

Evaluation of Performance-Based Incentives (PBI) for Volunteer Workers in Zambézia Province: Final Results

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1. Executive Summary

In August 2017, FGH began the roll-out of a performance-based incentive (PBI) initiative for volunteer workers in select health facilities (HF). Performance was evaluated by select health indicators for which increases in absolute numbers or proportions were tied to a marginal financial incentive payout each quarter. Volunteer cadres, including Peer Educators (PE), Association Members (AM), Male Champions (MC), and community-based TB DOTS (TB DOTS) volunteers, received incentives based on HF performance, whereby all volunteers linked to HF achieving quarterly targets received the same incentive payout. We share here final results of program evaluation of a novel performance-based incentive (PBI) to specific volunteer cadres engaged in community-health facility (clinic) linkage-related work. In summary, the changes affecting cadres of volunteers through the evaluation period could have largely influenced the yield of patient tracing activities, specifically i) **Association Members (AM)**: Sharp decrease in contact tracing activities after August 2016 that appeared to coincide with end of Ogumaniha/SCIP project activities; ii) **Peer Educators (PE)**: Consistent improved performance over time (NOTE: FGH contracted large numbers of new PE during the period of evaluation to scale to current program ratios); iii) **Male Champions (MC)**: Consistent improved performance over time (NOTE: FGH also trained many new MC and scaled-up this novel initiative in large number of sites during period of evaluation); and iv) **Community-based TB DOTS volunteers (TB DOTS)**: Positive trend over time (NOTE: Program had fewer volunteers for many of these months; received specific training and mentorship unique to their program activities).

The most consistent improvement from PBI by cadre seen among TB DOTS volunteers. TB DOTS activities have not been scaled up in all districts and they perform a relatively small proportion of patient tracing activities presently; additional longer-term data (including qualitative data) is needed to determine if this cadre (or specific aspects of their training/ activities) should play a more significant role going forward. Factors to investigate to better understand increasing trends observed for TB DOTS and to provide insights for future initiatives are listed below:

- Supervision / oversight
- Documentation used by volunteers
- Training given to volunteers
- Strategies for interacting / engaging with community

We also recognize certain **limitations** with this analysis/evaluation. Specifically, the roll-out of the PBI Initiative was not done in a stepped wedge intervention design or with uncontaminated comparison sites to allow for pre-post comparisons with a control. Throughout the evaluation period there were many overlapping novel initiatives and/or quality improvement programmatic changes that took place, thus the unique or sole effect of PBI initiative cannot be quantified. This is consistent with limitations found in many other PBI strategies [1] [2]. Specifically, i) we had different calendar period for roll-out of PBI payouts for cadres; ii) PBI payouts for each improved

indicator varied across cadres, and iii) we have had historical programmatic challenges in tracking volunteers.

2. Project Background

In August 2017, FGH began the roll-out of a performance-based incentive (PBI) initiative for volunteer workers in select health facilities (HF). Performance was evaluated by select health indicators for which increases in absolute numbers or proportions were tied to a marginal financial incentive payout each quarter. Volunteer cadres, including Peer Educators (PE), Association Members (AM), Male Champions (MC), and community-based TB DOTS (TB DOTS) volunteers, received incentives based on HF performance, whereby all volunteers linked to HF achieving quarterly targets received the same incentive payout. We conducted this evaluation to assess the impact of the PBI initiative on volunteer performance and health outcome metrics at HF included in the initial rollout. Specifically, we assessed performance pre- and post-implementation by tracking trends of programmatic indicators related to *performance measures* [Objective 1], including (i) preventive home visits and patient contact tracing activities (searches), and (ii) patients found and returned to HF; and *HIV-related indicators* [Objective 2], including (i) adults and pregnant women (PW) 12-month retention in care, (ii) new pediatric ART enrollments, and (iii) persons newly enrolled in TB care/services.

3. Evaluation Purpose and Questions

The overall purpose of this evaluation was to assess the impact of the PBI initiative on volunteer performance and health outcome metrics at the FGH-supported health facilities included in the initial rollout.

