

## ANONYMOUS UNLINKED STUDY OF THE PREVALENCE OF ANTI-HIV ANTIBODIES IN MOTHERS OF LIVE NEWBORNS FROM 6 AUTONOMOUS REGIONS 2003 – 2009

### SUMMARY

#### STUDY OBJECTIVES

- 1) To study HIV seroprevalence in mothers of live newborns and to monitor its evolution over time.
- 2) To identify differences in prevalence according to geographic distribution.

#### METHODOLOGY

**Population:** Live newborns in the Autonomous Regions of the **Balearic Islands, Canary Islands, Castilla-La Mancha, Castilla and Leon, Valencia, and Galicia, from 2003 to 2009**. The samples are anonymous and unlinked.

**Laboratory analysis:** The tests for the presence of HIV antibodies were conducted in the National Centre of Microbiology, in residual dried blood samples without personal identification taken from the regional programmes for early detection of metabolic diseases in newborns. The samples were analysed for HIV-1 and HIV-2 by ELISA tests and were confirmed with Western Blot.

**Statistical analysis:** The variables analysed were test result, and Autonomous Regions and province of residence. The seroprevalence of infection and its 95% confidence intervals were calculated using the exact binomial method, and the evolution over time was calculated using the  $\chi^2$  test for trends.

#### RESULTS

**2009:** The number of samples analysed was 112,119, with 153 positive results for HIV-1 and 1 for HIV-2. The overall prevalence of the two subtypes was **1.37‰** (95% CI: 1.16-1.61). The lowest prevalence was in Castilla-La Mancha (0.74‰ - 95% CI: 0.39-1.26), and the highest in the Canary Islands, with 3.07‰ (95% CI: 2.02-4.46).

Coverage of the study in the 6 Autonomous Regions overall, calculated using the number of births published by the National Statistics Institute, reached 76% in 2009, although there were differences among regions. These births represent 23% of all births in Spain in 2009.

**2003-2009:** The total number of samples analysed in the 6 regions was 858,768, with a total of 1,260 positive results for HIV-1 and 5 for HIV-2. The overall prevalence for the period 2003-2009 was 1.47‰ (95% CI: 1.39-1.55). A statistically significant **downward trend** can be seen throughout the period ( $p=0.007$ ).

By Autonomous Regions, the lowest total prevalence was identified in Castilla-La Mancha (0.86‰ – 95% CI: 0.70-1.04), and the highest in the Canary Islands, with 1.97‰ (95% CI: 1.65-2.33), followed by the Balearic Islands, with 1.91‰ (95% CI: 1.61-2.23) and Valencia, with 1.78‰ (95% CI: 1.64-1.93). No significant trends by Autonomous Regions were found during the period.

#### CONCLUSIONS

- **HIV prevalence** in the mothers of live newborns in this study remains at **over 1‰**, but shows a **downward trend**.

**Autonomous Regions of:**  
Balearic Islands, Canary Islands, Castilla-La Mancha, Castilla and Leon, Valencia and Galicia

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**ANONYMOUS UNLINKED STUDY OF THE PREVALENCE OF  
ANTI-HIV-1 and HIV-2 ANTIBODIES IN MOTHERS OF LIVE NEWBORNS  
FROM 6 AUTONOMOUS REGIONS  
2003 – 2009**

**WORKING GROUP**

**1) Regional programmes for HIV/AIDS and the early detection of metabolic diseases that participated in 2009:**

**Autonomous Region of the Balearic Islands:** Rosa Aranguren (Coordinadora de HIV/sida), Francisca González (Jefe del Servicio de Promoción de la Salud) and Magdalena Vila (Responsable Laboratorio Neonatología del H. Son Dureta)

**Autonomous Region of the Canary Islands:** Domingo Núñez (Coordinador Regional de Prevención de Sida), Eduardo Doménech (Jefe del Departamento de Pediatría and Director del H. Universitario de Canarias) and Flora Barroso (Profesora asociada de Pediatría and Responsable del Centro de Detección and Prevención de Metabolopatías)

**Autonomous Region of Castilla-La Mancha:** Juan Atenza (Director Gerente del Instituto de Ciencias de la Salud) and Eva Pérez (Jefe de Sección de Química Clínica. Laboratorio- Instituto de Ciencias de la Salud).

