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The ‘InfoPlus Adherence’ Project: Developing and Evaluating a Provider-Delivered National EMR Alert - Based ART Adherence Counseling Program in Haiti

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Background



Setting: Haiti

- Population: 11 million
- GNI per capita: \$760 USD
- Life expectancy: 63.5 years of age
- Literacy: 78% women and 83% men
- Households with electricity: 41%



HIV/AIDS in Haiti

- Generalized epidemic
- HIV prevalence: 2.3% women, 1.6% men
- On ART: 92,000 patients, 62% of all PLWH
- Viral suppression: 64% of those on ART

Sources:

World Bank (<https://data.worldbank.org/country/Haiti>)

Demographic and Health Surveys (<https://dhsprogram.com/pubs/pdf/SR249/SR249.pdf>)

PEPFAR, Haiti Country Operational Plan 2018 Strategic Direction Summary (<https://www.pepfar.gov/documents/organization/285862.pdf>)

InfoPlus Adherence Project Overview

Aim

After conducting formative research on the potential role of EMR alerts and healthcare providers in ART adherence counseling in Haitian HIV primary care clinics, we aimed to develop and evaluate in a preliminary clinical trial the *InfoPlus Adherence* intervention.

Innovation/Significance

- Introduces *predictive analytics* to improve HIV clinical management
- Pairs improvements to a *routine data system* with *theory-based behavior change intervention* for patients and health care workers

Funding

National Institutes of Mental Health (NIMH R34MH112378, Project Officer M. Stirratt)

- Nancy Puttkammer and Jane Simoni (MPIs)
- 3-year pilot project

Procedures



Formative Work

- Qualitative interviews
- Algorithm and EMR alert development

Pilot trial

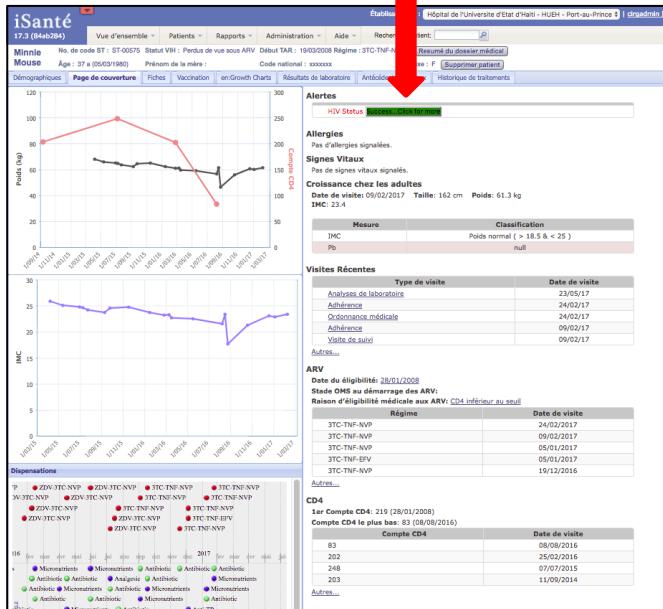
- 2 ART clinics
 - Intervention site randomly chosen: HUJ
 - Control site received standard care: HUEH
- Inclusion: adults, started ART within past 12 months
- Surveyed at study enrollment, exit
 - Follow up: median 6.5 mos, range 4-12 mos
- Not powered for efficacy, but did measure :
 - Viral load (primary outcome)
 - ART adherence (secondary outcome)
 - Mechanisms of effect:
 - Information Motivation Behavioral Skills (IMB) model (Amico, 2005)
 - Patient provider communication (PPC) (Schneider 2004)
- Exit focus groups with HCW at intervention site

References: Amico, K. R., et al. (2005). "An empirical test of the Information, Motivation and Behavioral Skills model of antiretroviral therapy adherence." AIDS Care 17(6): 661-673; Schneider J, Kaplan SH, Greenfield S, Li W, Wilson IB (2004). Better Physician-Patient Relationships Are Associated with Higher Reported Adherence to Antiretroviral Therapy in Patients with HIV Infection. J Gen Intern Med. 2004;19:1096 –103.

