



An Assessment of the Actionable Drivers of HIV Outcomes

A Study of the COVida Case Management System in Three Provinces in Mozambique

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ABBREVIATIONS

~	absence or lack of causal condition (often a low value)
*	AND (Boolean algebra operator)
ART	antiretroviral therapy
CBO	community-based organization
ChallRecruitRetain	challenges in recruiting and retaining activists
EA	expenditure analysis
fsQCA	fuzzy-set qualitative comparative analysis
HowCaseAssign	how cases are assigned
INE	Instituto Nacional de Estatística
LevEducation	level of education
LevSuppSuper	level of supportive supervision
M&E	monitoring and evaluation
OutofPocket	out-of-pocket costs
OVC	orphans and vulnerable children
MISAU	Ministério da Saúde
NonMonInc	nonmonetary incentives
PEPFAR	United States President's Emergency Plan for AIDS Relief
PI	principal investigator
PRI	proportional reduction in inconsistency
QCA	qualitative comparative analysis
QualTeamMtgs	quality of care team meetings
SupRatio	supervision ratio
TaskRatio	task ratio (administrative to case)
TimeCase	time spent per case
TotTimeCOVida	total time spent working for COVida
USAID	United States Agency for International Development
WorkExp	work experience

EXECUTIVE SUMMARY

Background

In Mozambique, more than a million children are HIV-positive or otherwise vulnerable because of HIV. In response to this crisis, the United States President's Emergency Plan for AIDS Relief (PEPFAR) funds programs that serve orphans and vulnerable children (OVC) affected by HIV. These programs employ caseworkers who provide services to OVC and their families to their reduce vulnerability to HIV—such as by linking OVC to HIV testing services and HIV-positive children and adults to HIV care. PEPFAR seeks to understand how the operationalization of case management can be improved to increase knowledge of HIV status and encourage retention on antiretroviral therapy (ART).

The COVida program was the context of this study. COVida supports roughly 300,000 OVC and caregivers per year to access high-quality comprehensive services nationally.

Purpose and Study Questions

The purpose of this study was to learn more about the features of the COVida case management system, with a view to making recommendations on how to improve the effectiveness and efficiency of case management in improving beneficiary outcomes. The study also estimated costs of conducting case work and identified the cost drivers of case management. It produced evidence-informed, actionable recommendations to programs in Mozambique on how to shift their strategies, and ultimately, their resources, to optimally balance quality and cost.

The study answered the following research questions:

1. What is the relationship between the modifiable attributes of the COVida case management system and the proportion of pediatric cases that have changed their reported HIV status from status unknown or not revealed to HIV status known?
2. What is the relationship between the modifiable attributes of the COVida case management system and the proportion of pediatric cases with HIV status unknown or not revealed at the last assessment?
3. What is the relationship between the modifiable attributes of the COVida case management system and the proportion of pediatric cases with HIV status known at the last assessment?
For each of questions 1–3, the following was also determined: when high values for each outcome are present, what values are associated with each modifiable attribute?
4. What is the cost of providing case work by activists?
5. What are the cost drivers of case management?

Methods

Qualitative comparative analysis (QCA) was used to identify the combinations of modifiable case management attributes that led to improved HIV status knowledge (research questions 1–3). Data were collected for 70 randomly selected caseworkers, called activists, across six community-based organizations (CBOs) located in three provinces in Mozambique. A survey questionnaire was administered to activists (N=70), activista chefes (managers) (N=18) and their supervisors (N=12), and project documentation was collected. Surveys and interview transcripts were qualitatively coded to identify common themes related to case management. Eleven modifiable attributes, called conditions in QCA, were hypothesized as the most important factors that influence case management effectiveness: *caseload, challenges recruiting and retaining activists, complexity, how cases are assigned, level of supportive supervision, out-*

of-pocket costs, quality of care team meetings, supervision ratio, time spent per case, training, and work experience. Criteria for these 11 conditions were defined in order to consistently determine to what extent a condition was present (a value of 1) or absent (a value of 0) for each activista. Based on these criteria, values were assigned to all activistas for the conditions and outcomes and were then summarized in a table called a truth table. The truth table was analyzed using fs/QCA software in order to identify the simplified combinations of conditions that led to the three outcomes. Results were determined based on how consistently, or regularly, a given combination of conditions (called a pathway) resulted in the outcome.

Retrospective cost and program data, including budgets, work plans, expenditure summaries, accounting, financial accounts, and timesheets, were collected from multiple sources to calculate and analyze the costs of providing case management services to OVC through the COVida project (research questions 4 and 5). We collected costing data from the central level for overall project expenditures, as well as from budgets and monthly expenditure reports for each of the six CBOs. In addition, we conducted interviews with staff at the central level (N=2), and at each CBO (N=12) to contextualize the costing data. Interview responses were used to support the analysis of expenditure data and informed how we assigned costs to categories. These expenditures were analyzed using activity-based costing, in which costs are assigned to activities.

Findings

For the outcome “percent change in HIV known status,” six pathways led to the positive (high) outcome. *How cases are assigned* was present in all six pathways, which means that every instance of a high percent change in HIV known status was partially explained by an activista’s CBO having a formal process to assign cases that considered complexity, caseload, experience, skills, and proximity. For activistas with more complex cases, *training, quality of care team meetings, and/or work experience* were vital for an activista to have the tools to address challenges. Most activistas lacked *out-of-pocket expenses*, which was key for them to dedicate more time and energy to their beneficiaries. Activistas who spent less time per case had high levels of support that prepared them well for case management: *work experience, level of supportive supervision, supervision ratio, training, and/or quality of care team meetings.*

For the outcome on the “percentage of beneficiaries with HIV status unknown,” only one pathway consistently led to the outcome. All activistas described by this pathway were part of CBOs who struggled to recruit and retain activistas, primarily because of low salaries, low motivation, and insufficient activista skills or training. These activistas had too many cases and a high proportion of complex cases, and they therefore were unable to spend much time with each household, which made it difficult to address the needs of their beneficiaries. Finally, activistas lacked direct, one-on-one, and regular support. Their meetings with their managers typically only corrected paperwork and did not discuss complex cases, goal-setting, resource access, or other issues.

For the outcome on the “percentage of beneficiaries with HIV status known,” five pathways were identified. When an activista had *work experience*, they worked efficiently and had a lower risk of becoming burned out, allowing them to provide more effective case management services to beneficiaries. When an activista lacked work experience, it was important that the activista had a caseload that was near the ideal caseload (n=50, based on activista chefe and supervisor responses) and that the activista attended weekly care team meetings that were comprehensive and addressed care issues beyond paperwork. Activistas also had minimal challenges: *lack of out-of-pocket costs* and *lack of complexity* meant that activistas had the resources to complete their work and did not have many cases that required extended amounts of their time. Lastly, most activistas with high percentages of beneficiaries with HIV status known managed approximately 50 cases and underwent significant training (> 10 days); these conditions contributed to activistas’ preparedness and energy for effective case management.

From our costing analysis, we found that the organization of these CBOs was very similar, as prescribed by headquarters. The proportion of expenditures attributable to case management was consistent across CBOs. The breakdown of costs to cost drivers was also mostly consistent across CBOs, with the largest costs made up of mostly staffing, supervision, and activista subsidies (on average 20% for each of three categories), while office costs were low (on average 5 percent). More remote CBOs that work in areas with lower population density incurred additional training costs, as additional travel expenditures for activistas and trainers were required. Case management average cost per beneficiary between enrollment and graduation was US\$4.67 and appeared to vary more by CBO location than by number of beneficiaries served.

Conclusions and Recommendations

The results of this study highlight the importance of activista experience and training; activista support through high-quality care team meetings, one-on-one supervision, and low supervision ratios; of appropriate caseload allocation, i.e., not overworking activistas by assigning too many cases or complex cases; and the importance of providing activistas with resources such as transportation and airtime.

Based on our findings, to improve HIV testing outcomes we recommend the following actions for CBOs of the COVida project:

- Implement a formal process to assign cases that considers case complexity and proximity as well as activista caseload, experience, and skills. Activistas should not be assigned more than 50 cases, and 10 percent or less should be complex cases¹ that require extended amounts of time. This will reduce activista overwork and burnout.
- Provide activistas with at least two types of external support, such as high-quality and weekly care team meetings where direct managers meet with activistas to assist with challenges and hold activistas accountable to case management plans.
- Hire experienced activistas and provide all activistas with regular follow-up trainings so that activistas have the tools to address challenging cases and complicated issues.
- Provide activista chefes, supervisors, and relevant CBO staff with ongoing supportive supervision and mentorship training. Ensure low supervision ratios so that managers are available and not overworked.
- Expand both nonmonetary and monetary incentives offered to activistas, such as providing awards, certificates, thank you letters, increasing stipends, implementing bonuses, and reimbursing activistas for work-related expenses to incentivize activistas to stay in their position longer and to increase satisfaction and motivation. Further analysis could investigate the relationship between cost and activista retention.

¹ According to the study respondents, complex cases include people living with HIV who default on their treatment, pregnant HIV-positive women, HIV-positive children, and beneficiaries who do not reveal their HIV status to activistas.

INTRODUCTION

Orphans and Vulnerable Children Programming

The HIV epidemic has exacted a formidable toll on children and their families. Currently, 13.4 million children are living without one or both parents because of the HIV epidemic; 80 percent of these children live in sub-Saharan Africa. In addition, 1.8 million children under age 15 are living with HIV (UNAIDS, 2018). Despite some decline in HIV adult prevalence worldwide and increasing access to treatment, the number of children affected by or vulnerable to HIV remains alarmingly high.

Globally, there is a large number of community-based programs to support children orphaned or made vulnerable as a result of the HIV epidemic. The objective of these programs, broadly speaking, is to reduce the vulnerability of OVC through a combination of monitoring, direct assistance, and linkages to support structures. This research study relates specifically to programs funded through PEPFAR.

PEPFAR OVC programming delivers family-centered interventions that seek to improve child well-being and mitigate the impact of HIV on children and families. The primary mechanism for service delivery and support is client case management. Clients are enrolled into a program, a caseworker is assigned, and the caseworker assesses client needs, outlines a care plan and a series of actions to achieve that care plan, monitors care plan achievement, and ultimately exits the client from the program once the care plan has been achieved.

Caseworkers may be part of the informal workforce or professionals—in most cases, they are volunteers or stipend-paid members of the community who are trained by the program to provide services to clients but otherwise have no formal social work training or qualifications. Caseworkers are usually supported by or linked to a CBO—hubs for OVC program management. CBOs employ caseworker supervisors whose role is to review client files with caseworkers, support them in meeting clients' needs, support time management, assess training needs and identify training opportunities, and provide encouragement and support to help them cope with job stress (4Children, 2017; 4 Children, 2018).

The scope of these programs and their target population has shifted over time, matched with changes in the HIV epidemic. Originally, OVC programming under PEPFAR was established to provide support to “AIDS orphans”—to mitigate the impact of orphanhood. Once ART was scaled up, and mortality rates started declining (and HIV prevalence started increasing), programs targeted HIV-affected communities, providing prevention and impact mitigation support to families. Now, in the countdown to epidemic control, OVC programs will have an expanding role in reaching the most vulnerable children with HIV services—testing and treatment—and in ensuring retention and adherence to ART. To this end, PEPFAR has introduced a new indicator referred to as OVC_HIVSTAT, which tracks whether the HIV status of OVC clients is known and documented, and if not, whether OVC clients have had an HIV risk assessment. For those with documented HIV-positive status, the indicator also tracks whether the OVC client is currently on ART. Pediatric retention and coverage is the highest priority for PEPFAR, followed by documentation of HIV status.

PEPFAR OVC programs are now revising their strategies to address these priorities, augmenting caseworker trainings to cover more HIV-focused material, and honing client referral strategies with health facilities. However, there is little evidence on how to best structure the case management intervention to meet these refined objectives and to deliver improved performance against OVC_HIVSTAT. This risks their ability to support epidemic control. Further, as donor resources become more strained, OVC programs are making tough decisions around how to meet targets. For instance, although an average caseload of 15–30 clients is recommended (4Children, 2018), many OVC programs have target caseloads of two to three times this number, and in reality, caseloads may be even higher than that. Program managers and donors need to understand better what components of their case management system can be shifted, to maximize efficiencies and impact.

The Mozambique Context

HIV prevalence in Mozambique is 15.4 percent among women and 10.1 percent among men ages 15–49 years (Ministério da Saúde [MISAU], Instituto Nacional de Estatística [INE], & ICF International, 2015). Among adolescents and young adults ages 15–24 years, HIV prevalence is 10 percent among females and 3 percent among males (MISAU, et al., 2015). An estimated 200,000 children under 15 years are living with HIV, and another 916,000 are orphaned or otherwise vulnerable due to HIV (PEPFAR, 2018).

Mozambique has successfully put more than 1 million people living with HIV on treatment, including approximately 75,000 children under 15 years (PEPFAR, 2019). However, this represents only half of people living with HIV in Mozambique (PEPFAR, 2018). Further, low rates of treatment retention, especially among children, adolescents, and young adults, threaten to undermine epidemic control. Program data indicate that only 70 percent of children living with HIV were retained 12 months after beginning treatment—less than 60 percent in Zambezia, Inhambane, and Cabo Delgado (PEPFAR, 2019).

OVC programs in Mozambique have a clear mandate to improve outcomes across the clinical cascade for children and adolescents, beginning with identifying those who are living with HIV but who are undiagnosed, to supporting ART adherence, and ultimately achieving viral suppression. OVC programs provide “wraparound” services that address the underlying barriers to successful ART retention and adherence outcomes and address the HIV prevention needs of HIV-affected communities and families.

The COVida Project

COVida (in full) (2016–2021) is a USAID-funded OVC program in Mozambique led by FHI 360, with support from CARE and Palladium. The project has four key objectives:

- Increase the utilization of quality social, health, and nutritional services among the children and caregivers within the target OVC households
- Reduce the economic vulnerability of OVC households so that they can better provide and plan for the essential needs of the children in their care
- Increase the capacity of district government and communities to respond to and manage cases for vulnerable families and children

The project supports roughly 300,000 OVC and caregivers per year to access high-quality, comprehensive, compassionate services nationally. Project activities include strengthening the capacity of networks of community-focused providers to initiate and retain clients in HIV and other care and to refer them for onward services, strengthening village savings and loan groups to improve households’ access to financial products, and providing early childhood stimulation and nutrition-focused activities.

Study Purpose, Objectives, and Research Questions

The purpose of this study was to learn more about the features of the COVida case management system that influence HIV-related beneficiary outcomes. The study also aimed to estimate costs of providing case work by activistas and identify the cost drivers of case management.

The study had the following **objectives**:

1. Examine the modifiable attributes of the COVida case management system that contribute to positive changes in HIV status
2. Estimate costs of providing case work by activistas and identify the cost drivers of case management
3. Provide evidence-informed recommendations to programs on how to shift case management strategies and resources to optimally balance quality and cost

The study answered the following **research questions**:

1. What is the relationship between the modifiable attributes of the COVida case management system and the proportion of pediatric cases that have changed their reported HIV status from status unknown or not revealed to HIV status known?
 - What are the values of the modifiable attributes that are present when a high change in HIV known status is present?
2. What is the relationship between the modifiable attributes of the COVida case management system and the proportion of pediatric beneficiaries for whom HIV status is not known or not revealed at last assessment?
 - What are the values of the modifiable attributes that are present when a high proportion of HIV status unknown or not revealed is present?
3. What is the relationship between the modifiable attributes of the COVida case management system and the proportion of pediatric beneficiaries for whom HIV status is known at last assessment?
 - What are the values of the modifiable attributes that are present when a high proportion of HIV status known is present?
4. What is the cost of providing case work by activists?
5. What are the cost drivers of case management?

METHODS

This mixed-methods study involved analysis of de-identified routine COVida project data, brief interviews with 119 COVida staff working in six CBOs and at the central level (Maputo), and compilation and analysis of project financial records to enable costing of case management.

Sampling

Our objective was to collect data from six CBOs: three working in rural areas and three working in urban areas. COVida has CBOs in all 11 provinces in Mozambique; however, to minimize costs, we opted to apply a three-stage sampling approach. We first selected three provinces—Maputo Province, Gaza, and Nampula—from which to select the CBOs, in collaboration with USAID and COVida. Province selection factors were percentage of children living with HIV (estimated), percentage of children on ART, number of COVida beneficiaries, number of COVida beneficiaries who were HIV positive, USAID priority status for a province, program stability (Zambézia was excluded due to recent changes in the program), and security (Cabo Delgado was excluded due to security concerns).

From each province, we selected CBOs with the highest number of HIV-positive beneficiaries served (first criterion, this was done to increase the probability for having data to examine ART adherence outcomes²). Among these, we selected one with low and one with a high proportion of beneficiaries with unknown HIV status (second criterion, this was done to have a variation of low and high performing CBOs on this indicator). In each CBO, we randomly selected 11–12 activists to abstract beneficiary data on outcomes of interest and conduct brief interviews. Only activists with six months of experience or more were included in the sampling frame. We then interviewed their “chain of command”—their supervisors (activista chefes), case management supervisors, etc., as well as financial staff at each CBO. We also collected cost data at the central project level in Maputo. The CBOs selected, with brief characteristics, are presented in Table 1.

² Initially, ART retention was also an intended study outcome, but two problems arose with the ART retention outcome data. First, for most activists, the majority of beneficiaries who were on ART at enrollment remained on ART at the last assessment. While this was a positive outcome for COVida, the lack of variation in ART retention made it difficult to determine whether a combination of conditions consistently leads to that outcome in the absence of examples of low or no ART retention and without well-established theory. Second, fewer than 10 of the 70 activists had more than five beneficiaries on ART, so these small numbers would not allow for there to be confidence in each activist's outcome value. For these reasons, QCA was not an appropriate analysis method for the outcome of ART retention, so this study focused instead on outcomes related to knowledge of HIV status.

Table 1. Site characteristics, January 2019

CBO	Province	District	Location (Rural vs. Urban)	% of COVida Pediatric Beneficiaries with HIV Status Reported as Unknown	Number of COVida HIV-Positive Pediatric Beneficiaries	
1	ACIDECO	Maputo Província	Manhiça	Rural	17%	233
2	SANTAC	Maputo Província	Boane	Urban	3%	126
3	Reencontro	Gaza	Chibuto	Urban	16%	117
4	ACTIVA	Gaza	Mandlakaze	Rural	1%	109
5	Ovarelelana	Nampula	Cidade de Nampula	Urban	59%	83
6	Ukumi Ossulu	Nampula	Moma	Rural	29%	125

Table 2 presents the information on the number and type of respondents interviewed in each of the selected CBOs.

Table 2. Number of conducted interviews by CBO and type of respondent

	# Activistas	# Activista Chefes	# Supervisors	# Managers	# Finance and Monitoring and Evaluation (M&E) Staff	Subtotal
ACIDECO	12	3	2	1	2	20
SANTAC	11	3	2	1	2	19
Reencontro	12	3	2	1	2	20
ACTIVA	12	3	2	1	2	20
Ovarelelana	11	4	2	1	2	20
Ukumi Ossulu	12	3	2	1	2	20
Total	70	19	12	6	12	119

Measures and Data Collection Sources

This study includes three dependent variables (outcomes of interest): change in HIV status knowledge among those beneficiaries for whom HIV status was unknown or not revealed at enrollment and HIV test was required based on risk assessment (research question 1), proportion of beneficiaries for whom HIV status at last assessment was not known or not revealed (research question 2), and proportion of beneficiaries for whom HIV status at last assessment was known (research question 3). All dependent variables were captured using routine COVida data and data reported to the OVC_HIVSTAT indicator. Data files included data on HIV status of the beneficiaries between enrollment and June 2019 (end of the third quarter [Q3] of fiscal year [FY] 2019, which is April–June 2019). Some beneficiaries were enrolled at the end of 2016. For some beneficiaries, the last assessment took place before April 01, 2019, i.e., before the beginning of Q3 FY 2019. To measure each of the three outcomes, we worked with data for

beneficiaries who were enrolled before April 01, 2019. This was done to allow at least one quarter for changes in HIV status to take place. All data related to the three outcomes of interest were prepared and provided by COVida.

To measure a change in HIV status knowledge of the beneficiaries, for each selected activista we focused on all beneficiaries who were reported as having unknown or not revealed HIV status at enrollment. For these beneficiaries, we examined changes in their HIV status knowledge between enrollment and June 30, 2019. We included only beneficiaries who had their HIV status recorded at least one time in addition to the time of enrollment. HIV status was considered known if the beneficiary status was HIV-positive, on ART, not on ART (likely HIV positive but not receiving treatment), or test not recommended (an initial HIV risk assessment was conducted by an activista and it was determined that HIV test was not required based on risk assessment). HIV status was considered unknown if the beneficiary status was unknown or not revealed. A change in status was recorded when a beneficiary's HIV status went from one of the unknown categories to one of the known categories between the time of their enrollment and the last assessment. The variable on change in HIV knowledge was measured as the proportion of those beneficiaries who learned their HIV status between enrollment and June 2019.

To measure the proportion of beneficiaries with not known HIV status at the last assessment, we created a variable on HIV status at the latest assessment that was available for each beneficiary in the data files provided by COVida. This number served as the denominator to calculate the proportion of interest. HIV status was considered unknown if the beneficiary status was unknown or not revealed.

To measure the proportion of beneficiaries with HIV status known at last assessment, we created a variable on HIV status at the latest assessment that was available for each beneficiary in the data files provided by COVida. This number served as the denominator to calculate the proportion of interest. HIV status was considered known if the beneficiary status was HIV-positive, on ART, not on ART (likely HIV positive but not receiving treatment), or test not recommended.

This study explored the impact of independent variables on each of these three dependent variables. These independent variables (see Table 3) were chosen based on factors such as variability across the dataset and donor priorities.

Table 3. Independent variables and data sources

Independent Variables	Primary Data Source	Secondary Data Source
Caseload complexity ³	Routine data	Interviews with CBO staff (activistas, activista chefes, supervisors)
Activista caseload, challenges recruiting and retaining activistas, how cases are assigned, level of supportive supervision, out-of-pocket costs, quality of care team meetings, supervision ratio, time spent per case, training, and work experience	Interviews with CBO staff (activistas, activista chefes, supervisors, COVida project coordinators, CBO managers)	N/A

³ According to the respondents, complex cases include people living with HIV who default on their treatment, pregnant HIV-positive women, HIV-positive children, and beneficiaries who do not reveal their HIV status to activistas. For the analysis, we defined complexity as the proportion of HIV-positive beneficiaries or beneficiaries with HIV status not revealed at enrollment.

Data Collection Methods

This study involved three data collection methods: (1) extraction of routine project data from existing COVida sources, (2) extraction of cost data from existing COVida records, and (3) semi-structured interviews with COVida project staff.

Routine Project Data Extraction

We extracted de-identified HIVSTAT data⁴ for all beneficiaries of the activistas selected for the study.

Cost Data Extraction

Retrospective cost and program data were collected from multiple sources, including budgets, work plans, expenditure summaries, and accounting/financial accounts, to calculate and analyze the costs of providing case management services to OVC through the COVida project. We collected both economic and financial costs. These data included costs of start-up and program development, recurrent costs of program implementation and delivery (staff costs, materials, transportation), and capital costs or those items whose useful life extends over multiple periods (vehicles, buildings, equipment). We also captured equipment/asset inventories to estimate the annual equivalent cost of these items. In addition, we documented economic costs, such as donations for program implementation, and determined their market value by asking what it would cost to obtain these items on the open market.

We collected cost data from the central level for overall project expenditures, as well as from budgets and monthly expenditure reports for each of the six CBOs. In addition, we conducted interviews with staff at the central level and at each CBO to contextualize the costing data. The interview responses were used to support the analysis of expenditure data and informed how we assigned costs to categories.

Interviews with COVida Staff

We conducted 119 semi-structured interviews with COVida staff at the CBO level, as well as at the central level. From each CBO we interviewed 20 people (11–12 activistas, three activista chefes, two supervisors, and three other staff). In total, we interviewed 70 activistas, 18 activista chefes, 12 supervisors, six CBO managers, six CBO M&E advisors, and six CBO finance managers. At the central level, we interviewed the COVida project director and financial manager.

Data collection in all three provinces took place on July 3–14, 2019. All interviews were administered using tablets (using the software Kobo Toolbox) and were recorded when respondent's permission was provided. Interviews with finance staff took place in July–August 2019. Specific sampling and recruitment procedures for each type of staff are outlined below. All potential participants received an information sheet about the study and data collectors sought and documented informed consent prior to beginning data collection. Data collectors administered the questionnaire to participants individually and privately, with their informed consent. All interviews were conducted in a private space at the CBO or COVida central office. Interviews lasted 30–90 minutes. All data collection tools were pilot tested and revised prior to fieldwork. Please see Appendix A for the information sheets, consent forms, and data collection tools.

Interviews with Activistas

We conducted brief semi-structured interviews with 11–12 randomly selected activistas at each site. Activistas that started work before January 1, 2019 and were still working on the day of data collection formed the sampling frame. We requested a list of all activistas who started work before January 1 from

⁴ OVC_HIVSTAT is one of the PEPFAR monitoring, evaluation, and reporting indicators that is titled as the percentage of orphans and vulnerable children (<18 years old) with HIV status reported to implementing partner.

the CBO and randomly sampled from that list. We shared the list of requested participants (an oversample of 15 to account for recruitment challenges) and asked that the CBO to gather these activistas at different times on the day of data collection. We provided information about the study to the CBO, to share with their activistas in advance of the study so that they were aware of the possibility of being selected to participate.

Trained data collectors elicited information about their caseload, training, the supportive supervision they received, the quality of their care team meetings, the nonmonetary incentives they received, the degree to which the care team was networked to reference services in the area, and their demographic characteristics (e.g., education, years working as an activista). In these interviews, data collectors also elicited information on activistas' work satisfaction, their suggestions for ways to improve the quality of services, the amount of time they spent working for COVida, and any costs they incurred that were not met by the project.

Interviews with Activista Chefes, Supervisors, and CBO Managers

We conducted brief semi-structured interviews with all activista chefes who supported selected activistas, their supervisors, and the CBO manager. We interviewed three activista chefes per site: two supervisors and one manager. We worked with the CBO in advance to identify the activista chefes that supported the selected activistas, as well as their supervisors, and arranged a time to interview them, as well as the CBO manager. In these interviews, trained data collectors elicited information on supervision structures and ratios, the level of supportive supervision, the quality of the care team meetings, nonmonetary incentives given to activistas, and the degree to which the care team was networked to other reference services in the area. Data collectors also inquired about the process of assigning cases to activistas and determining their caseload, activista turnover, and challenges with staff recruitment and retention.

Interviews with CBO Finance and M&E Staff, and Central-Level COVida Staff

We first interviewed the project director and financial manager to gain an understanding of the structure of the organization and the types of financial data available, as well as information about how the organization conducts case management activities. We collected expenditure analysis (EA) reports for three years, as well as detailed monthly expenditure data for the project. We also collected budgets and the number of beneficiaries served by quarter for each CBO. These data included recurrent costs, such as salaries, materials, office expenses, and transportation, lists of staff members with salary information and position title, and capital purchases.

We then interviewed a finance and an M&E officer at each of the six CBOs, to better understand how case management activities are conducted at each CBO, what resources are needed to support case management, and how costs are recorded in the financial data. From these interviews, we gained information about the roles of staff members and how they contribute to case management, what materials and transportation are provided to caseworkers and supervisors, and details about how training is provided. The interview responses were recorded in written summaries, which were then compiled into a spreadsheet to facilitate comparisons between CBOs.

Data collectors scheduled a time to speak with these staff in advance of data collection. Interviews were conducted both remotely and in person in each of the CBOs.

Table 4 summarizes areas of inquiry, by staff type.

Table 4. Areas of inquiry by COVida staff type

Topic	CBO Staff		
	Activistas	Activista Chefes, Supervisors, CBO Managers	Finance Managers, M&E Advisors
Demographic characteristics	X	X	
Training	X	X	X
Caseload	X		X
How cases are assigned		X	X
Quality of care team meetings	X	X	
Level of supportive supervision	X	X	
Supervision ratio		X	
Nonmonetary incentives	X	X	X
Degree to which care team is networked	X	X	X
Work satisfaction	X	X	
Time spent working for COVida	X	X	X
Out-of-pocket costs in working for COVida	X	X	X
Challenges in recruiting and retaining activistas		X	X
Program costs		X	X

Data Collection Team

We hired a local research organization, Maraxis, to conduct data collection for the study. Data collection at the CBO level was carried out by three data collection teams comprised of three people. Each team included a team lead, who was responsible for site-level coordination (and for conducting some interviews), a (second) interviewer, and a notetaker. A team of two data collectors worked on data collection of financial data at the CBO level. Data collection of cost data at the central level was conducted by one of the study co-investigators.

Members of the data collection team were selected based on level of education (a university degree is required), prior experience conducting qualitative interviews, knowledge of the study areas, and fluency in study languages. Other criteria for selection include maturity, friendliness, and ability to travel. We ensured a gender balance during recruitment of the data collection team.

The study team conducted one four-day data collector training workshop, led by the local principal investigator (PI), supported by a MEASURE Evaluation/Palladium investigator. The training provided the data collectors with a thorough knowledge and skill base to take on their roles as interviewer and/or notetaker, and ensured high-quality data and ethical conduct of the study. The training was classroom- and field-based, using participatory techniques and practical exercises. It was comprised of (1) facilitated sessions on the overall aims of the study and its procedures, including conducting interviews, recording and note taking, coding responses, transmitting data, quality assurance, the questionnaire, and ethical procedures; (2) mock interviews to test the tools and processes and practice skills; and (3) a field-based

pilot test in one of the CBOs close to Maputo. The local lead investigators received special instruction on the collection of cost data.

Quality Control

Sampling was conducted by Palladium; recruitment and data collection were carried out by an experienced and well-trained data collection team (as described above), overseen by the Mozambique-based PI. The local PI vetted all members of the data collection team, led the data collector training, instrument pilot testing, and fieldwork. The Palladium PI participated in the data collection training, including a field practicum, instrument pilot testing and data collection, working hand-in-hand with the local PI. Following each interview, members of the data collection team reviewed the notes and response coding. After data collection in a site had been completed, the data collection team and the local PI reviewed learning to inform data collection at the next site and ensure that communication protocols with COVIDa were being followed.

Using the Kobo Toolbox software enabled immediate data capture and review (after uploading of the data) directly via the Kobo Toolbox dashboard in real time. The programming included checking that all mandatory questions were answered and that responses were in the allowed ranges (checking for realistic numbers).

Interviews were tape recorded (if consent for recording was granted), ensuring a record of what transpired. These recordings enabled the analysts to spot check the validity of coding done in the field and determine the inter-rater reliability of coding. We randomly selected 10 recordings and compared the results to the original data sent via the Kobo Toolbox by the data collectors. Only a few minor errors were detected. They related to the recording of time spent with beneficiaries in minutes versus hours and provided the same response to the question requesting the information on the average, maximum and minimum number of minutes spent with a household. These errors were corrected in the entire data set.

Data Management

During data collection, all data were managed and overseen by the data collection team lead in the study area. Digital recordings from interviews were uploaded into a cloud-based server with password access and deleted from the recording devices. Notes, coding sheets, and signed consent forms were stored separately—consent forms were stored together, coding sheets and notes were stored together. (Coding sheets and notes did not include participants' names.) The data collection team lead was responsible for moving data securely back to Maputo and handing them over to the local PI. Once in Maputo, data and consent forms were stored (separately) in a locked cabinet (when not in use for data analysis) in the office of the local research partner.

Analysis

Preliminary Analysis and Data Preparation

Qualitative Data Analysis

All surveys and interviews were translated and transcribed. The transcriptions were qualitatively coded, a process whereby common and relevant themes are identified and sections of the transcripts that relate to the themes are tagged (Saldana, 2009). Qualitative coding facilitates aggregation of thematic data from within one transcript, as well as the comparison of themes across multiple transcripts. The qualitative coding employed a deductive approach, where topics related to modifiable case management attributes were identified by program experts and stakeholders before coding began (Ritchie & Lewis, 2003). For example, “training” was identified as a potentially important theme, because comprehensive training has

been shown to positively influence program outcomes in health (Routray, Schmidt, Boisson, Clasen, & Jenkins, 2015) and resource-limited contexts (Davis, Javernick-Will, & Cook, 2019; Opdyke, Javernick-Will, & Koschmann, 2018). Microsoft Excel was used for the coding, which was completed by the local partner, Maraxis. Next, the coded data were reviewed, and summaries of each theme were created for each activista, activista chefe, and supervisor. The summaries were compared across each of these three roles to identify and resolve conflicts. Conflicting statements were resolved by triangulating data from surveys, interviews, and documentation, to ensure internal validity (Basurto & Speer, 2012). The summaries were also used as a starting point to identify the main differences between activists across the modifiable attributes. This preliminary qualitative analysis was essential to set up the QCA (Basurto & Speer, 2012).

Quantitative Data Processing and Analysis

We carried out data cleaning, consistency, and missing values analysis to ensure high data quality. For data cleaning, we analyzed frequency distributions of variables to assess the problems of outliers and conducted cross tabulations to ensure consistency of responses. Because of the data cleaning that took place in real time as the data were being collected, minimal edits were required. Once we had conducted these checks, we saved a clean version of the data for the analysis.

Descriptive statistics were obtained, also using Microsoft Excel, to summarize the range, mean, median, mode, frequency, and cumulative average of quantitative variables. These statistics were important to understand the spread of data across activists for each modifiable attribute and to identify differences among activists. To compare difference in means between groups we used t-test. We also examined a correlation between variables before including them in the QCA. We used SAS version 9.4 to conduct this quantitative analysis. To examine changes in the HIV status over time, we used the Excel function called Exact for the exact match lookup in the beneficiary HIV status at enrollment and last assessment.

QCA

To identify the combinations of modifiable attributes that influenced a high percent change in HIV known status, a high percentage of beneficiaries with unknown HIV status, and a high percentage of beneficiaries with known HIV status, a fuzzy-set QCA (fsQCA) was conducted. We identified and calibrated outcomes, identified and calibrated potential causal conditions, conducted preliminary minimization and removal of causal conditions, created a truth table,⁵ and conducted the truth table analysis. The fsQCA allowed us to identify combinations of causal conditions (i.e., pathways) that led to the outcomes of interest for this study. Please see Appendix B for a detailed description of the QCA conducted for this study and the truth table, Appendix C for the calibration guide and Appendix D for the expanded analytical procedures.

Costing

Monthly financial data were collected beginning from the month in which the CBO began providing services under the COVida project, until April 2019; this ranged from nine to 23 months. The output measure was the number of beneficiaries represented by the PEPFAR OVC_SERV MER indicator. These were provided quarterly, as was the number of new beneficiaries, from the central level. The cumulative beneficiaries were calculated from OVC_SERV, using the new beneficiaries per quarter to adjust the totals to more closely match the time period for which financial data were collected. While there were changes to the indicator for beneficiary numbers over time, we assumed that these changes affected the six CBOs in the same fashion.

⁵ The truth table summarizes all fuzzy scores assigned to causal conditions and outcomes for all cases, reflecting the possible configurations of causal conditions associated with outcomes (Ragin, 2008).

CBOs did not track the actual costs involved for case management in their timesheets or routine monitoring and reporting. However, the expenditure data for the six CBOs were complete and comprehensive, allowing us to perform micro-costing analysis for these expenses. In this analysis, we assigned each line-item expenditure to cost categories. Some of these categories were entirely or partially related to case management, while others were excluded, for instance, costs related to economic strengthening activities. Additional above-site costs from the EAs were allocated to the CBOs and to case management activities, as indicated by the interviews and information contained within the EAs.

Following Gobin (2019), we assigned case management costs to seven categories:

Supervision	Supervisor salaries, such as field supervisors
Training	Caseworker training on case management Supervisor case management training
Transport	Travel costs for supportive supervision Vehicle and motorbike expenses, including bicycles for activists
Activista Support	Activista stipends, materials, supplies, and mobile phone credit Printing of case management tools/forms
General Personnel	Administrative staff costs
Office Costs	Recurrent office expenses and office supply costs
M&E	Salaries for M&E staff

We classified expenditures into these seven categories and allocated all or part of the expenses to case management based on a few sources of data. Interviews with financial and M&E staff included questions about the amount of training, supervisor and M&E staff time, and transportation dedicated to case management. These estimates varied by CBO, but in general, the answers to questions about resources needed for case management were consistent across CBOs, as they followed common program guidelines.

As part of the EA reporting process, an estimate of the amount of time that activists were spending on case management had been generated by the central program office. This estimate was based on the time required by activists to conduct specific case management activities, such as conducting assessments or monthly monitoring. We used this estimate of 18 percent to allocate caseworker support costs to case management versus other activities, such as economic strengthening or education support. The expenditure analyses for FY 2017 and FY 2018 also allocated site-level expenditures to case management versus other activities. COVida reported six percent of total project (site-level and above-site) expenses used for case management in FY 2017 and 25 percent in FY 2018. We used the average split for site-level activities (26%) to allocate general administrative and office costs to case management. Existing records did not allow administrative staff time to be allocated to activities such as case management, and the responses from CBO staff seemed to reflect time spent supporting all activities conducted by activists.

Above-site costs are those costs incurred at the headquarters level, instead of at individual CBOs. Above-national costs are incurred outside of Mozambique by the international implementing partner. A portion of above-site project management staffing costs were included at the national level, while above-national costs were excluded from costs of case management, as were above-site travel costs, and indirect

expenditures. Administrative travel from the CBOs to the central office, or to conduct CBO business apart from case management supervision, was also excluded from case management costs.

We did not include volunteer time or donated items in this analysis, as most CBOs did not report their use. Activistas are paid a stipend that includes mobile phone credit, which was included in activista support, along with other materials such as backpacks for papers and stationery, folders, shirts, and hats. As reported in the QCA, activistas often incur out-of-pocket expenditures for transportation, printing forms, and other items to support their work. We did not attempt to quantify these out-of-pocket expenses in the costing study. We identified costs of forms used in case management but did not distinguish those used for M&E. The M&E costs in this analysis reflect salaries for M&E staff. M&E staff are also provided phone and Internet credit and computers, but these were not distinguished from the same items provided to other administrative staff and were included under office costs.

Bicycles provided for the use of activistas and motorcycles used by supervisors, were provided by the central project and were not included in the expenses recorded by the CBOs. We assumed a cost of US\$150 per bicycle,⁶ annualized over an assumed five-year useful life, and US\$5,000 per motorcycle, annualized over a seven-year useful life.⁷ Two CBOs reported using cars in addition to motorbikes to transport supervisors, but these were not considered in costs of case management due to low usage for case management activities.

Ethical Review

All study activities adhered strictly to Mozambican and U.S. research ethics guidelines. We received institutional review board (IRB) review and approval from the Comitê Nacional de Bioética para a Saúde (CNBS) in Mozambique and Health Media Labs, Inc., in Washington, DC, USA.

In line with ethical practices, stringent procedures to uphold the fundamental principles governing research on human participants were followed. All members of the study team have undertaken an ethics course, and their research ethics certification was current. Field teams were trained and sensitized on ethical issues during data collection training. Importantly, during data collection, study managers carried out spot checks to ensure that research ethics were being upheld and that the participants were not harmed or exposed to unnecessary risk.

The study did address sensitive issues related to HIV; however, all data on COVida beneficiaries' HIV status or HIV treatment were deidentified by COVida before they were shared with the research team for analysis. Identifiable client information was not shared with the research team. All data files were password protected. In interviewing COVida staff, we did not ask about HIV, only about their demographic and job-related attributes, as outlined above. Particular care was taken to ensure that all questions were asked in a supportive and nonjudgmental manner. Respondents were free to stop participation at any point or choose not to answer specific questions.

The informed consent process for interview participants was individualized and private. The data collectors privately shared information about the study with each potential participant and obtained and documented a written informed consent. Informed consent was administered in the language preferred by the participant. If consent was granted for audio recording, we recorded the interview. Please see Appendix A for more information related to the informed consent procedures.

The information provided by respondents was held in strict confidence. All members of the study team were thoroughly trained in confidentiality and required to sign an understanding of confidentiality document. Interviews were conducted in a private setting where participants could not be observed or

⁶ Mozambikes.com

⁷ https://www.who.int/choice/cost-effectiveness/inputs/capital_goods/en/

overheard by others. Only direct participants and members of the data collection team were present during data collection.

When in the field, consent forms and notes were stored in a locked safe under the care of the lead local researcher. Audio recordings were uploaded to a cloud immediately after the discussion, and subsequently deleted from the recording device. Electronic recordings will be stored on a password-protected computer for three years and hard copies of the notes and consent forms will be stored by the local PI for three years in a locked cabinet, as outlined above.

The names of participants were captured during sampling. These were replaced with numbers during analysis. Any transcriptions did not include names of participants.

Particular care was taken to ensure that the information presented in the report is sufficiently aggregated to ensure that no single individual can be identified. Any quotes that are presented are illustrative and contain no potentially identifying information.

