CONTROLLING THE HIV EPIDEMIC WITH ANTIRETROVIRALS

HIV

Having the Courage of Our Convictions

1-2 October 2015 • Paris
HIV in KwaZulu-Natal and the ANRS Treatment as Prevention Trial

Deenan Pillay
Director, Africa Centre for Population Health, UKZN
Professor of Virology, UCL
Africa Centre for Population Health
Spatial Clustering of new HIV infections

Tanser et al CROI. Boston, MA; 2011.
Population prevalence of detectable virus (PPDV)

Prevalence(%):
- <5%
- 5 - 10%
- 10 - 15%
- 15 - 20%
- >20%

$RR = 1.78$

$P < 0.0001$
Life expectancy within the AC population

Women

Men

Bor et al. PLoS Med (in press)
Male-female differences in life expectancy

![Graph showing the gap in adult life expectancy between males and females from 2001 to 2011.]
Continuous time treatment cascade
Mortality through the Cascade of Care

Bor et al PLoS Med (in press)
Nurses seeing 80-200 ART patients a day

THE WORKLOAD!

Key: ARV patients at Sipho Zungu clinic
- Transferred out
- Lost to follow up (not seen in 9 months)
- Lost to follow up (clinic code)
- Died
- Active – seen in last 9 months

NURSES SEEING 80-200 ART PATIENTS A DAY
The ANRS 12249 TasP trial

- Cluster randomized trial (2011-2016) evaluating the feasibility, acceptability and efficacy of immediate ART on HIV incidence in rural KwaZulu-Natal, South Africa
  
  (Iwuji C et al, Trials 2013; Orne-Gliemann et al, BMC Publ Health 2015)

**Home-based HIV-testing (6 monthly rounds)**

*Trial area population: 22,000 individuals*

- **Referral to TasP clinic if identified HIV+**

**TasP clinics (1/cluster)**

**11 Intervention clusters:** Treat all HIV+ individuals regardless of CD4 count /clinical stage

**11 Control clusters:** Treat all HIV+ individuals according to South African guidelines
The ANRS 12249 TasP trial

- Cluster randomized trial (2011-2016) evaluating the feasibility, acceptability and efficacy of immediate ART on HIV incidence in rural KwaZulu-Natal, South Africa (Iwuji C et al, Trials 2013; Orne-Gliemann et al, BMC Publ H 2015)

Home-based HIV-testing (6 monthly rounds)

*Trial area population: 22,000 individuals*

Referral to TasP clinic if identified HIV+

TasP clinics (1/cluster)

- **11 Intervention clusters:** Treat all HIV+ individuals regardless of CD4 count /clinical stage
- **11 Control clusters:** Treat all HIV+ individuals according to South African guidelines

DoH clinic (3 clinics in trial area)

Treat all HIV+ individuals according to South African guidelines
HIV prevalence - All 22 clusters

First valid DBS HIV prevalence (%)
### Description of the study population

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Total (N=1218)</th>
<th>Women (N=880)</th>
<th>Men (N=338)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-29</td>
<td>508 (41.7)</td>
<td>399 (45.3)</td>
<td>109 (32.3)</td>
</tr>
<tr>
<td>30-39</td>
<td>340 (27.9)</td>
<td>229 (26.0)</td>
<td>111 (32.8)</td>
</tr>
<tr>
<td>40-49</td>
<td>186 (15.3)</td>
<td>123 (14.0)</td>
<td>63 (18.6)</td>
</tr>
<tr>
<td>50-84</td>
<td>184 (15.1)</td>
<td>129 (14.7)</td>
<td>55 (16.3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education level</th>
<th>Total (n(%))</th>
<th>Women (n(%))</th>
<th>Men (n(%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary or less</td>
<td>457 (37.5)</td>
<td>315 (35.8)</td>
<td>142 (42.0)</td>
</tr>
<tr>
<td>Some secondary</td>
<td>404 (33.2)</td>
<td>293 (33.3)</td>
<td>111 (32.8)</td>
</tr>
<tr>
<td>At least completed secondary</td>
<td>357 (29.3)</td>
<td>272 (30.9)</td>
<td>85 (25.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupational status</th>
<th>Total (n(%))</th>
<th>Women (n(%))</th>
<th>Men (n(%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed</td>
<td>200 (16.4)</td>
<td>114 (13.0)</td>
<td>86 (25.4)</td>
</tr>
<tr>
<td>Student</td>
<td>99 (8.1)</td>
<td>81 (9.2)</td>
<td>18 (5.3)</td>
</tr>
<tr>
<td>Other inactive</td>
<td>919 (75.5)</td>
<td>685 (77.2)</td>
<td>234 (69.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Knowing HV+ family member</th>
<th>Total (n(%))</th>
<th>Women (n(%))</th>
<th>Men (n(%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>459 (37.7)</td>
<td>364 (41.4)</td>
<td>95 (28.1)</td>
</tr>
<tr>
<td>No</td>
<td>759 (62.3)</td>
<td>516 (58.6)</td>
<td>243 (71.9)</td>
</tr>
</tbody>
</table>
Rates of linkage to HIV care within 3 months of referral by sex

- Total N=1218
- Women N=880
- Men N=338

<table>
<thead>
<tr>
<th>Gender</th>
<th>No linkage to clinics</th>
<th>Linkage to DoH clinic only</th>
<th>Linkage to TasP then to DoH clinics</th>
<th>Linkage to DoH then to TasP clinics</th>
<th>Linkage to TasP clinic only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>38.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>37.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>40.2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Global linkage to HIV care (%)  
P=0.42

Plazy et al IAS, 2015
Factors associated with linkage to HIV care within three months of referral

