TEXT MESSAGE REMINDERS PRIOR TO HIV CLINIC APPOINTMENTS DO NOT IMPROVE RETENTION IN CARE WHEN ADDED TO WEEKLY TEXT MESSAGE REMINDERS SUPPORTING ADHERENCE TO ART IN RURAL SIERRA LEONE: A RANDOMIZED, CONTROLLED, PILOT STUDY

J. Daniel Kelly[1,2,3], Sulaiman Conteh[3,4], Susannah F. Empson[5], Momudu Sesay[3], M. Bailor Barrie[2], Thomas P. Giordano[1]

[1]Baylor College of Medicine, Houston, TX, USA;

[2]Wellbody Alliance, Koidu Town, Sierra Leone;

[3]National HIV/AIDS Secretariat, Freetown, Sierra Leone;

[4]College of Medicine and Allied Health Sciences, Freetown, Sierra Leone;

[5]University of California, San Francisco, San Francisco, CA, USA.

Background

- Weekly short message service (SMS) reminders have improved adherence to antiretroviral therapy (ART)
  - Randomized controlled trials
    - Uganda (Pop-Eleches 2011)
    - Kenya (Lester 2010)
- SMS appointment reminders to HIV-negative persons in Switzerland demonstrated some effectiveness in clinic attendance (Junod Perron 2010).
- No study has assessed the impact of SMS appointment reminders for HIV care in the setting of weekly SMS adherence reminders.

Methods

- Randomized, controlled, pilot trial
- Kono District, Sierra Leone
- Inclusion criteria:
  - ART-naïve and ART-experienced
  - Any literacy level
  - People with or without cell phones
- Control group:
  1. Standard care
  2. Community-based ART with thrice-weekly home visits
  3. Weekly SMS adherence reminders
- Intervention group:
  4. Daily SMS reminders starting two days prior to their appointment and ending on the day of their expected visit.
- Intensive training period

Intervention

| 2 days prior • SMS 'aaa' | 1 day prior • SMS 'aa' | Day of appointment • SMS 'a' |
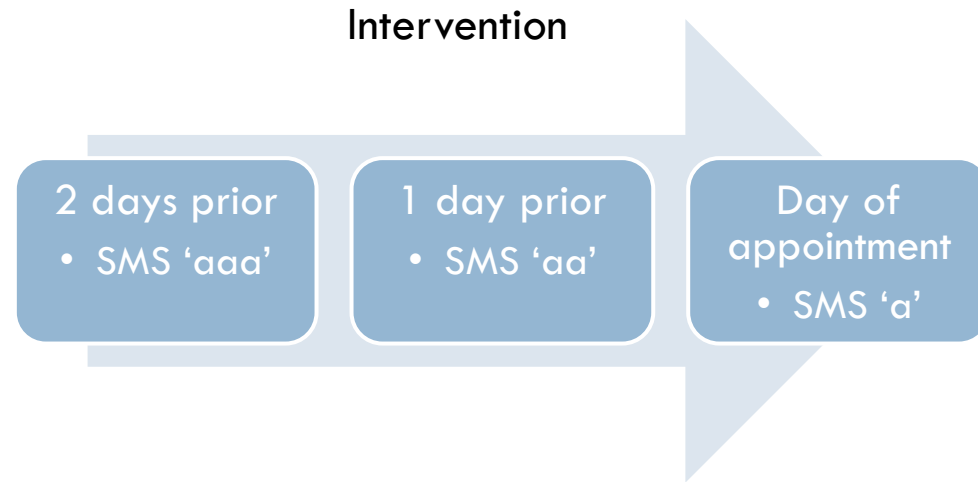
Interactive component to all SMS reminders

CHW ⇄ Patient
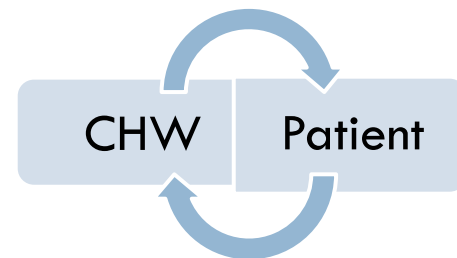
Outcomes

- **Retention in care** was measured by missed visits, and participants were considered retained if they attended all 3 of their visits.
- **Kept appointments** was measured as a cumulative variable of appointments attended over appointments scheduled.
- **Treatment interruptions** due to delays in clinic attendance were measured comparing home-based pill counts to refill dates and defined as at least a 48-hour period without pills in the home.
- **Adherence to ART** was measured by weekly home-based pill counts, and participants were considered adherent to ART if their adherence was $\geq$ 90%. Adherence was also analyzed as a continuous variable.
- Outcomes were measured **monthly for 3 months.**
- **Intention-to-treat** analysis
- T-test, chi-squared, and logistic regression with robust modeling

