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Health provider perspectives on differentiated service delivery for HIV in Oyo state, Nigeria: exploring the experiences of service providers from a demand perspective

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Abstract

Background Differentiated Service Delivery (DSD) models have been introduced to optimise HIV care by adapting services to client needs while reducing the burden on healthcare systems. In Nigeria, where HIV prevalence remains high. Understanding provider perspectives is critical to improving and sustaining DSD implementation. This study explored the experiences, challenges, and recommendations of healthcare providers involved in DSD delivery in Ibadan North, Oyo State.

Methods A qualitative descriptive study was conducted between July and September 2024, involving 11 key informant interviews and two focus group discussions across three DSD-implementing facilities. Participants included clinicians, ART counsellors, HTS providers, retention officers, and program managers. Data were analysed thematically using NVivo 12 software, following the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines.

Results Five core themes emerged: perceived benefits of DSD models, implementation challenges, eligibility and suitability of clients, human resource capacity and training, and strategic recommendations for sustainability. Providers reported that DSD models improved accessibility, reduced clinic congestion, and enhanced patient retention and viral suppression. However, challenges such as inaccurate client data, dependency on community models, systemic inefficiencies, and inadequate training impeded effective implementation. Participants emphasised the need for policy alignment, community engagement, capacity building, and stronger monitoring systems.

Conclusion DSD models hold promise for improving HIV service delivery in Nigeria. However, their success depends on addressing structural and operational challenges, tailoring approaches to local contexts, and strengthening health workforce capacity. These findings provide critical insights to inform national policy, support program scale-up, and contribute to achieving the UNAIDS 95-95-95 and SDG 3.3 targets.

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Introduction

Human Immunodeficiency Virus (HIV) and acquired immunodeficiency syndrome (AIDS) remain significant global public health concerns [1–3]. Despite substantial advances in public awareness, prevention, and treatment, HIV continues to affect millions worldwide [4–6]. Recent estimates suggest that as of 2022, approximately 39 million people are living with HIV (PLHIV) globally, with millions more having died from AIDS-related illnesses [1, 4, 7]. In Nigeria, the HIV/AIDS Epidemic Control Report (June 2023) estimated that 1.9 million people are currently living with HIV [8]. The global 95-95-95 Fast-Track Strategy, launched by UNAIDS, aims to end the AIDS epidemic by 2030 in alignment with Sustainable Development Goal 3.3 [9, 10]. this target remains challenging, particularly in high-burden regions such as sub-Saharan Africa (SSA) [2, 4, 5].

HIV continues to affect populations unequally [3, 11, 12]. Young women aged 15–24 years are particularly vulnerable, accounting for 26% of new infections among adults. This trend is especially pronounced in SSA, which accounts for 71% of global new HIV infections [13, 14]. In West Africa, young women represent 22% of new cases, with Nigeria alone accounting for approximately 290,000 women living with HIV as of 2016 [15–17]. While such disparities underscore the importance of gender-sensitive approaches, it is important to note that HIV affects a diverse range of individuals, including men, women, and key populations [13, 16, 18].

Since 2006, the Nigerian government has offered free antiretroviral therapy (ART) through designated treatment centres to reduce the national HIV burden, which at the time was estimated at 3.1 million people [17]. By 2020, Nigeria adopted the UNAIDS 95-95-95 targets, aiming for 95% of PLHIV to know their status, 95% of those diagnosed to receive sustained ART, and 95% of those on ART to achieve viral suppression by 2025 [9, 19, 20]. While there has been commendable progress toward these goals, critical gaps remain in ensuring equitable access to treatment and care for all affected populations. Much of Nigeria's HIV response has been heavily dependent on external donor funding, including long-term support from the United States Government through the President's Emergency Plan for AIDS Relief (PEPFAR) [21, 22]. The gradual reduction or withdrawal of donor funding poses significant risks to treatment continuity, health system capacity, and the sustainability of differentiated care models. These gaps include overburdened health facilities, geographic disparities in service availability, shortages of trained healthcare workers, stigma and discrimination, and inconsistent drug supply chains, factors that disproportionately affect rural residents, key populations, and socioeconomically disadvantaged groups [23, 24]. Such systemic and structural challenges undermine retention in care and viral suppression, thereby impeding national efforts to control the HIV epidemic. In response, innovative approaches such as Differentiated Service Delivery (DSD) have been introduced to tailor HIV services to the diverse needs of patients and reduce inefficiencies in the health system [25–27].

Differentiated Service Delivery (DSD) has emerged as a critical strategy to address these challenges [28–30]. DSD is defined as a client-centred approach that simplifies and adapts HIV services across the care cascade to reflect the preferences, expectations, and needs of people living with or vulnerable to HIV while reducing unnecessary burdens on the health system [27, 31, 32]. DSD models are built on four key pillars: *when (frequency of service delivery), where (location of service delivery), who (provider of services), and what (types of services offered)* [27, 28, 31, 32]. By adopting patient-centric approaches, DSD reduces the time and financial burdens associated with frequent clinic visits, such as long waiting times and transportation costs [33, 34].

