# Time to achieve viral load undetectability in ART patients living in four West and Central African countries (the OPP-ERA project)

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## BACKGROUND

- The main aim of ART is to decrease viral load (VL) to an undetectable level.
- Undetectable VL:
  - Reduces progression to AIDS
  - Improves long-term health
  - Lowers the risk of transmitting HIV
- The OPP-ERA project is implemented in Burundi, Cameroon, Côte d'Ivoire and Guinea since March 2013 in 7 laboratories . It aims to improve the monitoring of people living with HIV (PLWH) through an increased access to VL testing, with the implementation of open polyvalent platforms (OPP), an innovative system of molecular biology techniques for laboratories.
- Patients on ART need VL monitoring:
  - To confirm treatment success: undetectability of viral load
  - To identify whether and when treatment switch is required
  - To support treatment adherence
- Shortening the time to achieve reach an undetectability VL has positive implications in decreasing the risk of HIV morbidity, mortality, transmission and ART resistance.

## OBJECTIVE

The aim of the study is to estimate the probability to achieve viral load undetectability among ART patients who had first detectable viral load at enrollment within the OPP-ERA project.

## METHOD

- Databases of six OPP-ERA's laboratories located in Guinea, Cameroon, Burundi and Ivory Coast were merged.
- Each database includes repeated measures of VL collected during the first 20 months of the project among PLWH receiving ART followed in OPP-ERA's laboratories.
- Other information were collected: date of sample collection, age at VL testing, gender, ART regimen, date of ART initiation.
- Undetectable threshold was fixed at 1000 copies/ml. All labs are equipped with the same OPP and use the same reagent (Generic HIV®, Biocentric, Bandol, France). The analyses were restricted to PLWH with first VL detectable at enrollment in OPP-ERA and having benefited from at least two VLT.
- The Kaplan Meir method was used to estimate the duration and probability to achieve VL undetectability. This probability was compared between groups.
- Stata 11.0 was used for analysis.

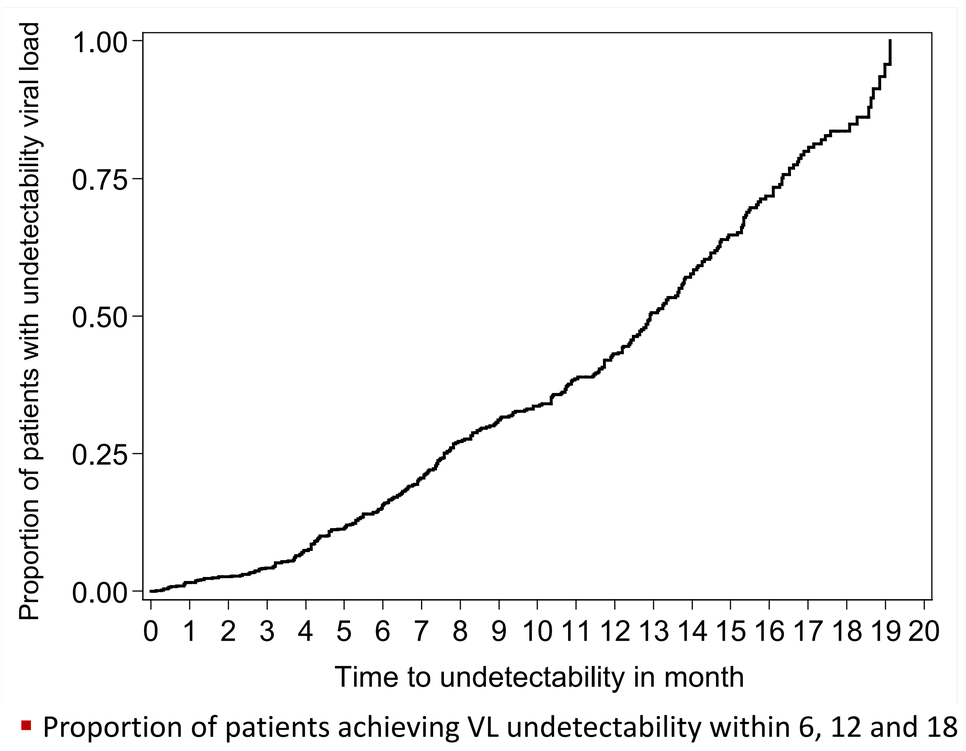
## RESULTS

- **Characteristics of PLWH receiving ART with first viral load measurement detectable at enrollment in OPP-ERA and followed from August 2014 to March 2016**

| Individual characteristics | Number of patients = 695<br>Total VL=1,536 |
|---|---|
| Gender, female, % (n) | 66% (457) |
| Median age in year (IQR) | 36 (27-45) |
| *Adults (>=15years)* | 12% (79) |
| *Children (<15years)* | 88% (603) |
| Median number of VL copies at first measure (copies/ml) (IQR) | 43,815 (7,155-276,093) |
| *1,000-50,000* | 52% (359) |
| *>50,000* | 48% (336) |
| Line of ART regimen | |
| *First line* | 90% (609) |
| *Second line* | 10% (64) |
| Patient initiating ART | |
| *Before OPP-ERA* | 81% (560) |
| *During OPP-ERA* | 19% (135) |
| Number of VL measurements per patient | |
| *2* | 82% (569) |
| *>2* | 18% (126) |
| Median time between two consecutives VLT in month (IQR) | |
| *Patient initiating ART before OPP-ERA* | 7 (4-12) |
| *Patient initiating ART during OPP-ERA* | 5 (4-8) |