Multivariable analysis (1/3) – Socio-demographic variables

<table>
<thead>
<tr>
<th></th>
<th>Total (N=1218)</th>
<th>Women (N=880)</th>
<th>Men (N=338)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>% link.</td>
<td>aOR [95%CI]</td>
</tr>
<tr>
<td><strong>Education level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary or less</td>
<td>457</td>
<td>48.4</td>
<td>1.00</td>
</tr>
<tr>
<td>Some secondary</td>
<td>404</td>
<td>34.7</td>
<td>0.67 [0.48-0.95]</td>
</tr>
<tr>
<td>Completed secondary</td>
<td>357</td>
<td>30.0</td>
<td>0.57 [0.40-0.82]</td>
</tr>
<tr>
<td><strong>Occupational status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>200</td>
<td>42.5</td>
<td>1.00</td>
</tr>
<tr>
<td>Student</td>
<td>99</td>
<td>18.2</td>
<td>0.48 [0.26-0.90]</td>
</tr>
<tr>
<td>Inactive</td>
<td>919</td>
<td>39.7</td>
<td>0.96 [0.69-1.34]</td>
</tr>
</tbody>
</table>

Multivariable model including age, education level, occupational status, assets, distance to clinic, ARV perceptions, HIV care status at referral, stigma, round of HIV testing, trial arm
Factors associated with linkage to HIV care within three months of referral

**Multivariable analysis (2/3) – HIV knowledge and perception**

<table>
<thead>
<tr>
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<th>Total (N=1218)</th>
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<tbody>
<tr>
<td></td>
<td>N</td>
<td>% link.</td>
<td>aOR [95%CI]</td>
</tr>
<tr>
<td>Knowing HIV+ family member</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>759</td>
<td>35.7</td>
<td>1.00 -</td>
</tr>
<tr>
<td>Yes</td>
<td>459</td>
<td>42.9</td>
<td>1.44 [1.12-1.85]</td>
</tr>
<tr>
<td>Would take ARVs if HIV+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No/DKN</td>
<td>78</td>
<td>26.9</td>
<td>1.00 -</td>
</tr>
<tr>
<td>Yes</td>
<td>1140</td>
<td>39.2</td>
<td>2.00 [1.16-3.45]</td>
</tr>
</tbody>
</table>

Multivariable model including age, education level, occupational status, assets, distance to clinic, ARV perceptions, HIV care status at referral, stigma, round of HIV testing, trial arm
Factors associated with linkage to HIV care within three months of referral

**Multivariable analysis (3/3) – Trial-related characteristics**

<table>
<thead>
<tr>
<th>Distance to the closest TasP clinic</th>
<th>N</th>
<th>% link.</th>
<th>aOR [95%CI]</th>
<th>N</th>
<th>% link.</th>
<th>aOR [95%CI]</th>
<th>N</th>
<th>% link.</th>
<th>aOR [95%CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 km</td>
<td>443</td>
<td>45.8</td>
<td>1.00 -</td>
<td>323</td>
<td>46.4</td>
<td>1.00 -</td>
<td>120</td>
<td>44.2</td>
<td>1.00 -</td>
</tr>
<tr>
<td>1-2 km</td>
<td>431</td>
<td>34.3</td>
<td>0.58 [0.44-0.78]</td>
<td>314</td>
<td>32.8</td>
<td>0.53 [0.38-0.75]</td>
<td>117</td>
<td>38.5</td>
<td>0.77 [0.44-1.35]</td>
</tr>
<tr>
<td>2-5 km</td>
<td>344</td>
<td>34.0</td>
<td>0.57 [0.42-0.78]</td>
<td>243</td>
<td>32.5</td>
<td>0.52 [0.36-0.75]</td>
<td>101</td>
<td>37.6</td>
<td>0.77 [0.42-1.38]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HIV care status at referral</th>
<th>N</th>
<th>% link.</th>
<th>aOR [95%CI]</th>
<th>N</th>
<th>% link.</th>
<th>aOR [95%CI]</th>
<th>N</th>
<th>% link.</th>
<th>aOR [95%CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTFU 13-24 months</td>
<td>196</td>
<td>57.1</td>
<td>1.00 -</td>
<td>145</td>
<td>54.5</td>
<td>1.00 -</td>
<td>51</td>
<td>64.7</td>
<td>1.00 -</td>
</tr>
<tr>
<td>LTFU &gt;24 months</td>
<td>193</td>
<td>43.0</td>
<td>0.57 [0.38-0.87]</td>
<td>152</td>
<td>42.1</td>
<td>0.61 [0.38-0.98]</td>
<td>41</td>
<td>46.3</td>
<td>0.49 [0.20-1.20]</td>
</tr>
<tr>
<td>Already diagnosed</td>
<td>305</td>
<td>32.8</td>
<td>0.40 [0.27-0.59]</td>
<td>236</td>
<td>32.2</td>
<td>0.40 [0.26-0.63]</td>
<td>69</td>
<td>34.8</td>
<td>0.38 [0.17-0.84]</td>
</tr>
<tr>
<td>Newly diagnosed</td>
<td>524</td>
<td>33.0</td>
<td>0.40 [0.28-0.57]</td>
<td>347</td>
<td>32.6</td>
<td>0.43 [0.28-0.65]</td>
<td>177</td>
<td>33.9</td>
<td>0.33 [0.16-0.66]</td>
</tr>
</tbody>
</table>

*Multivariable model including age, education level, occupational status, assets, distance to clinic, ARV perceptions, HIV care status at referral, stigma, round of HIV testing, trial arm*
ANRS 12 249

The way forward

- Incidence reduction between arms will be measured in the coming 9 months

- More comprehensive set of interventions needed to achieve the 90 x 90 x 90 target
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