InfoPlus Adherence: EMR-based Alert



Cover Page with Alert



Pop-Up Window

Calendrier de Risque

mars							avril							mai						
di	lu	ma	me	je	ve	sa	di	lu	ma	me	je	ve	sa	di	lu	ma	me	je	ve	sa
1	2	3	4	5	6	7	1	2	3	4	5	6	X	1	2	3	4	5	6	
8	9	10	11	12	13	14	8	9	10	11	12	13	X	8	9	10	11	12	13	
15	16	17	18	19	20	21	15	16	17	18	19	20	21	15	16	17	18	19	20	
22	23	24	25	26	27	28	22	23	24	25	26	27	28	22	23	24	25	26	27	
29	30	31					29	30	31					29	30	31				

Légende :

- Success
- Risque Minimale
- Risque Moyen
- Risque Haut
- Jours possible

X - Jours où le patient était en retard pour la recharge des médicaments antirétroviraux (le patient ne possédait pas de médicaments)

"L'Histoire de Mon Adhérence" discuté aujourd'hui Oui Non

Commentaires d'aujourd'hui

Décrivez brièvement les raisons de non-adhérence et/ou le plan d'action du jour visant à renforcer du patient aux ARVs

Sauvegarder Annuler

Commentaires antérieurs

Historique des raisons de non-adhérence et des plans d'action visant à renforcer du patient aux ARVs

Sauvegarder Annuler

InfoPlus Adherence: Job Aide



<p>Succès/Siksè</p> 	<p>Lè'w nan koulè ble sa a, sa vle di ou fè siksè, chaj viral ou vrèman endetektab, eta sante ou ap evolye trè byen. Sa vle di tou ou toujou pran medikaman ou byen epi ou toujou respekte dat randevou'w kòmsadwa.</p> <p>Mwen felisite'w epi mwen ankouraje'w pou'w toujou kontinye konsa pou'w ka toujou rete nan kategori moun ki nan koulè ble a, sa ki vle di pasyan kap travay pou li ka toujou rete an bòn sante. Pa janm bliye pa gen lòt moun ki ka jere sante'w pi byen pase'w. Kenbe la! Mèsi anpil.</p>
<p>Risque Minimal / Risk tou piti (fèb)</p> 	<p>Lè'w nan koulè vèt fonse sa a, sa vle di eta sante'w bon, men gen yon nivo risk tou piti/fèb. Donk, mwen felisite'w epi ankouraje'w fè plis jefò pou'w pran medikaman'w pi byen epi toujou vini nan randevou ou a tan pou'w ka nan kategori pasyan ki nan koulè ble a pito, sa ki vle di pasyan chaj viral yo endetektab, ki fè siksè nan trètman an. Mèsi anpil.</p>
<p>Risque Moyen / Risk mwayen</p> 	<p>Lè'w nan kategori koulè jòn fonse sa a, sa vle di risk lan kòmanse pi plis, eta sante'w pap evolye twò byen. Eske'w toujou pran medikaman'w ? Kòman ou pran medikaman'w yo ? Eske'w toujou vini nan randevou kòrèkteman ? Li enpòtan pou'w fè plis efò pou'w pran medikaman'w chak jou epi a lè, anplis toujou vini nan randevou'w tout tan. Mèsi anpil.</p>
<p>Risque Haut/ Wo risk</p> 	<p>Lè'w nan kategori oranj sa a, sa vle di ou gen yon nivo risk ki wo anpil. Sa vle di sante'w ap de pa fini. Eske'w toujou pran medikaman'w ? Kòman ou pran medikaman'w yo ? Eske'w toujou vini nan randevou'w tout tan ?</p> <p>Objektif nou se wè'w toujou an bòn sante, men pou sa rive fèt li mande efò ak kolaborasyon pa ou. Li enpòtan pou'w fè anpil efò pou'w ka amelyore eta sante'w. Nou konnen sante'w enpòtan pou ou anpil, nou konnen li pa fasil, men si'w vle ou ka rive. Ou dwe pran medikaman ou chak jou epi a lè, anplis toujou vini nan randevou ou a tan. Mèsi anpil.</p>
<p>Echèc posib/Echek tretman</p> 	<p>Lè'w nan koulè wouj sa a, sa vle di ou sou wout echèk trètman an. Eta sante ou grav anpil.</p> <p>Eske'w toujou pran medikaman'w ? Kòman ou pran medikaman'w yo ? Eske'w toujou vini nan randevou kòrèkteman ?</p> <p>Objektif nou se wè'w toujou an bòn sante, men pou sa rive fèt li mande efò ak kolaborasyon pa ou. Li enpòtan pou'w fè anpil efò pou'w ka amelyore eta sante'w. Nou konnen sante'w enpòtan pou ou anpil, nou konnen li pa fasil, men si'w vle ou kapab rive. Li enpòtan pou'w toujou pran medikaman ou chak jou epi a lè, anplis toujou vini nan randevou ou a tan. Mèsi anpil.</p>