Specific evaluation questions/objectives included:

- i) [Objective 1] Evaluate FGH PBI initiative prior to and following implementation by tracking trends of programmatic indicators related to performance (process) measures: (1) home visits and patient tracing (i.e., searches) (number of visits completed and patients found) and (2) patient re-linkage (number of patients returned to the HF in the same month of those visited and found), by recipient volunteer groups (i.e. peer educators, associations' volunteers, male champions, and TB DOTS volunteers;
- ii) [Objective 2] Evaluate FGH PBI initiative prior to and following implementation by tracking trends of programmatic indicators related to HIV-related indicators: (1) number of (non-pregnant) adults, pregnant adults, and pediatric patients on ART, (2) ART retention in

care rates at 12 months, and (3) new TB care enrollment; by district, by individual health facility, and overall.

Our hypothesis is that health facilities where the cadre-specific PBI initiative was implemented will have trends of improved patient tracing yield (in terms of percentage of patients sought and returned to the HF) and track with patient retention rates during the time frame of PBI initiative.

4. Evaluation Design, Methods, and Limitations

Type of Evaluation

We conducted an ecological observational evaluation to examine trends of programmatic indicators prior to and following the implementation of a novel PBI scheme developed for specific FGH volunteer cadres engaged in community-health facility (clinic) linkage-related work.

Summary of stakeholder engagement

FGH technical teams have ongoing collaborations with key stakeholders working in the community and specifically those involved with community-clinic linkages (i.e. community association members/workers, peer educators, CB-DOTS volunteers, Male champions, etc.). The PBI scheme for volunteer groups was piloted with awareness and support by the Zambézia Provincial Health Directorate (DPS-Z). The concept note and plan for secondary data analysis evaluation was approved by sponsoring institution CDC-MZ.

Sampling strategy

Inclusion criteria: All patient records and FGH performance incentive payment records related to indicators (outlined above) at the FGH-supported health facilities included in the novel PBI scheme rollout: Namacurra CS I, Macuse CS I, CS 7 Abril, Pebane CS I, Maganja da Costa CS I, Nante CS III, Mocubela, Tapata, Inhassunge CS I, Morrumbala CS I, Mopeia CS I, Ile CS I, Gilé CS I, HR de Alto Molócuè, and Chinde CS I. Exclusion criteria: Facilities enrolled in the PBI scheme after the initial rollout that took place during the month of Aug 2015.

Methods for data collection and analytics

Aggregated programmatic data were collected from the District Health Information System (DHIS) (for Objective 1), and from electronic patient database OpenMRS (for Objective 2), and routine (SAPR/APR) progress reports. The pre-PBI period for evaluation was defined as December 21, 2014 – July 20, 2015 (7 months). The post-PBI period was defined as: (i) [for PE and AM] August 21, 2015 – March 20, 2017 (19 months); (ii) [MC] January 21, 2016 - March 20, 2017 (14 months); and (iii) [TB DOTS] April 21, 2016 - March 20, 2017 (11 months). Data were evaluated from 15 HF initially included in the PBI scheme roll-out (HF of Namacurra, Macuse, 7 de Abril,

Pebane, Maganja da Costa, Nante, Mocubela, Tapata, Inhassunge, Morrumbala, Mopeia, Ile, Gilé, Chinde, and Alto Molócuè).

Ethical considerations and assurances

All data included in this analysis were aggregated, de-identified programmatic data. No consent process was necessary for the execution of this evaluation, as the programming was an ongoing approved initiative.

Deviations from SOW/protocol

There were none related to this evaluation.

Data quality assurance

FGH technical teams were on-site and overseeing the fidelity of the implementation of this PBI initiative. Programmatic data used in this evaluation was subject to routine data verification processes conducted by trained members of FGH's Monitoring and Evaluation (M&E) team and was stored securely on password-protected databases at district and provincial level offices. Data collection was completed by trained members of FGH and VUMC evaluation team.

Data Analysis Plan

Pre- and post-analysis plan, specifically, we evaluated the impact of this PBI initiative on key performance measures (i.e. home visits and patient contact tracing (i.e. searches), patients found and returned to the health facility) and HIV-related indicators (i.e. number of adults, pregnant, and pediatric patients currently receiving ART, ART retention in care rates at 12 months, and new enrollees into TB care) pre- and post-implementation of this initiative, using specific date ranges: pre-intervention [for all cadres]: Dec 21, 2014 – July 20, 2015 (7 months); post-intervention: [PE & AM]: Aug 21, 2015 – Mar 20, 2017 (19 months), [MC]: Jan 21, 2016 - Mar 20, 2017 (14 months), and [TB DOTS]: Apr 21, 2016 - Mar 20, 2017 (11 months).

