



# Assessing Health Outcomes of ART Differentiated Care Models in Migori County, Kenya

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## Abstract

### BACKGROUND

HIV remains a substantial global health challenge. In Kenya, the prevalence is approximately 6%, with Migori County experiencing notably high rates. Despite this, only a small portion of its population receive antiretroviral therapy (ART). Differentiated care, an individualized approach to HIV treatment, enhances outcomes and eases strain on health systems. This study assesses health outcomes of ART differentiated care in Migori County, Kenya, focusing on retention and viral load results for stable individuals living with HIV.

### METHODOLOGY

We employed a pre-post evaluation descriptive mixed methods study design to assess health outcomes following Differentiated Care Model (DCM) implementation. One hundred and ninety-two (192) stable HIV patients from Migori's rural sugar belt, meeting DCM inclusion criteria, were enrolled using single-stage cluster and systematic sampling. DCM outcomes were compared with the standard care model (control). Data sourced from patient records and key informant interviews were analyzed using Chi-square, Fisher's exact tests, logistic regression and thematic analysis.

### RESULTS

We observed notable statistical significance ( $p < 0.05$ ) in the association between DCM and health outcomes, including patient activity at 6 and 12 months ( $p < 0.001$ ), transfer-out retention at 6 and 12 months ( $p = 0.02$ ), loss to follow-up retention at 6 and 12 months ( $p = 0.006$  and  $p = 0.005$ , respectively), and deceased patient retention ( $p = 0.033$ ). However, the viral load suppression post-DCM did not show statistical significance.

### CONCLUSION

To conclude, Differentiated Care Models positively impact retention outcomes for stable HIV-positive patients, notably reducing lost-to-follow-up and deceased cases. Although not significant at 6 and 12 months, DCM shows promise in early-stage viral load suppression. Gender disparities exist in suppression rates. Patient adherence and viral load awareness are favourable

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## Introduction

Sub-Saharan Africa bears a substantial burden of HIV infection, with an estimated 25.5 million individuals living with the virus in the

region. Among the countries facing this challenge, Kenya stands out, reporting an average HIV prevalence of 6%, placing it among the top six most affected countries



globally <sup>1</sup>. Within Kenya's diverse counties, HIV prevalence varies significantly, ranging from 25.7% to 14.7% <sup>1</sup>. Despite this pronounced HIV/AIDS burden, Migori County grapples with a glaring gap: only a minority of residents receive antiretroviral therapy (ART), a cornerstone of HIV management <sup>1</sup>.

Acknowledging this complex context, differentiated care has emerged as a strategic approach tailored to the unique needs of individuals, aiming to optimize treatment outcomes while alleviating healthcare system strain <sup>2</sup>. Differentiated care is an approach to antiretroviral therapy (ART) delivery that tailors HIV treatment and care to the specific needs of each individual living with HIV. According to the International AIDS Society, the differentiated care model is a client-centered approach that simplifies and adapts HIV services from testing to ART Initiation, and from ART initiation to retention to achieving & maintaining viral suppression. It serves the needs of People Living with HIV (PLHIV) hence reducing the burdens resulting from HIV disease progression (advanced HIV disease) on the health system hence increasing efficiency.

Viral load suppression, a marker of effective viral control, plays a significant role in improving health outcomes for PLHIV, including reduced susceptibility to opportunistic infections and extended life expectancy. In this context, tailored care approaches that align with patient preferences and streamline clinical engagements have shown promise in sustaining or enhancing retention while reducing the healthcare system's burden. Notably, Differentiated Care Models foster patient engagement, leading to increased treatment satisfaction, better adherence, and improved viral load control, especially beneficial in resource-limited settings.

Despite this, the global "Test and Treat All" initiative recommended by the World Health Organization (WHO) has introduced challenges such as clinic congestion and appointment no-shows<sup>3</sup>. These challenges underscore the importance of improving patient

engagement and evaluating the outcomes of Differentiated Care Models.

This study was designed to explore the potential transformative impact of implementing a Differentiated Care Model for ART delivery in Migori County. Our objective was to investigate whether this approach results in measurable improvements in retention, viral suppression, and overall quality of life for People Living with HIV/AIDS (PLHIV).