Limitations

This is a robust study design to answer the research questions and provide actionable evidence to USAID and partners in managing their OVC programs. That said, there are limitations. These are outlined here:

- Data on the knowledge of HIV status were provided by the COVida project. We used these data in the analysis, but we did not assess the quality of these data.
- Due to the outcome data limitations (low number of cases per activista and low data variation) in this study, we were not able to examine the modifiable attributes of the COVida case management system that influence ART outcomes. Future research would need to be conducted to provide recommendations related to ART retention and adherence.
- This study did not consider differential clinical and community-level factors that affect outcomes. HIV testing outcomes may be influenced by factors such as new testing strategies (such as a focus on testing index cases of HIV-positive adults and the availability of community-based testing), actual and perceived health service quality, and the availability of HIV testing kits. Individual-level factors vary, but these were examined fully by including data from all beneficiaries served by randomly selected activistas.
- We were able to examine relationships between the variables of interest; however, we were not able to establish causality between any of these variables and outcomes.
- Our sample size of activista chefs and supervisors was less than 20; results may not be generalizable across all COVida activities chefs and supervisors. Results stated in percentages should be interpreted with caution.
- It was challenging for the study participants to estimate time allocated for various activities during a week, since they usually do not pay attention to the hours that they spend per task in a day. Therefore, in most cases respondents provided an estimation, and we worked with these data in the analysis.
- The six CBOs for this study were not selected randomly. While we selected activistas within each CBO using simple random sampling, the results of the study may not be generalizable to other CBOs that are a part of the COVida project.

RESULTS

Characteristics of Study Participants

We administered brief surveys to 70 activistas, 18 activista chefes, 12 supervisors, and six CBO managers. The majority of activistas (71.4%, N=70⁸) were female. The mean age was 30 years, with no difference between females and males (31.2 years old for females, and 26.9 years old for males, $p=0.067$). The youngest activista was 20 years old and the eldest was 57. Over half of activistas (57.1%) were 20–27 years old. Nearly 15 percent (14.3%) were 40 years and older. Half of activistas served beneficiaries in rural areas (51.4%).

The majority of activistas (72.9%, N=70) had secondary education, one-quarter (24.3%) had primary education, and 3 percent had technical or professional education.

The total number of years of experience working as an activista ranged from six months to eight years. More than 80 percent (82.86%) had two years of experience or less. Almost 60 percent of activistas (57.1%) had worked for COVida for two years, more than 10 percent (12.9) had worked there for one year, and 30 percent worked there for six to 12 months.

Two-thirds of activista chefes (66.7%, N=18) and three-quarters of supervisors (75%, N=12) worked as activistas in the past for COVida or another organization. Activista chefes' and supervisors' lengths of service as activistas ranged from three months to 10 years for activista chefes and from three months to six years for supervisors.

More than half of activista chefes (55.6%, N=18) were female. The mean age was 34 years. The youngest activista chefe was 21 years old, and the eldest was 51 years. Half of activista chefes (50%) were 21–32 years old. One-third (33.4%) were 40 years and older. The majority of activista chefes (77.8%, N=18) had secondary education, less than a fifth (16.7%) had primary education, and 6 percent had technical or professional education.

Number of years of work as activista chefes ranged from six months to three years. Less than half (44.4%) had worked for two years, and one-third (33.3%) had worked for one year. Almost 80 percent of activista chefes (77.8%, N=18) worked for COVida for two years, more than 15 percent (16.7%) had worked there for one year, and 6 percent worked for COVida for nine months.

The majority of supervisors (91.7%, N=12) were male. The mean age was 40 years. The youngest supervisor was 28 years old, and the eldest was 58. Half of supervisors (50%) were 28–37 years old. Two-thirds of supervisors (66.7%, N=12) had secondary education, and one-third (33.3%) had a university degree.

The number of years of work as supervisors ranged from six months to two years. The majority of supervisors (83.3%) had worked in this role for two years. Three-quarters of supervisors (75%, N=12) had worked for COVida for two years, less than 10 percent (8.3%) had worked there for one year, and 17 percent had worked at COVida for less than six months.

Four out of six CBO managers were female. The mean age was 51 years, with the range from 27 to 66 years. All six respondents had worked as CBO managers for two years, and all six had worked as activistas in the past.

⁸ In this report, "n" represents the numerator and "N" represents the denominator.

Quantitative and Qualitative Findings

Independent Variables

The following section provides quantitative findings for each of the variables of interest in our QCA analysis, followed by a high-level summary of qualitative findings from these variables. (Note: We reverse this order for the variable on complexity of cases.) While activists and not CBOs are our unit of analysis for this study, we provide some information on similarities and differences across CBOs in this section. (For more information on the CBO level differences, please see Truth Table 3 in Appendix B.) We support some of the qualitative findings with quotes from the respondents. The title of the positions of the respondents are not included with the quotations due to the identifying nature of this information.

Training

On average, activists had received eight days of training (mean =7.96, SD=4.69, range=3–20 days). Almost one-third (31.4%) had received four days of training. Activistas who had worked for COVIDa for one to two years had received a greater number of days of training on average (mean=9.4, SD=4.7, n=49) than activists who worked for six to twelve months (mean=4.5, SD=2.2, n=21). This difference in mean number of days between these two groups of activists was statistically significant (p-value<0.0001). The training is standardized, but activists who joined more recently, may not have received the refresher case management trainings that are annual. Activista chefs and supervisors had received 9.3 (SD=5.84, range=2–25 days) and 10 days (SD=5.84, range = 0-32 days) of training on average. More than 90 percent of activists reported that their training had included lectures (91.4%), role playing (97.1%), shadowing another activista (98.6%), the provision of materials (100%), and tests or quizzes (92.3%). Table 5 provides the information regarding the training content for all three groups of respondents.

Table 5. Training components

Components	Activistas, N=70				Activista chefs, N=18				Supervisors, N=12			
	Yes		No		Yes		No		Yes		No	
	n	%	n	%	n	%	n	%	n	%	n	%
Lectures	64	91.4	6	8.57	18	100	0	0	8	66.7	4	33.33
Role playing, hypothetical scenarios, or other hands-on activities	68	97.1	2	2.86	18	100	0	0	10	83.3	2	16.67
Shadowing another activista	69	98.6	1	1.43	17	94.4	1	5.56	10	83.3	2	16.67
Provided with materials	70	100	0	0	18	100	0	0	11	91.7	1	8.33
Quizzes or tests	65	92.9	5	7.14	16	88.9	2	11.11	10	83.3	2	16.67

The majority of respondents (75.7% of activists, 88.9% of activista chefs, and 66.7% of supervisors) reported that the training they received had prepared them to undertake all tasks in their daily work.

From our interviews, we learned that all CBOs receive the same training. In the qualitative responses, some activists focused more on certain components of the training when describing it—this could be due to personality differences of activists (how forthcoming they are in interviews), retention of the material, or reinforcement of certain concepts at the CBO level. Many respondents described in great detail what they learned in the trainings they receive:

I learned how to identify beneficiaries, how to follow up with them, how to make a weekly plan, do a household action plan. I learned how to close cases, how to graduate beneficiaries once they meet all the requirements to move to the next phase, which is graduation. I learned how to treat water. I learned about hygiene. I now know what a vulnerable child is, I learned about shelter, HIV testing and counseling. I learned about education, legal support, psychosocial support. I also learned how to use a MUAC.⁹ [Ovarelelana]

I learned how to mobilize beneficiaries such that they would not abandon treatment, how to graduate them... I learned how to complete assessment forms for initial data, the matrix on child support. To mobilize beneficiaries to continue to attend their savings groups. [ACTIVA]

In both ACTIVA and Reencontro, interviewees mentioned a mentoring and supervision training that happened this year for activistas chefes, M&E officers, supervisors, project officers, and project coordinators.

Responses to open-ended questions indicated that in addition to the formal training, activistas receive job training when accompanied by their activista chefes and or supervisors, especially for the more complex cases. Some activistas chefes reported that they had received extra lessons to prepare them to monitor the activistas. This is in addition to the general training that is provided to all the activistas and activistas chefes at the beginning of the year.

In terms of additional training needs, in all the CBOs, there were a few activistas who felt comfortable with what they knew so far and did not need any further training. Among those who said they were interested in additional training HIV testing, including being able to administer an HIV test in a beneficiary home, other HIV and health knowledge was most commonly cited, as described by the following respondents:

I would like to know more in the area of health, so I can do first aid, and to be trained on how to do [HIV] tests. [SANTAC]

To learn how to do an HIV test for beneficiaries who are too scared to go to health facilities [for a test]. [Ovarelelana]

Other areas of interest included more training on completing reporting forms, skills to provide motivational talks especially at health facilities on HIV or other diseases. Most respondents from Ukumi Ossulu specifically mentioned more training on child registration.

Activistas' Caseload

Activistas served 56 beneficiaries on average (mean=55.6, SD=16.1, range=25-106). Half of the activistas (50%) served between 25 and 52 beneficiaries.

Activista chefe and supervisors' responses on the ideal caseload varied between 5 and 70 (mean=47.5, SD=13.4, N=30). One third (33.3%) reported that 50 beneficiaries is the ideal caseload for activistas to have. In terms of the maximum caseload for activistas, responses varied between 30 and 120 beneficiaries (mean=63.7, SD=21.8), with 40 percent reporting 60 as the maximum caseload. CBO managers' responses on the ideal caseload varied between 20 and 80 (mean=45, SD=18.2).

From interviews with M&E officers we learned that the target caseload was 45–50 beneficiaries in SANTAC and ACIDECO, 50 beneficiaries in ACTIVA, and 60 beneficiaries in Reencontro, Ovarelelana, and Ukumi Ossulu. Respondents in SANTAC, ACIDECO, and Ovarelelana indicated 30 beneficiaries for

⁹ MUAC is middle-upper arm circumference. It is used to indicate severe malnourishment and a recommended threshold of admission to therapeutic feeding programs.

the ideal caseload. The ideal caseload was stated as 50 beneficiaries by the respondents in Reencontro and ACTIVA and as 60 by the respondents in Ukumi Ossulu.

There was no agreement across the CBOs of the ideal caseload. SANTAC and ACTIVA respondents appeared to be more focused on reaching the set project target, and indicated agreement with the caseload that had been stipulated by the project. Respondents from other CBOs felt it was either too high or, in a few cases, too low. The ideal number they cited differed from one person to the other, some said 20, 30, 45, 50, 60, and up to 80.

One issue that was raised was the length of time required in some areas to travel to client homes and how that can impede reaching the client targets for activistas. This is described by this respondent from ACIDECO:

In the area where I work, the cases are greatly dispersed. Imagine for someone with more than 20 cases, believe me when I say that in two months, they would not be able to visit all those houses, soon there would be beneficiaries without any visits.

In their responses to open-ended questions, respondents stated that building a trustful relation with beneficiaries takes time, and it requires regular visits, especially for more complex cases. It was reported by some activistas, supervisors, and activista chefes that high caseloads have a negative impact on the quality of the service, which may lead to an increased enrolment times (before graduation) for beneficiaries. The linkage facilitators were perceived to be an important bridge for bringing the cases to the activistas. They are based at the health facilities and refer cases to activista chefes or supervisors, who in turn allocate these caseloads to the activistas.

How Cases Are Assigned

According to activista chefes and supervisors, proximity to households and current caseload were the factors most often taken into consideration (83% and 80%, respectively; N=30) in assigning cases. Table 6 presents the details of the factors that are considered in the process of assigning cases to activistas.

Table 6. Factors considered in assigning cases, N=30

Factors	Yes		No	
	n	%	n	%
Current caseload	24	80	6	20
Complexity of cases	19	63.3	11	36.7
Proximity of households	25	83.3	5	16.7
Experience of activistas	21	70	9	30
Activista training and skills	23	76.7	7	23.3

When describing how cases are assigned to activistas, respondents described the process of first receiving referrals through the health facility linkage facilitator, and then having those cases distributed within the CBO by the activista chefes and supervisors. The major criteria for how cases were assigned was the proximity of the other activista cases and the overall workload of the activista. This respondent explains the process this way:

Cases come from the health facility where they are identified by the linkage facilitator and then passed on to the supervisor or activista chefe. Then they are given to the activistas based on where they live [in relation to other beneficiaries]... to facilitate the interaction between activista and beneficiary. [Reencontro]

Care Team Meetings

All activistas reported having regular care team meetings. The majority of respondents have these meetings weekly (80%, N=70) and one-fifth of activistas have these meetings monthly. More than 90 percent of activistas attend every meeting (91.4%), and the rest attend some of the meetings.

More than 90 percent of activistas (N=70) reported that the following activities take place during care team meetings: updates on performance against targets are shared (97.1%), implementation challenges are discussed (100%), activities are reviewed and planned (100%), there is discussion about caseload and decisions are made (100%), every activista shares an update on their cases (97.1%), activista chefes and supervisors follow up on referrals (100%), there is a discussion on a case management theme from the Home Visitation Cards (95.7%), and activista chefes and supervisors check on the emotional well-being of activistas (95.7%). All activista chefes and supervisors (100%, N=30) reported the above-mentioned activities during care team meetings. The majority of activistas (78.6%) and chefes and supervisors (86.7%) reported that other service providers are invited to the meetings to promote networking.

Respondents explained that the routine meetings with activistas are important to report challenges faced in the field and to look for solutions, correct and verify how forms are completed, report and discuss weekly work, problem solve, and create a plan for the following week:

To help me in my work. I talk about the challenges I have had in the field; they provide me with advice and train me on what I can do better than I did not do so well. [Ekumi Ossulu]

Some respondents described these meetings in more detail than others; however, Ovarelelana respondents in particular stood out in their detailed descriptions of high-quality care meetings, which included role play to ensure strong case management.

We talk about our challenges in the field. . . . We put in practice what we can do better. We make plans to organize our work. We ask for help from our activista chefe to solve the problems we have in the field. We correct our reporting forms; we do simulations on how to present ourselves in the field. And we are always talking about working closely together in our communities. [Ovarelelana]

Supportive Supervision

Activista chefes supervises from six to 10 activistas. More than half of activista chefes (55.6%, N=18) supervise eight activistas. Supervisors manage from two to five activista chefes. Fifty percent of supervisors manage four activista chefes (50%, N=12). On average, activistas meet with their chefes 4.6 times per month (SD=3.6, range=1–22, N=70). Half of activistas (50%) meet with their activista chefes four times a month, almost 15 percent met twice a month, and another 15 percent met eight times a month (i.e., twice a week).

In a given week, activistas spend 3.2 hours (SD=2.0, range=1–12, N=70) with their activista chefes. More than one-third of activistas (35.7%) reported spending two hours per week, and one-quarter (24.3%) reported spending four hours per week with their activista chefes.

Almost 70 percent of activistas (68.6%) reported having the same activista chefe. Over one-quarter (27.1%) of activistas had their activista chefe changed once and less than five percent (4.3%) reported this change happening twice during their work.

More than 90 percent of activistas (N=70) reported that their activista chefes provide the following support: help to develop clients family support plans (98.6%); provide direction regarding goals, priorities, and next steps for cases, particularly complex cases (97.1%); regularly follow up on activistas' goals and provide accountability (100%); provide guidance on time management strategies to enable activistas to equitably distribute their time across cases (92.9%); review case files and forms for completion and accuracy (100%); make activistas feel comfortable bringing challenges to her/him (100%); help activistas

resolve challenges with their work (100%); assist activistas in referring their beneficiaries to other services when they need help (94.3%); identify activistas' training needs, knowledge, and skills gaps, and identify opportunities for addressing these (91.4%); and participate in supportive supervision visits, accompany activistas to client visits at times, reviewing activistas' abilities and offering them constructive feedback after (100%). Slightly fewer activistas (82.9%) reported that their activista chefes assign and manage activistas' caseload, helping prevent overwork by reducing caseload, if necessary.

Activista chefes' and supervisors' proportion of responses regarding their role ranged from 50 percent dedicated for monitoring activistas' stress level to 100 percent for providing help with reporting forms and developing family support plans. See Table 7 for detailed information on the role of activista chefes and supervisors.

Table 7. Role of activista chefes (N=18) and supervisors (N=12)

Role	Activista Chefes (N=18)				Supervisors (N=12)			
	Yes		No		Yes		No	
	n	%	n	%	n	%	n	%
Improve activistas knowledge and skills	13	72.2	5	27.8	8	66.7	4	33.3
Encourage activistas to set regular goals	14	77.8	4	22.2	7	58.3	5	41.7
Provide regular follow-up and accountability to activista goals	15	83.3	3	16.7	11	91.7	1	8.3
Review case files with activistas, offer guidance	14	77.8	4	22.2	6	50.0	6	50.0
Help develop family support plans	18	100.0	0	0.0	10	83.3	2	16.7
Participate in managing difficult cases	15	83.3	3	16.7	9	75.0	3	25.0
Help activistas make referrals	15	83.3	3	16.7	8	66.7	4	33.3
Support the linkage facilitator and connect the linkage facilitator with activistas	11	61.1	7	38.9	10	83.3	2	16.7
Motivate activistas	13	72.2	5	27.8	10	83.3	2	16.7
Mobilize and engage with community leaders	10	55.6	8	44.4	7	58.3	5	41.7
Help activistas manage their time	13	72.2	5	27.8	8	66.7	4	33.3
Manage activistas caseload	13	72.2	5	27.8	9	75.0	3	25.0
Monitor activistas stress levels and offer support	10	55.6	8	44.4	6	50.0	6	50.0
Help with forms/reporting	18	100.0		0.0	11	91.7	1	8.3

All activista chefes and supervisors reported that they travel with supervisees to meet with clients jointly with the activista, and more than 75 percent (76.7%, N=30) reported that they travel with all their supervisees (77.8% of activista chefes, N=18 and 75% of supervisors, N=12). Eighty percent of activista chefes and supervisors travel with their supervisees weekly to meet with clients jointly, and the rest travel monthly.

At the time of data collection, activista chefes (N=18) supervised from six to 10 activistas, with over half (55.6%) supervising eight activistas. Supervisors (N=12) managed from two to five activista chefes with one-half (50%) supervising four activista chefes. Less than 20 percent of activista chefes (16.7, N=18) and one-third of supervisors (33.3%, N=12) reported frequent changes in the number of people supervised.

All activista chefes and activistas reported having at least weekly meetings with their supervisees. Activista chefes reported that they spend 11.6 hours per week for supervision (SD=9.4, range=1–32, N=18). The number of hours per week with each supervisee ranged from one to six, with one-third reporting one hour per week (33.3%) and over half (55.6%) reporting two to four hours per week. Supervisors reported that they spend 21.2 hours per week for supervision (SD=11.8, range=9–45, N=12). The number of hours per week with each supervisee ranged from one to six, with almost 70 percent reporting three or four hours per week.

According to our qualitative findings, across the CBOs, respondents said supervisors and activista chefes provide moral support, advice, encouragement, and motivation to activistas to do good work and serve their beneficiaries well. Respondents also described supervisors doing joint household visits as a supportive supervision exercise. From responses, we noted a level of thoughtfulness about the best way to motivate activistas and how to be a strong supervisor and manager:

For example, if as a supervisor of an activista, I am in the field supervising them and I note a mistake they make, I should correct the activista, not in the house of the beneficiary, but after we leave because then we can correct the errors from the field, and ask them to better complete their activities. [ACIDECO]

Nonmonetary Incentives

Only one-third of activistas (32.9%, N=70) and one-quarter of activista chefes and supervisors (26.7%, N=30) reported that activistas receive nonmonetary incentives such as gifts, awards, certificates, and thank you letters.

During interviews, most of the activistas underlined the importance of the collaboration and recognition they receive from their communities and the leaders. Being an activista elevates the status of the activistas in the community, as well as provides them with work experience that will help them later in finding other work:

Due to the work that I am undertaking in my community as an activista, I am becoming well known and a very respectable person. [ACTIVA]

Most of the activista chefes expressed content and gratitude to be selected for their role because all were once activistas, and during the training, they were selected by the supervisors to lead their activistas due to their high performance during the training. The fact of being singled out from among the others due to their performance during the training made them very motivated:

I am so excited and happy to work as an activista chefe. I do not know the reason why they nominated me to lead the other activistas but I am happy to do so. [ACIDECO]

Quality of Case Management

Nearly all activistas (94.3%, N=70) stated that they have the ability, resources and training to provide beneficiaries with high-quality case management. The majority of activistas (94.3%, N=70) reported that to encourage ART adherence among beneficiaries and to reduce stigma, they share examples of

themselves, friends, or family members taking ART and living well. All chefes and supervisors stated that the activistas whom they supervise provide high-quality case management (100%, N=30).

Care Team Networking

Most activistas stated that they are very well networked with other activistas (82.6%, N=70) and 10 percent stated that they are somewhat networked. Almost all activistas reported that they know what services are available for beneficiaries (100%), it is easy for them to make referrals for services (94.3%), they communicate regularly with people who provide reference services to their beneficiaries (90%), they are able to follow up directly with service providers regarding referral completion, the linkage facilitator is helpful to activistas and their beneficiaries (98.6%), and they share networks with other activistas (98.6%).

System of Referrals in CBOs

The majority of activista chefes and supervisors stated that a service mapping has been conducted or updated in the last year, all activistas have access to the service mapping (86.7%, N=30) and are directly linked to the health facility (93.3%), activistas are linked and referred to available nonhealth services (86.7%), the *facilitador de ligações* is able and useful in supporting referrals (100%).

Job Satisfaction

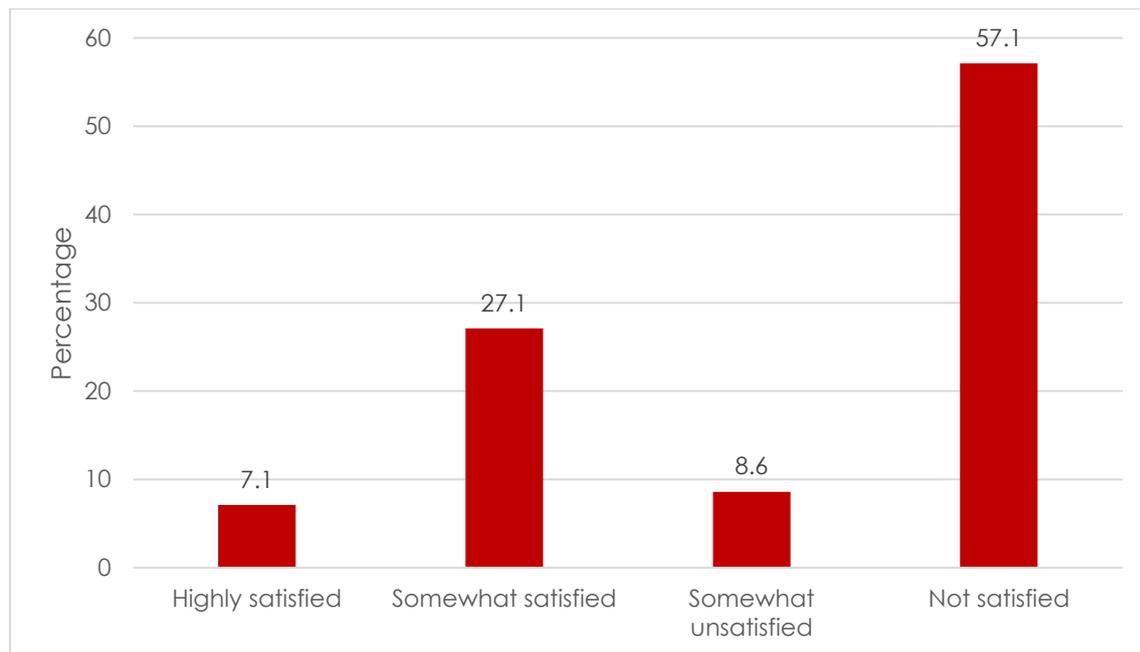
Most activistas (87.1%, N=70) and activista chefes and supervisors (93.3%, N=30) reported being highly satisfied with their job. The remaining activistas were somewhat satisfied (11.4%) or somewhat unsatisfied (1.4%). The rest of the chefes and supervisors (6.7%) reported being somewhat satisfied with their job.

From the responses to open-ended questions, we learned that all activistas like helping people and are happy to see improvements in their beneficiaries. Activistas also indicated that they learned many things in their work. Activista chefes stated that they liked their relationship with colleagues, enjoyed helping the communities, and appreciated the respect they got because of the work they did.

Satisfaction with Stipend and Payment Delays

All activistas receive 2,000 Meticaís per month (approximately US\$33), while the activista chefes receive a monthly stipend of 2,300 Meticaís (US\$38). More than half of activistas (57.1%, N=70) were not satisfied with the stipend amount, and more than a quarter were somewhat satisfied (27.1%) (Figure 1).

Figure 1. Activista's satisfaction with the stipend amount (N=70)



Stipend delays were reported by 43 percent of activistas (N=70). Among these respondents, most (83.3%, N=30) stated that stipends were delayed sometimes; the rest reported that stipends were always delayed. One-fifth of activista chefs reported stipend delays (20%, N=18), and one-fourth of supervisors reported delays with salaries (25%, N=12).

Less than 30 percent of activista chefs agreed that they were paid fairly (27.8%, N=18), and almost 60 percent of supervisors agreed that supervisors were paid fairly (58.3%, N=12).

Hours Working for COVida in a Week

Activistas reported working for COVida 19 hours per week (SD=7.5, N=70, range=3-49). More than 20 percent reported working for COVida nine hours per week and more than half (51.4%) reported working for COVida from 10 to 49 hours per week.

Although activistas are supposed to work three days per week, most of them reported working more than three days. Very often, beneficiaries were not available when activistas visited them, and activistas needed to visit them again at another time during the week.

Amount of Time Spent with a Household

Activistas reported spending 71 minutes on average with a household when they visited beneficiaries (mean=71.2, SD=35.3, range=15-180, N=70). One-fifth (21.4%) reported spending 45 minutes with a household, another fifth (18.6%) reported spending 120 minutes with a household, and more than one-third reported 60 minutes with a household. The average minimum amount of time with a household was 44 minutes (mean=44.3, SD=22.2, range=10-120, N=70). The average maximum amount of time with a household was 44 minutes (mean=108.2, SD=46.7, range=25-240, N=70).

According to activistas, complex cases require activistas spending more time with beneficiaries than other cases. Clients who take more activista time are people living with HIV who default on their treatment, pregnant HIV-positive women, and HIV-positive children.

Out-of-Pocket Expenses

Two-thirds of activistas (65.7%, N=70) reported that they incurred out-of-pocket expenses. The amount of these expenses in a week varied greatly (range = 1-500 Meticaís) and was on average 108 Meticaís (mean=107.5, SD=94.1, median=100, N=46). One quarter of activistas (23.9%, N=46) reported that they spent 50 Meticaís per week, and one-fifth (19.6%, N=46) reported spending 100 Meticaís per week for out-of-pocket expenses.

Over three-quarters of activista chefes (83.3, N=18) and one-half of supervisors (50%, N=12) stated that they incurred out-of-pocket expenses. The amount of these expenses in a week varied from 4 to 1000 Meticaís and was on average 195 Meticaís (mean=194.7, SD=243.7, median=150, N=18). Over 60 percent of activista chefes and supervisors (61.1%, N=18) reported that they spend from 50–200 Meticaís per week for out-of-pocket expenses.

While not every activista respondent said they spent their own money to conduct their work, when asked about out-of-pocket expenses, we found across all six CBOs that the majority of respondents did. They described spending their own money for transport from home to the beneficiaries' homes, buying airtime for communication, and helping beneficiaries to purchase food or transportation to the health facility:

What I pay for is out of my only expenses is airtime, and to pay for my mode of transport, in this case a bicycle that I received from an activista from COVida. Sometimes I buy gas when I ask to borrow a motorcycle to participate in a CBO general meeting, if my bike is broken. [Ovarelelana]

Some CBOs are fully equipped with bicycles, while others are not (see Table 8). The activistas who had not received bicycles highlighted transportation as an extra cost.

Table 8. Availability and demand for bicycles, by CBO

Province	Rurality	CBO	Number of Bicycles	No. of Activistas and Chefes	Difference in Supply vs. Demand
Maputo	Urban	SANTAC	91	91	0
Maputo	Rural	ACIDECO	80	80	0
Gaza	Urban	Reencontro	100*	100	0
Gaza	Rural	ACTIVA	78	59	+19
Nampula	Urban	Ovarelelana	110	171	-61
Nampula	Rural	Ukumi Ossulu	58	63	-5

*Estimate

Data source: Interviews with M&E officers

Due to the mechanical challenges of the copying machines in some of the CBOs, activistas reported using their own money to photocopy the case management forms used by COVida in order not to derail the work for the day or if they made a mistake on a form:

If I finish all my forms even though I have more visits to make, or if I fill a form out incorrectly, I take money out of my pocket to make copies. I also use money for transport and once I had to use my money to help an elderly woman because she had to take a child to the health facility. [Reencontro]

Some of the activista chefes also said they bought snacks for the activistas during the field visits and provided some money for transport for the activistas. Last but not least, some activistas reported using their money to help the neediest to buy food:

It is very difficult to go to a household where the members of the family tell you that they have not eaten for the last two days and you do nothing, I give them whatever I have for them to buy some food. This is especially so in a household where they [beneficiaries] are on ART. [ACTIVA]

Challenges in Recruiting and Retaining Activistas

Two-thirds of activista chefes and supervisors (66.7%, N=30) reported that they experience challenges with retaining activistas. Three out of six CBO managers reported challenges recruiting activistas and all six stated challenges retaining activistas in their CBOs. See Table 9 for the information on activista turnover as reported by M&E officers.

Table 9. Activista turnover, by CBO

CBO	Number of Activistas Replaced in Last Year	Current Number of Activistas and Activista Chefes
SANTAC	3	91
ACIDECO	5	80
Reencontro	10	100
ACTIVA	12	59
Ovarelelana	4	171
Ukumi Ossulu	Not provided	63

In our interviews, we asked supervisors and activista chefes to describe the extent to which their CBO experienced turnover in activistas, and we also asked activistas to describe difficulties they faced in their work. In both instances, and in response to several other questions, the issue of retention was described across all the CBOs.

Reasons why activistas leave their position included returning to school, finding another job that pays more, or becoming de-motivated because the level of effort for the position is not commensurate with the pay they are receiving. For instance, this respondent explains:

Some activistas leave because they get a better job, others leave so they can continue their studies, some leave because the subsidy is too little. [Reencontro]

Respondents also said some activistas leave their jobs because they learn other activistas on other projects are paid more.

Speaking freely... when activistas first are trained, they are really excited about the work, but when they start to work they start to see that their subsidy is very low compared to other activistas on other projects who have a good subsidy... [ACIDECO]

There should be a standardization of the subsidies paid to the activistas because these variations are not good; for example, some CBOs are implementing the Global Fund Project and the activistas are given a subsidy of 5,000 Meticaís per month, while the COVida activistas are getting 2,000 Meticaís per month. When our activistas get an opportunity in this project, they move without blinking. [SANTAC]

The low subsidy was not a reason for all activistas to leave their position—many transcripts highlighted the voluntary nature of the work the CBO and its activistas were doing, and how fulfilling this work was for them, even if they were not well paid. For instance, this individual describes other charitable factors that motivate them:

This job is very hard, but we do it because of our love for our neighbor, not to for the money, since we make very little. [ACTIVA]

HIV Status at Enrollment/Complexity

People living with HIV; children (and children living with HIV); and bedridden, elderly, and other particularly vulnerable individuals were cited by respondents as requiring the most time from activists:

Those who are HIV positive, children living with other children who need school kits, bedridden clients, children who are suffering from violence. [Ovarelelana]

These clients require more time and effort, as activists often must go above and beyond their duties. This respondent from ACTIVA describes how this is the case for bedridden patients:

There are other bedridden clients, who have no one to take care of them that the activista has to have a lot of patience for—even preparing food for them so this beneficiary can take their medication. [ACTIVA]

Activistas also described the challenges with clients who did not want to reveal their HIV status and those who defaulted on their HIV treatment, even though they received their information directly from the health facility:

Cases where the beneficiary does not want to reveal their status, you have to take a lot of time to try to convince them [to return to treatment] in situations where they patient defaulted on the ART. [SANTAC]

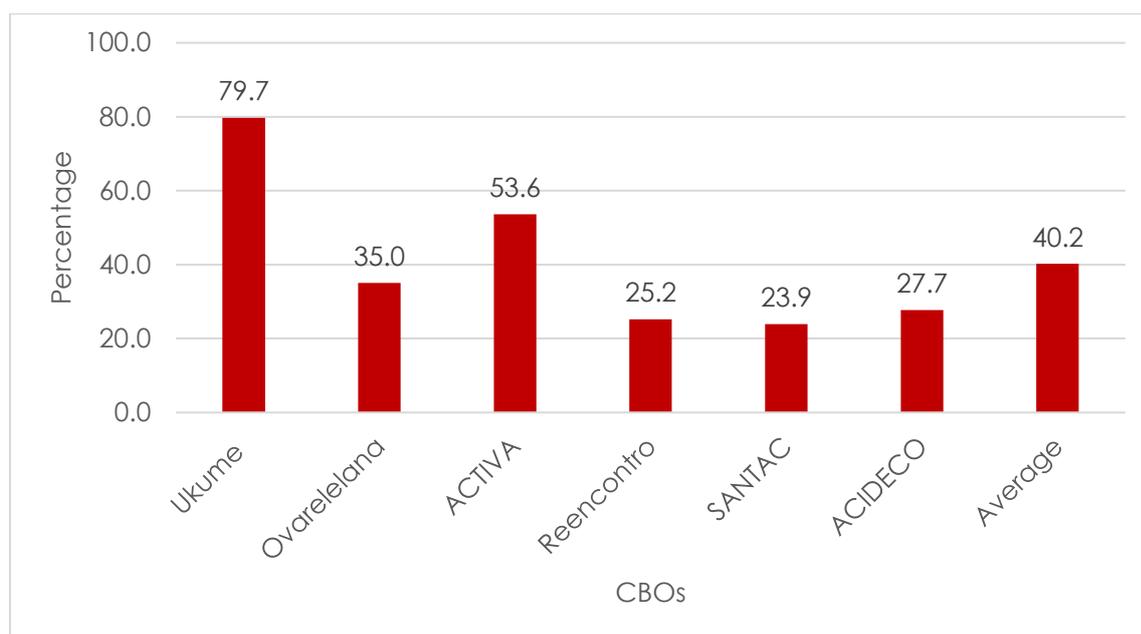
Among the 6,029 beneficiaries enrolled by surveyed activists (N=70) from the end of 2016 and June of 2019, 52.6 percent were HIV negative, 5.2 percent were HIV positive, 35 percent did not know their HIV status, 5.2 percent did not reveal HIV status, 0.3 percent were stated as not on ART, and for 1.7 percent the status was stated as “test is not recommended.” Ukume beneficiaries had the greatest proportion of beneficiaries with HIV status unknown (78.1%, N=964), and SANTAC had the lowest proportion of such beneficiaries (18.4%, N=783) at enrollment. ACTIVA had the greatest proportion of the beneficiaries who did not reveal their HIV status at enrollment (18.7%, N=748). ACTIVA had the greatest proportion of complex cases (26.3%, N=748) (complexity is defined in this study as the proportion of HIV-positive beneficiaries or beneficiaries with HIV status not revealed), and Ovarelelana had the lowest proportion of HIV-positive beneficiaries and beneficiaries with status not revealed at enrollment (3.2%, N=1,305). Table 10 presents the HIV status of beneficiaries at enrollment and the proportion of complex cases by CBO. Figure 2 presents the proportion of beneficiaries with HIV status unknown or unrevealed at enrollment.

Table 10. HIV status at enrollment and case complexity (N=6,029) , by CBO

CBO	HIV Status at Enrollment												Case Complexity (Sum of HIV Positive and Not Revealed)		Total N
	On ART/HIV Positive		Not Known		Not on ART		Not Revealed		Negative		Test Not Recommended		n	%	
	n	%	n	%	n	%	n	%	n	%	n	%			
Ukume	64	6.6	753	78.1	0	0.0	15	1.6	122	12.7	10	1.0	79	8.2	964
Ovarelelana	37	2.8	452	34.6	1	0.0	5	0.4	702	53.8	108	8.3	42	3.2	1305
ACTIVA	57	7.6	261	34.9	6	0.8	140	18.7	284	38.0	0	0.0	197	26.3	748
Reencontro	40	4.7	206	24.2	1	0.1	8	0.9	594	69.9	1	0.1	48	5.6	850
SANTAC	19	2.4	144	18.4	4	0.5	43	5.5	570	72.8	3	0.4	62	7.9	783
ACIDECO	81	5.9	323	23.4	4	0.3	59	4.3	911	66.1	1	0.1	140	10.2	1379
Total and average for all activistas	298	5.2	2139	35.0	16	0.3	270	5.2	3183	52.6	123	1.7	568	10.4	6029

Data source: COVida project routine data; the table provides data on all beneficiaries of surveyed activistas (N=70)

Figure 2. Proportion of beneficiaries with HIV status unknown or unrevealed at enrollment (N=6,029)



Dependent Variables/Outcomes

Knowledge of HIV Status at Last Assessment

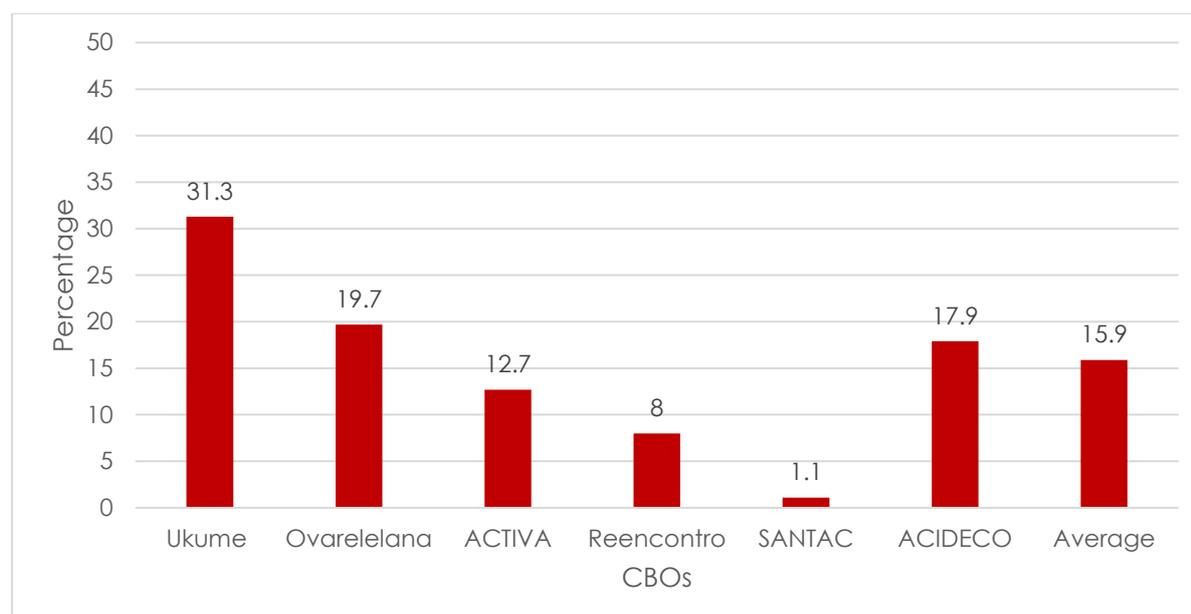
Among 5,146 beneficiaries enrolled by surveyed activistas (N=70) before April 01, 2019, 78.2 percent were HIV negative, 5.6 percent were HIV positive, 13.7 percent did not know their HIV status, 2.2 percent did not reveal their HIV status, 0.3 percent were stated as not being on ART, and for 0.3 percent, the status was stated as “test is not recommended.” On average, for more than 15 percent of beneficiaries, their HIV status was unknown or not revealed during the last assessment (15.9%, N=5,146). This proportion was the highest for Ukume (31.3%, N=796) followed by Ovarelelana (19.7%, N=860) and ACIDECO (17.6%, N=1,204) (Table 11 and Figure 3). However, these three CBOs also had a high proportion with unknown status at enrollment (Table 10). The next section presents our findings on the changes in HIV status over time.

Table 11. HIV status at last assessment, by CBO (N=5,146)

CBO	HIV Status at Last Assessment										HIV Status Known or Not at Last Assessment				Total N
	On ART/HIV Positive		Not Known		Not Revealed		Negative		Test is Not Recommended		HIV Status Known/Test is Not Recommended		HIV Status Unknown or Not Revealed		
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Ukume	59	7.4%	246	30.9%	3	0.4%	483	60.68%	5	0.6%	550	68.7%	249	31.3%	796
Ovarelelana	28	3.3%	166	19.3%	3	0.3%	658	76.51%	5	0.6%	694	80.3%	169	19.7%	860
ACTIVA	54	7.3%	51	6.9%	43	5.8%	590	79.95%	0	0.0%	687	87.3%	94	12.7%	738
Reencontro	38	4.7%	65	8.0%	0	0.0%	712	87.36%	0	0.0%	750	92.0%	65	8.0%	815
SANTAC	28	3.8%	2	0.3%	6	0.8%	697	95.09%	0	0.0%	731	98.9%	8	1.1%	733
ACIDECO	77	6.4%	162	13.5%	54	4.5%	911	75.66%	0	0.0%	1,042	82.1%	216	17.9%	1,204
Total and average for all activistas	284	5.6%	692	13.7%	109	2.2%	4,051	78.2%	10	0.3%	4,454	84.1%	801	15.9%	5,146

Data source: COVida project routine data; the table provides data on all beneficiaries of surveyed activistas (N=70) enrolled before April 01, 2019. These beneficiaries had enrollment data and data on at least one follow-up assessment. We excluded beneficiaries enrolled in Q3 FY 2019, since they had only enrollment data.

Figure 3. Proportion of beneficiaries with unknown or unrevealed HIV status at last assessment (N=5,146), by CBO



Changes in HIV Status Knowledge

Among beneficiaries with unknown or not revealed status¹⁰ at enrollment (N=1,897), almost 60 percent (58.0%) learned their status between enrollment and the last assessment. SANTAC had the greatest proportion of beneficiaries who learned their status over time (97.1%, N=175) followed by ACTIVA (76.6%, N=394) and Reencontro (68.1%, N=204). Ovarelelana had the lowest change on this indicator (12.4%, N=193) (Table 12 and Figure 4).

