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Research Article

Ethnographic-Delphi Futures Research on Desirable Scenarios of the NIMART Programme in South Africa

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Abstract

Introduction

New HIV infections continue to be a concern in South Africa, despite this country having one of the largest antiretroviral treatment programmes in the world. There is enough evidence that ART leads to favourable HIV-related clinical outcomes and improves the quality of life of PLHIV. ART rollout requires resources, and South Africa is a resource-constrained setting. South Africa continues to scale up its ART programme. The aim of this study was to predict and describe desirable scenarios of the NIMART programme in South Africa within the next two decades.

Method

This was the "Beginning-Online Delphi Ethnographic Research" version of an ethnographic-Delphi futures research study design in which informants were requested to construct NIMART programme scenarios which they desired to occur within the next two decades, and rate their probability to occur in a two-round Delphi process.

Results

Informants in this study desired a NIMART programme to benefit to PLHIV, by being accessible, increasing coverage, and bringing South Africa closer to an HIV-free generation. They also desired a sustainable NIMART programme, with NGO support, with government providing a political willingness to support the programme as well as implementation of cost-minimization strategies

The authors can argue that these scenarios are realistic and achievable, and that policy makers and authorities should work towards realisation of these scenarios.

Key Words: NIMART; ART; Ethnographic Futures Research; Ethnographic-Delphi Futures Research; Beginning-online Delphi Ethnographic Research; ART programme-literate

Introduction

The number of people on Antiretroviral treatment (ART) in the World Health Organisation (WHO) Africa region has increased from 4 087 500 in 2010 to 10 252 400 in 2015 [1]. South Africa has the highest number of People living with HIV (PLHIV) in the world as well as the largest ART programme in the world, with more than 3 million people receiving ART by the end of 2014 [1]. Shisana et al, (2014) reported that there were 6.4 million PLHIV in SA in 2012 [2], while WHO (2015) reported a total of 6.194 million PLHIV in 2015 [1]. Scaling up of ART in this country will require skills, finance and infra-structure [3]. SA is a resource-constrained setting, with only 27 000 doctors for a population of 48 million in 2008 [4].

ART rollout reduces HIV-related morbidity and mortality [5]. WHO reported that ART averted 4.2 million deaths in low and middle income countries between 2002 and 2012 [6]. South Africa contributed significantly to the global fight against HIV. For instance, by 2012 more than 2 million people were on antiretroviral therapy [2,3,6]. Facilities rolling out ART increased proportionally, with more than 2500 facilities rolling out ART by 2011 [7], which resulted in improvement in the quality of life, such that by 2012, life expectancy of PLHIV on treatment increased to 80% of normal life expectancy [6].

The vision of the South African National Strategic Plan (NSP) 2012-2016 (NSP) was an HIV- and TB free generation, as shown by the "zeros" in the NSP ("zero new HIV and TB infections"; "zero new infections due to vertical transmission"; "zero preventable deaths associated with HIV and TB" and "zero discrimination associated with HIV and TB") [7]. As per the consolidated HIV guidelines of 2015, which increased the ART eligibility CD4 count to 500 cells per ml, more than a million more people will become ART eligible, and all the 6.2 million PLHIV will be awaiting ART [8],

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more so with the adoption of the WHO "test and treat" guidelines. South Africa's increased need for resource becomes apparent [3]. Health service spending in South Africa is about 4% of the Gross Domestic Product (GDP) , with 0.7% of this being devoted to the ART programme [3].

In order to increase access to the ART programme in South Africa, the challenge of scarce resources should be addressed. Top on the list of resources to be addressed is the shortage of human resources. In order to mitigate human resource shortages in South Africa, a model which utilizes nurses to initiate and manage patients on treatment was adopted. This model, called Nurse initiated and managed ART programme (NIMART), as opposed to a physician driven model, called physician initiated and managed ART. Georgeu et al, (2012) described NIMART as a task-shifting model in which nurses are trained to take over tasks of initiating clients on ART, prescribe antiretroviral treatment, manage side effects and refer them to physicians for further management should a need arise [9]. NIMART is actually a strategy which is a part of the broader task-shifting policy, whose intention is to increase access to ART services by utilizing the services of nurses for the HIV programme. The task-shifting strategy aims to shift HIV management tasks from doctors to nurses, and nursing tasks to lower health care providing cadres. Implementation of NIMART makes use of nurses to diagnose HIV, assess ART eligibility, prescribe ART and manage side effects [10].

