Final Report

Impact, adaptability, and scalability of a community-based antiretroviral therapy delivery model for people living with HIV in Cambodia: A post-intervention qualitative study

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ការមិនទទួលស្គាល់៖ ការស្រាវជ្រាវនេះ គឺ/ត្រូវបានគាំទ្រដោយរដ្ឋាភិបាលអូស្ត្រាលី តាមរយៈការផ្តល់ជំនួយតូចមួយតាមរយៈកម្មវិធីអាហារូបករណ៍អូស្ត្រាលីប្រចាំនៅកម្ពុជា។មតិដែលបានបង្ហាញក្នុងការ ស្រាវជ្រាវនេះ គឺជាមតិរបស់អ្នកស្រាវជ្រាវ នឹងមិនឆ្លុះបញ្ចាំងពីទស្សនៈរបស់ រដ្ឋាភិបាល អូស្ត្រាលី ឬ កម្មវិធីអាហារូបករណ៍អូស្ត្រាលីប្រចាំនៅកម្ពុជានោះទេ។

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List of Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral
CAD	Community-based ART delivery
CAW	Community Action Worker
FGD	Focus group discussion
HCW	Healthcare worker
HIV	Human Immunodeficiency Virus
IDI	In-depth interview
ID Poor	Identification of Poor Households Program
KII	Key informant interview
KP	Key populations
MMD	Multi-month dispensing
MSM	Men who have sex with men
NGO	Non-governmental organizations
NSP	National Strategic Plan
PRH	Provincial Referral Hospital
PWID	People who inject drugs
RH	Referral Hospital
TG	Transgender

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Executive Summary

Background: A quasi-experimental study was conducted from May 2021 to April 2023 to evaluate the effectiveness of the community-based antiretroviral therapy (ART) delivery (CAD) model compared to the standard multi-month dispensing (MMD) model within the Cambodian context. Building on previous evaluations, this post-intervention qualitative study offers a deeper exploration of the contextual factors influencing key outcomes while examining the evolution and current status of the CAD model. Additionally, the study gathers insights from beneficiaries and stakeholders on the continuation, adaptability, and scalability of the CAD model.

Methods: Nearly 80 in-depth interviews and focus group discussions were conducted with people living with HIV (PLHIV), community action workers (CAWs), healthcare workers (HCWs), non-governmental organization (NGO) field staff, and multilevel stakeholders who had been involved in the CAD model in the parent study. The study team coded transcripts in NVivo 15 and conducted reflexive thematic analysis through an inductive and iterative process.

Results: Participants highlighted the effectiveness of the CAD model's various components—including medication delivery and CAW-led monitoring, follow-ups, education, and group meetings—in enhancing ART adherence, retention in care, and viral load suppression. However,

participants also identified several shortcomings, with some reporting instances of loss to follow-up and patients missing viral load testing appointments after the implementation of CAD.

The perceived impacts of the CAD model on mental health, physical health, quality of life, stigma and discrimination, and HCW workload were mostly positive. Medication delivery decreased transportation costs to health facilities, increased time available for work and family, minimized the risk of unwanted HIV status disclosure, and helped decongest healthcare facilities. Education, counseling, and social support were recognized as instrumental to PLHIV's physical and mental well-being. Moreover, CAWs helped reduce community-level stigma through education and served as intermediaries between PLHIV and HCWs.

The CAD model's operations have significantly scaled down since the end of the study period due to a lack of sustained funding and logistical incompatibility with the current social protection scheme. Discontinued medication delivery and diminished support from CAWs have reportedly led to setbacks in ART access and health outcomes.

Overall, the continuation of the CAD model received nearly unanimous support from PLHIV and CAWs. While HCWs and stakeholders were also generally supportive, they urged further consideration of how to overcome pressing logistical challenges. Participants recommended targeting groups facing heightened barriers to medication access, such as the elderly, those in remote areas, and poor individuals, among others, when asked about expanding the CAD model. Key barriers to adaptability and scalability included funding and resource constraints, healthcare system and policy obstacles, and geographic challenges. Facilitators included robust funding, capacity building, multilevel collaboration, and alignment with national strategies.

Conclusion: The continuation of the CAD model has received support from beneficiaries and stakeholders due to its perceived positive impacts on outcomes for PLHIV, the broader community, and the healthcare system. Nevertheless, addressing critical gaps in the CAD model and overcoming barriers to its adaptability and scalability are crucial, especially as its operations have declined substantially over the past year. The findings and lessons learned from this research have guided the development of key recommendations for the future of the CAD model.

1. Introduction

Cambodia has made substantial progress in ending the HIV epidemic. As of 2023, an estimated 89% of people living with HIV (PLHIV) were receiving antiretroviral therapy (ART), and 87% were estimated to have reached viral load suppression (UNAIDS, 2023). Despite these achievements, suboptimal engagement of PLHIV in the continuum of care remains a critical challenge, primarily due to the high demands of maintaining regular clinic visits for antiretroviral (ARV) refills (Chhim et al., 2018).

Multi-month dispensing (MMD) was introduced in Cambodia to minimize the need for frequent clinic visits, optimize healthcare resources, and enhance the efficiency of patient care (Ministry of Health, 2023b). Under this differentiated care model, stable PLHIV in Cambodia attend follow-up appointments at ART clinics every 3 to 6 months to receive their antiretrovirals and access other clinical services (Ministry of Health, 2023b). However, the community-based antiretroviral delivery (CAD) model could further alleviate the burden on PLHIV and health facilities by decentralizing ART delivery and employing a task-shifting approach (World Health Organization, 2021). The CAD model centers around community action workers (CAWs) delivering ART to the communities and serving as liaisons between healthcare workers (HCWs) and PLHIV (Tuot et al., 2021). Several studies outside of Cambodia have demonstrated the success of the CAD model in addressing gaps in treatment adherence and viral suppression (Barnabas et al., 2020; Eshun-Wilson et al., 2021), which prompted exploration into its applicability and effectiveness within the Cambodian context.

From May 2021 to April 2023, a quasi-experimental study was implemented in Cambodia's capital city, Phnom Penh, and nine provinces to understand the effectiveness of the CAD model versus the MMD model (Tuot et al., 2021). The study compared outcomes from MMD (control group) and CAD (intervention group) among stable PLHIV. A comprehensive evaluation was undertaken, comparing primary outcomes of ART adherence, care retention, and viral load suppression between the two models. Secondary outcomes included mental health, quality of life, HIV-related stigma and discrimination, healthcare provider workload, and cost-effectiveness (Tuot et al., 2021).

Baseline and endline quantitative surveys were conducted in April 2021 and May 2023, respectively. Qualitative interviews were planned for midline and endline. However, the endline qualitative evaluation could not be conducted due to significant project delays and budget limitations caused by the COVID-19 pandemic, warranting further qualitative exploration to address notable knowledge gaps about the contextual factors underlying the quantitative endline results. With over a year having elapsed since the end of the intervention, it is also essential to clarify the current status of the CAD model, including its enduring strengths and weaknesses. Such information is vital for informing sustainability efforts to ensure that the CAD model can continue to effectively deliver benefits with minimal disruption to its operations amid reduced or withdrawn external funding. Key sustainability considerations include increasing domestic resource mobilization, integrating into national systems, maximizing value for money, and tackling human rights and gender access barriers (The Global Fund, 2022). Looking ahead into the future of the CAD model as part of the national HIV response, it is equally important to gather diverse perspectives on the facilitators and barriers to the adaptability and scalability of the model, with a particular focus on addressing the needs of the most vulnerable groups of PLHIV in Cambodia.

This qualitative study was conducted to supplement the findings on key outcomes from the midline qualitative interviews and endline quantitative surveys of the quasi-experimental intervention, over one-year post-intervention completion. Additionally, the study aimed to gather diverse perspectives from PLHIV, HCWs, CAWs, non-governmental organization (NGO) field staff, and multilevel stakeholders regarding changes in the CAD model and its current status. It also sought to assess the model's future adaptability and scalability, including identifying barriers and facilitators. This report will present the qualitative findings, lessons learned, and actionable recommendations derived from this study.

2. Scope and Objectives

This study was conducted to explore stakeholders' and beneficiaries' perspectives on the impact, adaptability, and scalability of the CAD model. The detailed research objectives and questions are presented in Table 1.

Table 1: Research Questions and Objectives

Research Objectives	Research Questions
1. To understand the contextual factors behind the results obtained from the endline quantitative evaluation of the quasi-experimental study.	1.1 What contextual factors influenced the primary outcomes (ART adherence, care retention, viral load suppression) observed in the quantitative endline evaluation? 1.2 What contextual factors influenced the secondary outcomes (mental health, physical health, quality of life, stigma and discrimination, and healthcare provider workload) observed in the quantitative endline evaluation?
2. To understand the current status of the CAD model, one-year post-intervention completion.	2.1 What is the current status of the CAD model?
3. To assess changes in the CAD model and the experiences of beneficiaries and stakeholders over the past year since the study period was completed.	3.1 How has the CAD model changed over the past year since the study period was completed? 3.2 How have beneficiaries' and stakeholders' experiences with the CAD model changed over the past year since the study period was completed?
4. To explore beneficiaries' and stakeholders' perspectives on	4.1 What are beneficiaries' and stakeholders' perspectives on supporting the continuation of the CAD model?

supporting the continuation of the CAD model.	
5. To explore the perspectives of beneficiaries and stakeholders on the expansion of the CAD model to groups other than the currently enrolled stable people living with HIV.	5.1 What are beneficiaries’ and stakeholders' perspectives on the expansion of the CAD model to groups other than the currently enrolled stable people living with HIV? 5.2 What are important factors to consider, such as foreseeable challenges, if the CAD model expands to groups other than the currently enrolled stable people living with HIV?
6. To identify barriers and facilitators to the adaptability and scalability of the CAD model.	6.1 What factors hinder the adaptability and scalability of the CAD model? 6.2 What factors facilitate the adaptability and scalability of the CAD model?

3. Methodology

3.1 Study Design

This qualitative study was conducted from October 2024 to January 2025. It serves as the second part of a mixed-methods sequential explanatory research design (Ivankova et al., 2006), supplementing the midline qualitative interviews to provide additional context on the results obtained from the quantitative endline evaluation conducted from July to August 2023. Simultaneously, this study functions as a qualitative evaluation of the long-term impacts of the CAD model over one-year post-intervention completion, as well as its future adaptability and scalability. Qualitative data were collected from PLHIV, CAWs, HCWs, NGO field staff, and multilevel stakeholders involved in the CAD model during the parent study. This was achieved through in-depth interviews (IDIs), key informant interviews (KIIs), and focus group discussions (FGDs).

3.2 Study Sample

The sampling frame was constructed using participant lists from all 10 ART clinics that utilized the CAD model in the parent study. These clinics were located in Phnom Penh, Kampong Thom, Kampot, Koh Kong, and Takeo, and selected based on (i) the availability of implementing partners (Cambodian People Living with HIV Network, ARV User Association, and Partner in Compassion), (ii) the number of eligible PLHIV for enrollment, and (iii) advice from the national HIV program on the accessibility of the clinics.

Participants were purposively sampled from these lists. This included PLHIV who had received care via the CAD model during the intervention, HCWs at ART clinics (physicians, nurses, pharmacists, counselors) using CAD during the intervention, and CAWs acting as liaisons between patients receiving care via CAD and ART clinics. We also sampled subnational, national, and international stakeholders, as well as NGO field staff involved in implementing the CAD model. Sample sizes were determined based on estimations for reaching saturation and to ensure the representation of PLHIV, HCWs, and CAWs from each province and ART site.

Table 2: Sample Sizes by Data Collection Method

Study Population	IDI	FGD	KII
People living with HIV	21	10*	
Healthcare workers		10**	
Community action workers			20
Key Stakeholders			
NGO field staff			11
Subnational stakeholders			5
National stakeholders			4
International stakeholders			2
Total	**21**	**20**	**42**

*FGDs with people living with HIV consist of 5-8 participants
**FGDs with healthcare workers consist of 2-6 participants

3.3 Qualitative Tool Development

Semi-structured interview and focus group discussion guides were developed based on a literature review and preliminary discussions with key stakeholders. These guides were tailored to each participant group (PLHIV, CAWs, HCWs, and key stakeholders), incorporating both open-ended questions and probing questions to explore participants' perspectives in detail. Moreover, the study team revised the guides based on feedback to ensure they effectively captured the necessary information to address the study objectives while being appropriate for each participant group. These guides are attached as Annexes 1 to 5.

3.4 Data Collection Training

Experienced qualitative data collectors were recruited and participated in a two-day training before proceeding to fieldwork. The training content consisted of an overview of the CAD parent study and post-intervention study, study procedures, data collection tools, qualitative data collection techniques, ethical considerations, and fieldwork management. Data collectors also engaged in interactive activities such as role-play interviews and mock facilitation of focus group discussions to practice and gain peer feedback on their techniques and approaches. During the latter half of the training, pilot data collection took place, followed by reflection and feedback. The training concluded with a discussion on logistics for field data collection that would commence thereafter.