InfoPlus Adherence: Counseling Approach

Step 1

- **Introduction**
- “Taking medication is not easy”

Step 2

- **Explore Motivation**
- “What do you think of your medicines?”

Step 3

- **My Adherence Stories**
- “Tell me about a good day when you were able to take all your medicines. Tell me about a bad day when you were not able to take all your medicines.”

Step 4

- **Problem Analysis**
- “What made it hard to take your medicines on the bad day? What helped you on the good day?”

Step 5

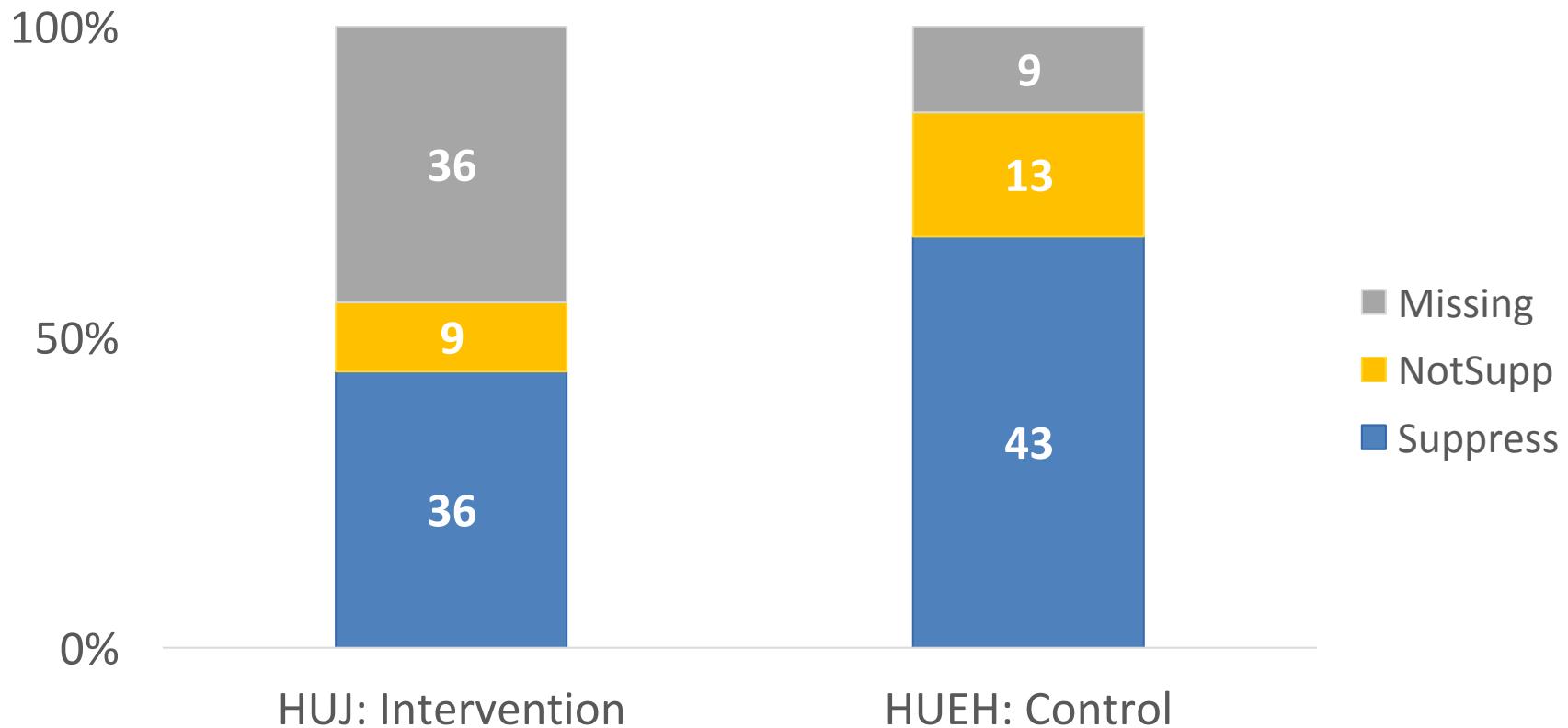
- **Solutions**
- “What are 3 possible solutions for the challenges you have been facing? Which one would you like to pick?”

