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A ‘one-stop shop’ approach in antenatal care: does this improve antiretroviral treatment uptake in Zimbabwe?

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Setting: Prevention of mother-to-child transmission (PMTCT) programme, Mpilo Hospital antenatal clinic, Zimbabwe

Objective: Before and after the introduction of a one-stop shop approach and task-shifting of antiretroviral treatment (ART) to midwives in the PMTCT programme, 1) to compare ART uptake and 2) to determine socio-demographic and other characteristics associated with non-initiation of ART post integration.

Design: Before and after cohort study.

Results: A total of 285 women were eligible for ART before the introduction of the one-stop approach and 280 after. Of the 285, 163 (57%) initiated ART before integration; this increased to 244/280 (87%) after integration (RR 1.5, 95% CI 1.4–1.7, P < 0.001). A total of 36 (13%) women did not initiate ART after integration; this was significantly associated with cotrimoxazole uptake (P = 0.03).

Conclusion: Integrating ART into antenatal care along with task-shifting to midwives considerably increased the uptake of ART. This provides further evidence for scaling up integration rapidly to other facilities in Zimbabwe, and is in line with the vision of a world where no child will be born with the human immunodeficiency virus by 2015.

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KEY WORDS
integration; PMTCT; task-shifting; operational research; Zimbabwe

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The 2009 Zimbabwe national ART guidelines recommend that CPT be initiated at least one week before the commencement of ART.  

### Integrating antiretroviral treatment into antenatal services

In 2010, before the introduction of the one-stop shop PMTCT approach, all pregnant women underwent HIV testing and counseling at the antenatal clinic. All mothers found eligible for ART were referred to a separate specialist ART clinic in a different building in the same hospital complex for consultation with a physician to start lifelong ART. In practice, the patient thus attended antenatal reviews at the antenatal clinic and separate ART reviews at the ART clinic.

From June 2011 onwards, after Mpilo’s antenatal clinic had successfully completed a training and accreditation process by the Ministry of Health (Table 1), ART initiation was task-shifted from physicians to trained midwives. In addition to HIV testing and counselling, all ART-eligible pregnant women were offered ART in the antenatal clinic in one room by one provider (the one-stop shop approach); 6 weeks after delivery, they were referred for continued care at the ART clinic.

### Data and analysis

Data were collected using a structured questionnaire and sourced from antenatal, pre-ART and ART registers. Aggregated totals of patients newly registered in the clinic, numbers of patients who had undergone HIV testing and numbers of patients who had been screened for ART eligibility were collected from monthly reports. Data were double-entered, validated and analysed using EpiData Version 3.1 (EpiData Association, Odense, Denmark), and cross-validated against the ART and CD4 registers.

The χ² test was used to compare differences in proportions; the t-test was used to compare differences between means. Relative risk (RR) was used to assess the strength of association. P ≤ 0.05 was considered statistically significant.

### Ethics approval

Ethics approval was obtained from the Mpilo Hospital Ethics Review Committee, Bulawayo, Zimbabwe, and the Ethics Advisory Group of the International Union Against Tuberculosis and Lung Disease, Paris, France.

### RESULTS

#### Antiretroviral treatment uptake before and after the introduction of the one-stop shop approach

A total of 285 women were eligible for ART before the introduction of the one-stop shop approach and 280 after its introduction. Table 2 shows HIV testing, ART eligibility and ART uptake during the two periods. Of the 285 women, 163 (57%) initiated ART before integration; this increased to 244/280 (87%) after integration (RR 1.5, 95% confidence interval 1.4–1.7, P < 0.001).

### Factors associated with non-initiation of antiretroviral treatment after integration

After integration, of 280 women eligible for ART (mean age 29.9 years, standard deviation [SD] ±5.8; mean gestational age 27.1 weeks, SD ±7; and mean baseline CD4 count 205.6 cells/μl, SD ±94.5), 36 (13%) did not initiate ART. Characteristics including age, marital status, gestational age, site of HIV testing, CD4 count, WHO stage, CPT and whether or not the partner had undergone HIV testing were assessed for possible associations with non-initiation of ART. The only significant association was CPT. Eight (22%) individuals who did not initiate ART were on CPT compared to 20 (8%) who did initiate ART (P = 0.03; Table 3).

### Table 1: Steps in integrating and accrediting antenatal clinics for antiretroviral therapy in Zimbabwe

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Development of standard operating procedures for use in the clinics</td>
</tr>
<tr>
<td>2</td>
<td>5-day training in ART for midwives</td>
</tr>
<tr>
<td>3</td>
<td>1-month clinical attachment of midwives to existing ART clinics (on-the-job training)</td>
</tr>
<tr>
<td>4</td>
<td>Specific criteria for accreditation of sites for integrated ART included:</td>
</tr>
<tr>
<td></td>
<td>— presence of a midwife trained in ART</td>
</tr>
<tr>
<td></td>
<td>— access to on-site CD4 testing technology (point-of-care or laboratory)</td>
</tr>
<tr>
<td></td>
<td>— availability of a secure antiretroviral drug storage facility on site</td>
</tr>
</tbody>
</table>

ART = antiretroviral therapy.