**Autonomous Region of Castilla and Leon:** Carmelo Ruiz (Jefe del Servicio de Epidemiología), Alfredo Blanco (Catedrático de Pediatría), Henar Marcos (Servicio de Epidemiología), Juan José Tellería (Coordinador del Laboratorio de Metabolopatías del Departamento de Pediatría) e Isabel Fernández (Coordinadora del Programa de Metabolopatías)

**Autonomous Region of Galicia:** José Antonio Taboada (Coordinador Plan de Prevención and Control del Sida), Ramón Vizoso (Servicio de Programas Poblacionais de Cribado) and José Ramón Alonso (Responsable Metabolopatías)

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**2) Reference laboratory:**

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**3) Design, coordination and epidemiological analysis:**

**National Centre of Epidemiology** (Instituto de Salud Carlos III)/ Secretaría del Plan Nacional sobre el Sida: Teresa Seisdedos, Mercedes Díez.



## INTRODUCTION

Surveillance of the prevalence of anti-HIV antibodies in blood samples of live newborns has been conducted in different Autonomous Regions since 1996. Their frequency and evolution reflect the level of HIV infection in mothers and are a valid estimate of the dimensions of HIV infection in women of reproductive age and in the low-risk heterosexual population of both sexes. This measure is also a useful source of information about the potential number of cases of vertical transmission, and may help in evaluating the impact over time of measures to prevent heterosexual transmission, as well as the impact of migratory flows from countries with generalised epidemics.

In addition to the results for 2009, this report includes data for the period 2003 to 2009 in the Balearic Islands, Canary Islands, Castilla–La Mancha, Castilla and Leon, Valencia, and Galicia. The Autonomous Region of Valencia joined the study in 2003, and Murcia and the autonomous city of Melilla withdrew in 2006.

## STUDY OBJECTIVES

- 1) To study HIV seroprevalence in mothers of live newborns and to monitor its evolution over time.
- 2) To identify differences in prevalence according to the geographic distribution of women included in the study.

## METODOLOGY

Anonymous unlinked study of the seroprevalence of HIV antibodies in dried blood samples of live newborns from the Autonomous Regions of the Balearic Islands, Canary Islands, Castilla-La Mancha, Castilla and Leon, Valencia, and Galicia, from 2003 to 2009.

The laboratory tests were conducted in the National Microbiology Centre, in residual dried blood samples without personal identification, taken from the regional programmes for early detection of metabolic diseases in newborns. The samples were analysed for HIV-1 and HIV-2. An ELISA test (Genscreen HIV1/2, Bio-Rad France) was performed in all samples. Reactive results underwent further testing by dual ELISA in parallel, and those doubly reactive (+/+) or uncertain (+/-) were confirmed by Western Blot (Chiron RIBA HIV-1/HIV-2 CIS, Ortho Diagnostic Systems, Inc. USA).

The variables analysed were: test result, Autonomous Region of residence and province of residence (in some cases). Seroprevalence of infection and its 95% confidence intervals was calculated by the exact binomial test with Stata/CI 10, and the evolution over time by the  $\chi^2$  test for linear trend with PASW Statistics 17.0 (SPSS).

## RESULTS

### 2009

The number of samples analysed was 112,119, with 153 positive results for HIV-1 and 1 for HIV-2. The overall prevalence of the two subtypes was 1.37‰ (CI: 1.16-1.61) (table 1 in annex and graph 1). The Autonomous Region with the lowest prevalence was Castilla-La Mancha, with 0.74‰ (95% CI: 0.39-1.26). The highest prevalence was in the Canary Islands, with 3.07‰ (95% CI: 2.02-4.46) (table 2 in annex and graph 2).



Overall coverage of the study in the 6 Autonomous Communities, calculated based on birth data published by the National Statistics Institute, reached 76% in 2009, although there were differences among regions. This coverage represents 23% of all births in Spain in 2009.

