What the Science is Saying; HIV Treatment and its Public Health Role in addressing HIV

REGIONAL PARLIAMENTARIANS FORUM
KINGSTON, JAMAICA
30-31 MAY 2017

ANTON BEST
SENIOR MEDICAL OFFICER OF HEALTH,
HIV/STI PROGRAMME, MINISTRY OF HEALTH, BARBADOS
This Presentation will look at:

1. The History and Basics of Antiretroviral therapy (ART)
2. HIV in the Caribbean
   a) Epidemiology
3. Antiretroviral therapy’s role in Prevention
   a) “Treatment as Prevention”
4. Studies showing the Impact of ART in
   a) Barbados
   b) The OECS
5. Fast-Track; Ending the AIDS Epidemic by 2030
1981: 5 cases of PCP in gay men from UCLA (MMWR)

By the end of 1981, there was a cumulative total of 270 reported cases of severe immune deficiency among gay men, and 121 of those individuals had died.

1983: Luc Montagnier and Françoise Barré-Sinoussi reported the discovery of a new virus (later called HIV) that is the cause of AIDS.

1985: The first commercial blood test for HIV was licensed, allowing screening of the U.S. blood supply.

1987: the first anti-HIV drug (AZT) was approved by the U.S. Food and Drug Administration.

1995: The first potent combination of anti-HIV drugs became available.
Life Cycle of HIV; Drug targets

1. Fusion of HIV to the host cell surface.
2. HIV RNA, reverse transcriptase, integrase, and other viral proteins enter the host cell.
3. Viral DNA is formed by reverse transcription.
4. Viral DNA is transported across the nucleus and integrates into the host DNA.
5. New viral RNA is used as genomic RNA and to make viral proteins.
6. New viral RNA and proteins move to the cell surface and a new, immature, HIV forms.
7. The virus matures by protease releasing individual HIV proteins.
Antiretroviral Therapy... What does it do?

Antiretroviral therapy (ART) is the daily use of a combination of HIV medicines to treat HIV.

- Reduces the amount of HIV in the body
- Protects the immune system
- Prevents HIV from advancing to AIDS
- Reduces the risk of HIV transmission

ART saves lives, but does not cure HIV

AIDSinfo
For more information, visit: aidsinfo.nih.gov
HIV in the Caribbean
PLHIV in the Caribbean in 2015

89% of PLHIV are in Haiti, Dominican Republic, Jamaica & Cuba.

A 17% reduction from 320,000 PLHIV in 2010 but that means that 50,000 people died during this period.

HIV prevalence Among Adults in the Caribbean (2014)

<table>
<thead>
<tr>
<th>Country</th>
<th>HIV Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haiti</td>
<td>1.9%</td>
</tr>
<tr>
<td>Guyana</td>
<td>1.8%</td>
</tr>
<tr>
<td>Jamaica</td>
<td>1.6%</td>
</tr>
<tr>
<td>Belize</td>
<td>1.2%</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>1%</td>
</tr>
<tr>
<td>Suriname</td>
<td>1%</td>
</tr>
<tr>
<td>Cuba</td>
<td>0.3%</td>
</tr>
<tr>
<td>OECS</td>
<td>0.6%</td>
</tr>
<tr>
<td>CAR Region</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Data source: SPECTRUM 2014, AIM Files 2014
Percent change in new HIV infections among adults in LAC; 2010 to 2015

Source: UNAIDS 2016 estimates.
People newly infected with HIV Caribbean in 2015

New HIV infections increased by 82% in Cuba from 2010 making it the country with the highest number of new infections in the region.

New HIV infections in 2010 was 10,000 a reduction of 6%.

New HIV infections declined by 59% in Haiti from 2010.

New HIV infections in 2015:
- Cuba: 31%
- Haiti: 15%
- Dominican Republic: 20%
- Jamaica: 17%
- Bahamas: 4%
- Guyana: 4%
- Trinidad & Tobago: 2%
- Suriname: 2%
- Belize: 1%

Distribution of AIDS Related Deaths in the Caribbean in 2015

- Haiti had the highest number of HIV related deaths in the region contributing to more than 50% of the number.
- Number of AIDS related deaths decreased by 61% from 21,000 in 2010.

HIV among MSM in the Caribbean; 2009-2013
HIV among FSW in the Caribbean; 2009-2013

HIV prevalence among sex workers in the Caribbean, 2009–2013

Preventing HIV transmission with ART
ART stops HIV replication

HIV viral load falls to undetectable levels in plasma as well as in sexual fluids

Sharp reduction in HIV transmission

From JS Montaner, MD, at San Francisco, CA: March 29, 2013, IAS-USA.
HPTN 052: Antiretroviral therapy as Prevention

A randomized control trial across 9 countries

N = 1,763 HIV sero-discordant couples

Primary prevention end point was HIV transmission to HIV negative partner

Results: 28 linked HIV transmissions
  - 27 in deferred ART arm
  - 1 in immediate ART arm

96% reduction in HIV transmission (p <0.001)

Cohen et al NEJM 2011; 365:493-505
Treatment as Prevention (TasP)

Is TasP the proverbial silver bullet???
Landis et al describe ten year VL trends and estimates VL suppression at a population level with improvement in VL suppression between 2002 to 2011, from 33.6% of clients achieving the 200 copies/mL threshold in 2002 to 70.3% in 2011 (p<0.001)²

An estimated 26.2% VL suppression, at a population level at the end of 2010 comparable to that seen in the US;

- VL suppression = 28% in the US (MMWR 2011)

HIV VL suppression amongst PLHIV in the OECS; 2009-2013

START Trial Results 2015

Time to first primary event

- Immediate initiation
- Deferred initiation

<table>
<thead>
<tr>
<th>Month</th>
<th>Immediate initiation</th>
<th>Deferred initiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2326</td>
<td>2359</td>
</tr>
<tr>
<td>12</td>
<td>2205</td>
<td>2190</td>
</tr>
<tr>
<td>24</td>
<td>1853</td>
<td>1829</td>
</tr>
<tr>
<td>36</td>
<td>1075</td>
<td>1077</td>
</tr>
<tr>
<td>48</td>
<td>574</td>
<td>549</td>
</tr>
<tr>
<td>60</td>
<td>157</td>
<td>162</td>
</tr>
</tbody>
</table>
The START Trial was the science behind “Treat All”

“We now have clear-cut proof that it is of significantly greater health benefit to an HIV-infected person to start antiretroviral therapy sooner rather than later,” said Anthony S. Fauci, Director of the US National Institute of Allergy and Infectious Disease (NIAID).

He added: “Moreover, early therapy conveys a double benefit, not only improving the health of individuals but at the same time, by lowering their viral load, reducing the risk they will transmit HIV to others. These findings have global implications for the treatment of HIV.”


May 27, 2015
What about HIV Pre-Exposure Prophylaxis (PrEP)?

PrEP is the use of ART to prevent HIV infection

Efficacy of oral PrEP has been shown in 4 randomized control trials and is high when the drug is used as directed

As of September 2015, the WHO recommends PrEP as an additional prevention option.
Progress towards 90-90-90 in the Caribbean

By 2020, 90% of all people living with HIV will know their HIV status.

By 2020, 90% of all people with diagnosed HIV infection will receive sustained ART.

By 2020, 90% of all people receiving antiretroviral therapy will have viral suppression.
ART Coverage in the Caribbean in 2015: Towards the second 90

HIV Prevention with Antiretroviral Drugs (since 2010)

- Topical pre-exposure prophylaxis (microbicides) for women
  - Abdool Karim Q, Science 2010

- Oral/injectable pre-exposure prophylaxis
  - Grant R, NEJM 2010 (MSM)
  - Baeten J, NEJM 2012 (Couples)
  - Thigpen M, NEJM 2012 (Heterosexuals)
  - Choopanya K, Lancet 2013 (PWID)
  - McCormack S, Lancet 2015 (MSM)
  - Molina JM, CROI 2015 (MSM)

- Treatment for prevention
  - Cohen M, NEJM 2011

- Oral post-exposure prophylaxis

- Sexual HIV Prevention

- HIV vaccine
  - Rerks-Ngarm S, NEJM, 2009

- Abstinence
  - Be Faithful

- Male circumcision
  - Gray R, Lancet 2007

- Treatment of STIs
  - Grosskurth H, Lancet 2000

- Male Condoms

- Female Condoms

- HIV Counselling & Testing
  - Coates T, 2000
  - Abstinence
  - Be Faithful

- Oral/injectable pre-exposure prophylaxis

- Treatment for prevention
  - Cohen M, NEJM 2011

- HIV vaccine
  - Rerks-Ngarm S, NEJM, 2009

- Abstinence
  - Be Faithful

- Male circumcision
  - Gray R, Lancet 2007

- Treatment of STIs
  - Grosskurth H, Lancet 2000

- Male Condoms

- Female Condoms

- HIV Counselling & Testing
  - Coates T, 2000
  - Abstinence
  - Be Faithful

- Oral/injectable pre-exposure prophylaxis

- Treatment for prevention
  - Cohen M, NEJM 2011

- HIV vaccine
  - Rerks-Ngarm S, NEJM, 2009

- Abstinence
  - Be Faithful

- Male circumcision
  - Gray R, Lancet 2007

- Treatment of STIs
  - Grosskurth H, Lancet 2000

- Male Condoms

- Female Condoms

- HIV Counselling & Testing
  - Coates T, 2000
  - Abstinence
  - Be Faithful

- Oral/injectable pre-exposure prophylaxis
Combination HIV Prevention

WHAT THE SCIENCE IS SAYING; MAY 2017
The Centrality of ART in comprehensive National HIV responses

- Social Determinants
- Governance/Leadership
- Continuum of HIV services
- Health System
- Health Financing
- Behavioural change through health promotion

ART
We have the vision and clearly articulated goals
But it will be challenging…. 

Global HIV Targets and Strategies

- **SDG 3:** Ensure healthy lives and promote well-being for all at all ages
  - By 2030, *end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases*
  - 90% of people diagnosed with HIV on ART by 2020 (95% by 2030)

**TARGETS**

<table>
<thead>
<tr>
<th>By 2020</th>
<th>By 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>90–90–90 HIV treatment</td>
<td>95–95–95 HIV treatment</td>
</tr>
<tr>
<td>500 000 New adult HIV infections</td>
<td>200 000 New adult HIV infections</td>
</tr>
<tr>
<td>ZERO Discrimination</td>
<td>ZERO Discrimination</td>
</tr>
</tbody>
</table>

WHO GHSS 2016-2021
Acknowledgements

◦ Prof Clive Landis, Deputy Principal, UWI, Cave Hill, Barbados
◦ Dr Eddy Beck, Senior Adviser, Strategic Information and Policy, UNAIDS RST LAC

Additional References

Thank you for your attention!

Questions?
Comments?

Anton Best
Senior Medical Officer of Health, HIV/STI Programme, Ministry of Health, BARBADOS
anton.best@health.gov.bb