Recognizing the fundamental importance of long-term care retention and consistent adherence to ART in effective HIV management, we confronted multifaceted challenges, including healthcare system limitations, stigma, financial constraints, and individual-level complexities. Addressing these challenges necessitates innovative interventions capable of enhancing retention and addressing these intricate dynamics.

This study aimed to expand the understanding of the impact of the Differentiated Care Model by evaluating retention and viral load dynamics. Our hypothesis theorized that implementing differentiated care in ART delivery for HIV care and treatment will yield improved retention and viral load outcomes for stable PLHIV, ultimately advancing the effectiveness of HIV care <sup>1,2</sup>.

## **Methodology**

### **Study design**

A pre-post evaluation descriptive mixed method study design was utilized to assess the health outcomes of stable HIV patients both before (2013-2015) and after (2017-2019) the implementation of the Differentiated Care Model. This study design was chosen to effectively evaluate the impact of this Care Model on achieving targeted outcomes.

### **Setting and participants**

The study took place in Ongo Health Centre, Bware Health Centre, Sibuoche Dispensary, and Othoro Sub County Hospitals, located within the rural sugar belt settlements of Migori County, Kenya. The participants



consisted of stable individuals living with HIV who met the criteria for enrollment in the Differentiated Care Model (DCM). Inclusion criteria encompassed PLHIV aged over 20 years, currently on their ART regimen for at least 12 months, absence of active opportunistic infections (including TB) in the last 6 months, consistent adherence to scheduled clinic visits during the previous 6 months, a recent viral load (VL) under 1,000 copies/mL, completion of 6 months of TB preventive treatment (IPT), non-pregnant or breastfeeding, having a BMI equal to or greater than 18.5, and PLHIV for whom extended follow-up intervals were feasible. Study sites (health facilities) were chosen through single-stage cluster sampling, and participants were selected using systematic sampling. Every second element from the sampling frame constituted the sample group.

### **Intervention and comparison groups**

The study entailed comparing the Differentiated Care Model of ART delivery (intervention arm) with the traditional standard of care model of ART delivery (control arm) in terms of health outcomes. Under the Differentiated Care Model, various components were provided to enrolled study subjects, including clinical assessment and monitoring, adherence support, timely medication and supply management, and psychosocial support encompassing counselling and services addressing emotional, psychological, and social needs, such as mental health and peer support groups, as well as assistance with disclosure and managing stigma-related concerns. Additional features were facility-based fast-tracked refills and client-centered care. This client-centred care involved tailoring treatment and support to the specific requirements and preferences of each individual, accounting for factors like age, gender, sexual orientation, socioeconomic status, and cultural background.

### **Data collection**

Data was sourced from diverse records, including ART Cohort Summary MOH361A, VL Register, Kenya EMR records, and Clinical Encounter Form MOH 257 at each site.

Structured key informant interviews, verbal and self-administered, utilized questionnaires for Differentiated Care model participants, capturing retention and adherence details. Comparisons were drawn between Differentiated Care (2017-2019) and old standard care (2013-2015) patient datasets. Retention outcomes (active, transfer-out, lost to follow-up, deceased) and viral load outcomes were evaluated and compared.

### **Statistical analysis**

Data analysis utilized Statistical Package for the Social Sciences (SPSS) version 28. Efficacy assessment of the intervention employed Chi-squared and Fisher's Exact tests, with a significance level (P-value) set at 0.05. Chi-square tested associations between DCM and retention outcomes in contingency tables. Logistic Regression explored relationships between dependent and independent variables, suitable for binary count data. Unadjusted odds ratios (ORs) and risk ratios (RRs) stemmed from simple regression models, while adjusted figures emerged from multivariate regression integrating predictors: period, gender, and age. Qualitative data collected was analyzed using the Nvivo software program. Thematic analysis was used to identify patterns and themes within qualitative data collected through interviews and questionnaires. Data were presented using tables, bar graphs, pie charts, pyramids, and dichotomous Likert Scale.

## **Results**

### **Demographic characteristics**

The study involved 192 patients, evenly split between the old standard of care (2013-2015) and the differentiated care model (2017-2019). Among females, 42% were aged 30-39, while the majority of males (40%) were aged 40-49. Both care models had similar female proportions: 67% (n=96) in the old standard care and 69% (n=96) in the differentiated care.

