The PISCIS Cohort contribution to the Epidemiological Surveillance of HIV and the HIV Treatment Cascade in Catalonia

Colin Campbell, Anna Esteve, Jordi Casabona and PISCIS Study Group
CEEISCAT, ASPCAT
aesteve@iconcologia.net
Outline

☐ Descripción de la Cohorte PISCIS

☐ Contribuciones de la Cohorte PISCIS
  ▪ Vigilancia epidemiológica del VIH en Cataluña
  ▪ Cálculo de indicadores de progreso
  ▪ Cascada de servicios en Cataluña
  ▪ Investigación clínica y guías de tratamiento

☐ Conclusiones y retos
PISCIS Cohort 1998-2011

Description

Open multicentric observational cohort study

Inclusion criteria:
- patients VIH +
- aged ≥ 16 years
- newly seen in the participating centers

14 Spanish Hospitals:
- 12 hospitals in Catalonia,
- 2 hospitals in the Balearic Islands
PISCIS Cohort Study

Description

☐ Starting date: January 1998

☐ Records of demographic, clinical, laboratory and treatment

☐ Quality was assessed by means of quality-control reports for each center

☐ Periodic record linkage with Mortality Registries

☐ Coordinating Center: Centre d’Estudis Epidemiològics sobre les ITS i Sida de Catalunya (CEEISCAT)
PISCIS Cohort Study
Description

Dataset updated until Dec2011:
- N=14,675 HIV infected patients
- 73,726 person-years of follow-up

Participating in international and national collaborations:
- COHERE-EUROCOORD, HIV-CAUSAL, ART-CC
- coRIS
PISCIS Cohort Study

Figure 1 Map of North American cohorts in the Antiretroviral Therapy Cohort Collaboration

Figure 2 Map of European cohorts in the Antiretroviral Therapy Cohort Collaboration

EuroSIDA covers 31 European countries plus Israel and Argentina; the Infección por HIV y SIDA (PISCIS) Cohort includes two regions: Catalonia and the Balearic Islands.
# PISCIS Cohort 1998-2011

## Patient characteristics

<table>
<thead>
<tr>
<th></th>
<th>Total Cohort PISCIS n(%)</th>
<th>Nous Diagnòstics n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL</strong></td>
<td>14549 (100,0%)</td>
<td>7694 (100,0%)</td>
</tr>
<tr>
<td><strong>Sexe(homes)</strong></td>
<td>11265 (77,4%)</td>
<td>6107 (79,4%)</td>
</tr>
<tr>
<td><strong>Edat al ingrés</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;24</td>
<td>731 (5,1%)</td>
<td>519 (6,9%)</td>
</tr>
<tr>
<td>25-45</td>
<td>10929 (76,5%)</td>
<td>5473 (73,0%)</td>
</tr>
<tr>
<td>45-49</td>
<td>1014 (7,1%)</td>
<td>481 (6,4%)</td>
</tr>
<tr>
<td>&gt;=50</td>
<td>1604 (11,2%)</td>
<td>1026 (13,7%)</td>
</tr>
<tr>
<td><strong>N missings</strong></td>
<td>271</td>
<td>195</td>
</tr>
<tr>
<td><strong>Grup de Transmissió</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UDVP</td>
<td>4240 (29,2%)</td>
<td>1023 (13,3%)</td>
</tr>
<tr>
<td>Homosexual/bisexual</td>
<td>4968 (34,2%)</td>
<td>3383 (44,0%)</td>
</tr>
<tr>
<td>Home heterosexual</td>
<td>2053 (14,1%)</td>
<td>1479 (19,2%)</td>
</tr>
<tr>
<td>Dona heterosexual</td>
<td>1962 (13,5%)</td>
<td>1223 (15,9%)</td>
</tr>
<tr>
<td>Altres</td>
<td>1313 (9,0%)</td>
<td>581 (7,6%)</td>
</tr>
<tr>
<td><strong>N missings</strong></td>
<td>13</td>
<td>5</td>
</tr>
</tbody>
</table>
# PISCIS Cohort 1998-2011

