



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.

Human immunodeficiency virus (HIV) prevalence among pregnant women attending antenatal care in Zimbabwe is high, at an estimated 16%.¹ Mothers infected with HIV have a high risk of transmitting their infection to newborns. Preventing mother-to-child transmission (PMTCT) is thus vital to prevent HIV in children. About 105 000 children are living with HIV in Zimbabwe,¹ the majority of whom were infected through mother-to-child transmission of HIV.

Antiretroviral treatment (ART) offered to HIV-positive women during pregnancy reduces mother-to-child transmission of HIV.² Achieving a high uptake of ART is thus essential to reduce transmission to infants,³ to provide treatment for HIV-infected women and to meet the 2015 Millennium Development Goals of reducing child mortality, improving maternal health and combating HIV/acquired immunodeficiency syndrome.⁴

By the end of 2009, less than 50% of pregnant women in Zimbabwe were undergoing HIV testing,⁵ and even more worrying was that ART uptake among those who were eligible had been unacceptably low, at 4%.⁶ In 2011, the Ministry of Health and Child Welfare introduced an integrated approach of offering ART at the Mpilo referral hospital, the third largest

hospital in Zimbabwe. This meant that women could receive antenatal care, HIV testing, counselling, CD4 testing and ART within the same clinic—a 'one-stop shop' approach.

We hypothesised that a one-stop shop approach would positively impact uptake by facilitating access to ART. Identifying those who did not access ART despite this initiative would also be important to improve equity. Two recent meta-analyses showed that integration significantly increased ART uptake.^{3,7} A PubMed search revealed no publications on the influence of a one-stop shop approach combined with task-shifting of ART initiation to midwives.

The aim of this study was thus 1) to compare ART uptake before and after the introduction of a one-stop shop approach to PMTCT combined with task-shifting at Mpilo Central Hospital, and 2) to determine the socio-demographic and HIV-related characteristics associated with non-initiation of ART despite this patient-friendly initiative.

METHODS

Design

This was a cohort study assessing ART uptake before and after the introduction of a one-stop shop PMTCT approach in antenatal care.

Study setting and population

The study site was the Mpilo Central Hospital located in Bulawayo, the second largest city in Zimbabwe. The study population included all pregnant women registered for antenatal care at the Mpilo antenatal clinic. The study periods were June 2010 to May 2011, before the introduction of the approach, and June 2011 to May 2012, after its introduction.

The antenatal clinic of Mpilo Central Hospital is a referral clinic that covers a population of 1.3 million from Bulawayo and Matabeleland North Province. Mpilo Hospital has 1000 beds and on average 250 new antenatal clinic consultations and 800 deliveries per month.

During the two study periods, all pregnant women presenting at Mpilo antenatal clinic were offered provider-initiated HIV testing and counselling. Women identified as HIV-positive had blood drawn for CD4 count in a separate room in the same clinic. CD4 testing was performed in the main hospital laboratory. ART eligibility was defined as World Health Organization (WHO) Stage 3 or 4, or a CD4 count of ≤ 350 cells/ μ l, irrespective of WHO stage.⁸ All ART-eligible women were also eligible for cotrimoxazole preventive therapy (CPT) and ART initiation, irrespective of gestational age.

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KEY WORDS

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

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TABLE 1 Steps in integrating and accrediting antenatal clinics for antiretroviral therapy in Zimbabwe

- Development of standard operating procedures for use in the clinics
- 5-day training in ART for midwives
- 1-month clinical attachment of midwives to existing ART clinics (on-the-job training)
- Specific criteria for accreditation of sites for integrated ART included:
 - presence of a midwife trained in ART
 - access to on-site CD4 testing technology (point-of-care or laboratory)
 - availability of a secure antiretroviral drug storage facility on site

ART = antiretroviral therapy.

The 2009 Zimbabwe national ART guidelines recommend that CPT be initiated at least one week before the commencement of ART.⁸

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 counselling 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.⁹ 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 χ^2 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. $P \leq 0.05$ 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

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

Variable	Before integration (June 2010– May 2011) <i>n</i> (%)	After integration (June 2011– May 2012) <i>n</i> (%)	<i>P</i> value
Newly registered women	2677	3099	
HIV-positive	310 (11)	252 (15)	<0.001
Eligible for ART	285*	280*	
Initiated on ART [†]	163 (57)	244 (87)	<0.001

*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.

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/ μ l, 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 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

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

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 relatively well and may not have appreciated the additional need for ART,¹² or they may have thought that they were taking ART instead of CPT. Specific awareness-raising about the added benefits of ART may be helpful, as health care workers faced with a large volume of patients and long queues may not have provided adequate information.¹³

Other factors in the published literature known to be associated with ART uptake, including poor knowledge about HIV and ART, psychological factors (shock, depression and denial), stigma and non-disclosure of HIV status and other factors related to the health system,^{13,14} could not be assessed using routinely collected data.

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

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Contexte : Le Programme de Prévention de la Transmission de la Mère à l'Enfant (PMTCT), clinique prénatale de l'Hôpital Mpilo, Zimbabwe.
Objectif : Etude avant-après de l'introduction d'une approche en une étape et du déplacement des tâches du traitement antirétroviral (ART) vers les accoucheuses du PMTCT, afin 1) de comparer la mise en route de l'ART et 2) de déterminer les caractéristiques socio-démographiques et autres en association avec la non-mise en route de l'ART dans la période post-introduction.

Schéma : Etude de cohorte avant et après.

Résultats : Avant l'introduction de la visite unique, 285 femmes ont été éligibles pour l'ART vs. 280 après cette introduction. Avant l'intégration, l'ART a été mis en route chez 163 (57%) des 285 femmes ;

après l'intégration, cette valeur a augmenté jusqu'à 244/280, soit 87% (RR 1,5 ; IC95% 1,4–1,7 ; $P < 0,001$). Après l'intégration, l'ART n'a pas été mis en route chez 36 femmes (13%) ; ce fait a été en association significative avec l'administration de cotrimoxazole ($P = 0,03$).

Conclusion : La mise en route de l'ART augmente considérablement après l'intégration de l'ART dans les soins prénatals en même temps que le déplacement des tâches vers les accoucheuses. Ceci ajoute une évidence de plus en faveur d'une extension rapide d'une telle intégration dans d'autres services du Zimbabwe, et est en accord avec le but recherché d'un monde sans enfants nés avec le virus de l'immuno-déficience humaine d'ici 2015.

Marco de referencia: El Programa de Prevención de la Transmisión Materno-infantil (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 sulfametoxazol ($P = 0,03$).

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.