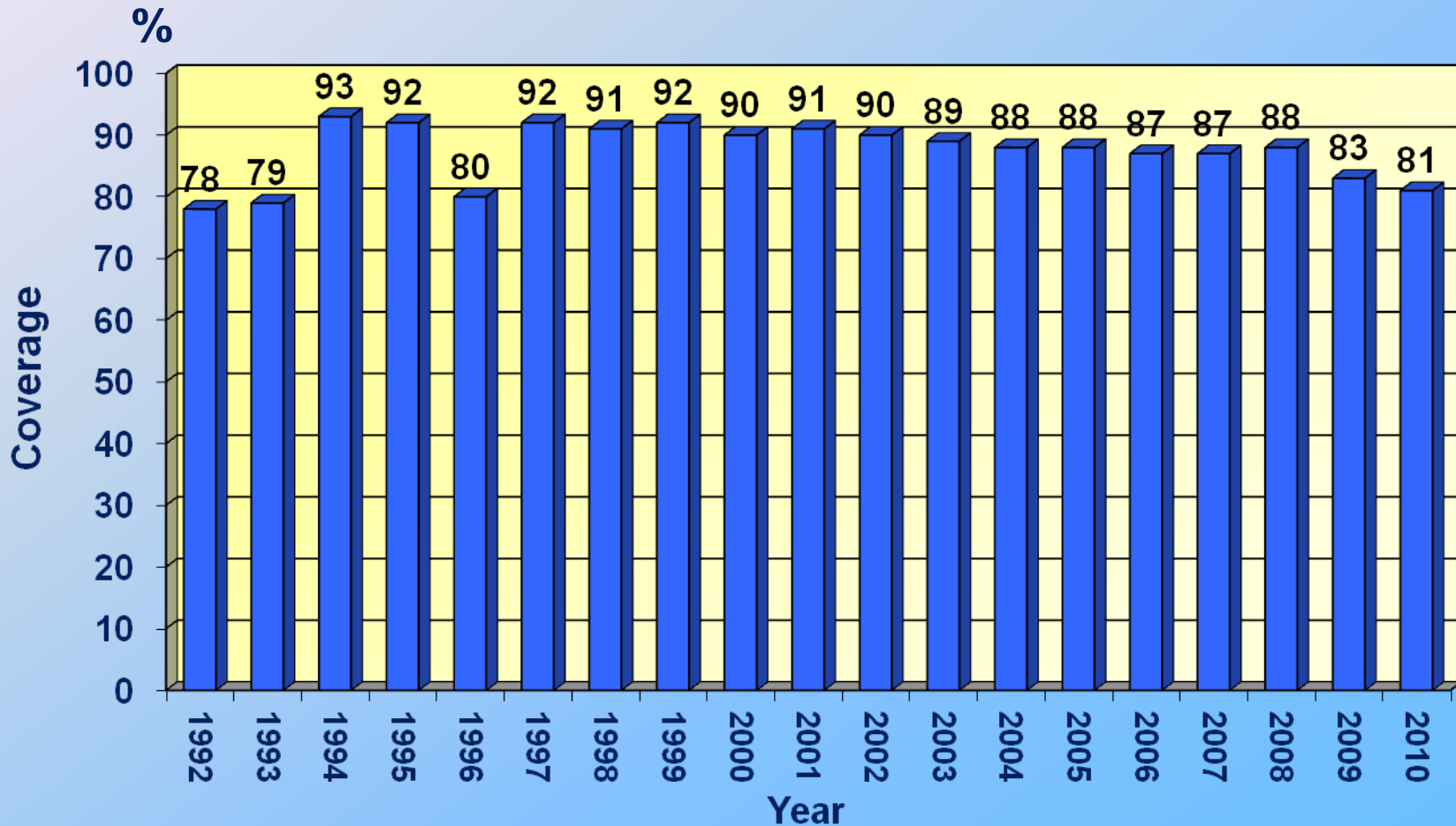
RECOMMENDATIONS FOR HEPATITIS B VACCINATION IN CATALONIA

1984 → Vaccination of risk groups

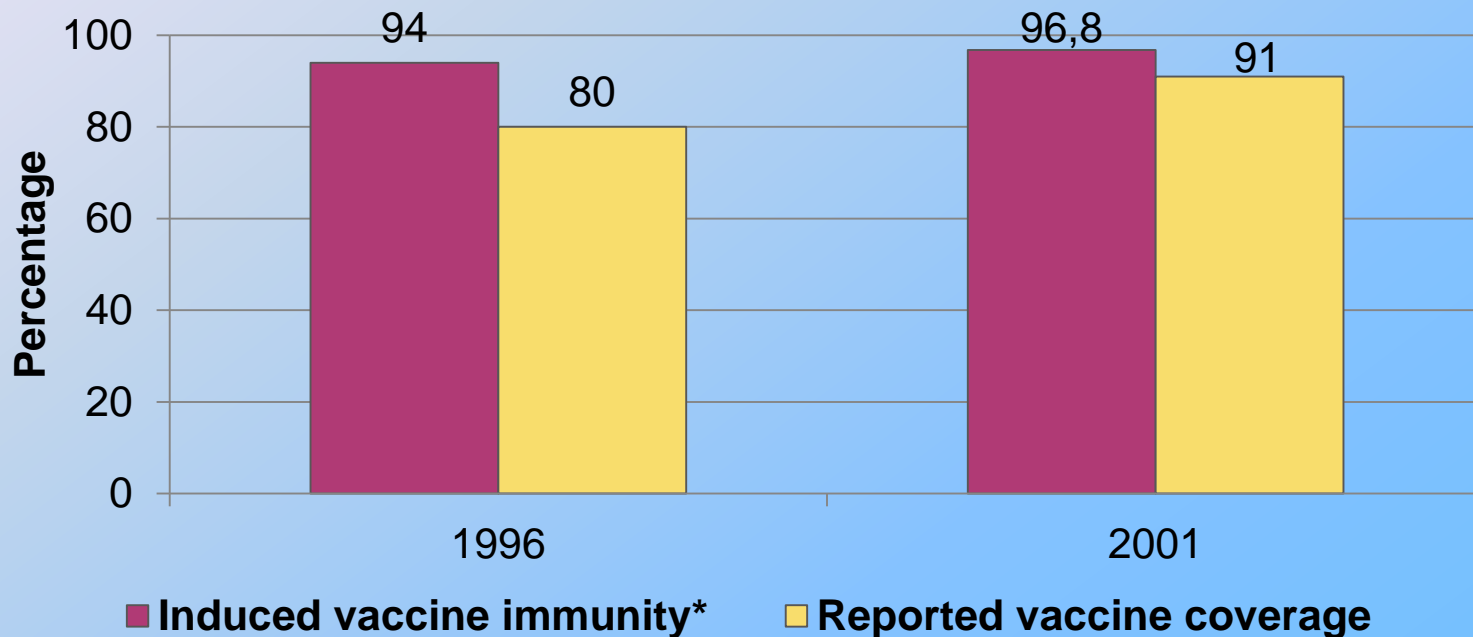
1991 → Universal vaccination of preadolescents with 3 doses (0-1-6 months)