South Africa has been implementing the NIMART programme since 2010 [11]. There is a view that NIMART may not be a feasible alternative to solving the challenge of scarcity of resources. For instance, Brennan et al (2011) was not convinced that there is enough evidence for NIMART implementation in third world countries, and that there is limited expertise among nurses to take over the HIV programme from doctors [12]. The authors (Brennan et al) argue that the NIMART model was adopted from first world countries with well skilled health care cadres [12]. Colvin et al (2010) argue that, despite having piloted a successful NIIMART programme in the Free State province, evidence to support a national NIMART rollout was still not sufficient enough [13]. They further argue that the success of their programme was mainly due to massive training and mentorship support from international organisations, and that this type of support is not feasible at National scale [13]. Zuber et al. (2014) is of the view that NIMART lacks legislative backing, and is not incorporated into the nursing education system [10]. Cameron et al, (2012) reported that only 7% of NIMART trained nurses were initiating children on ART [14]. The authors cited staff shortages in health facilities as the main reason for low initiating rates [14]. Davies et al (2013) also cited staff shortage and lack of training and mentorship as a challenge to a successful NIMART [15]. Cameron et al (2012) also reported that most nurses do not possess a dispensing certificate, and hence cited this is a barrier in NIMART implementation [14]. Lack of space in the public health sector for nurses to work in was also cited by Cameron et al as a challenge to the success of NIMART [14]. Bekker et al (2014) argued that the ART programme is less likely to be successful unless PLHIV are identified; initiated on ART; their side effects properly managed; becoming virally suppressed; and more importantly, retained in care [3]. This calls for increased budget for HIV-related testing, purchase of drugs, provision of human resource and infra-structure [3], Based on these doubts about the future of the NIMART programme, this study aimed at describing the possible desirable futures of the NIMART programme in SA, as perceived by HIV and AIDS practitioners, both from government, parastatals and NGO's, as well as predicting the probability that these scenarios will occur.

A number of studies have been performed to assess ART outcomes, both at present and in the future. These included assessing ART as a prevention strategy [16]; investigating the perceptions of adolescents on treatment about their future lives [17], predicted the dynamics of the epidemic, the number of people on treatment and the cost implications of initiating ART to clients with CD4 count of 350 [18], the AIDS 2031 project estimated future spending for the ART programme [19,20]); and Walensky and co-workers modelled the impact of various programme growth scenarios to the total HIV-related mortality [20]. Few studies predicted future desirable scenarios of the ART programme in South Africa. This paper describes the scenarios which experts in HIV and AIDS management desired to occur to the NIMART programme, and measures the probability that these scenarios will occur.

Materials and Method

Study Design

This study made use of the Beginning-online Delphi Ethnographic Research (BOLDER) version of an Ethnographic Delphi Futures research (EDFR) study design, as described by Edwards, in which online data collection techniques (by emails) are used [21]. Textor (1979) described the Ethnographic Futures Research (EFR) as a study of various futures which are likely to occur [22]. Poolpatarachewein (1980) described an Ethnographic-Delphi Futures Research (EDFR) as a combination of Textor's EFR and the classical Delphi technique [23], whose objectives were defined by Dalkey and Heler (1963) as to obtain consensus from a group of informants [24]. Marsden, Dolan and Holt (2003) used the BOLDER version described by Edwards, and completed their data collection in just four weeks [25].