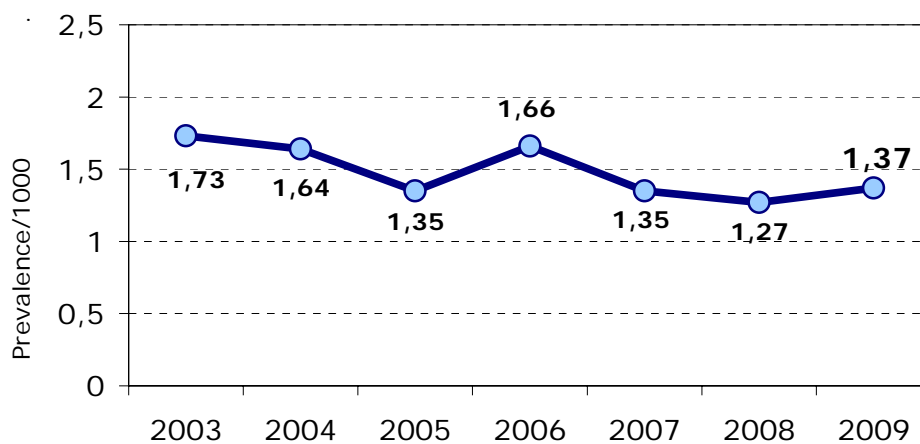
## 2003-2009

The total number of samples analysed in the 6 communities during 2003-2009 was 858,768, with a total of 1,260 positive results for HIV-1 and 5 for HIV-2.

The overall prevalence for 2003-2009 was 1.47‰ (95% CI: 1.39-1.55) (table 1 in the annex). A statistically significant downward trend was seen throughout the period ( $p=0.007$ ) (graph 1).

### Graph 1. Prevalence of HIV antibodies by year per 1000 live births

Balearic Islands, Canary Islands, Castilla-La Mancha, Castilla and Leon, Valencia, and Galicia

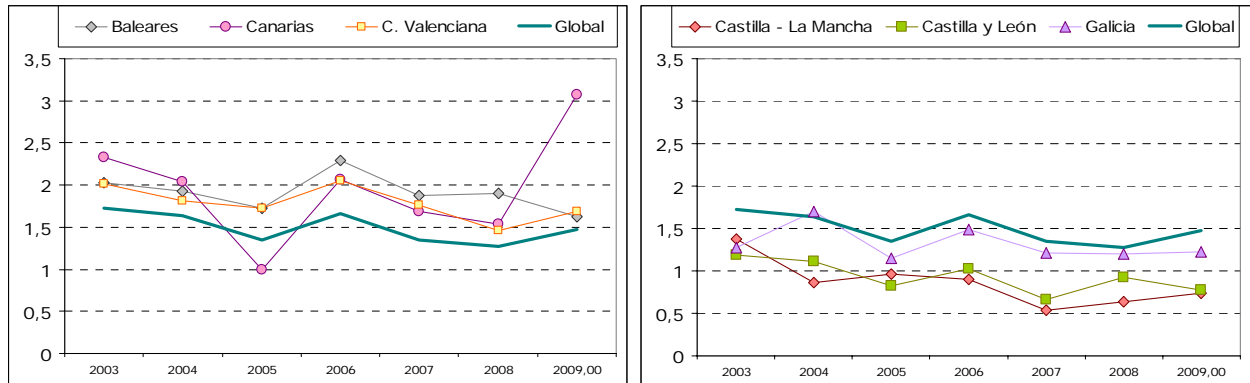


By Autonomous Region (tables 2 and 3 in annex, graph 2), the lowest prevalence was in Castilla-La Mancha (0.86‰; 95% CI: 0.70-1.04), and the highest was in the Canary Islands, with 1.97‰ (95% CI: 1.65-2.33), followed by the Balearic Islands, with 1.91‰ (95% CI: 1.61-2.23) and Valencia, with 1.78‰ (95% CI: 1.64-1.93). The number of cases in the Canary Islands increased in comparison with the preceding year, whereas the number of cases in the other Autonomous Regions remained the same or declined slightly. No significant trend during the period was found in any of the participating regions (table 2 in the annex and graph 2).

Between 2003 and 2009 the study coverage remained at around 85% of births in these regions, and 25% of those in the whole country.



**Graph 2. Prevalence of HIV antibodies per 1000 live births and by Autonomous Regions, 2003-2009**



## COMMENTS

The seroprevalence of HIV antibodies in mothers of live newborns in the 6 participating Autonomous Regions in 2009 was 1.47 per thousand. The prevalence has remained at over 1 per thousand, but with a statistically significant downward trend.

