Can the UNAIDS 90-90-90 target be reached?

Analysis of national HIV treatment cascades

Jacob Levi¹ & Alice Raymond¹; Anton Pozniak²; Pietro Vernazza³; Philipp Kohler³; Andrew Hill²

¹Imperial College London, Department of Public Health, London, United Kingdom
²St Stephens Centre, Chelsea and Westminster Hospital, London, UK
³Division of Infectious Diseases and Hospital Epidemiology, Cantonal Hospital of St. Gallen, Switzerland
UNAIDS 90-90-90:
HIV Treatment Targets for 2020 with Global Estimates (2014)

Target 1:
90% of HIV+ people diagnosed

Target 2:
90% of diagnosed people on ART

Target 3:
90% of people on ART with HIV RNA suppression

HIV Positive People

Diagnosed

On ART

Viral Suppression

36.9 million

90%

33.2 million

81%

29.5 million

73%

26.9 million

Global Estimates (2014-15) vs the Gap to reach 90-90-90 Targets

- HIV Positive People: 36.9 million
- Diagnosed: 19.8 million
- On ART: 15.0 million
- Viral Suppression <1000 (ITT)*: 11.6 million

Breakpoint 1: 13.4 million Undiagnosed
Breakpoint 2: 14.9 million not treated
Breakpoint 3: 15.3 million Not Virally Suppressed

Methods – Countries and 1 region included

- **11 full HIV treatment cascades:**
  - Switzerland
  - Australia
  - UK
  - Netherlands
  - France
  - Brazil
  - Average of countries from the Sub-Saharan African Region*
  - USA
  - Georgia
  - Estonia
  - Russia

(Full = reports percentage and number of people for all 3 UNAIDS targets and quotes the viral suppression cut-off used.

- **9 Partial cascades from:**
  - Denmark
  - Canada (British Columbia)
  - Rwanda
  - Belgium
  - Cuba
  - Columbia
  - Ukraine
  - Kyrgyzstan
  - Vietnam

(Partial = does not report percentages or numbers for all 3 UNAIDS targets or does not report viral suppression test cut-off used.

Methods - Definitions

- Estimates of six stages for each full cascade:

  1. Total number of people living with HIV
  2. Diagnosed as HIV positive
  3. Linked to care
  4. Retention in care
  5. On Antiretroviral Therapy
  6. Viral Suppression <1000 RNA copies/ml
     o (Undetectable HIV RNA <40-400)

- **Definitions varied** for each of the 6 categories between countries

- **Breakpoint**: >10% drop between successive UNAIDS targets in the cascade

- **Sources**: National reports, UNAIDS Database, Peer-reviewed articles, Conference proceedings.
Cascade of HIV care – Switzerland 2012

- **HIV Positive People**: 15,700
- **Diagnosed**: 12,700 (81%)
- **Linked to care**: 12,600 (80%)
- **Retained in Care**: 12,300 (79%)
- **On ART**: 11,200 (71%)
- **Viral Suppression <200 copies/ml**: 10,700 (68%)


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Cascade of HIV care – Russia 2013

Target 1 – Percentage of all HIV+ People Diagnosed
- Methodology

- Target 1 depends on the approach used to estimate:
  1. The number of all HIV + people living in that country
  2. The number tested and found to be HIV+

- Back-calculation method used to estimate total HIV epidemic size

- Heterogeneity of cascade study type:
  - Cross Sectional or Longitudinal cohorts (or combined approach)
    - Loss to follow up
    - Double counting
    - Expensive
    - Generalized vs. Focused Epidemics
  - Varying testing policies (2010 – 2014)
Target 1 – Percentage of all HIV+ People Diagnosed - Results

UNAIDS Target 1: 90% of all HIV+ people diagnosed

*SSA = Regional average
From 30 countries
Target 1 – Percentage of all HIV+ People Diagnosed - Results

UNAIDS Target 1: 90% of all HIV+ people diagnosed

(*SSA = Regional average from 30 countries)
Target 2 – Percentage of all HIV+ People on ART
- Methodology

- Estimates of the % on ART were calculated from:
  - Pharmacy records
  - Governmental drug purchases
  - Healthcare dispensary records
  - Adjusted for PEP & PrEP
  - Various ART regimens were not differentiated

- Linkage and Retention definitions were highly heterogeneous
- Neither linkage nor retention categories have UNAIDS 90-90-90 targets
  - Both are essential for getting people on treatment after diagnosis
  - May need more attention

- Treatment initiation guidelines vary (2010 – 2014)
- Now START trial & WHO – test and treat
- Eligibility and Adherence sometimes reported
Target 2 – Percentage of all HIV+ People on ART - Results