Study Population

Informants in this study were recruited from experts in HIV/AIDS management and research institutions and organizations and health care providers in South Africa. The following research institutions/ NGO's were invited to participate: Human Sciences Research Council, Medical Research Council, Health and Economics and HIV/AIDS research Division, AIDS Foundation SA, Development Centre For AIDS Research (Both the Perinatal HIV Research Unit in Johannesburg and the Desmond Tutu HIV Centre in Cape Town), Centre for AIDS Development Research Evaluation, The Foundation for Professional Development, HAVEG, South African National AIDS Council, Treatment Action Campaign, Absolute Return for Kids, Institute for Youth Development, Broad Reach Health care , International Centre for AIDS Care and Treatment Programs, Children's HIV Association (CHIVA-SA),

International Training and Education Centre for Health, Institute for Healthcare Improvement, HIV/AIDS STI and TB (HAST) directorate from Department of Health (National, Provincial and district levels), Medical Universities (University of Cape Town and WITS university) and the National Health Laboratory Services. Names/identities of organisations/individuals who responded and participated in this study are not disclosed as they are protected by the principle of anonymity. Informants included, among others, Comprehensive Care, Management and Treatment [CCMT] managers from districts and sub-districts in South Africa, clinicians in ART sites, CEO's of NGO's, clinical advisors, technical advisors, HIV and AIDS clinical mentors from NGOs providing support to the Department of Health, and pathologists from laboratories and academic institutions.

Sample and Sampling Technique

This study employed two sampling techniques, namely purposive sampling and snowballing. The author identified participants they considered to be experts in HIV and AIDS management and research. These identified experts were invited to participate in the study, and were also requested to each identify other informants they themselves considered knowledgeable in the HIV and AIDS field. The individuals identified by experts were also invited to participate, as well as to identify other informants. All identified informants were invited to participate.

Data Collection and Analysis

Data for this study was collected between 9 November 2010 and 19 May 2011. Responded administered instruments were sent to informants via email. Informants were request to complete the instrument, and return it back to the researcher by email. Three instruments were administered, namely the EFR-, 1st round Delphi-, and 2nd round Delphi instruments.

EFR Stage: During the EFR, informants were asked to fill in their demographic information and to construct scenarios they desired to occur to the NIMART programme in SA in the next two decades (by 2030). The scenarios constructed during this stage of the study were manually content analysed. The informants were requested to construct scenarios under two broad themes, namely, benefits of the NIMART programme to PLHIV and sustainability of the ART programme.

Scenarios constructed under these two main themes were used to develop the 1st round Delphi instrument. Content analysis of these desirable scenarios generated a 53-scenario-1st round Delphi instrument.

First Round Delphi Stage: During the 1st round Delphi stage, informants were asked to rate the probability that the 53 desirable scenarios generated during the EFR stage would occur. They were to rate their probability to occur in a 1 – 4 Linkert scale, where 1 indicated that the scenario was least likely to occur, and 4 indicated that the scenario was most likely to occur. The ratings were then analysed by the use of the Statistical Programme for Social Science (SPSS) for mean scores. Scenarios rated with mean scores less than 3.0 (likely to occur) were thus discarded, whereas those with mean scores of 3.0 and more were deemed to be likely to occur, and were thus used to generate the 2nd round Delphi instrument.

Second Round Delphi Stage: Informants were provided with feedback of the mean score ratings of the 1st round Delphi, versus their own ratings and the scenarios which were rated as more likely to occur. They were then advised to alter their 1st round ratings based on the groups ratings, and rate the probability that the 2nd round scenarios would occur, again in a 1 – 4 Linkert scale. Scenarios rated with a mean score of 3.2 (between likely to occur and most likely to occur) or more during this round were deemed to constitute consensus that these scenarios would occur. During each stage of data collection, the authors sent email messages to informants thanking them for their response. Reminder emails were also sent to informants whose responses were not yet received.

Quality control of the instrument is always an issue during data collection in research. In EDFR designs, quality control is not a major issue, as EDFR studies do not aim at correctly predicting the future, but rather at predicting probable futures as perceived by the informants. Content validity was assured by the interview technique used in this study, as the scenarios were generated by the informants themselves, and, after content analysis, were self-administered by the same informants during the two Delphi stages.