In Nigeria, as of 2022, an estimated 1.9 million PLHIV, with approximately 1.4 million currently receiving are on ART [35–38]. In this context, the implementation of DSD models has become increasingly important to ensure more efficient, patient-centered, and equitable HIV care [28, 32]. Before the COVID-19 pandemic, most PLHIV in Nigeria received monthly ART refills, leading to clinic congestion and inefficiencies [39, 40]. However, the pandemic and its associated movement restrictions necessitated a rapid shift in service delivery models. To mitigate treatment interruptions, Nigeria accelerated the adoption of DSD models and multi-month dispensing (MMD), a strategy that involves providing stable clients with several months' supply of ART at once, thereby reducing the frequency of clinic visits [40, 41]. While this transition has been critical in maintaining continuity of care, the experiences of PLHIV and healthcare providers with these models remain understudied. However, this study specifically focuses on the supply side of service delivery by exploring healthcare providers' perspectives, challenges, and strategies in implementing DSD models.

Despite the expansion of DSD models, healthcare providers in Nigeria continue to face significant operational and systemic challenges that hinder optimal

implementation. Prior studies conducted in other parts of the country have identified barriers such as limited resources, logistical inefficiencies, stigma, and policy misalignment [30, 42, 43]. However, there is limited empirical evidence on how these challenges manifest in Southwest, Nigeria, underscoring the need for localised research into healthcare providers' experiences with DSD implementation [30].

Understanding healthcare providers' perspectives, challenges, and strategies in implementing DSD is essential for improving HIV service delivery, particularly in high-burden regions like Oyo State, which accounts for 18.5% of Nigeria's total population of PLHIV [44, 45]. This study seeks to identify barriers, facilitators, and strategies for optimising DSD models in Ibadan North. By identifying barriers, facilitators, and strategies for optimising DSD models, this study aims to fill a critical gap in the literature. The findings of this study will provide valuable insights for policymakers, program managers, and healthcare providers in designing more efficient. These patient-centred healthcare services can better meet the needs of PLHIV and the broader population.

Methodology

Study Design

This study employed a qualitative descriptive design to explore healthcare providers' perspectives, challenges, and strategies in implementing DSD for HIV care in Ibadan, Oyo State. The design was chosen to capture context-rich insights across various healthcare system levels, focusing on the nuanced experiences of healthcare professionals working with DSD models [46–48]. Qualitative methods are particularly effective in capturing the diverse perspectives, attitudes, and social dynamics that quantitative methods might overlook, which is crucial for uncovering the underlying factors that influence the effectiveness of program implementation and addressing the barriers to success [49, 50].

Study setting

The study was conducted in Ibadan, Oyo State, a region with active DSD programs across diverse healthcare facilities. Three healthcare facilities were purposively selected for this study: Adeoyo Maternal and Child Health Teaching Hospital, Yemetu (Secondary Health Center); Comfort Medical Center (Secondary Health Center); and Idi-Ogungun Primary Health Center (Primary Health Center), all located in Ibadan. These facilities were chosen based on their active and long-standing engagement in implementing DSD models, including fast-track drug refills, multi-month dispensing, community-based ART distribution, and the current active DSD programs they are coordinating.

Study population

The target population included healthcare providers engaged in HIV care and DSD implementation, such as HIV-focused nurses, State Program Coordinators, counsellors, and other key professionals working across the healthcare continuum. This population was selected due to their comprehensive understanding of DSD models and firsthand experience in their execution. Their insights are crucial for evaluating DSD strategies, identifying challenges, and informing improvements to enhance patient-centred HIV care. Engaging these professionals ensures the study captures practical perspectives on DSD effectiveness and sustainability within the healthcare system.

Sampling technique

A purposive sampling technique was employed to select participants with substantial experience in DSD implementation and involvement [51, 52]. All participants had at least two years of experience in HIV service delivery and were actively involved in DSD models and implementation at the time of the study, from August – September 2024. This ensured that the data collected reflected informed perspectives on DSD implementation. The study conducted Key Informant Interviews (KIIs) with officials from the Oyo State Ministry of Health's Department of HIV Services, Clinicians, and Retention Officers. Additionally, the study conducted Focus Group Discussions (FGDs) with Pharmacists, ART Counsellors, and HTS service providers.

Sample size determination

Sample size calculation was not applicable in this study. Instead, the number of FGDs and KIIs was guided by the principle of data saturation, the point at which no new themes or insights emerged from the obtained data. Saturation was assessed based on the repetition of core themes, thematic coherence, and diminishing returns in new information [53].

To ensure comprehensive exploration of the topic and account for the complexity of DSD implementation, we initially planned a flexible number of interviews. We conducted 11 KIIs and two FGDs. Saturation was determined iteratively during data collection through regular debriefs and content assessments by the research team. Data collection ceased when it was judged that further interviews were unlikely to yield additional insights [54].

Study tools

We developed the KII and FGD guides using components of the Andersen Behavioural Model of Health Care Utilization to explore key factors influencing the implementation and effectiveness of DSD models for HIV care [55].

The interview guides are presented in See Supplementary File 1.