Study participant characteristics



	HUJ: Intervention (n=81)	HUEH: Control (n=65)
Male sex (%)	42%	40%
Age in years (mean)	36.2	38.7
SES* (% by tertile)	Low SES	29%
	Mid SES	30%
	High SES	29%
	Unknown	12%
Months since diagnosis (mean)	10.1	11.8
Months since ART start (mean)	2.2	1.9
WHO stage 3/4 (at ART init, %)	40%	20%

Viral load outcome by facility

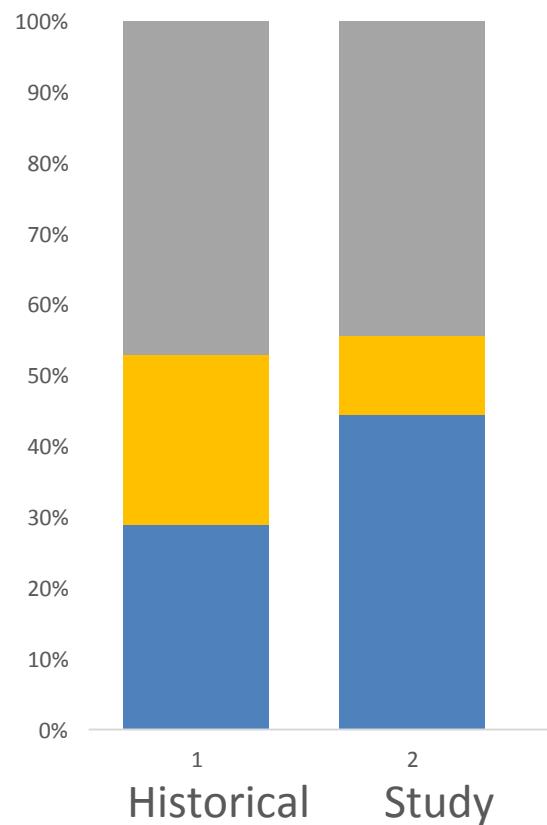


Unsuppressed VL: 20% in intervention vs. 23% in control site ($p=0.70$)