3.5 Data Collection

Study participants were directly recruited by the study team and local partners. IDIs and FGDs were conducted with PLHIV who were members of the intervention group in the parent study. FGDs were conducted with HCWs, and KIIs were conducted with CAWs at each ART clinic. KIIs were also conducted with subnational, national, and international stakeholders, as well as the NGO field staff involved in implementing the CAD model. IDIs and KIIs lasted approximately 40 to 60 minutes, while the FGDs lasted about 60 to 90 minutes. Aside from KIIs with key stakeholders conducted over Zoom, all interviews and FGDs were held in person. The interviews and FGDs solicited participants' perspectives on topics such as the CAD model's impacts on primary and secondary outcomes, its current status, how it has evolved over the past year, and considerations for its adaptability and scalability. Data collectors maintained detailed field notes for all interviews and FGDs.

3.6 Data Analysis

All KIIs, IDIs, and FGDs were de-identified, audio-recorded, transcribed into Khmer, and translated into English by experienced translators. The study team conducted reflexive thematic analysis following an inductive and iterative process. The qualitative data analysis software NVivo 15 was used to code each translated transcript. Bilingual members of the study team discussed unclear translated transcripts as needed. The study team kept reflective ideas in memos and participated in regular peer debriefings to resolve discrepancies and ensure inter-coder reliability.

3.7 Data Quality Assurance

Quality assurance of data followed KHANA's procedures for quality control. This included engaging data collectors in thorough training, regularly reviewing collected data, creating detailed field notes, systematically coding transcripts, participating in peer debriefing, and maintaining a systematic audit trail.

4. Participant Characteristics

4.1 People Living with HIV

A total of 21 IDIs and 10 FGDs (each consisting of 5 to 8 participants) were conducted with PLHIV. The sociodemographic characteristics of the participants are summarized in Table 3.

Table 3: Sociodemographic Information of People Living with HIV

Characteristics	IDI participants N=21	FGD participants N=68
Gender		
Male	5 (23.8%)	24 (35.3%)
Female	16 (76.2%)	44 (64.7%)
Age group		
Adults (25-49)	7 (33.3%)	23 (33.8%)
Older adults (50-64)	14 (66.7%)	38 (55.9%)
Elderly (65+)	0 (0.0%)	7 (10.3%)
ART duration		
Newly on ART (0-5 years)	0 (0.0%)	2 (2.9%)
Medium duration (6-10 years)	3 (14.3%)	5 (7.4%)
Long duration (11-15 years)	3 (14.3%)	6 (8.8%)
Very long duration (16-20 years)	14 (66.7%)	34 (50.0%)
Extensive duration (21+ years)	1 (4.8%)	21 (30.9%)
Education (years)		
Mean (SD)	4.9 (3.6)	4.3 (3.0)
Employment Status		
Unemployed	9 (42.9%)	19 (27.9%)

Farmer/fisherman	5 (23.8%)	16 (23.5%)
Self-employed business	1 (4.8%)	10 (14.7%)
Uniformed officer (policeman, soldier, military)	0 (0.0%)	1 (1.5%)
Construction/factory worker	1 (4.8%)	9 (13.2%)
Motor/taxi driver	0 (0.0%)	4 (5.9%)
Private employee	1 (4.8%)	6 (8.8%)
Other	4 (19.0%)	3 (4.4%)
Marital Status		
Never married	1 (4.8%)	1 (1.5%)
Married and living together	9 (42.9%)	42 (61.8%)
Married but not living together	0 (0.00%)	1 (1.5%)
Divorced	1 (4.8%)	5 (7.4%)
Widowed	10 (47.6%)	19 (27.9%)
ART Site		
Pochentong RH	2 (9.5%)	6 (8.8%)
Meanchey RH	2 (9.5%)	5 (7.4%)
Takeo PRH	2 (9.5%)	7 (10.3%)
Kirivong RH	2 (9.5%)	8 (11.8%)
Kampot RH	2 (9.5%)	8 (11.8%)
Kampong Trach RH	3 (14.3%)	7 (10.3%)
Smach Meanchey RH	2 (9.5%)	7 (10.3%)
SreAmbil RH	2 (9.5%)	7 (10.3%)
Kampong Thom PRH	2 (9.5%)	7 (10.3%)
Baray Santok RH	2 (9.5%)	6 (8.8%)
Province		

Phnom Penh	4 (19.0%)	11 (16.2%)
Takeo	4 (19.0%)	15 (22.1%)
Kampot	5 (23.8%)	15 (22.1%)
Koh Kong	4 (19.0%)	14 (20.6%)
Kampong Thom	4 (19.0%)	13 (19.1%)

4.2 Healthcare Workers

In total, 37 HCWs consisting of doctors, nurses, midwives, and lab technicians, among other professions, participated in FGDs. Their sociodemographic characteristics are shown in Table 4.

Table 4: Sociodemographic Information of Healthcare Workers

Characteristics	FGD participants N=37
Gender	
Male	13 (35.1%)
Female	24 (64.9%)
Age group	
Adults (25-49)	24 (64.9%)
Older adults (50-64)	12 (32.4%)
Elderly (65+)	1 (2.7%)
Profession	
Doctor	18 (48.6%)
Nurse	11 (29.7%)
Lab Technician	1 (2.7%)
Midwife	4 (10.8%)
Other	3 (8.10%)
ART Site	

Pochentong RH	5 (13.5%)
Meanchey RH	3 (8.1%)
Takeo PRH	2 (5.4%)
Kirivong RH	6 (16.2%)
Kampot RH	4 (10.8%)
Kampong Trach RH	4 (10.8%)
Smach Meanchey RH	3 (8.1%)
SreAmbil RH	5 (13.5%)
Kampong Thom PRH	2 (5.4%)
Baray Santok RH	3 (8.1%)
Province	
Phnom Penh	8 (21.6%)
Takeo	8 (21.6%)
Kampot	8 (21.6%)
Koh Kong	8 (21.6%)
Kampong Thom	5 (13.5%)

4.3 Community Action Workers

Twenty KIIs were conducted with CAWs, with an equal distribution across the five provinces. Their sociodemographic characteristics are presented in Table 5 below.

Table 5: Sociodemographic Information of Community Action Workers

Characteristics	**KII participants N=20**
Gender	
Male	13 (65.0%)
Female	7 (35.0%)

Age group	
Adults (25-49)	3 (15.0%)
Older adults (50-64)	16 (80.0%)
Elderly (65+)	1 (5.0%)
Duration in Position	
Mean years (SD)	2.7 (0.56)
ART Site	
Pochentong RH	2 (10.0%)
Meanchey RH	2 (10.0%)
Takeo PRH	3 (15.0%)
Kirivong RH	1 (5.0%)
Kampot RH	2 (10.0%)
Kampong Trach RH	2 (10.0%)
Smach Meanchey RH	3 (15.0%)
SreAmbil RH	1 (5.0%)
Kampong Thom PRH	3 (15.0%)
Baray Santok RH	1 (5.0%)
Province	
Phnom Penh	4 (20.0%)
Takeo	4 (20.0%)
Kampot	4 (20.0%)
Koh Kong	4 (20.0%)
Kampong Thom	4 (20.0%)

4.4 Stakeholders

While 22 KIIs were planned with key stakeholders, a total of 16 were conducted due to time constraints and scheduling conflicts. Their sociodemographic data are summarized in Table 6.

Table 6: Sociodemographic information of Stakeholders

Characteristics	KII participants N=16
Gender	
Male	13
Female	3
Type of Stakeholder	
NGO Field Staff	9
Subnational	4
National	2
International	1

5. Findings

5.1 Impact During Intervention

5.1.1 What contextual factors influenced the primary outcomes (ART adherence, care retention, viral load suppression) observed in the quantitative endline evaluation?

ART Adherence

Many participants highlighted how the CAD model's structured approach, in which CAWs ensured the consistent and timely delivery of medication to PLHIV, helped reduce treatment interruptions. This service was particularly beneficial for those who would have otherwise experienced irregular medication access due to financial constraints and travel challenges.

> *"We did not miss the medicine, because when we did not have a team leader, we delayed the appointment to the hospital because we did not have money to travel." (FGD58, PLHIV)*

> *"My family was happy, and it was easy for my family also. Sometimes he [family member] is too busy to take me to the hospital. I have a hard time traveling by myself because I cannot ride a motorcycle." (IDI11, PLHIV)*

Participants also discussed the benefits of medication delivery on adherence for PLHIV with work obligations, as it enabled them to receive their medication without having to take time off and lose wages.

> *"In the past, they [PLHIV] thought that they might miss the opportunity to come and take the medicine because they came to work, they were afraid of being fired, or they would waste their time working and not make much money. Now, they don't worry about anything." (KII44, CAW)*

> *"They [CAWs] deliver the medicine to our homes so easily. When we work, we don't have time to come and get the medicine by ourselves. Our factory rules are very strict, we can't ask permission." (FGD30, PLHIV)*

> *"The third thing is that patients never miss appointments because before coming to the hospital, they must ask for permission from their workplace. They got approval, it is okay, but if it is not approved, they will miss the appointment. Some patients are afraid to ask for permission, and then they will miss the appointment." (KII01, Stakeholder)*

Numerous HCWs attested to the role of home medication delivery in enhancing ART adherence as well.

> *"For patients, it has made accessing medication easier and more predictable, provided they adhere to the scheduled follow-ups." (FGD14, HCW)*

> *"Having a home delivery system meant that patients were more likely to adhere to their treatment schedules and less likely to miss appointments." (FGD15, HCW)*

In addition to medication delivery, regular monitoring and reinforcements by CAWs—including counting remaining medication, reminding PLHIV to take doses on time, and setting up alarm systems—were perceived as beneficial in lowering the chances of missed doses.

> *"They [PLHIV] take it regularly because we asked them, and we come to check the medicine. For example, they take medicine on the 01st until the 25th, when I come to visit and count how much medicine is left." (KII22, CAW)*

> *"Every month, the team leader goes to count his medicine, so they don't lie [...] So that means even if they [PLHIV] tell us that they are taking them right, but we count the pills wrong and see that they are not taking the right pills, then we educate them immediately, then it is good for them." (KII18, Stakeholder)*

> *"[They take medication] more regularly because we go to educate them, remind them to set the right time to take their medicine, and we often call them, because we are afraid that they will give up. Set an alarm clock for when to take their medicine." (KII44, CAW)*

Many PLHIV corroborated that enhanced ART adherence resulted from diligent monitoring and reminders from CAWs.

> *"[I take medicine] more regularly than before because CAW always informs and reminds us to take the medicine regularly and educates us." (IDI39, PLHIV)*

> *"I appreciate the guidance and reminders, such as being told to take my medication on time and being asked about my health. It makes me feel well cared for." (IDI63, PLHIV)*

Another critical component of the CAD intervention was education, intended to enhance the self-efficacy of PLHIV to adhere to their medication regimens. PLHIV discussed how CAWs imparted knowledge to them about the importance of consistent medication intake.

> *"They [CAWs] said that we take medicine and we know ourselves, we take it regularly. The medicine will only work if we take it regularly. For example, we take it at 7 o'clock. We must take it at 7 o'clock every day. And we also listen to their advice, we follow them." (IDI62, PLHIV)*

PLHIV were also taught essential medication management skills, such as proper medication storage, checking expiration dates, and counting pills.

> *"Second, they [CAW] let me know how to check the expiration date of the medicine when they give it to me, and thirdly, they let me know how to count the pills." (IDI26, PLHIV)*

> *"Some patients keep the medicine under the sun or hot weather, then their viral load increases. After we ask for the information and we tell them about the problem, that they keep their medicine in the wrong place, they follow us, then the viral load becomes*

> *normal." (KII23, CAW)*

> *"They [PLHIV] have a regular medication routine, store their medication properly, and know how to take care of their health. However, some members are still not 100%, but we continue to educate and share knowledge with them." (KII43, CAW)*

Moreover, social support from group meetings and encouragement from CAWs were reported to have reinforced positive health behaviors, helping PLHIV stay committed to their medication regimens.

> *"They [CAWs] see that we are more diligent compared to before; they encourage us to work harder. I personally notice that when I attend meetings, I take my medication on time—like at 6 in the morning." (IDI64, PLHIV)*

> *"We act like we are their family, we do not look down on them as we are a leader. When we went to visit them, we sat and discussed with them, we ate with them, and helped them with taking the medicine." (KII23, CAW)*

One PLHIV emphasized the long-term impact of CAD's adherence strategies, noting that the encouragement from their CAW increased their motivation to continue adhering to ART even after the project had ended.

> *"The team leader always encouraged me to continue taking the medicines and not give up even if the project ended, while I needed to take the medicines by myself. Before, I did not know how to take the medicines properly. I was neglecting to take the medicines and did not take them regularly. I have more motivation to continue taking medicines." (IDI28, PLHIV)*

Retention in Care

Several HCWs discussed how CAWs supported retention in care by facilitating more consistent and personalized follow-up with PLHIV. While HCWs lacked frequent direct contact with patients due to the large volume of individuals in their care, CAWs, who oversaw much smaller groups, served as a critical link as they were able to maintain closer relationships with PLHIV.

> *"Not much [treatment] abandonment because, as they said, there is a team leader. When we have a team leader, one team leader looks after their team of 20 people. Then, when it comes to time, if we didn't have them, we would have to personally look after 800 people […] We are not very close to the patients because we don't meet often, but we get a lot of feedback, a lot of information from the team leader. They rely on the team leader to follow up." (FGD59, HCW)*

When PLHIV missed scheduled appointments, CAWs were able to provide updates about their whereabouts and status—information that HCWs reported would have been difficult to obtain on their own. This structure allowed for improved patient tracking and enabled timely interventions to support continued engagement in care.

