Do ART eligibility expansions crowd out the sickest? Evidence from South Africa

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INTRODUCTION

- In August 2011, South Africa expanded adult antiretroviral therapy (ART) eligibility from a CD4 <200 to a CD4 <350 cells/μL.
- This policy was designed to increase access, but it is possible that an influx of new patients could crowd out sicker patients due to clinic capacity constraints.
- We assessed whether the 2011 eligibility expansion led to treatment delays among those previously eligible (CD4 <200 cells/μL) in 17 rural KwaZulu-Natal clinics.

METHODS

- Study population: All adult patients with 1st clinic visit between Jan '07-June '12, with first CD4 <350; ART-experienced and transfer patients were excluded.
- Exposure: First CD4 count pre- vs post-Aug '11 eligibility expansion (dichotomous)
- Outcome: Time to ART initiation, censored at 6 months after first visit if lost to follow-up, died, or failed to initiate ART
- Covariates included in all models: Months pre-expansion (continuous), months post-expansion (continuous), calendar month (categorical), Apr '10 policy change (dichotomous), months pre- Apr'10 (continuous), months post-Apr'10 (continuous)

Outcome	Model	Additional covariates
Monthly N of patients enrolled on ART	Linear, controlling for temporal autocorrelation	none
Proportion of patients initiating ART within 6 months of first new visit	Linear, controlling for temporal autocorrelation, excluding 6 months prior to expansion	none
Rate of ART initiation	Cox proportional hazards	Sex, age, history of TB

STUDY POPULATION

Table 1. Characteristics of patients with first visit before vs after eligibility expansion

	Exposure category		
	1st CD4 pre-expansion (n = 20672)	1st CD4 post-expansion (n = 3017)	Total (n = 23689)
First CD4 count < 200, n (%)	12780 (61.8)	1595 (52.9)	14375 (60.7)
First CD4 count 200 – 349, n (%)	7892 (38.2)	1422 (47.1)	9314 (39.3)
Initiate ART by 6 months, n (%)	8740 (42.3)	1718 (56.9)	10458 (44.2)
CD4 < 200*	7438 (85.1)	1008 (58.7)	8446 (80.8)
CD4 200 – 349*	1302 (14.9)	710 (41.3)	2012 (19.2)
Female, n (%)	13534 (65.8)	1822 (60.7)	15356 (65.1)
History of TB, n (%)	3344 (16.2)	290 (9.6)	3634 (15.3)
Age at first CD4, mean (SD)	33.7 (10.8)	33.1 (11.0)	33.7 (10.9)
Age at initiation, mean (SD)	35.7 (10.4)	34.1 (10.7)	35.5 (10.4)

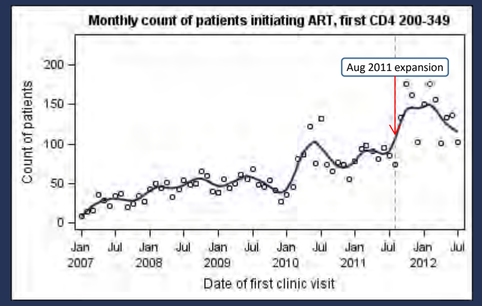
**% of total who initiate within 6 months for the indicated study period*

RESULTS

NEWLY ELIGIBLE: CD4 200 – 349

ALWAYS ELIGIBLE: CD4 < 200

Figure 1. Scatterplot with smoothed curve of **number of patients initiating ART** for each month of the study period



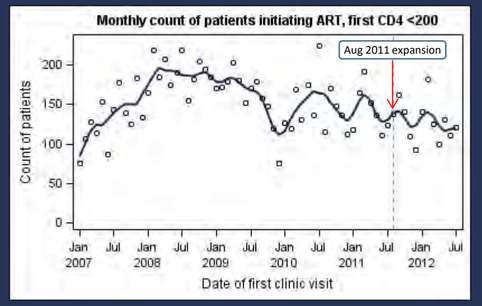
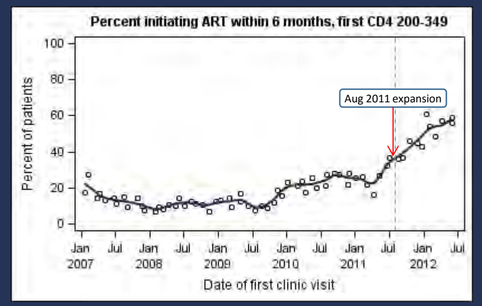