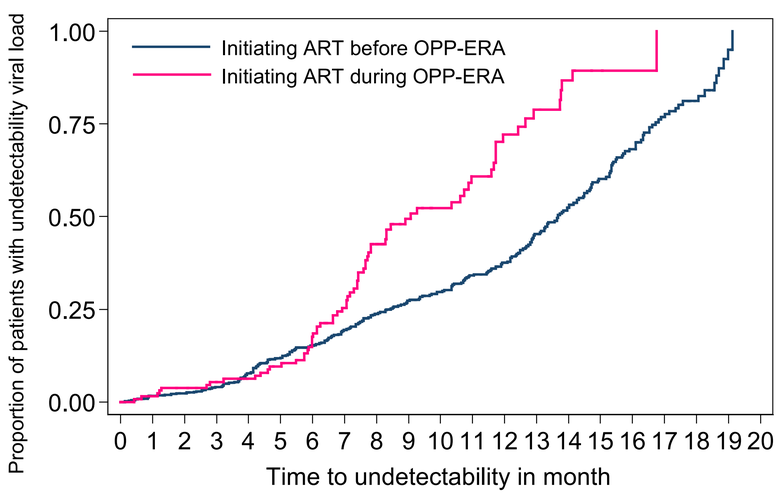
- IQR: interquartile range.
- About 35,000 VL test for 31,300 patients with a median duration of 4 years on ART were analysed.

- **Overall Kaplan-Meir estimates of over-time probability of viral load undetectability among PLWH receiving ART followed in the OPP-ERA project**



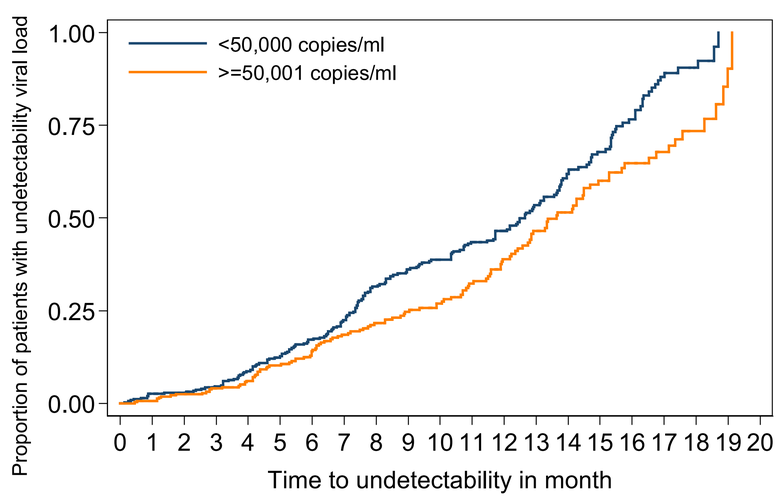

- Proportion of patients achieving VL undetectability within 6, 12 and 18 months: 14%, 41% and 83%.
- Median time for achieving undetectable VL was 13 months.

- **Kaplan-Meir estimates of over time probability of viral load undetectability among PLWH initiating ART Before and during the OPP-ERA project**



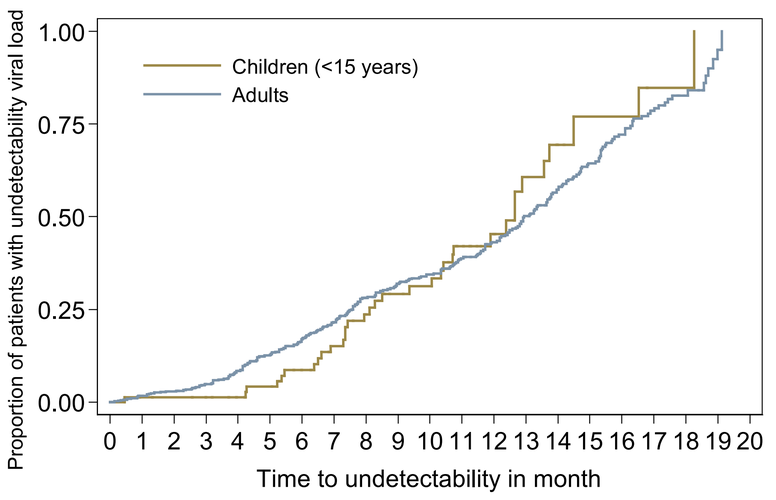

- During the OPP-ERA project: 9 months
- Before the OPP-ERA project : 14 months
- Log-rank test: p< 0.0001

- **Kaplan-Meir estimates of over time probability of viral load undetectability according to level of first detectable viral load in the OPP-ERA project**




- ≤50,000 copies/ml at enrollment : 13 months
- >50,000 copies/ml at enrollment : 14 months
- Log-rank test: p< 0.0001

- **Kaplan-Meir estimates of over time probability of viral load undetectability between adults and children on ART followed in the OPP-ERA project**




- No difference between adults and children
- No difference between line of ART regimen

## CONCLUSION

- The time to achieve VL undetectability is longer than expected in these patients benefiting from ART since several years.
- Patients who initiated ART during the OPPERA project achieve viral load undetectability more rapidly, which suggests that an earlier access to viral load testing allows for a closer virological monitoring in order to reinforce rapid adherence to ART and to avoid occurrence of ART resistance.
- To avoid treatment failure, at least one viral load testing shall be conducted annually among each patient on ART.

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