> *"So, the advantage is that they [CAWs] visit or inform us about where the patient is. Usually, we are here, and if the patient doesn't show up, we don't know where they've gone […] The CAD person knows and can give us specific information." (FGD47, HCW)*

Despite these benefits, some participants noted that patient attrition continued to pose a challenge even after the implementation of the CAD model.

> *"It remains a problem—even when we implement the CAD model, loss to follow-up cases persist, and when we implement the MMD model, we still face similar loss to follow-up issues. That is why this loss to follow-up issue is a problem; we must actively engage our patients to bring them back into our service." (KII19, Stakeholder)*

Viral Load Suppression

Some CAWs observed improvements in viral load suppression as a direct consequence of improved ART adherence.

> *"Yeah, it helps improve because we check the results with their viral load. They are good as a result of taking the medicine regularly." (KII22, CAW)*

> *"Before they took the medicine irregularly, but after this model, they take it regularly, then their viral load cannot be detected, so it is good for their health." (KII23, CAW)*

CAWs' efforts to educate PLHIV about the significance of CD4 counts (a laboratory test assessing immune function) and viral load tests reinforced the importance of adhering to scheduled blood tests, supporting regular monitoring of viral load suppression.

> *"They did not know about CD4 and viral load. We told them again and again. I asked them why we need to check CD4, they said they did not know, then I told them we check because we want to know the immunity in our body and viral load to check the virus in our blood." (KII23, CAW)*

However, even with these educational efforts and encouragement from CAWs, an HCW stated that some PLHIV skipped blood tests as they felt healthier and did not perceive an immediate need for monitoring.

> *"They started skipping blood tests because they felt healthy. When we scheduled appointments to monitor their health, particularly to test their viral load, some didn't show up. When this happened, we contacted the team leader, who then tried to encourage them to come in. However, some still refused." (FGD59, HCW)*

Meanwhile, another HCW attributed decreases in viral load testing to CAWs' failure to directly notify PLHIV about their scheduled appointments.

> *"In short, the policy is good when started, but they [CAWs] do not follow. Moreover, we tell them that the patient has an appointment for their blood test, but they do not meet the patient; they just tell the mother of the patient to tell them. But their mother did not notice, so this is the reason that blood tests for viral load decrease because they rarely*

> *meet the patient directly." (FGD60, HCW)*

Some PLHIV transitioned from stable to unstable status during CAD.

> *"Yes—they are stable and then enter the CAD model; however, after some time, when we do a viral load test, some patients become detectable again." (KII19, Stakeholder)*

When this occurred, HCWs called upon CAWs to bring the PLHIV in for counseling at the healthcare facility. This enabled HCWs to gather insights on key challenges to maintaining viral load suppression, such as irregular medication intake due to personal circumstances.

> *"When the virus recurs, we chat in the group and ask if the patient has the virus again. We tell the team leader to educate the patient and bring them in for a DCT [diagnostic counseling and testing]. We also ask why they are irregular with their medicine. After we research, the majority of responses say they are angry with their families. Some families have spouses who drink, and even though drinking is forbidden, the spouses beat them. Some patients work far away, so it becomes difficult to take their medicine regularly." (FGD47, HCW)*

To ensure closer monitoring of viral load, HCWs stated they would increase appointment frequency.

> *"Generally, we schedule a viral load test every year, though if there are issues, we might follow up every three months. In some cases, the interval is reduced to one month if the patient is not consistent." (FGD14, HCW)*

Enhanced adherence counseling provided a structure for PLHIV with detectable viral loads to have their progress closely monitored by HCWs. Once it was confirmed that PLHIV had returned to stable status, they were allowed to independently maintain viral load suppression through their medication regimen.

> *"When CAD patients have a detectable viral load, doctors require them to undergo enhanced adherence counseling. Patients must visit the doctor monthly for three months and have their viral load tested. If their viral load is below 40 copies, meaning undetectable, they can continue with long-term medication." (KII19, Stakeholder)*

5.1.1 What contextual factors influenced the secondary outcomes (mental health, physical health, quality of life, stigma and discrimination, and healthcare provider workload) observed in the quantitative endline evaluation?

Mental Health

Many participants shared how the CAD model's structured medication delivery system helped reduce anxiety and stress related to medication access among PLHIV, promoting better mental health.

> *"Yes, it [mental health of PLHIV] is definitely better because we bring the medication directly to them. Normally, when patients receive their medication this way, they feel happier compared to when they have to collect it themselves. If things are made easier for them, there's nothing for them to worry about or struggle with. So, they are happy to participate in this program." (KII19, Stakeholder)*

The interactive components of the CAD model—group meetings and workshops—were reported to have alleviated feelings of isolation and shame among PLHIV by allowing them to connect with others experiencing similar struggles.

> *"When we have the leader, he/she will share with us the health-related workshops or meetings where we can join and meet other people. It made us feel more enjoyable than staying home. Also, we feel we are not alone because there are people who have the same condition as us." (FGD07, PLHIV)*

> *"Yes, in general, it [CAD] has helped a lot, psychologically, as I said, they [PLHIV] are brave in expressing their feelings to their target group, meaning that they are carriers, they express their feelings to each other. So, they understand each other's feelings, not*

> *like us. We are not sick people and we do not know what they are going through." (KII18, Stakeholder)*

> *"Before joining this project, I had a mental breakdown because no one helped support or communicate with me, but after joining this project, they have supported us a lot. We have meetings and sharing, so our mental health is better." (IDI36, PLHIV)*

Improved mental health not only resulted from the supportive communities formed among PLHIV but also from the regular check-ins, encouragement, and motivation provided by CAWs. Many PLHIV expressed that these interactions made them feel valued and well cared for.

> *"For me, having the team leader is like having a personal advisor." (FGD07, PLHIV)*

> *"When they [CAWs] come to visit, we also naturally feel happy too. I am not joking—deep down, we feel joy knowing that someone still cares about us or acknowledges us in some way. In our hearts, we think, 'Ah, thank you.'" (IDI24, PLHIV)*

Consequently, PLHIV reported feeling mentally reinvigorated from the social support they gained from CAD.

> *"It [CAD] changes me to be more patient, mentally strong, and not overthinking again [...] I feel like I am alive again." (IDI25, PLHIV)*

Physical Health

PLHIV also saw improvements in physical health as a result of their participation in CAD. Regular medication adherence, facilitated by CAD, contributed to stable health conditions and fewer complications. PLHIV who consistently took their medication reported fewer severe symptoms, including reduced fever, chills, dizziness, and body aches. Some PLHIV noted weakened stamina over time, likely due to long-term medication use, but overall, they felt better than before CAD.

> *"But over time, our bodies do get weaker compared to healthy people. The longer we take medicines, the weaker we become, especially in the stomach and overall strength. However, issues like dizziness, back pain, or body aches aren't as bad as before. There's no longer severe fever or chills like before." (IDI24, PLHIV)*

CAWs regularly monitored physical health, checking blood pressure and temperature when visiting patients.

> *"They take the temperature and blood pressure […] we are glad because we have someone to follow up on our health." (FGD58, PLHIV)*

> *"For example, if a team member needs to get medicine for five people, we go to all five people's homes and check their blood pressure and temperature." (KII34, CAW)*

Some PLHIV even contacted their CAW for impromptu check-ups when they fell ill.

> *"We had a CAW team leader who visited once or twice per month, because during that time, there was enough fuel for travelling to visit their well-being and conduct health check-ups. And sometimes, they would even call and request a home visit before the scheduled date. For example, if someone was feeling unwell, they would say, 'Bong, I'm not feeling well.' The team leader also had medical equipment, like a thermometer, and would visit their homes to check up on them." (KII56, Stakeholder)*

Participants discussed how education provided by CAWs on hygiene, healthy lifestyle choices (good diet, avoiding alcohol, safe sex practices, etc.), and disease prevention improved overall health awareness among PLHIV.

> *"Building trust with the community is what we talk about, we use our intentions to educate them on health, eating right, especially preventing opportunistic diseases for them in remote areas, as well as related to tuberculosis and malaria." (KII46, CAW)*

> *"The team leader also educated them about avoiding alcohol to prevent it from affecting the effectiveness of the medicines. The team leader frequently visited to provide this education. When he/she visited, we also advised the team leader on what topics to educate them on, such as using condoms, in case they had partners." (KII56, Stakeholder)*

> *"Yes, they [CAWs] encouraged us and advised us to eat green vegetables. They always advised us." (FGD58, PLHIV).*

Additionally, CAWs guided PLHIV on where to go if health complications arise, encouraging them to avoid delaying seeking necessary care.

> *"We know what to do when we get sick and where we can go. Before, when we had a headache or vertigo, we did not treat it and it became worse, then after we have been educated or recommended, we can take care of our health better." (IDI39, PLHIV)*

Weight gain and improved physical appearance were frequently mentioned as indicators of better health, helping PLHIV feel more "normal" compared to the past.

> *"When we had this disease a long time ago, we were thin and ugly, but now we have gained weight and look like normal people." (FGD58, PLHIV)*

Improved physical health allowed some PLHIV to engage more actively in daily activities, including work and social interactions.

> *"They said that he is very relieved to have a CAD project to help them. Their health is better, they have the power to sell vegetables." (KII46, CAW)*

Quality of Life

PLHIV experienced an overall improved quality of life due to reduced travel costs, saved time, and easier access to medication. Many PLHIV were able to focus on work, childcare, and other responsibilities without the burden of frequent hospital visits. Extra time devoted to working helped increase financial stability.

> *"First, I save time, second, money. As I said, I don't spend time here from day and night. So, I only have to wait for my team leader in the afternoon [...] I work in all kinds of ways to fulfill my role as a mother and earn money for my children to go to school. In a day, if I go to the farm, I earn 2 kilos, I earn 40,000. And if I come to bring medicine, then I lose 40,000 in a day." (IDI26, PLHIV)*

> *"The first benefit is that with the drug, they [PLHIV] save time, and the second is the budget, they have to travel from 25,000 to 30,000 Riel. The third point is that he saves time at home watching their children or starting a business." (KII21, CAW)*

> *"Another thing is that the patient who is a member of the group is happy because they save a lot of time to see the doctor, which means they have time to take care of a child. They have many small children, who are grandchildren, and their mother goes to the factory. They have time to see their grandchildren. The person selling is still selling, so they make a lot of money from the project." (KII18, Stakeholder)*

By improving the health and increasing the available time of PLHIV, the CAD model enhanced their ability to independently manage daily responsibilities, reducing the burden on family members.

> *"My husband has more time to do his job instead of helping me much. Moreover, I know how to take the medicines regularly and properly. I think my family's condition is getting better." (IDI28, PLHIV)*

> *"My wife is happier and I feel safer. Our family's life has improved a lot because we have enough time to work." (IDI51, PLHIV)*

As a result, some participants emphasized how the positive impacts of an enhanced quality of life transcend beyond the individual, extending into the family and community spheres.

> *"For me, I think not only when the HIV person gets a better life, the one who benefits from the HIV person is their family. Their children, their husband, when they are healthy, they can put effort into their family, and also the whole community." (KII01, Stakeholder)*

Stigma and Discrimination

Participants praised the CAD model for contributing to a significant reduction in HIV-related stigma within communities. Community awareness about HIV improved through CAD as CAWs helped dispel fear and misconceptions about the disease through community education. Community members became more accepting after learning that HIV does not spread through casual contact.

> *"They [CAWs] also shared this knowledge as well. They said the disease will not occur when eating together or holding each other's hands. It is only transmitted when the spouse is living together." (IDI25, PLHIV)*

PLHIV reported reduced stigma over time, crediting CAWs' educational efforts for changing community perceptions. While stigma still exists in some cases, particularly in certain households, most PLHIV feel less discriminated against.

> *"Today, for patients and the general population to live together normally, without discrimination, with regular medication, healthy, strong, able to work like the general population. It has helped reduce discrimination against patients through group meetings and discussions." (IDI51, PLHIV)*

> *"They know this disease is not infectious by talking, so they are not discriminating against us." (IDI54, PLHIV)*

> *"A long time ago, they discriminated against us, they did not even want their child to play with our child because they were afraid of us. We are pitiful for our children, but*

> *now they do not discriminate against us." (FGD58, PLHIV)*

Sentiments about reduced community-level stigma were echoed by CAWs and stakeholders.

> *"There is almost no discrimination. Now and in the community, knowing that you have AIDS doesn't make you feel bad. In the past, we said that there were many people who, just knowing that you have AIDS, can't enter their house or drink water. Now, it's not, like it's simple, and it's related to our project. As I said, it's good for them, there's no discrimination." (KII18, Stakeholder)*

> *"There is less discrimination than before due to organizations and awareness, including widespread dissemination." (KII43, CAW)*

Some PLHIV shared that they became empowered to advocate for themselves, seek support, and integrate more comfortably into society.

> *"There is no hiding, we dare to show our faces. My neighbors can say what they want to do. They discriminate, they don't discriminate, I don't hide it. As long as I am healthy, I will continue to fight and raise my children." (FGD30, PLHIV)*

Such impacts were also felt by CAWs, who were empowered by their role in the CAD model to participate in society with less fear.