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<td>7694 (100,0%)</td>
</tr>
<tr>
<td>Naïf al ingrés</td>
<td>9476 (65,1%)</td>
<td></td>
</tr>
<tr>
<td>CD4+ basal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cd4&lt;200</td>
<td>3723 (32,3%)</td>
<td>2183 (33,7%)</td>
</tr>
<tr>
<td>200&lt;=cd4&lt;350</td>
<td>2501 (21,7%)</td>
<td>1315 (20,3%)</td>
</tr>
<tr>
<td>cd4&gt;=350</td>
<td>5316 (46,1%)</td>
<td>2985 (46,0%)</td>
</tr>
<tr>
<td>CD4+ basal (mediana)</td>
<td>367,07[149,0;523,5]</td>
<td>360,82[132,0;526,0]</td>
</tr>
<tr>
<td>Diagnòstic de SIDA al ingrés</td>
<td>2883 (19,8%)</td>
<td>1329 (17,3%)</td>
</tr>
<tr>
<td>Diagnòstic de SIDA durant seguiment</td>
<td>938 (6,4%)</td>
<td>497 (6,5%)</td>
</tr>
<tr>
<td><strong>Estatus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>En seguiment</td>
<td>9189 (63,2%)</td>
<td>5532 (71,9%)</td>
</tr>
<tr>
<td>Exitus</td>
<td>1253 (8,6%)</td>
<td>504 (6,6%)</td>
</tr>
<tr>
<td><strong>Persones-any de seguiment</strong></td>
<td>72378.6</td>
<td>39106.1</td>
</tr>
</tbody>
</table>
PISCIS Cohort complements HIV Surveillance

- Key feature is individual longitudinal surveillance
- Basic source of information for the Integrated Epidemiological Surveillance of HIV and STIs in Catalonia (SIVES)
- Describes the socio-demographic, epidemiological, clinical and biological characteristics of the new HIV diagnoses
- Monitors the long-term clinical outcome of patients with HIV infection
- Assesses the impact of antiretroviral therapy on the progression of the infection
- Provides core indicators for monitoring HIV/AIDS epidemic
Reportable events captured by a comprehensive longitudinal surveillance system of HIV

# Health indicators derived from the PISCIS Cohort

<table>
<thead>
<tr>
<th>Mortality indicators</th>
<th>Population</th>
<th>Estimated value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality rate in patients AIDS diagnosed (per 1000 person-years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Global</td>
<td>27.3</td>
</tr>
<tr>
<td></td>
<td>Men</td>
<td>28.5</td>
</tr>
<tr>
<td></td>
<td>Women</td>
<td>23.1</td>
</tr>
<tr>
<td></td>
<td>IDU</td>
<td>34.0</td>
</tr>
<tr>
<td></td>
<td>Heterosexual men</td>
<td>17.9</td>
</tr>
<tr>
<td></td>
<td>Heterosexual women</td>
<td>29.2</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>36.5</td>
</tr>
<tr>
<td>Percentage of AIDS cases who live more than 18 months</td>
<td>Global</td>
<td>90.0</td>
</tr>
<tr>
<td>Percentage of AIDS cases who live more than 10 years</td>
<td>Global</td>
<td>25.0</td>
</tr>
</tbody>
</table>
# Health indicators derived from the PISCIS Cohort

<table>
<thead>
<tr>
<th>Treatment indicators</th>
<th>Population</th>
<th>Estimated value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of HIV cases who lived more than 5 years after ART start</td>
<td>Global</td>
<td>92.6</td>
</tr>
<tr>
<td>Late presenters</td>
<td></td>
<td>91.0</td>
</tr>
<tr>
<td>New HIV diagnosis</td>
<td></td>
<td>96.8</td>
</tr>
<tr>
<td>Life expectancy in patients who start ART (in years)</td>
<td>Global A los 20 años</td>
<td>40.5</td>
</tr>
<tr>
<td>Potential years of life lost before age 65 years due to HIV infection in patients who initiate ART (per 1,000 persons-years)</td>
<td>Global A los 35 años</td>
<td>30.0</td>
</tr>
<tr>
<td><strong>GARP 4.1 INDICATOR.</strong> Percentage of HIV cases on TAR</td>
<td>Global</td>
<td>92.4</td>
</tr>
<tr>
<td><strong>GARP 4.2 INDICATOR.</strong> Percentage of HIV cases on ART 12 months after ART initiation</td>
<td>Global</td>
<td>89.2</td>
</tr>
<tr>
<td>Percentage of cases with undetectable viral load at 6 months after ART initiation</td>
<td>Global</td>
<td>94.9</td>
</tr>
</tbody>
</table>