Ethical considerations

Ethical clearance for this study was obtained from the Research, Ethics and Publication Committee of the University of Limpopo (MEDUNSA campus). Informed consents were obtained from all informants, who were also informed that they were to participate voluntarily, without any compensation, and that they may withdraw their participation anytime during the study should they so wish.

Results

Demographic Information

Table 1 below presents the distribution of informants who participated during the ethnographic-, 1st round Delphi - and 2nd round Delphi stages of the study. During the EFR stage, 18 informants cited scenarios which they desired to occur to the NIMART programme in SA by 2030. During the 1st round of the Delphi stage, 34 informants predicted the probability of these desirable scenarios to occur. Of these 34 1stround Delphi informants, 12 had participated during the EFR stage and 22 informants were new informants who were invited during the 1st round Delphi stage. During the 2nd round Delphi stage, 3 of the 12 informants who had participated during the EFR and 1st round Delphi stages dropped out, and thus only 31 informants were retained from the 1st round informants.

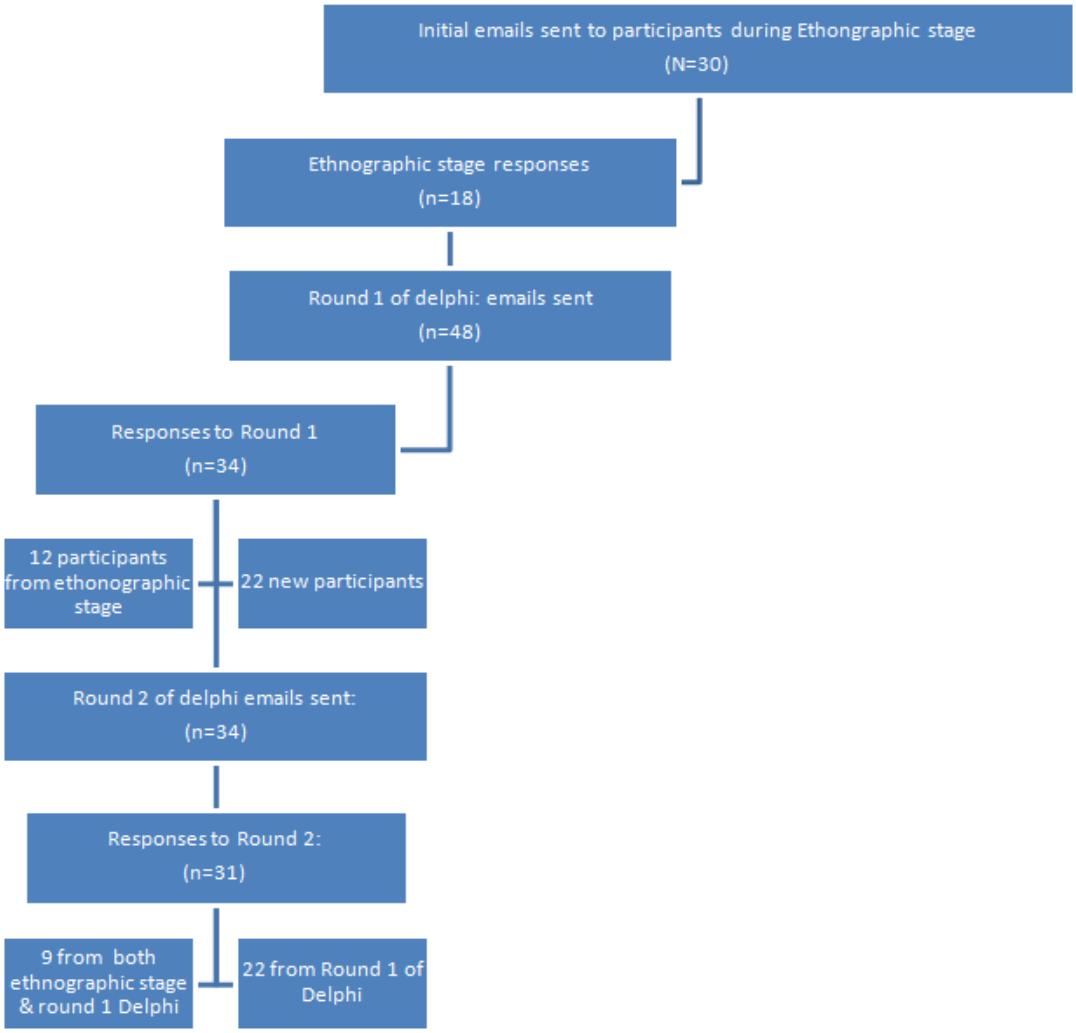
Response and Retention Rates

Diagram 1 below presents the number of informants who were invited versus the number who responded during the three stages of data collection, namely EFR, 1st and 2nd round Delphi stages. During the EFR stage, 30 prospective informants were invited to participate. Of those invited, 18 responded and participated, with a 60% response rate. Forty-eight informants were invited to participate during the 2nd round Delphi stage. Of these, 34 informants responded and participate, and the response rate was 71%. Of the 18 EFR respondents, 12 still responded during the 1st Delphi stage, with a 67% EFR to 1st round Delphi retention rate. The 2nd round response rate was 91%, while the EFR to 2nd round retention rate was 50%, while the 1st to 2nd round retention rate was 91%.

TABLE 1: DISTRIBUTION OF INFORMANTS DURING EFR, 1ST AND 2ND ROUND DELPHI STAGES

TYPE OF ORGANIZATION	EFR STAGE	DELPHI STAGES	
		1ST ROUND	2ND ROUND
Department of Health (DoH)	5	17	16
Non-Governmental Organisation	7	12	10
DoH+ Pathologist/virologists/ UNIVERSITIES	6	5	2
TOTALS	18	EFR 12 1ST ROUND 22 TOTAL 34	EFR 9 1st ROUND 22 TOTAL 31

ANNEXURE 1: RETENTION AND RESPONSE RATES FROM EFR TO 1ST AND 2ND ROUND DELPHI STAGES.



This part is method and not the result.