### Table 2: ART uptake among pregnant women attending antenatal clinics before and after introduction of an integrated one-stop shop approach, Mpilo, Zimbabwe

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Newly registered women</td>
<td>2677 (93%)</td>
<td>3099 (97%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>HIV-positive</td>
<td>310 (11%)</td>
<td>252 (15%)</td>
<td></td>
</tr>
<tr>
<td>Eligible for ART</td>
<td>285*</td>
<td>280*</td>
<td></td>
</tr>
<tr>
<td>Initiated on ART†</td>
<td>163 (57%)</td>
<td>244 (87%)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*Includes women who presented with a positive HIV test result from other facilities.
† Relative risk 1.52 (95% CI 1.42–1.71).
ART = antiretroviral treatment; HIV = human immunodeficiency virus; CI = confidence interval.

### Table 3: Factors associated with non-initiation of ART among those eligible at Mpilo antenatal care clinic, Zimbabwe, after introduction of the one-stop shop approach, June 2011–May 2012

<table>
<thead>
<tr>
<th>Variable</th>
<th>Initiated on ART n (%)</th>
<th>Not initiated on ART n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>244 (100)</td>
<td>36 (100)</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>189 (77.5)</td>
<td>20 (56)</td>
<td>0.5</td>
</tr>
<tr>
<td>Single</td>
<td>18</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>37</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Place of HIV testing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On site</td>
<td>109 (45)</td>
<td>19 (53)</td>
<td>0.9</td>
</tr>
<tr>
<td>Elsewhere</td>
<td>89</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>46</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Partner HIV tested</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14 (5.7)</td>
<td>2 (5.6)</td>
<td>0.9</td>
</tr>
<tr>
<td>No</td>
<td>126</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>104</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>WHO Stage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>175 (72)</td>
<td>24 (66.7)</td>
<td>0.5</td>
</tr>
<tr>
<td>2</td>
<td>44</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>19</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Initiated on CPT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20 (8.2)</td>
<td>8 (22)</td>
<td>0.03</td>
</tr>
<tr>
<td>No</td>
<td>161 (66)</td>
<td>24 (70)</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>63</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

ART = antiretroviral treatment; HIV = human immunodeficiency virus; WHO = World Health Organization; CPT = cotrimoxazole preventive therapy.
DISCUSSION

This is the first study to assess the impact of a one-stop shop approach to ART initiation in antenatal care when combined with task-shifting to midwives. With this new approach, nearly 90% of ART-eligible women accessed treatment; this is considerably higher than data reported in the literature, and is very encouraging.3-7 The study adds evidence for rapidly scaling up ART integration into other facilities in Zimbabwe and elsewhere. It is also in line with the vision of a world where no child will be born with HIV by 2015.10 During the same period in Zimbabwe, there was an increase in the number of ART-eligible women accessing treatment, from 20% in 2010 to 33% in 2011.11

The strengths of this study are that it was conducted under programme conditions and is likely to reflect the reality at facility level. We used data from existing sources and the data were carefully collected and validated. This is also the first study to assess the impact of integration along with task-shifting.

A limitation is that we had insufficient statistical power to assess associations with non-initiation of ART after integration. As routinely collected data were used, data were missing from certain records (Table 3). It is also possible that some patients who initiated ART were not recorded in the registers. In addition, as our comparison group was a historical control, this may have introduced a possible bias. However, there were no changes in staffing, and access issues such as transport and poverty level, which might have affected uptake, remained the same. In addition, intermittent antiretroviral drug ruptures in the post-integration period may have negated the effect of ART uptake in this period.

A surprising finding was that more women on CPT did not initiate ART after integration. We do not know the reasons for this finding but it is possible that those already on CPT were feeling adequately informed.13 Finding but it is possible that those already on CPT were feeling relatively well and may not have appreciated the additional need for ART,12 or they may have thought that they were taking ART relatively well and may not have appreciated the additional need for ART.

In conclusion, a one-stop shop approach to ART integration along with task-shifting considerably increased ART uptake and is of benefit to mothers and newborns. This is in line with the goal of ensuring that no child is born with HIV by 2015.10

References


6 Joint United Nations Programme on HIV/AIDS. Together we will end AIDS. UNAIDS/2012/2013.


Marco de referencia: El Programa de Prevención de la Transmisión Maternoinfantil (PMTCT) en la consulta prenatal del hospital Mpilo, en Zimbabwe.

Objetivo: 1) Comparar la aceptación del tratamiento antirretrovírico (ART) y 2) determinar las características sociodemográficas y otras características que se asocian con la falta de iniciación del ART, antes y después de la introducción de un mecanismo de ‘ventanilla única’ que integra el ART a los servicios de atención prenatal y la delegación de las funciones de suministro del tratamiento a las parteras, en el marco del Programa de PMTCT.

Métodos: Fue este un estudio de cohortes anteriores y posteriores a la introducción del mecanismo de ventanilla única.

Resultados: Antes de la introducción del nuevo mecanismo de centralización se presentaron 285 mujeres aptas para recibir el ART y 280 mujeres después del comienzo de su aplicación. De las 285 mujeres, 163 (57%) iniciaron el ART antes de la integración y después de la misma esta proporción aumentó a 244/280 (87%; RR 1,5; IC95% 1,4–1,7; P < 0,001). Treinta y seis mujeres (13%) no iniciaron el ART después de la integración y esta falla se asoció de manera significativa con las mujeres que recibían la asociación trimetoprim y sulfametoxasol (P = 0,03).

Conclusión: La integración de la administración del ART a los servicios de atención prenatal, acompañada de la delegación de funciones a las parteras, aumenta de manera considerable la aceptación del ART. Esta observación respalda una rápida ampliación de escala de esta integración a otros centros en Zimbabwe y corresponde al objetivo mundial de eliminar en el 2015 los nacimientos de niños contaminados por el virus de la inmunodeficiencia humana.