The guides were structured to elicit information on:

1. Experiences and perceptions of implementing DSD.
2. Challenges and facilitators within the health system.
3. The role of training, resources, and policy support.
4. Perceived effects of DSD on ART adherence, patient engagement, viral load suppression, and satisfaction with care.

To ensure clarity, contextual relevance, and appropriateness of the questions, we conducted a pretest of the guides with a small subset of participants not included in the main study. Feedback from the pretest was used to refine the wording, flow, and probe structure of the interview tools. Separate guides were tailored for program managers and healthcare providers, reflecting their roles and perspectives in DSD implementation.

Data collection

Data was collected between August and September 2024, comprising two FGDs with 16 participants (8 per group) and 11 KIIs. FGD participants included pharmacists, ART counsellors, pharmacy technicians, and HTS providers. KIIs were conducted with program managers, clinicians, and retention officers involved in DSD implementation in Oyo State (see Table 1).

The interview guides were semi-structured and developed based on key themes of interest. All interviews were conducted in English (Nigeria's national language), in locations that ensured privacy, such as small halls, private rooms, and offices.

Each FGD lasted approximately 45–60 min, while KIIs ranged from 30 to 45 min. Interviews were audio-recorded, and field notes were taken concurrently to capture non-verbal cues and contextual details. This dual approach enhanced the accuracy and richness of the data.

Data analysis

Thematic analysis was employed to extract key themes from the data collected. Data from FGDs and KIIs were transcribed, coded, and analysed. The interview guides for the FGDs and KIIs explored key themes such as the perceived effectiveness of different DSD models, logistical and operational challenges, healthcare provider experiences with policy implementation, and recommendations for scaling up DSD models. Transcription was done independently among the team members and then checked for verification and accuracy with simultaneous audio playing. The study content was analysed thematically, indexed, and coded inductively using the QRS NVivo 12 software package (QRS International, Doncaster, Australia) for the content analysis of unstructured qualitative data [56]. The initial open codes were sorted into sub-themes based on their similarity. According to the participant's responses, these sub-themes were clustered and refined to form broad themes and debated within the research team. Data collection, analysis, and reporting followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist [57, 58]. The details of the COREQ for this study are presented in Supplementary File 2.

To ensure rigour and trustworthiness, we applied Guba and Lincoln's criteria, focusing on credibility, dependability, confirmability, and transferability throughout the research process [59]. Two members of the research team (GA and OO) independently coded a subset of transcripts from each participant group using NVivo 12 software, and interrater reliability was assessed to ensure coding consistency.

A collaborative coding approach was adopted to resolve discrepancies. After independent coding, two senior team members (FT and OR) facilitated a line-by-line discussion of the coded data. Differences in interpretation were discussed with additional team members (AT and OM) to reach a consensus and refine the coding framework. An audit trail was maintained to document all coding decisions, rationale for changes, and team deliberations, enhancing transparency and traceability of the analytic process.

Inter-coder reliability checks were conducted periodically, with Cohen's Kappa coefficient used to assess the level of agreement. According to Cohen's interpretation scale, a Kappa score of 1.00 was achieved, indicating near-perfect agreement among coders [60].

Table 1 Participants of KIIs and FGDs

Participants		Male	Female	Total
Pharmacists	FGD	-	2	2
Clinician	KII	3	1	4
Retention Officer	FGD	3	1	4
Program Managers	KII	2	-	2
Pharm technicians	FGD	1	2	3
HTS Service Providers	FGD	4	4	8
ART Counsellors	FGD	4	-	4

Ethical consideration

Ethical approval for this study was obtained from the Oyo State Ministry of Health Research Ethics Committee (Ref: AD 13/479/879) and the Lead City University Research Ethics Committee (Ref: LCU-REC/24/130). The study was conducted in full accordance with the ethical principles outlined in the Declaration of Helsinki for research involving human participants [61]. All participants were provided detailed information about the study in English and Yoruba to ensure comprehension. Informed consent was obtained from all participants prior to participation, including verbal and written consent.

Table 2 Socio-Demographic characteristics of respondents ($n=27$)

Variable	Frequency *N*	Variable %
Age		
20–25	6	22.2
25–30	8	29.6
31–35	3	11.1
35–40	4	14.8
41–45	6	22.2
Gender		
Male	17	63.0
Female	10	37.0
Marital Status		
Single	17	55.6
Married	10	44.4
Profession		
Clinician	4	14.8
Retention Officer	4	14.8
Program Managers	2	7.4
Pharm technicians	3	11.1
Pharmacists	2	7.4
HTS Service Providers	8	29.6
ART Counsellors	4	14.8

Participants were informed of their right to decline participation or withdraw at any stage without consequence. Confidentiality was strictly maintained throughout the study. Audio recordings and transcribed data were stored securely using password-protected digital files and pseudonyms to protect participant identity. Access to the data was restricted to the research team. The principal investigator handled the interview guides and consent forms exclusively to ensure data integrity and confidentiality.