EFR Stage: The aim of the EFR stage of this study was to describe various futures which informants in this study desired to occur to the NIMART programme in SA in the next two decades. During the EFR stage, informants cited various future scenarios of the NIMART programme which they desired. These scenarios were thematically analysed into the two main themes, namely, that the NIMART programme should benefit PLHIV, and that it should render the ART programme sustainable.

Delphi Stages: 1st and 2nd rounds: The Delphi stages aimed at predicting the probability that the desired scenarios cited during the EFR stage would occur. Informants were requested to rate the probability that these scenarios will occur, in a 1-4 Linkert scale as flows: 1=least likely to occur, 2=less likely to occur, 3=likely to occur and 4=most likely to occur. It is the view of researchers in this study that that if informants are of the view that a scenario has a 75% (mean score of 3 out of 4 chances) chances to occur in the 1st round, that scenario would be considered to be from likely to most likely to occur. During the 2nd round, a mean score of 3.2 of 4 chances 4 (80% chances to occur) is indicating that the scenario has a high chance to occur. Scenarios rated with a mean score of 3.0 and more during the 1st round Delphi were thus included in the 2nd round stage, and those rated with a mean score of <3.0 were discarded. During the 2nd round, scenarios rated with a mean score of 3.2 were deemed to constitute consensus. The key findings of this study are summarised in table 2 below. Table 2 presents a description of scenarios which EFR stage informants desired to occur, arranged under each theme and sub-theme. It also presents the Delphi process outcomes._Table 2 presents Scenarios which EFR stage informants desired to occur, and the 1st and 2nd round Delphi stage ratings of probabilities of these scenarios to occur. As can be seen in table 2, EFR informants desired that the NIMART programme should lead to accessibility of the ART programme for all. It is the perception of informants that more health facilities will be constructed in order to render the programme accessible, and that this accessibility of the ART programme will increase coverage to ART services, such that all clients who are in need of, and eligible to, ART, will have access to it, and will be initiated on treatment, while those who require HIV testing will be tested and thus will know their HIV status. It is also the perception of EFR stage informants that NIMART will lead to improvement in HIV treatment outcomes, such that the quality of life of PLHIV will improve, with a resultant improvement in retention in HIV care and a reduction in health spending as a result of a reduction in clinic visits. First and 2nd round Delphi informants concurred that these scenarios are likely to occur.

