Cascade of medical care to HIV-infected patients in Europe

Cristina Mussini
UNAIDS: New HIV treatment target

90% of people tested
90% of people diagnosed with HIV on treatment
90% of people on treatment with suppressed viral load

Figura 3. Incidenza delle nuove diagnosi di infezione da HIV per 100.000 residenti in Italia, Portogallo, Spagna, Regno Unito, Francia, Grecia e Germania

HPTN 052: HIV-1 Transmission

Total HIV-1 Transmission Events: 39

Early ART led to a 96% reduction of sexual transmission of HIV-1 in serodiscordant couples

Linked Transmissions: 28

Unlinked or TBD Transmissions: 11

Immediate Arm: 1

Delayed Arm: 27

Single transmission in patient in immediate HAART arm believed to have occurred close to time therapy began and prior to suppression of genital tract HIV

$p < 0.001$
HIV-ve partners reporting condomless penetrative sex during eligible CYFU

% reporting

0  20  40  60  80  100

<table>
<thead>
<tr>
<th>Category</th>
<th>% Reporting</th>
</tr>
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<tbody>
<tr>
<td>Vaginal sex with ejaculation</td>
<td>HT ♀</td>
</tr>
<tr>
<td>Vaginal sex</td>
<td>HT ♂</td>
</tr>
<tr>
<td>Receptive anal sex</td>
<td>MSM</td>
</tr>
<tr>
<td>Receptive anal sex with ejaculation</td>
<td></td>
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<tr>
<td>Only insertive anal sex</td>
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</table>
Rate of HIV transmission according to sexual behaviour reported by the negative partner

**HT ♂ Vaginal sex with ejaculation (CYFU=192)**

**HT ♀ Vaginal sex (CYFU=272)**

Receptive anal sex with ejaculation (CYFU=93)

**MSM Receptive anal sex without ejaculation (CYFU=157)**

Insertive anal sex (CYFU=262)

- Estimated rate
- 95% confidence interval
Number of active HAART participants and number of new HIV diagnoses per year in British Columbia, Canada, 1996–2009

Effects of ARV scale up on HIV transmission in 53 low and middle income countries

Figure 2: HIV transmission rate (new infections in 2013 / total HIV-infected people) versus ART coverage in 53 countries, weighted by epidemic size.

Hill A, et al. poster 1118
Cascade of HIV care – United Kingdom

Breakpoint in cascade: undiagnosed HIV positive and not linked to care

- Living with HIV: 98,400
- Diagnosed: 77,610 (79%)
- Linked to care: 69,198 (70%)
- In care: 65,928 (67%)
- On ART: 57,072 (58%)
- Adherent to ART: 86.6%
- Virologically suppressed: 73.5%

Cascade of HIV care – United States

- Living with HIV: 114820
- Diagnosed: 940376
- Linked to care: 755516
- In care: 424834
- On ART: 375461
- Adherent to ART: 290495
- Virologically suppressed: 25%

Breakpoint in cascade: retention in care
- 75.4%
- 30.9%

Centres for Disease Control Fact sheet, December 2013
Treatment cascade of adults living with HIV in Russia, 2014

What about Italy
The continuum of HIV care in Italy, 2012
A tentative description

Mammone ICAR’14
Lazzaretti IAS ‘11
Fusco ICAR ‘14
ISS-COA ‘13
ICONA ‘13 + Others

Living With HIV
Diagnosed
Linked in Care
In Care
On ART
Undetectable
The continuum of HIV care in Italy, 2012
A tentative description

\[ \Delta - 59962 \text{ persons} \quad (-44\%) \]

- Living With HIV: 129,529
- Diagnosed: 110,100
- Linked in Care: 104,595 (5%)
- In Care: 94,136
- On ART: 82,463
- Undetectable: 72,567

88.0%  65.9%
We conclude that ensuring access to HIV care, appointing expert health facilities and care providers, and routine monitoring of HIV-infected patients promotes retention in care. Quality assessment through accreditation and the measurement of performance benefits the delivery of HIV care.

Engelhard et al. AIDS 2016
Being followed by GPs is not the best in British Columbia

Lourenco et al. HIV Medicine 2015

Fig. 1  Non-HIV-related health care utilization by retention status among 5231 individuals linked to HIV care between 2000 and 2010 in BC, Canada. The distribution of the 90% of study individuals retained in HIV care (shown as a patterned bar) and the distribution of the 10% of study individuals not retained in HIV care (shown as a solid bar) are shown by the type of non-HIV-related health care service used. GP, billed Medical Services Plan non-HIV-related general practitioner visit; Hosp. adm., non-HIV-related hospital admission; Rx, non-HIV-related hospital prescription; Specialist, billed Medical Services Plan non-HIV-related specialist visit.
Retention in care in Modena, Milan San Paolo and Spallanzani hospitals
• A total of 731 HIV-infected individuals diagnosed with HIV infection between 1st January 2008 and 31st December 2010 (198 from MC, 161 from SPID, accounting for 1800 person-year follow-up (PYFU).