Results

Table 2 presents the socio-demographic characteristics of the study participants. Most respondents were between 25 and 30 (8/27, 29.6%), followed by those aged 20–25 and 41–45 (6/27, 22.2%). Gender distribution shows a male predominance (17/27, 63.0%). Over half of the participants were single (17/27, 55.6%), while the rest were married (10/27, 44.4%). Professionally, the group was diverse, with HTS Service Providers (18.5%), Clinicians (14.8%), Retention Officers (14.8%), and ART Counsellors (14.8%) forming the majority. Other roles included Program Managers (11.1%), Pharmacists (11.1%), and Pharmacy Technicians (7.4%) (See Table 2).

Thematic analysis overview

Table 3 shows the thematic analysis overview explored healthcare providers' perspectives on implementing DSD

Table 3 Thematic areas

Themes	Subthemes	Description
Perceived Benefits of DSD Models	Improved Accessibility and Convenience	DSD models reduce travel and waiting time, making services more accessible for clients with busy schedules or long distances.
	Retention in Care and Viral Suppression	Implementing DSD models has led to improved retention in care and better viral suppression, especially during COVID-19.
	Patient-Centeredness and Empowerment	Community-based and flexible models empower patients and reduce stigma, promoting sustained engagement in care.
Implementation Challenges	Poor Contact Information and Tracking Difficulties	Incorrect or outdated client contact information hinders follow-up and continuity of care.
	Misuse and Dependency on Community Models	Patients have become overly reliant on community services, resisting a return to the facility even when needed.
	Systemic Issues and Health Worker Exploitation	Instances of health workers exploiting the system for personal gain and community pharmacy reporting gaps were noted.
Eligibility and Suitability of Clients	Client Selection Based on Adherence and Viral Load	Eligibility for DSD is based on factors like viral suppression and biometric enrolment.
	Limitations for Non-Adherent Clients	Clients with poor adherence may not benefit from DSD, which can undermine its effectiveness.
Human Resource Capacity and Training	Gaps in Knowledge Among Health Workers	Healthcare workers require ongoing training to implement and adapt DSD strategies effectively.
	Need for Policymaker Sensitization	Many policymakers are unaware of the operational aspects of DSD, leading to suboptimal policy decisions.
Strategic Recommendations for Sustainability	Strengthening Support Systems	Support from partners and pharmacy networks enhances DSD implementation and monitoring.
	Addressing Structural Barriers	Economic hardship, stigma, and lack of mental health integration limit the effectiveness of DSD.
	Policy and Advocacy Needs	Clear and supportive policies are needed to scale and sustain DSD models across diverse settings.

models for HIV care in Ibadan, Oyo State. Five major themes emerged through the KIIs and FGDs, each representing critical insights into the benefits, barriers, and opportunities for sustaining DSD implementation locally. While the BMHSU framework informed the development of our interview guide to ensure coverage of predisposing, enabling, and need-related factors, the thematic analysis was conducted inductively to allow new, context-specific insights to emerge. Consequently, several themes align with BMHSU constructs (e.g., enabling factors such as logistical inefficiencies and policy barriers), while others reflect emergent factors relevant to differentiated HIV service delivery in the study context (See Supplementary File 3).

Theme 1: perceived benefits of DSD models

Participants broadly acknowledged that DSD models have significantly improved the delivery of HIV care. They highlighted reduced waiting times, improved client convenience, better retention in care, and increased viral suppression. Patient-centred approaches, such as fast-track () and where clinically stable patients collect their medications quickly without routine clinical consultations), community ART refill models, were viewed as empowering for clients and adaptable to individual needs.

Sub-theme 1: improved accessibility and convenience

DSD models, especially fast-track, weekend, and community models, were praised for improving convenience, reducing waiting times, and eliminating the need for frequent clinic visits, particularly for working-class clients and those living far from facilities.

> *Some clients who came to the facility were attended to straight. They did not have to see the doctor. They just took their records and sent them to the pharmacy.*
> *— Program Coordinator, Participant 11, KII*

> *We usually schedule different times for them so some can come on weekends. We tailor that for working-class individuals. We open the clinic on weekends for them.*
> *— Clinician, Participant 4, KII*

> *On the weekend, those people find it difficult to come. So, if that opportunity were not there, they probably would not come or delay their coming.*
> *— ART Counsellor, Participant 26, FGD*

> *Patients do not want to spend much time at the hospital. They want to come to a place and do 4 or 5 different things instead of bouncing around from one building to the other building.*
> *— ART Counsellor, Participant 24, FGD.*

Sub-theme 2: retention in care and viral suppression

Participants consistently reported that DSD models improved retention in care and helped maintain or achieve viral suppression, especially for clients in hard-to-reach areas and during COVID-19.