### **Retention comparison**

Within the old standard care (2013-2015) group, 67% (n=96) were females, while in the differentiated care group, 69% (n=96)



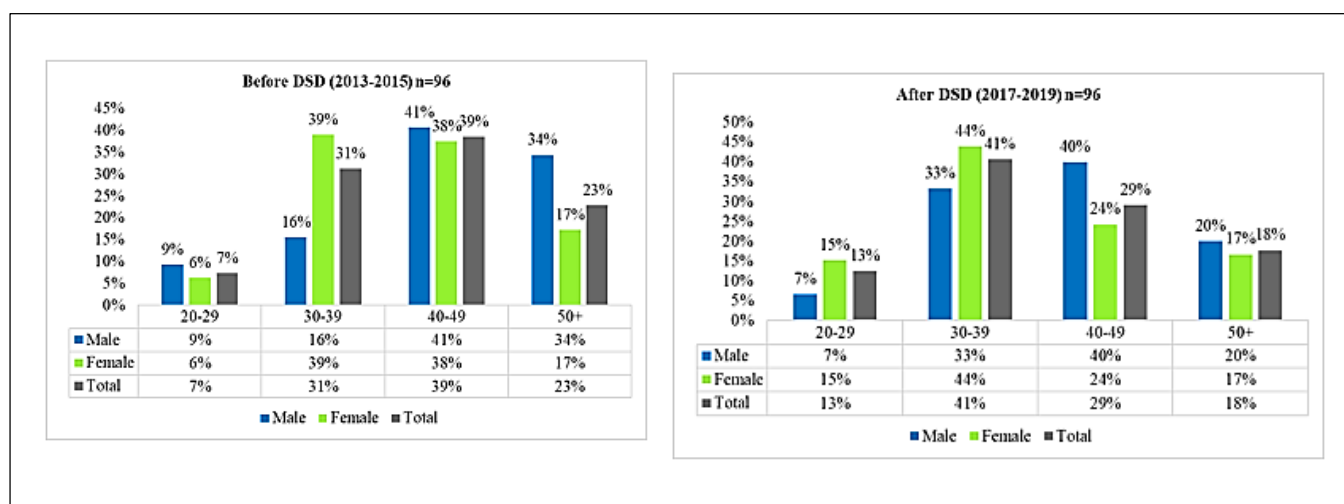
were females. Retention to care was assessed by comparing participants at the study's start and end for both models. Significantly higher rates were observed in the differentiated model: 77% at 6 months and 85% at 12 months, in contrast to the standard care model with 40% at 6 months and 54% at 12 months.

### Active retention outcomes

In our analysis, we utilized the chi-square test to assess the relationship between DCM and health outcomes. We considered statistical significance at a P-value threshold of <0.05. Our findings revealed a significant association between the number of active patients and DCM at 6 and 12 months, as indicated in Table 1, with a P-value of 0.01, leading to the rejection of the null hypothesis.

The results of our multivariate logistic regression analysis demonstrated significant associations between patient activity levels and DCM. At 6 months post-DCM, patients were 5.13 times more likely to be active, and this likelihood remained at 4.95 times at the 12-month mark (both  $p < 0.001$ ).

When examining gender differences, females had 1.36 times the odds of being active at 6 months compared to males, with a similar trend observed at 12 months. Furthermore, patients exhibited a 1.947-fold increase in activity at 6 months post-DCM compared to pre-DCM levels, a statistically significant finding.



**Figures 1a and 1b:**

Age distribution of the Study population before 1. a and 1. b after DSD

**Table 1:**

Chi-Square Association on Active Retention Outcomes at 6 and 12 months.

| Period                | Active at 6 Months  |            |        |            |       |            | P-Value |
|-----------------------|---------------------|------------|--------|------------|-------|------------|---------|
|                       | Inactive            |            | Active |            | Total |            |         |
|                       | Count               | Percentage | Count  | Percentage | Count | Percentage |         |
| Before DSD(2013-2015) | 58                  | 80%        | 38     | 40%        | 96    | 100.0%     | <0.001  |
| After DSD(2017-2019)  | 22                  | 23%        | 74     | 77%        | 96    | 100.0%     |         |
| Total                 | 80                  | 42%        | 112    | 58%        | 192   | 100.0%     |         |
| Period                | Active at 12 Months |            |        |            |       |            | P-value |
|                       | Inactive            |            | Active |            | Total |            |         |
|                       | Count               | Percentage | Count  | Percentage | Count | Percentage |         |
| Before DSD(2013-2015) | 44                  | 46%        | 52     | 54%        | 96    | 100.0%     | <0.001  |
| After DSD(2017-2019)  | 14                  | 15%        | 82     | 85%        | 96    | 100.0%     |         |
| Total                 | 58                  | 30%        | 134    | 70%        | 192   | 100.0%     |         |