REPORTED HEP B IMMUNIZATION COVERAGES (THREE DOSES). CATALONIA, 1992-2010



Prevalence of hepatitis B vaccine-induced immunity in adolescents aged 14 years in Catalonia



* AntiHBs (+) and AntiHBc (-)

Salleras et al. Vacunas 2000; 1:3-6



Departament of Health
Generalitat of Catalonia



OBJECTIVE

To analyze the evolution of reported cases of acute hepatitis B in Catalonia from 1991 to 2010



Departament of Health
Generalitat of Catalonia



METHODS (I)

✓ ***Clinical case definition*** → An acute illness with a discrete onset of symptoms and:

-jaundice, or

-elevated serum aminotransferase levels

✓ ***Laboratory confirmation*** → Detection of IgM to hepatitis B core antigen (anti-HBc)

or

→ Hepatitis B surface antigen (HBsAg) positive and negativity for markers of other hepatitis viruses



METHODS (II)

→ For each reported case, the following variables were collected:

- Year
- Age
- Sex

→ For each year: the incidence rate in the whole population and in the 10-19 years age group, vaccine coverage of adolescents and the proportion of immigrants.

→ Incidence rates and rate ratios (with 95%CI) for every year and for five-year periods compared to 1991



METHODS (III)

- To evaluate trends of incidence rates :
 - Pearson's correlation coefficient
 - Spearman's correlation coefficientwere calculated