> *"It makes us stop discriminating against ourselves. It makes us confident in meeting people around us. It makes us feel more courageous, it makes us feel normal compared to other patients, like our people are normal. I was very shy, I didn't show my face much. Now, it's okay, I dare to come forward wherever I go. Whether it's the hospital or the Red Cross, commune, or district, I come forward. I don't hide my face like before." (KII45, CAW)*

Nonetheless, fear of disclosure still affected some PLHIV, particularly those with professional jobs (e.g., teachers) who worried about societal judgment.

> *"Some people might not want to join the team because they have their own business and jobs to work. Some are teachers, so they are afraid it will affect their status and business. They are afraid that it will affect their reputation." (IDI52, PLHIV)*

> *"If others know, it could hurt their reputation. And there's still a sense of shame, even for those who run businesses—they don't want people to know they're living with HIV because of the embarrassment." (KII56, Stakeholder)*

However, CAD's confidentiality measures—such as discreet medicine pickup locations—accommodated lingering fears of discrimination, allowing PLHIV to feel safer and more comfortable participating in the intervention.

> *"The discrimination is still there. There are some PL who cannot be delivered to their homes. They ask for appointments at various places so that they can come and receive their medicine. Because they go to their homes, the discrimination from their neighbors is still there." (KII46, CAW)*

> *"They help us keep it confidential by telling people that we come to take stuff, or set the place where there are no people." (FGD07, PLHIV)*

Healthcare Provider Workload

Participants noted that the CAD model helped streamline patient appointments and medication distribution, reducing congestion in health facilities and allowing HCWs to manage cases more efficiently.

> *"The medicine goes to the community, reducing the work of doctors in the clinic. One person can share it with many people, so it reduces the work of doctors." (KII18, Stakeholder)*

> *"For healthcare providers, the project has helped reduce the daily workload by streamlining appointments and reducing the number of patients who need in-person consultations." (FGD14, HCW)*

This proved especially beneficial amid staffing shortages and long wait times that fostered patient dissatisfaction.

> *"Yes, but the good thing is that during the CAD project, we didn't have to deal with a lot of patients who were demanding things. For example, when they come, they usually demand quick service, saying they've waited too long, and want us to hurry. But, as you know, we have limited staff, and we're serving many people, so it can be a challenge." (FGD59, HCW)*

Some CAWs organized group appointments for blood draws, which improved the efficiency of healthcare services by reducing the need for multiple individual appointments.

> *"A successful point is organizing group appointments for blood draws, considering reducing the members' expenses while achieving the same results. We arrange group appointments for blood draws at the referral hospital by renting a car." (KII43, CAW)*

CAWs also served as a key liaison between PLHIV and HCWs. Fear of judgment and discrimination often deterred PLHIV from communicating their issues and asking questions directly to HCWs. PLHIV felt more comfortable expressing their needs to CAWs, who would then relay that information to HCWs.

> *"If we came to the hospital by ourselves we were not brave enough to ask the doctor, we were not close to them, but with the team leader we are close we can tell them all our problems when it comes to the doctor we did not want to talk to […] We are afraid of the doctor, we feel discriminated against. Our knowledge is low. We are not brave to ask the question, we think that we are asking them the wrong question." (IDI36, PLHIV)*

This allowed for a more systematic approach to communication and issue resolution, streamlining the process of addressing patient concerns.

> *"Generally, the patients in his community do not usually mention issues at the hospital or the place where they receive services. They are afraid to bring it up and get into conflict. So, he raises the issue with his team leader – that is indeed a good benefit. When the team leader raises the issue, it is then brought to the ART side. Then, we resolve the issue with him; he recognizes the problem, and we accommodate it, and it becomes effective, and he accepts it on both sides." (KII42, Stakeholder)*

Moreover, CAWs would also help bring PLHIV who required testing to the health center, as well as assist with paperwork and medication preparation at the request of the health center staff.

> *"Even though we have not been working together for a while, at the health center, for example, the teacher at the health center, when they need testing, they contacted me […] 'Now, [CAW's name], you help take them to the hospital and take another test to see if they are having this virus or not […] you help register them and make a book for them, help prepare the medicine for them.'" (KII45, CAW)*

5.2 Impact Post-Intervention

5.2.1 What is the current status of the CAD model?

Since the project's official end, many participants reported that their CAD groups have become inactive, primarily due to the absence of funding and other logistical challenges.

> *"The team leader has not brought the medicines for me as before for about one year now. My team leader does not receive any salary and needs to spend on transportation as well. He/she looks after almost 20 patients, and their homes are far from each other." (IDI28, PLHIV)*

> *"They just announced to their subordinates that we should come and get the medicine*

> *ourselves. Because the project ended, they didn't bring it anymore. There is no motorbike service to go to the houses in the village. There is no money for gas." (FGD57, PLHIV)*

For some CAD groups who do remain active, their ability to provide support is limited compared to when the project was fully operational. Consequently, groups have significantly reduced in size. When asked about the sizes of their respective CAD groups during and after the intervention, CAWs stated:

> *"Before we had 20 people, now we have reduced to 10 people. Some people we can connect to, some people cannot." (KII02, CAW)*

> *"24 people [during CAD], so now there are 7-8 people." (KII44, CAW)*

> *"Now there are only 7 or 8 people left, the elderly. They are struggling because they are far away." (KII34, CAW)*

In some cases, home medication delivery persists at the convenience of CAWs who serve in a volunteer capacity amid a lack of continued funding.

> *"Some activities do continue. There are still people who work in the vicinity of their homes – they still deliver medication and perform routine tasks." (FGD15, HCW)*

Home medication delivery has ceased in other groups, however, some CAWs still provide reminders and encouragement to PLHIV.

> *"No, they are not active, but they call to ask us or they remind me to come to bring the medicine, sometimes at the beginning of the month, sometimes at the end of the month, they call again. Twice a month." (IDI26, PLHIV)*

> *"Thus, my team leader only came sometimes to tell me to take the medicines regularly and on time, and not give up." (IDI28, PLHIV)*

In general, group meetings have also stopped, but some CAWs continue to visit PLHIV on an individual basis.

> *"Before, we always had meetings. Now, we do not have. They just come to visit us." (IDI37, PLHIV)*

> *"Sometimes my team leader comes to visit me, or I go to his house." (IDI28, PLHIV)*

> *"Before they had a meeting at the hospital, but now, we separate. They only visit us individually at home." (IDI54, PLHIV)*

Other CAWs have completely stopped providing services. Many CAWs have taken on other jobs due to financial need, making it difficult to dedicate time to CAD activities.

> *"Some CAWs need money, so they find other jobs to work [...] I have a part-time job." (KII05, CAW)*

> *"One factor is that we are busy going to that side to visit them. We have some business; we need to do other things for our living." (KII67, CAW)*

5.2.2 How has the CAD model changed over the past year since the study period was completed?

Multiple participants reported that hospitals now require PLHIV to pick up their medication in person. The current social protection system—where registered members can receive free healthcare services using an Identification of Poor Households Program (ID Poor)/Equity card—requires PLHIV to scan their thumbprints at the health facility for the facility to be reimbursed for the medical fee. This has impacted CAWs' previous role in medicine delivery.

> *"The system requires patients to come in person and verify their identity with a fingerprint scan. The system mandates that the patient must be physically present to receive services, so CAWs cannot collect their documents and submit them on their*

> *behalf." (KII19, Stakeholder)*

> *"And when we finished the project, we still had four groups that were still working, but later, because of the issuance of equity cards to people with HIV, the remaining four groups were also disbanded because they required their clients to come to see the doctor in person and get an equity card from the hospital." (KII18, Stakeholder)*

Additionally, previous subsidy programs that helped PLHIV cover transportation costs have reportedly been discontinued, discouraging regular visits and affecting their ability to remain engaged in treatment.

> *"Financial support is much less available now. In the past, there were subsidy cards that reduced travel costs, but those supports have diminished or stopped entirely." (FGD15, HCW)*

The role of CAWs has shifted from proactive support to a more reactive one, where PLHIV now reach out when they need help rather than receiving routine assistance.

> *"But now, when the team members are busy with work, they call us, we go and open it for them." (KII66, CAW)*

> *"When the project is finished, I don't come to visit frequently. Until a patient calls me and asks me to help, I respond to him." (KII67, CAW)*

In some areas, CAWs operate informally through mutual support networks, where better-off PLHIV contribute money to help fund transport and medication access for those in need. In certain cases, PLHIV compensate CAWs for transportation costs, but this is not a consistent practice.

> *"Some of them give 5,000 for the petrol. It's according to their ability. But just because of their living conditions, we don't want to accept it, but this is from their heart." (KII46,*

> *CAW)*

> *"I continue to do the same activities, for example, we deliver medicines to help them at home. I continue to do it until today. Sometimes they give us 4-5 thousand for our gas. Yes, some of them have money, so they help fill up a liter of petrol for us. Some of them don't, sometimes we see that they are poor, sometimes I help them." (KII45, CAW)*

Some PLHIV also noted changes in medication refill schedules after medication delivery ceased.

> *"Before, when they distributed medicine to our home, I could use it for four months, but when I go to take the medicine myself, I can only use it for three months." (FGD07, PLHIV)*

5.2.3 How have beneficiaries' and stakeholders' experiences with the CAD model changed over the past year since the study period was completed?

PLHIV are increasingly managing their medication independently. Many participants stated that the absence of CAD's home delivery service has made it harder for many PLHIV, particularly those facing financial or mobility constraints, to access their medicine.

> *"Since the project ended, they no longer give it to me; I have to go get it by myself now [...] We arrive around 8, 9, or 10 AM when the doctors start work; then at 12, we go back home." (IDI63, PLHIV)*

> *"They helped us so that when they took the medicine home, it was a bit easier. When they stopped bringing it for us, we had problems going to the hospital to get the medicine." (IDI61, PLHIV)*

The lack of consistent meetings and CAW check-ins after CAD ended has led to increased feelings of isolation among PLHIV, who now report less peer interaction and emotional support.

> *"It makes me feel like, we are very lonely, thinking about it deeply [...] Last time, at least*

> *once or twice per month, they used to come." (IDI24, PLHIV)*
>
> *"It's lonelier than when we had the team leader [...] when will I meet them and greet them?" (IDI26, PLHIV)*
>
> *"CAD finished, then make the patients feel lonely because there is no one to talk to." (KII05, CAW)*

Some HCWs have noted a decline in the number of PLHIV visiting healthcare centers with the discontinuation of the project.

> *"There is a noticeable reduction. In the past, many patients would come in regularly; now, the numbers have decreased. For example, whereas we might have seen about ten patients per session previously, now that number might have dropped to around five in some cases." (FGD15, HCW)*

Previously, attendance was higher due to structured support, but now fewer patients come in regularly for check-ups and medication refills. Fewer patient visits mean reduced opportunities for HCWs to provide consistent counseling, follow-ups, and timely interventions, impacting overall care quality. In response to these challenges, stakeholders have increased efforts to follow up with PLHIV.

> *"This, in turn, can lead to fewer patients coming in regularly, which impacts our follow-up and overall service continuity." (FGD15, HCW)*
>
> *"Nowadays, the challenge is that some patients do not come for their scheduled appointments or simply give up. Currently, our teams try to resolve these issues by calling and even visiting patients at home to encourage them to resume services." (KII41, Stakeholder)*

Some HCWs have attributed lower appointment attendance to PLHIV becoming accustomed to the convenience of home medication delivery, leading them to refuse in-person visits. In turn, HCWs have started enforcing stricter policies to increase service uptake.

> *"Previously, patients received their medications delivered to their homes, but then the service was cut off, making it even harder […] They got used to convenience, so now some don't want to come back. That's why we are enforcing stricter rules, and we are encouraging them to continue using the service. If CAD remains permanently active, then there won't be a problem. But because NGO projects only last 3–4 years, we are the ones left to handle the consequences when the support disappears." (FGD29, HCW)*

Power dynamics between HCWs and CAWs have reportedly shifted as well since HCWs can no longer issue orders to CAWs and rely on them for consistent support.

> *"For me, that area isn't 100% like their previous role, but they [CAWs] still do the same work. Whatever help they can provide, they will. The difference is that, if we look at it in percentage terms, when it was their role, we had the right to give them orders and advise them. But once the project is over, we no longer have that right." (FGD47, HCW)*

5.3 Adaptability and Scalability

5.3.1 What are beneficiaries' and stakeholders' perspectives on supporting the continuation of the CAD model?

Overall, PLHIV expressed strong support for the continuation of CAD. Home delivery of medication was particularly valued as it saved time and reduced travel costs.

> *"If this project comes back, it is good. It can reduce spending money on travel. We did not have anything to ride. If we book a moto, we spend 30000 to 40000 riels, compared to food, we can eat for 3 to 4 days." (IDI36, PLHIV)*

> *"I want them to bring the medicine for us because we save money for travel and have more time to look after my grandchildren." (IDI54, PLHIV)*

Many PLHIV want CAD to return not just for home medicine delivery, but also for its role in mental health support, stigma reduction, and continued encouragement. Several PLHIV emphasized the emotional reassurance that CAD provided, stating that seeing CAWs made them feel supported and more confident.

> *"Yeah, I want this project to continue. I did not know how to talk. When I have this project, I am happy because they educate us." (IDI54, PLHIV)*
>
> *"Also, I want them to use good words that could encourage us." (FGD07, PLHIV)*
>
> *"Because I feel that when I see all of you, I feel happy and reassured—as if my own confidence and sense of belonging are restored." (IDI64, PLHIV)*

Some PLHIV stated they want the project to last indefinitely, as ART is a lifelong treatment, and having consistent support would ease their burden.