This information will contribute to monitoring the epidemic in the context of a comprehensive HIV surveillance system. The results cannot be directly generalised to all of Spain, however study coverage is very high for several of the participating regions. In 2009 it was 91% in Galicia, 83% in Castilla-La Mancha, and 100% in the Balearic Islands and Castilla and Leon, giving the study maximum external validity for the regional population. Furthermore, this study contributes information that aids surveillance of the trend of HIV infection in the sentinel population with minimal selection bias and at low cost.



## ANNEX

**Table 1. Prevalence (‰) of HIV antibodies (subtypes 1 and 2) in mothers of live newborns, 2003-2009**

Balearic Islands, Canary Islands, Castilla-La Mancha, Castilla and Leon, Valencia and Galicia

Year	Total (6 regions)	HIV+	Prevalence (‰)	95% CI
2003	113,823	197	<b>1.73</b>	1.58-1.99
2004	112,781	185	<b>1.64</b>	1.14-1.89
2005	124,742	168	<b>1.35</b>	1.15-1.57
2006	123,193	205	<b>1.66</b>	1.44-1.91
2007	131,581	177	<b>1.35</b>	1.15-1.56
2008	140,529	179	<b>1.27</b>	1.09-1.47
2009	112,119	154	<b>1.37</b>	1.16-1.61
<b>Total</b>	<b>858,768</b>	<b>1,265</b>	<b>1.47</b>	<b>1.39-1.55</b>

**Table 2. Prevalence (‰) of HIV in mothers of live newborns, by Autonomous Region, 2003-2009**

	2003	2004	2005	2006	2007	2008	2009	TOTAL
<b>BALEARIC ISLANDS</b>								
N	10.352	10.336	11.598	10.912	11.205	13.128	12.235	79.766
HIV (+)	21	20	20	25	21	25	20	152
Prevalence (‰)	<b>2,03</b>	<b>1,93</b>	<b>1,72</b>	<b>2,29</b>	<b>1,87</b>	<b>1,90</b>	<b>1,63</b>	<b>1,91</b>
95% CI	1.29-3.16	1.09-2.78	1.05-2.66	1.48-3.38	1.16-2.86	1.23-2.81	0.10-2.52	1.61-2.23
<b>CANARY ISLANDS</b>								
N	11.577	9.309	8.112	8.726	9.494	11.071	8.797	67.086
HIV (+)	27	19	8	18	16	17	27	132
Prevalence (‰)	<b>2,33</b>	<b>2,04</b>	<b>0,99</b>	<b>2,06</b>	<b>1,69</b>	<b>1,54</b>	<b>3,07</b>	<b>1,97</b>
95% CI	1.57-3.44	1.22-3.18	0.43-1.94	1.22-3.25	0.96-2.74	0.89-2.46	2.02-4.46	1.65-2.33
<b>CASTILLA-LA MANCHA</b>								
N	18.807	6.981	19.867	17.867	18.487	18.656	17.666	118.331
HIV (+)	26	6	19	16	10	12	13	102
Prevalence (‰)	<b>1,38</b>	<b>0,86</b>	<b>0,96</b>	<b>0,90</b>	<b>0,54</b>	<b>0,64</b>	<b>0,74</b>	<b>0,86</b>
95% CI	0.92-2.06	0.17-1.55	0.58-1.49	0.51-1.45	0.26-0.99	0.33-1.12	0.39-1.26	0.70-1.04
<b>CASTILLA AND LEON</b>								
N	12.656	19.750	18.319	20.590	20.997	22.786	22.125	137.223
HIV (+)	15	22	15	21	14	21	17	125
Prevalence (‰)	<b>1,19</b>	<b>1,11</b>	<b>0,82</b>	<b>1,02</b>	<b>0,67</b>	<b>0,92</b>	<b>0,77</b>	<b>0,91</b>
95% CI	0.69-2.00	0.65-1.58	0.46-1.35	0.63-1.55	0.36-1.12	0.57-1.41	0.45-1.23	0.76-1.08
<b>VALENCIAN COMMUNITY</b>								
N	41.618	48.747	50.305	49.593	54.045	53.948	30.767	329.023
HIV (+)	84	88	87	102	95	79	52	587
Prevalence (‰)	<b>2,02</b>	<b>1,81</b>	<b>1,73</b>	<b>2,06</b>	<b>1,76</b>	<b>1,46</b>	<b>1,69</b>	<b>1,78</b>
95% CI	1.62-2.51	1.43-2.18	1.39-2.13	1.67-2.49	1.42-2.15	1.16-1.82	1.26-2.21	1.64-1.93
<b>GALICIA</b>								
N	18.813	17.658	16.541	15.505	17.353	20.940	20.529	127.339
HIV (+)	24	30	19	23	21	25	25	167
Prevalence (‰)	<b>1,28</b>	<b>1,70</b>	<b>1,15</b>	<b>1,48</b>	<b>1,21</b>	<b>1,19</b>	<b>1,22</b>	<b>1,31</b>
95% CI	0.84-1.93	1.09-2.31	0.69-1.79	0.94-2.22	0.75-1.85	0.77-1.76	0.79-1.80	1.12-1.53