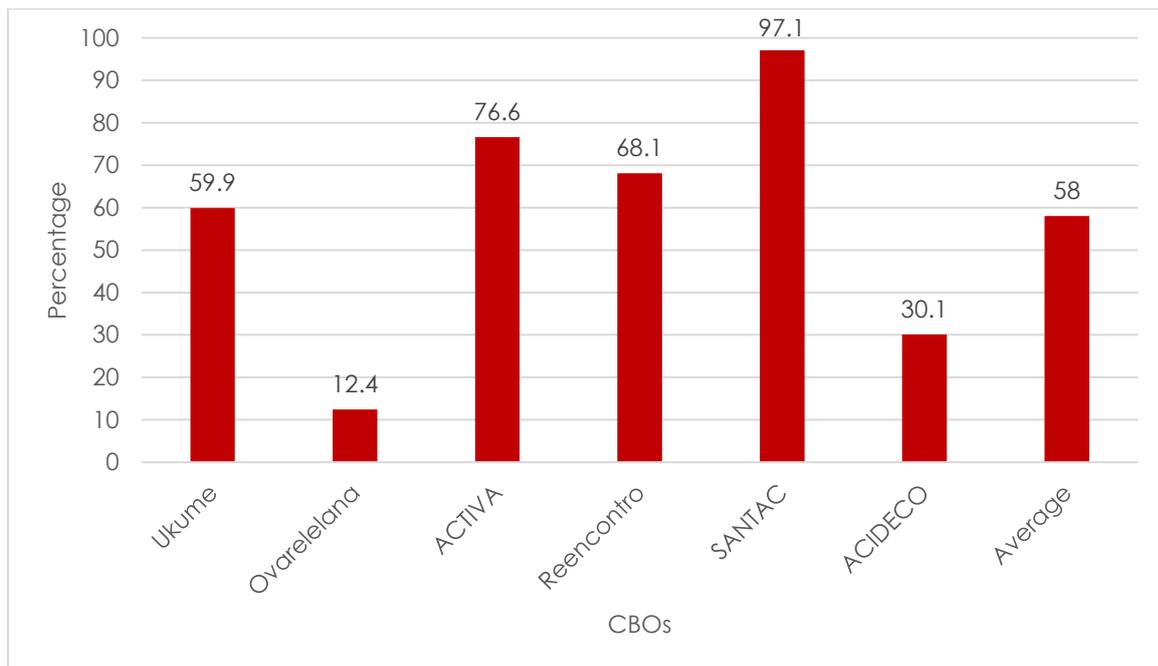
Table 12. Changes in HIV status knowledge over time (N=1,897), by CBO

CBO	Yes, Changes in Status		No Changes in Status		Total
	Count	Percentage	Count	Percentage	
Ukume	372	59.9%	249	40.1%	621
Ovarelelana	24	12.4%	169	87.6%	193
ACTIVA	302	76.6%	92	23.4%	394
Reencontro	139	68.1%	65	31.9%	204
SANTAC	170	97.1%	5	2.9%	175
ACIDECO	94	30.3%	216	69.7%	310
Total and average for all activistas	1101	58.04%	796	41.96%	1897

Data source: COVida project routine data; the table provides data on all beneficiaries of surveyed activistas (N=69) who were enrolled before April 01, 2019 and had HIV status not known or not revealed at enrollment. These beneficiaries had enrollment data and data on at least one follow-up assessment. We excluded beneficiaries enrolled in Q3 FY2019 since they had only enrollment data. One activista did not have beneficiaries with unknown or not revealed status at enrollment.

¹⁰ Unknown HIV status means that a beneficiary did not know her/his HIV status. Not revealed HIV status means that a beneficiary knew her/his HIV status but did not share this information with an activista.

Figure 4. Proportion of beneficiaries who learned their HIV status over time (N=1,897), by CBO

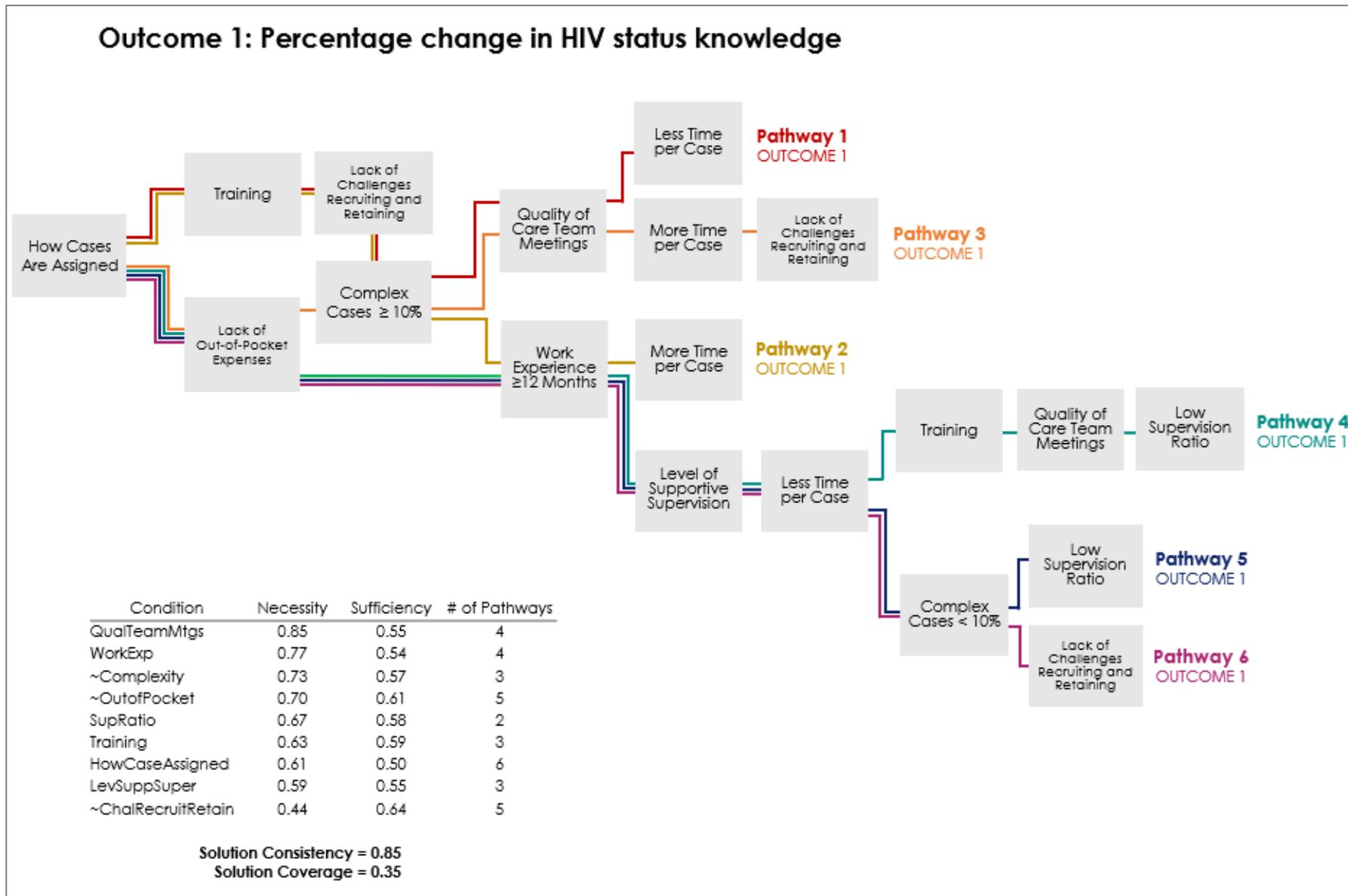


QCA Results

Results for Outcome 1: Percentage Change in HIV Known Status

For Outcome 1, there were six pathways that led to a high percent change in HIV known status (Figure 5). Each pathway is one branch, with five to eight conditions. For example, from Figure 6, Pathway 1 contained the following conditions: *How cases are assigned, training, lack of challenges recruiting and retaining, complexity, quality of care team meetings, and less time per case.* The solution consistency was 0.85, and coverage was 0.35. These pathways described the conditions that led to improved knowledge of HIV status for activists from CBOs 2, 3, 4, and 6 (Table 21 in Appendix D). While some of the pathways are complicated (i.e., with more than five conditions), the solution presented in Figure 6 reflects the most simplified combinations of conditions that consistently led to a high percent change in HIV known status. No single condition was necessary or sufficient; instead, multiple conditions were required to achieve an increase in HIV status knowledge.

Figure 5. Final pathways to Outcome 1 (solution presented is the intermediate solution obtained using fs/QCA software) (Ragin, 2017)



Common Conditions. One condition was shared by all six pathways: *how cases are assigned*. This demonstrates that activista chefes and supervisors should consider activista caseload, work experience, skills, case complexity, and activista proximity to case in order to prepare activistas well for effective case management. In particular, consideration of caseload and complexity of cases ensured that activistas were not overburdened and had enough time to address the needs of each beneficiary. In contrast, activistas who did not achieve high percent changes in HIV known status were part of programs that lacked a formal procedure to assign cases. For example, an activista chefe from CBO 5 stated, “The communities are divided into boroughs and the cases are allocated randomly.” *How cases are assigned*, thus, is an essential attribute of programs with effective case management that improve knowledge of HIV status.

Two other conditions were present in five of the six pathways: *lack of challenges recruiting and retaining* and *lack of out-of-pocket expenses*. For most activistas who achieved a high change in HIV status knowledge, their supervisors actively worked to retain activistas by ensuring that activistas had access to follow-up trainings and the opportunity to discuss job stress and complex beneficiaries. In CBOs 1 and 5, which had low percent changes in HIV status knowledge, activista retention was inhibited by dissatisfaction with the activista stipend. In fact, two-thirds of all activistas were unsatisfied with their stipend amount.

Recruitment and retention challenges could be mitigated by increasing activista stipends and ensuring that activistas receive adequate training and supervision support. Activistas with high percent changes in HIV status knowledge, for the most part, did not have out-of-pocket expenses. CBOs should dedicate funds toward activista transportation to beneficiaries, which will alleviate activista financial stress.

Activista Support and Experience. Five of the six pathways had at least one condition that reflected activista skills and external support: *level of supportive supervision, quality of care team meetings, low supervision ratio, training, and/or work experience (≥12 months)*. These pathways had a high amount of redundancy between conditions that ensure activistas were well equipped and well supported, which explains why most activistas were able to spend less time per case and still achieve desirable outcomes. Supportive supervision was most effective when activista chefes met with each activista at least twice per week and traveled with all activistas periodically to “know what is happening in the communities with the activistas, know the situations and look for joint solutions, [and] verify that the beneficiaries are receiving the services required from the activistas.” Low supervision ratios were not necessary for high levels of supportive supervision, but low ratios helped to ensure that activista chefes and supervisors had more long-term time and energy to assist with complex cases.

Further, these results demonstrate alternative ways to support activistas, which may be useful to CBOs that have limited resources. For example, in Pathway 1, activista support occurred through training and high-quality and weekly care team meetings, where activistas shared experiences, discussed challenges, and created case plans. In Pathway 2, activista support occurred through training and because activistas had two or more years of case management experience. If a CBO has difficulty implementing regular care team meetings, hiring highly experienced activistas could provide an alternative. Similarly, training provided another layer of redundancy to activista support. While the number of training days proved to be less important, the most effective trainings were those that employed multiple training activities (e.g., lectures, role playing, tests) and covered topics such as first aid, how to refer beneficiaries to health services, techniques to encourage ART retention, and how to cope with work stress. Overall, the redundancy between activista support conditions emphasizes the importance of regular supervision meetings, team meetings, training, and low supervision ratios.

Complex Cases and Activista Preparation. The first three pathways show how activistas who have a high percentage of complex cases that require more time can still improve knowledge of HIV status. The presence of high-quality care team meetings, adequate training, and formal and thoughtful case assignment procedures has prepared these activistas well to manage complex cases. Finally, the presence of *more time per case* in Pathway 2 and *less time per case* in Pathway 1 may mean that this condition is not particularly important; activistas can still achieve a high percent change in HIV known status regardless of

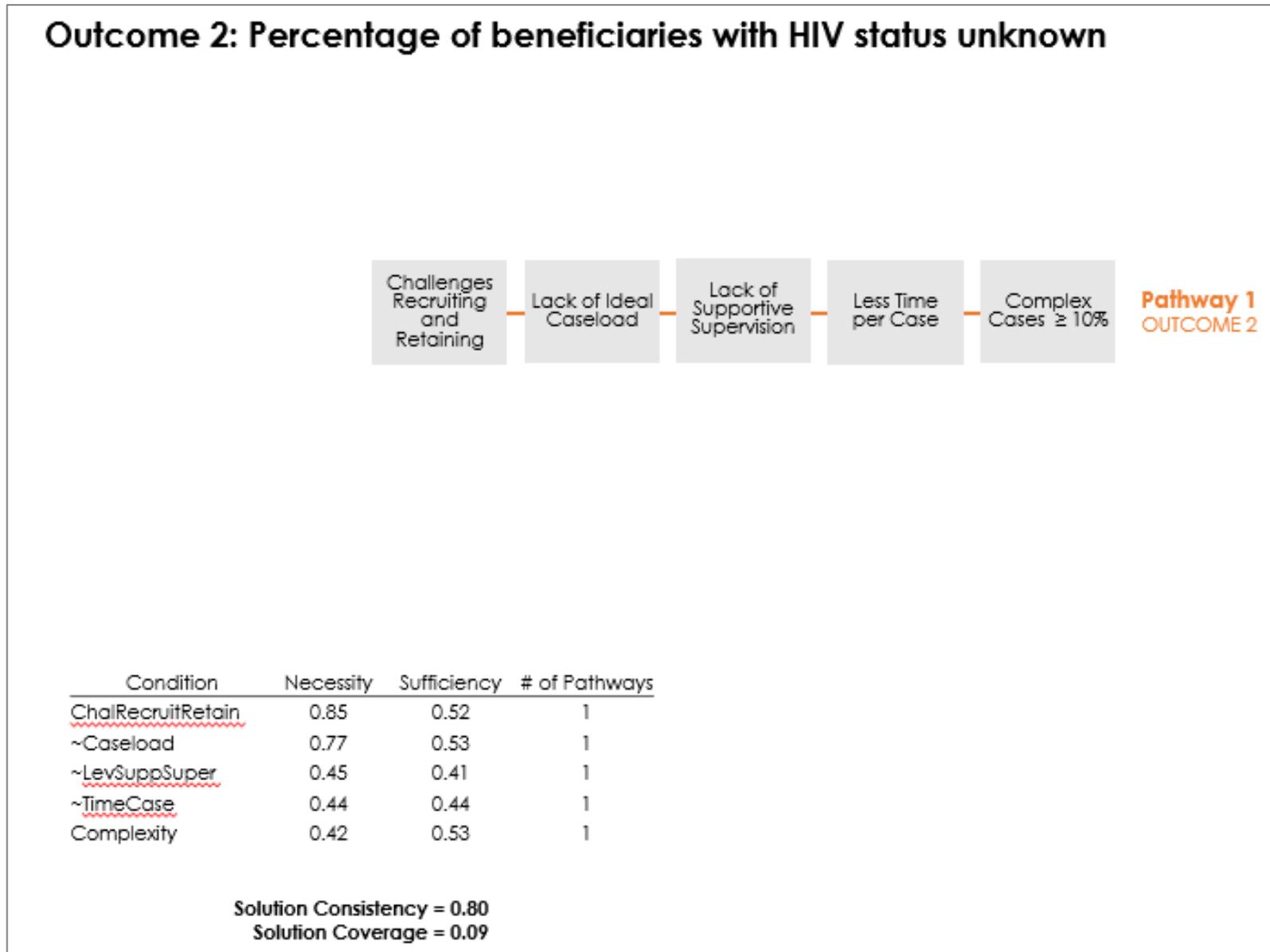
how much time they spend with each household. Some activistas spent more time per case because they managed a higher proportion of complex cases; others spent less time per case because they had fewer complex cases or because their work experience or training meant that they knew the importance of creating case plans prior to household visits (and followed those case plans) to maximize efficiency. For example, one activista stated, “I first finalize my work at home and then plan my work, and I do this on a weekly basis.” Activista chefes can help improve activistas’ efficiency by encouraging all activistas to create and follow a weekly plan; this may have the dual benefits of reducing time spent per case and increasing activista preparedness for complex cases.

Recommendations to Increase Changes in HIV Status Knowledge. In order to improve knowledge of HIV status, CBOs should ensure that their programs have formal protocols that assign cases based especially on caseload, complexity, and activista skills and protocols that seek to improve activista retention. Assigning beneficiaries with unknown HIV status to activistas who have two or more years of work experience may accelerate HIV testing. CBOs should also increase material resources provided to activistas: stipend increases and budgets for activista transportation may improve satisfaction and reduce activista turnover. Finally, CBOs should aim to provide activistas with at least two forms of high-quality support, especially for activistas with more complex cases. Support can occur through regular trainings, weekly care team meetings, and weekly individual meetings with activista chefes.

Results for Outcome 2: Percentage of HIV Status Unknown

The second outcome investigated was the percentage of beneficiaries with their HIV status unknown (i.e., unknown or not revealed) at the time of the last assessment. One pathway led to the outcome of percentage with HIV status unknown (Figure 6) and described activistas from CBOs 5 and 6 who had higher percentages of beneficiaries with unknown HIV status than the other CBOs (**Error! Reference source not found.**). This pathway had five conditions: *challenges recruiting and retaining, lack of ideal caseload, lack of supportive supervision, less time per case, and complex cases $\geq 10\%$* . The solution consistency was 0.80 and the coverage was 0.09. No conditions were necessary or sufficient; instead, the combinations of conditions had the most important influence on the outcome.

Figure 6. Final pathway to Outcome 2 (solution presented is the intermediate solution obtained using fs/QCA software) (Ragin, et al., 2017)



Activista Retention. *Challenges recruiting and retaining* activistas had a negative influence on unknown HIV status and stemmed primarily from low subsidies (i.e., activista salaries), delays in subsidy payment, lack of motivation, high caseloads, and lack of job preparedness. For example, a supervisor stated, “Activistas leave because of the low subsidy or because of the workload in terms of caseloads.” Activista retention challenges led to higher activista turnover and meant that existing activistas had had less time to learn a beneficiary’s HIV status by the last assessment.

Activista Overwork. The *lack of ideal caseload* means that activistas who had a high percentage of beneficiaries with unknown HIV status also had a caseload that was either far above or far below the ideal caseload (n=50); the ideal caseload was determined based on the average number of cases activista chefes and supervisors said an activista should ideally manage. The maximum caseload was 106 clients (more than twice the ideal caseload); the minimum caseload was 25 clients. Too few cases could mean that an activista did not have enough work and perhaps lost motivation. Too many cases could mean that an activista had too much work and could not dedicate adequate time to each beneficiary, leading to an inability to know the HIV status of each. For example, activista chefes whose activistas had low percentages of beneficiaries with unknown HIV status aimed to assign activistas only the ideal caseload to “not overload with work” since “increasing the number [would] make it difficult for the activista to cover all the families.” In addition to too many cases, activistas with high values for Outcome 2 also had more complex cases. The complex cases meant that they were unable to spend as much time with other beneficiaries, such as those with unknown status. Similarly, too many cases meant activistas spent less time per case, with some activistas spending as few as 15 minutes per household. As with Outcome 1, a formal process to assign cases based on caseload and complexity may reduce activista overwork.

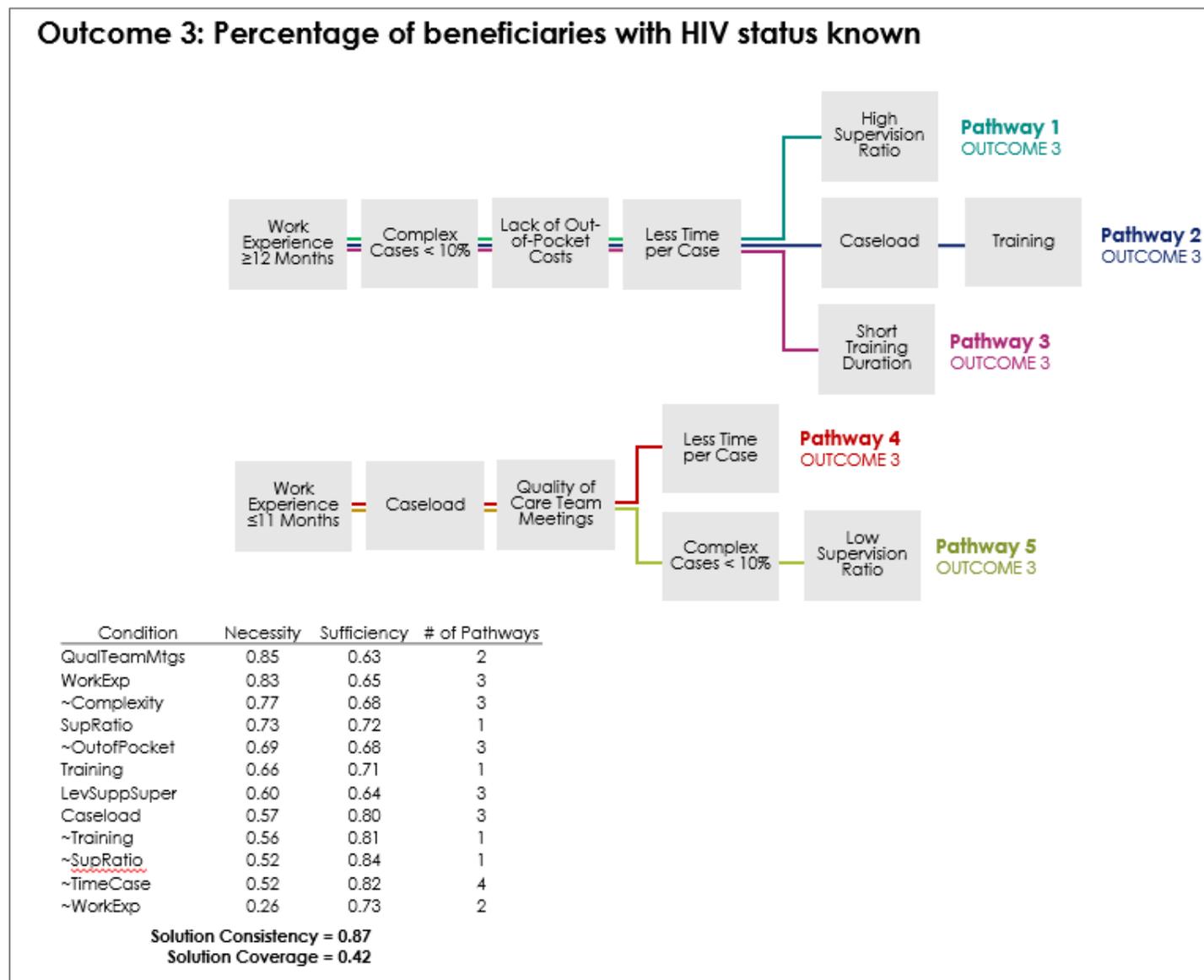
Inadequate Activista Support. Activistas with high percentages of beneficiaries with unknown HIV status also lacked supportive supervision. For example, regarding the purpose of the meetings with their activista chef, one activista stated, “The activista chefe corrects the filled forms and we sign the central registry form.” In contrast, activistas who received highly supportive supervision discussed their difficult cases and created goals and plans during these meetings. For example, one activista stated, “I develop a plan, and if someone has abandoned ART treatment that is where I need the activista chefe so that we can work together in this case.” Another activista summarized the tasks they accomplish during these meetings as “talking about challenges, presenting the filled templates and being corrected and taught how to fill them correctly, undertaking simulations of the daily activities, weekly reporting, and exchange of experience.”

Recommendations to Reduce HIV Unknown Status. In order to reduce the percentage of beneficiaries with unknown HIV status, CBOs must focus on eliminating challenges for activista retention. CBOs should also improve the support activistas receive and especially should focus on ensuring that all activista chefes meet weekly with activistas individually and develop comprehensive case management plans. Finally, CBOs should ensure that activistas are not overworked and are not assigned too many cases or too many complex cases.

Results for Outcome 3: Percentage of HIV Status Known

The third outcome investigated was the percentage of beneficiaries with their HIV status known at the time of the last assessment. Five pathways led to the outcome of percentage of HIV status known (Figure 7), each with four to six conditions. This solution had a consistency of 0.87 and a coverage of 0.42, which are acceptable values for QCA (Ragin, 2008). This solution described activistas from CBOs 2, 3, 4, and 6. No conditions were necessary or sufficient; instead, the combinations of conditions had the most important influence on the outcome.

Figure 7. Final pathway to Outcome 3 (solution presented is the intermediate solution obtained using fs/QCA software) (Ragin, et al., 2017)



Activistas with Work Experience. Pathways 1, 2, and 3 shared four conditions: *work experience* ≥ 12 months, *complex cases* $< 10\%$, *lack of out-of-pocket costs*, and *less time per case*. The presence of *work experience* combined with the *complex cases* $< 10\%$ is one of the main reasons why activistas were able to spend less time with each household (approximately 25 minutes or less, on average). In these first three pathways, activistas worked efficiently and had lower risk of becoming burned out, allowing them to provide more effective case management services to beneficiaries. Additionally, these activistas had minimal challenges: *lack of out-of-pocket costs* and *complex cases* $< 10\%$ meant that activistas had the resources to complete their work and did not have many cases that required more time. For activistas who did not have high percentages of beneficiaries with HIV status known, the presence of out-of-pocket costs could be a reason. These activistas spent their own money “for transport, buying food for the neediest of the beneficiaries, buying airtime.” If activistas have access to more resources, their effectiveness may improve.

For Pathway 1, the *low supervision ratio* meant that the ratios of activistas to activista chefe and of activista chefe to supervisor were higher (10:1 and 5:1, respectively). However, since these activistas had more experience and fewer case challenges, the supervision ratio did not negatively affect their case management effectiveness. In Pathway 2, activistas had caseloads close to the ideal ($n=50$) and underwent significant training (> 10 days); these conditions contributed to activistas’ preparedness and energy for effective case management. In Pathway 3, *short training duration* reflects training that lasted for five or fewer days. However, most trainings still did cover important case management topics (e.g., goal setting, common challenges), and these activistas may have required less training due to their experience as activistas for more than two years.

Activistas without Work Experience. Pathways 4 and 5 differed from the first three pathways mainly due to the presence of *work experience* ≤ 11 months. While the *work experience* ≤ 11 months in Pathways 4 and 5 was not hypothesized to lead to a high percentage of beneficiaries with HIV known status, these two pathways demonstrate two alternative combinations of conditions that are sufficient to overcome an activista’s lack of work experience. Notably, when an activista had less work experience, it was essential that the activista had a caseload that was near the ideal caseload ($n=50$) and that the activista attend weekly care team meetings that were comprehensive and addressed care issues beyond paperwork. Additionally, while these activistas had less work experience, they received important support that ensured they managed cases effectively. High-quality and weekly care team meetings with near-perfect activista attendance were essential. In the most beneficial of these meetings, activistas were “presenting the work [and] questions we have to the activista chefe who accompanies us to the beneficiaries’ houses [and] checking whether the forms have been filled well.” The “developing weekly plans and sharing of information” enabled activistas to gain important skills to manage difficult cases and was a valuable source of accountability for activista preparedness. In contrast, activistas who did not attend or did not have access to high-quality care team meetings described the meetings as unhelpful where the focus was solely for “correcting forms.”

Recommendations to Achieve High HIV Known Status. To improve an activista’s ability to learn their beneficiaries’ HIV status, CBOs should ensure that activistas are well supported and have access to resources to provide good case management and connect their beneficiaries to additional services. When activistas have prior work experience, CBOs can reduce challenges (e.g., out-of-pocket expenses) by budgeting funds for activista airtime (i.e., cell phone service used for case management) and transportation. When activistas do not have much prior work experience, CBOs should ensure that activistas do not manage more than 50 cases and that activistas attend weekly meetings to discuss and plan for case management challenges.

Costing Results

Table 13 summarizes information about the six CBOs that we sampled, including name, location, the current number of activists, cumulative program beneficiaries served over the reporting period, and the number of months of data collected. Note that Ovarelelana includes activities in Nampula City (urban) and Anchilo (rural), as the cost data for both sites were reported together for this organization.

Table 13. CBO characteristics

CBO	SANTAC	ACIDECO	Reencontro	ACTIVA	Ovarelelana	Ukumi Ossulu
Province	Maputo	Maputo	Gaza	Gaza	Nampula	Nampula
Number of months of data collected	11	27	9	9	23	23
Activistas	81	71	89	53	155	53
Beneficiaries	5,649	17,866	11,777	6,190	14,373	8,057

We estimated the annual costs of providing case management services for each CBO by dividing the total cost by the number of months in the reporting period and converting to years. We also estimated the percent of total expenditures attributable to case management. We estimated the cost of case management per beneficiary for each CBO, and the breakdown of case management costs to each of the seven categories by percentage. These results are shown in Table 14.

Table 14. Case management total annual costs, costs per beneficiary, and costs by category, in USD

	SANTAC	ACIDECO	Reencontro	ACTIVA	Ovarelelana	Ukumi Ossulu	Average
Annual cost of case management (USD)	\$34,660	\$40,141	\$34,654	\$20,981	\$47,185	\$22,929	\$33,425
Cost per beneficiary of case management (USD)	\$5.62	\$5.06	\$2.21	\$2.54	\$6.29	\$5.45	\$4.67
Proportion of total expenditures	45%	42%	48%	41%	45%	39%	43%
Cost breakdown:							
Supervision	21%	25%	23%	16%	19%	15%	20%
Training	11%	4%	11%	11%	16%	20%	12%
Transport	12%	10%	15%	12%	15%	15%	13%
Activista support	23%	24%	16%	23%	12%	14%	19%
General personnel	18%	16%	24%	19%	14%	16%	18%
Office costs	6%	4%	4%	4%	6%	9%	5%
M&E	10%	17%	8%	15%	18%	12%	13%

Case Management Expenditures

When comparing the proportion of expenditures attributable to case management across CBOs, we found a range of 39 percent to 48 percent. We expected the percentage to be fairly consistent across CBOs, given the similar interview responses about central guidance on activista caseloads, training, and staffing structure from the COVida project headquarters. These estimates were higher than the 26 percent allocated to case management across the 2017 and 2018 EA reports, as the EA estimates did not attempt to allocate program management and overhead expenses to case management activities.

Cost per Beneficiary

The cumulative beneficiary total numbers shown in Table 13 represent beneficiaries served over a time period to match the financial data, ranging from nine to 27 months. Recently, the target number of beneficiaries for some CBOs, assigned at the central level, has increased, as has the target number of cases per activista. Four of the six M&E staff interviewed expressed that these caseloads are above the ideal number per activista.

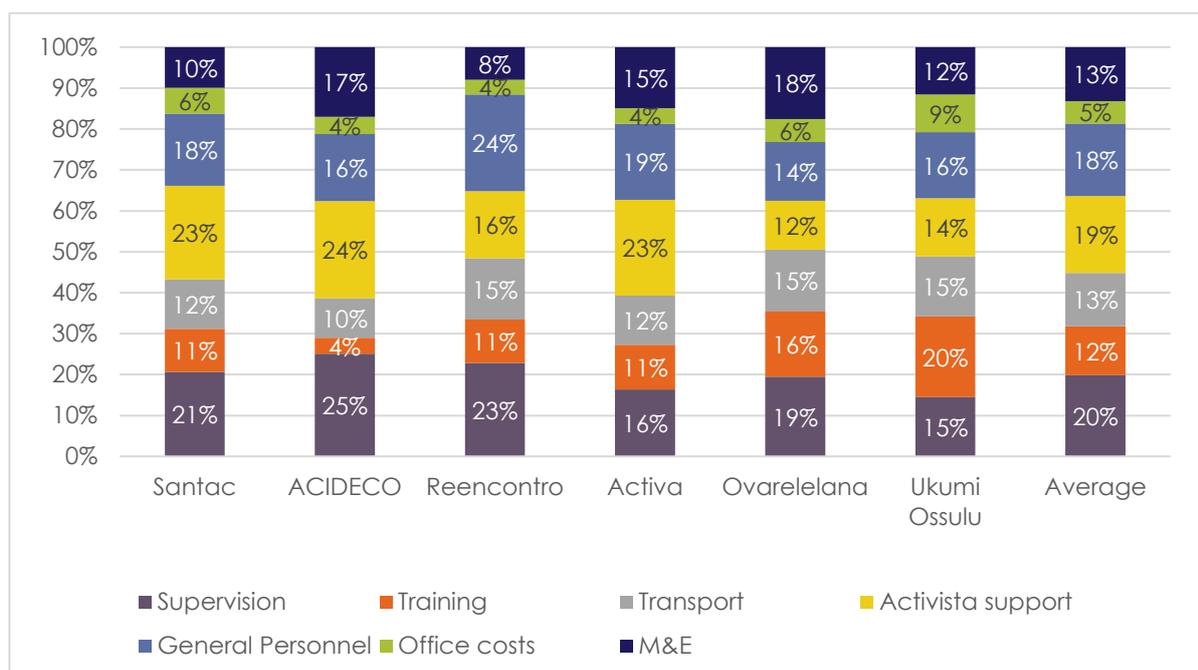
Costs per beneficiary on average between enrollment and graduation range from US\$2.21 to US\$6.29, with an average of US\$4.67. Comparing across provinces, Gaza province had the lowest average cost per beneficiary, while the two CBOs in Nampula province had higher than average costs. The highest cost per beneficiary was found at Ovarelelana, which provides services to both urban and rural populations. Ovarelelana has the highest number of activistas, and uses additional supervisors, M&E staff, office rent, motorbikes, and computers, compared to other CBOs. This may be necessary to serve beneficiaries in multiple locations; however, their target number of beneficiaries was recently increased by COVida. As discussed below, the two CBOs in Nampula province also have additional training expenses for activista travel.

The two CBOs with the lowest costs per beneficiary, located in Gaza province, were also the two CBOs that reported financial data for the shortest amount of time (nine months). These CBOs joined COVida after participating in other projects and were already serving beneficiaries at the time when their financial reporting begins. Some other organizations reported 1–2 months of expenses for startup before beneficiaries were served. The lower costs for the organizations in Gaza province may be partly explained by lower recorded start-up costs compared to other organizations. However, these CBOs also spent the least on training per activista (as they used their own venue for training), paid lower salaries than the Maputo-based CBOs, and had lower office expenses than most of the other organizations.

Cost Drivers

Looking across the percentage of costs attributed to each cost driver (Figure 8), supervision costs were highest on average. This was due to the high percentage of time that interview respondents at the CBOs indicated as spent by supervisors on supporting activistas in their case management activities. Supervision costs were followed by caseworker support, including the stipends and materials provided to activistas, along with the costs of printing paper forms used for case management. The cost of the paper forms was significant, including the printers needed for their production. CBOs mentioned that the quantity of paper forms needed every day by activistas to register all their activities hampered the efficiency of the process, and that a lack of printing capacity sometimes resulted in out-of-pocket expenses among activistas for generating forms.

Figure 8. Cost breakdown by category and CBO



General personnel made up the next highest percentage of costs, including managers, accountants, guards, support staff, and above-site project management support. If M&E staff were included in general personnel, this would be the largest cost driver. Office costs represented a low proportion of the expenses of case management. As activists work primarily in the field, the administrative staff office needs attributed to case management were low.

Variation in training costs showed geographical differences. The duration, frequency, and number of activists trained per session was generally consistent across CBOs, and the resulting training cost per activist were similar within each province. The two CBOs in Gaza province had lower than average training costs and used their own venue for training. For those activists traveling longer distances, the program provided transportation allowances, which contributed to the training costs for the two CBOs in Nampula—Ovarelelana and Ukumi Ossulu. Ukumi Ossulu used the largest amount of transportation allowances to activists, representing 20 percent of the cost of activist training. This CBO also trained smaller groups of activists per session, resulting in higher costs per activist. Ovarelelana conducted training sessions in both the city and rural locations.

Table 15. Training costs of case management, in USD

	SANTAC	ACIDECO	Reencontro	ACTIVA	Ovarelelana	Ukumi Ossulu	Average
Annualized training cost (USD)	\$3,651	\$1,567	\$ 3,678	\$2,294	\$7,502	\$4,507	\$3,867
Average training cost per activist per year (USD)	\$40.12	\$19.59	\$36.78	\$38.87	\$43.87	\$75.12	\$41.35

Table 15 shows the training cost for each CBO, annualized over the reporting period, and the average training cost per activist, compared to the average across all CBOs. Note that the costs here included training for activists, as well as additional training for supervisors, M&E staff, and trainers.

Transportation costs were similar across CBOs and were made up of the costs of bicycles provided to activistas, the cost of motorcycles used by field supervisors (including maintenance, registration, and fuel), and other transportation costs relating to supervision. Transportation for administrative staff to report to headquarters or conduct other duties were excluded from the cost of case management.

CONCLUSIONS AND RECOMMENDATIONS

QCA was used to investigate how the modifiable attributes of PEPFAR-funded OVC case management programs interact with and relate to client outcomes, including changes in knowledge of HIV status. Three outcomes were identified to measure case management effectiveness: percent change in HIV known status, percentage of beneficiaries with unknown HIV status, and percentage of beneficiaries with known HIV status. Overall, the results of this study highlight the importance of activista experience, through prior work experience or training; the importance of activista support through high-quality care team meetings, one-on-one supervision, and low supervision ratios; the importance of not overworking activistas by assigning too many cases or complex cases; and the importance of providing activistas with resources such as transportation and airtime.

While we had various sources of information for our independent variables (activistas, chefes, supervisors, M&E officers), we obtained consistent results on our variables of interest. Overall, respondents believed that they had the ability, resources, and training to provide a high quality of case management. Some activistas highlighted that they would like to have more training on completing forms, while others wanted to receive training on HIV testing, because though they provided referrals, most beneficiaries do not go to the hospitals for testing because of the distance, or they are not willing to go. To overcome these barriers, activistas suggest that they get trained to perform these tests at home. All respondents reported weekly care team meetings and strong care team networking. Activistas and supervisors are motivated by the good work they are doing. While the majority have high job satisfaction, more than half of respondents were not satisfied with the stipend amount, almost half reported stipend delays, and two-thirds reported out-of-pocket expenses for transportation, photocopying, food for beneficiaries, and other expenses. We found that nonmonetary incentives were minimal and varied by CBO.

From our costing analysis, we found that the organization of these CBOs was very similar, as prescribed by headquarters. The proportion of expenditures attributable to case management was consistent across CBOs. The breakdown of costs to cost drivers was also mostly consistent across CBOs, with the largest costs made up of staffing and activista subsidies; office costs were low. More remote CBOs incurred additional training costs, as additional travel expenditures for activistas and trainers were required. Cost per beneficiary appeared to vary more by CBO location than by the number of beneficiaries served.

Comparing these findings to those of a similar study of OVC programs in six sub-Saharan African countries (Gobin, 2019), similar trends in the breakdown of costs were seen. Both studies found general personnel and supervision to be significant sources of costs, along with training and caseworker support. Office costs and transportation were less significant cost drivers, although the CBOs in this study had higher transportation costs and lower costs for training, on average, than those reported in Gobin 2019. We also found low variability in the cost drivers across CBOs in this study, compared to the variation documented between countries in the earlier study, which we would expect, as the COVida CBOs work under centralized guidelines.

Gobin (2019) finds costs per beneficiary ranging from US\$9.77 to US\$50.41, with an average cost of US\$22.21 per beneficiary. They note that staff often responded that they allocated a high proportion of their time to case management activities, without being able to define how their tasks related to case management. This was attributed to the integral nature of case management within OVC programs. These estimates for time spent on case management were also used to allocate office and capital costs. In our interviews, we also received seemingly high estimates of time spent on case management for overhead staff. We compared estimates of the percentage of expenditures reported for case management in the EA reports to the reported values for overhead staff time, and used the lower EA values instead, resulting in lower case management costs by comparison.

In terms of recommendations for future research, while we were not able to demonstrate the influence of nonmonetary incentives such as awards, certificates, and thank you letters due to the low variability and low necessity of this variable in the QCA model, it could be worth exploring their impact in a program where nonmonetary incentives are more common and more regularly used.

Based on our findings, to improve HIV testing outcomes we recommend the following actions for CBOs of the COVida project:

- ◆ Document and implement a formal process for assigning cases that considers case complexity and proximity, as well as activista caseload, experience, and skills. Activistas should not be assigned more than 50 cases, and 10 percent or less should be complex cases that require extended amounts of time. This will reduce activista overwork and burnout.
- ◆ Provide activistas with at least two types of external support, such as high-quality and weekly care team meetings, where direct managers meet with activistas to assist with challenges and hold activistas accountable to case management plans.
- ◆ Hire experienced activistas and provide all activistas with regular follow-up trainings so that activistas have the tools to address challenging cases and complicated issues. As PEPFAR/OVC programming evolves to focus increasingly on supporting HIV-positive children, programs will need to ensure that activistas and their supervisors are well trained to meet the programs' pediatric retention and adherence goals.
- ◆ Provide activista chefes, supervisors, and relevant CBO staff with ongoing supportive supervision and mentorship training. Ensure low supervision ratios so that managers are available and not overworked.
- ◆ Expand the financial resources offered to activistas, such as increasing stipends, implementing bonuses, and reimbursing activistas for work-related expenses to incentivize activistas to stay in their position longer and to increase satisfaction and motivation. Further analysis could investigate the relationship between cost and activista retention.