> *"Yes, for the project, I continue to participate and support forever. Because as I always say, I do it for my life. I want to live to see my children. So, I will take care of my health until the end to help PLHIV. It's not just me, there are many in my village. Let the project move forward." (IDI26, PLHIV)*
>
> *"I want the project to be continued from now till I die. That is what I want." (IDI27, PLHIV)*
>
> *"I want this project to help forever is good, because we need to take this medicine forever, if we did not have the medicine or forgot to take it, we will get sick." (IDI40, PLHIV)*

Many PLHIV recognized the dedication of CAWs, who often volunteered their services despite having no financial backing. They suggested that the organization ensure CAWs receive proper financial support and operational resources, such as transport stipends and phone allowances, to continue their work effectively.

> *"I want the organization to have enough funds for them [CAWs], because they always help, as if we did not have money for food, they help depending on their ability. So, I want to request to support CAWs, encourage them, and get more funds or benefits for them." (IDI39, PLHIV)*

CAWs also strongly support the continuation of the CAD model, emphasizing its benefits for both PLHIV and themselves.

> *"The big suggestion is people around my age, 90 percent have depression, and they are afraid, do not want to show. So, I want this project to come back and help them to discuss their problems and support them to come get service, meet a doctor, do the blood test." (KII05, CAW)*

> *"I support it because the patients have reduced their expenses for going to the hospital to get medicine and the group leader has additional income." (KII68, CAW)*

Many CAWs find personal fulfillment in helping PLHIV, with some mentioning they are willing to continue their roles indefinitely.

> *"I request the owner of the project to start up this project again so that I can help my PL in my community." (KII20, CAW)*

> *"I can work with this project until I die, I can work without discrimination because I enjoy working with it." (KII04, CAW)*

While some CAWs mentioned they would work in a volunteer capacity, other CAWs requested greater financial support if the CAD project were to continue.

> *"I want the project to continue, and there will be funding for me. I am grateful for the*

> *project." (KII45, CAW)*

> *"Have additional income to support my family and help patients." (KII68, CAW)*

Meanwhile, sentiments regarding the continuation of the CAD model were more varied among HCWs. Some HCWs expressed strong support for the continuation and expansion of the CAD model.

> *"In my view, the CAD project is beneficial because it provides patients with more time and reduces their costs. Moreover, if the project can be integrated even on a small scale into daily life, it is very advantageous. (FGD14, HCW)*

> *I would like the project to be reactivated and expanded, perhaps with additional staff and resources." (FGD09, HCW)*

Other HCWs had reservations about continuing the CAD model, primarily due to the IDPoor/Equity card fingerprinting requirements. As hospitals rely on this system for funding, some HCWs expressed reluctance to approve CAD without addressing how hospitals will compensate for potential income loss from reduced in-person visits.

> *"How can we process if the project comes back? Because our hospital will lose income, and it needs the patients to come for their thumbprint." (FGD60, HCW)*

Stakeholders reiterated concerns about the fingerprinting requirement and its financial repercussions for hospitals.

> *"They [PLHIV] need to provide their fingerprint. There is also a separate team that verifies the use of the equity card. If a patient states they did not visit the hospital, the hospital cannot claim payment […] The hospital does not take the risk. The patient must be present and provide a fingerprint for verification. Otherwise, the hospital loses financial support." (KII19, Stakeholder)*

Furthermore, other stakeholders strongly advocated for the continuation and expansion of CAD, citing its important role in promoting medication access and adherence among PLHIV who face significant financial and distance barriers.

> *"I have no objections. I support it because it helps our patients who live in remote areas and lack the ability to access necessary services. I don't want them to spend too much money, like $10 to $20, which could be a burden, so I support it […] I support it because it encourages the patients to stay committed, reduces abandonment, and ensures they take their medicines regularly. We can reduce the risks." (KII56, Stakeholder)*

> *"Like those from the other side of Baty, it's 70 kilometers more to come here, and if you think about it, it takes a day, so you have to pay for a taxi, it's a lot of money. And if the medicine reaches the community and they are well, they have nothing to spend, [CAW] rides a motorbike to their house, and we want that if this is the case, I fully support it and want to continue and expand it even more." (KII18, Stakeholder)*

5.3.2 What are beneficiaries' and stakeholders' perspectives on the expansion of the CAD model to groups other than the currently enrolled stable people living with HIV?

Participants supported expanding CAD to serve other vulnerable populations. They frequently emphasized prioritizing individuals who experience intersecting barriers to medication access, such as financial hardship, distance/transportation challenges, and/or mobility issues arising from disability, illness, or old age.

> *"I think poor people cannot afford their 3 meals properly, while people with disabilities cannot do anything to earn. They are likely to depend on their families. I think it will be good if they receive any support from your organization. So, they can be alive like others." (IDI27, PLHIV)*

> *"PLHIV who are hidden, poor families, in remote areas, and those who lack transportation or difficult to travel." (IDI51, PLHIV)*

> *"First, the disabled people due to difficulty traveling, second, the poor cannot afford, they really want us to help." (KII23, CAW)*

> *"Sometimes the elderly. No one helps, their children are far away, and they earn a living by themselves." (KII67, CAW)*

Some participants also suggested expanding to individuals with other health conditions, like diabetes and tuberculosis, who require long-term medication management similar to PLHIV.

> *"Besides PL patients, there should be diabetes patients because they also need to take the medicines for the rest of their lives [...] yes, and also tuberculosis patients because they also need to take medicines." (IDI27, PLHIV)*

Unstable PLHIV were another group that participants felt could benefit greatly from the CAD model, potentially even more so than stable PLHIV.

> *"If out of 100 high-viral-load patients, we can reduce that number to just 10, the project will be a success. That's the way I see it—we should not focus on stable patients but on those with high viral loads." (KII19, Stakeholder)*

> *"I want to suggest helping poor people, and the ones that their health is not stable, I want them to join the group as well because we can help them a lot [...] because I see that the person they are infected with HIV and they are not stable, it is more difficult due to they have a mental problem and there is no one to visit or encourage them." (KII21, CAW)*

In addition, several participants advocated for increased engagement with key populations (KP)—such as men who have sex with men (MSM) and transgender (TG) individuals, as well as people who inject drugs (PWID)—who are particularly vulnerable to HIV.

> *"Most of the key population groups, like MSM, TG, or others, I've asked for help with these groups." (FGD29, HCW)*

> *"Yes, vulnerable groups like KP, especially MSM, are the most challenging […] MSM, TG groups, and if there are PWID groups, those who use drugs, they are even more challenging." (KII19, Stakeholder)*

5.3.3 What are important factors to consider, such as foreseeable challenges, if the CAD model expands to groups other than the currently enrolled stable people living with HIV?

Some participants stated that CAD would require more doctors and nurses, particularly in high-demand areas, to ensure efficient service delivery.

> *"More healthcare personnel are needed, especially in areas where the patient load is high. The current staffing levels are insufficient to ensure optimal service." (FGD14, HCW)*

Expansion would also entail increasing the CAW workforce to manage a larger volume of PLHIV. Several participants stressed the importance of selecting CAWs who belong to the target groups and identify with the individuals they serve. However, a stakeholder noted this might be challenging.

> *"The key is selecting staff who work closely with the CAW team, and we also need to make sure the patients we choose are from the community […] The main challenge would be the difficulty in selecting enough individuals from these groups." (KII56, Stakeholder)*

> *"Don't involve someone who hasn't experienced it; involve someone from their group." (FGD29, HCW)*

Other foreseeable challenges include difficulty engaging and retaining key populations such as MSM, TG, and PWID in care. These groups tend to be more discrete and mobile, indicating the need for effective follow-up and monitoring systems.

> *"It would be difficult with teams like MSM (Men who have Sex with Men) because they often hide their identities more than regular patients." (KII56, Stakeholder)*

> *"If we focus on the high-risk groups, MSM, TG, people with long hair, short hair, drug users—all of these groups are important […] We have to follow them, make sure they don't disappear." (FGD29, HCW)*

Moreover, when discussing strategies to promote the continued engagement of key populations, several participants highlighted the critical role of collaboration between healthcare facilities and organizations.

> *"If they [MSM and TG] have access to services, we are used to seeing them every day. When they come to us, we laugh and joke with our staff. After a while, they get used to it and keep coming. But if an NGO is not working with the medical side, eventually, they'll stop coming." (FGD29, HCW)*

> *"Currently, we can't engage the KP groups effectively on our own […] Therefore, we need to cooperate with partners in the provinces, starting with the provincial AIDS program and working together with ARTVCCT and our partner organizations to be able to achieve what we aim to do. If we don't work with these partner organizations, we won't see results." (KII19, Stakeholder)*

5.3.4 What factors hinder the adaptability and scalability of the CAD model?

Funding & Resource Limitations

Participants widely recognized the lack of funding as the most significant obstacle to the CAD model's future operability.

> *"The main challenge with the CAD project was the distribution of medicines. At that time, we didn't provide enough financial support to our staff, such as the team leaders. The funding was limited, and their salaries were not very high." (KII56, Stakeholder)*

> *"If there's no budget, there's no team to continue. How can sustainability exist under those conditions? Who would provide medications to the patients? Who would cover their fuel costs? That's the main factor. So, once it ended, it ended completely. They still need funding. To put it simply, it all depends on the budget." (FGD29, HCW)*

While group savings initiatives were attempted as a means of sustaining the CAD model, they were unsuccessful in most cases. Many participants struggled to contribute consistently and their savings were quickly depleted, underscoring the need for external funding.

> *"Previously, we encouraged them to have a team 'savings package.' However, when they started saving money, they could only save for a few months. When they ran out of money, they would use their savings for the team leader to distribute medicines for them. There was only a small amount of savings left after that." (KII56, Stakeholder)*

Although the CAD model aligns with national HIV goals, as remarked by one stakeholder, such financial constraints hinder its ability to make a continued impact in the future.

> *"The CAD project, if we think about it, aligns with the national goals. We are doing our best, but the issue is that the funds are running out. It is not just about filling the capacity or improving the health of PLHIV; we want to improve their quality of life." (KII56, Stakeholder)*

Healthcare System & Policy Barriers

Participants named inadequate cooperation between HCWs and CAWs as another challenge. Some doctors perceived the CAD model as disorganized or unbeneficial. Additionally, some hospitals imposed strict policies that prevented CAWs from picking up medicine for multiple PLHIV at once, limiting the model's ability to streamline medication access.

> *"Sometimes we want to take medicine for five people, but the doctor does not allow us, people have different appointments. Some doctors understood us, but other doctors*

> *blamed us." (KII33, CAW)*

On top of these challenges, many participants discussed how the IDPoor/Equity card fingerprinting requirement directly hinders the CAD model's core function of home medication delivery, with no current workaround for this policy barrier.

> *"In this location, it's so strict! No one can affix on behalf of another. Even if three people arrive together, only one fingerprint is accepted. For example, if a whole family gets ill together—father, mother, and child—only one person can come to affix the fingerprint, the other two won't be able to claim the medications." (FGD29, HCW)*

> *"However, nowadays, some patients are not as happy because the subsidy card requires them to come to the hospital for consultation, medication dispensing, and blood draws in order for the hospital to generate income." (KII41, Stakeholders)*

Geographic Challenges

Many PLHIV live in remote areas, making it difficult for CAWs to reach them. The workload was particularly heavy for CAWs covering large geographical areas, with long travel distances between patients.

> *"In these mountainous areas, sometimes there are few patients, and the villages are far apart. It is difficult to call them in for meetings, or to bring medicine from the hospital to distribute in the community, because the distance is a major obstacle." (KII42, Stakeholder)*

> *"The houses of the group members are far from each other, and it is difficult to travel during the rainy season." (KII68, CAW)*

Traveling long distances, sometimes through difficult terrain, also posed personal security concerns for CAWs.

> *"When we deliver it to a house, it goes into the forest and the road is difficult. Sometimes I have difficulty. Firstly, in the rainy season, it slips. And secondly, when they are in the forest, sometimes we go into the road, it's not good, there are stones. Sometimes I fall." (KII45, CAW)*

> *"It's hard to travel long distances, it's hard to travel. And the jungle is scary. We go down alone. Along the way is a quiet road. So, we only worry about our own safety." (KII46, CAW)*

5.3.5 What factors facilitate the adaptability and scalability of the CAD model?

Robust Funding & Long-Term Financial Planning

Participants stressed that expansion of the CAD model is only feasible with adequate financial support, including funding for transport, food assistance, and salaries for CAWs, as well as benefits for PLHIV.

> *"So, if they have a package including everything, food, petrol, phone top-up, it is easy for them [CAWs] to help the patients." (KII05, CAW)*

> *"Additional financial support—such as renewed subsidy cards—might also ease the burden on patients and improve adherence." (FGD15, HCW)*

Several stakeholders emphasized how strategic long-term financial planning is vital for the CAD model's adaptability and scalability, noting that accurate, reliable data is essential to help ensure that expenditures align with evolving needs and priorities.

> *"To ensure long-term sustainability, we need to have planned expenditures […] Yes, ensuring it aligns with the current situation and collecting accurate data on their needs across all teams." (KII56, Stakeholder)*

As another stakeholder discussed, proactive planning for possible financial challenges is necessary for adapting to changes in the funding landscape.