Proportion and rates were calculated to estimate trends and changes over time intervals pre- and post-PBI strategy implementation. For indicators where a rate calculation is not possible, averages were calculated for both the pre- and post-periods. When a rate calculation was possible, monthly data was used to calculate rates for comparison. Frequencies and averages (95% Confidence Intervals [CIs]) were reported when possible to evaluate pre- and post- time periods. For Objective 1, paired design comparison of proportion and rates and 95% (CIs) were used to assess trend and changes between pre- and post-period. For Objective 2, paired design comparison of proportions and their corresponding 95% CIs between pre- and post-periods were performed. Trend analyses were conducted between Objective 2 indicators and process measures for volunteer group patient tracing activities (i.e. visits completed, patients found, and patient patients returned in the same month of the visit) by volunteer group.

Limitations of design

Patient contact tracing data were only available beginning in October 2015, which was after the post-PBI period had already begun (per evaluation analysis plan). Roll out of PBI Initiative was not done in a stepped wedge intervention design or with uncontaminated comparison sites to allow

for pre-post comparisons with a control. Throughout the evaluation time periods, there were many overlapping novel initiatives and/or quality improvement programmatic changes that took place, thus the unique or sole effect of PBI Initiative cannot be quantified.

5. Findings and conclusions

Results

For Objective 1, overall improved performance in *patient contact tracing activities* was seen during the evaluation period (Graph 1). Specifically, PE volunteer performance consistently improved throughout the evaluation period, MC performance showed modest improvement, TB DOTS performance remained consistent, and AM performance markedly diminished after August 2016, with a slight uptick towards the end of evaluation period. In terms of proportion of patients re-linking to care at HF among those sought and found, patients traced by TB DOTS volunteers displayed the most favorable positive trends with consistent improvements (in yield) over time. Among the four cadres, TB DOTS volunteers were the only group in which a statistically significant positive linear trend ($p=0.032$) was found for the proportion of patients who returned to the HF among those being sought. For [Objective 2] *HIV-related indicators*: Consistent increases in adult and pregnant women (PW) retention rates were seen during the evaluation period, which corresponded with upward trends in the proportion of patients returning to HF among those sought by AM and TB DOTS volunteers; with no improvements seen with PE or MC groups (Graphs 2 and 3). Modest improvements were seen in the proportion of pediatric patients returned to the HF among those sought by AM and TB DOTS volunteers (Graph 4). Increasing trends among persons newly enrolled into TB care/services were seen throughout the evaluation period, possibly attributable in part to TB DOTS volunteers' activities (Graph 5).

Challenges

Roll out of the PBI Initiative was not done in a stepped wedge intervention design or with uncontaminated comparison sites to allow for pre-post comparisons with a control. Throughout the evaluation period, there were many overlapping novel initiatives and/or quality improvement programmatic changes that took place, thus the unique or sole effect of PBI Initiative cannot be quantified, which is consistent with limitations found in many other PBI strategies. Other limitations included: use of different calendar periods for rolling out of PBI payouts for different cadres; PBI payouts for each improved indicator varied across cadres; and programmatic challenges in tracking volunteers' activities.

Conclusions

Changes affecting volunteer cadres could have largely influenced the yield of patient tracing activities; for example: (i) AM: sharp decrease in yield after August 2016, which coincided with the end of FGH's Strengthening Communities through Integrated Programming (SCIP)/Ogumaniha activities (focused on increasing access to HIV care for children, women, and families in the province); (ii) PE: consistent improved performance over evaluation period, which coincided

with FGH efforts to contract large numbers of new PE to scale up to current program ratios; (iii) MC: consistent improved performance in patient tracing and HF linkage activities over this period, during which FGH also trained many new MC and scaled-up this novel initiative in a large number of sites; however, it was not possible to detect improvements in patient retention from these activities; (iv) TB DOTS: saw positive yield trends over the evaluation period, during which time the program had relatively fewer volunteers, who received specific training and mentorship unique to their program activities. Overall, the most consistent improved performance by cadre was seen among TB DOTS volunteers. As TB DOTS activities have not been scaled-up in all districts and they perform a relatively small proportion of patient contact tracing activities presently, additional longer-term data (including qualitative) is needed to determine if this cadre (or specific aspects of their training/activities) should play a more significant role going forward. Factors to investigate to better understand the positive trends observed and provide insights for future initiatives: (i) training given to volunteers; (ii) documentation used by volunteers; (iii) supervision of cadre’s activities; and (iv) strategies for engaging with community.