- Statistical significance was established assuming an alpha error of 0.05



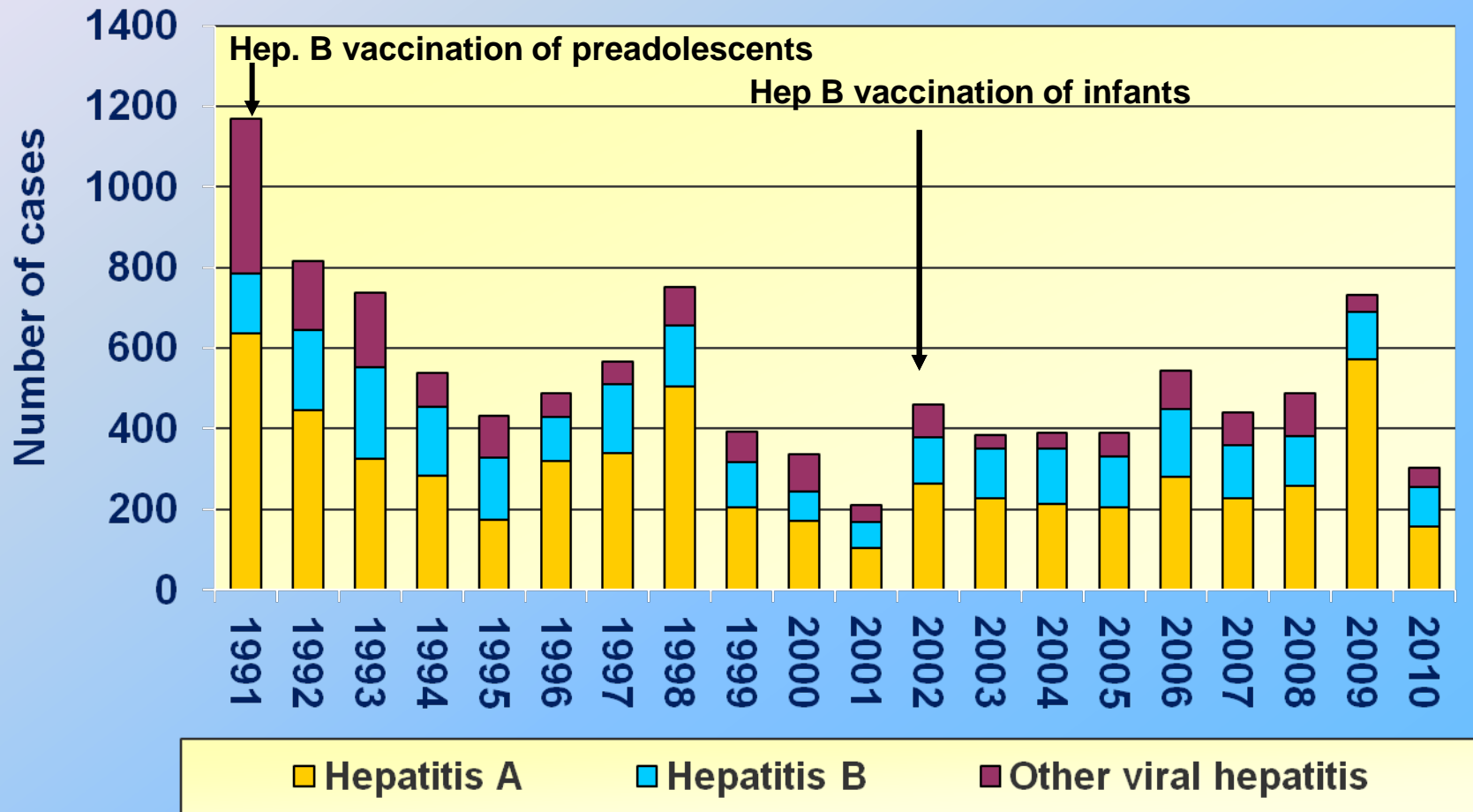
RESULTS



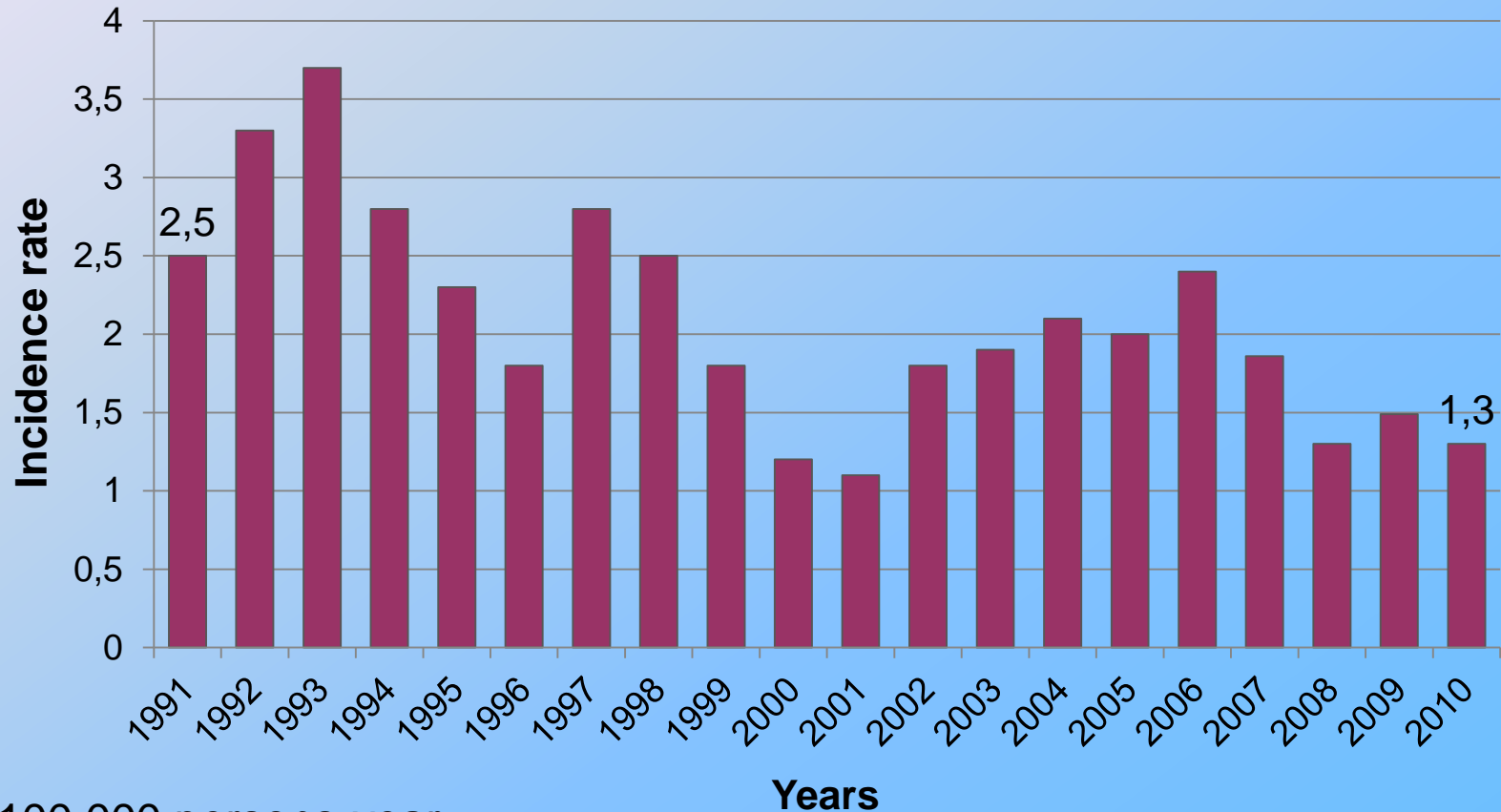
Departament of Health
Generalitat of Catalonia