> *"In the future, if governmental support in medication subsidies decreases, our hospital revenue might face challenges, so we need to prepare for that." (KII41, Stakeholder)*

Human Resources & Capacity Building

In addition to monetary support, participants articulated that the adaptability and scalability of CAD depend significantly on a capable workforce, equipped with the necessary expertise to deliver high-quality services and meet ongoing demands.

> *"Firstly, human resources, and secondly, those who are capable. We cannot hire people who are not qualified to advise. They should understand the program and have the skills needed to provide proper advice [...] The most important thing is to ensure that they not only know the theory but also have practical experience. It's crucial that they have the right demeanor and communication skills. We need advisors who are truly capable of ensuring the quality of the advice given. Without this, it could harm the patients." (KII19, Stakeholder)*

Participants highlighted the importance of increasing capacity-building opportunities to ensure the continued growth and expansion of the CAD model. As one HCW stated, CAWs should not only be equipped with skills in basic medication delivery, but also become well-versed in communication, punctuality, and consistent patient follow-up to enhance the overall impact of CAD.

> *"I would like CAD to train the team leaders more. Let them be more involved, not just waiting to give out the medication. They should understand the importance of coming on time, communicating with the doctor, and following through with the treatment." (FGD59, HCW)*

Other participants emphasized the need for more training for CAWs in patient care, monitoring, evaluation, and data management.

> *"I hope that in the future, if a new CAD project is re-created, the next phase will ensure that the team leader gains concrete knowledge, unlike before, and will have sufficient resources to conduct monthly monitoring and evaluations." (KII56, Stakeholder)*

> *"We should focus on ensuring that they record the vital signs more accurately – for instance, making sure that the weight is measured correctly. Sometimes, their records are not very precise, and that is the problem. But we continuously work to address it; it is not a monthly issue. Once we fix it, they do it properly the next time." (FGD14, HCW)*

> *"Regular workshops and training sessions could also help reinforce best practices in patient care and data management." (FGD14, HCW)*

Multilevel Collaboration & Alignment with National Strategies

Many participants expressed that adaptability and scalability require effective coordination between partner organizations, HCWs, local authorities, and the national government, voicing the need for improved communication and knowledge-sharing to achieve desired outcomes.

> *"It is important to establish clear communication channels among all stakeholders and to ensure that resources (both human and financial) are allocated efficiently." (FGD14, HCW)*

> *"Strengthening partnerships with local authorities and community organizations would help improve consistency and ensure that patients receive their medication without too much delay." (FGD09, HCW)*

> *"Collaboration among all stakeholders is key. Strengthening partnerships with local authorities and community organizations could help improve the continuity of care." (FGD15, HCW)*

A stakeholder acknowledged past budget limitations that hindered collaborative efforts and expressed the desire for future discussions to achieve more shared understanding and stronger alignment of CAD with the broader objectives of local authorities and national guidelines.

> *"For my role, it is necessary to encourage more meetings with stakeholders, because in the past we did not have the budget to meet with the authorities. Only meetings between the two partner organizations have the opportunity to meet with stakeholders as well as local authorities and integrate existing government policies to better understand them, and we will work together." (KII01, Stakeholder)*

Another stakeholder voiced similar insights about increased collaboration, with the ultimate goal being the integration of the CAD model into the national healthcare system.

> *"Our goal for the CAD project is to integrate it into the national healthcare system effectively. We aim to coordinate with hospital departments, specifically doctors, to engage in workshops and share knowledge so that they understand the role of CAD." (KII56, Stakeholder)*

Achieving effective adaptation and scaling-up of CAD to the national level requires support at all levels of government, as stressed by one stakeholder.

> *"Regarding sustainability, if there is a lot of support from the national level, support from the local level, the commune level, and the level where they know a lot, then our progress is also good." (KII18, Stakeholder)*

A different stakeholder suggested embedding the CAD model into the existing AIDS framework at all levels of government to promote its long-term sustainability and alignment with national health goals. This integration would help ensure that efforts are not fragmented and that the CAD model can continue to have a lasting impact.

> *"If you look at the health issues, we want to say that the AIDS program at all levels is already there, so we should include CAD into the scope of each program to work with the activities of each AIDS program, from the ministry level to NCHADS to NDA to all levels*

of the AIDS program, CAD must be settled to all of them in order for all of that to be sustainable in the long run, and we respond in a community manner to the current Royal Government." (KII01, Stakeholder)

6. Discussion

Primary Outcomes

Results from this post-intervention qualitative study demonstrate the CAD model's perceived effectiveness in promoting ART adherence. Participants' insights exemplified how key components of the CAD model—including home medication delivery, patient education, structured reminders, and social support—functioned synergistically to mitigate barriers to medication access and empower PLHIV to remain committed to their medication regimens. Existing literature attests to the benefits of a multifaceted approach to enhancing ART adherence. For instance, a systematic review examining ART adherence interventions in Sub-Saharan Africa found that multilevel interventions, such as those that integrate individual (e.g., reminders, pill counting) and community-level (e.g., support groups) approaches, have the greatest potential for improving adherence (Pugh et al., 2022).

Participants also reported how the CAD model supported retention in care, with CAWs playing a pivotal role in reducing loss-to-follow-up through diligent tracking efforts. CAWs' closer relationships to PLHIV, relative to those maintained by HCWs, were advantageous when obtaining information about patients' whereabouts when they missed appointments. Other studies have provided evidence for improved retention in care with community-based ART initiatives (Ayala et al., 2021; Grimsrud et al., 2016; Okoboi et al., 2015). However, some participants in this study mentioned that patient attrition persisted after implementing CAD, suggesting the need to strengthen retention strategies in future CAD model iterations.

Some participants reported improvements in viral load suppression as a result of enhanced ART adherence and education from CAWs about the importance of viral load testing. Correspondingly, numerous studies have seen increases in viral load suppression with community-based ART initiatives in comparable contexts (Barnabas et al., 2020; Eshun-Wilson et al., 2021; Okoboi et al., 2015). At the same time, some participants observed PLHIV transitioning from stable to unstable status during CAD. HCWs attributed this issue to missed blood testing appointments, citing that some PLHIV did not recognize a need for testing due to improved physical health and that some

CAWs failed to inform PLHIV directly of upcoming appointments. This highlights a critical area of improvement.

These qualitative findings provide valuable context for the results obtained from the endline quantitative evaluation conducted at the conclusion of the quasi-experimental study period in April 2023. The endline quantitative evaluation found that while the CAD model was effective in maintaining ART adherence, retention in care, and viral load suppression at levels comparable to MMD, it did not yield significant improvements in any of these primary outcomes. By highlighting the mechanisms through which the CAD model effectively supported these primary outcomes, as well as the CAD model's limitations, this qualitative post-intervention study offers depth and nuance to the quantitative endline results in the absence of an endline qualitative study.

Secondary Outcomes

The broad impacts of the CAD model were illustrated across the secondary outcomes. Medication delivery enabled PLHIV to bypass barriers to medication access, such as transportation costs and taking time off work, which reportedly alleviated stress and contributed to better mental health among PLHIV. By affording PLHIV more time to engage in work and family responsibilities, as well as greater financial stability, medication delivery was perceived to have significantly improved quality of life. Participants in a qualitative study by Gilbert et al. echoed these sentiments, with the authors referring to the time savings and income-generating opportunities resulting from community ART delivery as "increased efficiency" (2021). The same study described how "flexibility"—allowing PLHIV to easily select the locations of community-based visits—helped minimize the risk of unwanted disclosure and external stigma (Gilbert et al., 2021). This aligns with what participants discussed about how CAWs offered discreet medication pickup locations upon request, accommodating those who feared the stigma and discrimination associated with delivery to their homes. Consistent with findings from other studies (Katirayi et al., 2022; Pellecchia et al., 2017), medication delivery was also reported to have relieved HCW workload by reducing decongestion and streamlining care. With fewer in-person consultations required, HCWs could focus more on critical cases (World Health Organization, 2008).

CAWs' contributions extended well beyond medication delivery. The personalized education, counseling, and encouragement provided by CAWs were perceived as highly conducive to enhanced mental and physical health among PLHIV. In addition to individualized care, group meetings and workshops facilitated by CAWs enabled PLHIV to build community and access peer support, which further contributed to better psychosocial well-being. Such benefits are evidenced in studies conducted in other settings (Kintu et al., 2021; Pellecchia et al., 2017; Rasschaert et al., 2014). Furthermore, CAWs' educational efforts aimed at dispelling common myths about HIV transmission were perceived to be effective in reducing community-level stigma. CAWs also functioned as liaisons between PLHIV and HCWs, which was particularly instrumental for PLHIV who feared interacting with HCWs. This not only ensured that patient concerns were addressed promptly by HCWs but also may have relieved psychological burden on PLHIV by removing the need for them to participate in stressful encounters with those they feared might judge or discriminate against them. Such efforts by CAWs have proven crucial, as a study conducted in Cambodia highlighted the need for community-based interventions to reduce stigma and discrimination while supporting PLHIV in managing these challenging situations (Yi et al., 2015).

Current Status & Changes in CAD

This study provided necessary insights into how CAD operations have evolved since the study period's conclusion and the current status of the CAD model. CAD operations have significantly scaled down in the absence of sustained funding. Results showed variability between CAD groups, with some CAWs electing to voluntarily carry out activities like medication delivery and check-ins with PLHIV, while others have completely discontinued their role, primarily due to the necessity of engaging in paid employment. Although group savings schemes have been attempted to subsidize CAWs' services, participants have reported that these have not been sustainable, highlighting the importance of more robust funding mechanisms. Moreover, while some better-off PLHIV have been able to compensate CAWs directly for continued medication delivery, those facing greater financial hardship have had to rely on CAWs' goodwill or manage their medication pickups independently. Besides the lack of monetary support, policy barriers like the ID Poor/Equity card fingerprinting requirement have had direct implications for medication delivery, as it requires PLHIV to present themselves in person. Further research and collaboration with relevant stakeholders are necessary to ensure logistical compatibility with national social protection schemes. Because of the CAD model's diminished operations since the end of the study period, gains achieved through CAD, such as increased ART adherence and improved mental health, have reportedly declined, suggesting the need for sustained implementation.

Adaptability and Scalability

Support for the continuation of the CAD model was generally high but varied among groups. Nearly all PLHIV and CAWs favored its continuation, citing its benefits for both parties. Although HCWs and stakeholders were also supportive of continuing CAD, they expressed more reservations and urged further consideration of how to overcome challenges like misalignment with the national social protection scheme, particularly regarding the ID Poor/Equity card fingerprinting requirement and its potential repercussions on health facility revenue. The 2024-2028 National Strategic Plan (NSP) for a Comprehensive, Multi-Sectoral Response to HIV/AIDS includes plans to scale up registration of PLHIV in ART sites into the country's social protection system, with the aim of expanding coverage to 95% of PLHIV by 2028 (Ministry of Health, 2023a). It is imperative to ensure that the CAD model integrates effectively with these national efforts to maximize its impact and sustainability.

When asked about expanding CAD, participants suggested targeting subpopulations that face heightened barriers to medication access, including the elderly, people living with disabilities, those residing in remote areas, and the poor, among others. Some recommended a greater focus on key populations like MSM, TG, and PWID. Notably, this aligns with the NSP, which outlines a strategy focused on expanding differentiated HIV treatment and care for KP and PLHIV (Ministry of Health, 2023a). Moreover, a scoping review of studies conducted in Sub-Saharan Africa demonstrated the potential of community-based ART service delivery to improve HIV care engagement and outcomes like ART adherence, retention in care, and viral load suppression among key populations (Ibiloye et al., 2022). Participants also expressed that CAD should be expanded to serve unstable PLHIV, who they felt might benefit more than stable PLHIV. However, the feasibility of such an expansion is uncertain, given their greater need for clinical monitoring and more frequent healthcare visits. Foreseeable challenges in the expansion of CAD, as noted by participants, include resource constraints, healthcare workforce limitations, and difficulty engaging and retaining certain groups.

Overall, funding and resource limitations were perceived to be the greatest barriers to the CAD model's adaptability and scalability. These challenges are compounded by health system barriers, such as inadequate cooperation between HCWs and CAWs. A systematic review identified similar issues, naming poor integration of community health workers into the healthcare system and lack of buy-in from facility staff as barriers to effective community-based HIV care (Ngcobo et al., 2022). A recurring consideration was the fingerprinting requirement linked to ID Poor/Equity cards. Geographic challenges were also recognized to compromise the CAD model's adaptability and scalability. Facilitators of the adaptability and scalability of the CAD model include robust funding and long-term financial planning, a capable workforce with ample opportunities for capacity-building, multilevel stakeholder collaboration, and integration of the CAD model into the country's existing HIV/AIDS strategy. Further, according to Decroo and colleagues, the success of community-based ART programs relies on a long-term vision and sustained commitment from national governments (2013)—and the CAD model is no exception.

7. Conclusions and Recommendations

7.1 Conclusions

The CAD model has received significant support from beneficiaries and stakeholders given its perceived benefits on key outcomes for PLHIV as well as broader community-level and healthcare system impacts. As CAD operations have significantly declined over the past year, reportedly reversing gains in ART access and health outcomes, it is crucial to consider strategies for the CAD model's continuation. Its long-term sustainability, adaptability, and scalability will require strategic planning to address critical gaps and barriers identified in this study. Moving forward, evidence-based adaptations will be essential for integrating the CAD model into national healthcare strategies, maximizing the CAD model's benefits, and ensuring continued progress in HIV treatment and care in Cambodia.