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APPENDIX A. Study Protocol and Data Collection Tools

An assessment of the actionable drivers of HIV outcomes: A study of the COVida case management system in Maputo Province, Nampula and Gaza

Study Protocol

May 2018



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ACRONYMS AND ABBREVIATIONS

ART	anti-retroviral therapy
CBO	community-based organization
HIV	human immunodeficiency virus
M&E	monitoring & evaluation
OVC	orphans and vulnerable children
PEPFAR	President's Emergency Plan for AIDS Relief
PI	principal investigator
QCA	qualitative comparative analysis
USAID	United States Agency for International Development

1. INTRODUCTION

1.1 Orphans and Vulnerable Children Programming

The HIV epidemic has exacted a formidable toll on children and their families. Currently, 13.4 million children are living without one or both parents due to the HIV epidemic; 80 percent of these children live in sub-Saharan Africa. In addition, 1.8 million children under age 15 are living with HIV (UNAIDS, 2018). Despite some decline in HIV adult prevalence worldwide and increasing access to treatment, the number of children affected by or vulnerable to HIV remains alarmingly high.

Globally, there is a large number of community-based programs to support children orphaned or made vulnerable due to the HIV epidemic. The objective of these programs, broadly speaking, is to reduce the vulnerability of orphans and vulnerable children (OVC) through a combination of monitoring, direct assistance and linkages to support structures. This research study relates specifically to programs funded through the President's Emergency Plan for AIDS Relief (PEPFAR).

PEPFAR OVC programming delivers family-centered interventions that seek to improve child well-being and mitigate the impact of HIV on children and families. The primary mechanism for service delivery and support is client case management. Clients are enrolled into a program, a caseworker is assigned, and the caseworker assesses client needs, outlines a care plan and a series of actions to achieve that care plan, monitors care plan achievement, and ultimately exits the client from the program once the care plan has been achieved.

Caseworkers may be part of the informal workforce or professionals – in most cases they are volunteers or stipend-paid members of the community who are trained by the program to provide services to clients, but otherwise have no formal social work training or qualifications. Caseworkers are usually supported by or linked to a community-based organization (CBO) – hubs for OVC program management. CBOs employ caseworker supervisors whose role is to review client files with caseworkers; support them in meeting clients' needs, support time management; assess training needs and identify training opportunities; and provide encouragement and support to help them cope with job stress (4Children, 2017; 4 Children, 2018).

The scope of these programs and their target population has shifted over time, matched with changes in the HIV epidemic. Originally, OVC programming under PEPFAR was established to provide support to “AIDS orphans” – to mitigate the impact of orphanhood. Once ART was scaled-up, and mortality rates started declining (and HIV prevalence started increasing), programs targeted HIV-affected communities, providing prevention and impact mitigation support to families. Now, in the countdown to epidemic control, OVC programs will have an expanding role in reaching the most vulnerable children with HIV services – testing and treatment – and in ensuring retention and adherence to ART. To this end, PEPFAR has introduced a new indicator referred to as OVC_HIVSTAT, which tracks whether the HIV status of OVC clients is known and documented, and if not whether OVC clients have had an HIV risk assessment. For those with documented HIV positive status, the indicator also tracks whether the OVC client is currently on anti-retroviral treatment (ART).

PEPFAR OVC programs are now revising their strategies to address these priorities, augmenting caseworker trainings to cover more HIV-focused material, and honing client referral strategies with health facilities. However, there is little evidence on how to best structure the case management intervention to meet these refined objectives and to deliver improved performance against OVC_HIVSTAT. This risks their ability to support epidemic control. Further, as donor resources become more strained, OVC programs are making tough decisions around how to meet targets with less. For instance, although an average caseload of 15-30 clients is recommended (4Children, 2018), many OVC programs have target caseloads of two to three times this number, and in reality, caseloads may be even higher than that.

Program managers and donors need to understand better what components of their case management system can be shifted, to maximize efficiencies and impact.

This study will produce evidence-informed, actionable recommendations to programs and donors in Mozambique and beyond, on how to shift their strategies, and ultimately, their resources, to optimally balance quality and cost.

1.2 The Mozambique context

HIV prevalence in Mozambique is 15.4 percent among women and 10.1 percent among men ages 15-49 years (MISAU et al., 2015). Among adolescents and young adults ages 15–24 years, HIV prevalence is 10 percent among females and three percent among males (MISAU et al., 2015). An estimated 200,000 children under 15 years are living with HIV and another 916,000 are orphaned or otherwise vulnerable due to HIV (PEPFAR, 2018).

Mozambique has successfully put more than 1 million people living with HIV on treatment, including approximately 75,000 children under 15 years (PEPFAR, 2019). However, this represents only half of people living with HIV in Mozambique (PEPFAR, 2018). Further, low rates of treatment retention, especially among children, adolescents, and young adults, threaten to undermine epidemic control. Program data indicates that only 70 percent of children living with HIV were retained 12 months after beginning treatment – less than 60 percent in Zambezia, Inhambane and Cabo Delgado (PEPFAR, 2019).

OVC programs in Mozambique have a clear mandate to improve outcomes across the clinical cascade for children and adolescents, beginning with identifying those who are living with HIV but who are undiagnosed, through to supporting ART adherence, and ultimately viral suppression. OVC programs provide “wrap around” services that address the underlying barriers to successful clinical outcomes and address the HIV prevention needs of HIV-affected communities and families.

1.3 The COVida project

The project has four key objectives:

Increase the utilization of quality social, health, and nutritional services among the children and caregivers within the target OVC households.

Reduce the economic vulnerability of OVC households so they can better provide and plan for the essential needs of the children in their care.

Increase the capacity of district government and communities to respond to and manage cases for vulnerable families and children.

The project supports roughly 300,000 OVC and caregivers per year to access high-quality, comprehensive, compassionate services nationally. Project activities include strengthening the capacity of networks of community-focused providers to initiate and retain clients in HIV and other care and refer them for onward services; strengthening village savings and loan groups to improve households’ access to financial products; and providing early childhood stimulation and nutrition-focused activities.

2. RESEARCH QUESTIONS

1. What is the relationship between the modifiable attributes of the COVida case management system¹¹ and the proportion of pediatric cases that have changed their reported HIV status from status unknown to status known/test not required based on a risk assessment¹²?
 - For each scenario that predicts a positive outcome, what is the tipping point (quantifiable marker) at which gains are lost?
2. What is the relationship between the modifiable attributes of the COVida case management system and the proportion of pediatric beneficiaries living with HIV that are (still) on antiretroviral therapy?
 - For each scenario that predicts a positive outcome, what is the tipping point (quantifiable marker) at which gains are lost?
3. What is the cost of providing casework by activists and what are the cost drivers of case management?

3. METHODOLOGY

3.1 Overview

This is a multi-method study involving analysis of de-identified routine COVida project data, brief interviews with approximately 112 COVida staff working in six community-based organizations (CBOs) and at the central level (Maputo), and compilation and analysis of project financial records to enable costing of case management.

3.2 Sampling

Our objective is to capture / collect data from six CBOs, including three working in rural areas, and three working in urban areas. COVida has CBOs in all 11 provinces in Mozambique; however, to minimize costs, we opted to apply a three-stage sampling approach. We first selected three provinces, Maputo Province, Gaza and Nampula, from which to select the CBOs, in collaboration with USAID and COVida. Province selection factors included: percentage of children living with HIV (estimated), percentage of children on ART, number of COVida beneficiaries, number of COVida beneficiaries who are HIV+, USAID priority status for a province, program stability (Zambézia was excluded due to recent changes in the program), and security (Cabo Delgado was excluded due to security concerns). From each province we selected two CBOs with the highest number of HIV positive beneficiaries served (first criterion, this was done to increase the probability for having data to answer research question 2) and among these, we selected one with low and one with high proportion of beneficiaries with unknown HIV status (second criterion, this was done to have a variation of low and high performing CBOs on this indicator). In each CBO we will randomly select 10 activists to abstract beneficiary data on outcomes of interest and conduct brief interviews. We will then interview their “chain of command” – their supervisors (activista chefes), case management supervisors, etc., as well as financial staff at each CBO. The CBOs selected, with brief characteristics, are presented in Table 1.

Table 1. Site characteristics

¹¹ Modifiable attributes include: caseload, training, supervision ratios, the quality and quantity of team meetings and supportive supervision visits, activista characteristics (e.g., education level), nonmonetary incentives received, and the degree to which the care team is networked to (available) reference services. Of note, we will only include in this study attributes which vary through the project. The variability of this list of attributes is to be determined with the project team. We will select up to five key attributes for the analysis in discussion with USAID. See Analysis section.

¹² This is a benchmark for all PEPFAR funded OVC projects – all children who are beneficiaries of the project need to have known HIV status or need to be risk assessed for HIV and be determined to not require a test.

CBO	Province	District	% of COVida pediatric beneficiaries with HIV status reported as unknown	Number of COVida HIV-positive pediatric beneficiaries	
1	ACIDECO	Maputo Província	Manhiça	17%	233
2	SANTAC	Maputo Província	Boane	3%	126
3	Reencontro	Gaza	Chibuto	16%	117
4	ACTIVA	Gaza	Mandlakaze	1%	109
5	Ovarelelana	Nampula	Cidade de Nampula	59%	83
6	Ukumi Ossulu	Nampula	Moma	29%	125

We will also collect cost data at the central project level in Maputo.

3.3 Measures and data collection sources

This study includes **two dependent variables**: change in HIV status knowledge among those beneficiaries for whom HIV status was unknown and HIV test was required based on risk assessment (research question 1) and change in ART treatment status (research question 2). All dependent variables will be captured using routine COVida data. HIV outcomes will be captured from the OVC_HIVSTAT indicator.¹³

To measure a change in HIV status knowledge, for each selected activista, we will focus on all beneficiaries who were reported on July 01, 2018 as having unknown HIV status and HIV test required based on risk assessment. For these beneficiaries, we will examine changes in their HIV status knowledge by June 30, 2019. The variable on change in HIV knowledge will be measured as the proportion of those beneficiaries who learned their HIV status between July 2018 and June 2019.

To measure changes in ART treatment status, for each selected activista, we will focus on all HIV-positive beneficiaries who were served on July 01, 2018. For these beneficiaries, we will examine changes in their ART status by June 30, 2019. A positive change in ART treatment status will be measured as the proportion of those beneficiaries who stayed on treatment or who initiated treatment between July 2018 and June 2019.

This study will explore the impact of approximately five **independent variables** on these two dependent variables. These independent variables will be chosen from the list in the table below (column 1), based on factors such as variability across the dataset, data quality and donor priorities.

Table 2. Illustrative independent variables and data sources

Illustrative independent variables	Primary data source	Secondary data source
Activista caseload	Routine data (at end of last quarter)	Interviews with CBO staff (activistas, activista chefes, supervisors, COVida)
Training received by activista	Routine data (paper records)	

¹³ If time and resources permit, we will also capture routine data from COVida's electronic child status index tool on school attendance, to allow for future analyses of this dependent variable.

		project coordinators, CBO managers)
Caseload complexity (to be defined following interviews)	Routine data	N/A
Supervision ratio (activista to chefe, chefe to supervisor)	Interviews with CBO staff (activistas, activista chefes, supervisors, COVida project coordinators, CBO managers)	
Quality of care team meetings (defined per COVida procedures, COVida, 2018)		
Level of supportive supervision		
Nonmonetary incentives		
Degree to which care team is networked		
Activista demographic characteristics, e.g., age, education		

3.4 Data collection methods

This study will involve three data capture/collection methods: (1) extraction of routine project data from existing COVida sources; (2) extraction of cost data from existing COVida records; and (3) semi-structured interviews with COVida project staff.

3.4.1 Routine project data extraction

We will extract de-identified HIVSTAT data for all beneficiaries of the activistas selected for the study, as well as data on their well-being from electronic Child Status Index records. Also, we will extract project data on caseload and training for the activistas in our study.

3.4.2 Cost data extraction

Retrospective cost and program data will be collected from multiple sources including budgets, work plans, expenditure summaries, accounting/financial accounts, and timesheets. We will strive to collect both economic and financial costs, depending on availability of data and feasibility. Key cost components to be measured include costs of start-up and program development, recurrent costs of program implementation and delivery (staff costs, materials, transportation), and capital costs or those whose useful life extends over multiple periods (vehicles, buildings, equipment). If available, we will also capture equipment/asset inventories to estimate the annual equivalent cost of these items. We will also document economic costs, such as donations for program implementation, and determine their market value by asking what it would cost to obtain these items or labor on the open market. Donations include both those items/time given free-of-charge and items/time given to the program at a subsidized price.

Costs will be collected from both the COVida project at the central level, and from one CBO in each province.

3.4.3 Interviews with COVida staff

We will conduct semi-structured interviews with COVida staff at CBO level as well as at the central level. This is the only primary data collection proposed in this study. Specific sampling and recruitment procedures for each type of staff are outlined below. All potential participants will receive an information sheet about the study and data collectors will seek and document informed consent prior to beginning data collection. Data collectors will then administer the questionnaire to participants individually and privately, with their informed consent. All interviews will be conducted in a private space at the CBO or partner office. Interviews will last between 30-45 minutes. Please see Appendices A and B for the information sheets, consent forms and data collection tools.

Interviews with activistas: We will conduct brief semi-structured interviews with 10 randomly selected activistas at each site. Activistas that started work before January 1st, 2019 and are still working on the day of data collection, will form the sampling frame. We will request a list of all activistas that started work before January 1st from the CBO, and randomly sample from that list. We will share the list of requested participants (an oversample, of 12, to account for recruitment challenges), and ask that the CBO to gather these activistas at different times on the day of data collection.¹⁴ We will share information about the study with the CBO, to share with their activistas, in advance of the study, so they are aware of the possibility of being selected to participate.

Trained data collectors will elicit information about their caseload, training, the supportive supervision they receive, the quality of their care team meetings, the nonmonetary incentives they receive, the degree to which the care team is networked to reference services in the area, and their demographic characteristics (education, years working as an activista, etc.). In these interviews, data collectors will also elicit information on activistas' work satisfaction, their suggestions for ways to improve quality of

¹⁴ If all 12 individuals are available and consent to participate, we will interview all 12. If fewer than 8 are available and consent, we will work to recruit another activista on the data of data collection.

services, the amount of time that they spend working for COVida and any costs they incur that are not met by the project.

Interviews with activista chefes, supervisors, COVida project coordinators and CBO managers:

We will conduct brief semi-structured interviews with all activista chefes that support selected activistas, their supervisors, and the COVida project coordinator and/or CBO manager. We anticipate that we will interview up to three activista chefes per site, and two supervisors, though this will depend on the supervision structure unique to each CBO. We will work with the CBO in advance to identify the activista chefes that support the selected activistas, as well as their supervisors, and arrange a time to interview them, as well as the COVida project coordinator and/or CBO manager. In these interviews, trained data collectors will elicit information on supervision structures and ratios, the level of supportive supervision, the quality of care team meetings, nonmonetary incentives given to activistas and the degree to which the care team is networked to other reference services in the area. Data collectors will also inquire about the process of assigning cases to activistas and determining their caseload, activistas turnover, and challenges with staff recruitment and retention. Also, data collectors will elicit information to support organization and assignment of costs and interpret quantitative findings on cost estimation.

Interviews with CBO finance and monitoring and evaluation (M&E) staff, and central level

COVida staff: In two of the sampled CBOs (one urban, and one rural), we will interview the finance manager and M&E lead. We will also interview approximately five staff at the central level, including the Chief of Party, the Finance Director and the M&E Specialist, and some of their support staff. The purpose of these interviews is to elicit contextual information about costs such as how they are tracked, as well as on cost categories. Data collectors will schedule a time to speak with these staff in advance of data collection. Interviews will be conducted at the COVida office.

SUMMARY: From each CBO we expect to interview 18 people (10 activistas, 3 activista chefes, 2 supervisors and 3 other staff). In total we expect to interview 60 activistas, 18 activista chefes, 12 supervisors, 6 COVida project coordinators/CBO managers, 6 CBO M&E Advisors and 6 CBO finance managers. At the central level, we expect to interview up to five COVida partner staff. This brings the total number of anticipated interviewees to 112.

Areas of inquiry, by staff type, are summarized in Table 3. Shaded columns refer to the costing component (research question 3).

Table 3. Areas of inquiry by COVida staff type

Topic	CBO staff			COVida partner staff
	Activistas	Activista chefes, supervisors, project coordinators, CBO managers	Finance Manager, M&E Advisor (6 sites)	
Demographic characteristics	X			
Training	X			
Caseload	X			
How cases are assigned		X		
Quality of care team meetings	X	X		
Level of supportive supervision	X	X		
Supervision ratio		X		
Nonmonetary incentives	X	X		X
Degree to which care team is networked	X	X		
Work satisfaction	X			
Time spent working for COVida	X			
Out-of-pocket costs in working for COVida	X			
Challenges in recruiting and retaining activistas		X		
Program costs		X	X	X

3.5 Data collection team

Data collection at CBO level will be carried out by three, four-person data collection teams. Teams will include a Team Lead, who will be responsible for site-level coordination (and for conducting some interviews), a (second) interviewer, and two notetakers. In two sites, a fifth member to the team will be added to capture the financial data of the CBO. Data collection at the central level (related to the costing element of the study), will be conducted by one of the study Co-Investigators.

Members of the data collection team will be selected based on level of education (a university degree is required), prior experience conducting qualitative interviews, knowledge of the study areas, and fluency in study languages. Other criteria for selection include maturity, friendliness, and ability to travel. We will ensure a gender balance during recruitment of the data collection team.

The study team will conduct one four-day data collector training workshop, led by the local Principal Investigator (PI), supported by Palladium Investigators. The ultimate objective of the training is to provide the data collectors with a thorough knowledge and skill base to take on their roles as interviewer and/or notetaker, or financial data specialist, and to ensure high-quality data and ethical conduct of the study. The training will be classroom- and field-based, using participatory techniques and practical exercises. It will comprise: (1) facilitated sessions on the overall aims of the study and its procedures,

including conducting interviews, recording and note-taking, coding responses, transmitting data, quality assurance, the questionnaire, and ethical procedures; (2) mock interviews to test the tools and processes and practice skills; and (3) a field-based pilot test. Data collectors will receive special instruction on the collection of cost data.

3.6 Quality control

Sampling will be conducted by Palladium; recruitment and data collection will be carried out by an experienced and well-trained data collection team (as described above), overseen by Mozambique-based Principal Investigator (to be determined – see Study Management section below). The local PI will vet all members of the data collection team, will lead the data collector training, instrument pilot testing and field work. The Palladium PI will participate in the data collection training including a field practicum, instrument pilot testing and data collection, working hand-in-hand with the local PI. Following each interview, members of the data collection team will review the notes and response coding (see Analysis section below). Interviews will be tape recorded (if consent for recording is granted), ensuring a record of what transpired. These recording will enable the analysts to spot check the validity of coding done in the field and determine the inter-rater reliability of coding (see below).

After data collection in a site has been completed, the data collection team and the local PI will review learning to inform data collection at the next site and ensure communication protocols with COVida are being followed. Two analysts – the local PI or designate and the Co-Investigator for Qualitative Research (see Management section below) will analyze data jointly.

3.7 Data management

During data collection, all data will be managed and overseen by the data collection team lead in the study area. Digital recordings from interviews will be uploaded into a cloud with password access and deleted from the recording devices. Notes, coding sheets and signed consent forms will be stored separately – consent forms will be stored together, coding sheets and notes will be stored together. (Coding sheets and notes will not include participants' names.) The data collection team lead is responsible for moving data securely back to Maputo and handing them over to the local PI. Once in Maputo, data and consent forms will be stored (separately) in a locked cabinet (when not in use for data analysis) in the office of the local research partner.

3.8 Data analysis

3.8.1 Research question 1 (casework and changes in HIV status knowledge)

We will apply “fuzzy set” qualitative comparative analysis (QCA) (Ragin, 1987, 2000, 2008; Rihoux and Ragin, 2008) to analyze the causal contribution of the different modifiable attributes of the OVC program, in addition to the contextual factors (e.g., location), to the two outcomes (changes in knowledge of HIV status, and ART treatment status). We will document the different configurations of factors or conditions associated with each case of an observed outcome, and work towards defining the simplest set of conditions that account for all the observed outcomes, as well as their absence. This type of analysis will provide information when and where different modifiable factors are important in producing outcomes.

The *activista* is the unit of analysis. A score for the dependent variable will be calculated for each *activista* and scores for each independent variable will be calculated for each *activista*, using data from all sources. The objective is to create a record of scores for each variable for each *activista*.

Calculating the dependent variable: As noted above, the data source for the dependent variable is routine COVida data. For each *activista* in the study, we will calculate the changes in knowledge of HIV

status among beneficiaries and categorize this variable as high, medium or low proportion for the QCA analysis. If project data allow, we will calculate the proportion of pediatric beneficiaries with HIV test referrals made (among those who needed a referral based on HIV risk assessment) as well as the proportion of referrals completed.

Calculating the independent variables: For some independent variables such as caseload, the data source is routine COVida data. For other independent variables, such as level of supportive supervision, the data source is interviews with activistas, activista chefes, supervisors and CBO managers. In calculating variables such as case complexity, we will rely on both interviews (to identify case complexity factors) and routine COVida data from the Child Status Index (to calculate the proportion of beneficiaries with these factors). Data analysts will review the distribution across all respondents and assign codes for each level of independent variable based on this distribution. Depending on data distribution, each independent variable will be assigned one of two (high, low) or one of three codes (high, medium and high).

The next step is to transform interview codes into the activista records to create the final coding matrix. For some variables, where the activista is the data source and where there are no additional data sources, this is straightforward. For instance, interview codes about demographic characteristics about the activista will simply become part of the final coding matrix. Most variables have a secondary data source, e.g., level of supportive supervision. In these instances, the analysts will reconsider each of the interview codes from the primary data source (activista interviews) in light of the interview codes assigned from the secondary data source (activista chefe interviews), using interview notes. This may result in adjustments to the code for a given activista before this code is written into the final coding framework. All final codes for each variable for each activista will be recorded.

Once the final coding matrix has been developed, we will assess variability and data quality across the independent variables and select with stakeholders up to five independent variables to include in the qualitative comparative analysis. The analysis must be limited to five independent variables to enable clear and actionable recommendations to follow.

Codes for the dependent variable will be added to create the final matrix or so-called Truth Table: see Table 4.

Table 4. Illustrative “Truth Table”

Activista	Independent variables (high, medium or low)					Changes in HIV status knowledge
	1 (e.g., caseload)	2	3	4	5	
1	High	Medium	Low	High	Medium	High
2	Low	Medium	High	Low	Medium	Low
3	...					

Data from the Truth Table will be analyzed using software (Compass). The final outputs will yield an analysis of the modifiable factors in case management that influence outcomes, in which circumstances. The analysis will produce information on whether the factor influences outcomes when high, medium or low. For instance, the analysis will demonstrate if caseload is a factor in meeting outcomes, when high, medium or low, in a range of contexts. This will serve to identify the “tipping point” at which caseload becomes a factor (e.g., when medium, when high, all the time).

3.8.2 Research question 2 (casework and changes in ART treatment status)

To answer research question 2, we will apply the same methods described above, using changes in ART treatment status as the dependent variable. The coding framework for all independent variables will

remain unchanged; however, cases may be dropped from the analysis. This analysis will be restricted to activistas that have HIV positive pediatric clients.

Calculating the dependent variable: As noted above, the data source for the dependent variable is routine COVida data. For each activista, we will calculate changes in the proportion of HIV-positive pediatric beneficiaries on ART and categorize this variable as high, medium or low proportion for the QCA analysis.

3.8.3 Research question 3 (costing)

We will use a combination of activity-based coding and step-down costing approach, through which we will categorize, assign, and allocate program costs. Program beneficiary data will also be used to calculate cost per beneficiary. The following steps will be used to accomplish this task:

Organize the program-specific financial reports, reviewing the financial reporting databases that document annual itemized expenditures, and group expenses into logical categories.

Reorganize and link financial report sub-categories to financial report input cost categories that describe the financial cost profile of the program. This involves reorganizing the information contained in financial reports into logical expenditure groups for key categories of inputs used in program implementation.

Identify and allocate a portion of shared organizational costs not attributed to specific programs.

Cost allocation is the assignment of costs to various, particular cost-centers, typically technical areas or service areas. Cost allocation takes place following the collection of financial records and detailed determination of program structure. There are three main steps in cost allocation:

1. Select and describe cost objects
2. Identify and accumulate overheads to be assigned to cost objects
3. Chose a method and allocation base for overhead allocation

Content analysis (using a framework of preestablished content areas) of qualitative interview notes will support organization and assignment of costs. Qualitative results will be used to explore, contextualize, and interpret quantitative findings. We will also use exploratory and confirmatory coding and transform some of the qualitative data into quantitative results and generate summary tables and visualizations of the qualitative data for reporting results.

3.8.4 Contextualizing findings

To contextualize findings we, as outlined above, will also elicit information from activistas on time spent working for COVida, their work satisfaction and their ideas for improving quality of care. From activista chefes and CBO managers will elicit information on how cases are assigned; and issues related to recruiting and retaining activistas. Key issues will be recorded in the questionnaires and entered for the analysis. Data analysts will review all responses and present a summary of main findings, applying the Framework analysis method (Ritchie & Lewis, 2003). We will use this information to explain some of the findings from the QCA analysis as well as present respondents' recommendations for program improvement.

3.9 Data storage and sharing

Digital audio files and any transcripts, interview notes and financial data will be stored on password-protected computers and made available to study co-investigators for analysis, as needed through the study period. Hardcopy consent forms will be stored in a secure filing cabinet accessible only to the local

PI. All digital and hard-copy materials will be stored after the study by the local PI for a period of three years.

3.10 Study Limitations

This is a robust study design to answer the research questions and provide actionable evidence to USAID and partners in managing their OVC programs. That said, there are limitations. These are outlined here:

- The quality of the routine data will impact the strength of the analysis and recommendations. The first step of analysis will be an assessment of the quality of routine data. The analysis plan will be adjusted depending on data quality for each indicator.
- This study will not consider clinical, and community level factors that affect outcomes. Individual level factors will vary, but these will be taken into account by including data from all beneficiaries served by randomly selected activists.
- For those independent variables that have more than one data source, we will need to make a decision on the type of data source to rely on if these data sources provide contradicting information. We will train data analysts and establish a system where more than one analyst is involved in the process of assigning codes in these cases.
- Due to the study design, we will be able to examine relationships between variables of interest, however, we would not be able to establish causality.

4. HUMAN SUBJECTS, CONFIDENTIALITY, AND DATA SECURITY CONSIDERATIONS

4.1 Human Subjects' Considerations and Ethics Review

All study activities will adhere strictly to Mozambican and U.S. research ethics guidelines, including 45CFR46 and CIOMS.

In line with ethical practices, stringent procedures to uphold the fundamental principles governing research on human participants will be followed. All members of the study team have undertaken an ethics course, and their research ethics certification is current. Field teams will be trained and sensitized on ethical issues during data collection training. Importantly, during data collection, study managers will carry out spot checks to ensure that research ethics are being upheld and that the participants are not harmed or exposed to unnecessary risk.

We are seeking institutional review board (IRB) review and approval from the Comitê Nacional de Bioética para a Saúde (CNBS) in Mozambique and Health Media Labs, Inc., in Washington, D.C., USA.

4.2 Assessment of Risks and Benefits to Participants

4.2.1 Potential Risks

There is little to no risk involved in this study to participants. The study does address sensitive issues related to HIV; however, all data on COVida beneficiaries' HIV status or HIV treatment will be deidentified by COVida before it is shared with the research team for analysis. Identifiable client information will not be shared with the research team. In interviewing COVida staff, we will not ask about HIV, only about their demographic and job-related attributed, as outlined above. Particular care will be taken to ensure that all questions are asked in a supportive and nonjudgmental manner. Respondents will be free to stop participation at any point or choose not to answer specific questions. The maximum effort will be made to ensure that all participants are not harmed physically, emotionally, socially, or in any in other ways.

4.2.2 Potential Benefits

There will be no direct benefit to participants for participating in this study, beyond any psychological benefits possibly associated with sharing their insights and experiences. However, the information provided may improve the quality of care received by PEPFAR OVC beneficiaries and may address workload imbalances among CBO staff and activists.

4.3 Informed Consent Process

The informed consent process for interview participants will be individualized and private, in that the data collectors will privately share information about the study with each potential participant and seek documented informed consent. Before all interviews, potential participants will be given a study information sheet. Participants may choose to read the information sheet themselves or have the data collector read it aloud to them. The information sheet will explain the purpose and nature of the study, the expected risks and benefits, and how long the session will last. It will also provide contact information for the study team. All potential participants will be made aware that their participation is voluntary and does not affect their jobs. All participants will be informed that the data collected will be held in strict confidence. The information sheet will explain that participants are free to terminate the interview at any point, and to skip any questions they do not wish to answer. After reading the information sheet or having it read to them, the participant will be given the chance to ask questions. The data collector will probe the respondent with questions to ensure adequate comprehension. Once there are no further questions, the data collector will read the consent form and seek informed consent. Informed consent will be administered in the language preferred by the participant. Participants may retain the information sheet.

We aim to audio record interviews. We will seek documented informed consent for this. If consent is not granted, we will not audio record the interview.

4.4 Compensation

No compensation will be provided to any participants.

4.5 Data Security and Confidentiality Considerations

The information provided by respondents will be held in strict confidence. All members of the study team will be thoroughly trained in confidentiality and required to sign an understanding of confidentiality document. Interviews will be conducted in a private setting where participants cannot be observed or overheard by others. Only direct participants and members of the data collection team will be present during data collection.

There is one exception as to when confidentiality may be breached. If during an interview the data collector learns of a current abusive situation or if there is evidence that a participant is in serious danger (emergency), then the data collector will report the case to the lead local researcher who, in turn, will report the case to the CBO/project team, as appropriate. Participants will be made aware of this exception through the following statement included on the consent form:

Everything you say today is confidential. There is one exception. If you tell us about a client who is in danger, and not being adequately helped, or if you think you might counseling or support, we will inform a member of the COVida team to make sure your client or you are helped.

With the exception of the above instances where a breach of confidentiality is necessary, COVida staff will not be made aware of individual participants' responses.

When in the field, consent forms and notes will be stored in a locked safe under the care of the lead local researcher. Audio recordings will be uploaded to a cloud immediately after the discussion, and subsequently deleted from the recording device. Electronic recordings will be stored on a password-protected computer for three years and hard-copy notes and consent forms will be stored by the local PI for three years in a locked cabinet, as outlined above.

The first names of participants will be captured during sampling. These will be replaced with numbers during analysis and the sampling file with names will be destroyed after data collection. Any transcriptions will not include names of participants.

Particular care will be taken during the presentation of the study findings that the information presented is sufficiently aggregated to ensure that no single individual can be identified. Any quotes that are presented will be illustrative and contain no potentially identifying information.

5. RESULTS AND DISSEMINATION

5.1 Expected Results

The results of this study will include:

- Information on whether various factors, at different levels of intensity, predict HIV outcomes under different conditions.
- The level of intensity at which various factors predict poor HIV outcomes, under different conditions.
- A detailed assessment of the costs of case management including the cost per beneficiary and the cost drivers of case management.

5.2 Dissemination Products

We will develop a final report and an accompanying brief and PowerPoint presentation, outlining findings from the study. If time and resources permit, we will also publish results through conference presentations, such as at the *Jornadas Nacionais de Saúde* conference in Maputo in September, and in peer-reviewed journals.

6. STUDY MANAGEMENT

This study will be conducted under the MEASURE Evaluation project funded by USAID and PEPFAR.

6.1 Stakeholder Engagement

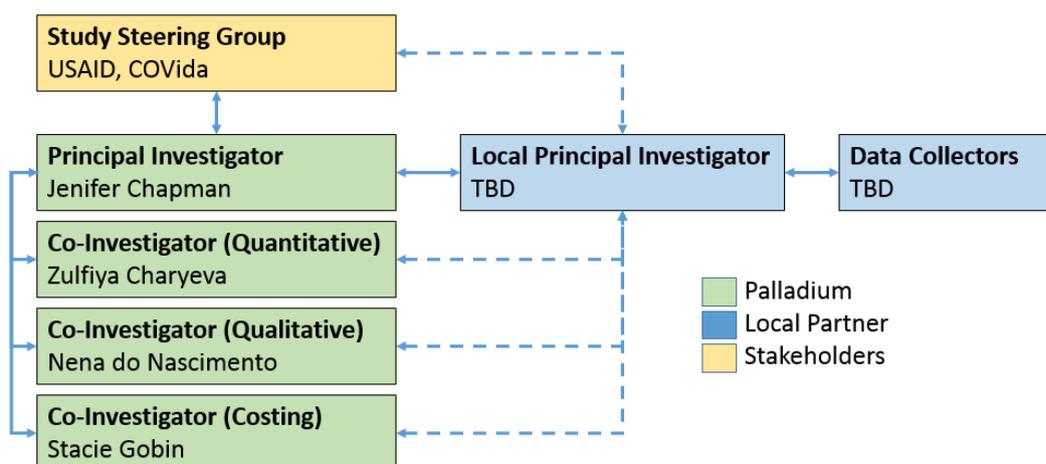
This study was conceptualized by representatives of USAID/Mozambique, and USAID/Washington, under the leadership of Palladium. This study will be conducted in consultations and collaborations with the FHI360-led, USAID-funded COVida project; USAID/Washington; and USAID/Mozambique.

6.2 Staffing and Management

The management structure for the study is depicted in Figure 1. The study will be managed by Palladium, led by Principal Investigator Jenifer Chapman, in partnership with Co-Investigators Zulfya Charyeva (quantitative), Nena do Nascimento (qualitative) and Lauren Morris (costing). Palladium will contract a local research partner, and this partner will identify a local Principal Investigator. The local Principal Investigator will manage data collection (and the data collection team) and will participate in data analysis

and dissemination. The entire research team will be advised by the study steering group comprised of USAID and COVida personnel. See Figure 1.

Figure 1. Study management structure



6.3 Study Timeline

A study timeline is presented in Table 5.

Table 5. Timeline

Task	Feb.	March	April	May	June	July	August	Sept.
Develop protocol	X							
CNBS review		X	X					
Contract local research partner		X	X	X				
Extract deidentified routine data				X				
Analyze routine data				X	X	X		
Prepare for primary data collection				X				
Train data collectors					X			
Collect primary data					X			
Compile data						X		
Analyze data						X	X	
Develop products							X	X
Disseminate results								X

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Appendix A. Information Sheets and Consent Forms

- Information sheet: Activistas
- Information sheet: Activista chefes and other CBO staff
- Consent form for all study participants

Information Sheet: Activistas

Introduction

You are being invited to take part in a research study. Before you decide whether or not you want to participate, it is important for you to understand the purpose of this study and what participation will involve. I'm going to read some information to you about the study. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. *[Alternatively, if they prefer and can read: Please take time to read the following information carefully. Thank you for reading this.]*

What is the purpose of the study?

The purpose of this study is to learn more about the features of the COVida case management system that influence HIV related beneficiary outcomes. The study will also estimate costs of providing casework by activists and identify the cost drivers of case management. This study is taking place in several provinces in Mozambique.

What does participation in the study involve?

We would like to invite you to participate in an interview. The interview will be led by a trained data collector supported by a note-taker. During the interview, the data collector will pose questions regarding your current caseload, your main responsibilities, type of training that you received, the role of your supervisor, and any suggestions you have on ways to improve beneficiary outcomes. These questions will be read from a questionnaire and the note-taker will write down what you say. An assigned ID, but not your name, will be written on this questionnaire.

You will not be asked to share any personal details during the interview, other than your age and education level. If, for any reason, you would prefer not to answer any specific question, you are free not to. If at any time during the interview you would like to stop participating, you may. You can stop altogether or take a break.

If you choose to participate, we ask that you be truthful, to the best of your knowledge, with all the information that you provide. Your honest answers to our questions will help us improve case management and ultimately better address the HIV epidemic in Mozambique.

With your consent, we would like to tape-record the interview so that we may better capture the details of what you say and recall what has been said after the interview.

You will be interviewed in private, at the organization where you work. No one else will be nearby when we conduct the interview; no one else will be able to hear your responses.

Your participation in this study will require approximately 45-60 minutes of your time (15 minutes for you to read the information sheet and consent form and decide whether you want to participate, and up to 45 minutes for the interview).

Why have YOU been chosen to participate?

You were randomly selected to participate in this study. We selected 10 activists from nine different organizations to participate in this study completely at random from a list of all activists working for COVida through these organizations. We are hoping to interview 90 activists in total, as well as approximately 50 other staff from these organizations. Your participation is purely voluntary. It is up to you to decide if you want to participate after reading this information.

Will the information I give you be kept confidential?

Your participation will be kept completely confidential. Your name will not be written on the questionnaire, any notes, or included in the audio file. No one will be able to trace the information you provide to us back to you. Statements from the interview might be used in the study report and in publications, but we will not attribute these statements to you or any other study participant.

In keeping with guidelines for good practice, audio files from the interviews will be stored on a password-protected computer with the study team for a period of three years.

Discomforts and risks

Considerable precautions have been taken to minimize any psychological, social or legal risks and discomforts to you if you decide to participate. Still, we understand that participation in an interview may be uncomfortable for some, and that the topics of discussion are sensitive.

Costs

We request one hour of your time.

Compensation

We greatly appreciate your willingness to consider participation in this study, however we will not be providing any monetary compensation for your participation. We will reimburse your transport expenses to the interview.

Study benefits

Although there is no immediate direct personal benefit to you the data generated from this study will be used to improve HIV testing and treatment for children and adolescents.

Rights to refuse or withdraw

This is a reconfirmation that you do not have to take part in this research if you do not wish to do so. You may also stop participating in this research at any time you choose. It is your choice and your rights will be respected.

What will happen to the results of the study? Will YOU have access to them?

The results of the study will be published in a report and possibly an academic journal. No persons will be identified in any report or publication. If you desire a hard-copy of any of the publications, you may contact a Study Investigator (contact details provided below) and request this.

Who is organizing and funding the research?

This study is managed by Palladium as part of the MEASURE Evaluation project. The study is being funded by the U.S. President's Emergency Plan for AIDS Relief via the U.S. Agency for International Development.

Who YOU can contact for more information?

If you have additional questions, you may call the local team lead, Rotafina Donco at [insert number]. This study has been reviewed and approved by the Comitê Nacional de Bioética para a Saúde (CNBS) Research Ethics Committee, which is a committee whose task it is to make sure that research participants are protected from harm. If you have any questions relating to your rights as a study participant, you can contact them at 82-406-6350.

THANK YOU. We appreciate your consideration.

You may keep this Information Sheet.

Information sheet: Activista chefes, Supervisors, other COVida staff

Introduction

You are being invited to take part in a research study. Before you decide whether or not you want to participate, it is important for you to understand the purpose of this study and what participation will involve. I'm going to read some information to you about the study. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

[Alternatively, if they prefer and can read: Please take time to read the following information carefully. Thank you for reading this.]

What is the purpose of the study?

The purpose of this study is to learn more about the features of the COVida case management system that influence HIV related beneficiary outcomes. The study will also estimate costs of providing casework by activistas and identify the cost drivers of case management. This study is taking place in several provinces in Mozambique.

What does participation in the study involve?

We would like to invite you to participate in an interview. The interview will be led by a trained data collector supported by a note-taker. During the interview, the data collector will pose questions regarding your main responsibilities, decision making process regarding activistas' caseload and type of cases assigned, type of training received by activista, their compensation, supportive supervision practices, activistas' turnover, and case management costs. These questions will be read from a questionnaire and the note-taker will write down what you say. An assigned ID, but not your name, will be written on this questionnaire.

You will not be asked to share any personal details during the interview, other than how long you have been in your current position. If, for any reason, you would prefer not to answer any specific question, you are free not to. If at any time during the interview you would like to stop participating, you may. You can stop altogether or take a break.

If you choose to participate, we ask that you be truthful, to the best of your knowledge, with all the information that you provide. Your honest answers to our questions will help us improve case management and ultimately better address the HIV epidemic in Mozambique.

With your consent, we would like to tape-record the interview so that we may better capture the details of what you say and recall what has been said after the interview.

You will be interviewed in private, at the organization where you work. No one else will be nearby when we conduct the interview; no one else will be able to hear your responses.

Your participation in this study will require approximately 45-60 minutes of your time (15 minutes for you to read the information sheet and consent form and decide whether you want to participate, and up to 45 minutes for the interview).

Why have YOU been chosen to participate?

You are being invited to participate in this study due to the nature of your job as an activista chefe, CBO manager, finance manager, or M&E officer. We selected representatives from nine different organizations to participate in this study. We are hoping to interview 90 activistas in total, as well as approximately 50 other staff from these organizations, including you. Your participation is purely voluntary. It is up to you to decide if you want to participate after reading this information.

Will the information I give you be kept confidential?

Your participation will be kept completely confidential. Your name will not be written on the questionnaire, any notes, or included in the audio file. No one will be able to trace the information you provide to us back to you. Statements from the interview might be used in the study report and in publications, but we will not attribute these statements to you or any other study participant.

In keeping with guidelines for good practice, audio files from the interviews will be stored on a password-protected computer with the study team for a period of three years.

Discomforts and risks

Considerable precautions have been taken to minimize any psychological, social or legal risks and discomforts to you if you decide to participate. Still, we understand that participation in an interview may be uncomfortable for some, and that the topics of discussion are sensitive.