**POPULATION:**

- HIV-related deaths
- AIDS
- HIV+
- Tested
- At risk
  - Core groups
  - Relevant groups

**INDICATORS:**

- Morbidity and Mortality
- Behavioural
- Health Services and Intervention
  - Prevention
  - Diagnosis
  - Treatment

**MORBIDITY AND MORTALITY**

- Linkage Mortality Registry, 1992
- AIDS Registry, 1987
- Monitoring recent infection, 2002
- Monitoring TDR, 2003-2005
- Monitoring vertical transmission, 1990
- Monitoring STI, 2006

**BEHAVIOURAL**

- PISCIS Cohort, 1998
- ITACA Cohort, 2008

**HEALTH SERVICES AND INTERVENTION**

- Testing monitoring, 1994
- Modelling/Projections, 1994
- Bio-behavioural surveillance, 1994
Are observational Cohorts representative?

- It is an aspiration of many cohorts!

- PISCIS covers about 70 – 75% of all new diagnosis of HIV in Cataluña, Baleares is population-based

- Includes naive and non-naive patients

- May be less representative of those diagnosed before 1998

Source: SIVES 2012

N=7694 new diagnoses

Source: SIVES 2012
New diagnosis of HIV, PISCIS Cohort 1998-2011

Origin

<table>
<thead>
<tr>
<th>Origin</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish</td>
<td>4556 (68,4%)</td>
</tr>
<tr>
<td>Western Europe</td>
<td>266 (4,0%)</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>109 (1,6%)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>321 (4,8%)</td>
</tr>
<tr>
<td>North Africa</td>
<td>107 (1,6%)</td>
</tr>
<tr>
<td>Latin America</td>
<td>1049 (15,7%)</td>
</tr>
<tr>
<td>North America</td>
<td>30 (0,5%)</td>
</tr>
<tr>
<td>Others</td>
<td>224 (3,4%)</td>
</tr>
</tbody>
</table>

Source: SIVES 2012
Late presenters among new diagnosis of HIV

Late presenters among new diagnosis of HIV

Source: SIVES 2012
HCV and HBV coinfection in new HIV diagnosis

Source: SIVES 2012
Incidence of opportunistic infections in the PISCIS Cohort

- Tuberculosis
- Pneumocystis jiroveci pneumonia
- Kaposi sarcoma
- Non-Hodgking lymphoma

Source: SIVES 2012
Mean Viral load in all patients in the PISCIS Cohort, by year

Source: PISCIS, Cataluña 2012
Mean Log10 Viral load in naive patients starting ART, PISCIS Cohort

Smoothed log10 Viral load

Months from initiation of cART

-50  -30  -10   10   30   50   70   90  110  130  150
Life expectancy at age 20 years in naive patients, PISCIS Cohort

- Heterosexual women: 50.2
- MSM: 49.6
- Heterosexual men: 36.6
- IDU: 28.7

Source: SIVES 2012
Modelling and projections

Figure 1: Total population (1000’s) of PLWH in Catalonia 1980-2017

Recently, the Integrated Epidemiological Surveillance of HIV and STIs in Catalonia has reported the HIV Treatment Cascade.

Graphically represents the HIV population at various stages of care.

It has become a tool for public health services to assess access to care, its quality throughout the process and the identification of major gaps.

Comparison with other countries is also possible.
Methods

Derivation of each stage of the treatment cascade

Estimated using Spectrum/EPP2011, a tool developed by WHO/UNAIDS to derive population estimates of the number of people living with HIV/AIDS from multiple sources of demographic and epidemiological data, including the PISCIS Cohort.
**Methods**

**Derivation of each stage of the treatment cascade**

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Estimated number of people living with HIV (PLWH) using Spectrum/EPP2011, a tool developed by WHO/UNAIDS to derive population estimates of the number of people living with HIV/AIDS from multiple sources of demographic and epidemiological data, including the PISCIS Cohort.</td>
</tr>
<tr>
<td>2</td>
<td>Without local estimates of undiagnosed HIV infection, we used European estimates published by ECDC and applied this to the Spectrum estimate of people with HIV. <em>75%</em></td>
</tr>
<tr>
<td>3</td>
<td><em>85%</em> of patients included in the PISCIS Cohort who had ≥1 visit in the year following inclusion in the Cohort.</td>
</tr>
<tr>
<td>4</td>
<td><em>91%</em> in follow-up in PISCIS Cohort who had cART during the last year.</td>
</tr>
<tr>
<td>5</td>
<td><em>95%</em> estimated from anecdotal data from testing centres of the number of people referred for a positive test who have a confirmatory test.</td>
</tr>
<tr>
<td>6</td>
<td><em>85%</em> of patients included in the PISCIS Cohort who had ≥1 visit in the year following inclusion in the Cohort.</td>
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* Percentage is applied to the previous column.
Methods
Derivation of each stage of the treatment cascade