UNAIDS Target 2:
81% of all HIV+ people on ART

(*SSA = Regional average From 30 countries)
Target 2 – Percentage of all HIV+ People on ART - Results

UNAIDS Target 2: 81% of all HIV+ people on ART

(*SSA = Regional average From 30 countries)
Target 3 – Percentage of all HIV+ People with HIV RNA suppression - Methodology

- UNAIDS 90-90-90 target = 73% of all HIV+ people achieving “viral suppression”
  - <1000 RNA copies/ml

- Some countries use “undetectable HIV RNA” as their definition or final target
  - <40 to <500 RNA copies/ml

- Various HIV RNA tests used with different “Undetectable” cut offs

- This changes the final percentage found to be “successfully treated”

- This must be taken into account when comparing cascades
  - E.g. Brazil
  - <50 RNA copies/ml = 35% “Undetectable HIV RNA”
  - <1000 RNA copies/ml = 40% “Suppressed”
Target 3 – Percentage of HIV+ People with HIV RNA suppression - Results

UNAIDS Target 3:
73% of all HIV+ people achieving viral suppression

(*SSA = Regional average
From 30 countries)
Target 3 – Percentage of HIV+ People with HIV RNA suppression - Results

UNAIDS Target 3: 73% of all HIV+ people achieving viral suppression

(*SSA = Regional average
From 30 countries)
Target 1 versus Target 2:
Rates of diagnosis and those diagnosed on treatment, by country

Percentage of all HIV + people diagnosed

Target 2 vs Target 3:
Percentage of diagnosed people on ART, versus HIV RNA suppression when on ART

UNAIDS 90-90-90
Target 3

UNAIDS 90-90-90
Target 2

*Average from: Botswana, Burkina Faso, Mali, Cameroon, Cote d’ivoire, Kenya, Senegal, Uganda, Malawi, Mozambique, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zimbabwe, Zambia.
Conclusions

• No country or region analysed so far met the final UNAIDS 90-90-90 coverage target of 73% of HIV positive people achieving undetectable HIV RNA.

• Large disparities were identified between countries

• All Western European countries achieved viral suppression for over >50% of HIV+ people
• All Eastern European countries achieved viral suppression for under <20% of HIV+ people

FAST TRACK: 95%-95%-95% by 2030

• Diagnosis is the largest breakpoint globally - Testing should be focussed on
• To facilitate comparisons between countries a standardized reporting method should be implemented
• This will allow us to better identify breakpoints and to prioritize resources and inform policy
Reference for full cascades


4 – Australia: The Kirby Institute. HIV, viral hepatitis and sexually transmissible infections in Australia Annual Surveillance Report 2014 UNSW Sydney: The Kirby Institute for infection and immunity in society


References for partial cascades


8 – Kyrgyzstan: M Mansfeld, M Ristol and G Likatavicius HIV Programme Review in Kyrgyzstan Evaluation report, December 2012 [WHO Collaborating Centre for HIV and Viral Hepatitis]. Figure 1, page 11

Cascade of HIV care – Australia 2013


- HIV Positive People: 26,764
- Diagnosed: 23,097 (86%)
- Linked to care: 20,788 (78%)
- Retained in Care: 20,369 (76%)
- On ART: 17,661 (66%)
- <400 copies Undetectable HIV RNA: 16,584 (62%)

Breakpoint 1

Breakpoint 2
Cascade of HIV care – United Kingdom 2013


Breakpoint 1

- HIV Positive People: 107,800
- Diagnosed: 81,510 (76%)
- Linked to care: 79,880 (74%)
- Retained in Care: 75,886 (70%)
- On ART: 73,290 (68%)
- <200 copies Undetectable HIV RNA: 65,961 (61%)

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Cascade of HIV care – Netherlands 2013

Cascade of HIV care – France 2010

Ref: Superville V CD. The spectrum of engagement in HIV care in France: strengths and gaps. Atlanta, USA: 20th Conference on Retroviruses and Opportunistic Infections.; March 2013

HIV Positive People: 149,900
Diagnosed: 121,100 (81%)
Linked to care: 111,150 (74%)
Retained in Care: 90,100 (60%)
On ART: 77,400 (52%)

<50 copies Undetectable HIV RNA
Cascade of HIV care – British Columbia (CA 2011)


Ref: National HIV Figures (71,300 PLWHIV) applied to the percentages from B Nosyk et al. STOP HIV/AIDS Study Group. www.ias2015.org
Cascade of HIV care – Brazil 2013

HIV Positive People: 734,000
Diagnosed: 589,000 (80%)
Linked to care: 537,000 (73%)
Retained in care: 448,000 (61%)
On ART: 355,000 (48%)
Viral Suppression <1000 RNA copies/ml: 255,000 (35%)
Viral Suppression <50 copies/ml: 293,000 (40%)

Cascade of HIV care – Sub-Saharan Africa 2013 (15 – 45 years old)

- **HIV Positive People (All ages)**: 23.5 million
- **Diagnosed (Age 15 - 49)**: 12.0 million
- **Linked to care**: 51%
- **Retained in care**: 43%
- **On ART**: 32%
- **Viral Supression (<500, <350, <200)**: 7.5 million

Viral suppression Data from: Botswana, Burkina Faso, Mali, Cameroon, Cote d’ivoire, Kenya, Senegal, Uganda, Malawi, Mozambique, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zimbabwe, Zambia.