> *DSD helped us maintain a high level of retention, at least for clients living in hard-to-reach areas… Even their viral load checks remained virally suppressed.*
> *— Clinician, Participant 6, KII*

> *We truly saw the impact when community distribution was temporarily stopped. Viral load coverage dropped, and adherence rates declined. When we resumed, we saw an immediate improvement.*
> *— Program Coordinator, Participant 11, KII*

> *We had as high as maybe 99% or 100% cases where there was no transmission from mother to child… the baby's outcome after 18 months was excellent.*
> *— Clinician, Participant 5, KII*

> *It has improved our patient outcomes largely… improved adherence to medications and treatments. We have gotten better viral suppression.*
> *— ART Counsellor, Participant 25, FGD.*

Sub-theme 3: patient-centeredness and empowerment

DSD models were seen as more responsive to patient preferences and needs. Participants noted that allowing patients to choose models (e.g., community vs. facility) built trust and respect, reduced stigma, and encouraged adherence.

> *The most important part is that they get treatment or access to everything they need… It depends on the patient's preference.*
> *— HTS Service Provider, Participant 19, FGD*

> *Most clients appreciate it. Even the other partners or family can do the pick-up for the wife.*
> *— Clinician, Participant 3, KII*

> *It allowed us to get to know the patients more. We communicate with them on a personal level… not just because you are concerned about drug pick-up.*
> *— HTS Service Provider, Participant 22, FGD*

> *It has empowered the patients sort of in aspects of decision-making.*
> *— ART Counsellor, Participant 18, FGD*

Theme 2: implementation challenges

Despite the perceived benefits, numerous challenges hinder the smooth implementation of DSD. These include difficulties in client tracking due to inaccurate contact information, growing dependency and misuse of community-based models, and systemic issues such as underreporting and exploitation of DSD systems by some healthcare providers.

Sub-theme 1: poor contact information and tracking difficulties

Participants described serious difficulties in reaching clients due to incorrect phone numbers, reluctance to disclose next of kin, or false addresses. These issues hinder follow-up, home visits, and appointment scheduling, especially for clients who default or miss drug refill dates.

Some people use wrong addresses, and their phone numbers are wrong. You try to call them; the numbers are not going.
—HTS Service Provider, Participant 19, FGD

They will not even want to give you any next of kin you will contact if they are unreachable. They often give fake names or say there is nobody.
— HTS Service Provider, Participant 19, FGD

Many clients, when they register, give phone numbers that are not theirs or switch lines and do not update us. It makes it hard to track them.
— ART Counsellor, Participant 19, FGD.

Sub-theme 2: misuse and dependency on community models

Although DSD models like community ART refill were introduced to improve access and retention, some patients began to misuse these options. Providers noted that clients expected full services, labs, check-ups, and counselling, to be done at home indefinitely, even beyond the COVID-19 emergency phase. This dependency created strain and reduced clinic-based engagement.

Some patients now feel the drugs should always be brought to their homes. Even when we try to bring them back for labs or doctor reviews, they refuse.
— HTS Service Provider, Participant 19, FGD

Community pharmacy model is good, but many clients do not want to return to the facility… they see it as the new normal, not a support system.
— ART Counsellor, Participant 19, FGD

The weekend model we created was to help working-class people. However, now some clients who do not even work insist on being attended to on weekends.
— HTS Service Provider, Participant 22, FGD.

Sub-theme 3: systemic issues and health worker exploitation

Some healthcare workers and facilities reportedly exploited systemic loopholes. Some participants mentioned practices like falsely reporting drug pick-ups, collecting transport stipends for unverified visits, or delays in updating client data. These behaviours undermine data quality and reduce trust in DSD models.

Some facilities collect funds to support community models, but they do not always do the follow-up… they just say they have delivered.
— Program Officer, Participant 12, KII

There were cases where drivers or health workers claimed they visited homes, but the clients said no one came.
— Program Officer, Participant 12, KII

Underreporting and falsified documentation are problematic, especially in community pharmacy models. They do not report returns or client refusals.
— ART Counsellor, Participant 26, FGD.

Theme 3: eligibility and suitability of clients

Healthcare providers emphasised the importance of strict adherence to eligibility criteria when enrolling clients into DSD models. Viral suppression, adherence history, and biometrics were key factors considered. Non-adherent clients or those with unstable conditions were regarded as unsuitable, with potential risks for treatment failure if included in DSD.

Sub-theme 1: client selection based on adherence and viral load.

Eligibility for DSD models is primarily based on the patient's clinical stability, which is defined by consistent adherence to ART, viral suppression, and completion of biometric enrolment. Healthcare providers emphasised the importance of enrolling only stable clients into community or fast-track models to ensure continuity and reduce the risk of treatment failure.

We ensure that the client is virally suppressed and has done their biometrics before we even consider community ART refill. That is the policy.
— ART Counsellor, Participant 27, FGD

If they are not virally suppressed, we cannot put them on a community model. We use their last viral load result and adherence level as major criteria.
— Program Officer, Participant 11, KII

We use the eligibility criteria from the national guideline—recent viral load, absence of opportunistic infections, good adherence… if not, we keep them on facility-based care.
— Program Officer, Participant 11, KII.

Sub-theme 2: limitations for non-adherent clients

Non-adherent clients who frequently miss appointments, fail to pick up medications, or have a poor understanding of their treatment—are often excluded from DSD models. Participants expressed concern that including such clients could lead to treatment interruption or drug resistance, which undermines the effectiveness of DSD interventions.