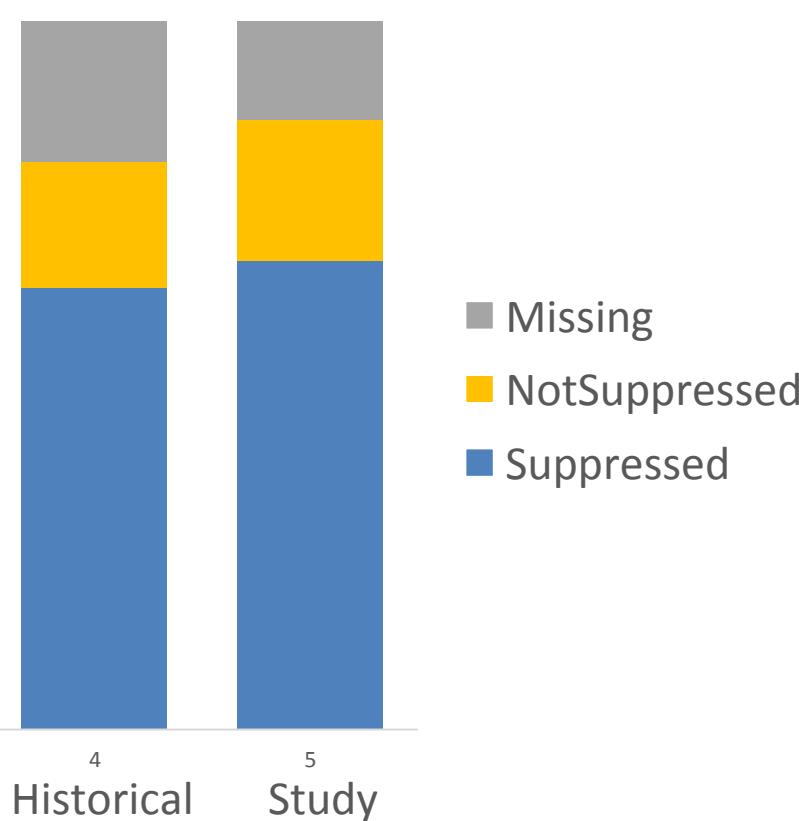
Viral Load: Historical Comparison



HUJ: Intervention Site



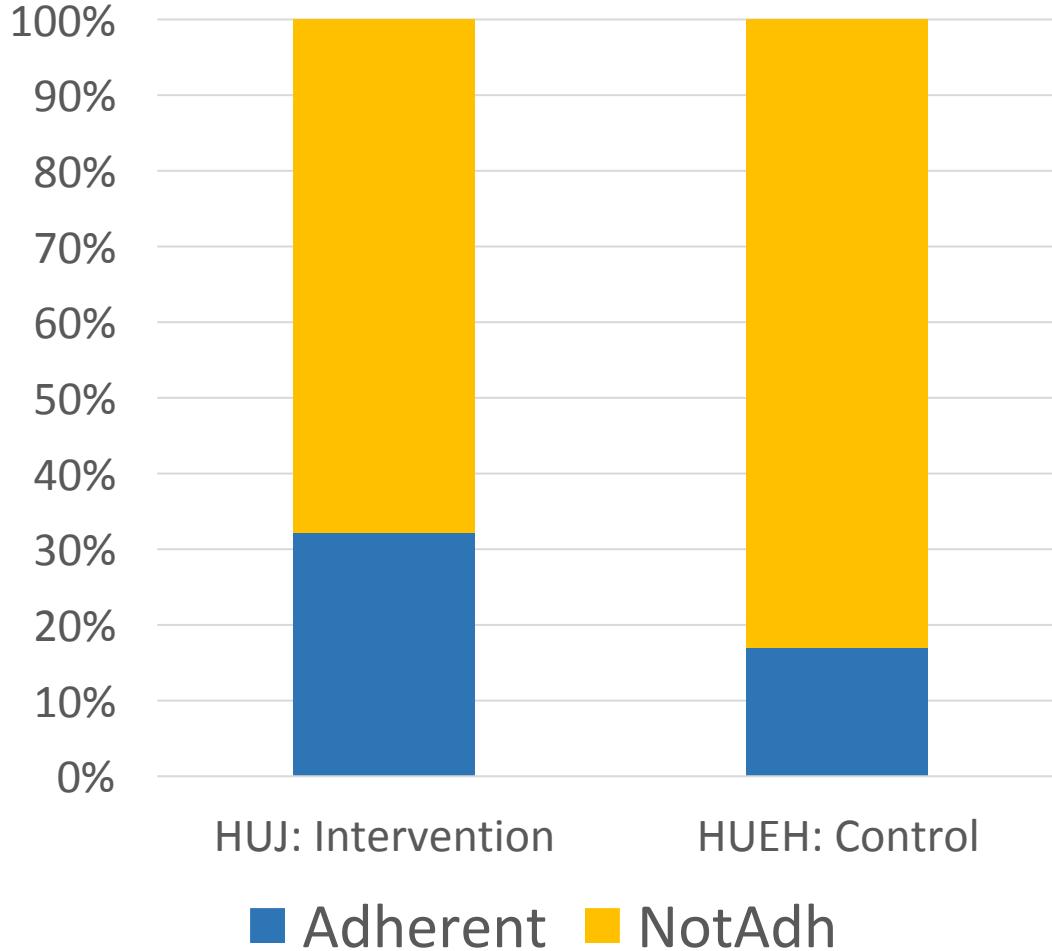
HUEH: Control Site



HUJ: 45% vs. 20%
unsuppressed VL in
historical vs. study period
(p=0.002)

HUEH: 22% vs. 23%
unsuppressed VL in
historical vs. study period
(p=0.88)

Adherence Outcomes



- Adherent >90% PDC (*proportion of days covered*)
- 32% at intervention site vs. 17% at control site ($p=0.04$)

Mechanisms: Pre-Post Survey Results



Construct Median (IQR)	Intervention Clinic: HUJ (n = 66)	Control Clinic: HUEH (n = 60)
IMB: Information (Score range: 0-9)	PRE: 7(6-8) POST: 8(7-9)	PRE: 8(7-8) POST: 8(8-9)
IMB: Motivation (Score range: 0-10)	PRE: 5(4-6) POST: 6.5(5-7.75)	PRE: 7(6-8) POST: 8(6.75-8)
IMB: Behavioral Skills (Score range: 0-13)	PRE: 13(11-13) POST: 12(5.75-13)	PRE: 12(11-12) POST: 12(11-12)
PPC: Communication (Score range: 0-25)	PRE: 15(15-15) POST: 15(15-15.75)	PRE: 20(17-20) POST: 20(15-20)
PPC: Satisfaction (Score range: 0-20)	PRE: 12(12-12.75) POST: 12(12-13)	PRE: 15.5(13-16) POST: 15.5(12-16)

IMB: Information, Motivation, Behavioral Skills; PPC: Patient – provider communication
Bolded entries are significant at $p \leq 0.05$

References: Amico, K. R., et al. (2005). "An empirical test of the Information, Motivation and Behavioral Skills model of antiretroviral therapy adherence." AIDS Care 17(6): 661-673; Schneider J, Kaplan SH, Greenfield S, Li W, Wilson IB (2004). Better Physician-Patient Relationships Are Associated with Higher Reported Adherence to Antiretroviral Therapy in Patients with HIV Infection. J Gen Intern Med. 2004;19:1096 –103.

Opinions of Alert



« ... many **patients are starting to be motivated by it**.... Some bring it up even when we do not mention it »

« We can see many things [in the EMR], but with the alert it becomes a **lot easier** to do so »

« I saw a patient who told me ... he couldn't take his medication regularly. **He said he could not lie to me** because I see everything »

Opinions of “My Adherence Stories”