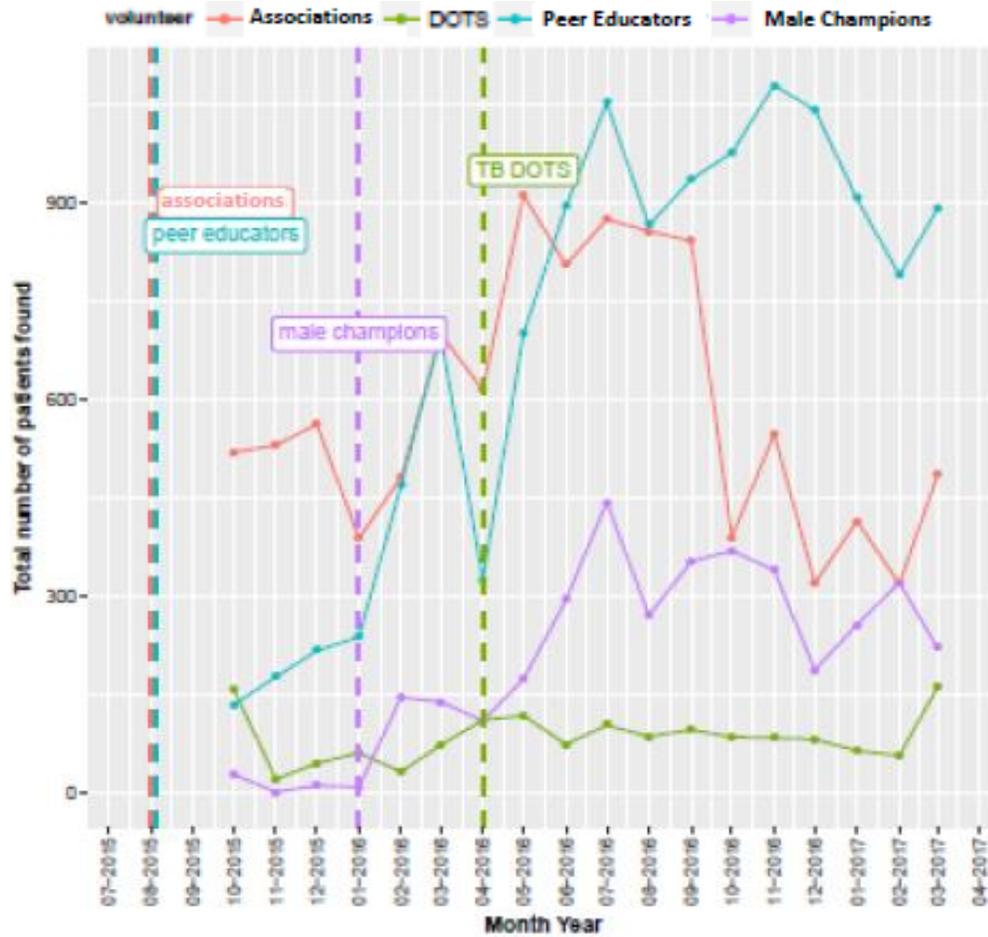
For context regarding the expansion of our volunteer programming and efforts between 2015 - 2017, we present here descriptive numbers for PBI-eligible volunteer cadres at indicated months in and around the PBI evaluation period:

Volunteer cadre	Pre-PBI evaluation period (Dec 2014 – July 2015)	PBI evaluation period (Aug 2015 – Mar 2017)		Post-PBI evaluation period (after Mar 2017)
	April 2015	August 2015	March 2017	May 2017
Peer Educators	54	102	226	n/a
Male Champions	n/a	78	94	n/a
Association Members	n/a	228	107	n/a
Community TB DOTS	n/a	n/a	n/a	51

* *Note:* Numbers are based on available reports from HR and program leads.