EVOLUTION OF REPORTED VIRAL HEPATITIS. CATALONIA, 1991- 2010



Hepatitis B. Reported incidence rate*. Catalonia, 1991-2010



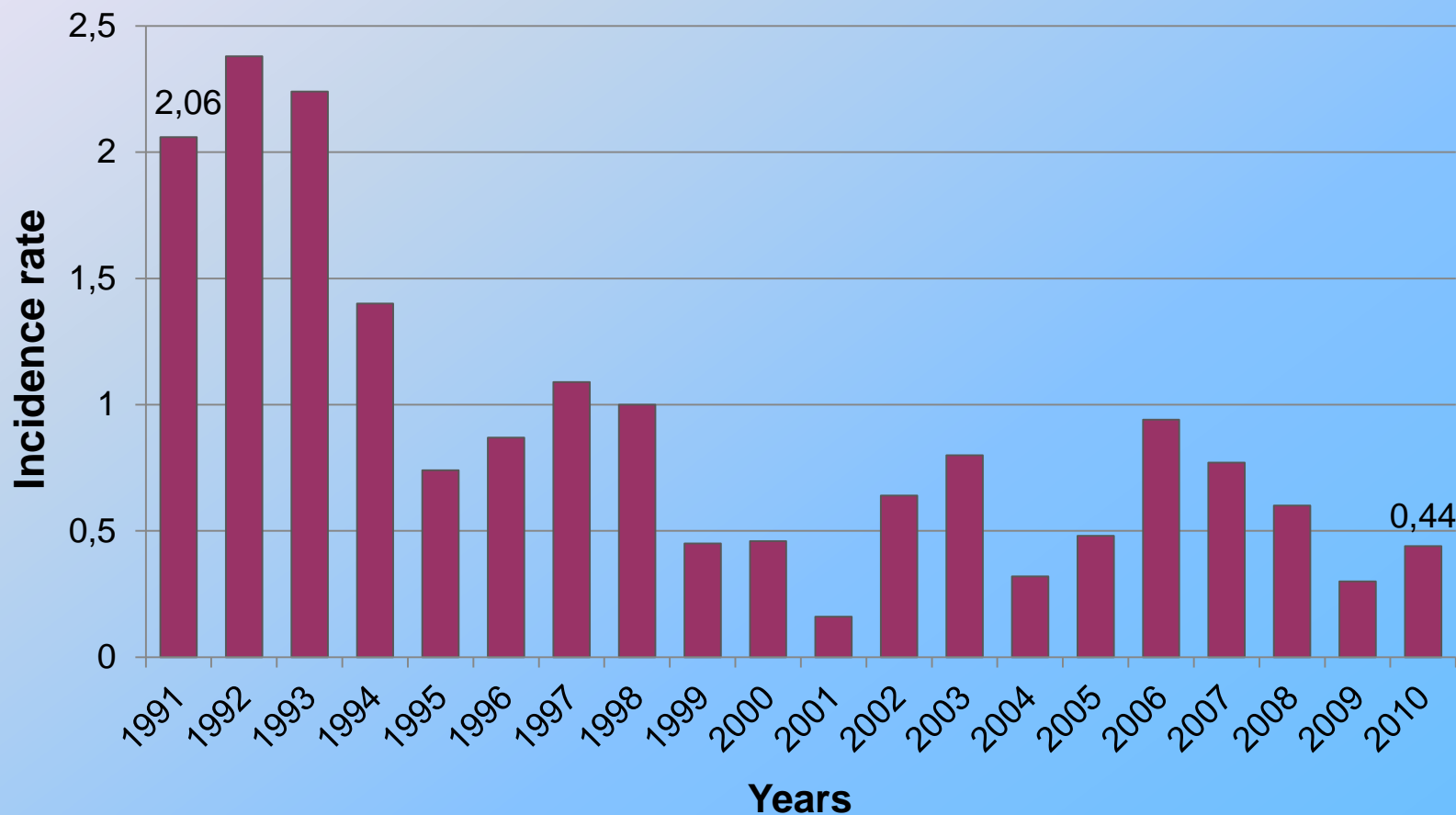
* per 100,000 persons-year



Departament of Health
Generalitat of Catalonia



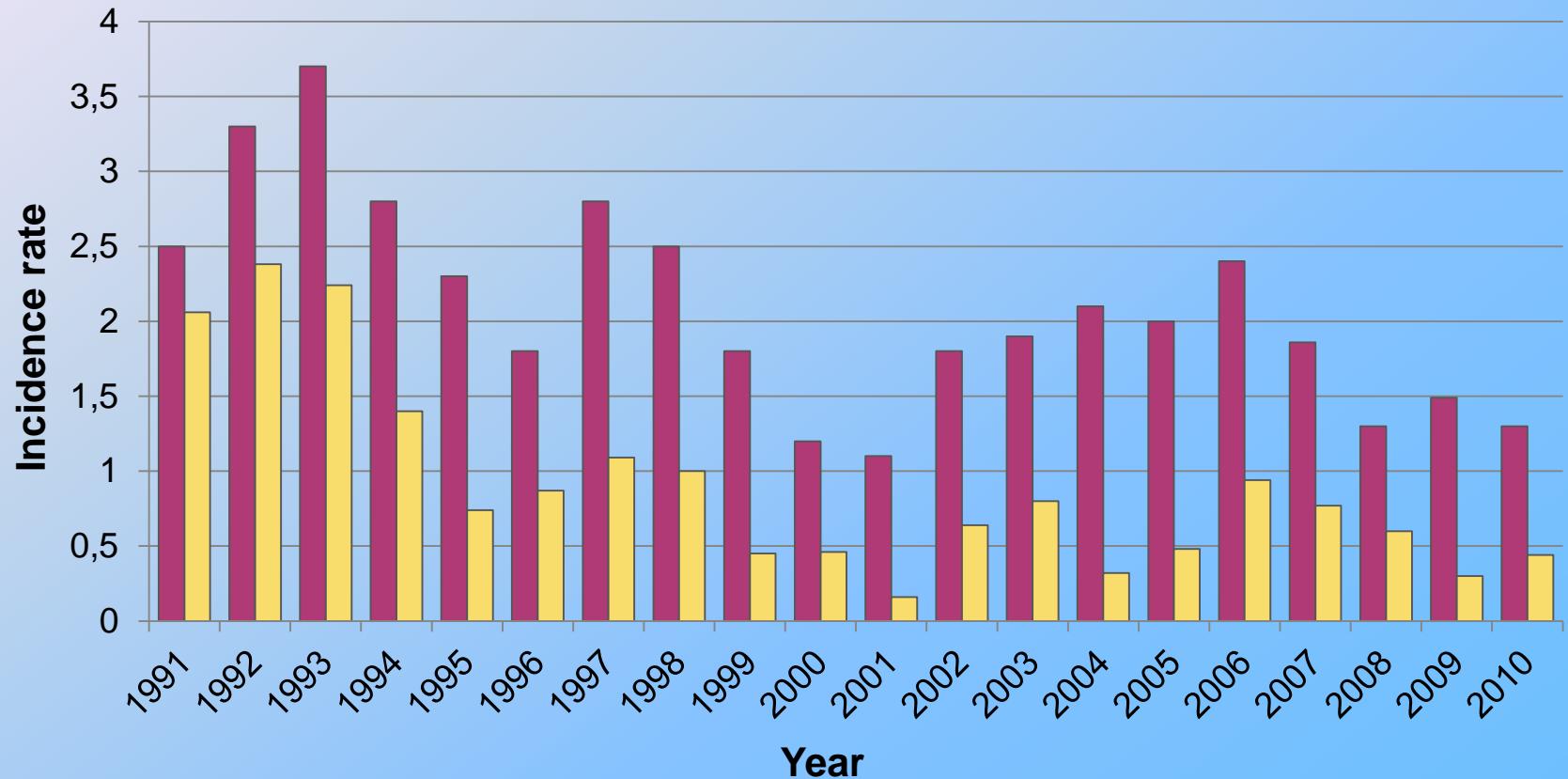
Hepatitis B. Reported incidence rate* in 10-19 year-olds. Catalonia, 1991-2010



* per 100,000 persons-year



Hepatitis B. Reported incidence rate*. Catalonia, 1991-2010



* per 100,000 persons-year

■ All ages ■ 10-19 years



Department of Health
Generalitat of Catalonia



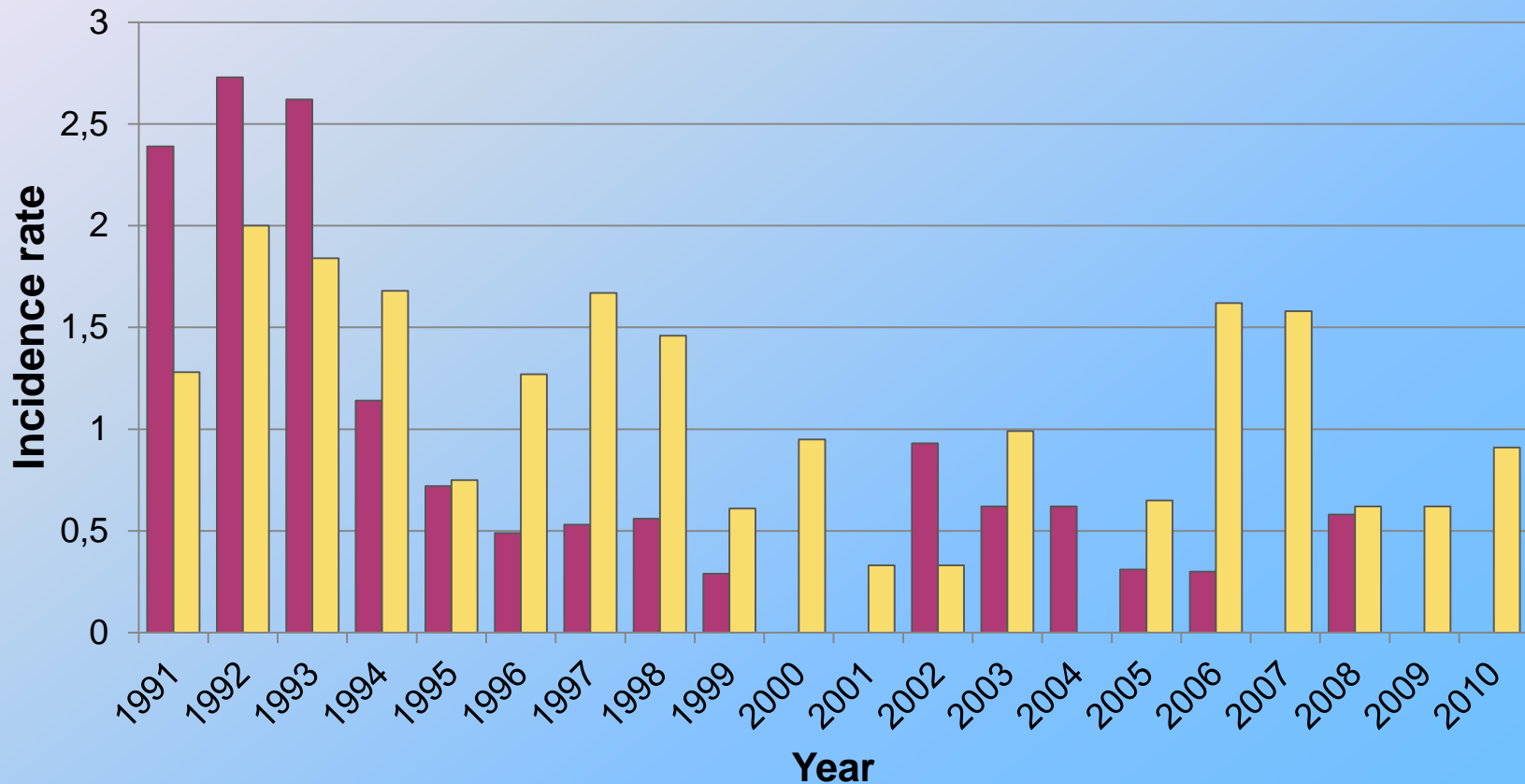
Hepatitis B in 10-19 year-olds. Incidence rates and rate ratios of five-year periods compared with 1991, when universal vaccination of preadolescents began