This association persisted even after adjusting for age and gender, with a relative risk (RR) of 1.873 (95% CI -1.432 – 2.450). However, gender differences at 6 months were not statistically significant (female odds 1.142 times that of males). Similarly, differences among various age groups, particularly in the 20-29-year age category, were not statistically significant at both 6 and 12 months.

Our analysis indicates significant associations between DCM and patient activity levels, with notable gender and age trends observed.

### Transfer-out retention outcomes

In the context of transfer-out retention outcomes, it was observed that the proportion of stable patients experiencing such outcomes decreased to 9% (9 out of 96 patients) at both the 6-month and 12-month intervals following the implementation of DCM. This is in comparison to the previous standard of care delivery, where 22% (21 out of 96 patients) experienced transfer-out retention outcomes at 6 months and 20% (19 out of 96 patients) at 12 months.

The association between DCM and transfer-outs (TOs) at these time points was assessed using Fisher's Exact test. It was noted that statistical significance was achieved at 6 months, with a P-value of 0.02, leading to the rejection of the null hypothesis. However, it's

worth mentioning that statistical significance was not reached when examining the association between DCM and TOs at 12 months, as indicated in Table 2, with a P-value of 0.06.

In the analysis, a multivariate log-binomial regression model was employed to examine the difference in transfer-outs (TOs) before and after DCM implementation. This analysis, even after adjusting for age and gender, yielded statistically significant results. At 6 months, the relative risk (RR) was 0.377 (95% CI 0.186 – 0.766), indicating that patients after DCM were 0.429 times less likely to experience TOs compared to patients before DCM. Similarly, at 12 months, the RR was 0.400 (95% CI 0.196 – 0.820), signifying that patients after DCM were 0.474 times less likely to undergo TOs compared to their pre-DCM counterparts.

Gender differences were also explored. Female patients were 1.908 times more likely to experience TOs at 6 months and 1.749 times more likely at 12 months than male patients. However, it's important to note that these differences were not statistically significant, with P-values of 0.133 at 6 months and 0.198 at 12 months. Furthermore, variations among different age groups were examined.

**Table 2:**  
Transfer Out Retention Outcomes at 6 and 12 Months

| TO at 6 months         |          |            |       |            |       |         |            |
|------------------------|----------|------------|-------|------------|-------|---------|------------|
| Period                 | No Event |            | Event |            | Total | P-Value |            |
|                        | Count    | Percentage | Count | Percentage | Count |         | Percentage |
| Before DSO [2013-2015] | 75       | 78.1%      | 21    | 21.9%      | 96    | 100.0%  | 0.028      |
| After DSO [2017-2019]  | 87       | 90.6%      | 9     | 9.4%       | 96    | 100.0%  |            |
| Total                  | 162      | 84.4%      | 30    | 15.6%      | 192   | 100.0%  |            |
| TO at 12 months        |          |            |       |            |       |         |            |
| Period                 | No Event |            | Event |            | Total | P-Value |            |
|                        | Count    | Percentage | Count | Percentage | Count |         | Percentage |
| Before DSD [2013-015]  | 77       | 80.2%      | 19    | 19.8%      | 96    | 100.0%  | 0.064      |
| After DSO[2017-2019]   | 87       | 90.6%      | 9     | 9.4%       | 96    | 100.0%  |            |
| Total                  | 164      | 85.4%      | 28    | 14.6%      | 192   | 100.0%  |            |



At 6 months, statistically significant differences were observed for TOs, with all age groups being less likely to experience TOs compared to patients aged 20-29 years. However, at 12 months, these differences were not statistically significant.

### Lost to follow-up retention outcomes

It was observed that, following the implementation of DCM, the proportion of stable patients experiencing LTFU decreased significantly. At 6 months, this reduction amounted to 12% (11 out of 96 patients), compared to the old standard of care delivery, which had a rate of 28% (27 out of 96 patients). Similarly, at 12 months, LTFU decreased to 3% (3 out of 96 patients) from the previous rate of 16% (15 out of 96 patients).