* *N/a* = not available

Graph 1. Tracing Activities: Patients found, per volunteer group



Description:

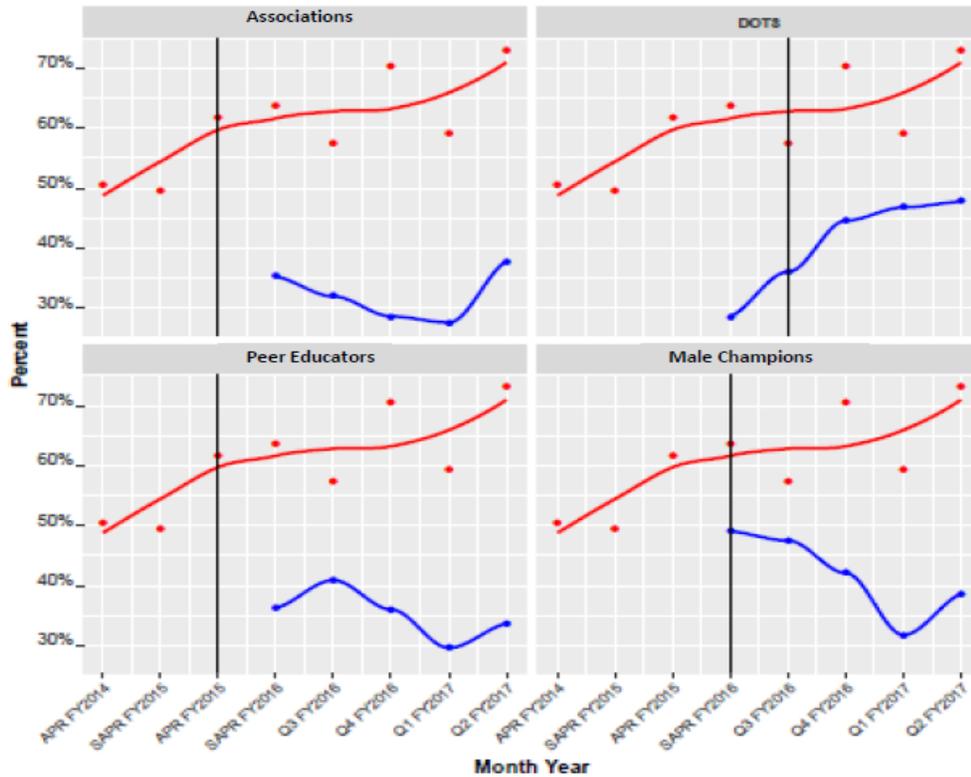
- Dotted lines indicate month PBI started for each cadre

Findings:

- General improved performance during evaluation period
- Association Members (AM): Sharp decrease in performance after Aug 2016, some regain
- Peer Educators (PE): Consistent improvement over time of evaluation
- Male Champions (MC): Fairly consistent improvement over time
- Community TB DOT (TB DOTS): Consistent throughout (but relatively small numbers)

Graph 2. HIV Indicators: Adjusted Adult Retention

Indicator — % 12 month retention rate — % returned HF among sought



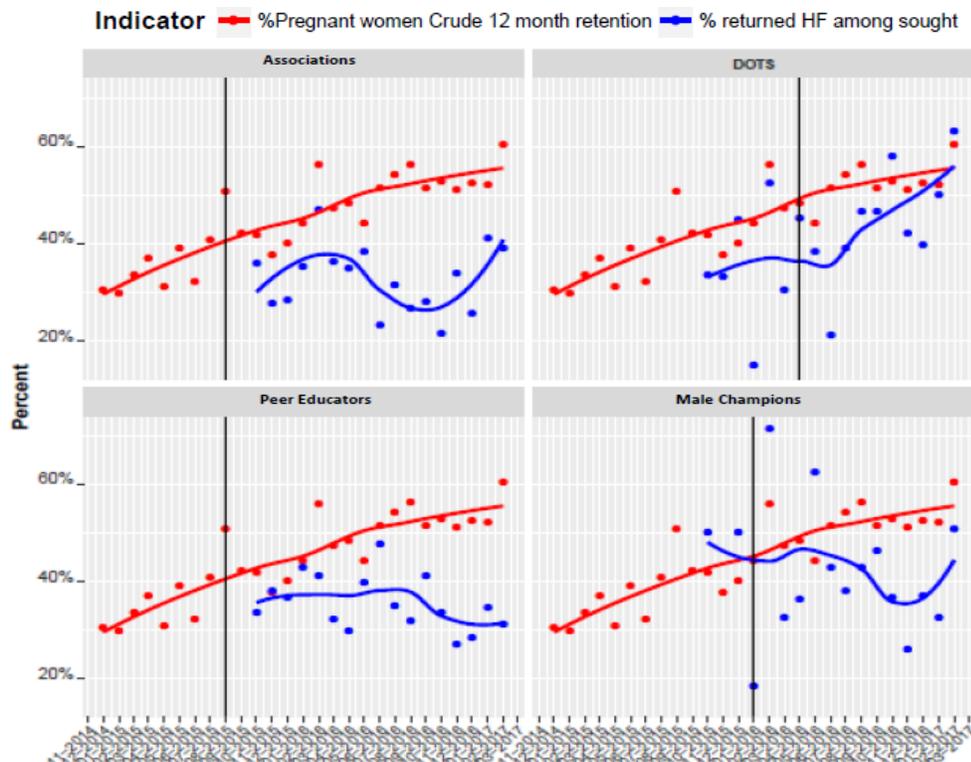
Description:

- Based on adjusted rates as reported in program performance reports (APR 2014 – Q2 2017)
- Overlaid with outcome for % of patients returned to HF among those sought (volunteer activity measure)
- Solid lines indicate month PBI started for each cadre

Findings:

- Consistent increase in adult retention during evaluation period (from ~51% to ~73%)
- Upward trends/improved retention: TB DOTS volunteers
- No improvements seen with PE or MC, nor consistent improvements seen with AM

Graph 3. HIV Indicators: Crude PW retention



Description:

- Crude retention for PW, overlaid with lowest lines for % pts returned to HF among sought
- Dotted lines indicate month PBI started for each cadre

Findings:

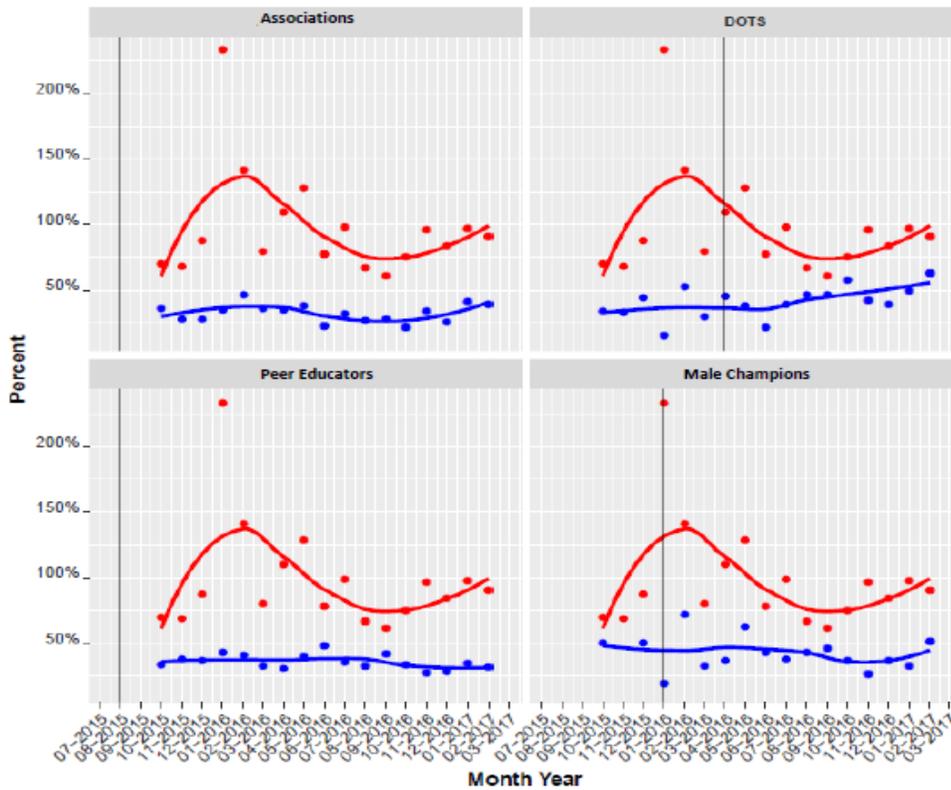
- Consistent significant increase in PW retention during period
- **AM:** Possible upward trend/improvement over time, non-linear
- **PE:** No improvements seen
- **MC:** No improvements seen
- **TB DOTS:** Marked upward trend/ improvement in retention