<u>Year</u>	<u>Incidence rate* (95% CI)</u>	<u>Rate Ratio (95% CI)</u>
1991	1.85 (1.03 – 2.99)	Reference
1992 – 1996	1.56 (1.21 – 1.98)	0.84 (0.49 – 1.51)
1997 – 2001	0.64 (0.40 – 0.99)	0.35 (0.18 – 0.69)
2002 – 2006	0.63 (0.34 – 0.94)	0.33 (0.16 – 0.66)
2007 – 2010	0.24 (0.18 – 0.51)	0.17 (0.08 – 0.34)

* per 100,000 persons-year



Hepatitis B. Reported incidence rate* in 10-19 year-olds by sex. Catalonia, 1991-2010



* per 100,000 persons-year

■ Male ■ Female



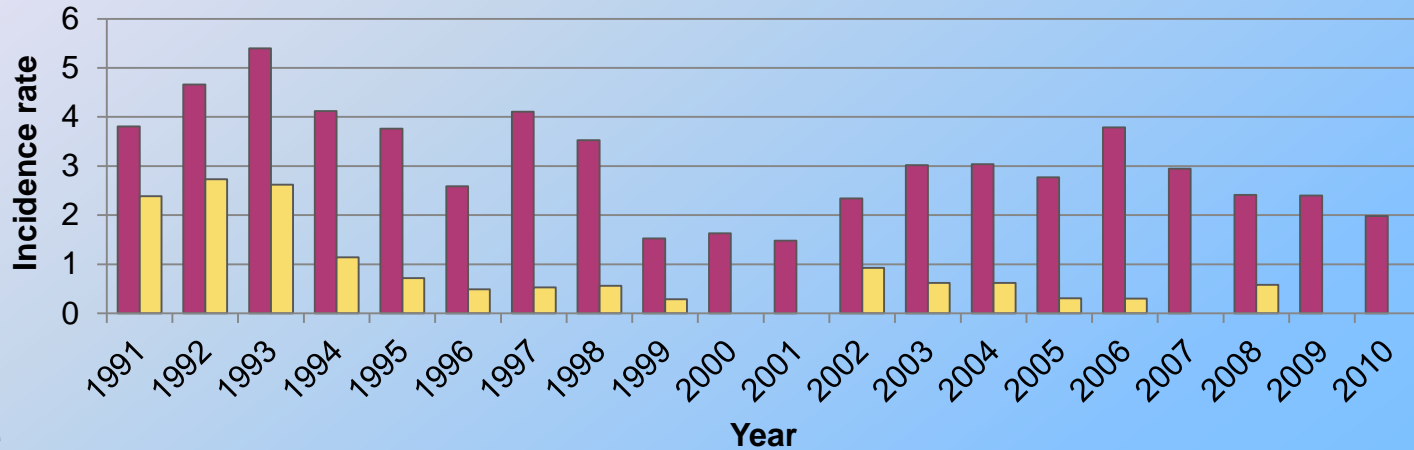
Department of Health
Generalitat of Catalonia



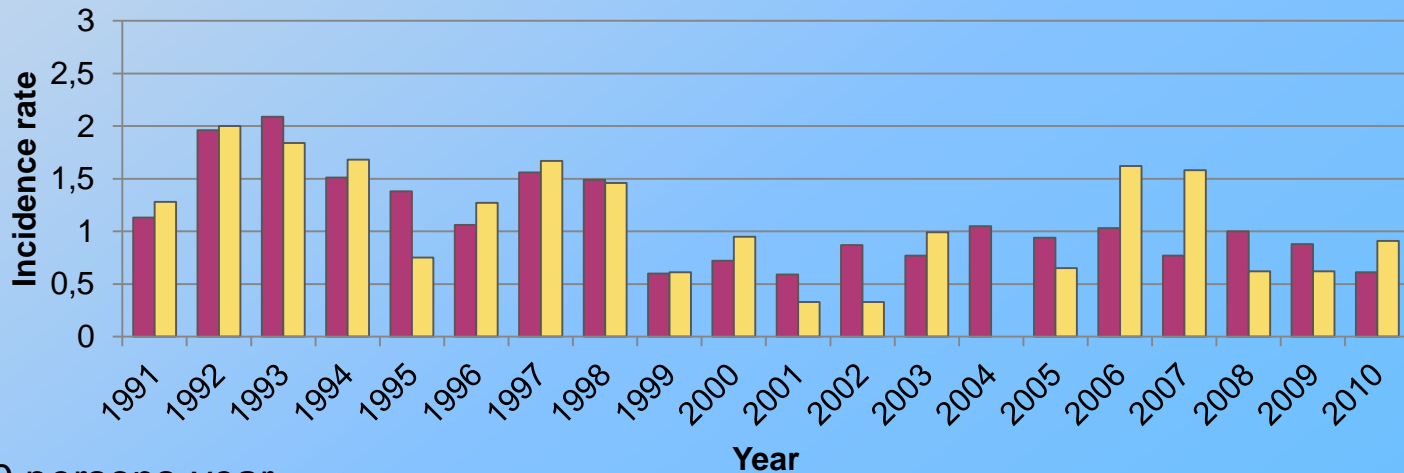
UNIVERSITAT DE BARCELONA
U
B

Hepatitis B. Reported incidence rate* by sex. Catalonia, 1991-2010

Male



Female



* per 100,000 persons-year

■ All ages ■ 10-19 years



Department of Health
Generalitat of Catalonia



Hepatitis B in 10-19 year-olds. Incidence rates* by sex and rate ratios of five-year periods compared with 1991, when universal vaccination of preadolescents began (1991)

<u>Year</u>	<u>Male</u>		<u>Female</u>	
	<u>Incidence rate</u>	<u>Rate Ratio (95% CI)</u>	<u>Incidence rate</u>	<u>Rate Ratio (95% CI)</u>
1991	2.39	Reference	1.28	Reference
1992 – 1996	1.73	0.72 (0.37 – 1.51)	1.39	1.08 (0.84 – 1.63)
1997 – 2001	0.81	0.33 (0.14 – 0.79)	0.54	0.42 (0.13 – 1.45)
2002 – 2006	0.80	0.33 (0.14 – 0.80)	0.39	0.31 (0.08 – 1.15)
2007 – 2010	0.80	0.33 (0.13 – 0.82)	0.54	0.42 (0.12 – 1.52)