7.2 Recommendations

Findings from this study have informed the following recommendations:

- **Integrate appointment adherence mechanisms:** Future CAD iterations should implement mechanisms to mitigate missed appointments for viral load testing and other health monitoring, such as appointment tracking and proactive patient follow-up by CAWs.
- **Decrease barriers to health facility visits:** Some CAWs reported coordinating group appointments for blood draws and renting transportation for patients, however, this was not a consistent practice across all CAD groups. Similar support should be systematically integrated into the CAD model to reduce barriers to health facility visits.
- **Improve coordination between HCWs and CAWs:** Strengthen communication channels, hold regular meetings, and implement feedback and grievance mechanisms to ensure conflicts/issues are resolved promptly.
- **Ensure alignment with social protection schemes:** Collaborate with national stakeholders to find alternative verification methods or exceptions to the ID Poor/Equity card fingerprinting requirement to enable CAWs to pick up medication for PLHIV.
- **Enhance CAW training/capacity building:** Provide comprehensive onboarding training and ongoing refresher training for CAWs to ensure they are well equipped to effectively

and empathetically serve PLHIV while adhering to established procedures. Continuous education should incorporate competency assessments and updates on evolving best practices to enhance service quality.

- **Develop a stepwise scale-up plan:** Create a phased scale-up plan by identifying priority sites for the introduction of the CAD model in each stage.
- **Engage in long-term financial planning:** Create a comprehensive financial plan to ensure long-term sustainability. This plan should outline funding needs, potential sources, and strategies for maintaining financial stability over time.
- **Collaborate with relevant stakeholders:** Strengthen partnerships and knowledge-sharing among government agencies, NGOs, healthcare facilities, etc., to support effective integration of the CAD model into the public health system and adoption into the national and provincial HIV/AIDS strategy.

8. Ethical Considerations

Ethical approval for this research was obtained from the National Ethics Committee for Health Research (NECHR) of the Ministry of Health, Cambodia (approval letter no. 313 NECHR, dated September 27, 2024) and the Institutional Review Board of the National University of Singapore. Written informed consent was obtained from all participants following the NECHR's requirements and local practices in Cambodia, and confidentiality was ensured by not using participant names and assigning coding IDs for qualitative analysis. No identifiable information will be presented or reported when disseminating research results. All data has been stored on password-protected computers, with access restricted to authorized research staff. Participants received a token of appreciation for their time spent in the interview or focus group discussion.

9. Study Limitations

The study data may be subject to information bias, as it relies on respondents' recall and self-reported experiences, which can be influenced by memory limitations, social desirability, and personal perceptions. Furthermore, as a qualitative study, the analysis is inherently subject to researchers' perspectives and potential biases, which may shape how data is coded, categorized, and interpreted. The study's design, sample size, and sampling approach restrict the generalizability of findings beyond the specific CAD project sites. The insights gained are context-specific and should not be assumed to represent broader populations or different settings. This study is simply intended to provide an in-depth exploration of the CAD project sites rather than to establish widely generalizable conclusions.

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11. Annexes

Annex 1: Question Guide for In-Depth Interviews with People Living with HIV

Introduction

Welcome, and thank you for taking the time to participate in this interview today! My name is [interviewer], and I will be facilitating our conversation. This study aims to understand the impact, adaptability, and scalability of the community-based antiretroviral therapy delivery (CAD) model one year after its implementation among people living with HIV, healthcare workers, and stakeholders. We would appreciate you taking about 45 minutes to respond to our questions. Your answers will be confidential, and we will not take your name. Your participation in this study is voluntary, and you will not be affected in any way if you decide not to participate. You are free to not answer the questions you feel uncomfortable with, and you can withdraw from this interview at any time without stating the reason.

Do you have any questions related to this study? Do you agree to participate in this interview?

Respondent provided verbal consent to be interviewed: ___ YES___ NO

For the record and data analysis, we would like to audio-record this interview. Only our study team will have access to the audio files. Do you agree to have the interview audio-recorded?

Respondents provided verbal consent to have audio recorded: ___ YES___ NO

Demographic profile

Could you share with us:

1. How old are you?
2. What is your gender?
3. What is your current marital status?
4. How many children do you have?
5. What level of formal education have you completed?

6. What is your main occupation (the primary source of income – ask also for the household?)?
7. How long have you been on ART? …………… Year.......... months

Current Status of CAD Model

8. Have any of the CAD groups/CAWs remained active over the past year since the study period was completed?
   a. If so, in what ways have they been active?
   b. Have they been operating in the same way as they were during the CAD model intervention?
   c. If operating differently, how is it different?
   d. If active, what factors do you think enabled this continuity (e.g., CAW's dedication, group saving scheme, group members' requests/demands, etc.)?
   e. On the other hand, what do you think hindered the continuity of those inactive groups? (e.g., funding, supervision, etc.)?

Changes Since the Study Period

9. Over the past year, how has your experience been with the CAD model?
   a. How satisfied are you with the CAD model and the services it provides?
   b. What aspects of the CAD model are you most satisfied with, and why?
10. How would you describe the quality of care you have received through the CAD model compared to before?
11. Has the way you receive your medication changed since the study period? If so, how has that affected you?
   a. Have there been any changes in your ART adherence? If so, what factors contributed to the change(s)?
12. Have there been any changes in other aspects of your life (e.g., physical health, mental health, social support)? If so, what factors contributed to the change(s)?
13. How has your (and other people living with HIV's) perception of the CAD model changed since its implementation? What factors influenced these changes?

Model's Strengths/Benefits and Weaknesses/Challenges

14. What are the key strengths or benefits of the CAD model one year after the study period was completed?

15. How effective has communication been between you and your healthcare providers or community action workers under the CAD model?

16. How has the CAD model affected your relationships with other people living with HIV?

17. How has your family's or community's support changed since you started receiving care through the CAD model?

    a. What role do you think the CAD model has played in influencing this support?

18. In your view, how did the CAD model bring about changes in the lives of people living with HIV?

    a. How did the CAD model help improve or not improve ART adherence? Why? Please explain how this change occurred.

    b. How did the CAD model help improve or not improve the mental health of people living with HIV? Why? Please explain how this change occurred.

    c. How did the CAD model help reduce or increase stigma and discrimination? Why? Please explain how this change occurred.

    d. How did the CAD model help improve or not improve the quality of life of people living with HIV? Why? Please explain how this change occurred.

19. How easy or difficult has it been for you to participate in the CAD model?

    a. Have you faced any challenges in continuing your participation in the program?

20. Have you faced any other challenges regarding the CAD model?

    a. How were these challenges addressed?

21. Do you have any specific suggestions for how the CAD model could be enhanced to better serve:

    a. people living with HIV?

    b. the broader community (e.g., family and friends of people living with HIV, community organizations, local leaders)?

Adaptability and Scalability

22. Would you continue receiving care through the CAD model in the future? Why or why not?

   a. What would encourage you to continue participating in the CAD model in the future?

23. In your view, who else can potentially benefit from the CAD model other than the currently enrolled stable people living with HIV (e.g., vulnerable populations at higher risk of discrimination, specific subgroups experiencing increased barriers to ART access, those in remote villages, etc.)? Please elaborate.

   a. What are the factors to consider if we expand to these populations?

   b. What are the foreseeable challenges?

   c. How can these challenges be addressed?

   d. What are the enabling factors that may help such expansion?

24. What are your expectations for the model if it expands, and what outcomes are you most hopeful for?

25. We have come to the end of this interview. Do you have any other comments or suggestions on the CAD model that you would like to share with us?

Annex 2: Question Guide for Focus Group Discussions with People Living with HIV

Introduction

Welcome, and thank you for taking the time to participate in the discussion today! My name is [moderator], and this is [note-taker]. This study aims to understand the impact, adaptability, and scalability of the community-based antiretroviral therapy delivery (CAD) model one year after its implementation among people living with HIV, healthcare workers, and stakeholders. We would appreciate you taking about 90 minutes to respond to our questions. As much as we would like to encourage all discussions in this session to be kept confidential, there is no effective way to stop anyone from sharing the discussions beyond this group. We will not take down your name and personal identifiers and any quotes from the discussion will be referenced to a general group of "people living with HIV". Your participation in this study is voluntary, and you will not be affected in any way if you decide not to participate. You are free to not answer the questions you feel uncomfortable with, and you can withdraw from this interview at any time without stating the reason. You may reach out to the research staff in the room to signal that you would like to leave the interview.

Do you have any questions related to this study? Do you agree to participate in this interview?

Respondents provided verbal consent to be interviewed: ___ YES___ NO

For the record and data analysis, we would like to audio-record this interview. Only our study team will have access to the audio files. Do you agree to have the interview audio-recorded?

Respondents provided verbal consent to have audio recorded: ___ YES___ NO

Demographic profile

Could you share with us:

1. How old are you?
2. What is your gender?
3. What is your current marital status?

4. How many children do you have?
5. What level of formal education have you completed?
6. What is your main occupation (the primary source of income – ask also for the household?)?
7. How long have you been on ART? …………… Year.......... months

Current Status of CAD Model

8. Have any of the CAD groups/CAWs remained active over the past year since the study period was completed?
    a. If so, in what ways have they been active?
    b. Have they been operating in the same way as they were during the CAD model intervention?
    c. If operating differently, how is it different?
    d. If active, what factors do you think enabled this continuity (e.g., CAW's dedication, group saving scheme, group members' requests/demands, etc.)?
    e. On the other hand, what do you think hindered the continuity of those inactive groups? (e.g., funding, supervision, etc.)?

Changes Since the Study Period

9. Over the past year, how has your experience been with the CAD model?
    a. How satisfied are you with the CAD model and the services it provides?
    b. What aspects of the CAD model are you most satisfied with, and why?
10. How would you describe the quality of care you have received through the CAD model compared to before?
11. Has the way you receive your medication changed since the study period? If so, how has that affected you?
    a. Have there been any changes in your ART adherence? If so, what factors contributed to the change(s)?
12. Have there been any changes in other aspects of your life (e.g., physical health, mental health, social support)? If so, what factors contributed to the change(s)?

Model's Strengths/Benefits and Weaknesses/Challenges

13. What are the key strengths or benefits of the CAD model one year after the study period was completed?
14. How effective has communication been between you and your healthcare provider(s) under the CAD model? How has it been between you and your community action worker?
15. How has the CAD model affected your relationships with other people living with HIV?
16. How has your family's or community's support changed since you started receiving care through the CAD model?
    - *a. What role do you think the CAD model has played in influencing this support?*
17. In your view, how did the CAD model bring about changes in the lives of people living with HIV?
    - *a. How did the CAD model help improve or not improve ART adherence? Why? Please explain how this change occurred.*
    - *b. How did the CAD model help improve or not improve the mental health of people living with HIV? Why? Please explain how this change occurred.*
    - *c. How did the CAD model help reduce or increase stigma and discrimination? Why? Please explain how this change occurred.*
    - *d. How did the CAD model help improve or not improve the quality of life of people living with HIV? Why? Please explain how this change occurred.*
18. How easy or difficult has it been for you to participate in the CAD model?
    - *a. Have you faced any challenges in continuing your participation in the program?*
19. Have you faced any other challenges regarding the CAD model?
    - *a. How were these challenges addressed?*
20. Do you have any specific suggestions for how the CAD model could be enhanced to better serve:
    - *a. people living with HIV?*
    - *b. the broader community (e.g., family and friends of people living with HIV, community organizations, local leaders)?*

Adaptability and Scalability

21. Would you continue receiving care through the CAD model in the future? Why or why not?

    a. What would encourage you to continue participating in the CAD model in the future?

22. In your view, who else can potentially benefit from the CAD model other than the currently enrolled stable people living with HIV (e.g., vulnerable populations at higher risk of discrimination, specific subgroups experiencing increased barriers to ART access, those in remote villages, etc.)? Please elaborate.

    a. What are the factors to consider if we expand to these populations?
    b. What are the foreseeable challenges?
    c. How can these challenges be addressed?
    d. What are the enabling factors that may help such expansion?

23. What are your expectations for the model if it expands, and what outcomes are you most hopeful for?

24. We have come to the end of this focus group discussion. Do you have any other comments or suggestions on the CAD model that you would like to share with us?

Annex 3: Question Guide for Focus Group Discussions with Health Care Workers

Introduction

Welcome, and thank you for taking the time to participate in the discussion today! My name is [moderator], and this is [note-taker]. This study aims to understand the impact, adaptability, and scalability of the community-based antiretroviral therapy delivery (CAD) model one year after its implementation among people living with HIV, healthcare workers, and stakeholders. We would appreciate you taking about 90 minutes to respond to our questions. As much as we would like to encourage all discussions in this session to be kept confidential, there is no effective way to stop anyone from sharing the discussions beyond this group. We will not take down your name and personal identifiers and any quotes from the discussion will be referenced to a general group of "healthcare providers". Your participation in this study is voluntary, and you will not be affected in any way if you decide not to participate. You are free to not answer the questions you feel uncomfortable with, and you can withdraw from this interview at any time without stating the reason. You may reach out to the research staff in the room to signal that you would like to leave the interview. Do you have any questions related to this study?

Do you agree to participate in this interview?