	Control (n=46)	Intervention (n=48)	p-value
Age	33.2	33.4	0.47
Female	34 (73.9)	40 (83.3)	0.12
ART-experienced	35 (76.1)	40 (83.3)	0.22
≤ primary school	27 (58.7)	30 (62.5)	0.53
Illiterate	26 (56.5)	32 (66.7)	0.14
Ever owned a phone	35 (76.1)	39 (81.3)	0.50
Ever opened an SMS	19 (41.3)	16 (33.3)	0.08
Ever sent an SMS	14 (30.4)	13 (27.1)	0.29
Married	18 (39.1)	19 (39.6)	0.76
Ever alcohol use	20 (43.5)	18 (37.5)	0.37
Ever tobacco use	16 (34.8)	17 (35.4)	0.76
Income (< USD 1 per day)	26 (56.5)	28 (58.3)	0.69
Far distance (> USD 1 for transportation)	35 (76.1)	37 (77.1)	0.74
Undisclosed	18 (39.1)	17 (35.4)	0.54
Enacted stigma	10 (21.7)	15 (31.3)	0.10
High internalized stigma	30 (65.2)	30 (62.5)	0.62

Outcomes

	Control % (n/N)	Intervention % (n/N)	p-value
Retention in care	63.2 (36/57)	68.5 (37/54)	0.69
Appointments kept	74.3 (124/171)	81.5 (132/162)	0.07
$\geq$ 1 treatment interruption	77.2 (44/57)	74.1 (40/54)	0.83
Adherence to ART	89.5 (50)	90.4 (48)	0.47
$\geq$ 90% adherence to ART	66.0 (33/50)	64.6 (31/48)	1.00

Disaggregated data

Attended 'x' of 3 appointments	Control (n=57)	Intervention (n=54)	p-value
0	11	4	<0.01
1	1	5	
2	9	8	
3	36	37	

Retention in care: multivariate analysis

Retention in care	Adjusted OR	95% CI	P-value
Age	1.02	0.97 to 1.06	0.48
Gender	0.88	0.25 to 3.14	0.85
Literacy	1.34	0.50 to 3.61	0.57
Sent SMS before	0.69	0.17 to 2.83	0.61
Stigma	1.08	0.37 to 3.14	0.88
Social support	0.94	0.09 to 10.33	0.96
Intervention	0.45	0.16 to 1.32	0.15

Retention in care: multivariate analysis

Retention in care	Adjusted OR	95% CI	P-value
Age	1.02	0.97 to 1.06	0.48
Gender	0.88	0.25 to 3.14	0.85
Literacy	1.34	0.50 to 3.61	0.57
Sent SMS before	0.69	0.17 to 2.83	0.61
Replied to SMS $\geq$ 1	7.06	1.83 to 27.22	<0.01
Stigma	1.08	0.37 to 3.14	0.88
Social support	0.94	0.09 to 10.33	0.96
Intervention	0.45	0.16 to 1.32	0.15

Adherence to ART: multivariate analysis

>90 adherence to ART	Adjusted OR	95% CI	P-value
Age	0.98	0.94 to 1.02	0.37
Gender	1.51	0.34 to 6.71	0.59
Literacy	1.04	0.26 to 4.12	0.98
Sent SMS before	2.43	0.56 to 10.67	0.24
Replied to SMS ≥ 1	0.84	0.21 to 3.41	0.81
Stigma	3.20	1.06 to 9.68	0.04
Social support	0.29	0.02 to 3.41	0.32
Intervention	0.87	0.23 to 3.23	0.83

Process indicators of intervention

≥ 1 SMS sent during the study	≥ 1 SMS sent per month

72.2%

CHW → Patient

76.9%

22.2%

CHW → Patient

75.0%
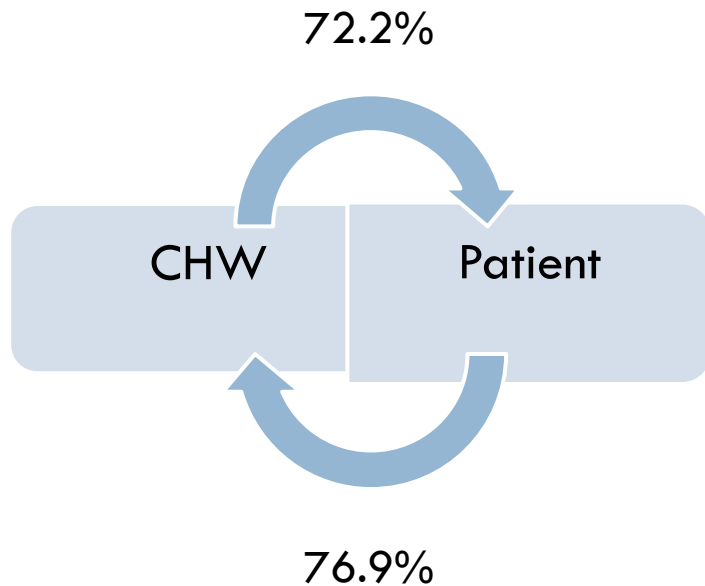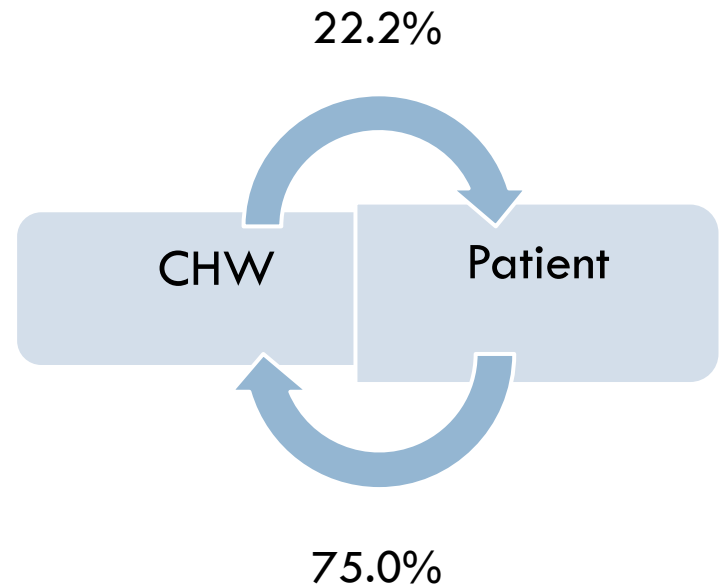
Adjusted outcomes based on SMS sent