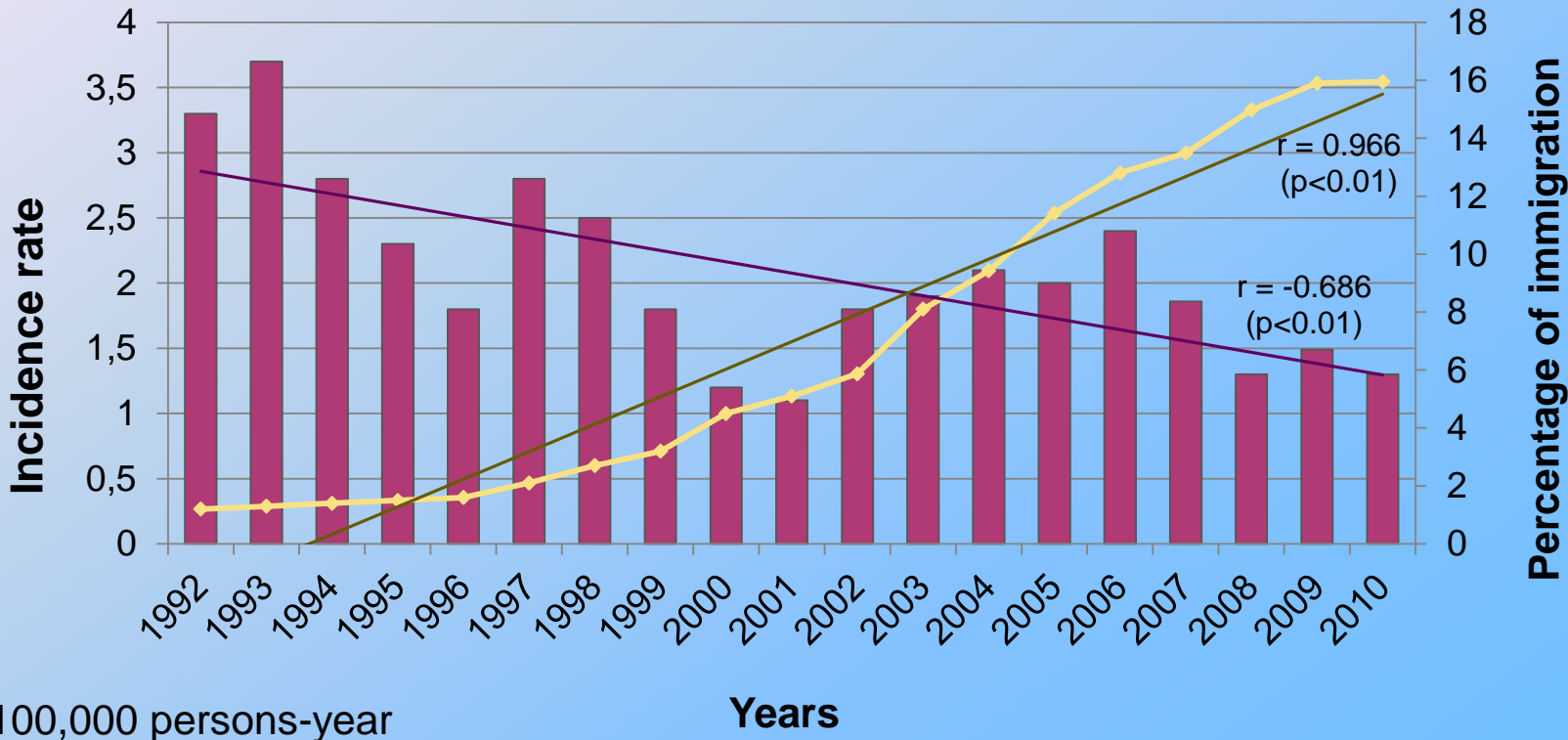
* per 100,000 persons-year



Department of Health
Generalitat of Catalonia



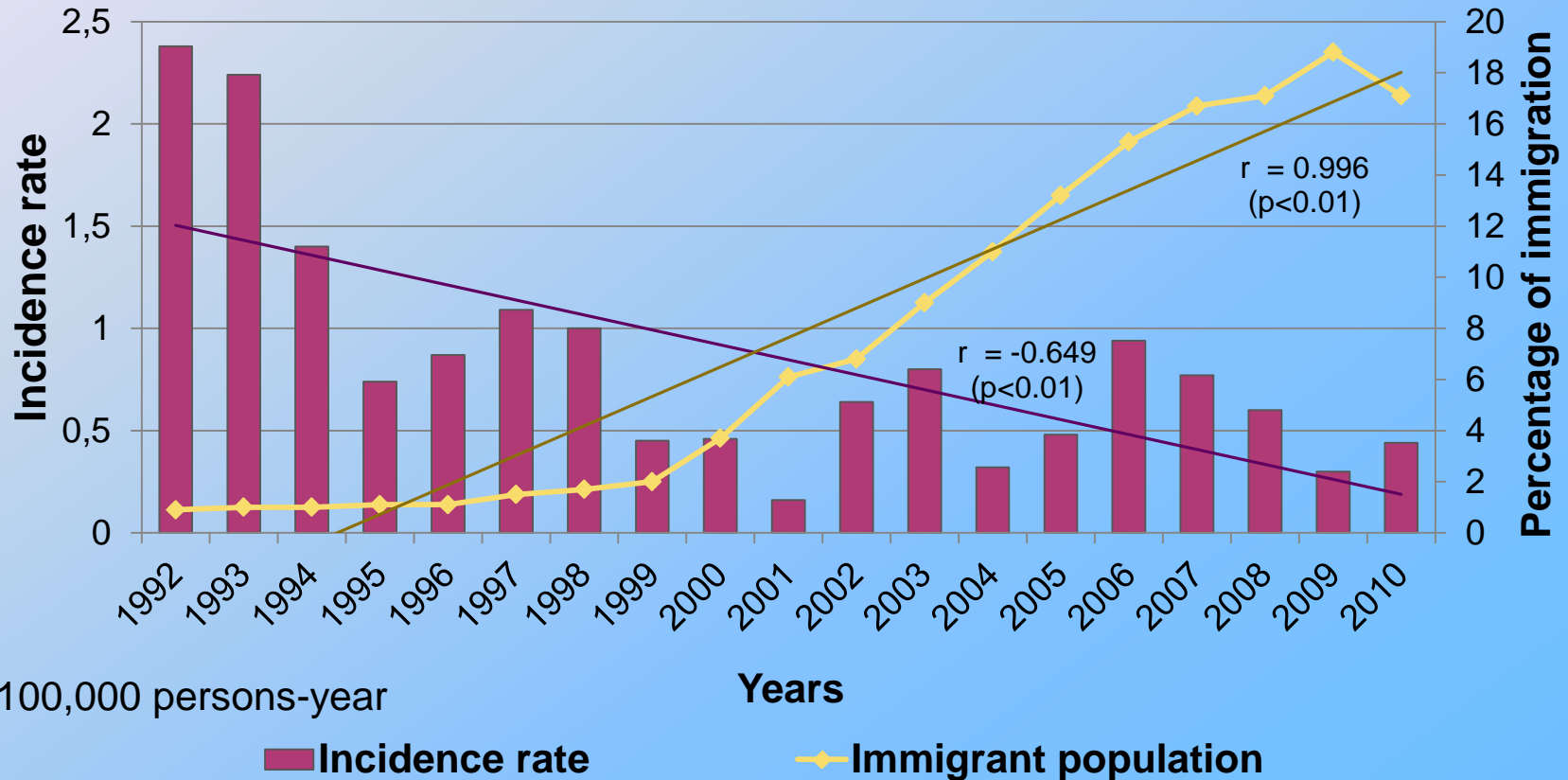
Hepatitis B. Reported incidence rate* and percentage of immigrant population. Catalonia, 1992-2010