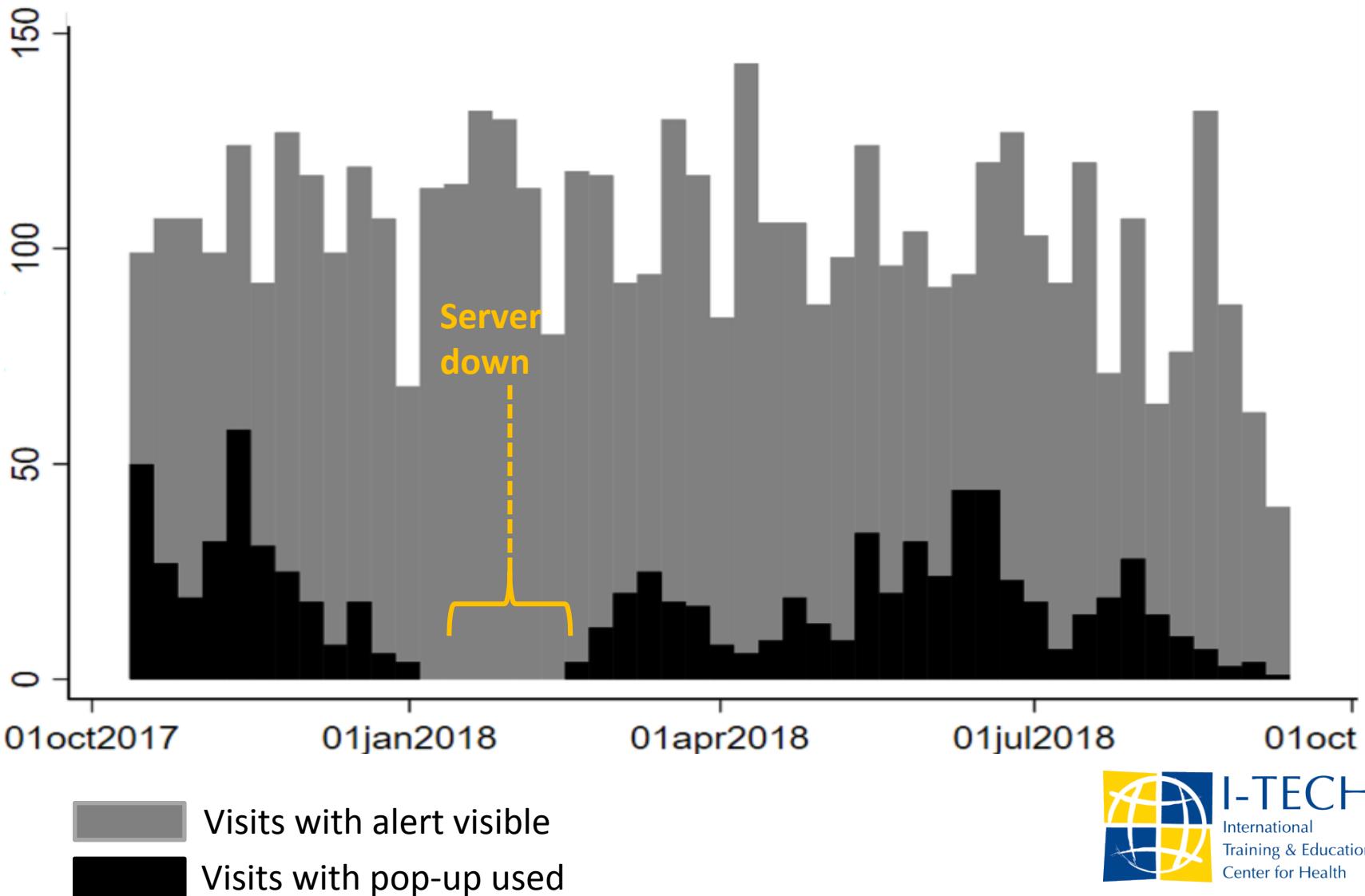


« It helps different health workers to **use the same language** »

« ...Instead of just giving out the medications, [My Adherence Stories] helps **patients feel valued and prepared** »

« Before, patients said they were adherent and it stopped there... Now ...you can **dialogue with the patient** and help them to find alternatives. »

Alert usage, weekly



Implementation & Study Challenges



- Generally good understanding of intervention
 - Some misperceptions on factors in alert algorithm
- Fidelity of implementation somewhat weak
 - Poor use of problem-solving portion of “My Adherence Stories”
- Technology challenges with EMR alert
- Missing VL measures



Discussion



Summary

Intervention highly acceptable, mixed implementation, promising evidence of efficacy

Limitations

- Clinics not necessarily comparable, only 2 sites
- Not powered for efficacy
- Higher potency may be needed (booster training)

Next steps

- Adapt intervention for community-based ART distribution
- Optimize prediction algorithm (machine learning)
- Extend alerts for all patients
- Reinforce “My Adherence Stories”



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Thank You!