EFR stage informants also desired that with the implementation of NIMART, the ART programme should become sustainable. Informants desired that government should make long-term plans for resources to be available. They also desired that NGOs should continue to partner with government to bring in skills and financial resources for the programme. It was also desired cited by EFR stage informants that, in order to render the programme sustainable, cost-minimization strategies should be implemented. Cost-minimization strategies cited included implementation of reduced laboratory-based toxicity and efficacy testing as well as reducing cost of the programme by introducing a "treatment holidays" strategy, in which clients on treatment whose CD4 count has increased to above a given threshold should be given treatment holidays, but monitored regularly for a CD4 count drop to below a certain threshold value, at which stage they would be re-initiated on treatment. First and 2nd round Delphi informants reached consensus that funded NGOs are likely to continue to partner with government, and that government is likely to make long-term plans for the programme. There was, however, no consensus that cost-minimization strategies (reducing laboratory-based monitoring of toxicity and efficacy) will be implemented. EFR informants also desired that NIMART should lead to ART-literacy, which will lead to increased adherence. First and 2nd round Delphi informants reached consensus that ART-literacy will increase due to the introduction of NIMART, and that this will in turn lead to improved adherence.

Discussions and Conclusion

The objective of this study was to describe NIMART programme scenarios in SA by 2030 as desired by HCW and practitioners in HIV and AIDS, as well as to predict the probability that these desired scenarios would indeed occur. The authors found it necessary to adopt the BOLDER version of the EDFR technique due to the advantage of shorter turn-around time in receiving responses from informants, and completion of data collection and analysis, as study instruments were sent to respondents by email, who in turn emailed their responses back to the investigators. As a result of using this innovative technique first described by Edwards, the authors completed The EFR data collection, its contend analysis and construction of 1st round Delphi instrument, collection of 1st round Delphi data, its analysis, the construction of the 2nd round Delphi instruments, and the collection of the 2nd round Delphi data in just 6 months (9 November 2010 and 19 May 2011). Another advantage of EDFR design is that, unlike in a focus group discussion, outcomes are not influenced by character or seniority or domination of discussions during data collection, as informants are separated from, and unknown to each other, both during and after the discussions.

This study found that the NIMART programme will, indeed benefit PLHIV by increasing access to, and retention on the programme, as well as increasing coverage. Proximity of health facilities to home will also increase adherence and improve health-seeking behaviour, as this would reduce competing interests. This finding confirms findings by other researchers [15,26]. This study also found that NIMART will render the ART programme sustainable in that NGOs will still partner with government to make resources available for the programme, as well as government making long-term plans for the project. Informants also desired that cost-minimization strategies should be employed to make the NIMART programme sustainable. Cost-minimization strategies included reduction in laboratory-based toxicity and efficacy monitoring. This study found that it is unlikely that such cost-minimization strategies can be employed, a finding which differs from what

Table 2: EFR stage desirable scenarios of the NIMART programme, with 1st and 2nd round Delphi process outcomes.