To assess the association between LTFU retention outcomes at 6 and 12 months before and after the introduction of the Differentiated Care Model (DCM) for ART

delivery, Fisher's Exact test was employed. The results led to the rejection of the null hypothesis, confirming a significant statistical association between DCM and LTFU outcomes at both 6 months (P-value 0.006) and 12 months (P-value 0.005), as presented in Table 3. The regression analysis indicated that patients were less likely to experience LTFU at 6 months after DCM, with a relative risk of 0.407 (95% CI 0.215 – 0.774). While it's worth noting that females were less likely to experience LTFU at both 6 and 12 months compared to males, these differences did not reach statistical significance. Furthermore, when examining the various age groups, no statistically significant differences were observed for LTFU at 12 months. Patients were 0.200 times less likely to experience LTFU 12 months after the implementation of DCM.

**Table 3:**  
Lost to Follow Up Retention Outcomes at 6 and 12 months

| LTFU at 6 months       |          |            |       |            |       |            |       |
|------------------------|----------|------------|-------|------------|-------|------------|-------|
| Period                 | No Event |            | Event |            | Total |            |       |
|                        | Count    | Percentage | Count | Percentage | Count | Percentage |       |
| Before DSD [2013-2015] | 69       | 71.9%      | 27    | 28.1%      | 96    | 100.0%     | 0.006 |
| After DSD [2017019]    | 85       | 88.5%      | 11    | 11.5%      | 96    | 100.0%     |       |
| Total                  | 154      | 80.2%      | 38    | 19.8%      | 192   | 100.0%     |       |
| LTFU at 12 months      |          |            |       |            |       |            |       |
| Period                 | No Event |            | Event |            | Total |            |       |
|                        | Count    | Percentage | Count | Percentage | Count | Percentage |       |
| Before DSD [2013-2015] | 81       | 84.4%      | 15    | 15.6%      | 96    | 100.0%     | 0.005 |
| After DSD [2017019]    | 93       | 96.9%      | 3     | 3.1%       | 96    | 100.0%     |       |
| Total                  | 174      | 90.6%      | 18    | 9.4%       | 192   | 100.0%     |       |

**Table 4:**  
Dead Retention Outcomes at 6 and 12 Months

| Dead at 6 months     |          |            |       |            |       |         |       |
|----------------------|----------|------------|-------|------------|-------|---------|-------|
| Period               | No Event |            | Event |            | Total |         |       |
|                      | Count    | percentage | Count | percentage | Count | Percent |       |
| Before DSO [2013015] | 86       | 89.6%      | 10    | 10.4%      | 96    | 100.0%  | 0.033 |
| After DSO [2017019]  | 94       | 97.9%      | 2     | 2.1%       | 96    | 100.0%  |       |
| Total                | 180      | 93.8%      | 12    | 6.3%       | 192   | 100.0%  |       |
| Dead at 12 months    |          |            |       |            |       |         |       |
| Period               | No Event |            | Event |            | Total |         |       |
|                      | Count    | percentage | Count | percentage | Count | Percent |       |
| Before DSO [2013015] | 86       | 89.6%      | 10    | 10.4%      | 96    | 100.0%  | 0.033 |
| After DSO [2017019]  | 94       | 97.9%      | 2     | 2.1%       | 96    | 100.0%  |       |
| Total                | 180      | 93.8%      | 12    | 6.3%       | 192   | 100.0%  |       |

### **Dead retention outcomes**

It was observed that after the implementation of DCM, the rate of dead retention at both 6 and 12 months significantly decreased to 2% (2 out of 96 patients), compared to the pre-DCM standard care delivery with a rate of 10% (10 out of 96 patients). This reduction was statistically significant, as indicated by Fisher's exact test (P-value 0.033), as shown in Table 4.

From the regression analysis, it was found that patients were 0.200 times less likely to experience dead retention at 6 and 12 months before DCM, compared to the standard care delivery, and this difference was statistically significant. Even after adjusting for age and gender, the statistical significance was maintained, with a relative risk (RR) of 0.219 (95% CI 0.049 – 0.982). Although female patients were 0.477 times less likely to experience dead retention at both time points compared to male patients, the p-value indicated that this difference was not statistically significant. Additionally, there were no statistically significant differences among different age groups or for patients aged 20-29 years.