Respondents provided verbal consent to be interviewed: ___ YES___ NO

For the record and data analysis, we would like to audio-record this interview. Only our study team will have access to the audio files. Do you agree to have the interview audio-recorded?

Respondents provided verbal consent to have audio recorded: ___ YES___ NO

Demographic profile

Could you share with us:

1. What is your profession (e.g., nurse, doctor, etc.) and official position in the organization, if any (e.g., head of department, consultant, etc.)?
2. What is your primary role in the HIV programs and the CAD intervention?

Current Status of CAD Model

3. Have any CAD groups/CAWs remained active over the past year since the study period was completed?
    - *a. If so, in what ways have they been active?*
    - *b. Have they been operating in the same way as they were during the CAD model intervention?*
    - *c. If operating differently, how is it different?*
    - *d. If active, what factors do you think enabled this continuity (e.g., CAW's dedication, group saving scheme, group members' requests/demands, etc.)?*
    - *e. On the other hand, what do you think hindered the continuity of those inactive groups? (e.g., funding, supervision, etc.)?*

Changes Since the Study Period

4. Over the past year, how has your healthcare practice's collaboration with the CAD model evolved?
5. How has the health facility (you and your colleagues)'s perception of the CAD model changed since its implementation? What factors have influenced these changes?

Model's Strengths/Benefits and Weaknesses/Challenges

6. What are the key strengths or benefits of the CAD model one year after the study period was completed?
7. Have you or your healthcare practice faced any challenges regarding the CAD model?
    - *a. How were these challenges addressed?*
8. In your view, how did the CAD model bring about changes at the health facility level?
    - *a. How has the CAD model affected your workload as a healthcare provider?*
    - *b. How has your involvement in the CAD model influenced your job satisfaction?*
9. In your view, how did the CAD model bring about changes in the lives of people living with HIV?
    - *a. How did the CAD model help improve or not improve ART adherence? Why? Please explain how this change occurred.*

b. How did the CAD model help improve or not improve retention in care? Why? Please explain how this change occurred.

10. What challenges have you faced in maintaining engagement with key stakeholders (the government, local authorities, and other stakeholders (e.g., people living with HIV, NGOs, healthcare providers, CAWs, etc.) in the CAD model?

11. Do you have any specific suggestions for how the CAD model could be enhanced to better serve:

a. people living with HIV?

b. healthcare providers?

c. broader community (e.g., family and friends of people living with HIV, community organizations, local leaders)?

Adaptability and Scalability

12. Would you support the continuation of the CAD model for stable people living with HIV? Why or why not?

13. Would you support the continuation of CAD by integrating the model into your health facility operations and how can it be done?

a. Would you support the use of resources available or allocated to your health facility to support the continuation of CAD?

b. What do you think are the other resources available to support CAD?

14. In your view, who else can potentially benefit from the CAD model other than the currently enrolled stable people living with HIV (e.g., vulnerable populations at higher risk of discrimination, specific subgroups experiencing increased barriers to ART access, those in remote villages, etc.)? Please elaborate.

a. Who do you think are the priority groups?

b. What are the factors to consider if we expand to these populations?

c. What are the foreseeable challenges?

d. How can these challenges be addressed?

e. What are the enabling factors that may help such expansion?

15. How effective was the training you received in supporting you in implementing the CAD model?

    a. What additional training or support do you think is necessary for further supporting the CAD model for stable people living with HIV, and if it is scaled up?

16. In what other ways could the model be adapted or modified for successful scaling-up while maintaining its effectiveness and community buy-in?
17. How do you see healthcare providers' role in the CAD model evolving if the model is expanded?
18. How can collaboration between health facilities and other stakeholders, including government, local authorities, and others (e.g., people living with HIV, NGOs, CAWs, etc.) be improved to ensure successful scaling-up?
19. What are your expectations for the model if it expands, and what outcomes are you most hopeful for?
20. We have come to the end of this focus group discussion. Do you have any other comments or suggestions on the CAD model you would like to share with us?

Annex 4: Question Guide for Key Informant Interviews with Community Action Workers

Introduction

Welcome, and thank you for taking the time to participate in this interview today! My name is [interviewer], and I will be facilitating our conversation. This study aims to understand the impact, adaptability, and scalability of the community-based antiretroviral therapy delivery (CAD) model one year after its implementation among people living with HIV, healthcare workers, and stakeholders. We would appreciate you taking about 45 to 60 minutes to respond to our questions. Your answers will be confidential, and we will not take your name. Your participation in this study is voluntary, and you will not be affected in any way if you decide not to participate. You are free to not answer the questions you feel uncomfortable with, and you can withdraw from this interview at any time without stating the reason.

Do you have any questions related to this study? Do you agree to participate in this interview?

Respondent provided verbal consent to be interviewed: ___ YES___ NO

For the record and data analysis, we would like to audio-record this interview. Only our study team will have access to the audio files. Do you agree to have the interview audio-recorded?

Respondents provided verbal consent to have audio recorded: ___ YES___ NO

Demographic profile

1. What is your primary role in the CAD model/ART Group?
2. How long have you been involved in this role?

Current Status of CAD Model

3. Have any CAD groups/CAWs remained active over the past year since the study period was completed?
    a. *If so, in what ways have they been active?*

b. Have they been operating in the same way as they were during the CAD model intervention?

c. If operating differently, how is it different?

d. If active, what factors do you think enabled this continuity (e.g., CAW's dedication, group saving scheme, group members' requests/demands, etc.)?

e. If active, is there any kind of ongoing support or resources that help you manage the demands of your work?

f. On the other hand, what do you think hindered the continuity of those inactive groups? (e.g., funding, supervision, etc.)?

Changes Since the Study Period

4. Over the past year, how has your involvement with the CAD model evolved?
5. How has your (and other CAWs') perception of the CAD model changed since its implementation? What factors have influenced these changes?

Model Strengths/Benefits and Weaknesses/Challenges

6. What are the key strengths or benefits of the CAD model one year after the study period was completed?
7. Have you or other CAWs faced any challenges regarding the CAD model?
   a. How were these challenges addressed?
8. How do you build and maintain trust with the community members you work with?
   a. Have you faced any challenges in this regard?
9. How do you collaborate with other CAWs or healthcare providers? Can you describe a time when this collaboration was particularly important?
10. In your view, how did the CAD model bring about changes in the lives of people living with HIV?
    a. How did the CAD model help improve or not improve ART adherence? Why? Please explain how this change occurred.
    b. How did the CAD model help improve or not improve retention in care? Why? Please explain how this change occurred.

c. How did the CAD model help improve or not improve the mental health of people living with HIV? Why? Please explain how this change occurred.

d. How did the CAD model help reduce or increase stigma and discrimination? Why? Please explain how this change occurred.

e. How did the CAD model help improve or not improve the quality of life of people living with HIV? Why? Please explain how this change occurred.

11. Do you have any specific suggestions for how the CAD model could be enhanced to better serve:

a. people living with HIV?

b. CAWs?

c. broader community (e.g., family and friends of people living with HIV, community organizations, local leaders)?

Adaptability and Scalability

12. Would you support the continuation of the CAD model for stable people living with HIV? Why or why not?

13. How have you adapted the CAD model to fit the specific needs of the communities you work with?

a. Can you provide an example of an adaptation that was particularly successful?

14. In your view, who else can potentially benefit from the CAD model other than the currently enrolled stable people living with HIV (e.g., vulnerable populations at higher risk of discrimination, specific subgroups experiencing increased barriers to ART access, those in remote villages, etc.)? Please elaborate.

a. What are the factors to consider if we expand to these populations?

b. What are the foreseeable challenges?

c. How can these challenges be addressed?

d. What are the enabling factors that may help such expansion?

15. How can collaboration between the national government, local authorities, and other stakeholders (e.g., people living with HIV, NGOs, healthcare providers, CAWs, etc.) be improved to ensure successful scaling-up?

16. In what other ways could the model be adapted or modified for successful scaling-up while maintaining its effectiveness and community buy-in?
17. How do you see CAWs' role in the CAD model evolving if the model is expanded?
18. What are your expectations for the model if it expands, and what outcomes are you most hopeful for?
19. How has your role as a CAW contributed to your personal or professional development? What new skills have you gained?
20. Do you see yourself continuing in this role in the long term?
21. We have come to the end of the interview. Do you have any other comments, recommendations, or questions on the CAD model that you would like to share with us?

Annex 5: Question Guide for Key Informant Interviews with Stakeholders

Introduction

Welcome, and thank you for taking the time to participate in this interview today! My name is [interviewer], and I will be facilitating our conversation. This study aims to understand the impact, adaptability, and scalability of the community-based antiretroviral therapy delivery (CAD) model one year after its implementation among people living with HIV, healthcare workers, and stakeholders. We would appreciate you taking about 45 minutes to respond to our questions. Your answers will be confidential, and we will not take your name. Your participation in this study is voluntary, and you will not be affected in any way if you decide not to participate. You are free to not answer the questions you feel uncomfortable with, and you can withdraw from this interview at any time without stating the reason.

Do you have any questions related to this study? Do you agree to participate in this interview?

Respondent provided verbal consent to be interviewed: ___ YES___ NO

For the record and data analysis, we would like to audio-record this interview. Only our study team will have access to the audio files. Do you agree to have the interview audio-recorded?

Demographic profile

Could you share with us:

1. What is your position?
2. How long have you been involved in this position?
3. What is your role in this position?

Current Status of CAD Model

4. Have any CAD groups/CAWs remained active over the past year since the study period was completed?
   a. If so, in what ways have they been active?
   b. Have they been operating in the same way as they were during the CAD model intervention?

c. If operating differently, how is it different?

d. If active, what factors do you think enabled this continuity (e.g., CAW's dedication, group saving scheme, group members' requests/demands, etc.)?

e. On the other hand, what do you think hindered the continuity of those inactive groups? (e.g., funding, supervision, etc.)?

Changes Since the Study Period

5. Over the past year, how has your organization's collaboration with the CAD model evolved?
6. How has your organization (you and your colleagues)'s perception of the CAD model changed since its implementation? What factors influenced these changes?

Model's Strengths/Benefits and Weaknesses/Challenges

7. What are the key strengths or benefits of the CAD model one year after the study period was completed?
    a. In your view, what innovations has the CAD model introduced in HIV service delivery?
8. Have you or your organization faced any challenges regarding the CAD model?
    a. How were these challenges addressed?
9. How effective have the monitoring and evaluation systems been in tracking the outcomes of the CAD model?
    a. What improvements could enhance the quality of data and its use in decision-making?
10. How has the data from CAD model evaluations influenced decision-making at your level?
    a. Can you provide examples of any policy or programmatic changes made based on this data?
11. In your view, how did the CAD model bring about changes in the lives of people living with HIV?
    a. How did the CAD model help improve or not improve ART adherence? Why? Please explain how this change occurred.

b. How did the CAD model help improve or not improve the mental health of people living with HIV? Why? Please explain how this change occurred.

c. How did the CAD model help reduce or increase stigma and discrimination? Why? Please explain how this change occurred.

d. How did the CAD model help improve or not improve the quality of life of people living with HIV? Why? Please explain how this change occurred.

12. Do you have any specific suggestions for how the CAD model could be enhanced to better serve:

a. people living with HIV?

b. broader community (e.g., family and friends of people living with HIV, community organizations, local leaders)?

Adaptability and Scalability

13. Would you support the continuation of the CAD model for stable people living with HIV? Why or why not?

14. How do you perceive the current funding model for CAD?

a. In your opinion, how cost-effective is the CAD model compared to other ART delivery models? (e.g., MMD)

15. How efficient do you think the current resource allocation is for the CAD model? Are there areas where resources could be optimized?

16. What strategies could be employed to secure long-term financial sustainability?

17. How well do you think the CAD model aligns with national HIV/AIDS strategies and goals*?*

a. What aspects of the model best support these strategies?

18. How can the CAD model be better integrated into existing national health systems infrastructure? What challenges or successes have been observed in this integration?

a. What policy changes or support do you think are necessary to sustain and scale the CAD model nationally?

19. In your view, who else can potentially benefit from the CAD model other than the currently enrolled stable people living with HIV (e.g., vulnerable populations at higher risk

of discrimination, specific subgroups experiencing increased barriers to ART access, those in remote villages, etc.)? Please elaborate.

a. What are the factors to consider if we expand to these populations?

b. What are the foreseeable challenges?

c. How can these challenges be addressed?

d. What are the enabling factors that may help such expansion?

20. What has been your experience with the coordination of efforts across different levels (national, provincial, local) in implementing the CAD model? Are there any gaps that need to be addressed?

21. How effective has the collaboration between the government, local authorities, and other stakeholders (e.g., people living with HIV, NGOs, healthcare providers, CAWs, etc.) been in supporting the CAD model?

a. What strategies could enhance stakeholder buy-in and participation?

b. What improvements could be made to ensure successful scaling-up?

22. How adaptable has the CAD model been in responding to emerging challenges, such as changes in the HIV epidemic or health system priorities?

23. In what other ways could the model be adapted or modified for successful scaling-up while maintaining its effectiveness and community buy-in?

24. How do you see your role in the CAD model evolving if the model is expanded?

25. What are your expectations for the model if it expands, and what outcomes are you most hopeful for?

26. We have come to the end of the interview. Do you have any other comments or suggestions on the CAD model that you would like to share with us, i.e., your long-term vision for the CAD model in the national HIV/AIDS response?