* per 100,000 persons-year

■ Incidence rate ◆ Immigrant population

Hepatitis B. Reported incidence rate* and percentage of immigrant population in 10-19 years age group. Catalonia, 1992-2010



* per 100,000 persons-year

■ Incidence rate

◆ Immigrant population

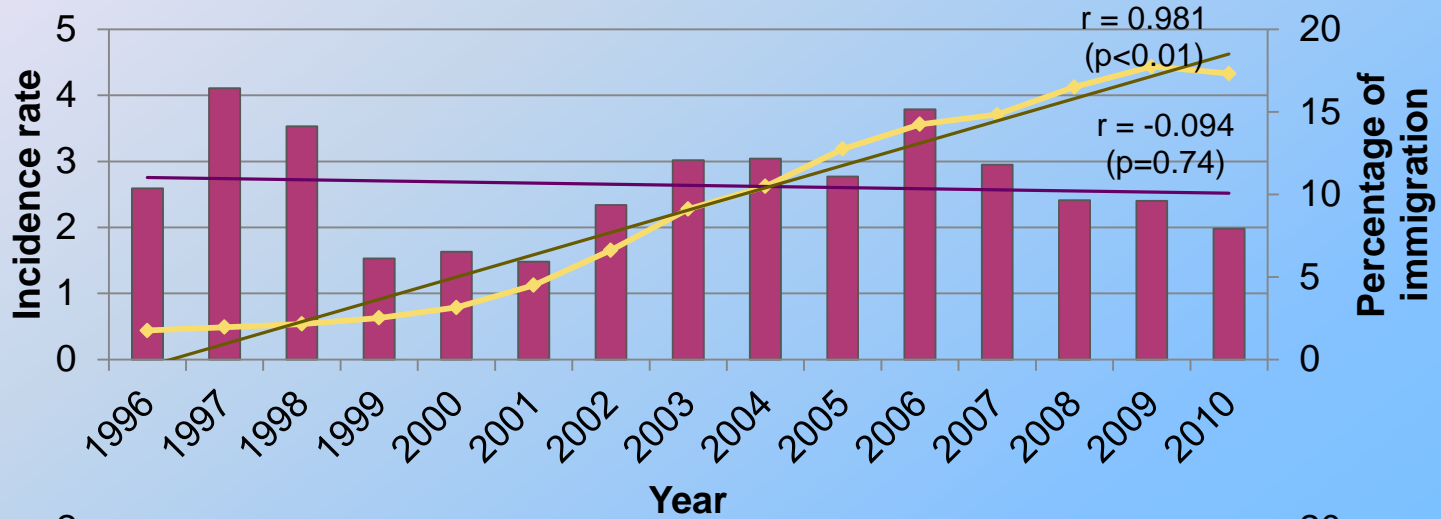


Departament of Health
Generalitat of Catalonia

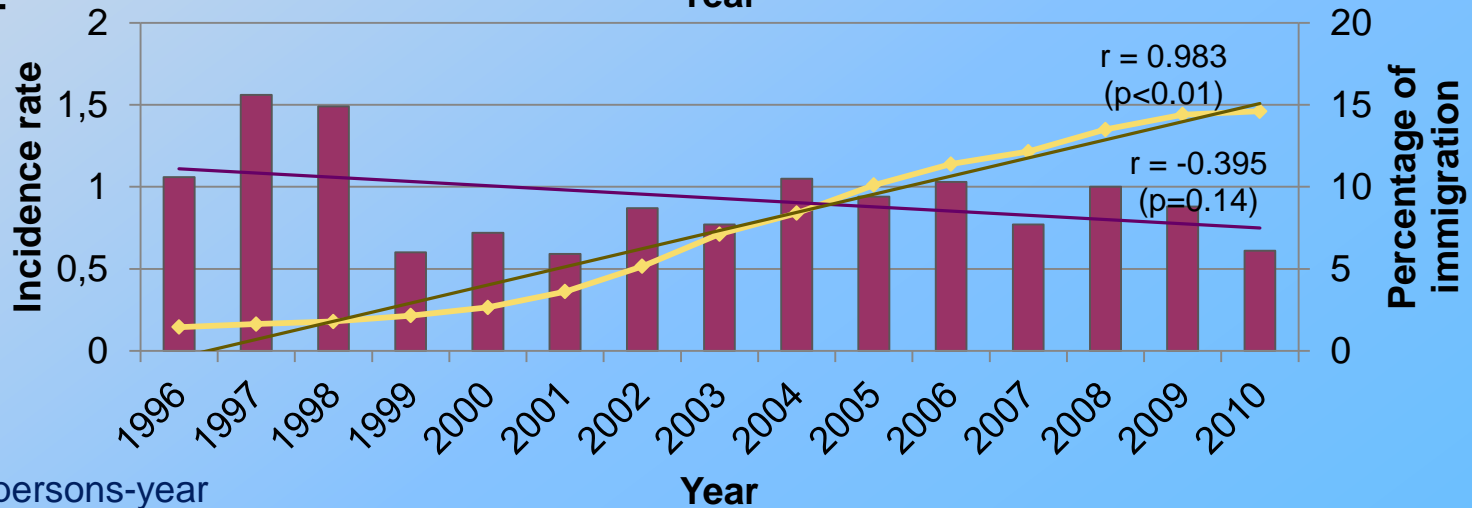


Hepatitis B. Reported incidence rate* and percentage of immigrant population by sex. Catalonia, 1996-2010