THEME 1: The NIMART programme should benefit PLHIV EFR stage informants cited a desire that the NIMART programme should benefit the entire South African population. They cited various scenarios which they desired to occur, which would result in the programme benefiting PLHIV and the communities. These scenarios are described below under the following headings: A. The ART programme should be accessible to all who require it B. NIMART should increase coverage to ART services, C. NIMART should increase adherence to, and retention in, care, and D. NIMART should lead to improved treatment outcomes for those who ART The probability that these scenarios will occur are discussed under the 1st and 2nd round Delphi stages.		
Scenario A: The ART programme should be accessible to all, including those in rural areas.		
EFR stage	**1st round Delphi**	**2nd round Delphi**
Informants desired that NIMART should render the HIV care, treatment and support programme accessible to all who need it, in all settings, including the rural setting.	Sixty percent of informants were of the view that it is most likely (4 rating) that ART services will be accessible to all who require it, , while34% were of the view that it is likely that SART services will be accessible. Only 6% (6/32) of informant rated it as unlikely to occur. About 6% (2/34) of informants either did not know or did not comment. The mean score as rated by informants for this scenario was 3.6.	Fifty five percent of informants were of the view that it is most likely (4 rating) that ART services will be accessible to all, including in rural area, and 16% were of the view that this is likely to occur (3 rating), with 29% being of the view that it is less likely to occur. (2 rating). The mean score rating for this scenario was 3.3.
EFR stage informants also desired that more health facilities be available, mainly in rural areas. These facilities should be closer to where they are needed, and thus reduce transport costs to clinics. Informants were of the view that proximity of health facilities will increase health care-seeking behaviour.	Almost 65% of informants were of the view that it is likely(3 rating) that proximity of health services will increase adherence, while more than 30% were of the view that this is most likely (4 rating).. Only 3% of were of the view that it was least likely (1 rating) that proximity of services will increase adherence.. Almost 10% of informants indicated that they either did not know or did not comment. The mean score for this scenario was 3.3.	Informants reached consensus (mean score of 3.5) that NIMART will bring ART services closer to where they are needed, so that clients will not need to travel far to access services, and that proximity of such services will increase adherence. More than 50% of informants were of the view that it is most likely that NIMART will indeed bring ART services closer, and the resultant of such proximity of services will increase adherence., and the remaining 50% were of the view that it is likely that this will be so.
Scenario B: NIMART should increase coverage to ART services		
Informants cited a desire that the NIMART programme should increase programme coverage, such that all who require these services should be able to access them.	More than 60% of informants believed that it was most likely that most clients who require ART will have access to it, including infants, children, adolescents and adults, while 30% believed that it was likely. First round Delphi informants concurred that this is likely to occur, as they rated it with a mean score of 3.5.	Almost 60% of 2nd round Delphi informants believed that it was likely that most people who require ART will have access to it, and more than 40% were of the view that itis most likely that those who require ART will indeed have access to it. Second round Delphi informants reached consensus that most clients who require ART will have access to it, as they rated it with a mean score of 3.4.
EFR informants desired that the majority of PLHIV should be initiated on treatment and that most South Africans should test for HIV and know their status.	Forty five percent of 1st round Delphi informants believed that it was most likely that most South African will know their HIV status, and almost 50% believed this was likely. Consensus was reached by 1st round Delphi informants that most South African will know their HIV status, as they rated the probability that this will occur with a mean score of 3.4	Consensus was reached that NIMART will lead to most South Africans knowing their HIV status, as almost 40% of 2nd round Delphi informants believed that this was most likely to occur, and 45% were of the view that this is likely to be so. Only 16% of informants believed that it was less likely that most South Africans will know their HIV status. Generally, 2nd round Delphi informants believed that is is likely that most South Africans will know their HIV status, as they rated the probability of this to occur with a mean score of 3.2.
Scenario C: NIMART should bring HIV services closer to where they are needed		
EFR informants cited a desired that NIMART should bring ART services specifically, and health services generally, closer to where they are needed. Informants argued that proximity of health services will increase health seeking behaviour, increase adherence to treatment as well retention in care. Informants also cited a desire that proximity of ART services should increase adherence and that is should improve patient tracking. They cited a desire that improve tracking systems should be implemented, including computer-based tracking systems.	Almost 65% of informants (20/31) rated as likely to occur the scenario that proximity to home will adherence, and more than 30% rated it as most likely to occur. They informants either did not know whether proximity to home will improve adherence, or did not comment. The overall mean score for this scenario was 3.3.	Proximity to home of ART services is most likely to increase adherence, as rated by more than 52% of 2nd round Delphi informants, while the remaining 48% rated this scenario as likely to occur. The overall mean score for this scenario was 3.5.

