

# How Far are we from Early cART for all? A Nationwide Population-based Study in France

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### **Abstract #:** 1043

Important note: *Our results have been updated since we submitted our abstract* to the CROI conference. We present here the updated results.

### ABSTRACT

Background: Ensuring early universal access to combination antiretroviral treatment (cART), and especially within the first year of HIV infection, is critical to reach the end of AIDS and control the HIV epidemic. However, how far or how close we are from early universal cART initiation remains unknown.

Methods: We estimated the timing of HIV care in France in 2010 using statistical modeling and two large data sources: the national HIV surveillance system and the French Hospital Database on HIV (FHDH). To estimate the distribution of times from infection to diagnosis, we fitted a back-calculation model to the annual numbers of new HIV diagnoses. To estimate the distribution of times from HIV diagnosis to care entry, from care entry to cART initiation and from cART initiation to reaching undetectable viral load, we used survival methods and data on the dates of HIV diagnosis, care entry, cART initiation and viral suppression of the 6268 HIV-infected individuals who newly engaged in care between 2008 and 2010 and were enrolled onto the FHDH cohort. We summed up the distributions to obtain the distributions of time intervals from HIV infection to cART access. Figures were computed overall and by HIV exposure

**Results:** We found that only 9.0% of HIV-infected individuals accessed cART within the first year of infection (see Table). This proportion reached 10% among men who have sex with men (MSM) and French national heterosexual women The estimated median time interval from HIV infection to cART initiation was 5.4 years (IQR: 2.8-8.1). MSM and heterosexual women had the shortest median time to cART initiation (around 4.8 years) and injecting drug users (IDUs) the longest (8.5 years). Time lost in accessing cART was mainly due to delays in HIV testing (overall median: 3.4 years), except for IDUs where it was also due to delayed care entry once diagnosed (median of ~1 year versus <1 month for other groups). Times to reaching viral suppression once on cART were short (around 6 months in median).

**Conclusions:** Our study shows that even in a country like France, where the health care system offers one of the best environments for HIV care, we are far from early ART for all. Similar gap is likely to exist in other settings and should be investigated. To close this gap, evaluating patient flow-time through the continuum of care will be key to identify what kind of actions is needed to accelerate cART access.

### BACKGROUND

Effective combination antiretroviral treatment (cART), by suppressing HIV replication, dramatically improves the prognosis of HIV infection and AIDS and lowers the risk of HIV transmission.

As individual health and prevention have converged, attention has focused on how well individuals living with HIV are engaged in care and, particularly, on the percentage of HIV-infected individuals who are on

Several steps have to be taken to be on cART, starting with getting tested for HIV, being linked to medical care, remaining in care and being prescribed cART. Several studies evaluated the percentages of HIVinfected individuals in each step of the care continuum. In 2014, UNAIDS launched an ambitious new target to end the AIDS epidemic, known as 90-90-90. It calls for 90% of people living with HIV to know their HIV status, 90% of them to be on cART, and 90% of them to have achieved viral suppression.

However, the percentage of individuals in each step of the care continuum offers an incomplete picture of the care continuum, as it does not provide any information on the elapsed time between becoming HIVinfected and accessing cART.

To estimate the timing of HIV care in France and identify the barriers that delay access to cART

Data on new HIV diagnoses, including date

of diagnosis, demographic information (sex

and nationality), HIV transmission category,

and clinical status at diagnosis are

recorded in a national database, managed

by the French National Institute for Public

Health Surveillance (InVS).





To estimate the distribution of times from infection to diagnosis, we used national HIV surveillance data and statistical modeling. The method has been described elsewhere (2). Briefly, we fitted a back-calculation model to the annual number of new HIV diagnoses to estimate the annual number of new HIV infections and the distribution of times from infection to diagnosis. We then used the estimated distributions of times from infection to diagnosis for individuals newly infected with HIV in 2007.

To estimate the distributions of times from diagnosis to care entry, from care entry to cART initiation and from cART initiation to reaching undetectable viral load, we used data on the the dates of HIV diagnosis, care entry, cART initiation and viral suppression of 6,268 HIV-infected individuals who newly engaged in care between 2008 and 2010 and were enrolled onto the FHDH cohort. Among the 6,268 FHDH enrollees, 4418 individuals initiated cART and 3617 achieved viral suppression. Individuals who entered care and did not initiate treatment and individuals who initiated treatment and did not achieve viral suppression were censored at the time of last known contact. From these data, we estimated Kaplan-Meier cumulative probability functions of the time intervals from HIV diagnosis to care entry, from care entry to cART initiation and from cART initiation to viral suppression.

We then used the estimated distributions and the inversion method to generate 2000 values of each of the following time intervals: from HIV infection to diagnosis, from diagnosis to care entry, from care entry to cART initiation and from cART initiation to viral suppression.