**Table 3. Prevalence (%o) of HIV in mothers of live newborns, by province, 2003-2009**

	2003		2004		2005		2006		2007		2008		2009		Total for the period	
	(%o)	95% CI	(%o)	95% CI	(%o)	95% CI	(%o)	95% CI	(%o)	95% CI	(%o)	95% CI	(%o)	95% CI	(%o)	95% CI
<b>BALEARIC ISLANDS</b>	<b>2,03</b>	<b>1.29-3.16</b>	<b>1,93</b>	<b>1.09-2.78</b>	<b>1,72</b>	<b>1.05-2.66</b>	<b>2,29</b>	<b>1.48-3.38</b>	<b>1,87</b>	<b>1.16-2.86</b>	<b>1,90</b>	<b>1.23-2.81</b>	<b>1,63</b>	<b>0.10-2.52</b>	<b>1,91</b>	<b>1.61-2.23</b>
<b>CANARY ISLANDS</b>	<b>2,33</b>	<b>1.57-3.44</b>	<b>2,04</b>	<b>1.22-3.18</b>	<b>0,99</b>	<b>0.43-1.94</b>	<b>2,06</b>	<b>1.22-3.25</b>	<b>1,69</b>	<b>0.96-2.74</b>	<b>1,54</b>	<b>0.89-2.46</b>	<b>3,07</b>	<b>2.02-4.46</b>	<b>1,97</b>	<b>1.65-2.33</b>
Las Palmas	1,35	0.61-2.55	2,55	1.31-4.45	0,71	0.14-2.07	1,09	0.35-25.40	1,15	0.42-2.50	0,72	0.20-1.84	1,87	0.75-3.85	1,38	1.02-1.83
Gran Canaria	0,96	1.57-3.44	2,35	1.07-4.46	0,90	0.18-2.62	1,10	0.30-2.82	1,26	0.41-2.95	0,95	0.26-2.44	2,55	1.02-5.24	1,38	0.97-1.90
Fuerteventura	3,63	0.63-14.53	4,07	1.02-22.43	0	-	4,00	0.10-22.08	0	-	0	-	0	-	1,78	0.49-4.56
Lanzarote	2,21	0.38-8.89	3,18	0.38-11.43	0	-	0	-	1,12	0.28-6.24	1,87	0.23-6.73	0	-	1,26	0.51-2.60
Sta. Cruz de Tenerife	3,67	2.17-5.79	1,52	0.61-3.12	1,28	0.41-2.99	3,14	1.67-5.36	2,34	1.12-4.29	2,18	1.16-3.80	3,95	2.42-6.10	2,56	2.04-3.17
Tenerife/Gomera/Hierro	3,52	2.08-5.85	1,64	0.66-3.37	1,14	0.31-2.91	3,26	1.68-5.67	2,55	1.22-4.68	1,97	0.95-3.62	3,93	2.20-6.47	2,57	2.02-3.22
La Palma	5,57	0.97-22.21	0	-	2,6	0.06-14.42	2,22	0.05-12.31	0	-	0	-	4,03	1.31-9.37	2,51	1.15-4.76
<b>CASTILLA-MANCHA</b>	<b>1,38</b>	<b>0.92-2.06</b>	<b>0,86</b>	<b>0.17-1.55</b>	<b>0,96</b>	<b>0.58-1.49</b>	<b>0,90</b>	<b>0.51-1.45</b>	<b>0,54</b>	<b>0.26-0.99</b>	<b>0,64</b>	<b>0.33-1.12</b>	<b>0,74</b>	<b>0.39-1.26</b>	<b>0,86</b>	<b>0.70-1.04</b>