Some of them are not reliable. You put them on fast-track, and they still do not return until two months later. Those kinds of clients should not be on DSD.
— ART Counsellor, Participant 25, FGD

For someone who cannot adhere to even monthly visits, giving them three-month refills will worsen their outcome. They will stop taking drugs or go off-track.
— ART Counsellor, Participant 27, FGD

We tried enrolling one of our clients in the home delivery model, but he kept changing his address, and we later found out he was not even taking his drugs properly.
— HTS Service Provider, Participant 23, FGD.

Theme 4: human resource capacity and training

The successful implementation of DSD models depends heavily on the capacity of healthcare workers. Participants noted significant gaps in training and awareness, especially among newer staff and those unfamiliar with emerging DSD approaches. Additionally, there was a call for greater awareness among policymakers, many of whom are removed from frontline realities.

Sub-theme 1: gaps in knowledge among health workers

Many healthcare providers expressed the need for continuous capacity building and refresher training to keep up with evolving DSD models. Some staff were unfamiliar with newer models or lacked clarity on implementation processes. This knowledge gap affects proper enrollment, monitoring, and patient engagement under DSD.

Some of the staff do not even know what DSD means beyond giving drugs for three months… They need training on what it involves.
— Clinician, Participant 4, KII

They know about fast-track but ask them about family models or community pharmacy—they are lost. We have not had proper updates.
— Program Manager, Participant 11, KII

There has been turnover in staff, and most of the new ones have not attended any DSD training. It affects how they explain it to clients or implement it properly.
— Program Manager, Participant 11, KII.

Sub-theme 2: Need for Policymaker Sensitization.

Participants reported that some policymakers and higher-level decision-makers lack a deep understanding of DSD models, leading to poor planning, unrealistic targets, or misaligned resource allocation. Providers emphasised the need to sensitise those at the policy level to align their strategy with on-the-ground realities.

We are doing the work, but those setting the targets do not understand the constraints… especially around community models.
— HTS Service Provider, Participant 19, FGD

Some of the policies are too theoretical. They have not sat with the clients or walked in our shoes. They say, 'enrol 80% in DSD' without considering who qualifies.
— HTS Service Provider, Participant 20, FGD.

"The policymakers need sensitisation too. Sometimes, they ask us to push people into models without checking if they are stable or virally suppressed."
— Program Coordinator.

Theme 5: strategic recommendations for sustainability

Participants offered clear strategies to sustain and scale DSD models. These included strengthening partnerships with community actors and pharmacy associations, addressing structural barriers such as poverty and stigma, integrating mental health services, and advocating for more flexible and context-responsive policies supported by effective monitoring tools.

Sub-theme 1: strengthening support systems

Participants recommended enhancing collaboration among stakeholders, including implementing partners,

pharmacy associations, and community actors, to improve service coordination and sustain DSD implementation. Suggestions included improved supervision, shared learning, and stronger community pharmacy support.

> *We need to partner more with the Association of Community Pharmacists. If they are not carried along, they will keep underreporting or doing things incorrectly.*
> *— Retention Officer, Participant 9, FGD*

> *We have been doing CQI (continuous quality improvement) with some facilities… It helps when the team reviews challenges and corrects errors regularly.*
> *— Program Manager, Participant 11, KII*

> *It is not just the health workers; community leaders can help us educate clients, especially about the importance of viral load testing and follow-up.*
> *— Clinician, Participant 6, KII.*

Sub-theme 2: addressing structural barriers

Structural barriers—such as poverty, stigma, poor mental health services, and poor integration across health services—were identified as major threats to the long-term success of DSD. Providers called for more holistic approaches, including addressing social determinants of health and integrating mental health into HIV care.

> *Some of the clients do not even have food to take their drugs. They live in poverty. You cannot talk about adherence without fixing their economic issues.*
> *— ART Counsellor, Participant 25, FGD*

> *Mental health is a big issue. We see clients who are depressed, but there is no one to refer them to… It affects how they take their drugs or respond to counselling.*
> *— Pharm Technicians, Participant 14, FGD*

> *Stigma is still high in some communities. That is why they do not give correct addresses or visit the facility. We need to do more awareness work.*
> *— Pharm Technicians, Participant 15, FGD.*

Sub-theme 3: policy and advocacy needs

Respondents emphasised the need for clearer, more flexible policies and stronger advocacy for DSD at both community and government levels. Concerns were raised about rigid implementation targets and the lack of context-specific adaptations. Participants also recommended improved monitoring tools and policy engagement to promote accountability.

> *The DSD guidelines should allow for some flexibility. Not all LGAs are the same. We need room to adapt based on our local realities.*
> *— HTS Service Provider, Participant 18, FGD*

> *We need to carry policymakers along. Sometimes, the policies do not reflect what is happening on the ground… We need joint planning meetings.*
> *— Program Manager, Participant 12, KII*

> *The tools we use to monitor DSD are still too manual and fragmented. To scale, we need better reporting systems and digital tools.*
> *— Program Manager, Participant 11, KII.*

Discussion

This study explored healthcare providers' perspectives on implementing DSD models for HIV care in Ibadan, Oyo State. The findings highlight the promise and complexity of DSD implementation, revealing how providers navigate the intersection of policy, patient needs, and resource constraints. While DSD has improved patient access, adherence, and retention, several operational, structural, and systemic challenges must be addressed to ensure its sustainability and effectiveness.