Costs

We request one hour of your time.

Compensation

We greatly appreciate your willingness to consider participation in this study, however we will not be providing any monetary compensation for your participation.

Study benefits

Although there is no immediate direct personal benefit to you the data generated from this study will be used to improve HIV testing and treatment for children and adolescents.

Rights to refuse or withdraw

This is a reconfirmation that you do not have to take part in this research if you do not wish to do so. You may also stop participating in this research at any time you choose. It is your choice and your rights will be respected.

What will happen to the results of the study? Will YOU have access to them?

The results of the study will be published in a report and possibly an academic journal. No persons will be identified in any report or publication. If you desire a hard-copy of any of the publications, you may contact a Study Investigator (contact details provided below) and request this.

Who is organizing and funding the research?

This study is managed by Palladium as part of the MEASURE Evaluation project. The study is being funded by the U.S. President's Emergency Plan for AIDS Relief via the U.S. Agency for International Development.

Who YOU can contact for more information?

If you have additional questions, you may call the local team lead, Rotafina Donco at [insert number]. This proposal has been reviewed and approved by the Comitê Nacional de Bioética para a Saúde (CNBS) Research Ethics Committee, which is a committee whose task it is to make sure that research participants are protected from harm. If you have any questions relating to your rights as a study participant, you can contact them at 82-406-6350.

THANK YOU. We appreciate your consideration. You may keep this Information Sheet.

Consent form

Hello, my name is [*insert name*]. I work as a [*insert position title*] at [*insert name of local partner*]. As you heard or read from the Information Sheet, together with the U.S. Agency for International Development, we are gathering information about the features of the COVida case management system that influence HIV related beneficiary outcomes.

The findings of this study will support the Government of the Republic of Mozambique to modify case management to improve beneficiary outcomes related to HIV.

This interview will take less than 1 hour. I would like to emphasize that there are no right or wrong answers.

All information provided by you will be kept private. Your name will not be documented anywhere or referenced in any presentation or report.

Again, your participation in this discussion is completely voluntary. You may choose not to answer any question, if you so prefer. However, we thank you for your willingness to respond honestly and openly to questions that we will ask you.

Do you have any questions about the study or your participation?

[ANSWER ANY QUESTIONS. IF ALL QUESTIONS ARE ANSWERED, PROCEED.]

Recording

By agreeing to participate in the study, you will also be giving us your permission to record our conversation today so that later we can recall all the information that you will provide. The recording will be stored on a password-protected computer belonging to the study team for a period of three years.

Do you have any questions about recording?

[ANSWER ANY QUESTIONS. IF ALL QUESTIONS ARE ANSWERED, AND INDIVIDUAL WOULD LIKE TO PARTICIPATE, PROCEED WITH DOCUMENTATION OF INFORMED CONSENT.]

PARTICIPANT STATEMENT AND SIGNATURE FOR PARTICIPATION

I certify that the study has been explained to me, that all my questions have been answered satisfactorily, and that I voluntarily agree to participate in the study. I understand I am free to discontinue participation at any time if I so choose. *If I do not agree, I do not need to sign.*

Signature or Thumb print of Participant: _____

[Box for Thumbmark]



Date: _____

PARTICIPANT STATEMENT AND SIGNATURE FOR TAPE-RECORDING

I certify that I understand that this interview will be recorded, and that all my questions on the recording have been answered satisfactorily. I voluntarily agree to take part in this recorded interview. *If I do not agree, I do not need to sign.*

Signature or Thumb print of Participant: _____

[Box for Thumbmark]



Date: _____

INTERVIEWER'S STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to learn about the study. All questions and clarifications raised by the participant have been addressed.

Signature of Interviewer (who sought consent): _____

Printed name of Interviewer (who sought consent): _____

Date: _____

Appendix B. Data Collection Tools

- Interview Guide with Activistas
- Interview Guide with Activista Chefes and Supervisors
- Interview Guide with COVida Project Coordinators / CBO Managers
- Interview Guide for other COVida Staff (Costing)

Interview Guide with Activistas

Name of Interviewer:	
Date of Interview (day/month):	
Name of the CBO:	
Length of Interview (minutes):	_____ minutes

1	Record Sex	Female	1
		Male	2
2	How old are you?	_____ years	
3	What is the highest level of education that you have completed?	Primary	1
		Secondary	2
		Technical/Professional	3
		University	4
4	a) How long have you been working as an activista with COVida (in years)	a) _____ years	
	b) <u>If less than one year, indicate number of months.</u>	b) _____ months	
5	a) Before coming to COVida, had you been an activista in another program?	Yes No	1 2 (SKIP to #6)
	b) Which program? Any others? <u>List all mentioned.</u>		
	c1) For how long were you working as an activista in that program/those programs (in years)? c2) <u>If less than one year, indicate number of months.</u>	a) _____ years b) _____ months	
6	Have you previously been a beneficiary of an OVC program?	Yes	1
		No	2
7	What is your current caseload?	_____ households	
	a) How many households do you serve? b) How many clients is this, roughly? Please include children and the one primary caregiver in each household.	_____ clients	
8	In which administrative posts do you work? <u>List all mentioned.</u>		
9	a) Approximately how many hours in total do you spend working for COVida in a typical week?	a) In total	_____
	b) How many of these hours do you spend with clients?	b) With clients	_____
	c) How many of these hours do you spend travelling to and from clients' houses?	c) Travelling	_____

	d) How many of these hours do you spend talking about your cases or other work related issues with your supervisor, care team or someone else in the care network?	d) Case conferencing	_____
	e) How many of these hours do you spend filling in forms or carrying out other administrative tasks? <u>Total all hours and make sure final tally is sensical. Adjust response to A if needed.</u>	e) Administrative tasks	_____
10	a) How long do you spend with a household, on average? b) What is the minimum number of minutes that you spent with a household? c) What is the maximum number of minutes that you spend with a household? <u>Record average amount of time in minutes and provide minimum and maximum time in the household.</u>	a) _____ average minutes b) _____ min minutes c) _____ max minutes	
11	We know activists spend different amounts of time with clients, based on their needs. What types of clients require more of an activista's time? What qualities do they have? <i>[Probes: clients experiencing violence, clients who are HIV-positive.]</i> <u>List all types of clients that require more time and qualities associated with these clients.</u>		
12	a) Do you have enough time to meet the needs of all of your clients?	Yes No	1 2
	b) Please explain your response.		
13	Please tell me about all of the trainings that you have taken part in to prepare you to work as an activista for COVida. I am interesting pre-service trainings, in-service trainings and any orientations you have received on the job. a) Specifically, what did you learn in these trainings? <u>List main topics</u>		
	b) I'm interested in finding the number of days of training you have had to work as an activista for COVida. Let's figure this out together. <u>Work with respondent to go through all trainings since they started working for COVida and assign number of days for each. Tally these and record total number of training days.</u>		_____ days
	c) Please describe the format of the trainings. <u>Probe with each item if necessary. Answer all questions.</u>		
	1. The training included lectures.	Yes =1	No =2
	2. The training included role playing, hypothetical scenarios, or other hands-on activities.	Yes =1	No =2
	3. The training included shadowing another activista.	Yes =1	No =2
	4. The training provided me with materials (e.g., handouts, flyers, manuals).	Yes =1	No =2
	5. The training included quizzes or tests to confirm what I learned.	Yes =1	No =2
	d) How well do you feel that your COVIDa training prepared you to do your work as an activista? <u>Record one option.</u>	My training prepared me to undertake <u>all</u> tasks in my daily work My training prepared me to undertake <u>most, but not all</u> , tasks in my daily work	1 2

		My training prepared me to undertake <u>some, but not most</u> , tasks in my daily work	3
		My training did not prepare me to undertake any of the tasks required in my daily work	4
	e) What topics do you think you need more training on to do your job well? <u>List.</u>		
14	I have some questions about your supervisor.		___ times per month
	a) How many times each month do you meet with your activista-chefe?		
	b) About how many hours do you spend with your activista-chefe in a given week?		___ hours per week
	c) What is the purpose of these meetings?		
	d) How many times has your activista chefe changed since you began work? <u>Indicate total number of changes.</u>		___ activista chefe changes
15	Please describe the role of your <i>activista chefe</i> . <u>Probe with each item if necessary. Answer all questions.</u>		
	a) Your <i>activista chefe</i> helps develop your clients' family support plans	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	b) Your <i>activista chefe</i> provides direction regarding goals, priorities and next steps for your cases, particularly your complex cases	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	c) Your <i>activista chefe</i> regularly follows up on your goals and provides accountability	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	d) Your <i>activista chefe</i> provides guidance on time management strategies to enable you to equitably distribute you time across your cases	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	e) Your <i>activista chefe</i> reviews your case files and forms for completion and accuracy	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	f) Your <i>activista chefe</i> makes you feel comfortable bringing challenges to her/him	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	g) Your <i>activista chefe</i> helps you resolve challenges with your work	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	h) Your <i>activista chefe</i> assists you in referring your clients to other services, when you need help	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	i) Your <i>activista chefe</i> identifies your training needs, knowledge and skills gaps and helps identify opportunities for addressing these	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	j) Your <i>activista chefe</i> assigns and manages your caseload, helping prevent overwork by reducing your caseload if necessary	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	k) Your <i>activista chefe</i> participates in supportive supervision visits, accompanying you to your client visits at times, reviewing your abilities and offering you constructive feedback after	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	l) <u>Sum up the number of "Yes" responses and write down the number</u>		

Quality of care team meetings

16	a) Some activistas, activista chefes and supervisors hold regular meetings – weekly or monthly – to discuss work and clients. Does your group have these meetings?	Yes No Don't know	1 2 (SKIP to #18) 3 (SKIP to #18)
	b) How frequent are these team meetings?	Weekly Monthly Quarterly Other	1 2 3 4
	c) How often do you participate in these team meetings?	I attend every meeting I attend some meetings I do not attend these meetings	1 2 3 (SKIP to #18)
17	Please describe what happens during these meetings. <u>Probe with these features if necessary. Answer all questions.</u>		
	a) Updates on performance against targets are shared	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	b) Implementation challenges are discussed	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	c) Activities are reviewed and planned	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	d) There is discussion about caseload and decisions are made	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	e) Every activista shares an update on their cases	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	f) Activista chefes and supervisors follow up on referrals	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	g) There is a discussion on a case management theme from the Home Visitation Cards	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	h) Activista chefes and supervisors check on the emotional wellbeing of activistas	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	i) Other service providers are invited to meetings to promote networking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	j) <u>Sum up the number of “Yes” responses and write down the number</u>	_____ number of “Yes” responses	
18	Please describe the referral system for this CBO. <u>Probe with these items if necessary. Answer all questions.</u>		
	a) I know what services are available for my clients	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	b) It is easy for me to make referrals for services	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	c) I communicate regularly with people who provide reference services to my clients	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	d) I am able to follow up directly with service providers regarding referrals completion	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	e) The <i>Facilitador de Ligações</i> is helpful to me and my clients	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	f) I share my networks with other activistas	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	g) <u>Sum up the number of “Yes” responses and write down the number</u>	_____ number of “Yes” responses	
19	a) To what degree are you networked with other activistas?	Very well networked	1 2

		Somewhat networked	3
		Somewhat not networked	4
		Not networked at all	
	b) What activities have improved networking? <u>List.</u>		
	c) What other activities could further improve networking? <u>List.</u>		
20	a) In your view, how supportive or unsupportive are community leaders of COVida?	Very supportive	1
		Somewhat supportive	2
		Ambivalent	3
		Not supportive	4
	b) Please explain your response.		
21	In addition to your stipend, have you received any nonmonetary incentives to continue work? <i>[Probes: gifts, awards, certificates, thank you letters.]</i>	Yes	1
		No	2 (SKIP to Q23)
22	Please describe any nonmonetary incentives that you received. <i>[Probes: gifts, awards, certificates, thank you letters.]</i> <u>Record the incentives listed by the respondent.</u>		
23	Do you incur any out of pocket expenses in your work with COVida in a usual week? <i>[Probe: SMS, transport]</i>	Yes	1
		No	2
24	How much do you spend for out of pocket expenses during a usual week?	_____ (in Meticaís)	
25	Please describe what you pay for using these out of pocket expenses. <u>Record items.</u>		
26	a) How satisfied or unsatisfied are you with your job as an activista?	Highly satisfied	1
		Somewhat satisfied	2
		Somewhat unsatisfied	3
		Not satisfied	4
	b. Please explain your response		
27	What do you like most about working as an activista? <u>Record items.</u>		
28	What do you like least about working as an activista? <u>Record items.</u>		
29	a) How much is your stipend? Enter 999 if does not want to answer		
	b) How satisfied or unsatisfied are you with your stipend amount?	Highly satisfied	1

		Somewhat satisfied 3 Somewhat unsatisfied 4 Not satisfied	2 3 4
	c) Please let us know whether your stipends/salaries are delayed	Yes No	1 2 (SKIP to Q30)
	d) Please explain your response (how often they are delayed, every pay period, every other pay period, other options)		
30	What can you do better to improve knowledge of HIV status among your clients? <u>Record items.</u>		
31	What can your activista chefe do better to improve knowledge of HIV status among your clients? <u>Record items.</u>		
32	What other programmatic changes or improvements do you think would improve knowledge of HIV status among your clients? <u>Record items.</u>		
33	Please let us know if you share examples of yourself, friends or family members taking ART and living well to help with adherence/reduce stigma	Yes No	1 2
34	What can you do better to improve ART retention among children and adolescents living with HIV? <u>Record items.</u>		
35	What can your activista chefe do better to improve ART retention among children and adolescents living with HIV? <u>Record items.</u>		
36	What other programmatic changes or improvements do you think would improve ART retention among children and adolescents living with HIV? <u>Record items.</u>		
37	a) Do you think you have the ability, resources and training to provide this high-quality case management? b) If not - what will enable you to provide this type of care? <u>Record responses.</u>	Yes No	1 2
38	a) What aspects of case management do you think influence knowledge of HIV status among your program's clients the most? <u>List.</u>		
	b) What aspects of case management do you think influence ART retention among children and adolescents living with HIV the most? <u>List.</u>		

Those are all of the questions I have for today. Is there anything else you'd like to tell me about you or your work for the program before we complete the interview?

THANK YOU!

Interview Guide with Activista Chefs and Supervisors

Name of Interviewer:		
Date of Interview (day/month):		
Name of the CBO:		
Job title	Activista Chefe <input type="checkbox"/>	Supervisor <input type="checkbox"/>
Length of Interview (minutes):	_____ minutes	

1	Record Sex	Female	1
		Male	2
2	How old are you?	_____ years	
3	What is the highest level of education that you have completed – primary, secondary or tertiary?	Primary	1
		Secondary	2
		Technical/Professional	3
		University	4
4	a) How long have you been working with COVida? b) <u>If less than one year, indicate number of months.</u>	a) _____ years b) _____ months	
5	If job title is activistas chefe: a1) How long have you been in your current role as an activistas chefe b1) <u>If less than one year, indicate number of months.</u>	a1) _____ years b1) _____ months	
	If job title is supervisor: a) How long have you been in your current role as a supervisor? b) <u>If less than one year, indicate number of months.</u>	a1) _____ years b2) _____ months	
6	a) Have you ever worked as an activista?	Yes No	1 2 (SKIP #7)
	b) Did you work as an activista for COVida or another project, or both?	Yes: COVida only Yes: COVida + another project No	1 2 3
	c1) For how many years did you work as an activista, with your own caseload? Round to nearest year. c2) <u>If less than one year, indicate number of months.</u>	c1. _____ years c2. _____ months	

7	1. If job title is activistas chefe: Tell me about your role as an activistas chefe. What are your main responsibilities? Anything else?		
	2. If job title is supervisor: Tell me about your role as a supervisor. What are your main responsibilities? Anything else?		
	<u>Note all mentioned. Do NOT probe with response categories.</u>		
	a) Improve activistas' knowledge and skills	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	b) Encourage activistas to set regular goals	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	c) Provide regular follow up and accountability to activista goals	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	d) Review case files with activistas, offer guidance	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	e) Help develop family support plans	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	f) Participate in managing difficult cases	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	g) Help activistas make referrals	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	h) Support the <i>Facilitador de Ligações</i> and connect the <i>Facilitador de Ligações</i> with activistas	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	i) Motivate activistas	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	j) Mobilize and engage with community leaders	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	k) Help activistas manage their time	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	l) Manage activistas' caseload	<input type="checkbox"/> Yes	<input type="checkbox"/> No
m) Monitor activistas' stress levels and offer support	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
n) Help with forms / reporting	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
o) <u>Sum up the number of "Yes" responses and write down the number</u>	_____ number of "Yes" responses		
8	1. If job title is activistas chefe: a1) How many activistas do you currently supervise?	a1) _____ activistas	
	2. If job title is supervisor a2) How many activistas chefes do you currently supervise?	b2) _____ activistas chefes	
	b) Does this number change often?	Yes No	1 2 (SKIP to #8d)
	1. If job title is activistas chefe c1. If so, over the last three months, about how many different activistas have you supervised? 2. If job title is supervisor c2. If so, over the last three months, about how many different activista chefes have you supervised?	c1) _____ different activistas c2) _____ different activistas chefes	

	<p>2. If job title is activistas chefes</p> <p>d1. What is the maximum number of supervisees (activistas) that you have ever had in your current role?</p> <p>2. If job title is supervisor</p> <p>d2. What is the maximum number of supervisees (activista chefe) that you have ever had in your current role?</p>	<p>d1) _____ activistas</p> <p>d2) _____ activistas chefes</p>	
9	<p>1. If job title is activistas chefes</p> <p>a1) About how many hours a week do you spend with your supervisees (activista /) either working one-on-one with them or in groups?</p> <p><u>Record the number of hours spent working directly with activistas.</u></p> <p>2. If job title is supervisor</p> <p>a2) About how many hours a week do you spend with your supervisees (activista chefe) either working one-on-one with them or in groups?</p> <p><u>Record the number of hours spent working directly with activistas chefes.</u></p>	<p>a1) _____ hours activistas</p> <p>a2) _____ hours activistas chefes</p>	
	<p>1. If job title is activistas chefes</p> <p>b1 How often do you meet with each supervisee (activista) alone?</p> <p>2. If job title is supervisor</p> <p>b2. How often do you meet with each supervisee (activista chefe) alone?</p>	<p>At least weekly</p> <p>2-3 times per month</p> <p>Once per month</p> <p>Less than monthly</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p>
	<p>1. If job title is activistas chefes</p> <p>How many hours, on average, do you spend with each supervisee (activista) in a given week?</p> <p><u>If less than 1, record 1.</u></p> <p>2. If job title is supervisor</p> <p>How many hours, on average, do you spend with each supervisee (activista chefe) in a given week?</p> <p><u>If less than 1, record 1.</u></p>	<p>c1) _____ hours activistas</p> <p>c2) _____ hours activistas chefes</p>	
10	<p>a) Do you hold meetings with multiple activistas at one time to discuss cases, workload, performance, or other things?</p>	<p>Yes</p> <p>No</p>	<p>1</p> <p>2 (SKIP to #12)</p>

	b) Tell me about these meetings. How often do you hold them?	Weekly Monthly Quarterly (3 months) Other	1 2 3 4
	c) Who is invited? Anyone else? <u>List.</u>		
	d) Who attends? <u>List.</u>		
	e) Is attendance required?	Yes No	1 2
11	Please describe what happens during these meetings. <u>Probe with these features if necessary. Answer all questions.</u>		
	a) Updates on performance against targets are shared	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	b) Activista goals are set and discussed	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	c) Implementation challenges are discussed	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	d) Activities are reviewed and planned	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	e) There is discussion about caseload and decisions are made	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	f) Every activista shares an update on their cases	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	g) Activista chefes and supervisors follow up on referrals	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	h) There is a discussion on a case management theme from the Home Visitation Cards	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	i) Activista chefes and supervisors check on the emotional wellbeing of activistas	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	j) Other service providers are invited to meetings to promote networking	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	k) <u>Sum up the number of “Yes” responses and write down the number</u>	_____ number of “Yes” responses	
12	a) Do you ever travel with your supervisees to meet with clients jointly with the activista?	Yes No	1 2 (SKIP TO #13)
	b) Do you travel with all of your supervisees?	Yes No	1 2
	c) How often do you travel with your supervisees to meet with clients jointly?	Weekly Monthly Quarterly (3 months) Other	1 2 3 4
	d) What are the reasons you travel with your supervisees to meet with clients jointly? <u>List.</u>		
13	How do you motivate your supervisees? Any other way?		

	<u>List.</u>		
14	Please tell me about all of the trainings that you have taken part in to prepare you for or improve your work (as an activista chefe / as a supervisor) for COVida. Specifically, what did you learn in these trainings? <u>Record main topics</u>		
15	Please describe the format of the trainings. <u>Probe with each item if necessary.</u> <u>Answer all questions.</u>		
	a) The training included lectures.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	b) The training included role playing, hypothetical scenarios, or other hands-on activities.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	c) The training included shadowing another activista.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	d) The training provided me with materials (e.g., handouts, flyers, manuals).	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	e) The training included quizzes or tests to confirm what I learned.	<input type="checkbox"/> Yes	<input type="checkbox"/> No
16	I'm interested in finding how the number of days of training you have had to work as an activista chefe / supervisor at COVida. Let's figure this out together. <u>Work with respondent to go through all trainings and assign number of days for each. Tally these and record total number of training days.</u>	_____ days	
17	How well do you feel that your training prepared you to do your work as an activista chefe / supervisor for COVida? <u>Record one option.</u>	My training prepared me to undertake <u>all</u> tasks in my daily work	1
		My training prepared me to undertake <u>some</u> tasks in my daily work	2
		My training did not prepare me to undertake the tasks required in my daily work	3
18	a) Are there things that you think you could do better in your job?	Yes	1
		No	2 (SKIP to 19)
	b) If yes - What are they? <u>List.</u>		
	c) What is preventing you from doing them, if anything? <u>List. If nothing, write nothing.</u>		
	d) What additional resources / training do you need to do your job well, if any? <u>List. If none, write none.</u>		

19	a). Please describe the process of assigning cases to activistas. <u>(Probes: How are activistas assigned to a case? What are the criteria? Who does this? Are cases matched with beneficiaries by age, sex, HIV status, childrearing status, or if it's a free for all?)</u>			
	Record the response: _____			
	b). What factors are considered? <u>Probe with response categories if necessary. Answer all questions.</u>			
	1. Current case load	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
	2. Complexity of cases	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
	3. Proximity of households	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
4. Experience of activistas	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
5. Activista training / skills	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
20	1. What do you think is the ideal caseload for an activista in this area? <i>[Probe: How many beneficiaries should be assigned for one activista, ideally? Please provide a number of households/ clients.]</i>	a. _____ ideal number of households	b. _____ ideal number of clients <18 years old	c. _____ ideal number of clients 18+ years old
	2. What do you think is the minimum caseload for and activista in this area?	a. _____ minimum number of households	b. _____ minimum number of clients <18 years old	2. _____ minimum number of clients 18+ years old
	3. What do you think is the maximum caseload for and activista in this area?	a. _____ maximum number of households	b. _____ maximum number of clients <18 years old	c. _____ maximum number of clients 18+ years old
	d. Please explain your response.			
21	We know activistas spend different amounts of time with clients, based on their needs. What types of clients require more of an activista's time? What qualities do they have? <i>[Probes: clients experiencing violence, clients who are HIV-positive.]</i> <u>Record all mentioned.</u>			
22	a) In addition to their stipends, do activistas here receive nonmonetary incentives to continue work such as gifts, awards, certificates, thank you letters?	Yes	1	
		No	2 (SKIP to #23)	
	b) What nonmonetary incentives do activistas receive to continue work?			

	<i>[Probes: gifts, awards, certificates, thank you letters.]</i> <u>List.</u>		
	c) Do all activists receive the same nonmonetary incentives or does this vary?	The same Varies Don't know	1 2 3 (SKIP to #23)
	d) Please explain your response (to the previous question).		
23	a) In your opinion, what are the elements of high-quality case management?		
	b) Do the activists that you supervise provide high-quality case management?	Yes No	1 (SKIP to #24) 2
	c) If no – Why not?		
24	a) What aspects of case management do you think influence knowledge of HIV status among your program's clients the most? <u>List.</u>		
	b) What more can activists do to increase the numbers of children and adolescents who know their HIV status? Can you think of anything new or different they could do? <u>List.</u>		
	c) What more can you do to increase the numbers of children and adolescents who know their HIV status? Can you think of anything new or different you could do? <u>List.</u>		
25	a) What aspects of case management do you think influence ART retention among children and adolescents living with HIV the most? <u>List.</u>		
	b) What more can activists do to improve ART retention among children and adolescents living with HIV? Can you think of anything new or different they could do? <u>List.</u>		
	c) What more can you do to improve ART retention among children and adolescents living with HIV? Can you think of anything new or different you could do?		

	<u>List.</u>		
26	What other programmatic changes or improvements do you think would improve knowledge of HIV status among your supervisees' clients? <u>Record items.</u>		
27	What other programmatic changes or improvements do you think would improve ART retention among children and adolescents living with HIV? <u>Record items.</u>		
28	What factors do you think most influence the quality of care that activistas provide? <u>List.</u>		
29	Please tell me about activista turnover in this CBO.	Yes	1
	a) Do you have any challenges retaining activistas?	No	2
	b) If yes - Why do you think that activistas leave? If no – What does your organization do to retain activistas? <u>List.</u>		
30	Please describe the extent to which activistas are networked with other service providers in the area. <u>Probe with items as necessary. Answer all questions.</u>		
	a) A service mapping has been conducted/updated in the last year. All activistas have access to the service mapping.	<input type="checkbox"/> Yes = 1	<input type="checkbox"/> No =2
	b) All activistas are directly linked to the health facility.	<input type="checkbox"/> Yes = 1	<input type="checkbox"/> No =2
	c) Activistas are linked to and refer to available non-health services?	<input type="checkbox"/> Yes = 1	<input type="checkbox"/> No =2
	d) The <i>Facilitador de Ligações</i> is able and useful in supporting referrals	<input type="checkbox"/> Yes = 1	<input type="checkbox"/> No =2
	e) What activities have improved networking? <u>List.</u>		
	f) What activities could further improve networking? <u>List.</u>		
31	a) Do you think you are paid fairly for the work you do?	Yes	1 (SKIP to #32)
		No	2
	b) If no – Why not?		
32	a) Do you incur any out of pocket expenses in your work as an activista chefe / supervisor with COVida in a usual week? [<i>Probe: SMS, transport</i>]	Yes	1
		No	2 (SKIP tp #33)

	b) How much do you spend for out of pocket expenses during a usual week?	_____ (in Meticaais)	
	c) Please describe what you pay for using these out of pocket expenses. <u>Record items.</u>		
33	a) Please let us know whether your stipends/salaries are delayed	Yes	1
		No	2 (SKIP to #34)
	b) Please explain your response <i>[Probe how often they are delayed, every pay period, every other pay period, other options]</i>		
34	Why did you choose to become an activista chefe / supervisor?		
35	a) How satisfied or unsatisfied are you with your job as an activista chefe?	Highly satisfied	1
		Somewhat satisfied	2
		Somewhat unsatisfied	3
		Not satisfied	4
	b) Please explain your response		

Those are all of the questions I have for today. Is there anything else you'd like to tell me about you or your work for the program before we complete the interview?

THANK YOU!

Interview Guide with COVida Project Coordinators / CBO Managers

Name of Interviewer:		
Date of Interview (day/month):		
Name of the CBO:		
Job Title	CBO Manager <input type="checkbox"/>	COVida Project Coordinator <input type="checkbox"/>
Length of Interview (minutes):	_____ minutes	

1	Record Sex	Female	1
		Male	2
2	How old are you?	_____ years	
3	a) How long have you been the CBO manager / COVida Project Coordinator here? b) <u>If less than one year, indicate number of months.</u>	a) _____ years b) _____ months	
4	a) Have you ever worked as an activista?	Yes	1
		No	2 (SKIP to #5)
	b) For how many years did you work as an activista? c) <u>If less than one year, indicate number of months.</u>	b) _____ years c) _____ months	
5	a) How many activistas work for this CBO with COVida at the moment?	_____ activistas	
	b) How are activistas recruited? (Record the response)	_____	
6	How many activista chefes work for this CBO with COVida at the moment?	_____ activista chefes	
7	a) Per your policy, how many activistas does each activista chefe supervise?	_____ activistas	
	b) In reality, how many activistas does each activista chefe supervise?	_____ activistas	
8	How many supervisors work for this CBO with COVida?	_____ supervisors	
9	a) Per your policy, how many activista chefes does each supervisor supervise?	_____ activista chefes	
	b) In reality, how many activista chefes does each of these people supervise?	_____ activista chefes	

10	What factors do you think most influence the quality of care that activistas provide? Any others? <u>List.</u>		
11	a) Do the activista chefes and supervisors hold meetings with multiple activistas at one time to discuss cases, workload, performance, or other things?	Yes No	1 2 (SKIP to #12)
	b) How often are they held?	Weekly Monthly Quarterly (3 months) Other	1 2 3 4
	c) Who participates? Anyone else? <u>List.</u>		
	d) In your opinion, how effective are these meetings in improving case management and the performance of the program?	Effective Not effective	1 2
	e) Please explain your answer (to the previous question).		
12	Who determines what training which activista gets? What are the criteria? Record response.		
13	a). Please describe the process of assigning cases to activistas. <u>(Probes: How are activistas assigned to a case? What are the criteria? Who does this? Are cases matched with beneficiaries by age, sex, HIV status, childrearing status, or if it's a free for all?)</u>		
	b). What factors are considered? <u>Probe with response categories if necessary. Answer all questions.</u>		
	1. Current case load	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	2. Complexity of cases	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	3. Proximity of households	<input type="checkbox"/> Yes	<input type="checkbox"/> No
	4. Experience of activistas	<input type="checkbox"/> Yes	<input type="checkbox"/> No
5. Activista training / skills	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
14	1. What do you think is the ideal caseload for an activista in this area? <i>[Probe: How many beneficiaries should be assigned for one activista, on average? Please provide a number of households/ clients.]</i> 2. What do you think is the minimum caseload for an activista in this area? 3.. What do you think is the maximum caseload for an activista in this area?	a. ____ ideal number of households a. ____minimum number of households a. ____maximum number of households	b. ____ ideal number of clients <18 years old c. ____minimum number of clients 18+ years old

	<p><u>Record the numbers for households and clients.</u></p>		<p>b. _____ _minimum number of clients <18 years old</p> <p>b. _____ _maximum number of clients <18 years old</p>	<p>c. _____ maximum number of clients 18+ years old</p>
	d. Please explain your response.			
15	<p>We know activists spend different amounts of time with clients, based on their needs. What types of clients require more of an activist's time? What qualities do they have?</p> <p><i>[Probes: clients experiencing violence, clients who are HIV-positive.]</i></p> <p><u>Record all mentioned.</u></p>			
16	a) Please describe the training that each COVida activista receives.			
	b) How satisfied or unsatisfied are you that the training that COVida activists receive prepares them to do their jobs well?	<p>Very satisfied</p> <p>Somewhat satisfied</p> <p>Somewhat not satisfied</p> <p>Not satisfied</p>	<p>1</p> <p>2</p> <p>3</p> <p>4</p>	
17	a) In addition to their stipends, do your activists receive nonmonetary incentives to continue work such as gifts, awards, certificates, thank you letters?	<p>Yes</p> <p>No</p>	<p>1</p> <p>2 (SKIP to #18)</p>	
	b) What nonmonetary incentives do your activists receive to continue work? Probes: gifts, awards, certificates, thank you letters			

	c) Do all activistas receive the same or does this vary?	The same Varies Don't know	1 2 3 (SKIP to #16)
	d) Please explain your response (to the previous question).		
18	a) Do COVida activista chefes receive any additional training for their role as a chefe?	Yes No	1 2
	b) Please describe the training that each COVida activista chefe receives (in addition to any training they receive to be an activista).		
	c) How satisfied or unsatisfied are you that the training that COVida activista chefes receive prepares them to do their jobs as activista chefes well?	Very satisfied Somewhat satisfied Somewhat not satisfied Not satisfied	1 2 3 4
19	a) Please describe the training that each COVida supervisor receives.		
	1. The training included lectures.	<input type="checkbox"/> Yes =1	<input type="checkbox"/> No =2
	2. The training included role playing, hypothetical scenarios, or other hands-on activities.	<input type="checkbox"/> Yes =1	<input type="checkbox"/> No =2
	3. The training included shadowing another activista.	<input type="checkbox"/> Yes =1	<input type="checkbox"/> No =2
	4. The training provided me with materials (e.g., handouts, flyers, manuals).	<input type="checkbox"/> Yes =1	<input type="checkbox"/> No =2
	5. The training included quizzes or tests to confirm what I learned.	<input type="checkbox"/> Yes =1	<input type="checkbox"/> No =2
	b) How satisfied or unsatisfied are you that the training that COVida supervisors receive prepares them to do their jobs well?	Very satisfied Somewhat satisfied Somewhat not satisfied Not satisfied	1 2 3 4
20	a) Do you have any challenges recruiting activistas in this CBO?	Yes No	1 2 (SKIP to #121)
	b) If Yes - Please explain your response.		
21	a) Do you have any challenges retaining activistas in this CBO?	Yes No	1 2 (SKIP to #22)
	b) If Yes - Why do you think that activistas leave?		
22	a) Do you have any challenges recruiting activista chefes in this CBO?	Yes No	1 2 (SKIP to #23)

	b) If Yes - Please explain your response.		
23	a) Do you have any challenges retaining activista chefes in this CBO?	Yes No	1 2 (SKIP to #24)
	b) If Yes - Why do you think that activistas leave?		
24	What happens when an activista is leaving the organization? Will the work be assigned to a new recruited activista, or reassigned to existing activistas?	Assigned to a new recruited activista	1
		Reassigned to existing activistas	2
25	a) In your view, how supportive are community leaders of COVida?	Very supportive Somewhat supportive Ambivalent Not supportive	1 2 3 4
	b) Please explain your response.		
26	a) What aspects of case management do you think influence knowledge of HIV status among your program's clients the most? <u>List.</u>		
	b) What more can activista chefes do to increase the numbers of children and adolescents who know their HIV status? Can you think of anything new or different they could do? <u>List.</u>		
	c) What more can you do to increase the numbers of children and adolescents who know their HIV status? Can you think of anything new or different you could do? <u>List.</u>		
27	a) What aspects of case management do you think influence ART retention among children and adolescents living with HIV the most? <u>List.</u>		
	b) What more can activista chefes do to improve ART retention among children and adolescents living with HIV? Can you think of anything new or different they could do? <u>List.</u>		

	c) What more can you do to improve ART retention among children and adolescents living with HIV? Can you think of anything new or different you could do? <u>List.</u>	
28	What other programmatic changes or improvements do you think would improve knowledge of HIV status among your supervisees' clients? <u>Record items.</u>	
29	What other programmatic changes or improvements do you think would improve ART retention among children and adolescents living with HIV? <u>Record items.</u>	

Those are all of the questions I have for today. Is there anything else you'd like to tell me about you or your work for the program before we complete the interview?

THANK YOU!

Interview Guide for other COVida Staff (Costing)

Name of Interviewer:			
Date of Interview (day/month):			
Operating Unit	CBO <input type="checkbox"/>	Central <input type="checkbox"/>	
Name of CBO, if applicable:			
Role of Interviewee:	Finance <input type="checkbox"/>	M&E <input type="checkbox"/>	Other <input type="checkbox"/>
Length of Interview (minutes):	_____ minutes		

Questions relate to the specific role of the interviewee. Ask only the relevant questions.

Chief of Party and/or Deputy and/or Technical Director

- Can you describe the [insert name] program briefly?
 - What is the purpose/goal of the program?
 - Who are your sub-partners in country and what they are responsible for?
- Please describe how well you think this program is achieving its goals.
- Please describe case management fits into overall goals of [insert program name].
- Please describe the program management activities.
- Program inputs
 - Please describe the all of the program activities that are related to case management. (What happens and where? How often? Describe the specific inputs of program components / case management.)
 - How would you take activities/program inputs and align them with the COVida case management process? (Use printed image of the process and allow interviewee to write in or verbally describe which phases of the process link to which input.)
- What aspects of case management do you think influence knowledge of HIV status among your program's clients the most?
- What programmatic changes or improvements do you think would improve knowledge of HIV status among your program's clients?
- What aspects of case management do you think influence ART retention among children and adolescents living with HIV the most?
- What programmatic changes or improvements do you think would improve ART retention among children and adolescents living with HIV?

Finance Staff

Financial Director

- Have there been prior cost assessments or evaluations other than the EA?

- EA reporting
 - Please describe your current structure/process for reporting to EA.
 - Where does the data come from? What information is aggregated/grouped together and how?
 - Please describe how you determine which expenses belong in the EA expenditure categories?
- Financial system(s) structure
 - Please describe how COVida tracks costs and expenses.
 - Do you have one or multiple reporting systems? What variables/data is contained where?
 - How are you getting data from the sub-partners? When? In what format?
 - How frequently is data reported into these systems?
 - How and when are receiving expenditure data / financial reports from your sub-partners?
 - Which sub-partners are working on case management?
 - Does the financial data included in those financial reports from sub-partners show detailed or disaggregated data to where we can determine what is being spent on case management?
 - Do you do any checks for data quality? If so, please describe.
 - Please describe any perceived weakness or shortcomings of the current system.
 - Are there costs/expenses incurred but not tracked in these systems?
 - How do the financial tracking systems/processes link to another data tracking taking places (indicator/outcome data; intervention specific inputs; etc.)?
- Other requests:
 - Introductions to other staff as needed
 - Assistance with preliminary data dump

Financial Team Staff

- Request assistance acquiring/reviewing specific data records:
 - Inventories of buildings/equipment (with dates of purchase?)
 - Commodity/procurement records
 - Staffing/labor cost records (timesheets/other) –need data attributing staff time to specific interventions/case management
 - Trainings (dates of trainings, # attendees, intervention focus, cost total or broken down by any input components like food, space, hotel, travel, staffing)
- Please describe potential costs that are incurred but not tracked.
- Once we have raw data--Assess how reported expenses can be attributed to case management and potentially to the stages of the case management process

M&E Staff

- Please describe any ongoing research/monitoring of the program.
- Please describe any data tracking systems/processes in place. [Probes: how do you track beneficiaries and their case/progress, and have you ever linked this information to cost?]
- Please describe what measures are in place to control data quality?
- Please describe how your program is tracking outcome data—and specifically how this information corresponds to case management.

APPENDIX B. QCA Method

Overview of the QCA Method

QCA is a method that combines quantitative and qualitative analyses to determine which combination of variables results in an outcome of interest (Ragin, 2008). QCA was developed in the early 1980s by sociologist Charles Ragin and uses fuzzy logic and Boolean algebra to investigate the relationship between combinations of causal conditions and an outcome (Ragin, 1987, 2008). Since then, QCA has gained traction and grown in use, particularly in the past decade with rapid growth in the fields of international development (Davis, et al., 2019; Kaminsky & Jordan, 2017; Peletz, et al., 2018), infrastructure (Chatterley, Linden, & Javernick-Will, 2013; Chatterley, Javernick-Will, Linden, Alam, & Bottinelli, 2014; Kunz, Fischer, Ingold, & Hering, 2015; Marks, Kumpel, Guo, Bartram, & Davis, 2018), disaster recovery (Jordan, Javernick-Will, & Tierney, 2016; Opdyke, et al., 2018), and health (Chatterley, et al., 2014; Pelcastre-Villafuerte, et al., 2014).

QCA is well suited for the intermediate space between quantitative, statistical analysis and qualitative case studies (Kaminsky & Jordan, 2017). Like case study analysis, QCA relies upon in-depth case knowledge to validate the relationships between variables and an outcome (Ragin, 1987). Like statistical analyses, QCA can be used to identify trends across multiple cases and can produce more generalizable results (Ragin, 2008). Additionally, another critical component of the analysis is the use of theory to hypothesize and validate the causal relationships, as well as to operationalize the variables and the outcome in a measurable way (Ragin, 2008). Since QCA requires in-depth case knowledge, it is difficult to use this method with an extremely large N . Similarly, since QCA is applied to complex problems, it is typically important to have a greater number of cases than the small N often used in case studies.

In QCA, the variables are referred to as causal conditions (and called as such herein) and are similar to independent variables in a traditional statistical analysis (Kaminsky & Jordan, 2017). For this study, the modifiable attributes of case management are the causal conditions. The outcome is similar to the dependent variable and is the phenomenon that is the main focus of the study (Kaminsky & Jordan, 2017). The purpose of QCA is to identify the combinations of conditions that result in the outcome; these combinations are referred to as pathways. In order to identify the pathways, the following steps are conventionally followed for QCA (Davis, et al., 2019): (1) identify the outcome; (2) identify the conditions hypothesized to influence the outcome; (3) identify cases that exhibit the outcome, cases that lack the outcome, and cases that have variation across the conditions; (4) collect in-depth data (similar to a case study) on the conditions and outcomes for every case (sometimes, steps two through four are repeated iteratively); (5) calibrate the conditions to define what criteria mean a condition is present or absent; (6) calibrate the outcome to define when the outcome is present or absent; (7) using the calibrations, assign values to all cases for the conditions and outcome; (8) assemble the values in a truth table; (9) use QCA software to minimize the truth table, where the most simplified combinations of conditions that explain the outcomes are identified; and (10) validate the results with case knowledge and theory.