• Not retained in care if lost to follow-up for at least 18 months at 1st June 2012

• No differences between the cohorts were found.

• nd 372 from SC) were included in the analysis,
Cascade of care

85.6% 59.9%

- Tested: N = 359
- Linked in care: N = 348
- Retained in care: N = 276
- On ARV: N = 251
- HIV-RNA undetectable: N = 215

Deceased: 11
Moved: 13
NRC: 48
Factors associated with NRC (Poisson regression model)

- Incidence rate of NRC in pooled cohorts was 8.76/100 PYFU (95% CI: 7.51–10.22)
Subanalysis for reasons of NRC

• Data from MC and SPID only

• We evaluated proportion of patients resulted retained in care, on ARV and with undetectable HIV-RNA plasma level at the end of follow-up

• A total of 880 PYFU were considered

• Using the definition of NRC (accounting for a total of 11 patients not linked in care and 48 patients not retained in care), IR of NRC was 6.70/100 PYFU (95% CI 5.19 – 8.64)
Reasons for NRC

Voluntary 21 patients (35.6%)
Unreacheable 38 patients (64.51%)
Factors associated with NRC (Poisson regression model in the subanalysis)
Non retention is a crucial moment

Late Diagnosis

Delayed Presentation

Late Presentation

Late Presentation?

12-month CD4 count or progression to AIDS

Early missed visits and mortality

- Study of UAB 1917 Clinic patients initiating outpatient HIV care, 2000 - 2005 (N=543)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>HR (95%CI)(^a)</th>
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<tbody>
<tr>
<td>“No show” visit in 1(^{st}) year</td>
<td>2.90 (1.28-6.56)</td>
</tr>
<tr>
<td>Age (HR per 10 years)</td>
<td>1.58 (1.12-2.22)</td>
</tr>
<tr>
<td>CD4 count &lt;200 cells/(\mu)L</td>
<td>2.70 (1.00-7.30)</td>
</tr>
<tr>
<td>Log(_{10}) plasma HIV RNA</td>
<td>1.02 (0.75-1.39)</td>
</tr>
<tr>
<td>ART started in 1(^{st}) year</td>
<td>0.64 (0.25-1.62)</td>
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\(^a\) Cox proportional hazards (PH) analysis also adjusts for sex, race/ethnicity, insurance, affective mental health disorder, alcohol abuse, and substance abuse.

Centers for AIDS Research Network of Integrated Clinical Systems (CNICS) Cohort Study

Mugavero et al. *Clin Infect Dis* 2009;48
2,708 (21.8%) out of 12,429 patients were LC; the incidence rate ranged from 12.3 in 1998 to <1 per 100 PYFU in 2014. 433 patients (16.7%) re-enter the cohort after a mean gap in care of 2.8±2 years. Median CD4 before LC were 551±323 cells/uL while after RC were 444±359 cells/uL (paired t-test p<0.001). 10.7% of the patients had a CD4 cell count <200 LC that increase to 25% after RC (Mc Nemar’s test p<0.001). Median HIVRNA before LC was 4103 copies/mL, with 27.6 % of patients with an HIVRNA <400 copies/mL and 8.8% with >100000 copies/mL.
Clinical events

22 patients developed AIDS (5%), 21 a serious non-AIDS event (5%) and 48 (11%) had an hospitalization within 6 months after re-entering in care. In a multivariable model adjusted for gender, risk factor, late presentation, HCV-coinfection and current CD4, patients with a gap in care had an increased risk of clinical events (RR= 2.36, 95% CI 2.06-2.71, p<0.001).
Proportion of transmissions by stage in the infection and care continuum versus proportion of these stages among infected men The Netherlands

- 71% of transmission events originated from undiagnosed men
- 22% from diagnosed but not yet treated men
- 6% from men who initiated ART
- 1% from men with no contact to care for at least 18 months.

An estimated 43% of the recipient MSM were infected by men undergoing their first year of infection.

Conclusions

Retention in care is the main problem of patients diagnosed with HIV and linked to care.

Indeed, untreated patients are not only at risk of clinical progression but also of transmitting the infection.
EACS HIV Summer School Residential Course

- **When**
  Annually in September

- **Where**
  Aix en Provence, France

- **For**
  Healthcare practitioners and clinical researchers

- **Morning**
  Research and clinical plenaries for all

- **Afternoon**
  Research (A) and clinical (B) modules

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**Morning**

Core Course

- Module A
  Identifying appropriate research questions, study designs, clinical trials and observational studies, sample size calculations, applying for grants, and organising studies.

- Module B
  In-depth lectures and case-based discussions around opportunistic infections, viral hepatitis co-infections and co-morbidities in the context of HIV infection.
Clinical Management of HIV
Online Course

Main topics

• Epidemiology and surveillance of HIV
• Opportunistic infections and co-morbidities
• Antiretroviral therapy and complications of ART
• Continuum of HIV Care
• Key affected populations
• Treatment as prevention of HIV

Russian translation available