Estimated number of people living with HIV (PLWH) estimated using Spectrum/EPP2011, a tool developed by WHO/UNAIDS to derive population estimates of the number of people living with HIV/AIDS from multiple sources of demographic and epidemiological data, including the PISCIS Cohort.

Without local estimates of undiagnosed HIV infection, we used European estimates published by ECDC and applied this to the Spectrum estimate of people with HIV.

Estimated from anecdotal data from testing centres of the number of people referred for a positive test who have a confirmatory test.

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Methods
Derivation of each stage of the treatment cascade

Estimated using Spectrum/EPP2011, a tool developed by WHO/UNAIDS to derive population estimates of the number of people living with HIV/AIDS from multiple sources of demographic and epidemiological data, including the PISCIS Cohort.

**Step 1**
Estimated number of people living with HIV (PLWH)

**Step 2**
% of PLWH diagnosed

*75%

**Step 3**
% contacting services

*95%

**Step 4**
% in regular care

*85%

Without local estimates of undiagnosed HIV infection, we used European estimates published by ECDC and applied this to the Spectrum estimate of people with HIV.

Estimated from anecdotal data from testing centres of the number of people referred for a positive test who have a confirmatory test.

% of patients included in the PISCIS Cohort who had ≥ 1 visit in the year following inclusion in the Cohort.

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Estimated from anecdotal data from testing centres of the number of people referred for a positive test who have a confirmatory test.

% of patients included in the PISCIS Cohort who had ≥1 visit in the year following inclusion in the Cohort.

% in follow-up in PISCIS Cohort who had cART during the last year.

* Percentage is applied to the previous columns.
**Methods**

**Derivation of each stage of the treatment cascade**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Estimated number of people living with HIV (PLWH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>% of PLWH diagnosed</td>
</tr>
<tr>
<td>Step 3</td>
<td>% contacting services</td>
</tr>
<tr>
<td>Step 4</td>
<td>% in regular care</td>
</tr>
<tr>
<td>Step 5</td>
<td>% Treated</td>
</tr>
<tr>
<td>Step 6</td>
<td>% with VL under 50 /ml</td>
</tr>
</tbody>
</table>

Estimated using Spectrum/EPP2011\(^1\), a tool developed by WHO/UNAIDS to derive population estimates of the number of people living with HIV/AIDS from multiple sources of demographic and epidemiological data, including the PISCIS Cohort.

Without local estimates of undiagnosed HIV infection, we used European estimates published by ECDC and applied this to the Spectrum estimate of people with HIV.

Estimated from anecdotal data from testing centres of the number of people referred for a positive test who have a confirmatory test.

% of patients included in the PISCIS Cohort who had ≥ 1 visit in the year following inclusion in the Cohort.

% in follow-up in PISCIS Cohort who had cART during the last year.

% VL <50 in the PISCIS Cohort.

* Percentage is applied to the previous columns
Results

The Treatment Cascade for Catalonia in 2011
The HIV Treatment Cascade: France, Australia, USA, UK
Contribution to clinical guidelines: Assessment of the optimal time to initiate cART


<table>
<thead>
<tr>
<th>CD4</th>
<th>leadtime</th>
<th>n</th>
<th>AIDS</th>
<th>HR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;350</td>
<td>-</td>
<td>625</td>
<td>17</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>200-350</td>
<td>Unadjusted</td>
<td>650</td>
<td>25</td>
<td>1.56</td>
<td>(0.84-2.90)</td>
</tr>
<tr>
<td>200-350</td>
<td>Adjusted</td>
<td>670</td>
<td>45</td>
<td>1.85</td>
<td>(1.03-3.33)</td>
</tr>
</tbody>
</table>

Proportion of AIDS free >350 CD4
200-350 CD4
200-350 CD4 adjusted by leadtime

Years from HAART initiation

Generalitat de Catalunya
Agència de Salut Pública de Catalunya
Cercle d'Estudis Epidemiològics
entre les Infeccions de Transmissió Sexual i Sida de Catalunya
Contribution to clinical guidelines:
Optimal timing for initiation of cART in individuals presenting with AIDS
Final remarks

- The PISCIS Cohort is an essential information source generating information on the quality of HIV screening programs and health care.
- It is advisable to maintain the PISCIS Cohort as a permanent source of information to complement and enhance existing surveillance systems,
- and increasing the population representativeness in the forthcoming years.
Future challenges

- Financiamiento insuficiente
- Coordinaciones más eficientes
- LOPD
- Cobertura de morbilidad importante: envejecimiento, cardiovascular, viral hepatitis (genotype, new treatments), cáncer
PISCIS Study Group

**Coordinators:** J. Casabona (Centre d'Estudis Epidemiològics sobre les Infeccions de Transmissió Sexual i Sida de Catalunya: CEEISCAT), Jose M. Miró (Hospital Clínic-Idibaps, Universitat de Barcelona).

**Field Coordinator:** C. Campbell (CEEISCAT).

**Steering committee:** J. Casabona, A. Esteve, C. Campbell (CEEISCAT), Jose M. Miró (Hospital Clínic-Idibaps, Universitat de Barcelona), D. Podzamczer (Hospital Universitari de Bellvitge-IDIBELL), J. Murillas (Hospital Son Espases de Mallorca).

**Scientific committee:** JM Gatell, C. Manzardo (Hospital Clínic-Idibaps, Universitat de Barcelona), C. Tural, B. Clotet (Fundació Lluita contra la Sida, Fundacio irsicaixa, Hospital Universitari Germans Trias i Pujol, Universitat Autónoma de Barcelona), E. Ferrer (Hospital Universitari de Bellvitge-IDIBELL), M. Riera (Hospital Son Espases de Mallorca), F. Segura, G. Navarro (Corporació Sanitària i Universitària Parc Taulí, Universitat Autònoma de Barcelona), L. Force (Hospital de Mataró, Consorci Sanitario del Maresme), J. Vilaró (Hospital General de Vic), A. Masabeu (Hospital de Palamós), I. García (Hospital General d’Hospitalet), M. Guadarrama (Hospital Comarcal de l'Alt Penedès), C. Cifuentes, F. Homar (Hospital Son Llàtzer), D. Dalmau, À. Jaen (Hospital Universitari Mútua de Terrassa), P. Domingo (Hospital de la Santa Creu i Sant Pau), V. Falcó, A. Curran (Hospital Universitari Vall d’Hebron), C. Campbell, C. Agustí (CEEISCAT).

**Data Management and Statistical Analysis:** A. Esteve, A. Montoliu (CEEISCAT), I. Pérez (Hospital Clínic-Idibaps, Universitat de Barcelona), Jordi Curto (Hospital Universitari de Bellvitge-IDIBELL)

**Technical Support:** F. Sànchez (CEEISCAT), F. Gargoulas, (Hospital Son Espases y Hospital Son Llàtzer), A. Gómez (Hospital Comarcal de l'Alt Penedès), JC Rubia (Hospital General d’Hospitalet)

**Associated investigators:** L. Zamora, J.L. Blanco, F. Garcia- Alcaide, E. Martínez, J. Mallolas, (Hospital Clínic-Idibaps, Universitat de Barcelona), JM. Llibre, G. Sirera, J. Romeu, A. Jou, E. Negredo, C. Miranda (Fundació Lluita contra la Sida, Hospital Universitari Germans Trias i Pujol, Universitat Autònoma de Barcelona), M. Saumoy, JM. Tiraboschi, A Imaz, F. Bolao, C. Cabellos, C. Peña, S. DíYacovo (Hospital Universitari de Bellvitge-IDIBELL), M. Sala, M. Cervantes, M.J. Amengual, M. Navarro, V. Segura (Corporació Sanitària i Universitària Parc Taulí, Universitat Autònoma de Barcelona,) P. Barrufet, (Hospital de Mataró, Consorci Sanitario del Maresme), J. Molina, M. Alvaro, J. Mercadal (Hospital Alt Penedès de Vilafranca), T. Payeras (Hospital Son Llàtzer).

**Civil Society Representatives:** Juanse Fernández (Comitè 1er de Desembre), Jesús E. Ospina (RedVIH)