Foundational to QCA is set theory, a branch of mathematical theory that posits that all objects (e.g., factors, variables, attributes) can be described in terms of collections, or sets (Ragin, 2006; Zadeh, 1965). Sets are defined based on thresholds of membership or the specific criteria that something must meet in order to be considered to have membership in the set (Ragin, 2007). For QCA, set membership is defined to determine to what extent each case (i.e., *activista*) exhibits membership for each of the causal conditions (Ragin, 2008). The process of defining set membership (i.e., in-set membership) and its converse, lack of set membership (i.e., out-of-set membership), is called calibration. Calibration is an iterative process between theory and collected data that aims to develop a common measuring stick to use to determine whether a case falls in the set, out of the set, or somewhere in between (Basurto & Speer, 2012). This measuring stick is essential, as it must be applied uniformly to all cases evaluated in

order to identify the meaningful differences between cases, which will subsequently allow the influence of these differences on the outcome to be analyzed (Basurto & Speer, 2012).

A variant of QCA, called fuzzy-set QCA (fsQCA), uses fuzzy logic in which cases can have partial membership in a set (Ragin, 2008). FsQCA is commonly employed when there is a finer variation of cases such that cases do not always fall completely into or completely out of the set (Kaminsky & Jordan, 2017). For example, for a condition such as *work experience*, in-set membership could be when an activista has two or more years of experience in case management; out-of-set membership could be when an activista has no experience in case management; however, many activistas may fall in between, having somewhere between zero and two years of experience. Fuzzy sets, which range from 0 to 1, are useful to define cases that fall between fully in- and fully out-of- the set. Since most modifiable attributes of case management could not be measured adequately dichotomously, fsQCA was the analysis method selected.

Outcome Identification and Calibration

Three outcomes were investigated for this study: (1) percent change in HIV known status, (2) percentage of HIV status unknown or not revealed at last assessment, and (3) percentage of HIV status known at last assessment.

The three outcomes were calibrated using the direct calibration approach (see Appendix C), where a quantitative value associated with in-set membership, out-of-set membership, and the crossover point is first identified based on theory and the distribution of the raw, quantitative data, and then the data are normalized between these points (Ragin, 2007). The first outcome investigated was the percentage of beneficiaries who changed their reported HIV status from unknown or not revealed to known. This outcome, referred to as “change in HIV status known” was measured as the percentage of an activista’s beneficiaries who learned their HIV status between enrollment and July 2019. These beneficiaries were enrolled before April 1, 2019 and had their HIV status recorded at least one time in addition to the time of enrollment. HIV status was considered known if the beneficiary status was HIV positive, on ART, not on ART (likely HIV positive but not receiving treatment), or test not recommended (likely not HIV positive). HIV status was considered unknown if the beneficiary status was unknown or not revealed. A change in status was recorded when a beneficiary’s HIV status went from one of the unknown categories to one of the known categories between the time of their enrollment and the last assessment (July 2019). In-set membership is when the percentage of an activista’s beneficiaries with a change in HIV known status is greater than or equal to 75 percent. Out-of-set membership is when the percentage of an activista’s beneficiaries with a change in HIV known status is less than or equal to 25 percent. The crossover point is when the percentage of an activista’s beneficiaries with a change in HIV known status is equal to 50 percent.

The second outcome investigated was the percentage of beneficiaries with their HIV status unknown at the time of the last assessment. This outcome was measured as the percentage of beneficiaries whose HIV status was unknown or not revealed. Since beneficiaries will have been enrolled for at least three months, it is expected that three months is sufficient time to discover their HIV status if case management is done well. Therefore, the variables that relate to effective case management are also expected to positively influence knowledge of HIV status during that time. In-set membership is when the percentage of an activista’s beneficiaries with HIV status unknown is greater than or equal to 70 percent. Out-of-set membership is when the percentage of an activista’s beneficiaries with HIV status known is less than or equal to 10 percent. The crossover point is when the percentage of an activista’s beneficiaries with HIV status known is equal to 25 percent.

The third outcome investigated was the percentage of beneficiaries with their HIV status known at the time of the last assessment. This outcome was measured as the percentage of beneficiaries whose status was either HIV positive or negative (and was not unknown or not revealed) at the time of the last assessment. This third outcome was added to the study after the analysis for Outcome 2 was completed

and revealed only one pathway; investigating what factors influence both known and unknown HIV status may provide more useful and comprehensive recommendations for case management providers. For Outcome 3, in-set membership is when the percentage of an activista’s beneficiaries with HIV status known is greater than or equal to 95 percent. Out-of-set membership is when the percentage of an activista’s beneficiaries with HIV status known is less than or equal to 75 percent. The crossover point is when the percentage of an activista’s beneficiaries with HIV status known is equal to 80 percent.

Identification of Potential Causal Conditions

First, a list of hypothesized causal conditions was assembled from past PEPFAR programs and research, literature, and case knowledge (Table). The potential causal conditions were all modifiable factors from COVida case management. While other factors may be influential for the outcomes, such as activista age or sex, and CBO district and region, these factors were not explicitly included in the analysis because they were not modifiable. Such factors are included in the discussion of results. In total, 23 potential causal conditions were identified in an initial list (Table 1).

Table 1. The 23 hypothesized causal conditions from literature and case knowledge that may influence knowledge of HIV status

Hypothesized Causal Condition
Care team networking
Caseload
Complexity
Challenges in recruiting and retaining activists
Distance to a functioning health facility
Effectiveness of family support plans
How cases are assigned
Level of education
Level of supportive supervision
Non-monetary incentives
Out-of-pocket costs in working for COVida
Perceived quality of health service
Program costs
Quality of care team meetings
Salary amount
Strength of wider referral network
Supervision ratio
Task ratio
Time spent per case
Time spent working for COVida
Training
Work experience
Work satisfaction

Preliminary Minimization and Removal of Causal Conditions

Twenty-three causal conditions is too many for 70 cases in QCA, because too much of the logic space, or all of the possible combinations of conditions, would not be represented by empirical cases (Ragin, 2008). In research focusing on social phenomena, such as how organizational and institutional conditions influence HIV case management, there naturally is limited diversity, and thus, it is very common to find it impossible to identify an empirical case that represents each possible combination of conditions (Ragin, 2008). While theory can suggest what outcomes might occur for combinations that lack empirical cases, conclusions about those combinations cannot be drawn with as much certainty. As a result, researchers aim to reduce the logic space by increasing the number of cases and reducing the number of causal conditions analyzed (Ragin 2008). To reduce the logic space, this analysis of 70 activists was ultimately

limited to 11 causal conditions, which is a well-accepted amount for QCA (Kaminsky & Jordan, 2017). In order to reduce the original 23 hypothesized conditions, conditions were removed based on lack of variation across the cases within a condition (known as domain conditions); correlations with other conditions, indicating that two conditions may be measuring the same item; lack of data; or low necessity, indicating that the condition was less important for the outcome (Table 2). Necessity and sufficiency are the two QCA metrics used to analyze individual conditions and can be helpful to narrow down a large list of potential conditions. Necessity reflects how important a condition is for an outcome, based on how often the condition is present when the outcome is present (Figure 1); necessity scores above 0.9 are required for a condition to be “necessary” for the outcome. Sufficiency reflects to what extent a condition contributes to the presence of the outcome (Figure 1); a sufficiency score above 0.8 is required for a condition to be “sufficient” alone to produce the outcome. Necessity and sufficiency scores of the 23 hypothesized conditions are presented in Table 19, Table 22, and Table 25 in Appendix D.

Table 2. Reasons for exclusion of potential causal conditions and final list of 11 included conditions

Hypothesized Causal Condition	Included	Excluded*	Domain (Constant)
Care team networking			X
Caseload	X		
Complexity	X		
Challenges in recruiting and retaining activists	X		
Distance to a functioning health facility		Lack of Data	
Effectiveness of family support plans		Lack of Data	
How cases are assigned	X		
Level of education		Minimized	
Level of supportive supervision	X		
Non-monetary incentives		Low Necessity	
Out-of-pocket costs in working for COVida	X		
Perceived quality of health service		Lack of Data	
Program costs		Lack of Data	
Quality of care team meetings	X		
Salary amount			X
Strength of wider referral network		Lack of Data	
Supervision ratio	X		
Task ratio		Minimized	
Time spent per case	X		
Time spent working for COVida		Minimized/Low Necessity	
Training	X		
Work experience	X		
Work satisfaction			X

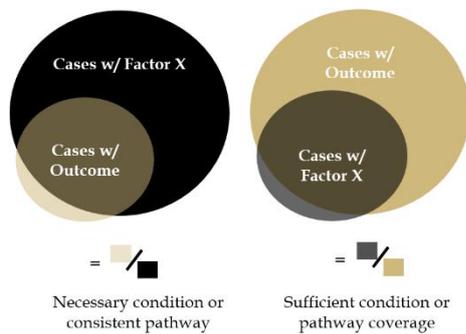
*Exclusion reasons:

Low necessity = causal condition was removed because its necessity score was less than 0.3, a conventional cutoff for condition exclusion (Davis, et al., 2019; Opdyke, et al., 2018), and because case knowledge indicated that it was not an important driver of the outcomes

Minimized = causal condition was removed during the analysis because logically simplified pathways without the condition were more consistent (consistency ≥ 0.8), and case knowledge supported the condition’s exclusion from the pathway

Lack of data = causal condition was removed because there was not sufficient data to calibrate and assign fuzzy values to all activists for the condition

Figure 1. Metrics used to evaluate individual and combinations of causal conditions in QCA, adapted from Kaminsky & Jordan (2017)



Three conditions from the initial list were determined to be domain conditions because they were relatively constant across all 70 cases and were removed from analysis. These domain conditions were *care team networking*, *salary amount*, and *work satisfaction*. Most activists felt well networked with other activists, nearly all activista stipends were 2000 Meticaís/month, and all activists, chefes, and supervisors felt somewhat satisfied or very satisfied with their job.

Six potential causal conditions were removed from the analysis due to lack of data: *effectiveness of family support plans*, *perceived quality of health service*, *distance to a functioning health facility*, *strength of wider referral network*, and *program costs*. Additionally, *program costs* was determined to be a less influential factor than the other modifiable characteristics and was also removed because it was measured only at the CBO level and not at the activista level. Two hypothesized causal conditions were removed because their necessity scores were below 0.3 (Davis, et al., 2019; Opdyke, et al., 2018) and because case knowledge indicated that they were not main drivers of the three outcomes: *nonmonetary incentives* (for all outcomes) and *total time spent working for COVida* (for Outcome 1). *Non-monetary incentives* had low necessity for all outcomes due to its lack of variation. *Total time spent working for COVida* was positively correlated with *time spent per case*, and the latter was determined to be a better measure of an activista’s time because it was not influenced by an activista’s caseload. Finally, two potential causal conditions were removed through a re-examination of case knowledge and theoretical evidence in preliminary iterations of fsQCA that demonstrated that these hypothesized causal conditions were not the most influential drivers of the outcomes: *level of education* and *task ratio*. For all analyses, these conditions were not present in any consistent pathways. As a final check on the completeness of each final solution, the removed conditions were added back in and never resulted in higher solution consistency or coverage. From these initial analysis steps, the number of causal conditions analyzed was reduced to 11: *caseload*, *complexity*, *challenges in recruiting and retaining activists*, *how cases are assigned*, *level of supportive supervision*, *out-of-pocket costs*, *quality of care team meetings*, *supervision ratio*, *time spent per case*, *training*, and *work experience*.

Calibration of Causal Conditions

Two methods were used to calibrate the potential causal conditions. First, the indirect calibration method was used for conditions that primarily had qualitative data (Basurto & Speer, 2012): *challenges recruiting and retaining*, *how cases are assigned*, *level of education*, *level of supportive supervision*, *out-of-pocket costs*, *time spent per case*, and *training*. Past project reports, other documentation, literature, and expert knowledge were used to establish initial definitions for in-set membership (the criteria that correspond with a value of 1, when the condition is fully present for a given case or the case has full membership in the set of that condition), out-of-set membership (the criteria that correspond with a value of 0, when the condition is fully absent for a given case or the case has full non-membership in the set of that condition), and the crossover point (the criteria that correspond with a value of 0.5, when the condition is neither present nor absent and is the point of maximum ambiguity). Next, qualitative data summaries were reviewed to determine meaningful differences between the activists. For most of the indirectly calibrated conditions, four-value

fuzzy sets were used: 0 (fully out of the set), 0.33 (more out of the set than in), 0.67 (more in the set than out), and 1 (fully in the set); these sets are very common for fsQCA (Basurto & Speer, 2012; Ragin, 2008). For example, for the condition of *challenges recruiting and retaining*, in-set membership (a fuzzy set value of 1) was defined as “the entire care team does not report issues with recruiting or retaining activists, is fully staffed, and has a clear plan in place to recruit and retain activists.” A value of 0.67 was defined as “there are some issues with activista recruiting or retention, such as activists leaving due to low subsidies. The care team demonstrates clear actions and plans devised to alleviate activista turnover.” A value of 0.33 was defined as “there are many issues with activista recruiting or retention, and activists leave for reasons beyond the low subsidy. The care team may have plans to alleviate activista turnover, but no action has been taken.” Out-of-set membership (a value of 0) was defined as “the care team reports significant issues with recruiting and retaining activists, is under-staffed, and lacks a clear plan to recruit and retain activists.” The complete calibration guide for all conditions is included in Appendix C. For *level of education*, a three-value fuzzy set was more appropriate. The remaining conditions, *caseload* and *complexity*, were calibrated using the direct calibration method, which is common for conditions with only quantitative data that can be normalized between anchor points (Ragin, 2007).

Truth Table Assembly

Once the causal conditions and outcomes were calibrated, the calibration definitions were used to assign fuzzy values to each case, for every condition and outcome. The qualitative coding and summaries and the quantitative values were used to determine whether each activista met the required criteria for in-set membership, out-of-set membership, or a membership value in between. These fuzzy values were assembled in a table (Table 3), called a truth table, that summarizes all fuzzy scores assigned to causal conditions and outcomes for all cases, reflecting the possible configurations of causal conditions associated with outcomes (Ragin, 2008).

Table 3. Truth table used in the final fsQCA of the three HIV status outcomes

Activista	Outcomes			Causal Conditions										
	Activista ID	OutChange	OutUnknown	OutKnown	Caseload	ChalRecruitRetain	Complexity	HowCaseAssigned	LevSuppSuper	OutoPocket	QualTeamMtg	SupRatio	Training	TimeCase
1112	0	0	1	0.29	0.33	0.5	1	1	0	1	0.7789	0.42	0.67	1
1113	0	0.02	0.98	0.86	0.33	0.77	1	0.33	0	0.33	0.7789	0.42	1	0.67
1115	0	1	0	0.82	0.33	0.5	1	1	0	0.33	0.7789	0.42	0.67	1
1116	0	0.99	0.01	0.82	0.33	0.86	1	0.67	0	1	0.7789	0.58	0.67	1
1228	0.07	1	0	0.06	0.67	0.77	1	0.33	0	1	0.7571	0.75	0	1
1229	0.67	0.93	0.07	0.01	0.67	1	1	1	0	0.67	0.7571	0.42	0	1
2229	1	0	1	0.95	0.67	0.5	1	0.33	0	1	0.7571	0.75	0	1
3111	0.92	0.96	0.04	0.11	0.33	0.23	0.33	0.33	0.33	1	0.7571	0.42	0.67	0.67
3112	0.97	0.1	0.9	0.01	0.33	0.03	0.33	0.67	0.33	0	0.3551	0.33	0	1
3113	0.99	0.02	0.98	0.01	0.33	0.05	0.33	0.33	0.33	1	0.3551	0.33	0.67	0.33
3114	1	0	1	0.01	0.33	0.03	0.33	0.67	0.33	0.67	0.3551	0.17	0.67	0.33
6211	0.19	1	0	0.01	1	0.01	0.33	0.67	0.33	1	0.3551	0.33	0.67	0
6212	0.93	1	0	0.01	1	0.35	0.33	0.67	0	1	0.732	0.58	1	0
6213	0	1	0	0.03	1	0.5	0.33	0.67	0.33	1	0.732	0.58	0.67	0
6214	0.9	1	0	0.04	1	0	0.33	0.67	0	1	0.732	0.58	1	0.33
12210	0.99	0.02	0.98	0.43	0.67	0.05	1	0.33	0	1	0.598	0.67	0.33	1
12211	0.16	0.98	0.02	0.65	0.67	0.23	1	0.67	0	1	0.598	0.84	1	1
12314	0.01	0.64	0.36	0.01	0.33	0.35	1	0.67	0	1	0.598	0.84	0	1
12315	0	0.75	0.25	0.01	0.33	0.05	1	0.67	0	1	0.598	0.84	1	1
12316	0	1	0	0.08	0.33	1	1	0.33	0.33	1	0.3551	0.84	0.67	1
12321	0.5	0.09	0.91	0.35	0.33	0.01	1	0.33	0	1	0.3551	1	1	1
22210	1	0	1	0.94	0.67	0.01	1	0.67	0	1	0.3551	0.67	0.67	1
22213	1	0	1	0.95	0.67	0.01	1	0.33	0	1	0.3551	0.67	0	1
23314	1	0.08	0.92	0.92	1	0.65	0	1	0.33	1	0.6231	0.67	0.33	1
23315	1	0	1	0.94	1	0	0	1	0	1	0.6231	0.5	0.33	1
23317	1	0	1	0.57	1	0.14	0	1	0.33	0.33	0.6231	0.33	0.33	1
23322	1	0	1	0.57	1	0.01	0	0.67	0.67	0.33	0.6231	0.5	0.67	1
23425	1	0	1	0.65	0.33	0	1	1	0	0.67	0.6231	0.33	0.33	1
23427	1	0	1	0.5	0.33	0	1	1	1	1	0.6231	0.67	0.67	0.67
23428	1	0	1	0.5	0.33	0.01	1	1	0	1	0.6231	0.5	0.67	1
23430	0.77	0.06	0.94	0.01	0.33	0.08	1	1	0.67	0.67	0.6231	0.5	0.67	0.67
31212	0.94	0.98	0.02	0.82	0.33	0.23	0.33	0	0	1	0.6231	0.33	0.67	0.67
31213	0.02	0.24	0.76	0.92	0.33	0.01	0.33	0	0.67	1	0.6231	0.33	0.67	0.33
31214	0.97	0.02	0.98	0.65	0.33	0.86	0.33	0	0.33	1	0.6231	0.33	0.67	0
31215	0.23	0.7	0.3	0.18	0.33	0	0.33	0	0.33	0.33	0.6231	0.17	0.33	0.33
33424	0.79	0.07	0.93	0.18	0.33	0.03	0.33	0.33	0	1	0.6231	0.5	0.33	1
33425	0.5	0.02	0.98	0.08	0.33	0.01	0.33	0.33	1	0.33	0.6231	0.5	0.67	1
33426	0	0	1	0.92	0.33	0.03	0.33	0.33	0	1	0.6231	0.5	0.67	1
33427	0.35	0.34	0.66	0.82	0.33	0.05	0.33	0.33	0.33	1	0.6231	0.5	0.67	1
42215	1	0	1	0.86	1	1	0.67	0	0.67	0.67	0.4891	0.42	0.33	0.33
42217	0	0.11	0.89	0.86	1	1	0.67	0	0.67	1	0.4891	0.42	0.33	0.67
42218	0.5	0.02	0.98	0.5	1	0.14	0.67	0	0.67	1	0.4891	0.42	0.67	0.33
42219	0	0.5	0.5	0.92	1	1	0.67	0	0.67	1	0.4891	0.42	0.33	0.33
42320	0.98	0.67	0.33	0.95	0.33	0.23	0.33	0	0.67	1	0.4891	0.58	0.67	0.67
42321	0.75	0.99	0.01	0.82	0.33	0.23	0.33	0	0.67	0.33	0.4891	0.58	0.67	1
42322	0.99	0.09	0.91	0.89	0.33	0.77	0.33	0	1	1	0.4891	0.58	0.33	0.33
42325	0.95	0.89	0.11	0.43	0.33	0.92	0.33	0	1	0.33	0.4891	0.58	0.67	1
42429	0.84	0.9	0.1	0.82	0.33	0.77	0.33	0.33	0.33	0.33	0.598	0.5	0.33	0.33
42430	1	0	1	0.5	0.33	0.5	0.33	0.33	1	1	0.598	0.5	0.33	1
42431	1	0.06	0.94	0.5	0.33	0.65	0.33	0.33	0.33	0.33	0.598	0.5	1	1
42432	0.97	0.91	0.09	0.95	0.33	0.99	0.33	0.33	0.33	1	0.732	0.5	0.67	0.33
51212	0	0.85	0.15	0.08	0.67	0.05	0.33	0.67	1	1	0.732	0.83	0.67	1
51213	0.01	1	0	0.01	0.67	0.05	0.33	0.67	1	1	0.732	0.67	0.33	1
51215	0	0.96	0.04	0	0.67	0.14	0.33	0.67	0.67	0.67	0.732	0.83	0.67	1
52425	0.35	0.54	0.46	0.35	0.67	0	1	0.67	0.67	1	0.732	0.75	0.67	1
52429	0	1	0	0.92	0.67	0	1	0.67	0.33	1	0.732	0.42	1	0.67
52430	0.01	0.96	0.04	0.65	0.67	0	1	0.67	0.67	1	0.732	0.42	0.67	1
52431	0.12	0.82	0.18	0.94	0.67	0	1	0.67	0.67	1	0.732	0.58	1	1
52534	0	0.84	0.16	0.01	1	0.03	1	1	0.33	0.33	0.6231	0.5	1	1
52535	0	0.88	0.12	0.89	1	0.14	1	1	0.67	1	0.6231	0.5	1	0.67
52536	0	0.81	0.19	0.29	1	0.05	1	1	0.67	1	0.6231	0.67	1	1
52537	0.14	0.67	0.33	0.77	1	0.03	1	1	0.67	0.33	0.6231	0.5	0.67	0.67
61318	0.83	0.99	0.01	0.03	1	0.14	1	1	0.33	1	0.732	1	0.33	1
61319	0.28	1	0	0	1	0.08	1	1	0.33	1	0.732	0.67	0.67	1
61320	0	1	0	0.05	1	0.97	1	1	1	0.33	0.732	0.67	1	1
61321	0.56	1	0	0.01	1	0.14	1	1	0.33	1	0.732	0.84	1	1
62210	0.98	0.54	0.46	0.01	1	0.65	1	1	0.33	1	0.732	1	1	0.33
62211	0.92	1	0	0.02	1	0.35	1	1	0	1	0.732	1	1	1
62212	0.92	0.98	0.02	0.03	1	0.05	1	1	0	1	0.732	0.84	0.67	1
62213	0.99	0.06	0.94	0.04	1	0.35	1	1	0.33	1	0.732	1	0.33	1

Truth Table Analysis

Following the calibration of the causal conditions and outcomes (Appendix C), the truth table was analyzed using the “Truth Table Analysis” function in fs/QCA software (Ragin, et al., 2017). Truth table

analysis relies on the process of minimization. Minimization allows for the logical simplification of possible pathways (Ragin, 2008; Ragin, et al., 2017). For instance, two rows in the truth table that result in the same outcome might differ by only one causal condition, and removing the differing causal condition produces a more simplified expression. The minimization process performs these stepwise comparisons for all possible combinations and yields the simplified combinations that are minimally sufficient to produce the outcome. All possible combinations of conditions were investigated to determine (1) whether a given group of conditions consistently (i.e., nearly always) led to (i.e., was present when) the outcome (i.e., a high percent change in beneficiary HIV known status for each activist); and (2) whether the consistent combinations made sense with in-depth knowledge of the data (for example, it would *not* make sense for challenges recruiting and retaining activists to be a factor that contributed to a high percent change in beneficiary HIV known status, but it *would* make sense for high-quality care team meetings to positively affect this outcome).

Fs/QCA software produces complex, intermediate, and parsimonious solutions for all pathway analyses. Complex and parsimonious solutions were examined at each step of the analysis but were not ultimately presented. Complex solutions do not consider any simplifying assumptions and, therefore, do not incorporate important theoretical knowledge (Ragin, 2008). In the complex solution, all possible pathways that are not represented by an observed case (i.e., remainders) are assumed to not exhibit the outcome analyzed and are thus not included in the solution for the (positive) outcome (Ragin, 2008). Complex solutions are often longer and are difficult to draw useful conclusions due to their complexity and case-specificity. Parsimonious solutions arise when all remainders are used to obtain the most simplified pathway possible that produces the outcome (Ragin, 2008). However, the minimization in the parsimonious solution may not align with theory (i.e., may yield incomplete explanations), making these solutions more difficult to justify (Ragin, 2008). Finally, intermediate solutions provide a middle ground that incorporates the use of simplifying assumptions (based on theory and case knowledge) to minimize the pathways (beyond the complex solutions), while also maintaining important case complexity (Kaminsky & Jordan, 2017; Ragin, 2008). Intermediate solutions are the most commonly presented solutions in QCA literature (Chatterley, et al., 2014; Davis, et al., 2019; Kaminsky & Jordan, 2017; Kunz, et al., 2015; Marks, et al., 2018; Opdyke, et al., 2018; Peletz, et al., 2018). Therefore, for this research, only intermediate solutions were presented.

While researchers attempt to maximize the number of cases and minimize the number of conditions analyzed to cover more of the logic space, not all causal combinations will have empirical cases. These combinations that lack empirical cases are called counterfactuals in QCA; thus, they are evaluated using counterfactual analysis (Ragin, 2008). Counterfactual analysis is a hypothetical thought experiment where researchers use theoretical knowledge to make assertions about whether the presence or absence of causal conditions would lead to the outcome (Kaminsky & Jordan, 2017). The goal of counterfactual analysis is to determine which of the possible unobserved pathways could theoretically lead to the outcome and which unobserved pathways would likely not occur. For the counterfactual analysis, “easy” counterfactuals were used; this allows the research to specify assumptions for whether a causal condition’s presence or absence would be expected to be associated with each outcome (Table 4).

Table 4. Summary of simplifying assumptions for the three outcomes

Condition	Outcome		
	Outcome 1: % Change in HIV Known Status	Outcome 2: % of HIV Status Unknown at Last Assessment	Outcome 3: % of HIV Status Known at Last Assessment
Caseload	Present	Absent	Present
Complexity	Absent	Present	Absent
Challenges in recruiting and retaining activists	Absent	Present	Absent
How cases are assigned	Present	Absent	Present
Level of supportive supervision	Present	Absent	Present
Out-of-pocket costs	Absent	Present	Absent
Quality of care team meetings	Present	Absent	Present
Supervision ratio	Present	Absent	Present
Time spent per case	Present or Absent	Present or Absent	Present or Absent
Training	Present	Absent	Present
Work experience	Present	Absent	Present

The validity of the results was determined based on two important QCA metrics: consistency and coverage. A consistent pathway is one where a set of conditions that are all or partly present (denoted by a score of greater than 0.5) leads to (i.e., is present when) a high percent change in beneficiary HIV known status (is present). Consistency (Figure 1) demonstrates the relative frequency that a pathway will result in a particular outcome or how *consistently* a pathway leads to that particular outcome; the accepted cut-off value for a consistent pathway is 0.8 (Ragin, 2006). The goal of QCA is to identify the pathways that are consistent, and further, to identify the most simplified version of the pathways that still are consistent. Further, *coverage* (Figure 1) is the percentage of cases with an outcome that is explained by a given pathway (Rihoux & Ragin, 2009). Coverage lacks a cut-off value because it is a metric for generalizability (Ragin, 2006); lower coverage scores, however, reflect more case-specific and less generalizable results (Ragin, 2008). Each pathway has its own consistency and coverage values, which refers to how often a pathway is present when the outcome is also present, and how many of the activists who exhibit the outcome can be explained by the pathway, respectively. In addition, the overall solution (i.e., set of consistent pathways for an outcome) has a consistency value (how often the complete set of pathways are present when the outcome is present) and a coverage value (how many of the activists who exhibit the outcome are explained by at least one of the pathways).

For all analyses performed, a consistency score of 0.8 was used as the minimum score required for a pathway to be considered for inclusion in the final solution (Ragin, 2008). Additionally, the proportional reduction in inconsistency (PRI), which adjusts the consistency metric to account for causal conditions that might be both subsets of the outcome and the negated outcome (Ragin, 2008), was also evaluated. PRI is similar to the concept of the proportional reduction in error in statistics and is a more robust measurement of how consistently a pathway leads to an outcome. Pathways with large differences between consistency and PRI scores (e.g., 0.83 and 0.70, respectively) or with PRI scores below 0.8 were also removed to reduce the influence of cases that are a subset of both the outcome and negated outcome (Opdyke, et al., 2018). Once a preliminary solution was obtained, a subset/superset analysis was performed for each outcome in order to further reduce the number of causal conditions in each pathway

while maintaining or increasing each pathway’s consistency and coverage (Ragin, 2008). Finally, pathways were compared with theory and case knowledge to ensure that the final solutions presented the most complete and simplified explanations for the outcomes analyzed.

APPENDIX C. QCA Calibration Guide

Outcomes

Outcome 1: Change in HIV Known Status

The first outcome investigated was the percentage of beneficiaries who changed their reported HIV status from unknown or not revealed to known. This outcome, referred to as “change in HIV status known” was measured as the percentage of an activista’s beneficiaries who learned their HIV status between enrollment and July 2019. These beneficiaries were enrolled before April 1, 2019 and had their HIV status recorded at least one time in addition to the time of enrollment. HIV status was considered known if the beneficiary status was HIV positive, on ART, not on ART (likely HIV positive but not receiving treatment), or test not recommended (likely not HIV positive). HIV status was considered unknown if the beneficiary status was unknown or not revealed. A change in status was recorded when a beneficiary’s HIV status went from one of the unknown categories to one of the known categories between the time of their enrollment and the last assessment (July 2019). In-set membership was when the percentage of an activista’s beneficiaries with a change in HIV known status was greater than or equal to 75 percent. Out-of-set membership was when the percentage of an activista’s beneficiaries with a change in HIV known status was less than or equal to 25 percent. The crossover point was when the percentage of an activista’s beneficiaries with a change in HIV known status was equal to 50 percent. These cut-off values were determined based on breakpoints identified from the raw, plotted outcome data (**Figure 1**). The outcome was measured quantitatively and was calibrated directly (**Figure 2**).

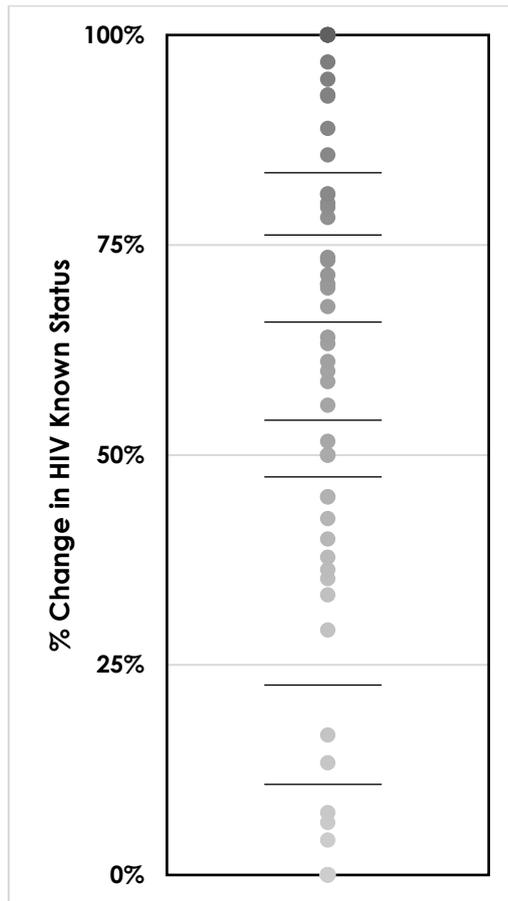


Figure 1. Raw values for the percentage of each activist's cases where HIV known status changed

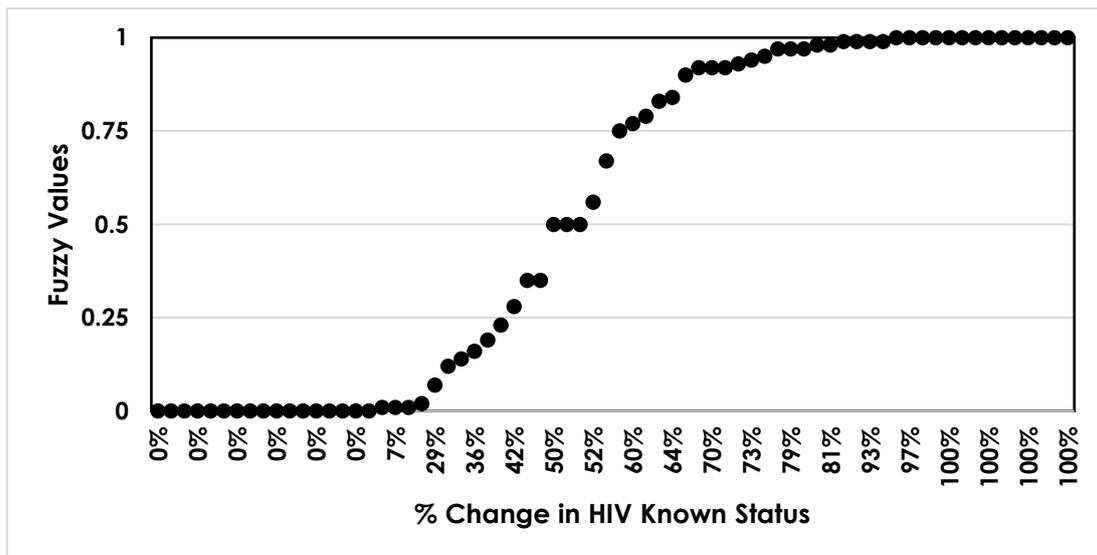


Figure 2. Direct calibration for Outcome 1: Change in HIV known status

Outcome 2: Percentage of Beneficiaries with HIV Status Unknown

The second outcome investigated was the percentage of beneficiaries with their HIV status unknown at the time of the last assessment. This outcome was measured as the percentage of beneficiaries whose HIV status was unknown or not revealed. Since beneficiaries will have been enrolled for at least three months, it is expected that three months is sufficient time to discover their HIV status if case management is done well. Therefore, the variables that relate to effective case management are also expected to positively influence knowledge of HIV status during that time. In-set membership was when the percentage of an activista's beneficiaries with HIV status unknown was greater than or equal to 70 percent. Out-of-set membership was when the percentage of an activista's beneficiaries with HIV status known was less than or equal to 10 percent. The crossover point was when the percentage of an activista's beneficiaries with HIV status known was equal to 25 percent. These cut-off values were determined based on breakpoints identified from the raw, plotted outcome data (**Figure 3**). The outcome was measured quantitatively and was calibrated directly (**Figure 4**).

Figure 3. Raw values for the percentage of each activista's cases where HIV status was unknown at the last assessment

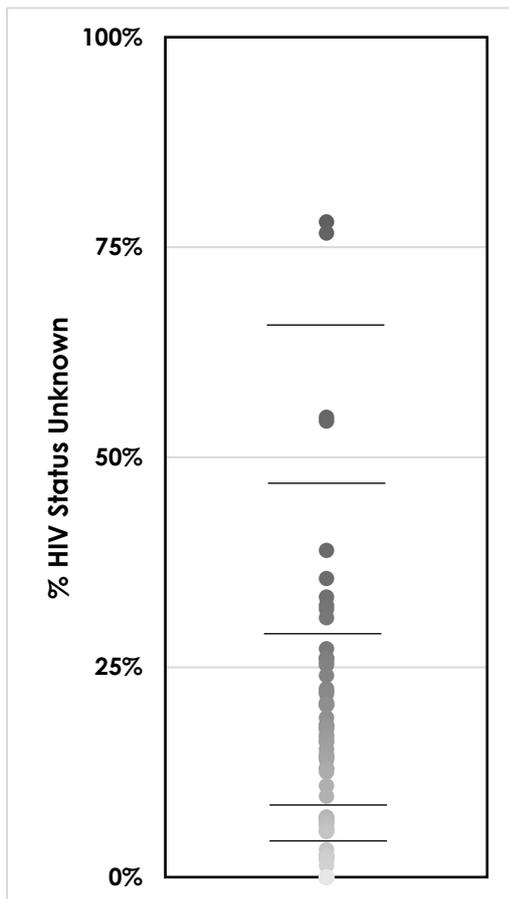
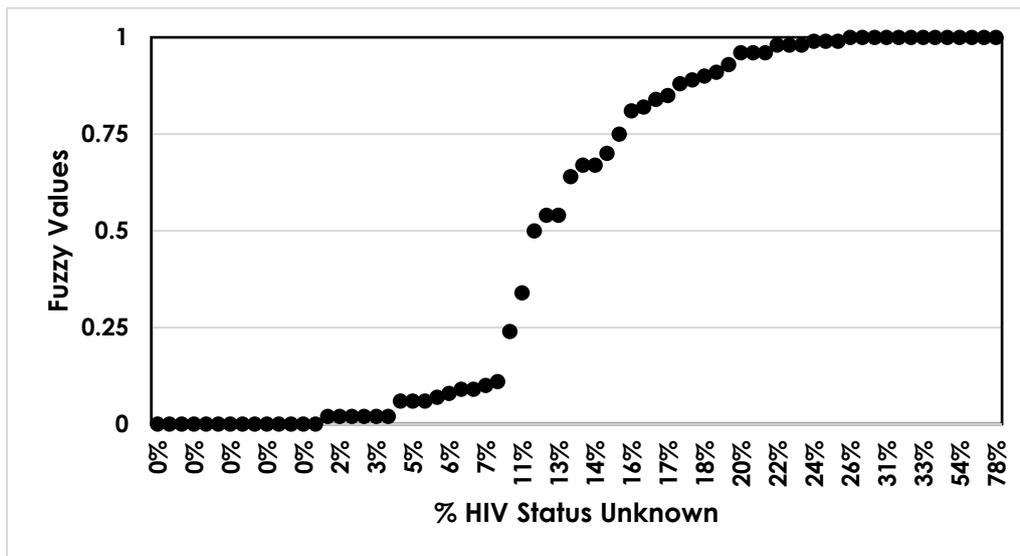


Figure 4. Direct calibration for Outcome 2: Percentage HIV status unknown



Outcome 3: Percentage of Beneficiaries with HIV Status Known

The third outcome investigated was the percentage of beneficiaries with their HIV status known at the time of the last assessment. This outcome was measured as the percentage of beneficiaries whose status was either HIV positive or negative (and was not unknown or not revealed) at the time of the last assessment. In-set membership was when the percentage of an activista’s beneficiaries with HIV status known was greater than or equal to 95 percent. Out-of-set membership was when the percentage of an activista’s beneficiaries with HIV status known was less than or equal to 75 percent. The crossover point was when the percentage of an activista’s beneficiaries with HIV status known was equal to 80 percent. These cut-off values were determined based on breakpoints identified from the raw, plotted outcome data (**Figure 5**). The outcome was measured quantitatively and was calibrated directly (**Figure 6**).

Figure 5. Raw values for the percentage of each activista's cases where HIV status was known at the last assessment

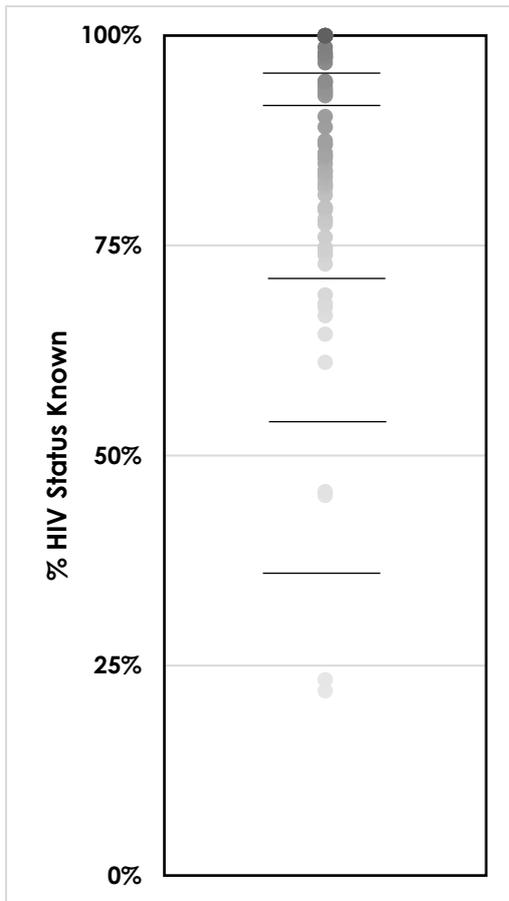
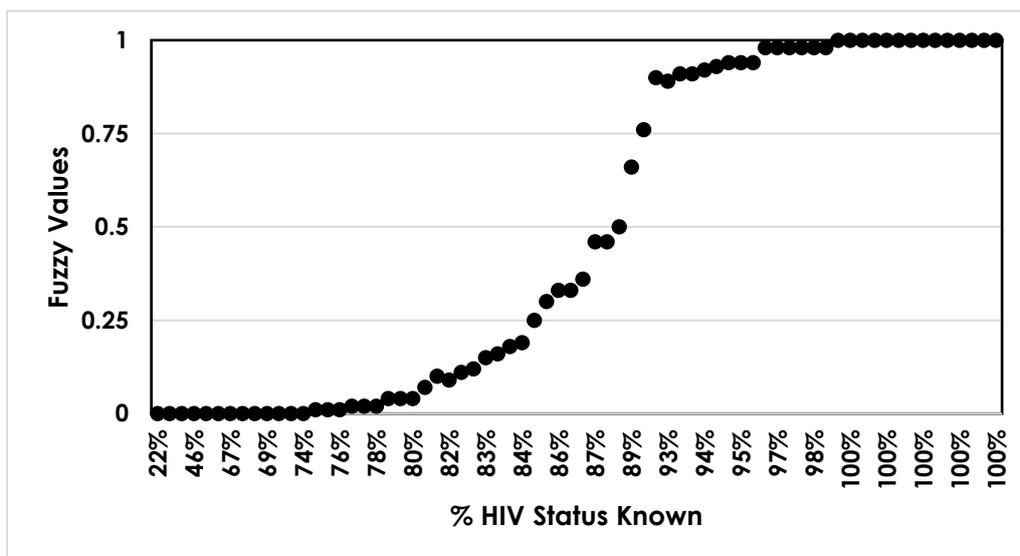


Figure 6. Direct calibration for Outcome 3: Percentage HIV status known



Potential Causal Conditions

Table 1 summarizes the potential causal conditions considered in the analysis of the three outcomes.