Male



Female



■ Incidence rate ◆ Immigrant population

* per 100,000 persons-year

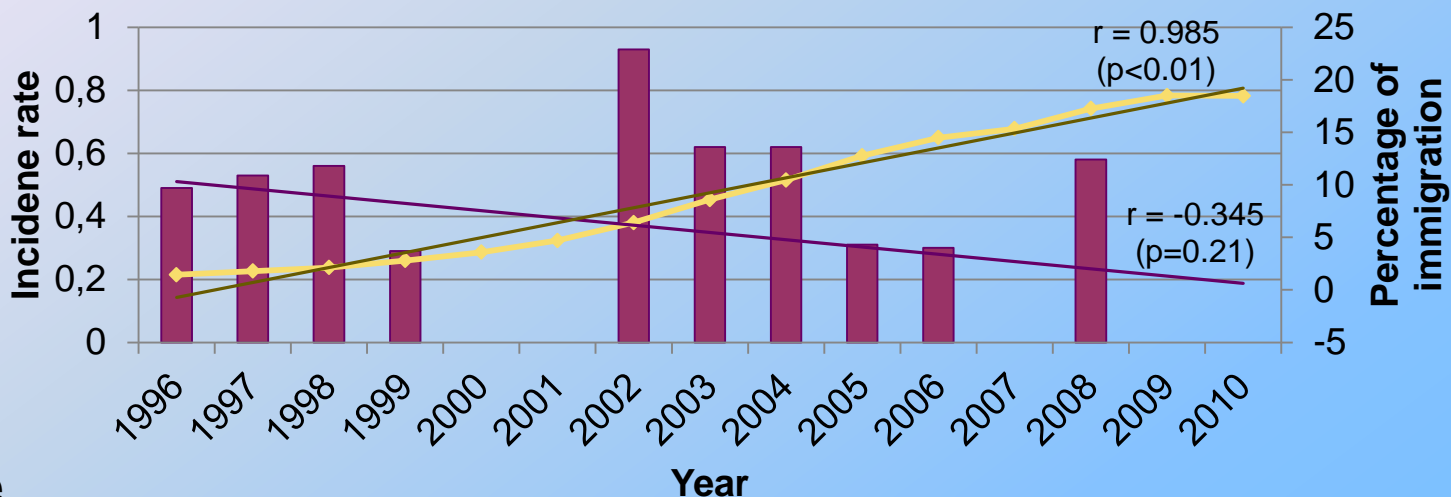


Department of Health
Generalitat of Catalonia

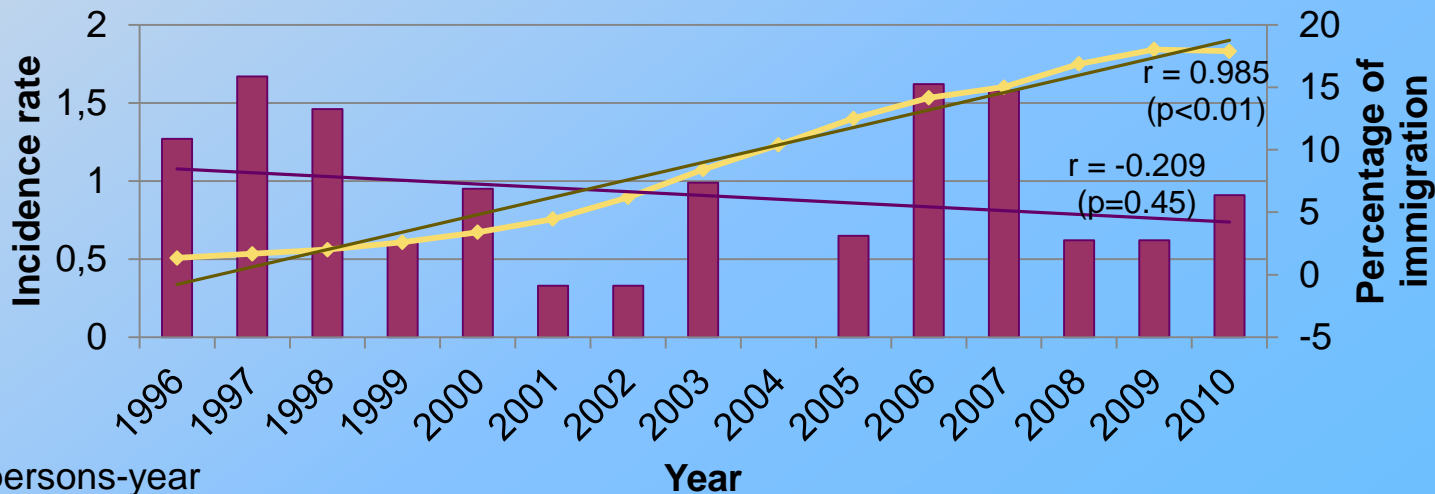


Hepatitis B. Reported incidence rate* and percentage of immigrant population by sex in 10-19 years age group. Catalonia, 1996-2010

Male



Female



■ Incidence rate ◆ Immigrant population

* per 100,000 persons-year



Department of Health
Generalitat of Catalonia



Percentages of immigration in five-year periods compared with the first year when this information was available (1996)

<u>Year</u>	<u>Male</u>	<u>Female</u>
	<u>% (95%CI)</u>	<u>% (95% CI)</u>
1996	1.76 (1.75 – 1.78)	1.45 (1.43 – 1.46)
1997–2001	2.85 (2.83 – 2.88)	2.35 (2.32 – 2.37)
2002–2006	10.80 (10.75 – 10.85)	8.50 (8.46 – 8.55)
2007–2010	16.64 (16.58 – 16.71)	13.70 (13.64 – 13.76)



Percentages of immigration in 10-19 year-olds for five-year periods compared with the first year when this information was available (1996)

<u>Year</u>	<u>Male</u>	<u>Female</u>
	<u>% (95%CI)</u>	<u>% (95% CI)</u>
1996	1.44 (1.40 – 1.47)	1.34 (1.31 – 1.38)
1997 – 2001	2.90 (2.87 – 2.92)	2.74 (2.71 – 2.77)
2002 – 2006	10.38 (10.54 – 10.63)	10.34 (10.30 – 10.40)
2007 – 2010	17.42 (17.36 – 17.49)	16.97 (16.-91 – 17.04)



CONCLUSIONS

- ✓ **1.** The reported incidence of acute hepatitis B (AHB) has fallen by 48% in the whole population nineteen years after the introduction of universal vaccination of preadolescents. The decrease was greater (61%) between 1991 and 2001.
- ✓ **2.** In the 10-19 years age group, corresponding to vaccinated cohorts, the reduction after nineteen years of vaccination is 81%. The greatest reduction was observed between the years 1991 and 2001: 100% in males and 74.2% in females.



CONCLUSIONS

- ✓ **3.** Although the reported incidence of AHB has fallen nineteen years after the introduction of universal vaccination of preadolescents, no reduction has been observed since 2001 in the whole population or in the 10-19 years age group.
- ✓ **4.** Between 2002 and 2010, the percentage of immigrants increased by 171% in the whole population, 161% in the 10-19 years age groups and 196% in the 10-19 years old males. This may explain why the impact of universal vaccination of preadolescents has been suboptimal.



RECOMMENDATIONS

- ✓ **Specific activities targeting the vaccination of immigrants should be implemented to improve the impact of hepatitis B vaccination in the community.**
- ✓ **Special efforts should be directed to immigrants coming from countries where mass vaccination programmes have still not been launched or where the coverage is still very low .**



ACKNOWLEDGEMENTS

We would like to thank:

Reporting physicians

- Directorate of Public Health. Generalitat of Catalonia
- Agency of Public Health of Barcelona
- Department of Public Health. University of Barcelona

This study was partially funded by

- CIBER Epidemiología y Salud Pública (CIBERESP), Instituto de Salud Carlos III, Spain
- AGAUR, expedient number GR09/0030



Department of Health
Generalitat of Catalonia



Thank you



29/11/2011