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Cascade of HIV care – United States 2011

Ref: H Bradley et al: HIV Diagnosis, Care, and Treatment Among Persons Living with HIV — USA, 2011. [http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6347a5.htm?s_cid=mm6347a5_w#tab1]
Cascade of HIV care – Georgia 2012

Cascade of HIV care – Estonia 2013

Ref: Kaja-Triin Laisaar, et al. Engagement in the Continuum of HIV Care in Estonia. 9th International Conference on HIV Treatment and Prevention Adherence June 2014;Miami page 29.
Cascade of HIV care – Rwanda 2013

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number</th>
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<tbody>
<tr>
<td>Living with HIV</td>
<td>204,899</td>
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<tr>
<td>Diagnosed</td>
<td>183,515</td>
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<tr>
<td>Linked to care</td>
<td>176,174</td>
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<tr>
<td>Retained in care</td>
<td>129,405</td>
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<tr>
<td>On ART</td>
<td>106,371</td>
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Breakpoint 2: 63%
Breakpoint 3: 52%

Cascade of HIV care – Denmark 2010

<table>
<thead>
<tr>
<th>HIV Positive People</th>
<th>Diagnosed</th>
<th>Linked to care</th>
<th>In care</th>
<th>On ART</th>
<th>Viral Suppression &lt;500 copies/ml</th>
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</thead>
<tbody>
<tr>
<td>6,500</td>
<td>5,519</td>
<td>5,243</td>
<td>4,857</td>
<td>4,029</td>
<td>3,863</td>
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</tbody>
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Cascade of HIV care – Belgium 2010

HIV Positive People: 12,989
Diagnosed: 11,684
Linked to care: 12,446
Retained in care: 9,367
On ART: 8,928
Viral Suppression <500 copies/ml: 69%

Unknown: 90%
Linked to care: 82%
Retained in care: 72%

Cascade of HIV care – Cuba 2012

- Living with HIV: 19,626
- Diagnosed: 14,648 (75%)
- Linked to care: 13,494 (69%)
- Retained in care: 12,849 (65%)
- On ART: 8,102 (41%)
- Virologically suppressed: 5,898 (30%)

Cascade of HIV care – Columbia 2013


Breakpoint 1
- Living with HIV: 100%
- Diagnosed: 45%

Breakpoint 2
- Linked to care: 38%
- Retained in care: 33%

Breakpoint 3
- On ART: 23%
- Virologically suppressed:
Cascade of HIV care – Ukraine 2012

Living with HIV: 237,903
Diagnosed: 104,540 (44%)
Linked to care: 57,066 (24%)
Retained in care: 53,163 (22%)
On ART: 41,520 (17%)
Virologically suppressed: 


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Cascade of HIV care – Kyrgyzstan 2014

<table>
<thead>
<tr>
<th>Status</th>
<th>Number</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Living with HIV</td>
<td>8,021</td>
<td>100%</td>
</tr>
<tr>
<td>Diagnosed</td>
<td>5,642</td>
<td>70%</td>
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<tr>
<td>Linked to care</td>
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<td></td>
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<tr>
<td>Retained in care</td>
<td>2,480</td>
<td>31%</td>
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<tr>
<td>On ART</td>
<td>1,501</td>
<td>19%</td>
</tr>
<tr>
<td>Virologically suppressed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ref: M Mansfeld, M Ristol and G Likatavicius HIV Programme Review in Kyrgyzstan Evaluation report, December 2012 (WHO Collaborating Centre for HIV and Viral Hepatitis). Figure 1, page 11
Cascade of HIV care – Vietnam 2012

- Living with HIV: 256,845
- Diagnosed: 201,703 (79% of living with HIV)
- Linked to care: 72,711 (36% of diagnosed)
- Retained in care: 28% (36% of linked to care)
- On ART: 129,405 (54% of retained in care)
- Virologically suppressed: 28% (54% of on ART)


Ref: National HIV Figures (71,300 PLWHIV) applied to the percentages from B Nosyk et al. STOP HIV/AIDS Study Group.

www.ias2015.org
Cascade Standardization Tools

Ref: