Can we treat our way out of the HIV epidemic?

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Schoolboy’s (and politician’s) tricks for evading the question

1. Could you repeat the question?

Yes, No, Maybe...
I don’t know, can you repeat the question?
Schoolboy’s (and politician’s) tricks for evading the question

1. Could you repeat the question?
2. Could you explain that again?

OH YOU DON'T UNDERSTAND?

LET ME EXPLAIN IT AGAIN THE EXACT SAME WAY I EXPLAINED IT THE FIRST TIME
Schoolboy’s (and politician’s) tricks for evading the question

1. Could you repeat the question?
2. Could you explain that again?
3. Restate it as a question YOU want to answer!
Schoolboy’s (and politician’s) tricks for evading the question

1. Could you repeat the question?
2. Could you explain that again?
3. Restate it as a question you want to answer!

“Look, we know how now, brown cow. What we really want to know is why – why now brown cow?”
Is treatment essential for the control of the HIV epidemic?

Richard E. Chaisson, MD
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How do we use ART to control the HIV epidemic?

- Treatment as treatment
  - Treat to prevent disease/death
- Treatment as prevention
  - Prevent mother-to-child transmission
  - Prevent heterosexual transmission
  - Prevent male-to-male transmission
- Preventive treatment
  - Pre-exposure prophylaxis (PrEP)
  - Post-exposure prophylaxis (PEP)
- Combination prevention
Number of People Receiving Antiretrovirals in Low- and Middle-Income Countries

ART scale-up averted 4.2 million deaths, 2002-2012
At the country-level, the HIV response is already having a dramatic impact on life expectancy.

Source: World Bank life expectancy data
Antiretroviral Therapy as HIV Prevention

- Prevention of mother-to-child transmission
- Post-exposure prophylaxis
- Pre-exposure prophylaxis
- Treatment of chronic infection
AIDS Free Generation = Prevention of Mother to Child Transmission of HIV
Stage 3 (AIDS) Classifications among Perinatally Infected Persons, 1985–2011—United States and 6 Dependent Areas

Note. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.
Impact: PMTCT averted more than 800 000 child infections

Number of children acquiring HIV infection in low- and middle-income countries, 1996–2012

- Green: based on no ARV medicines for PMTCT
- Blue: based on current coverage of ARV medicines for PMTCT
Pediatric antiretroviral coverage varies by region

- Caribbean: 34%
- Latin America: 71%
- Sub-Saharan Africa: 24%
- Middle East: 6%
- Asia and Pacific: 28%
- Eastern Europe and Central Asia: 59%

Source: UNAIDS estimates 2014
Preliminary MTCT Outcomes of Infants Born to HIV+ Women With TB and HIV+ Controls: Tshepiso Study

- HIV MTCT TB/HIV cases: 2/64 (3.2%)
- HIV MTCT HIV+ controls: 2/129 (1.5%)
- Overall rate of MTCT: 4/193 (2.1%)
Antiretroviral Therapy as HIV Prevention

- Prevention of mother-to-child transmission
- Post-exposure prophylaxis
- Pre-exposure prophylaxis
- Treatment of chronic infection


### Oral FTC/TDF PrEP Studies

<table>
<thead>
<tr>
<th>Study Description</th>
<th>Effect Size (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truvada for HIV discordant couples (Partners PrEP)</td>
<td>75% (55; 87)</td>
</tr>
<tr>
<td>Truvada for young Heterosexuals (TDF-2)</td>
<td>63% (22; 83)</td>
</tr>
<tr>
<td>Truvada for MSM (iPrEx)</td>
<td>42% (15; 63)</td>
</tr>
<tr>
<td>Truvada for women (FEM-PrEP)</td>
<td>6% (-69; 41)</td>
</tr>
</tbody>
</table>
Effectiveness and Adherence in Trials of Oral and Topical Tenofovir-Based Prevention

Percentage of participants’ samples that had detectable drug levels  Pearson correlation = 0.86, p=0.003
Antiretroviral Therapy as HIV Prevention

- Prevention of mother-to-child transmission
- Post-exposure prophylaxis
- Pre-exposure prophylaxis
- Treatment of chronic infection
Immediate vs. Delayed ART in Sero-Discordant Couples

HR = 96.3% reduction in transmission
No difference whether index patient was Male or Female

HPTN 052: clinical benefit for earlier ART

Number of subjects experiencing ≥1 event

<table>
<thead>
<tr>
<th>Disease</th>
<th>Delayed</th>
<th>Immediate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculosis</td>
<td>34 (4%)</td>
<td>17 (2%)</td>
</tr>
<tr>
<td>Serious bacterial infection</td>
<td>13 (1%)</td>
<td>20 (2%)</td>
</tr>
<tr>
<td>WHO Stage 4 event</td>
<td>19 (2%)</td>
<td>9 (1%)</td>
</tr>
<tr>
<td>Oesophageal candidiasis</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Cervical carcinoma</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Cryptococcosis</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>HIV-related encephalopathy</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Herpes simplex, chronic</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Kaposi’s sarcoma</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>CNS Lymphoma</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Pneumocystis pneumonia</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Septicemia</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>HIV Wasting</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Bacterial pneumonia</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: Grinsztejn B, et al, Lancet Infectious Diseases, 4 March 2014
Effect of ART coverage on rate of new HIV infections in a rural South African population

For every 10% increase in coverage there is a 17% decrease in individual risk.

Proportion of all HIV-infected people receiving ART (CD4 ≤ 200)

Countries that scaled up treatment faster have reduced incidence.
HIV incidence vs. ART coverage in 51 countries, weighted by epidemic size (2012 data)

AIDS-related death rates vs. ART coverage in 51 countries, weighted by epidemic size (2012 data)

Source: Hill, Pozniak, Raymond, Heath and Ford, AIDS 2014.
The new treatment paradigm: 
90-90-90

Single target → Cascade target
Death → Death and transmission
Number → Equity
Incremental funding → Frontload Investments
90% of HIV+ people tested is possible
HIV+ population tested at least once
90% of eligible people on treatment is possible
High coverage in several countries

- **Brazil**: 72%
- **Botswana**: 71%
  - UNAIDS Situation Room
90% virally suppressed is possible
Proportion of patients with viral suppression in Latin America and the Caribbean in 2013
Therefore, be it resolved:

• Is treatment essential for the control of the HIV epidemic?
  - Absolutely! ART is the key to pMTCT, PrEP can work and TasP has population-level impacts and is feasible.

• Can we treat our way out of the HIV epidemic?
  - We must treat our way out of the epidemic.

Special thanks to Tom Quinn and Julio Montaner