### **Viral load suppression outcomes**

The analysis involved an examination of changes before and after enrollment in the Differentiated Care Model (DCM). Surprisingly, it was found that there was no significant improvement in viral load suppression. To explore the association between DCM and viral load suppression at 6 and 12 months, a Chi-square analysis was conducted. This analysis compared patients receiving DCM to those on standard care. The results revealed insignificant p-values (p-value = 0.836), indicating that there was no significant association between viral load suppression and DCM at both time points.

For predicting the relationships between viral load outcomes and independent variables, logistic regression analysis was employed. In this analysis, unadjusted odds ratios (ORs) and risk ratios (RRs) were derived

from simple regression models with single predictors. Adjusted ORs and RRs, on the other hand, were calculated using multivariate regression models that included all predictors (period, gender, and age).

The analysis showed that the odds of patients in DCM achieving viral load suppression were 1.090 times that of those not in DCM. However, it's important to note that this difference was not statistically significant. Additionally, female patients were found to be less likely to achieve viral load suppression compared to males at both 6 and 12 months, but these differences did not reach statistical significance. Furthermore, the analysis using log-binomial regression indicated that patients after DCM were 1.012 times more likely to achieve viral load suppression at 6 months compared to patients before DCM. Again, it's worth mentioning that this difference lacked statistical significance.

The adjusted relative risks (RRs) suggested minimal differences between the pre- and post-DCM periods. Female patients were less likely to achieve viral load suppression at 6 months compared to males, but this observation did not attain statistical significance. Additionally, the results indicated no significant differences among different age groups or for patients aged 20-29 years in terms of viral load suppression outcomes.

### **Structured key informant interviews findings**

In our study, we conducted structured key informant interviews, utilizing both verbal and self-administered questionnaires, with participants living with HIV who were enrolled in the Differentiated Care Model (DCM) of ART delivery. We aimed to gather evidence regarding retention in care and viral load outcomes. Thematic analysis was used to identify patterns and themes within qualitative data collected through interviews and questionnaires.

A total of 153 clients met the eligibility criteria in the selected facilities, and we achieved a high completion rate of 98% (150

out of 153). Among female participants, those aged 20-29 accounted for the majority, representing 46%. Among male participants, the majority fell into the age groups of 30-39 (31%) and 40-49 (30%). Occupationally, farmers constituted the largest group at 19%, followed by housewives at 16%, businessmen at 9%, and Boda Boda riders at 9%.

Thematic analysis of occupation highlighted the prevalence of informal labor, the importance of agriculture-related work, the challenges faced by housewives, the impact of transportation-related occupations, and the role of education-related occupations

Regarding their experiences with care, 41% of respondents reported being treated with friendliness, courtesy, and respect "a lot of the time," while 38% reported experiencing this "all the time". Thematic analysis reflected a generally positive perception of the health facility staff's treatment of patients. Of the interviewed respondents (99%), 46% received phone call appointment reminders from clinic staff "all the time," and 38% received such reminders "a lot of the time."

Concerning the length of time spent at the clinic, 39% felt that the duration of their last clinic visit was "just right," while 37% considered it "too short." Nearly all respondents (99%) reported having their concerns addressed satisfactorily.

Regarding medication adherence, 77% of respondents indicated that they had never forgotten to take their medicines, and 97% reported being diligent in taking their medications. An impressive 91% of respondents never discontinued their medications despite experiencing worsened health while on treatment. Furthermore, 94% of the respondents were aware of their current viral load, and among those with access to viral load testing, 98% had a suppressed viral load. In terms of health education, 51% of the respondents received health talks during all visits, while 45% received them during most visits. Thematic analysis reflected a generally positive perception of the frequency of health

talks on viral load for stable patients in the differentiated care model of ART delivery

## Discussion

Our investigation in Migori County, Kenya, sheds light on the adoption of Differentiated Care Models (DCM) and their impact on the care of stable individuals living with HIV. This approach, centred around the patient, shows promise in revolutionizing HIV care delivery.