Participants described DSD models as instrumental in improving convenience, reducing patient wait times, and promoting continuity of care, particularly through community ART refill, MMD, and weekend clinic models. These approaches aligned with patient preferences and reduced the burden on healthcare facilities. Similar benefits have been observed across SSA, where DSD has improved viral suppression and retention outcomes by decentralising care and reducing unnecessary clinic visits [33, 62, 63]. Patient-centred models also empower clients by offering greater flexibility and respect for individual needs. This reinforces previous findings, which suggest that aligning HIV services with patient preferences enhances satisfaction and long-term engagement in care [27, 33].

Significant operational challenges have hindered optimal DSD implementation despite the benefits. Inaccurate contact information, frequent changes of address, and poor disclosure of next-of-kin details were commonly cited, making it difficult to track patients and deliver medications. Other Nigerian and regional studies have noted these logistical inefficiencies and underscored the need for improved data management systems and digital

health solutions [30, 64]. Additionally, overdependence on community-based models has created a sense of entitlement among some clients, who expect home delivery and weekend services regardless of clinical eligibility. This unintended consequence calls for clear communication of eligibility criteria and periodic reassessment of client suitability [65]. Structural barriers such as stigma, economic hardship, and transportation costs constrain patient engagement, especially in urban settings. Clients may avoid participation in Community Adherence Groups or skip appointments due to fear of unintended HIV status disclosure. These findings echo earlier work showing that stigma significantly limits the uptake of community models in urban areas [27, 66]. To achieve the UNAIDS target of zero discrimination by 2030, stigma reduction initiatives must be prioritised, including targeted media campaigns and community sensitisation [67].

Healthcare providers emphasised that not all clients are appropriate for DSD models. Adherence, viral suppression, and biometric enrolment were essential participation criteria. This selective enrolment strategy mirrors WHO and Nigerian national guidelines, which caution against placing unstable clients in community models [27, 68]. Conversely, clients with poor adherence or inconsistent follow-up were seen as poor candidates for DSD. Enrolling such clients risks treatment interruption, resistance, or disengagement from care. These findings reinforce the need for continuous adherence monitoring, patient education, and the flexibility to shift clients between models based on clinical status and social context.

The study revealed critical gaps in training and knowledge among healthcare providers, particularly among newer staff. High turnover, limited training coverage, and lack of refresher sessions were commonly cited. These issues are consistent with prior findings, which linked DSD implementation underperformance to inadequate staff training and capacity [30, 62]. Additionally, a knowledge gap exists among policymakers and decision-makers, leading to unrealistic targets and poor alignment between policy and practice. Effective DSD implementation requires frontline workers and policymakers to understand the operational demands and contextual realities of service delivery.

To sustain DSD gains, participants recommended strengthening support systems through improved collaboration with implementing partners, community pharmacy associations, and CQI (Continuous Quality Improvement) teams [69, 70]. Enhanced engagement with community actors and decentralisation of oversight can foster accountability and improve service quality. Participants also highlighted the importance of addressing structural barriers such as poverty, stigma, and lack of mental health services, factors that influence retention and adherence. Integrating social and mental health support into HIV care is essential for the holistic success of DSD. Finally, the need for adaptive and context-specific policies was emphasised. While national DSD guidelines provide a helpful framework, they must be tailored to local realities. When disconnected from ground-level constraints, rigid implementation targets may undermine the very goals they seek to achieve. Strengthening advocacy, improving monitoring tools, and incorporating provider feedback into policy revisions can enhance DSD scalability and equity [30, 33, 40, 42, 48, 62].

This study provides timely and context-specific insights into the implementation of DSD models from the perspective of frontline HIV service providers and implementers in a high-burden urban setting. One of its key strengths lies in the depth and richness of the qualitative data drawn from in-depth interviews and FGDs. Including a variety of healthcare actors, including ART clinicians, program managers, and implementing partners, enabled a multidimensional understanding of the opportunities and challenges surrounding DSD implementation in Ibadan, Oyo State. Additionally, the study is grounded in real-time programmatic experiences, offering practical recommendations that can inform policy and practice at local and national levels.

However, several limitations should be acknowledged. First, the findings are based solely on the perspectives of healthcare providers and implementing partners and do not include the voices of patients, whose lived experiences could provide a fuller understanding of DSD acceptability and outcomes. Second, the study was conducted in a single urban LGA, which may limit the transferability of the findings to rural or less-resourced settings. Lastly, social desirability bias may have influenced how participants discussed sensitive topics, particularly those involving systemic challenges or accountability issues.