Table 1. Summary of all potential causal conditions influencing HIV status outcomes

Causal Conditions	Abbreviation for fsQCA Software	Definition	Assumption for Influence on Outcomes*
Caseload	Caseload	The number of unique cases that the activista is currently managing	Presence (A caseload that more closely matches the ideal caseload leads to better case management.)
Complexity	Complexity	The percentage of an activista's caseload in which clients require more time (e.g., are HIV positive or status not revealed)	Absence (A lower proportion of complex cases that require more time allows for better case management.)
Challenges in recruiting and retaining activistas	ChalRecruitRetain	Difficulties that a CBO experiences in recruiting or retaining activistas	Absence (The lack of challenges in recruiting and retaining activistas leads to better case management.)
How cases are assigned	HowCaseAssigned	All decisions and activities associated with how cases are assigned to an activista	Presence (Case assignment that considers more factors leads to better case management.)
Level of education	LevelofEducation	The number of years and type of education the activista has	Presence (Higher education leads to better case management.)
Level of supportive supervision	LevSuppSuper	The amount of assistance, support, and help for effective case management that an activista receives from supervisor	Presence (Highly supportive supervision leads to better case management.)
Non-monetary incentives	NonMonInc	All nonmonetary compensation that activistas receive as incentives or rewards for performing more effective case management, such as gifts, awards, certificates, or thank you letters	Presence (Non-monetary compensation leads to better case management.)
Out-of-pocket costs	OutofPocket	Any expenses an activista incurs related to case management (e.g., SMS, transport) that are not paid for or reimbursed by the CBO	Absence (The lack of out-of-pocket expenses leads to better case management.)
Quality of care team meetings	QualTeamMtgs	The beneficial activities associated with routine meetings between an activista, their peers (other activistas), and	Presence (High-quality team meetings lead to better case management.)

		their supervisors (activista chefes), and the frequency with which the meetings are held and attended by the activista	
Supervision ratio	SupRatio	The number of activistas assigned to each activista chefe, and the number of activista chefes assigned to each supervisor	Presence (Lower ratios lead to better case management.)
Task ratio	TaskRatio	The ratio of minutes an activista spends on cases to the minutes an activista spends on administrative tasks	Presence (The more time an activista spends directly focused on cases leads to better case management.)
Time spent per case	TimeCase	The average number of minutes that an activista spends with one case	Presence or absence (The more time spent with each household could lead to better case management OR burnout and subsequently poor case management.)
Time spent working for COVida	TotTimeCOVida	The total number of hours per month that an activista spends on all activities related to case management and their role as an activista	Presence or absence (The more time spent managing cases could lead to better case management OR burnout and subsequently poor case management.)
Training	Training	All activities associated with the formal training program an activista participated in upon being hired for case management and the number of training days an activista received	Presence (More training leads to better case management.)
Work experience	WorkExp	The maximum value of the number of years/months of COVida experience and other activista experience	Presence (More work experience leads to better case management.)

*To simplify the QCA, researchers often make assumptions based on case knowledge and theory of whether the presence or absence of a condition will lead to the outcome(s) of interest (Ragin, 2008). If there is not sufficient evidence to suggest the directionality of the condition's influence on the outcome, both the presence and the absence of the condition are analyzed. These assumptions are for Outcomes 1 and 3; the opposite of the listed assumptions applies for Outcome 2.

Caseload

Caseload was defined as the difference between the number of unique cases (i.e., households) that the activista is currently managing and the average ideal number of cases (as identified in the survey from activista chefes and supervisors). From the survey results, most activista chefes and supervisors considered a caseload of approximately 50 cases to be ideal. Caseloads that are closer to the ideal number are hypothesized to positively influence effective case management and, therefore, a positive change in both study outcomes. *Caseload* was calibrated using the direct calibration method. The anchor points were

determined based on the spread of activista chefe and supervisor responses for ideal caseload (**Figure 7**). In-set membership was when the difference between the number of cases an activista managed and the average ideal caseload was zero (**Figure 8**). Out-of-set membership was when the difference between the number of cases an activista managed and the average ideal caseload was 20. The crossover point was when the difference between the number of cases an activista managed and the average ideal caseload was 10.

Figure 7. Raw values for the difference in the number of cases an activista currently manages and the average ideal caseload

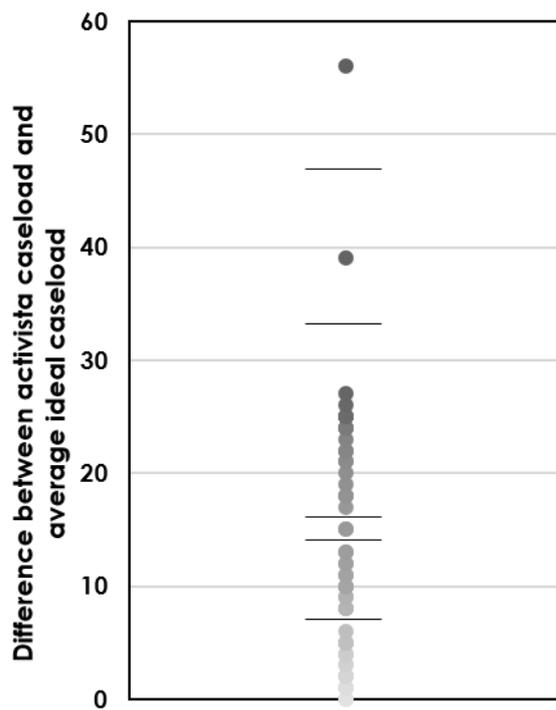
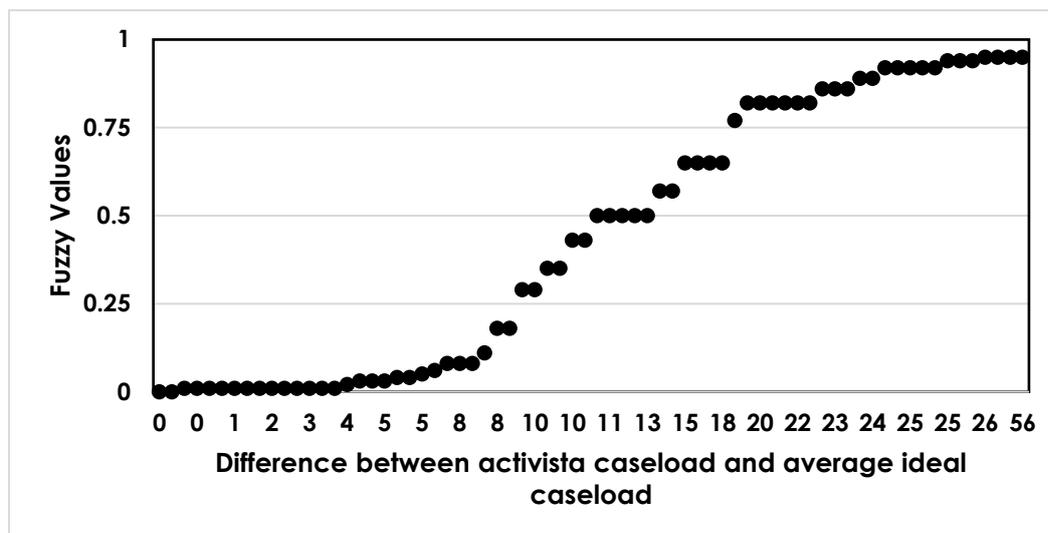


Figure 8. Direct calibration for caseload



Challenges in Recruiting and Retaining Activistas

Challenges in recruiting and retaining activistas was defined as difficulties that a CBO experiences in recruiting or retaining activistas. The absence of recruiting and retaining challenges was hypothesized to positively influence effective case management and, therefore, a positive change in both study outcomes. In-set membership was when the entire care team did not report issues with recruiting or retaining activistas and was fully staffed (**Table 2**). Out-of-set membership was when the care team reported significant issues with recruiting and retaining activistas, was under-staffed, and did not have a plan to improve activista retention.

Table 2. Indirect calibration for challenges in recruiting and retaining activistas

Fuzzy Value	Calibration
1	The entire care team does not report issues with recruiting or retaining activistas, is fully staffed, and has a clear plan in place to recruit and retain activistas.
0.67	There are some issues with activista recruiting or retention, such as activistas leaving due to low subsidies. The care team demonstrates clear actions and plans devised to alleviate activista turnover.
0.33	There are many issues with activista recruiting or retention, and activistas leave for reasons beyond the low subsidy. The care team may have plans to alleviate activista turnover, but no action has been taken.
0	The care team reports significant issues with recruiting and retaining activistas, is understaffed, and lacks a clear plan to recruit and retain activistas.

Complexity

Complexity was defined as the percentage of an activista’s total caseload that were clients who required more time (i.e., clients who were HIV positive or clients with HIV status not revealed). Caseloads with fewer complex cases were hypothesized to positively influence effective case management and, therefore,

a positive change in both study outcomes. Raw data for *Complexity* came from HIV status at the last assessment (**Figure 9**). This variable was also measured and calibrated using data from beneficiaries with at least two assessments and from HIV-positive beneficiaries only; in both of these instances, necessity scores were lower than complexity as measured relying on the last assessment, and, therefore, complexity was calibrated using data from the last assessment, as this also accounted for more of an activista’s total beneficiaries. In-set membership was when 15 percent or more of an activista’s clients required more time (**Figure 10**). Out-of-set membership was when 5 percent or fewer of an activista’s clients required more time. The crossover point was when 10 percent of an activista’s clients required more time.

Figure 9. Raw data for caseload complexity, where complexity was defined as the percentage of an activista’s caseload who were clients that required more time (i.e., were either HIV positive or status not revealed)

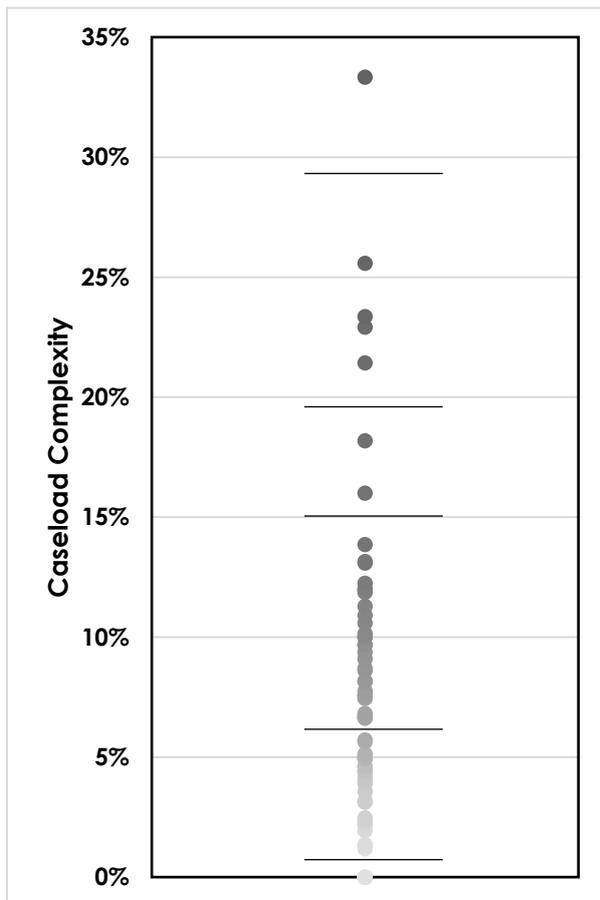
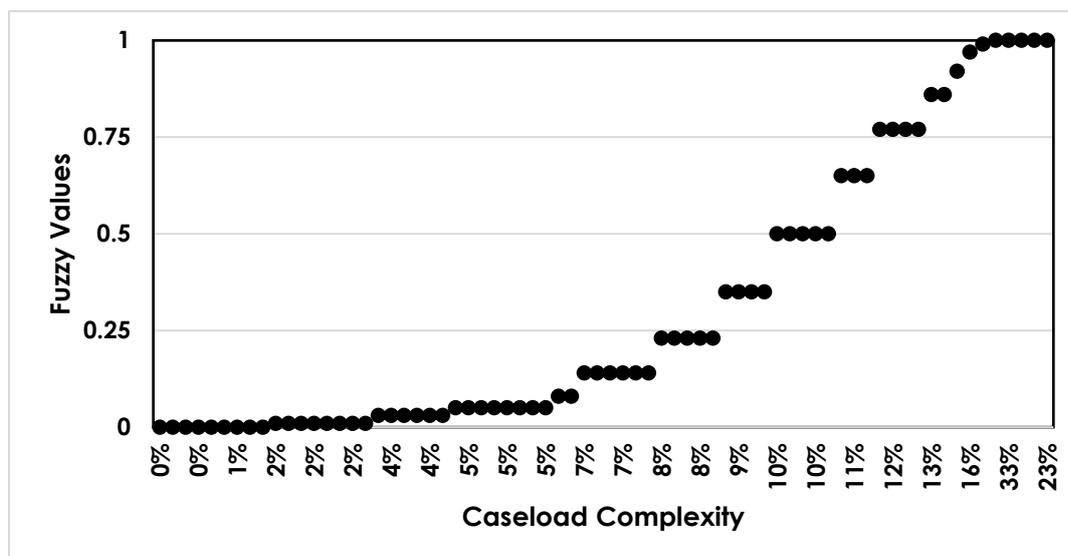


Figure 10. Direct calibration for caseload complexity



How Cases Are Assigned

How cases are assigned was defined as all decisions and activities associated with how cases were assigned to an activist. A process that considered many factors, especially complexity, was hypothesized to positively influence effective case management and, therefore, a positive change in both study outcomes. In-set membership was when there was a clear, formalized process to assign cases that was always followed and ensured that cases were assigned to activists relatively equally; this process assigned cases based on existing caseload, case complexity, activist experience and skills, and activist proximity to the case (Table 3). Out-of-set membership was when there was no formalized process to assign cases, and care team members were unsure of the process.

Table 3. Indirect calibration for how cases are assigned

Fuzzy Value	Calibration
1	There is a clear, formalized process to assign cases that is always followed and ensures that cases are assigned to activists equally. Cases are assigned based on case complexity and at least three of the four other factors: caseload, activist experience and skills, and activist proximity to household.
0.67	Cases are assigned based on at least three of the four following factors: existing caseload, activist experience and skills, and activist proximity to household.
0.33	Cases are assigned based primarily on activist proximity to the household and/or only one of the following other factors: activist experience and skills, and existing caseload. Case complexity is not considered.
0	There is no formalized process to assign cases (e.g., no factors are considered), and care team members are unsure of the process.

Level of Education

Level of education was defined as the highest level of education that an activista had completed (i.e., primary, secondary, technical/professional, or university). A higher level of education was posited to influence effective case management and, therefore, a positive change in each of the two study outcomes. In-set membership was when an activista had some post-secondary education such as technical or professional training or university education (**Table 4**). Out-of-set membership was when an activista had only primary education or below. A three-value fuzzy set was chosen for this causal condition because no activists had any university education, and most activists had completed some secondary education.

Table 4. Indirect calibration for level of education

Fuzzy Value	Calibration
1	The activista has completed some technical or professional post-secondary education such as a vocational school or certificate program and/or has completed some university education.
0.7	The activista has completed some secondary education.
0	The activista has completed only primary education or has not had any type of formal education.

Level of Supportive Supervision

Level of supportive supervision was the amount of assistance, support, and help for effective case management that an activista received from their supervisor. Supportive supervision was posited to be critical for effective case management because it provides direction-setting and oversight that are critical, particularly for work with vulnerable populations. In-set membership was when the activista met with their activista chefe for six or more hours per week (**Table 5**). The activista felt comfortable voicing any issue or challenge to their activista chefe and felt well-supported. Additionally, the activista met regularly with their activista chefe, and their activista chefe helped with most or all of the following tasks: helped the activista set goals, developed family support plans and next steps for complex cases, provided time management guidance, reviewed case files for completion and accuracy, helped resolve challenges, provided assistance for referring clients to other services, identified knowledge gaps and training needs and provided a means to close those gaps, and accompanied the activista on home visits. Out-of-set membership occurred when the activista did not meet with their activista chefe or meetings happened less than quarterly, and when the activista felt unsupported by their supervisor.

Table 5. Indirect calibration for level of supportive supervision

Fuzzy Value	Calibration
1	The activista feels comfortable voicing any issue or challenge to their activista chefe and feels well-supported. Additionally, the activista meets regularly with their activista chefe (i.e., three or more times per week), and their meeting duration is for six or more hours per week. Their activista chefe helps with most or all of the following tasks: helps the activista set goals, develop family support plans and next steps for complex cases, provides time management guidance, reviews case files for completion and accuracy, helps resolve challenges, provides assistance for referring clients to other services, identifies knowledge gaps and training needs and provides a means to close those gaps, and accompanies the activista on home visits. The activista chefe receives a similar level of support from their supervisor.
0.67	The activista feels supported by their activista chefe. The activista meets somewhat frequently with their activista chefe (i.e., at least once a week) and their meeting duration is between two and five hours per week. Their activista chefe helps with several of the following tasks: helps the activista with time management, helps refer clients to other services, identifies activista training/skills gaps, resolves challenges, and occasionally accompanies the activista on home visits. The activista may have a suggestion for how their supervision could be more supportive. The activista chefe receives a similar level of support from their supervisor.
0.33	The activista meets somewhat infrequently with their activista chefe (i.e., once a month) and/or their meeting duration is less than two hours per week. Their activista chefe helps with some tasks, such as resolving challenges or reviewing case files, but this help does not occur regularly. Notably, the activista chefe does not help with referring clients to other services, time management, or identifying activista training/skills gaps. The activista expresses a need for more support. The activista chefe receives a similar level of support from their supervisor.
0	The activista meets with their activista chefe infrequently (i.e., once a month or less) and for less than an hour each time. The meetings exclusively cover administrative tasks (e.g., signing forms), and the activista feels unsupported by their supervisor. The activista chefe receives a similar level of support from their supervisor.

Non-Monetary Incentives

Non-monetary incentives was defined as all nonmonetary compensation that activists received as incentives or rewards for performing more effective case management, such as gifts, awards, certificates, or thank you letters. The presence of nonmonetary incentives was hypothesized to positively influence effective case management and, therefore, a positive change in both study outcomes. In-set membership was when an activista had received one or more nonmonetary incentives (**Table 6**). Out-of-set membership was when the activista had not received any nonmonetary incentives.

Table 6. Indirect calibration for nonmonetary incentives

Fuzzy Value	Calibration
1	The activista has received one or more nonmonetary incentives.
0	The activista has never received a nonmonetary incentive.

Out-of-Pocket Costs

Out-of-pocket costs was defined as any expenses an activista incurred related to case management (e.g., SMS, transport) that was not paid for or reimbursed by the CBO. The absence of out-of-pocket costs was hypothesized to positively influence effective case management and, therefore, a positive change in both study outcomes. In-set membership was when the activista incurred weekly out-of-pocket expenses greater than or equal to 200 Meticaís (10% of the activista salary) (**Table 7**). Out-of-set membership was when the activista never incurred out-of-pocket expenses. The crossover point was when the activista incurred weekly out-of-pocket expenses of 100 Meticaís (5% of the activista salary).

Table 7. Indirect calibration for out-of-pocket costs

Fuzzy Value	Calibration
1	The activista incurs weekly out-of-pocket expenses of 200 Meticaís or greater.
0.67	The activista incurs weekly out-of-pocket expenses between 100 and 200 Meticaís.
0.33	The activista incurs weekly out-of-pocket expenses up to (but not including) 100 Meticaís.
0	The activista never incurs out-of-pocket expenses.

Quality of Care Team Meetings

Quality of care team meetings was defined as the beneficial activities associated with routine meetings between an activista, their peers (other activists), and their supervisors (activista chefes), and the frequency with which the meetings were held and attended by the activista. Typically in these meetings, activists sign paperwork, figure out weekly/monthly plans, learn about new forms, discuss problems/issues encountered, talk about how to behave around beneficiaries, and ask questions. These activities were hypothesized to positively influence an activista's case management. In-set membership for *quality of care team meetings* was when the activista regularly attended team meetings at least weekly, and the meetings regularly included multiple activities, such as goal setting, problem resolution, expected behavior, experience sharing, checkups on activists' emotional well-being, follow-up on referrals, and asking questions (**Table 8**). Out-of-set membership was when team meetings did not occur.

Table 8. Indirect calibration for quality of care team meetings

Fuzzy Value	Calibration
1	Team meetings occur regularly and frequently (i.e., weekly), and the activista attends all team meetings. Team meetings are used for goal-setting and accountability, problem resolution, discussions of expected behavior, experience sharing, planning, announcements of new forms or procedures, checkups on activistas' emotional well-being, follow-up on referrals, and asking questions. Activistas participate equally in the meetings and describe the meetings as very beneficial.
0.67	Team meetings are more frequent (i.e., usually weekly), and the activista may miss some meetings per quarter. Team meetings are usually used for planning, announcements of new forms or procedures, or for asking questions. Activistas describe the meetings as usually beneficial.
0.33	Team meetings are less frequent (i.e., monthly), and the activista attends all meetings. Team meetings are usually used for planning, announcements of new forms or procedures, or for asking questions. Activistas describe the meetings as usually beneficial.
0	Team meetings are less frequent (i.e., monthly) and/or are used only to sign paperwork. The activista misses one or more meetings per quarter. Activistas do not describe the meetings as beneficial.

Supervision Ratio

Supervision ratio was defined as the number of activistas assigned to each activista chef. Lower ratios were hypothesized to positively influence effective case management and, therefore, a positive change in both study outcomes. The overall *supervision ratio* condition was aggregated from two micro-conditions—chefe:activista ratio and supervisor:chefe ratio. Since the chefe:activista supervision ratio likely has the most direct influence on each case due to their more frequent interactions, it is likely that this supervision ratio is more influential in overall case management than that of the chefs and supervisors.

Consequently, the supervision ratio condition used a weighted sum from the two micro-conditions (**Table 9**), where the fuzzy value for the chefe:activista ratio was weighted by 0.67, and the fuzzy value for the supervisor:chefe ratio was weighted by 0.33. In-set membership was when an activista chefe supervised six or fewer activistas (**Table 10**) and a supervisor supervised three or fewer chefs (**Table 11**). Out-of-set membership was when an activista chefe supervised more than 10 activistas and a supervisor supervised more than five chefs.

Table 9. Aggregation method for supervision ratio

Weighting	Micro-condition
0.67	Chefe:activista ratio
0.33	Supervisor:chefe ratio

Table 10. Indirect calibration for *chefe:activista ratio* (micro-condition of supervision ratio)

Fuzzy Value	Calibration
1	The chefe supervises six or fewer activistas.
0.8	The chefe supervises seven activistas.
0.6	The chefe supervises eight activistas.
0.4	The chefe supervises nine activistas.
0.2	The chefe supervises 10 activistas.
0	The chefe supervises more than 10 activistas.

Table 11. Indirect calibration for *supervisor:chefe ratio* (micro-condition of supervision ratio).

Fuzzy Value	Calibration
1	The supervisor supervises three or fewer chefes.
0.67	The supervisor supervises four chefes.
0.33	The supervisor supervises five chefes.
0	The supervisor supervises more than five chefes.

Task Ratio

Task ratio was defined as the ratio of the total number of hours per month that an activista spent on active case management to the total number of hours per month that an activista spent on administrative tasks (e.g., paperwork). More time spent directly on case management was hypothesized to positively influence effective case management and, therefore, a positive change in both study outcomes. Task ratio was calibrated directly (**Figure 11**). In-set membership was when the ratio of time spent on case conferencing vs. administrative tasks was greater than or equal to 4, demonstrating that the activista spent a majority of their time focused on their casework (**Figure 12**). Out-of-set membership was when the ratio of time spent on case conferencing vs. administrative tasks was less than or equal to 1, demonstrating that the activista spent a significant amount of time consumed with administrative tasks. The crossover point was when the ratio of time spent on case conferencing vs. administrative tasks was 2.5.

Figure 11. Raw data for *task ratio*

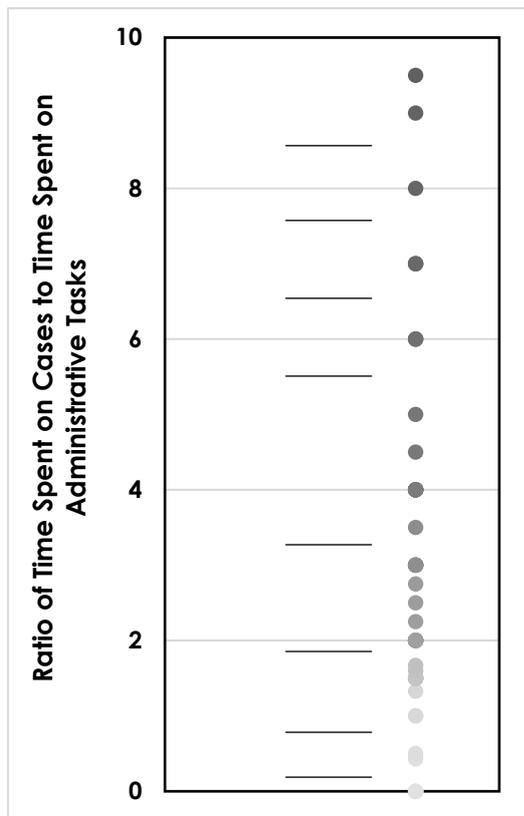
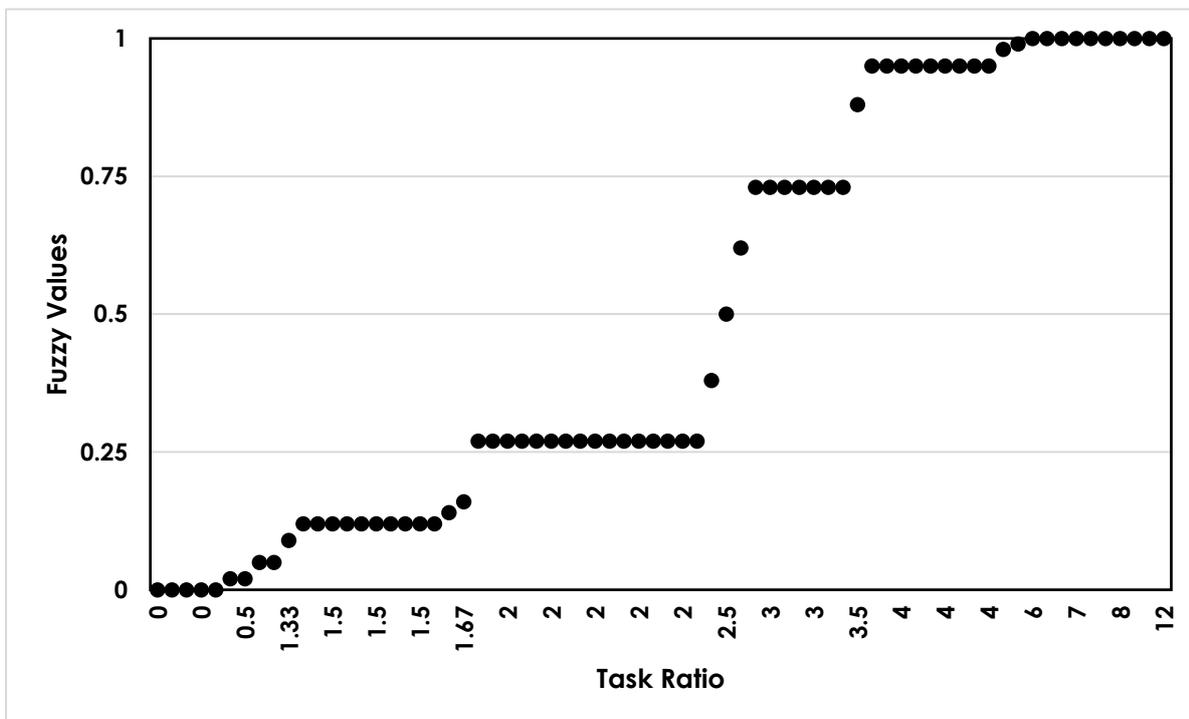


Figure 12. Direct calibration for *task ratio*



Time Spent Per Case

Time spent per case was defined as the average number of minutes that an activista spent with one case. A higher number of minutes spent with each household could either positively or negatively influence the outcomes. It is possible that the presence of this condition means that an activista is able to be more thorough and has enough time to address all the needs and concerns of their clients on each visit. It is also possible that the more time an activista spends with each household, the more likely they are to burn out and, therefore, offer ineffective case management. In-set membership was when an activista spent 100 or more minutes for one case, on average (**Table 12**). Out-of-set membership was when an activista spent 30 or fewer minutes for one case, on average.

Table 12. Indirect calibration for *time spent per case*

Fuzzy Value	Calibration
1	Activista spends 100 minutes or more with each household, on average
0.67	Activista spends between 60 and 99 minutes with each household, on average
0.33	Activista spends between 30 and 59 minutes with each household, on average
0	Activista spends 30 minutes or less with each household, on average

Time Spent Working for COVida

Time spent working for COVida was defined as the total number of hours per month that an activista spent on all activities related to case management and their role as an activista. A greater amount of time spent working for COVida per week was hypothesized to positively influence effective case management and, therefore, a positive change in both study outcomes. *Time spent working for COVida* was calibrated directly (**Figure 13**). In-set membership was when an activista spent 20 or more hours per month working for COVida (**Figure 14**). Out-of-set membership was when an activista spent five or fewer hours per month working for COVida. The crossover point was when an activista spent 15 hours per month working for COVida.

Figure 13. Raw data for *time spent working for COVida* by activista

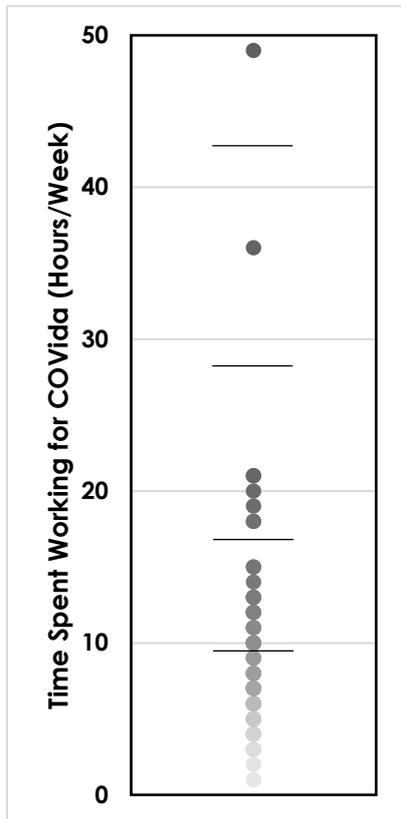
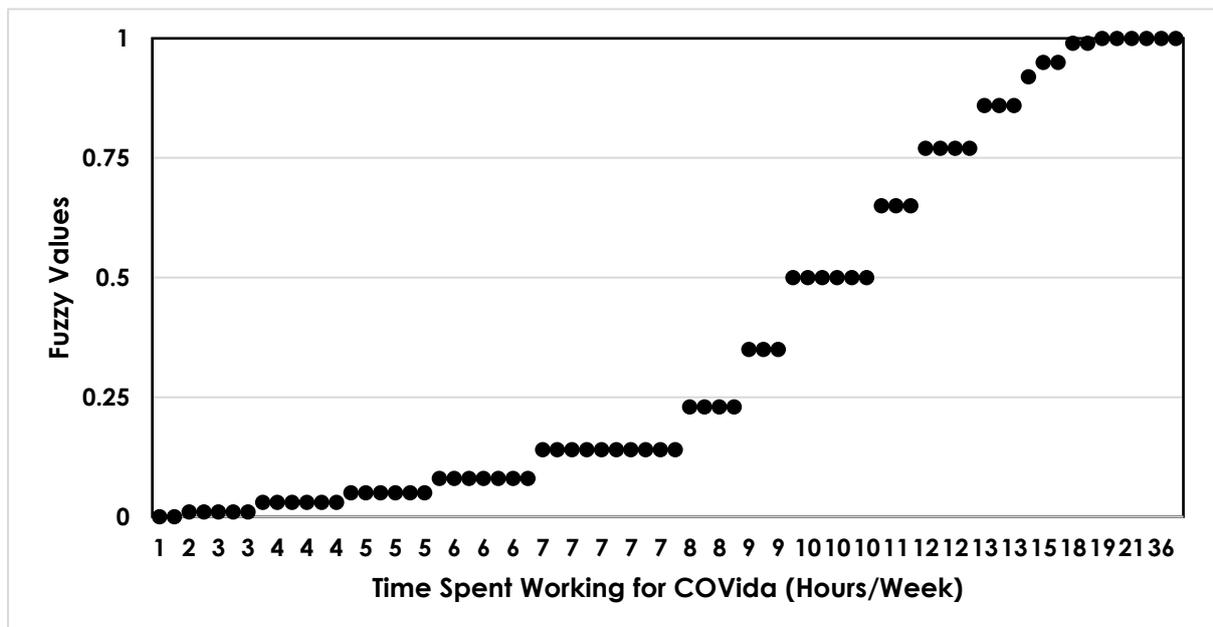


Figure 14. Direct calibration for *time spent working for COVida*



Training

Training was defined as the number of training days provided to the activista, their chefe, and their chefe's supervisor. A greater amount of training was hypothesized to positively influence effective case management and, therefore, a positive change in both study outcomes. The overall *training* condition was aggregated from three micro-conditions: activista training, chefe training, and supervisor training. Since the activistas have the most direct influence on each case, it is likely that their training is more influential in the overall case management than that of the chefes and supervisors. Consequently, the *training* condition used a weighted sum from the three micro-conditions, where the fuzzy value for the activista training was weighted by 0.5, and the fuzzy values for the chefe training and supervisor training were weighted by 0.25 each (Table 13). In-set membership was when training lasted for 12 or more days (Table 14, Table 15, Table 16). Out-of-set membership was when training lasted for three or fewer days.

Table 13. Aggregation method for training

Weighting	Micro-condition
0.5	Activista training
0.25	Chefe training
0.25	Supervisor training

Table 14. Indirect calibration for activista training (micro-condition of training)

Fuzzy Value	Calibration
1	The activista's training lasted for 12 or more days.
0.67	The activista's training lasted from eight to 11 days.
0.33	The activista's training lasted from four to seven days.
0	The activista's training lasted for three days or less.

Table 15. Indirect calibration for chefe training (micro-condition of training)

Fuzzy Value	Calibration
1	The chefe's training lasted for 12 or more days.
0.67	The chefe's training lasted from eight to 11 days.
0.33	The chefe's training lasted from four to seven days.
0	The chefe's training lasted for three days or less.

Table 16. Indirect calibration for supervisor training (micro-condition of training)

Fuzzy Value	Calibration
1	The supervisor's training lasted for 12 or more days.
0.67	The supervisor's training lasted from eight to 11 days.
0.33	The supervisor's training lasted from four to seven days.
0	The supervisor's training lasted for three days or less.

Work Experience

Work experience was defined as the total number of months an activista had been employed as an activista either with COVida or another organization. More work experience was hypothesized to positively influence effective case management and, therefore, a positive change in both study outcomes. In-set membership was when an activista had worked as an activista for 24 or more months (**Table 17**). Out-of-set membership was when an activista had worked as an activista for six months or less.

Table 17. Indirect calibration for work experience

Fuzzy Value	Calibration
1	Activista has worked as an activista for 24 or more months.
0.67	Activista has worked as an activista for 12 to 23 months.
0.33	Activista has worked as an activista for seven to 11 months.
0	Activista has worked as an activista for six months or less.

APPENDIX D. Expanded QCA Analytical Procedures

This appendix provides a detailed summary of the analyses of the causes of the three outcomes in question: percent change in HIV known status, percentage HIV status unknown, and percentage HIV status known. It includes additional details on analysis procedures, including simplifying assumptions, necessity and sufficiency for each causal condition, subset/superset analyses, and the final identification of the solution pathways. **Table 18** presents the preliminary truth table used in initial analyses.