### Enrollment and retention outcomes

One remarkable finding was the substantial enrollment of stable patients into the Differentiated Care Model, resulting in significantly higher retention rates at both the six-month and one-year marks. This underscores the potential of DCM to bolster patient retention. Notably, while both genders experienced improved retention, females had slightly lower rates. This discrepancy might be due to the unique challenges faced by women, especially those initiating ART during pregnancy. Past studies have highlighted the vulnerability of this subgroup to lower retention rates, emphasizing the need for tailored ART delivery systems throughout their lifetime<sup>4</sup>.

Our findings align with existing research on patient-centric care models, which also reported positive retention outcomes<sup>5-7</sup>. The improved patient experiences within DCM, characterized by respectful and friendly healthcare interactions, likely contributed to these better retention rates. Additionally, the implementation of phone call reminders and reduced waiting times at healthcare facilities likely played a pivotal role in shaping these outcomes. Similar to our findings, a study in Uganda demonstrated that DCM implementation led to improved retention rates, shorter waiting times, and increased patient satisfaction<sup>8</sup>.

Higher retention rates, as shown in our study, correlate with reduced loss to follow-up and improved retention outcomes, underscoring the significance of patient-centred care models in sustaining engagement in HIV care.





## **Viral load suppression**

We also examined the impact of the Differentiated Care Model on viral load suppression among stable HIV patients. Surprisingly, our investigation did not reveal significant improvements in viral load suppression when comparing patients on DCM with those on the standard care model<sup>9,10</sup>. This suggests that DCM may not necessarily lead to substantial enhancements in viral load suppression, particularly among stable patients whose clinical outcomes tend to be sustained rather than markedly improved. Modest increases in viral load suppression, noted in a similar study<sup>11</sup>, might be attributed to this phenomenon.

Gender-based disparities in viral load suppression were evident, with females exhibiting lower rates than males, although this difference did not reach statistical significance<sup>12</sup>. This observation may be linked to the gender-based variations in retention rates we observed. Further exploration is necessary to elucidate the factors contributing to these gender-related differences in viral load suppression among DCM patients.

Our regression analyses, while not statistically significant, hinted at approximately 1.090 odds of achieving viral suppression on the DCM model, with similar odds at both the six-month and one-year intervals. These results suggest that DCM may have a positive impact on viral load suppression, particularly among patients in the early stages of treatment. Additionally, a significant proportion of patients reported never forgetting to take their medication and displayed a diligent approach to medication adherence. Most patients were aware of their current viral load status and received pertinent information during their health facility visits.

In summary, our study adds to the growing body of evidence supporting the effectiveness of DCM in improving retention rates among HIV-positive patients. However, its impact on viral load suppression, especially among stable patients, appears to be more

modest. Further research is warranted to unravel the nuanced factors influencing these outcomes, with particular attention to gender-based variabilities in viral load suppression.

## **Limitations of the study**

We conducted our research solely in Migori County, Kenya, potentially limiting the generalizability of our findings to other regions in Sub-Saharan Africa. Additionally, the retrospective nature of our study introduces the possibility of recall bias, as participants were required to recall experiences and outcomes over a defined period. Furthermore, the reliance on medical records and self-reports could introduce information bias. Our study did not explore the economic aspects of DCM, such as cost-effectiveness and resource allocation. Future research should delve into these dimensions to yield a more comprehensive understanding of DCM's impact on healthcare systems in Sub-Saharan Africa.

## **Conclusion**

In conclusion, our study highlights the potential benefits of implementing Differentiated Care Models in HIV care and treatment. DCM was associated with improved retention outcomes, reduced transfer-outs, decreased loss to follow-up, and lower dead retention rates. These findings suggest that DCM can enhance the effectiveness of HIV care, especially in resource-limited settings like Migori County, Kenya. However, it's essential to recognize the need for continued efforts to improve viral load suppression outcomes. Overall, our study contributes valuable insights to the ongoing efforts to optimize HIV care delivery and improve patient outcomes.

## **Recommendations**

For healthcare providers and other stakeholders, we recommend adopting and implementing differentiated care models to enhance the quality of care for HIV-positive patients. Further research is needed to understand why there are differences in the effectiveness of these models between genders and to assess the long-term impact on viral load



suppression rates. This study highlights the importance of continuously evaluating and improving these care models to ensure the best outcomes for HIV-positive individuals. Healthcare providers should continue to prioritize patient education and medication adherence to achieve better viral load suppression results.

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