Future research should incorporate the perspectives of PLHIV to complement provider insights and deepen understanding of how DSD models impact client experiences, satisfaction, and health outcomes. Comparative studies across rural and urban settings are also needed to assess contextual differences in DSD implementation, scalability, and sustainability. In addition, implementation research focused on co-designing interventions with providers and clients could yield more patient-centred, locally appropriate strategies. Further exploration of stigma-reduction approaches, mental health integration, and digital innovations in service delivery tracking will be essential for optimising DSD models and achieving long-term public health goals.

This study offers critical evidence to inform policy and practice in Nigeria's HIV response. As Nigeria continues

its journey toward achieving the UNAIDS 95-95-95 targets and ending AIDS as a public health threat by 2030, it is essential to improve the design, delivery, and sustainability of DSD models [10]. The insights from frontline providers can guide the adaptation of national DSD guidelines to local contexts, foster patient-centred innovations, and enhance system accountability [31, 71, 72]. The findings also directly support Sustainable Development Goal 3.3, which calls for ending the epidemics of AIDS, tuberculosis, and other communicable diseases by 2030 [73, 74]. By identifying barriers, such as stigma, poor health infrastructure, and training gaps, and recommending solutions like stakeholder engagement, flexible policies, and integrated mental health support, the study aligns with the WHO Global Health Sector Strategy on HIV (2022–2030), which prioritises differentiated and people-centred approaches [75–77].

This study underscores the importance of health system responsiveness, decentralisation, and equitable service delivery. Its contribution lies in amplifying healthcare workers' voices and guiding policymakers and program managers toward actionable, scalable strategies to strengthen HIV care delivery in Nigeria and beyond.

While this study provides valuable insights into the implementation of DSD models in a high-burden urban setting, several limitations should be acknowledged. First, although the BMHSU was involved in the development of the interview guide, the thematic analysis employed both deductive and inductive approaches. As a result, not all findings could be neatly categorised within the BMHSU domains, which may limit comparability with strictly theory-driven studies. Second, the study relied on self-reported accounts by healthcare providers, which introduces the possibility of recall bias, especially when discussing historical service delivery practices. Finally, some questions explored perceptions of patient experiences; while providers offer valuable insights, these perspectives may not fully capture the views and preferences of people living with HIV themselves.

Conclusion

This study explored healthcare providers' perspectives, challenges, and strategies related to the implementation of DSD models for HIV care in Ibadan North, Oyo State. The findings demonstrate that DSD approaches have substantial potential to improve HIV care delivery by enhancing accessibility, retention in care, and patient-centeredness. However, persistent challenges such as logistical inefficiencies, inconsistent training among healthcare workers, stigma, and policy misalignment continue to limit the effectiveness and sustainability of these models. Addressing these barriers will be critical for realising the full benefits of differentiated care in Nigeria.

Recommendation

To enhance the implementation of DSD models, several recommendations are proposed. Strengthening data and logistics systems is essential to ensure accurate patient tracking, maintain up-to-date contact information, and prevent interruptions in medication supply. Investing in continuous capacity building and mentorship programs for healthcare providers and program managers will help sustain competence and understanding of evolving DSD approaches. Aligning national policies more closely with local realities can create an enabling environment that supports flexible and context-appropriate service delivery. In addition, integrating support services that address structural barriers, including mental health care, stigma reduction interventions, and economic assistance, can improve engagement and adherence among people living with HIV. Ultimately, future research should prioritise incorporating the perspectives of service users themselves to complement provider insights and inform patient-centred models that are responsive to the diverse needs and preferences of various populations. By adopting these strategies, stakeholders can strengthen the implementation of DSD, advance progress toward achieving universal access to HIV care, and contribute to the realisation of the UNAIDS 95-95-95 targets and Sustainable Development Goal 3.3.

Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
UNAIDS	Joint United Nations Programme on HIV/AIDS
DSD	Differentiated Service Delivery
FGD	Focused Group Discussion
HIV	Human Immunodeficiency Virus
SDG	Sustainable Development Goals
SSA	Sub-Saharan Africa
ART	Antiretroviral Therapy
PLHIV	People Living with HIV
KII	Key Informant Interview

Supplementary Information

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Supplementary Material 1.

Supplementary Material 2.

Supplementary Material 3.

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Authors' contributions

AMG, FTA, ORA, OCE conceptualized the study, AMG, MTO, AA, OMM, OOM led data collection, and AMG and FTA drafted the initial manuscript. AMG, FTA,

DOR, ORA contributed to data analysis and interpretation. OCE, ATL, LOE, AOG reviewed and edited manuscript drafts for intellectual content. All authors reviewed and approved the final version of the manuscript.

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Data availability
The datasets generated and/or analysed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
Ethical approval for this study was obtained from the Oyo State Ministry of Health Research Ethics Committee (Ref: AD 13/479/879) and the Lead City University Research Ethics Committee (Ref: LCU-REC/24/130). The study was conducted in full accordance with the ethical principles outlined in the Declaration of Helsinki for research involving human participants. All participants received detailed information about the study in English and Yoruba to ensure full understanding. Written informed consent was obtained from all participants prior to participation. Participants were informed of their right to decline or withdraw from the study at any time without penalty.

Consent for publication
Not Applicable.

Competing interests
The authors declare no competing interests.

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