Table 18. Expanded truth table used in preliminary analysis to calculate the necessity and sufficiency of all potential causal conditions to identify the most important conditions for the final analysis

Activista ID	OutChange	OutUnknown	OutKnown	LevelofEducation	WorkExp	Training	CaseLoad	Complexity	HowCaseAssigned	QualTeamMlgs	LevSuppSuper	SupRatio	NonManInc	TotTimeCOVida	TimeCase	TaskRatio	OutofPocket	ChalRecruitRetain
1112	0	0	1	0.7	1	0.42	0.29	0.5	1	1	1	0.78	0	0.84	0.67	0.73	0	0.33
1113	0	0.02	0.98	0.7	0.67	0.42	0.86	0.77	1	0.33	0.33	0.78	0	0.08	1	0.05	0	0.33
1115	0	1	0	0.7	1	0.42	0.82	0.5	1	0.33	1	0.78	0	0.08	0.67	0.27	0	0.33
1116	0	0.99	0.01	0.7	1	0.58	0.82	0.86	1	1	0.67	0.78	0	0.23	0.67	1	0	0.33
1228	0.07	1	0	0.7	1	0.75	0.06	0.77	1	1	0.33	0.76	0	0.03	0	0.27	0	0.67
1229	0.67	0.93	0.07	0	1	0.42	0.01	1	1	0.67	1	0.76	0	0.05	0	0.95	0	0.67
2229	1	0	1	0.7	1	0.75	0.95	0.5	1	1	0.33	0.76	0	0.14	0	0.73	0	0.67
3111	0.92	0.96	0.04	0	0.67	0.42	0.11	0.23	0.33	1	0.33	0.76	0	0.08	0.67	0.27	0.33	0.33
3112	0.97	0.1	0.9	0	1	0.33	0.01	0.03	0.33	0	0.67	0.36	0	0.14	0	0.16	0.33	0.33
3113	0.99	0.02	0.98	0	0.33	0.33	0.01	0.05	0.33	1	0.33	0.36	0	0.23	0.67	0.95	0.33	0.33
3114	1	0	1	0.7	0.33	0.17	0.01	0.03	0.33	0.67	0.67	0.36	0	0.14	0.67	0.12	0.33	0.33
4211	0.19	1	0	0	0	0.33	0.01	0.01	0.33	1	0.67	0.36	0	0.23	0.67	0	0.33	1
4212	0.93	1	0	0.7	0	0.58	0.01	0.35	0.33	1	0.67	0.73	0	0.03	1	0	0	1
4213	0	1	0	0.7	0	0.58	0.03	0.5	0.33	1	0.67	0.73	0	0.23	0.67	0.38	0.33	1
4214	0.9	1	0	0.7	0.33	0.58	0.04	0	0.33	1	0.67	0.73	0	0.86	1	0.27	0	1
12210	0.99	0.02	0.98	0	1	0.67	0.43	0.05	1	1	0.33	0.60	0	0.03	0.33	0.27	0	0.67
12211	0.16	0.98	0.02	0	1	0.84	0.65	0.23	1	1	0.67	0.60	0	0.05	1	0.27	0	0.67
12314	0.01	0.64	0.36	0.7	1	0.84	0.01	0.35	1	1	0.67	0.60	0	0.35	0	0.88	0	0.33
12315	0	0.75	0.25	0.7	1	0.84	0.01	0.05	1	1	0.67	0.60	0	0.03	1	0.73	0	0.33
12316	0	1	0	1	1	0.84	0.08	1	1	1	0.33	0.36	0	0.08	0.67	1	0.33	0.33
12321	0.5	0.09	0.91	0	1	1	0.35	0.01	1	1	0.33	0.36	0	0.05	1	1	0	0.33
22210	1	0	1	0.7	1	0.67	0.94	0.01	1	1	0.67	0.36	1	0.08	0.67	1	0	0.67
22213	1	0	1	0	1	0.67	0.95	0.01	1	1	0.33	0.36	1	0.05	0	0	0	0.67
23314	1	0.08	0.92	0.7	1	0.67	0.92	0.65	0	1	1	0.62	1	0.01	0.33	0.02	0.33	1
23315	1	0	1	0.7	1	0.5	0.94	0	0	1	1	0.62	1	0	0.33	0.12	0	1
23317	1	0	1	0.7	1	0.33	0.57	0.14	0	0.33	1	0.62	0	0.01	0.33	0.73	0.33	1
23322	1	0	1	0.7	1	0.5	0.57	0.01	0	0.33	0.67	0.62	0	0.01	0.67	0	0.67	1
23425	1	0	1	0.7	1	0.33	0.65	0	1	0.67	1	0.62	0	0.05	0.33	0.27	0	0.33
23427	1	0	1	0.7	0.67	0.67	0.5	0	1	1	1	0.62	0	0.01	0.67	0.12	1	0.33
23428	1	0	1	0.7	1	0.5	0.5	0.01	1	1	1	0.62	0	0.05	0.67	0	0	0.33
23430	0.77	0.06	0.94	0.7	0.67	0.5	0.01	0.08	1	0.67	1	0.62	0	0	0.67	0.09	0.67	0.33
31212	0.94	0.98	0.02	0.7	0.67	0.33	0.82	0.23	0.33	1	0	0.62	0	0.03	0.67	0.27	0	0.33
31213	0.02	0.24	0.76	0.7	0.33	0.33	0.92	0.01	0.33	1	0	0.62	0	0.14	0.67	0.27	0.67	0.33
31214	0.97	0.02	0.98	0.7	0	0.33	0.65	0.86	0.33	1	0	0.62	0	0.08	0.67	0.27	0.33	0.33
31215	0.23	0.7	0.3	0.7	0.33	0.17	0.18	0	0.33	0.33	0	0.62	0	0.01	0.33	0.12	0.33	0.33
33424	0.79	0.07	0.93	0.7	1	0.5	0.18	0.03	0.33	1	0.33	0.62	0	0.77	0.33	0.12	0	0.33
33425	0.5	0.02	0.98	0	1	0.5	0.08	0.01	0.33	0.33	0.33	0.62	0	0.14	0.67	0.95	1	0.33
33426	0	0	1	0	1	0.5	0.92	0.03	0.33	1	0.33	0.62	0	0.35	0.67	0.5	0	0.33
33427	0.35	0.34	0.66	0	1	0.5	0.82	0.05	0.33	1	0.33	0.62	0	0.14	0.67	1	0.33	0.33
42215	1	0	1	0.7	0.33	0.42	0.86	1	0.67	0.67	0	0.49	0	0.14	0.33	0.73	0.67	1
42217	0	0.11	0.89	0.7	0.67	0.42	0.86	1	0.67	1	0	0.49	0	0.08	0.33	0.73	0.67	1
42218	0.5	0.02	0.98	0.7	0.33	0.42	0.5	0.14	0.67	1	0	0.49	0	0.14	0.67	0.62	0.67	1
42219	0	0.5	0.5	0.7	0.33	0.42	0.92	1	0.67	1	0	0.49	0	0.35	0.33	0.12	0.67	1
42320	0.98	0.67	0.33	0.7	0.67	0.58	0.95	0.23	0.33	1	0	0.49	0	0.95	0.67	1	0.67	0.33
42321	0.75	0.99	0.01	0	1	0.58	0.82	0.23	0.33	0.33	0	0.49	0	0.03	0.67	0.27	0.67	0.33
42322	0.99	0.09	0.91	0.7	0.33	0.58	0.89	0.77	0.33	1	0	0.49	0	0.14	0.33	0.27	1	0.33
42325	0.95	0.89	0.11	0	1	0.58	0.43	0.92	0.33	0.33	0	0.49	0	0.14	0.67	0.98	1	0.33
42429	0.84	0.9	0.1	0.7	0.33	0.5	0.82	0.77	0.33	0.33	0.33	0.60	0	0.77	0.33	1	0.33	0.33
42430	1	0	1	0.7	1	0.5	0.5	0.5	0.33	1	0.33	0.60	0	0.65	0.33	0.95	1	0.33
42431	1	0.06	0.94	0	1	0.5	0.5	0.65	0.33	0.33	0.33	0.60	0	0.5	1	0.27	0.33	0.33
42432	0.97	0.91	0.09	0	0.33	0.5	0.95	0.99	0.33	1	0.33	0.73	0	0.5	0.67	0.95	0.33	0.33
51212	0	0.85	0.15	0.7	1	0.83	0.08	0.05	0.33	1	0.67	0.73	0	0.5	0.67	0.95	1	0.67
51213	0.01	1	0	0.7	1	0.67	0.01	0.05	0.33	1	0.67	0.73	1	0.95	0.33	0.95	1	0.67
51215	0	0.96	0.04	1	1	0.83	0	0.14	0.33	0.67	0.67	0.73	1	0.5	0.67	0.27	0.67	0.67
52425	0.35	0.54	0.46	0.7	1	0.75	0.35	0	1	1	0.67	0.73	1	0.5	0.67	0.02	0.67	0.67
52429	0	1	0	0.7	0.67	0.42	0.92	0	1	1	0.67	0.73	1	1	1	0.27	0.33	0.67
52430	0.01	0.96	0.04	0.7	1	0.42	0.65	0	1	1	0.67	0.73	1	0.77	0.67	0.12	0.67	0.67
52431	0.12	0.82	0.18	0.7	1	0.58	0.94	0	1	1	0.67	0.73	1	1	1	0.12	0.67	0.67
52534	0	0.84	0.16	0.7	1	0.5	0.01	0.03	1	0.33	1	0.62	1	0.99	1	1	0.33	1
52535	0	0.88	0.12	0.7	0.67	0.5	0.89	0.14	1	1	1	0.62	1	0.5	1	0.12	0.67	1
52536	0	0.81	0.19	0.7	1	0.67	0.29	0.05	1	1	1	0.62	0	0.99	1	0.95	0.67	1
52537	0.14	0.67	0.33	0	0.67	0.5	0.77	0.03	1	0.33	1	0.62	0	0.65	0.67	0.05	0.67	1
61318	0.83	0.99	0.01	0.7	1	1	0.03	0.14	1	1	1	0.73	0	0.86	0.33	1	0.33	1
61319	0.28	1	0	0.7	1	0.67	0	0.08	1	1	1	0.73	0	1	0.67	0.99	0.33	1
61320	0	1	0	0.7	1	0.67	0.05	0.97	1	0.33	1	0.73	1	1	1	0.12	1	1
61321	0.56	1	0	0.7	1	0.84	0.01	0.14	1	1	1	0.73	1	0.65	1	0.27	0.33	1
62210	0.98	0.54	0.46	0.7	0.33	1	0.01	0.65	1	1	1	0.73	1	1	1	0.95	0.33	1
62211	0.92	1	0	0.7	1	1	0.02	0.35	1	1	1	0.73	1	1	1	0.14	0	1
62212	0.92	0.98	0.02	0.7	1	0.84	0.03	0.05	1	1	1	0.73	1	0.77	0.67	1	0	1
62213	0.99	0.06	0.94	0.7	1	1	0.04	0.35	1	1	1	0.73	1	0.92	0.33	0.73	0.33	1

Outcome 1 Analysis: Percent Change in HIV Status

Necessity and Sufficiency of Causal Conditions for Outcome 1

Necessity and sufficiency of the hypothesized causal conditions were calculated for Outcome 1 (Table 22).

Table 19. Necessity and sufficiency of hypothesized causal conditions for Outcome 1

Condition	Necessity	Sufficiency
QualTeamMtgs	0.85	0.55
WorkExp	0.77	0.54
~Complexity	0.73	0.57
~OutofPocket	0.70	0.61
SupRatio	0.67	0.58
ChalRecruitRetain	0.65	0.56
Training	0.63	0.59
HowCaseAssigned	0.61	0.50
TimeCase	0.60	0.53
LevSuppSuper	0.59	0.55
LevelofEducation	0.54	0.54
TaskRatio	0.51	0.56
Caseload	0.50	0.61
~TimeCase	0.50	0.69
~ChalRecruitRetain	0.44	0.64
TotTimeCOVida	0.30	0.52
NonMonInc	0.23	0.49

Preliminary Outcome 1 Pathway Analysis

First, in fs/QCA software, the Truth Table Analysis function was used to run a preliminary analysis of the possible combinations of conditions that influence Outcome 1. This analysis yielded 10 preliminary pathways (Table 20).

Table 20. Preliminary pathways to Outcome 1 (solution presented is the intermediate solution obtained using fs/QCA software) (Ragin, et al., 2017)

Combination	Raw Coverage	Unique Coverage	Consistency
WorkExp*Training*~HowCaseAssigned*TimeCase*~ChalRecruitRetain	0.16	0.04	0.76
~WorkExp*~Complexity*QualTeamMtgs*TimeCase*~OutofPocket*~ChalRecruitRetain	0.09	0.01	0.77
Training*Caseload*~HowCaseAssigned*QualTeamMtgs*~TimeCase*~ChalRecruitRetain	0.11	0.01	0.86
WorkExp*~Complexity*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket*~ChalRecruitRetain	0.07	0.02	0.80
~Complexity*~HowCaseAssigned*QualTeamMtgs*~SupRatio*TimeCase*~OutofPocket*~ChalRecruitRetain	0.11	0.00	0.80
~Caseload*~Complexity*~HowCaseAssigned*QualTeamMtgs*TimeCase*~OutofPocket*~ChalRecruitRetain	0.10	0.01	0.87
~WorkExp*Caseload*QualTeamMtgs*SupRatio*TimeCase*~OutofPocket*~ChalRecruitRetain	0.07	0.00	0.73
WorkExp*Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.07	0.01	0.89
Caseload*Complexity*~HowCaseAssigned*QualTeamMtgs*SupRatio*TimeCase*~OutofPocket*~ChalRecruitRetain	0.08	0.00	0.99
WorkExp*Training*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.08	0.01	0.90

Solution Coverage: 0.31

Solution Consistency: 0.82

To arrive at these preliminary results, the following input conditions and assumptions were used:

- ◆ LevEducation (present)
- ◆ WorkExp (present)
- ◆ Training (present)
- ◆ Caseload (present)
- ◆ ~Complexity (absent)
- ◆ HowCaseAssigned (present)
- ◆ QualTeamMtgs (present)
- ◆ LevSuppSuper (present)
- ◆ SupRatio (present)
- ◆ TimeCase (present or absent)
- ◆ TaskRatio (present)
- ◆ ~OutofPocket (absent)
- ◆ ~ChalRecruitRetain (absent)

Outcome 1 Subset/Superset Analysis

While the preliminary solution consistency (0.82) was high, and within the acceptable range for a final solution, 10 pathways is too many to provide actionable recommendations. Furthermore, three of the

preliminary pathways had consistency scores below the acceptable cutoff (0.8), and the solution coverage was low (0.31). To determine if causal conditions could be removed to further simplify the pathways and to reduce the number of pathways in the solution and to potentially increase the consistency and coverage of the solution, a subset/superset analysis was performed to search for pathways that have similar consistency but higher coverage scores. For the subset/superset analysis, pathways with similar consistency and higher coverage are presented (i.e., subsets of the original pathway). If these do not exist, five subsets with consistency above 0.8 are presented. Finally, for the three pathways with low consistency, only subsets with consistency above 0.8 are presented.

Outcome 1 Pathway 1 (Preliminary):

WorkExp*Training*~HowCaseAssigned*TimeCase*~ChalRecruitRetain

Goal: Identify subsets with consistency above 0.76 (pathways must be above 0.8 to be accepted in the final solution) and coverage above 0.16.

Subset	Consistency	Coverage
Training*~HowCaseAssigned*~ChalRecruitRetain	0.80	0.20

Outcome 1 Pathway 2 (Preliminary):

~WorkExp*~Complexity*QualTeamMtgs*TimeCase*~OutofPocket*~ChalRecruitRetain

Goal: Identify subsets with consistency above 0.77 (pathways must be above 0.8 to be accepted in the final solution) and coverage above 0.09.

Subset	Consistency	Coverage
~WorkExp*QualTeamMtgs*TimeCase*~OutofPocket*~ChalRecruitRetain	0.81	0.12
~WorkExp*QualTeamMtgs*~OutofPocket*~ChalRecruitRetain	0.81	0.12
~WorkExp*TimeCase*~OutofPocket*~ChalRecruitRetain	0.81	0.12
~WorkExp*QualTeamMtgs*~ChalRecruitRetain	0.80	0.15

Outcome 1 Pathway 3 (Preliminary):

Training*Caseload*~HowCaseAssigned*QualTeamMtgs*~TimeCase*~ChalRecruitRetain

Goal: Identify subsets with consistency near 0.86 and coverage above 0.11.

Subset	Consistency	Coverage
Caseload*~HowCaseAssigned*~TimeCase*~ChalRecruitRetain	0.87	0.13
Training*Caseload*~HowCaseAssigned*~TimeCase*~ChalRecruitRetain	0.86	0.12
Caseload*~HowCaseAssigned*QualTeamMtgs*~TimeCase*~ChalRecruitRetain	0.86	0.12

Outcome 1 Pathway 4 (Preliminary):

WorkExp*~Complexity*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket*~ChalRecruit Retain

Goal: Identify subsets with consistency near 0.80 and coverage above 0.07.

Subset	Consistency	Coverage
WorkExp*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.91	0.17
WorkExp*~Complexity*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.89	0.15
WorkExp*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket	0.89	0.14
WorkExp*~Complexity*~HowCaseAssigned*LevSuppSuper*~TimeCase*~Outof Pocket	0.87	0.12
WorkExp*~Complexity*~HowCaseAssigned*~TimeCase*~OutofPocket	0.86	0.17
~HowCaseAssigned*LevSuppSuper*~OutofPocket*~ChalRecruitRetain	0.85	0.10
WorkExp*~HowCaseAssigned*LevSuppSuper*~OutofPocket*~ChalRecruitRetain	0.83	0.09
~Complexity*~HowCaseAssigned*LevSuppSuper*~OutofPocket*~ChalRecruit Retain	0.83	0.09
~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket	0.83	0.15
WorkExp*~Complexity*~HowCaseAssigned*~OutofPocket	0.83	0.22
WorkExp*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket*~Chal RecruitRetain	0.82	0.08
~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket*~ChalRecruitRe tain	0.82	0.08
WorkExp*~Complexity*~HowCaseAssigned*LevSuppSuper*~OutofPocket*~Ch alRecruitRetain	0.81	0.08
WorkExp*~HowCaseAssigned*~TimeCase*~OutofPocket	0.81	0.20
~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.81	0.21
~Complexity*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.81	0.19
WorkExp*~HowCaseAssigned*~TimeCase*~OutofPocket*~ChalRecruitRetain	0.81	0.12
~Complexity*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket	0.81	0.13
WorkExp*~HowCaseAssigned*~OutofPocket	0.80	0.25
WorkExp*~Complexity*~TimeCase*~OutofPocket	0.80	0.34

Outcome 1 Pathway 5 (Preliminary):

~Complexity*~HowCaseAssigned*QualTeamMtg*~SupRatio*TimeCase*~OutofPocket*~ChalRecruit Retain

Goal: Identify subsets with consistency near 0.80 and coverage above 0.11.

Subset	Consistency	Coverage
~HowCaseAssigned*~SupRatio*~OutofPocket*~ChalRecruitRetain	0.83	0.15
~HowCaseAssigned*~SupRatio*~ChalRecruitRetain	0.82	0.21
~HowCaseAssigned*~SupRatio*TimeCase*~OutofPocket*~ChalRecruitRetain	0.82	0.13
~HowCaseAssigned*QualTeamMtg*~SupRatio*~OutofPocket*~ChalRecruitRetain	0.82	0.13

~HowCaseAssigned*QualTeamMtgs*~SupRatio*TimeCase*~OutofPocket*~ChalRecruitRetain	0.82	0.13
~Complexity*~HowCaseAssigned*~SupRatio*~OutofPocket*~ChalRecruitRetain	0.81	0.13
~HowCaseAssigned*~SupRatio*TimeCase*~ChalRecruitRetain	0.80	0.18
~Complexity*~HowCaseAssigned*~SupRatio*~OutofPocket	0.80	0.20
~HowCaseAssigned*QualTeamMtgs*~SupRatio*~ChalRecruitRetain	0.80	0.17

Outcome 1 Pathway 6 (Preliminary):

~Caseload*~Complexity*~HowCaseAssigned*QualTeamMtgs*TimeCase*~OutofPocket*~ChalRecruitRetain

Goal: Identify subsets with consistency near 0.87 and coverage above 0.10.

Subset	Consistency	Coverage
~Caseload*~HowCaseAssigned*QualTeamMtgs*~OutofPocket*~ChalRecruitRetain	0.89	0.12
~Caseload*~HowCaseAssigned*TimeCase*~OutofPocket*~ChalRecruitRetain	0.88	0.11
~Caseload*~Complexity*~HowCaseAssigned*QualTeamMtgs*~OutofPocket*~ChalRecruitRetain	0.88	0.11
~Caseload*~HowCaseAssigned*QualTeamMtgs*TimeCase*~OutofPocket*~ChalRecruitRetain	0.88	0.11

Outcome 1 Pathway 7 (Preliminary):

~WorkExp*Caseload*QualTeamMtgs*SupRatio*TimeCase*~OutofPocket*~ChalRecruitRetain

Goal: Identify subsets with consistency above 0.73 (pathways must be above 0.8 to be accepted in the final solution) and coverage above 0.07.

Subset	Consistency	Coverage
~WorkExp*QualTeamMtgs*TimeCase*~OutofPocket*~ChalRecruitRetain	0.81	0.12
~WorkExp*QualTeamMtgs*~OutofPocket*~ChalRecruitRetain	0.81	0.12
~WorkExp*TimeCase*~OutofPocket*~ChalRecruitRetain	0.81	0.12
~WorkExp*QualTeamMtgs*~ChalRecruitRetain	0.80	0.15

Outcome 1 Pathway 8 (Preliminary):

WorkExp*Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket

Goal: Identify subsets with consistency near 0.89 and coverage above 0.07.

Subset	Consistency	Coverage
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.93	0.11
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper	0.93	0.13
Caseload*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.92	0.11
Caseload*~HowCaseAssigned*LevSuppSuper	0.92	0.13
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~OutofPocket	0.92	0.10
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio	0.92	0.12

WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket	0.91	0.09
Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~OutofPocket	0.91	0.10
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.91	0.09
WorkExp*Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.91	0.09
Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio	0.91	0.12
WorkExp*Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper	0.91	0.11
Caseload*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket	0.91	0.09
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*~TimeCase	0.91	0.10
Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.91	0.09
Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.91	0.09
WorkExp*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.91	0.17
WorkExp*Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper*SupRatio*~OutofPocket	0.90	0.08
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~TimeCase	0.90	0.10
Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper	0.90	0.11
WorkExp*Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper*SupRatio	0.90	0.10
Caseload*~HowCaseAssigned*LevSuppSuper*~TimeCase	0.90	0.10
Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~TimeCase	0.90	0.10
Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper*SupRatio*~OutofPocket	0.90	0.08
Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper*SupRatio	0.90	0.10

Outcome 1 Pathway 9 (Preliminary):

Caseload*Complexity*~HowCaseAssigned*QualTeamMtgs*SupRatio*TimeCase*~OutofPocket*~ChalRecruitRetain

Goal: Identify subsets with consistency near 0.99 and coverage above 0.08.

Subset	Consistency	Coverage
Caseload*Complexity*~HowCaseAssigned*~OutofPocket*~ChalRecruitRetain	0.99	0.09
Caseload*Complexity*~HowCaseAssigned*SupRatio*~OutofPocket*~ChalRecruitRetain	0.99	0.09

Outcome 1 Pathway 10 (Preliminary):

WorkExp*Training*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket

Goal: Identify subsets with consistency near 0.90 and coverage above 0.08.

Subset	Consistency	Coverage
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.93	0.11
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper	0.93	0.13

WorkExp*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*~OutofPocket	0.92	0.10
Caseload*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.92	0.11
Caseload*~HowCaseAssigned*LevSuppSuper	0.92	0.13
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~OutofPocket	0.92	0.10
WorkExp*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper	0.92	0.12
Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*~OutofPocket	0.92	0.10
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio	0.92	0.12
WorkExp*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*SupRatio*~OutofPocket	0.92	0.09
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket	0.91	0.09
Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~OutofPocket	0.91	0.10
WorkExp*Training*Caseload*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.91	0.09
WorkExp*Training*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*~OutofPocket	0.91	0.09
Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper	0.91	0.12
WorkExp*Training*Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~OutofPocket	0.91	0.09
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.91	0.09
WorkExp*Training*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*SupRatio*~OutofPocket	0.91	0.09
Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio	0.91	0.12
WorkExp*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*~TimeCase*~OutofPocket	0.91	0.09
WorkExp*Training*Caseload*~HowCaseAssigned*LevSuppSuper	0.91	0.11
Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*SupRatio*~OutofPocket	0.91	0.09
Caseload*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket	0.91	0.09
WorkExp*Training*Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio	0.91	0.11
Training*Caseload*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.91	0.09
Training*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*~OutofPocket	0.91	0.09
WorkExp*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*SupRatio	0.91	0.11
WorkExp*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.91	0.08
WorkExp*Caseload*~HowCaseAssigned*LevSuppSuper*~TimeCase	0.91	0.10
Training*Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~OutofPocket	0.91	0.09
Training*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper*SupRatio*~OutofPocket	0.91	0.09

Caseload*~HowCaseAssigned*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.91	0.09
WorkExp*Training*Caseload*~HowCaseAssigned*QualTeamMtgs*LevSuppSuper	0.91	0.10
WorkExp*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.91	0.17

From the subset/superset analysis, *caseload* was the only condition that could be removed because it increased pathway consistency and coverage. The removal of any other conditions reduced consistency of an individual pathway and/or of the overall solution below the acceptable threshold. For example, the removal of *work experience* and *time case* increased the consistency and coverage of Preliminary Pathway 2 but reduced these scores for the other preliminary pathways and for the solution overall. As a check, multiple different combinations of conditions were investigated again to identify any other possible consistent pathways. All possible additions and subtractions of conditions did not yield any further consistency pathways.

Final Outcome 1 Pathway Analysis

The revised intermediate solution for Outcome 1 is presented in **Table 21**. From the preliminary 10 pathways, the final solution contains six, simplified pathways. Each pathway contains six to eight conditions.

Table 21. Final pathways to Outcome 1 (solution presented is the intermediate solution obtained using fs/QCA software) (Ragin, et al., 2017)

Combination	Raw Coverage	Unique Coverage	Consistency	# of Activistas
HowCaseAssigned*Training*~ChalRecruitRetain* Complexity*QualTeamMtgs*~TimeCase	0.09	0.01	0.93	3 (CBOS: 3, 4)
HowCaseAssigned*Training*~ChalRecruitRetain* Complexity*WorkExp*TimeCase	0.09	0.01	0.93	3 (CBOS: 4, 6)
HowCaseAssigned*~OutofPocket*Complexity* QualTeamMtgs*TimeCase*~ChalRecruitRetain	0.19	0.02	0.95	7 (CBOS: 3)
HowCaseAssigned*~OutofPocket*WorkExp*LevSuppSuper* ~TimeCase*Training*QualTeamMtgs*SupRatio	0.10	0.01	0.86	4 (CBOS: 2, 3)
HowCaseAssigned*~OutofPocket*WorkExp*LevSuppSuper* ~TimeCase*~Complexity*SupRatio	0.11	0.01	0.86	4 (CBOS: 3, 4)
HowCaseAssigned*~OutofPocket*WorkExp*LevSuppSuper* ~TimeCase*~Complexity*~ChalRecruitRetain	0.07	0.00	0.80	3 (CBOS: 2)

Solution Coverage: 0.35

Solution Consistency: 0.85

To arrive at these final Outcome 1 results, the following input conditions and assumptions were used:

Final Outcome 1 Pathway Analysis Input Conditions and Assumptions

- ◆ WorkExp (present)
- ◆ Training (present)
- ◆ ~Complexity (absent)
- ◆ HowCaseAssigned (present)
- ◆ QualTeamMtgs (present)
- ◆ LevSuppSuper (present)
- ◆ SupRatio (present)
- ◆ TimeCase (present or absent)
- ◆ ~OutofPocket (absent)
- ◆ ~ChalRecruitRetain (absent)

Outcome 2 Analysis: Percentage of HIV Status Unknown at Last Assessment

Necessity and Sufficiency of Causal Conditions for Outcome 2

Necessity and sufficiency of the hypothesized causal conditions were calculated for Outcome 2 (Table 22).

Table 22. Necessity and sufficiency of causal conditions for Outcome 2

Condition	Necessity	Sufficiency
ChalRecruitRetain	0.85	0.52
TimeCase	0.81	0.51
~Caseload	0.77	0.53
~NonMonInc	0.68	0.35
~TotTimeCOVida	0.63	0.38
TotTimeCOVida	0.61	0.63
~TaskRatio	0.60	0.45
~LevelofEducation	0.58	0.49
~Training	0.56	0.51
~SupRatio	0.55	0.55
OutofPocket	0.47	0.49
~LevSuppSuper	0.45	0.41
~TimeCase	0.44	0.44
Complexity	0.42	0.53
~HowCaseAssigned	0.37	0.42
~WorkExp	0.30	0.52
~QualTeamMtgs	0.19	0.45

Preliminary Outcome 2 Pathway Analysis

First, in fs/QCA software, the Truth Table Analysis function was used to run a preliminary analysis of the possible combinations of conditions that influence Outcome 2. This analysis yielded 14 preliminary pathways (Table 23).

Table 23. Preliminary pathways to Outcome 2 (solution presented is the intermediate solution obtained using fs/QCA software) (Ragin, et al., 2017)

Combination	Raw Coverage	Unique Coverage	Consistency
~Caseload*Complexity*~LevSuppSuper*~SupRatio*TimeCase*~OutofPocket	0.09	0.00	0.72
~Caseload*Complexity*~LevSuppSuper*~TimeCase*~OutofPocket*ChalRecruitRetain	0.09	0.00	0.80
~Training*~Caseload*Complexity*~TimeCase*~OutofPocket*ChalRecruitRetain	0.10	0.00	0.73
~Caseload*Complexity*QualTeamMtgs*~LevSuppSuper*~SupRatio*TimeCase	0.10	0.00	0.71
~Caseload*Complexity*QualTeamMtgs*~LevSuppSuper*~TimeCase*ChalRecruitRetain	0.10	0.00	0.77
~Training*~Caseload*Complexity*QualTeamMtgs*~TimeCase*ChalRecruitRetain	0.11	0.00	0.71
~WorkExp*Training*~Caseload*~HowCaseAssigned*TimeCase*ChalRecruitRetain	0.10	0.00	0.73
~WorkExp*~Caseload*~HowCaseAssigned*SupRatio*TimeCase*ChalRecruitRetain	0.11	0.01	0.73
~WorkExp*Training*~Caseload*Complexity*TimeCase*ChalRecruitRetain	0.07	0.00	0.74
~WorkExp*~Caseload*Complexity*SupRatio*TimeCase*ChalRecruitRetain	0.07	0.00	0.74
~WorkExp*~Training*~Caseload*Complexity*~OutofPocket*ChalRecruitRetain	0.05	0.00	0.71
~WorkExp*~Training*~Caseload*Complexity*QualTeamMtgs*ChalRecruitRetain	0.06	0.00	0.71
~WorkExp*~Caseload*Complexity*TimeCase*~OutofPocket*ChalRecruitRetain	0.07	0.00	0.74
~WorkExp*~Caseload*Complexity*QualTeamMtgs*TimeCase*ChalRecruitRetain	0.07	0.00	0.74

Solution Coverage: 0.24

Solution Consistency: 0.74

To arrive at these preliminary results, the following input conditions and assumptions were used:

- ◆ ~LevEducation (absent)
- ◆ ~WorkExp (absent)
- ◆ ~Training (absent)
- ◆ ~Caseload (absent)
- ◆ Complexity (present)
- ◆ ~HowCaseAssigned (absent)
- ◆ ~QualTeamMtgs (absent)
- ◆ ~LevSuppSuper (absent)
- ◆ ~SupRatio (absent)

- ◆ TimeCase (present or absent)
- ◆ ~TaskRatio (absent)
- ◆ OutofPocket (present)
- ◆ ChalRecruitRetain (present)

Outcome 2 Subset/Superset Analysis

The preliminary solution consistency and coverage are too low to be accepted for the final solution. Additionally, 14 pathways is too many. To determine if causal conditions could be removed to further simplify the pathways, reduce the number of pathways in the solution, and increase consistency and coverage, a subset/superset analysis was performed. For the subset/superset analysis, all preliminary pathways were explored. However, from the 13 preliminary pathways that had consistency scores below 0.8, no subsets existed that increased this consistency above 0.8. Therefore, only the preliminary pathway (Pathway 2) with consistency above 0.8 is presented.

Outcome 2 Pathway 2 (Preliminary):

~Caseload*Complexity*~LevSuppSuper*~TimeCase*~OutofPocket*ChalRecruitRetain

Goal: Identify subsets with consistency near 0.80 and coverage above 0.09.

Subset	Consistency	Coverage
~Caseload*Complexity*~LevSuppSuper*~TimeCase*ChalRecruitRetain	0.80	0.09

The subset/superset analysis did not produce any pathways that met the minimum consistency threshold and increased coverage, and it produced only one subset with the same consistency and coverage. This subset did not have *lack of out-of-pocket costs*, and upon a re-examination of case knowledge, the simplified subset was accepted as the final solution. The *lack of out-of-pocket costs* was hypothesized to positively influence positive outcomes, so while *out-of-pocket costs* was absent in the cases explained by this pathway, it likely did not contribute to the low percentage of beneficiaries with known HIV status. Instead, it was determined that the other conditions present in the pathway (and in the subset) were more important factors. As a check, multiple different combinations of conditions were investigated again to identify any other possible consistent pathways. All possible additions and subtractions of conditions did not yield any further consistency pathways.

Final Outcome 2 Pathway Analysis

The revised intermediate solution for Outcome 2 is presented in **Table 24**. The one consistent pathway was accepted as the final solution. The coverage score for this solution is low, because few cases are described by this pathway. However, this pathway was the only combination of conditions that consistency led to a high percentage of beneficiaries with unknown HIV status at the last assessment. This pathway had five conditions.

Table 24. Final pathway to Outcome 2 (solution presented is the intermediate solution obtained using fs/QCA software) (Ragin, et al., 2017)

Combination	Raw Coverage	Unique Coverage	Consistency	# of Activistas
ChalRecruitRetain*~Caseload*~LevSuppSuper*~TimeCase*Complexity	0.09	0.00	0.80	6 (CBOs: 1, 5, 6)

Solution Coverage: 0.09

Solution Consistency: 0.80

To arrive at these final Outcome 2 results, the following input conditions and assumptions were used:

- ◆ ~Caseload (absent)
- ◆ Complexity (present)
- ◆ ~LevSuppSuper (absent)
- ◆ TimeCase (present or absent)
- ◆ ChalRecruitRetain (present)

Outcome 3 Analysis: Percentage of HIV Status Known at Last Assessment

Since there was only one pathway that led to Outcome 2, the percentage of beneficiaries with HIV status *unknown* at the last assessment, a fsQCA was also performed for the negated outcome, or the percentage of beneficiaries with HIV status *known* at the last assessment (referred to herein as Outcome 3). No new calibration was performed for this analysis; Outcome 3 was analyzed as the inverse of Outcome 2, and the assumptions used for the Outcome 3 analysis were the opposite of those used for Outcome 2. For example, an activista with an Outcome 2 score of 0.10 would have an Outcome 3 score of 0.90. Similarly, if a condition was hypothesized to positively influence Outcome 2 when present, it was then hypothesized to positively influence Outcome 3 when absent.

Necessity and Sufficiency of Causal Conditions for Outcome 3

Necessity and sufficiency of the hypothesized causal conditions were calculated for Outcome 3 (Table 25).

Table 25. Necessity and sufficiency of causal conditions for Outcome 3

Condition	Necessity	Sufficiency
QualTeamMtgs	0.85	0.63
WorkExp	0.83	0.65
~TotTimeCOVida	0.78	0.76
~Complexity	0.77	0.68
SupRatio	0.73	0.72
~OutofPocket	0.69	0.68
HowCaseAssigned	0.69	0.64
Training	0.66	0.71
TimeCase	0.64	0.65
LevelofEducation	0.61	0.70
LevSuppSuper	0.60	0.64
Caseload	0.57	0.80
TaskRatio	0.54	0.69
~TimeCase	0.52	0.82
~ChalRecruitRetain	0.51	0.85
TotTimeCOVida	0.37	0.61
NonMonInc	0.22	0.53

Preliminary Outcome 3 Pathway Analysis

First, in fs/QCA software, the Truth Table Analysis function was used to run a preliminary analysis of the possible combinations of conditions that influence Outcome 3. This analysis yielded six preliminary pathways (Table 26).

Table 26. Preliminary pathways to Outcome 3 (solution presented is the intermediate solution obtained using fs/QCA software) (Ragin, et al., 2017)

Combination	Raw Coverage	Unique Coverage	Consistency
WorkExp*~Complexity*~QualTeamMtgs*LevSuppSuper*~TimeCase*~OutofPocket*~ChalRecruitRetain	0.05	0.01	0.71
WorkExp*~Complexity*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket*~ChalRecruitRetain	0.07	0.01	0.80
~WorkExp*~Training*Caseload*HowCaseAssigned*QualTeamMtgs*~TimeCase*OutofPocket	0.12	0.06	0.86
WorkExp*Caseload*~Complexity*~QualTeamMtgs*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.05	0.00	0.80
WorkExp*Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.09	0.03	0.94
~WorkExp*~Training*Caseload*~Complexity*QualTeamMtgs*SupRatio*TimeCase*OutofPocket*~ChalRecruitRetain	0.06	0.01	0.80

Solution Coverage: 0.27

Solution Consistency: 0.84

To arrive at these preliminary results, the following input conditions and assumptions were used:

- ◆ LevEducation (present)
- ◆ WorkExp (present)
- ◆ Training (present)
- ◆ Caseload (present)
- ◆ ~Complexity (absent)
- ◆ HowCaseAssigned (present)
- ◆ QualTeamMtgs (present)
- ◆ LevSuppSuper (present)
- ◆ SupRatio (present)
- ◆ TimeCase (present or absent)
- ◆ TaskRatio (present)
- ◆ ~OutofPocket (absent)
- ◆ ~ChalRecruitRetain (absent)

Outcome 3 Subset/Superset Analysis

The preliminary solution consistency is above the acceptable threshold. Since the coverage was low and some of the pathways were complicated (i.e., had a large number of conditions), a subset/superset analysis was performed to determine if causal conditions could be removed to further simplify the pathways, reduce the number of pathways in the solution, and increase consistency and coverage. For the subset/superset analysis, all preliminary pathways were explored. However, from the one preliminary pathway that had consistency scores below 0.8 (Pathway 1), no subsets existed that increased this consistency above 0.8. Therefore, only the preliminary pathways with consistency above 0.8 are presented. For these pathways, subsets that had similar consistency and increased coverage are presented.

Outcome 3 Pathway 2 (Preliminary):

WorkExp*~Complexity*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket*~ChalRecruitRetain

Goal: Identify subsets with consistency near 0.80 and coverage above 0.07.

Subset	Consistency	Coverage
WorkExp*~Complexity*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket	0.86	0.13
WorkExp*~Complexity*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.83	0.15
WorkExp*~HowCaseAssigned*LevSuppSuper*~TimeCase*~OutofPocket	0.82	0.15
WorkExp*~Complexity*~HowCaseAssigned*~TimeCase*~OutofPocket	0.82	0.18
~Complexity*~HowCaseAssigned*LevSuppSuper*~OutofPocket*~ChalRecruitRetain	0.82	0.09
WorkExp*~HowCaseAssigned*~TimeCase*~OutofPocket	0.82	0.22
WorkExp*~HowCaseAssigned*LevSuppSuper*~OutofPocket	0.80	0.16

Outcome 3 Pathway 3 (Preliminary):

~WorkExp*~Training*Caseload*HowCaseAssigned*QualTeamMtgs*~TimeCase*OutofPocket

Goal: Identify subsets with consistency near 0.86 and coverage above 0.12.

Subset	Consistency	Coverage
~WorkExp*~Training*Caseload*QualTeamMtgs*~TimeCase*OutofPocket	0.87	0.13
~WorkExp*~Training*Caseload*~TimeCase*OutofPocket	0.87	0.13

Outcome 3 Pathway 4 (Preliminary):

WorkExp*Caseload*~Complexity*~QualTeamMtgs*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket

Goal: Identify subsets with consistency near 0.80 and coverage above 0.05.

Subset	Consistency	Coverage
WorkExp*Caseload*~Complexity*LevSuppSuper*~TimeCase	0.87	0.21
WorkExp*Caseload*~Complexity*LevSuppSuper*SupRatio*~TimeCase	0.87	0.21
Caseload*~Complexity*LevSuppSuper*~TimeCase	0.87	0.21
Caseload*~Complexity*LevSuppSuper*SupRatio*~TimeCase	0.87	0.21
WorkExp*Caseload*~Complexity*LevSuppSuper*~TimeCase*~OutofPocket	0.86	0.19
WorkExp*Caseload*~Complexity*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.86	0.18
Caseload*~Complexity*LevSuppSuper*~TimeCase*~OutofPocket	0.85	0.19
Caseload*~Complexity*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket	0.85	0.18
WorkExp*Caseload*~Complexity*~TimeCase	0.85	0.29
Caseload*~Complexity*~TimeCase	0.85	0.29
WorkExp*Caseload*~Complexity*SupRatio*~TimeCase	0.84	0.27
Caseload*~Complexity*SupRatio*~TimeCase	0.84	0.27
WorkExp*Caseload*~Complexity*~TimeCase*~OutofPocket	0.83	0.25
Caseload*~Complexity*~TimeCase*~OutofPocket	0.83	0.25
WorkExp*Caseload*~TimeCase	0.83	0.35
WorkExp*Caseload*~Complexity*SupRatio*~TimeCase*~OutofPocket	0.82	0.23

Caseload*~Complexity*SupRatio*~TimeCase*~OutofPocket	0.82	0.23
WorkExp*~Complexity*~QualTeamMtgs*LevSuppSuper*~TimeCase	0.82	0.10
~Complexity*~QualTeamMtgs*LevSuppSuper*~TimeCase	0.82	0.10
WorkExp*Caseload*LevSuppSuper*~TimeCase	0.82	0.22
WorkExp*Caseload*~TimeCase*~OutofPocket	0.82	0.30
WorkExp*Caseload*LevSuppSuper*SupRatio*~TimeCase	0.82	0.22
Caseload*LevSuppSuper*~TimeCase	0.82	0.22
Caseload*LevSuppSuper*SupRatio*~TimeCase	0.81	0.22
WorkExp*Caseload*SupRatio*~TimeCase	0.81	0.32
Caseload*~TimeCase	0.81	0.39

Outcome 3 Pathway 5 (Preliminary):

WorkExp*Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper*SupRatio*~TimeCase*~OutofPocket

Goal: Identify subsets with consistency near 0.94 and coverage above 0.09.

Subset	Consistency	Coverage
WorkExp*Caseload*~Complexity*~HowCaseAssigned*LevSuppSuper	0.94	0.13

Outcome 3 Pathway 6 (Preliminary):

~WorkExp*~Training*Caseload*~Complexity*QualTeamMtgs*SupRatio*TimeCase*OutofPocket*~ChalRecruitRetain

Goal: Identify subsets with consistency near 0.80 and coverage above 0.06.

Subset	Consistency	Coverage
~WorkExp*Caseload*QualTeamMtgs*SupRatio*OutofPocket	0.81	0.14
~WorkExp*Caseload*SupRatio*OutofPocket	0.81	0.14
~WorkExp*~Training*Caseload*QualTeamMtgs*SupRatio*OutofPocket	0.81	0.14
~WorkExp*~Training*Caseload*SupRatio*OutofPocket	0.81	0.14
~WorkExp*~Training*Caseload*QualTeamMtgs*OutofPocket	0.80	0.14
~WorkExp*~Training*Caseload*OutofPocket	0.80	0.14
~WorkExp*Caseload*QualTeamMtgs*OutofPocket	0.80	0.15

From the subset/superset analysis, removing the following conditions increased consistency and coverage of an individual pathway: *how cases are assigned* and *lack of challenges recruiting and retaining*. The truth table analysis was run again without these two conditions, and overall solution consistency and coverage improved. As a check, multiple different combinations of conditions were investigated again to identify any other possible consistent pathways. All possible additions and subtractions of conditions did not yield any further consistency pathways.

Final Outcome 3 Pathway Analysis

The revised intermediate solution for Outcome 3 is presented in **Table 27**. There were five pathways that led to a high percentage of beneficiaries with known HIV status at the last assessment. Each pathway included four to seven conditions.

Table 27. Final pathway to Outcome 3 (solution presented is the intermediate solution obtained using fs/QCA software) (Ragin, et al., 2017)

Combination	Raw Coverage	Unique Coverage	Consistency	# of Activistas
WorkExp*~Complexity*~OutofPocket*LevSuppSuper*~TimeCase*~SupRatio	0.23	0.01	0.88	9 (CBOS: 4)
WorkExp*~Complexity*~OutofPocket*LevSuppSuper*~TimeCase*Caseload*Training	0.22	0.02	0.86	9 (CBOS: 3)
WorkExp*~Complexity*~OutofPocket*LevSuppSuper*~TimeCase*~Training	0.24	0.01	0.80	10 (CBOS: 2, 3)
~WorkExp*Caseload*QualTeamMtgs*~TimeCase	0.14	0.07	0.86	5 (CBOS: 3, 6)
~WorkExp*Caseload*QualTeamMtgs*~Complexity*SupRatio	0.09	0.02	0.80	3 (CBOS: 2,3)

Solution Coverage: 0.42

Solution Consistency: 0.87

To arrive at these final Outcome 3 results, the following input conditions and assumptions were used:

- ◆ WorkExp (present)
- ◆ Training (present)
- ◆ Caseload (present)
- ◆ ~Complexity (absent)
- ◆ QualTeamMtgs (present)
- ◆ LevSuppSuper (present)
- ◆ SupRatio (present)
- ◆ TimeCase (present or absent)
- ◆ ~OutofPocket (absent)

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