Figure 2. Scatterplot with smoothed curve of **percent of new patients who will initiate ART within 6 months**, for each month of the study period



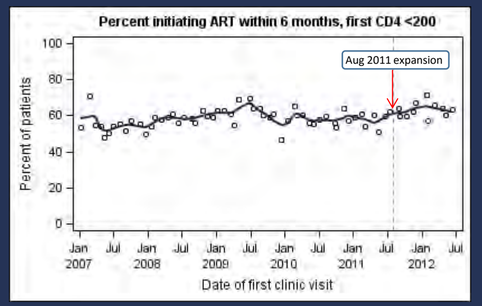
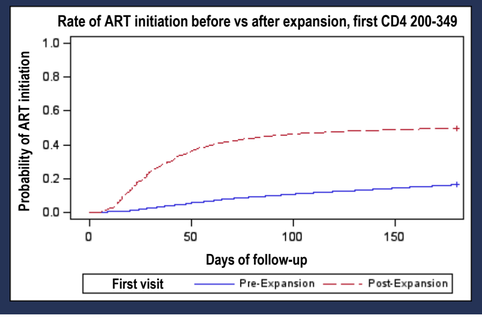


Figure 3. Kaplan-Meier curves of **rate of ART initiation** for patients who first present before vs after the ART eligibility expansion



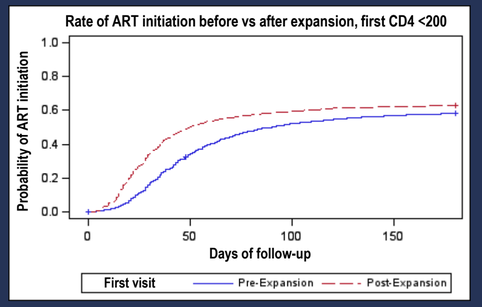


Table 2. Adjusted regression results

Outcome	Effect estimate	Newly eligible (CD4 200-349)	Always eligible (CD4 <200)
Change in number of patients initiating ART per month	β (95% CI)	+85.2 (58.0 to 112.4)	+40.5 (-9.9 to 90.9)
Change in percent (%) of patients that initiate ART within 6 months of first visit	β (95% CI)	+13.4 (4.2 to 22.5)	+4.7 (-4.8 to 14.2)
Hazard ratio of ART initiation	HR (95% CI)	1.6 (1.2 to 2.2)	1.2 (1.0 to 1.4)

Following the August 2011 eligibility expansion:

- **Monthly number of patients initiating ART**
  - Increased by 85 patients (95%CI 58 to 112) in the 200-349 category
  - Increased by 41 patients (95% CI -10 to 91) in the <200 category
- **Percent of patients initiating ART within 6 months**
  - Increased by 13% (95% CI 4 to 23) in the 200-349 category
  - Increased by 5% (95% CI -5 to 14) in the <200 category
- **Rate of ART initiation**
  - Increased by 60% (95%CI 20% - 220%) in the 200-349 category
  - Increased by 20% (95%CI 0% - 40%) in the <200 category

CONCLUSIONS

- The ART eligibility expansion successfully increased ART initiation rates among the newly eligible.
- We did not observe short-term negative spillover effects among the always-eligible. ART initiation rates in this group remained stable before and after the expansion.
- It will be important to monitor whether these improvements can be maintained in the long term, especially with further extension of ART to patients with CD4 350 – 500 cells/μL.

Funding was provided by USAID (INROADS USAID-674-A-12-00029). Africa Centre receives core funding from The Wellcome Trust. JB received funding from NIH award 1K01MH105320-01A1. This study was made possible by the generous support of the American people through the United States Agency for International Development (USAID) and the National Institutes of Health. The contents are the responsibility of the authors and do not necessarily reflect the views of USAID, NIH or the United States government.