Albacete	1,18	0.44-2.93	0,72	0.01-3.98	0,24	0.00-1.33	0,79	0.16-2.30	0,51	0.06-1.84	0,26	5.59e-06-1.43	0,53	0.06-1.93	0,60	0.33-0.99
Ciudad Real	0,83	0.27-2.27	1,13	0.13-4.09	0,55	0.11-1.60	0,42	0.051-1.53	0,42	0.05-1.52	0,61	0.13-1.77	0,67	0.14-1.95	0,61	0.37-0.96
Cuenca	1,17	0.20-4.72	0	-	0	-	1,95	0.40-5.70	1,29	0.15-4.67	1,91	0.39-5.5	0	-	0,99	0.47-1.81
Guadalajara	3,73	1.64-8.04	0	-	2,01	0.54-5.12	0,5	0.01-2.79	0,96	0.12-3.45	0,45	0.11-2.5	1,40	0.29-4.08	1,39	0.82-2.19
Toledo	1,23	0.54-2.65	0,47	0.01-2.64	1,74	0.86-3.10	1,23	0.49-2.53	0,33	0.04-1.19	0,50	0.10-1.47	0,88	0.28-2.04	0,96	0.67-1.33
<b>CASTILLA AND LEON</b>	<b>1,19</b>	<b>0.69-2.00</b>	<b>1,11</b>	<b>0.65-1.58</b>	<b>0,82</b>	<b>0.46-1.35</b>	<b>1,02</b>	<b>0.63-1.55</b>	<b>0,67</b>	<b>0.36-1.12</b>	<b>0,92</b>	<b>0.57-1.41</b>	<b>0,77</b>	<b>0.45-1.23</b>	<b>0,91</b>	<b>0.76-1.08</b>
Avila	1,34	0.07-8.67	0,83	0.02-4.63	1,71	0.20-6.17	0	-	0,74	0.02-4.10	0,67	0.02-3.73	0	-	0,69	0.25-1.50
Burgos	1,61	0.42-5.13	1,00	0.20-2.93	1,44	0.39-3.67	2,22	0.89-4.57	0,60	0.07-2.17	1,09	0.30-2.80	0,85	0.18-2.48	1,22	0.80-1.79
León	0,45	0.02-2.91	1,73	0.63-3.73	0,64	0.07-2.31	0,57	0.06-2.04	0,53	0.06-1.92	0,77	0.16-2.24	1,03	0.28-2.63	0,84	0.51-1.29
Palencia	2,65	0.46-10.61	0,84	0.21-4.66	0	-	1,66	0.20-5.99	1,59	0.19-5.75	0,76	0.02-4.22	0	-	1,00	0.43-1.97
Salamanca	1,03	0.18-4.13	2,49	1.00-5.12	0,79	0.09-2.86	0,70	0.08-2.51	0,67	0.08-2.44	1,96	0.72-4.25	2,27	0.91-4.68	1,45	0.97-2.10
Segovia	0	-	0	-	0	-	0	-	1,50	0.18-5.39	0,66	0.02-3.70	1,44	0.17-5.18	0,56	0.18-1.30
Soria	0	-	0	-	0	-	0	-	1,37	0.03-7.62	0	-	0	-	0,21	5.20e-06-1.14
Valladolid	1,70	0.63-4.21	0,87	0.23-2.21	1,13	0.36-2.64	1,36	0.05-2.80	0,39	0.05-1.42	0,88	0.29-2.05	0,18	4.51e-06-0.99	0,87	0.58-1.24
Zamora	1,25	0.07-8.10	0	-	0	-	0,78	0.02-4.36	0	-	0	-	0	-	0,25	0.03-0.90