Utilizing resources effectively for the first “90”

Strategic approaches to testing pregnant women for HIV across high and very low prevalence settings

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Background

- Declining resources for HIV response from donors
- Emphasis on prioritized/focused approach
- Key populations vs. general population
- Elimination of mother-to-child transmission of HIV
- WHO 2015 Consolidated Guidelines on HIV Testing Services – updated guidance for HIV testing policy for pregnant women
• Routinely offered HIV testing (**universal approach**)
• Focused HIV testing
  – Population
  – *Geographical area*
  – Health facility type
  – Health conditions
Strategic approaches to antenatal HIV testing

Question

• What are the health and cost outcomes of universal vs. focused HIV testing approach for pregnant women?

Cost-effectiveness analysis conducted to assess impact of different HIV testing strategies for PMTCT
Methods – country cases

• Four country-based cases with different HIV prevalence levels
  – High (17%) Namibia
  – Medium (7%) Kenya
  – Low (3%) Haiti
  – Very low (0.1%) Viet Nam

• Country divided into high, medium and low burden areas
**Methods – scenarios examined**

- **Four HIV testing approaches**

<table>
<thead>
<tr>
<th>Approach</th>
<th>Programme coverage</th>
<th>HIV burden</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td><strong>Current</strong></td>
<td>ANC HIV testing ARV</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Highly focused</strong></td>
<td>ANC HIV testing ARV</td>
<td>95%</td>
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<tr>
<td><strong>Focused</strong></td>
<td>ANC HIV testing ARV</td>
<td>95%</td>
</tr>
<tr>
<td><strong>Universal</strong></td>
<td>ANC HIV testing ARV</td>
<td>95%</td>
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</tbody>
</table>

- **Current coverage**: ANC 95%, HIV testing 95% among ANC attendees, and ARV 95% among tested positive.
- **High coverage**: (ANC current coverage), HIV testing 95% among tested positive.
- **Low coverage**: (ANC current coverage), HIV testing 20%, and ARV 95%.
Methods - assumptions

• Option B+ (lifelong ART for all HIV+ PW) with regimens recommended by WHO 2013 guidelines
• Breastfeeding
• Treatment for infected children – 20 years
• Unit costs
  - HIV tests, CD4, early infant diagnosis and viral load
    (WHO Central Procurement Service, UNICEF, and the Supply Chain Management System)
  - ARV (GPRM Report 2013 and CHAI ARV Ceiling Price List 2014)
  - Health services (WHO CHOICE)
Methods - outcomes

• Health outcomes
  – HIV positive pregnant women identified
  – Paediatric HIV infections averted
  – Quality-adjusted life years (QALYs) gained

• Cost outcomes
  – Total cost of:
    • HIV testing for pregnant women
    • PMTCT services (including HIV test, ART, etc.)
    • Paediatric treatment
  – Incremental cost per infection averted / QALY gained
    (based on PMTCT cost)
  – Cost saved (based on both PMTCT and paediatric treatment costs)
### Results – Universal approach
(per 1 000 000 pregnant women)

<table>
<thead>
<tr>
<th>HIV prevalence</th>
<th>HIV testing cost</th>
<th>Paediatric treatment cost</th>
<th>PMTCT cost (exclude testing cost)</th>
<th>Pediatric infections averted</th>
<th>HIV+ pregnant women identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td></td>
<td></td>
<td>$90</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Medium</td>
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<td>$50</td>
<td>X</td>
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</tr>
<tr>
<td>Low</td>
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<td>$20</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Very low</td>
<td></td>
<td></td>
<td>$10</td>
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<td>X</td>
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</tbody>
</table>

- **High HIV prevalence**: Costs are significantly higher, indicating a greater investment in healthcare.
- **Medium HIV prevalence**: Costs are moderate, reflecting a balanced approach.
- **Low HIV prevalence**: Costs are relatively low, showing a more focused strategy.
- **Very low HIV prevalence**: Costs are minimal, suggesting a minimal need for intervention.

The graph illustrates the economic implications of different HIV prevalence rates, highlighting the varying costs associated with testing, treatment, and PMTCT services.
Results – high prevalence setting
(HIV prevalence 17%, per 1,000,000 pregnant women)
Results – medium prevalence setting
(HIV prevalence 7%, per 1 000 000 pregnant women)

- Highly focused
- Current coverage
- Focused
- Universal

- HIV testing cost
- Paediatric treatment cost
- PMTCT cost (exclude testing cost)
- Pediatric infections averted
- HIV+ pregnant women identified

(HIV prevalence 7%, per 1 000 000 pregnant women)
Results – low prevalence setting
(HIV prevalence 3%, per 1 000 000 pregnant women)

- HIV testing cost
- Paediatric treatment cost
- PMTCT cost (exclude testing cost)
- Pediatric infections averted
- HIV+ pregnant women identified

Highly focused
Current coverage
Focused
Universal

US$ millions

Number of people

$0
$2
$4
$6
$8
$10
$12
$14
$16

25,000
20,000
15,000
10,000
5,000
0

Results – low prevalence setting
(HIV prevalence 3%, per 1 000 000 pregnant women)
Results – very low prevalence setting
(HIV prevalence 0.1%, per 1 000 000 pregnant women)
<table>
<thead>
<tr>
<th>HIV prevalence</th>
<th>Approach</th>
<th>ICER based on PMTCT costs</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Incremental cost per infection averted (US$)</td>
</tr>
<tr>
<td>High</td>
<td>Highly focused</td>
<td>(1146)</td>
</tr>
<tr>
<td></td>
<td>Current</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Focused</td>
<td>1154</td>
</tr>
<tr>
<td></td>
<td>Universal</td>
<td>1183</td>
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<tr>
<td>Medium</td>
<td>Highly focused</td>
<td>(761)</td>
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<tr>
<td></td>
<td>Current</td>
<td>*</td>
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<tr>
<td></td>
<td>Focused</td>
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<tr>
<td></td>
<td>Universal</td>
<td>840</td>
</tr>
<tr>
<td>Low</td>
<td>Highly focused</td>
<td>(900)</td>
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<tr>
<td></td>
<td>Current</td>
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<td></td>
<td>Focused</td>
<td>934</td>
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<td></td>
<td>Universal</td>
<td>953</td>
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<tr>
<td>Very low</td>
<td>Highly focused</td>
<td>(1728)</td>
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<td></td>
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<td>1977</td>
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<td></td>
<td>Current</td>
<td>**</td>
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<tr>
<td></td>
<td>Universal</td>
<td>4601</td>
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$^a$ based on both PMTCT and future paediatric treatment cost  * weakly dominated, ** dominated
Sensitivity analysis

- Parameters
  - HIV prevalence
  - Cost (HIV test kit, health services, and paediatric treatment)
- Universal approach remained cost-effective at HIV prevalence at 0.0005%
- Results remained unchanged with increased cost of HIV test kit, health services and treatment costs
Conclusions

• Universal approach is cost-effective even under the very low prevalence of <0.001%

• HIV testing for pregnant women is cost saving
  - universal approach saves the most in high to low prevalence settings

• WHO 2015 recommendations on testing approach for pregnant women
  - generalized epidemic - universal
  - low and concentrated epidemic - universal/focused
Conclusions

- Comprehensive analysis and thorough consideration required for the selection of strategic approaches
  - cost-effectiveness and immediate and long-term outcomes
  - elimination of mother-to-child transmission of HIV
  - quality maternal, newborn and child health care
  - integrated screening for HIV, syphilis and hepatitis B
  - equity and rights to access services
# Acknowledgements

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<th>WHO HQ</th>
<th>Shona Dalal</th>
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