Characteristics of individuals with HIV presenting late for care across Europe

Jens D Lundgren for the late presenters working group of COHERE in EuroCoord

Collaboration of Observational HIV Epidemiological Research Europe
Coordination: Copenhagen HIV Programme (CHIP) & Institut de Santé Publique, d’Épidémiologie et de Développement (ISPED)
Background

- Rates of HIV testing in many populations are low, resulting in late presentation
- Delays in diagnosis associated with:
  - poor prognosis
  - increased time for which the person remains infectious and unaware of their infection
- Many results from different countries using different definitions, consensus definition of late presentation published in 2011
  - CD4 count <350/mm³ or an AIDS diagnosis
- Cross Europe comparisons rare
- Region wide statistics useful for monitoring, targeting interventions and monitoring the epidemic

¹Antinori A et al, HIV Medicine 2011;12:61-64
Aims

Using data from COHERE\(^1\), a Europe wide collaboration of 33 cohorts across Europe

- Report the characteristics of LP
- Investigate temporal trends in the proportion of newly diagnosed people who are LP
- Characterise this proportion across different regions of Europe

Where LP defined as CD4<350/mm\(^3\) or AIDS at presentation for care

Inclusion criteria

- Adults (>16 years old)
- Presenting for care for the first time on or after 1/1/2000
- CD4 count available at or within 6 months of presentation
- Not from a seroconverter cohort included in COHERE

**Definitions**

- LP : CD4<350/mm³ / AIDS at presentation for care
- Advanced immunodeficiency : CD4<200/mm³ / AIDS at presentation for care
- Very advanced LP : CD4<50/mm³ / AIDS at presentation for care
LP across Europe: COHERE

84,524 presented for care

45,488 (54%) LP

28,081 (33%) advanced immunodeficiency

15,879 (19%) very advanced LP

11,903 (14%) with AIDS

LP: CD4 < 350/AIDS; advanced immunodeficiency: CD4 < 200/AIDS; very advanced LP: CD4 < 50/AIDS
## Characteristics at presentation (1)

<table>
<thead>
<tr>
<th></th>
<th>LP</th>
<th>Not LP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total presenting for care (N, % of total)</td>
<td>45488</td>
<td>53.8</td>
</tr>
<tr>
<td>Year presentation, month/year (median, IQR)</td>
<td>2/05</td>
<td>8/02 – 8/07</td>
</tr>
<tr>
<td>HIV Exposure N (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSM</td>
<td>14317</td>
<td>43.7</td>
</tr>
<tr>
<td>Heterosexual male</td>
<td>11158</td>
<td>66.1</td>
</tr>
<tr>
<td>Heterosexual female</td>
<td>11479</td>
<td>57.0</td>
</tr>
<tr>
<td>Male IDU</td>
<td>2393</td>
<td>57.8</td>
</tr>
<tr>
<td>Female IDU</td>
<td>718</td>
<td>50.8</td>
</tr>
<tr>
<td>Male other</td>
<td>3678</td>
<td>58.3</td>
</tr>
<tr>
<td>Female other</td>
<td>1745</td>
<td>60.4</td>
</tr>
<tr>
<td>Age, years (Median, IQR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>31 – 45</td>
<td>34</td>
</tr>
<tr>
<td>CD4, /mm³ (Median, IQR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>70 – 270</td>
<td>535</td>
</tr>
</tbody>
</table>

All p-values <0.0001

MSM; men who have sex with men
IDU; injection drug use
Characteristics at presentation (2)

- Not LP by region of presentation
- LP by region of presentation
- Not LP by region of origin
- LP by region of origin

**Region of presentation**
- South: 7796 patients
- Central: 39949 patients
- North: 35583 patients
- East: 1196 patients