Graph 4. HIV Indicators: Pediatric outcomes

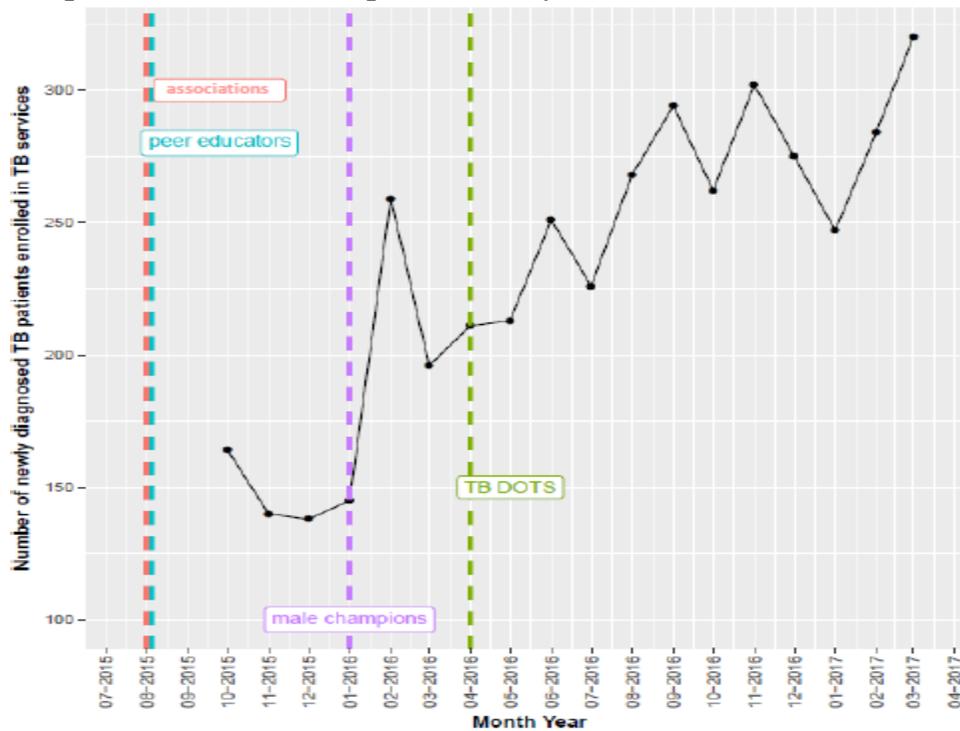
Indicator — % Children on ART — % returned HF among sought

Description:

- Rate of pediatric ART initiation, overlaid with rates of patients returning to HF among those sought, by volunteer cadre
- As proxy for number of children



Graph 5. HIV Indicators: persons newly enrolled in TB care/services



Description:

- Total number of newly diagnosed TB patients enrolled in TB care/services (all age groups and gender collapsed)

Findings:

- Continue to observe an increasing trend for TB care/services enrollment
- Can also observe that this trend was increasing prior to TB DOTS cadre being incentivized
- Still the upward trend showed in their performance data is so consistent, it seems likely some increase can be attributed to TB DOTS activities

6. Recommendations

Based on this analysis, we feel that more data is needed, especially given the positive trend seen among the TB DOTS volunteers. We plan to collect the additional data and further investigate these trends from a more recent period.

7. Dissemination plan

We plan to disseminate these findings to the DPS-Z, to personnel working at the HF where this intervention has been ongoing, and we will also share these findings with the HIV program at the National Public Health Directorate of the Ministry of Health.

8. References

[1]. Suthar AB, Nagata JM, Nsanzimana S, Bärnighausen T, Negussie EK, Doherty MC. Performance-based financing for improving HIV/AIDS service delivery: a systematic review. BMC Health Serv Res. 2017 Jan 4;17(1):6.

[2]. Schuster RC, de Sousa O, Reme AK, Vopelak C, Pelletier DL, Johnson LM, et al. Performance-based financing empowers health workers delivering prevention of vertical transmission of HIV services and decreases desire to leave in Mozambique. Int J Health Policy Manag. 2018 Jan 1;7(7):630-644.

9. Appendices *[Note: the following components were not applicable for this concept note]*

- a. Approved evaluation SOW/protocol/concept note
- b. Data collection instruments/tools
- c. Informed consent
- d. Bio-sketches
- e. Conflict of interest statement
- f. Evaluation costs
- g. Framework