We summed up the simulated time intervals from HIV infection to diagnosis, diagnosis to care entry and care entry to cART initiation to obtain simulations of the time intervals from HIV infection to cART initiation. Two thousand simulated time intervals were obtained, from which medians and interquartile ranges were calculated.

Figures were obtained overall and by HIV exposure group. Statistical comparisons between HIV exposure groups were carried out with the non-parametric Kruskal-Wallis test. Data analyses were performed using Matlab version R2014b and SAS version 9.4.

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### **OBJECTIVES**

### DATA SOURCE

### Nationwide reporting of new HIV diagnoses

### **METHODS**

cART initiation --> Viral suppression

Overall

- women and MSM.

### RESULTS

Timing of HIV care in France: estimated times in months (median and interquartile range) between stages of the continuum of HIV care and from infection to cART initiation, overall and by HIV exposure group



The overall median time from infection to cART initiation was 64.6 months. It comprised three steps: a median time of 40.6 months from infection to diagnosis, 0.6 month to engage in care once diagnosed, 5.9 months to initiate cART once in care. Heterosexual women and MSM had the shortest median time from infection to cART initiation (ranging from 55.7 to 60.1 months) and IDUs the longest (101.9 months), p<0.001.

• There were considerable and significant timing differences between exposure groups for the first three steps of the care continuum (all ps<0.001).

• MSM had the shortest median time from infection to diagnosis (32.6 months) and heterosexual men the longest, median values above 54.7 months.

• The median time from diagnosis to care entry was <1 month for all groups except for IDUs for whom it was almost 1 year.

• The median time from care entry to cART initiation varied from 10.0 months for MSM to ≤6.3 months for the other groups.

• Once on cART, the median time to reaching viral suppression was around 6 months for all groups.

• Overall, only 9% of HIV-infected individuals accessed cART within the first year of infection. It ranged from 5% among IDUs, 6% among non-French national heterosexual men, 8% among non-French national heterosexual women and French national heterosexual men, 10% among French-national heterosexual



### DISCUSSION

We found that only 9% of HIV-infected individuals accessed cART within the first year of infection in 2010 and it takes more than 5.4 years to access cART once HIVinfected for 50% of individuals.

### GAPS

The time lost in initiating cART was mainly due to delays in HIV testing (overall median of 3.4 years), except for IDUs where it was also due to delayed care entry once diagnosed (~1 year in median versus <1 month for other groups).

### **STRENGTHS**

Once in care, times to move from one stage to the next remained short (~6 months in median), except for MSM where the median time from care entry to cART initiation was 10 months. Time to initiate cART was longer among MSM because a higher fraction of them (compared to other exposure groups) were diagnosed and linked to care before being eligible for cART (i.e. with CD4 count >350 cells/mm<sup>3</sup>) and thus had to wait to initiate treatment; time to initiate cART is however expected to decrease after 2010, since the cART eligibility threshold was lowered to 500 cells/mm<sup>3</sup> in October 2010 and to universal treatment in 2013.

### CONCLUSION

Our study shows there exists a large gap between the time of HIV infection and the time of cART initiation in France

Similar gap is likely to exist in other settings and should be investigated.

Closing this gap will be key to reach the end of AIDS and control the epidemic.

Estimates of the flow-time in between steps of the care continuum should help identify the barriers that delay access to cART and monitor whether public health interventions are successful in addressing these barriers.

### ACKNOWLEGMENTS

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Medi	an (IQR)
101.9 (	(53.5-198.4)
60.1 (	(32.0-93.8)
72.6 (	40.8-108.4)
71.9 (	41.7-105.0)
55.7 (	30.8-86.9)
58.0 (	28.3-92.2)
64.6 (	33.5-97.5)
46.6 (	21.1-78.2)
35.9 (	10.3-64.4)
54.7 (	19.7-88.1)
55.8 (	28.3-82.7)
39.2 (	18.0-62.6)
32.6 (	7.3-64.4)
40.6 (	13.9-69.8)
11.3 (0 0.6 (0 0.4 (0 0.5 (0 0.6 (0 0.6 (0	0.4-124.3) 0.2-0.8) 0.1-1.4) 0.1-1.7) 0.2-2.1) 0.3-2.4) 0.2-3.2)
3.3 (*	1.3-21.2)
6.3 (*	1.2-24.2)
6.1 (*	1.2-22.2)
3.0 (*	1.0-14.6)
3.5 (*	1.0-15.4)
10.0 (1	1.7-25.8)
5.9 (*	1.2-21.1)
6.1 (3	8.0-12.6)
4.9 (2	2.8-8.5)
6.3 (3	3.5-11.3)
6.2 (3	3.8-12.8)
4.6 (2	2.6-7.9)
5.6 (3	3.0-9.3)
5.6 (3	3.1-9.9)
120	