|	Control (n/N)	Intervention (n/N)	p-value
Retention in care	63.2% (36/57)	68.5% (37/54)	0.69
Retention in care (conditioned on $\geq$1 SMS sent during the study)	63.2% (36/57)	76.9% (30/39)	0.18
Retention in care (conditioned on $\geq$1 SMS sent per month)	63.2% (36/57)	91.7% (11/12)	0.09

Are the CHWs sending an SMS to a biased population?

Adjusted process indicators based on participant's ownership of cell phone

≥ 1 SMS sent during the study	≥ 1 SMS sent per month

75.0%

CHW → Patient

76.9%

25.0%

CHW → Patient

75.0%
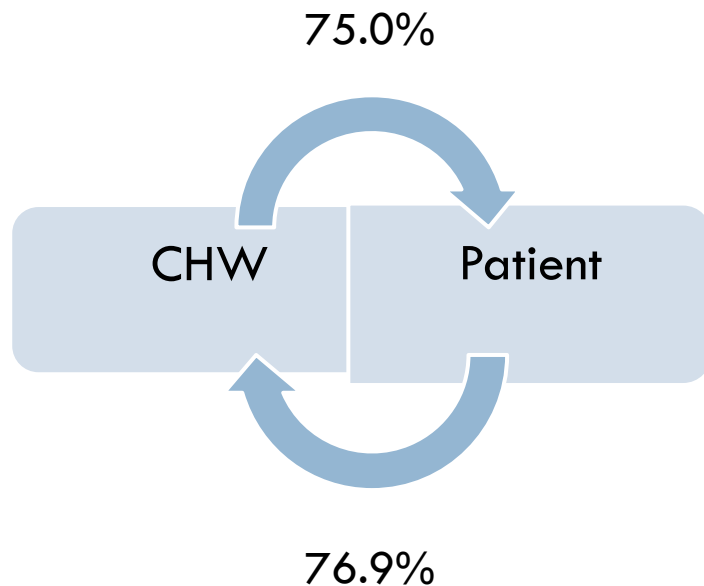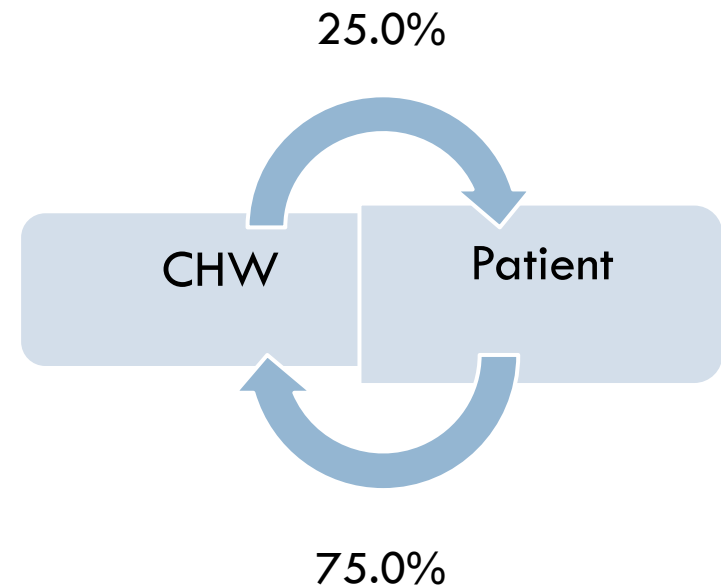
Limitations

- Small sample size
- Short evaluation period
- % of SMS sent by CHWs
- Unclear impact of community-based program

Conclusions

☐ SMS reminders prior to HIV clinic appointments did not improve retention in care when added to weekly SMS reminders supporting adherence to ART

☐ There may be some impact related to the number of appointments attended.

☐ Data needs to be collected over a more extended period of time to establish the reliability of findings.

☐ Further work needs to be done to understand which type of patients may benefit most from this intervention.