Impact of drug resistance on HIV programs

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World Health Day 2011
Thursday, 7 April 2011, Room B, PAHO HQ
Introduction

• 33.4 million people with HIV at global level
• HAART revolutionized HIV treatment
• Yet, adherence is the weakest link of ART

- Full adherence is essential for achieving suppression of viral replication
- Low adherence is associated with the emergence of resistance
HIV-Drug Resistance

Lifelong treatment with no cure

High rate of HIV replication/mutation

Some degree of HIV drug resistance (HIVDR) is inevitable

- Resistant strains can emerge if drug pressure is not sufficient to suppress HIV replication → SECONDARY HIVDR
- Resistant strains persist indefinitely and can re-emerge (even if they are not detected by standard resistance assays)
- Resistant strains can be transmitted → PRIMARY HIVDR

HIV-DR, costs, complexities of the regimens resulted in reluctance to widely expand ART treatments until early 2000
Number of people receiving antiretroviral therapy in low- and middle-income countries, by region, 2002–2009

- North Africa and the Middle East
- East, South and South-East Asia
- Europe and Central Asia
- Latin America and the Caribbean
- Sub-Saharan Africa
Primary HIV-DR in LAC

In LAC all countries started public ART programs between 1996-2003.

2010: >500,000 patients under TARV, 50% coverage

Primary HIV-DR remains relatively low (<10%)

Different studies published between 2001-2008
Secondary HIV-DR

- Rate of secondary HIV DR is difficult to compare due to the variability of criteria for inclusion, definition of failure, schemes used, time of collection of samples, population, etc.

Graph showing rates of secondary HIV DR across different regions and studies, with various years and locations mentioned.
ART in LAC: Strengths and Challenges

**Strengths:**
- Long term programs
- Wide availability of drugs
- Lab monitoring available

**Challenges:**
- Fragmented health services
- Variable quality of care
- Variable ART prices in the region
- Sustainability of programs

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Need to optimize efficacy and effectiveness of first line schemes for long-lasting use

*Survey of 59 low and middle income countries vs. 17 LAC countries. Universal Access Report 2010.*
Expenditures in new HIV drugs are increasing

Brazil, ART spending (US$ M/year)

Cost of most used 1st line ART: 20 US$/month
2nd line ART regimen costs: 80-300 US$/month
3rd line ART regimen costs: 1600-4200 US$/month
Patterns of use of new drugs in Brazil

Darunavir, raltegravir or enfuvirtide are used by 3.5% of the individuals receiving ART in Brazil but represent more than 20% of the ART spending.
Estimated trends in ART spending in El Salvador

In 2012 80% of ART budget for 2\textsuperscript{nd} line and salvage ART drugs.

3% of patients will use 25% of the ART resources.
What Needs to be Done?

Efforts should be focused on reducing the rate of emergence and spread of HIV-DR to limit its public health impact.

**Strengthening public health approach to ART:**
- Simplification, standardization of schemes
- Increasing efficacy of first line therapy
- Improving quality of services to support adherence and retention
- Implementing a strategy to prevent and monitor HIV-DR
PAHO/WHO HIV-DR Strategy

2000:
HIVResNet

2003:
3by5 Initiative

2004:
Threshold Survey

2006:
EWI

Monitor secondary HIVDR in patients on ART

Assess primary HIVDR in recently infected patients

Prevention:
Monitor factors associated with HIVDR

Early Warning Indicators

Results lead to **programmatic action** to:
- Minimize emergence and transmission of HIVDR
- Optimize quality of patient care
- Maximize programmatic efficiency
- Select population-based ART regimens
## Early Warning Indicators

Programmatic and site factors associated with secondary HIVDR.

The collection provides low cost, site-based evidence to optimize patient care.

<table>
<thead>
<tr>
<th>EWI</th>
<th>Target</th>
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<tbody>
<tr>
<td>Prescribing practices</td>
<td>100%</td>
</tr>
<tr>
<td>Lost to follow-up at 12 months</td>
<td>≤ 20%</td>
</tr>
<tr>
<td>Retention on appropriate 1\textsuperscript{st} line ART at 12 months</td>
<td>≥ 70%</td>
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<tr>
<td>On time pill pick-up</td>
<td>≥ 90%</td>
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<tr>
<td>Appointment keeping</td>
<td>≥ 80%</td>
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<tr>
<td>Drug stock out at the level of ART clinic</td>
<td>100%</td>
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Lessons Learned and Recommendations

• Increase of access has not resulted in any disquieting levels of primary HIV-DR
• Secondary resistance may jeopardize future sustainability of ART programs
• Public Health Principles to scaling-up ART need to be reinforced, in particular to select new HIV drugs
• National implementation of the PAHO/WHO HIV-DR Strategy would allow to investigate emergence and transmission of HIV-DR and to monitor causal and associated factors
Thanks!
Muchas gracias!

www.paho.org/FRVIH

www.who.int/hiv/topics/drugresistance/es/index.html

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