**Region of origin**
- Europe: 31370 patients
- Africa: 11835 patients
- Other: 5812 patients
- Unknown: 35509 patients

**Proportion of patients**
- South: 90% Not LP, 10% LP
- Central: 90% Not LP, 10% LP
- North: 70% Not LP, 30% LP
- East: 70% Not LP, 30% LP
- Europe: 90% Not LP, 10% LP
- Africa: 90% Not LP, 10% LP
- Other: 90% Not LP, 10% LP
- Unknown: 100% Not LP

*p-values <0.0001*
LP by year of presentation (1)

Crude odds ratio 0.96 (0.95 – 0.97) per calendar year

LP : CD4 < 350/AIDS; advanced immunodeficiency : CD4 < 200/AIDS
LP by year of presentation (2)

Crude odds ratio 0.96 (0.95 – 0.97) per calendar year
Crude odds ratio 0.95 (0.94 – 0.96) per calendar year

LP : CD4 < 350/AIDS; advanced immunodeficiency : CD4 < 200/AIDS
LP by year of presentation (3)

Crude odds ratio 0.96 (0.95 – 0.97) per calendar year
Crude odds ratio 0.95 (0.94 – 0.96) per calendar year
Crude odds ratio 0.94 (0.93 – 0.95) per calendar year

N            7367     7404     8046      7756     8591     8663      8251     8618     9057      7548     3223
Year of presentation

LP : CD4 < 350/AIDS; advanced immunodeficiency : CD4 < 200/AIDS
LP by year of presentation (4)

Crude odds ratio 0.96 (0.95 – 0.97) per calendar year
Crude odds ratio 0.95 (0.94 – 0.96) per calendar year
Crude odds ratio 0.94 (0.93 – 0.95) per calendar year
Crude 4.4 (3.8 – 5.0/mm$^3$) per year increase in CD4 at presentation

LP : CD4 < 350/AIDS; advanced immunodeficiency : CD4 < 200/AIDS
## Characteristics by year of presentation

<table>
<thead>
<tr>
<th>Characteristics by year of presentation</th>
<th>Year of presentation</th>
<th>2000</th>
<th>2005</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total presenting for care (N)</td>
<td></td>
<td>7367</td>
<td>8663</td>
<td>7548</td>
</tr>
<tr>
<td>Presenting late (N, % of total)</td>
<td></td>
<td>4222 (57.3)</td>
<td>4683 (54.1)</td>
<td>3671 (48.6)</td>
</tr>
<tr>
<td>With advanced immunodeficiency (N, % of total)</td>
<td></td>
<td>2769 (37.6)</td>
<td>2911 (33.6)</td>
<td>2069 (27.4)</td>
</tr>
<tr>
<td>Mode of infection/gender (N, % presenting late)</td>
<td></td>
<td>MSM 1185 (52.3)</td>
<td>1485 (43.6)</td>
<td>1354 (39.3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heterosexual male 1037 (66.4)</td>
<td>1149 (65.9)</td>
<td>808 (63.1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heterosexual female 1052 (55.8)</td>
<td>1285 (58.0)</td>
<td>746 (56.3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male IDU 383 (54.6)</td>
<td>245 (61.0)</td>
<td>116 (60.1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female IDU 101 (44.5)</td>
<td>65 (52.9)</td>
<td>31 (50.8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Male other 309 (65.7)</td>
<td>302 (58.3)</td>
<td>448 (47.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Female other 155 (60.8)</td>
<td>152 (59.8)</td>
<td>168 (55.5)</td>
</tr>
<tr>
<td>Region of origin (N, % presenting late)</td>
<td></td>
<td>Europe 1410 (54.3)</td>
<td>1632 (51.7)</td>
<td>1453 (46.5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Africa 693 (65.9)</td>
<td>805 (66.8)</td>
<td>560 (64.1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other 232 (64.4)</td>
<td>389 (58.1)</td>
<td>291 (52.2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unknown 1887 (56.1)</td>
<td>1857 (51.1)</td>
<td>1367 (45.6)</td>
</tr>
</tbody>
</table>
Characteristics associated with LP

- **Year of presentation**
- **Mode of infection/gender**
  - MSM
  - Male heterosexual
  - Female heterosexual
  - Male IDU
  - Female IDU
  - Male other
  - Female other
- **Region of origin**
  - Europe
  - Africa
  - Other
  - Unknown
- **Region of presentation**
  - West Central
  - South
  - North
  - East
- **Age**

*Adjusted* odds ratio (95% confidence interval)

*Adjusted for variables shown in figure. MSM; men who have sex with men IDU; injection drug use*
Adjusted odds of LP and year of presentation

Region of presentation: S; South. C; Central. N; North. E; East.
MSM; men who have sex with men. Het; heterosexual. IDU; injection drug use.
*Adjusted for age and region of origin.
Interaction between year and mode of infection or region of presentation <0.0001
### Multivariate predictors of CD4 at presentation

<table>
<thead>
<tr>
<th>Year of presentation (per yr later)</th>
<th>CD4</th>
<th>95% CI</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV Exposure/ gender N (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSM</td>
<td>Ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heterosexual male</td>
<td>-29.9</td>
<td>-32.8 to -15.2</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Heterosexual female</td>
<td>-14.0</td>
<td>-17.4 to -10.7</td>
<td></td>
</tr>
<tr>
<td>Male IDU</td>
<td>-18.4</td>
<td>-24.0 to -12.9</td>
<td></td>
</tr>
<tr>
<td>Female IDU</td>
<td>-4.1</td>
<td>-13.6 to 5.4</td>
<td></td>
</tr>
<tr>
<td>Male other</td>
<td>-24.0</td>
<td>-28.6 to -19.4</td>
<td></td>
</tr>
<tr>
<td>Female other</td>
<td>5.4</td>
<td>-1.9 to 12.7</td>
<td></td>
</tr>
<tr>
<td>Age (per 10 yr older)</td>
<td>-16.3</td>
<td>-17.4 to -15.2</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Region of presentation (N,% )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South</td>
<td>Ref</td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>West Central</td>
<td>-15.1</td>
<td>-19.5 to -10.8</td>
<td></td>
</tr>
<tr>
<td>North</td>
<td>7.9</td>
<td>5.3 to 10.5</td>
<td></td>
</tr>
<tr>
<td>East</td>
<td>0.3</td>
<td>-10.6 to 11.1</td>
<td></td>
</tr>
<tr>
<td>Region of origin Europe</td>
<td></td>
<td></td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Europe</td>
<td>Ref</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Africa</td>
<td>-5.4</td>
<td>-9.4 to -1.4</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>-14.4</td>
<td>-19.2 to -9.5</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>-18.6</td>
<td>-11.4 to -5.7</td>
<td></td>
</tr>
</tbody>
</table>

**Univariate 4.4 (3.8 – 5.0/mm³) increase in CD4 at presentation per year later presentation**

Figures show the adjusted CD4 at presentation, adjusted for the factors shown in the table.

MSM; men who have sex with men
IDU; injection drug use
Individuals at low, moderate and high risk for LP

Variation in proportion of LP depending on study population

- Low risk: 35.6%, N=5384 (MSM; men who have sex with men)
- Moderate risk: 47.0%, N=741 (IDU; injection drug use)
- High risk: 70.7%, N=2178 (Heterosexual)

Age:
- <35
- >55

Region of presentation:
- Europe

N:
- 15123
- 1576
- 3077

MSM; men who have sex with men IDU; injection drug use
### Availability of CD4 at presentation
#### Effect on proportion of LP

<table>
<thead>
<tr>
<th>CD4 count window</th>
<th>All N (%) LP</th>
<th>South %</th>
<th>Central %</th>
<th>North %</th>
<th>East %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 month</td>
<td>67,338 (55)</td>
<td>58</td>
<td>56</td>
<td>53</td>
<td>48</td>
</tr>
<tr>
<td>6 months</td>
<td>84,524 (54)</td>
<td>57</td>
<td>54</td>
<td>53</td>
<td>47</td>
</tr>
<tr>
<td>12 months</td>
<td>88,507 (54)</td>
<td>57</td>
<td>54</td>
<td>53</td>
<td>46</td>
</tr>
<tr>
<td>1st available</td>
<td>98,743 (53)</td>
<td>57</td>
<td>53</td>
<td>52</td>
<td>45</td>
</tr>
<tr>
<td>No CD4 in 1st 6 months :</td>
<td>102,532 (62)</td>
<td>63</td>
<td>64</td>
<td>68</td>
<td>74</td>
</tr>
<tr>
<td>LP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No CD4 in 1st 6 months and</td>
<td>102,532 (45)</td>
<td>51</td>
<td>44</td>
<td>47</td>
<td>26</td>
</tr>
<tr>
<td>no AIDS : not LP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*All figures are proportion of LP according to availability of CD4 at presentation*
Limitations

• Almost 20% excluded due to no CD4 counts, different estimates of proportion of LP depending on how you treat these patients in analyses
• Clinics enrolled in COHERE not necessarily representative of rest of Europe; 320+ clinics from 34 countries
• Screening practises for HIV will vary in different countries and across regions
• Limited data from East Europe and most affected by missing CD4 count data
Conclusions

- Over 50% of individuals with CD4 counts measured at or within 6 months of presentation are LP across Europe.
- The proportion of newly diagnosed persons who are LP decreased by 4% per year.
- Considerable variation within different exposure groups and regions of Europe.
- Median CD4 at presentation of all patients increased by only 1.2 cells/mm³ per year.
- Older non-MSM originating from outside of Europe, presenting in South or North Europe were more likely to be LP.
- A substantial number of ‘low risk’ individuals continue to be LP.
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Working group
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Steering committee:

Executive committee: Ian Weller (Chair, University College London), Manuel Battegay (SHCS, MoCHIV), Jordi Casabona (PISCIS), Dominique Costagliola (FHDF), Antonella d’Arminio Monforte (ICONA), Frank de Wolf (ATHENA), Maria Prins (CASCADE), Jesper Grarup (Head, Copenhagen Regional Co-ordinating Center), Geneviève Chene (Head, Bordeaux Regional Co-ordinating Centre).

Contributing cohorts: Robert Zangerle (AHIVCOS), Giota Touloumi (AMACS), Josiane Warszawski (ANRS CO1 EPF), Laurence Meyer (ANRS CO2 SEROCO), François Dabis (ANRS CO3 AQUITAINA), Murielle Mary Krause (ANRS CO4 FHDH), Jade Ghosn (ANRS CO6 PRIMO), Catherine Leport (ANRS CO8 COPILOTE), Frank de Wolf (ATHENA), Peter Reiss (ATHENA), Maria Prins (CASCADE), Heiner Bucher (CASCADE), Caroline Sabin (CHIC), Diana Gibb (CHIPS), Gerd Fätkenheuer (Cologne Bonn), Julia Del Amo (Co-RIS), Niels Obel (Dianish HIV Cohort), Claire Thorne (ECS), Amanda Mocroft (EuroSIDA), Ole Kirk (EuroSIDA), Christoph Stephan (Frankfurt), Santiago Pérez-Hoyos (GEMES-Haemo), Antoni Noguera-Julian (NENEXP and CORISPE-cat), Andrea Antinori (ICC), Antonella d’Arminio Monforte (ICONA), Norbert Brockmeyer (KOMPNET), José Ramos (Madrid Cohort), Manuel Battegay (SHCS, MoCHIV), Andri Rauch (SHCS), Cristina Mussini (Modena Cohort), Pat Tooke (NSHPC), Jordi Casabona (PISCIS), Jose M. Miró (PISCIS), Antonella Castagna (San Raffaelé), Stephane de Wit (St. Pierre Cohort), Tessa Goetghheber (Belgian Pediatric cohort, St Pierre), Carlo Torti (Italian Master Cohort), Ramon Teira (VACH), Myriam Garrido (VACH).

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