Sub-theme D: NIMART should improve treatment outcomes, including retention on treatment		
Informants cited a desire that implementation of NIMART should improve treatment outcomes, such that the quality of life for PLHIV should become meaningful. T5hey cited a desire that the NIMART should increase the lifespan of PLHIV, and that they should be involved in the economic activities	Almost 40% of 1st round Delphi informants believed that NIMART is most likely to improve both the quality of life and the lifespan of PLHIV, with more than 50% being of the view that this is likely to be so. Only 3% believed that this is least likely to occur. The overall mean rating for this scenario was 3.3	Forty-eight percent and 52% of 2nd round Delphi informants were of the view that NIMART is most likely and likely to improve the quality of life of PLHIV respectively. The overall mean score for this scenario to occur was 3.5
EFR stage informants also cited a desire that NIMART should lead to a sustainable ART programme, in which HIV-related spending will decline as a result of a reduction in HIV-related clinic visits.	More than 45% of informants were of the view that it was most likely that HIV-related hospital stay/visit will decline due to NIMART implementation, with 50% rating it as more likely. Two informants either did not whether NIMART will lead to a decline in hospital stay/visit, or chose not to comment. Overall, 1st round Delphi informants rated this likelihood with a mean score of 3.4	More than 70% of 2nd round Delphi informants were of the view that it was likely that NIMART is likely to reduce HIV-related hospital stay or visit, with almost 30% of informants being of the view that this was most likely to be the case. Informants rated the probability of this scenario to occur with an overall mean score of 3.2
THEME 2: NIMART should result in rendering the ART programme sustainable: The EFR stage informants cited a desire that the NIMART programme should make the ART programme in South Africa sustainable. They cited various scenarios which would render the programme sustainable. They desired that the country should not experience drug shortages, and that clients should receive treatment counselling and become ART-literate. Informants were of the view that treatment-literacy will result in increased adherence. These scenarios are described below under the following sub-themes: A. There should be resources for programme sustainability, as well as cost-minimization strategies, in order for the ART programme to be sustainable. B. HCW should be motivated and committed to undertake the NIMART programme C. NIMART should translate to ART-literacy		
Sub-theme A: There should be enough resources required to sustain the ART programme		
EFR stage informants cited a desire that Implementation of NIMART should lead to a sustainable ART programme. They desired that resources should be made available, as these were seen as enablers of ART programme sustainability. Informants desired that donor-funded NGOs continue to partner with the department of health, and bring with them skills required to man the NIMART programme.	During the 1st round Delphi, more than 60% of informants believed that it was most likely that NGOs will continue to provide support to the department of health in order to sustain the ART programme., with more than 30% of informants believing this to be likely, while only 6% believed that it was less likely that funded NGOs will continue to provide support, and thus assist in sustaining the ART programme. Overall, 1s round Delphi informants believed that NGOs will continue to provide support to the programme, when they rated its probability to occur with a mean score of 3.5.	informants who participated during the 2nd round Delphi stage could not reach consensus that donor-funded NGOs will provide skills required for the sustainability of the NIMART programme. Only 16% of 2nd round Delphi informants believed that it was most likely that donor-funded NGOs will provide these required skills, while 68% believed it was likely that NGOs will provide these skills, with another 16% believing that it is less likely that NGOs will provide these skills. The overall mean score rated by 2nd round Delphi informants for the probability that donor funded NGOs may provide the necessary skills required for the NIMART programme was 3.0.
Informants in this study cited a desire that the South African government should put in place long-term plans in terms of resources required for the NIMART programme.	During the 1st round of the Delphi process, 65% of 1st round Delphi informants believed that it was most likely that the South African government will indeed commit to long-term financial planning for the ART programme, while more than 25% of informants believed that it was more likely. Six percent of informants, however, still believed that it was less likely than the South African government may commit to long-term financial planning for the ART programme, with 3 informants indicating that they either did not know whether the government will commit to long-term financial planning, or chose not to comment on the probability that this scenario may occur. 1st round Delphi informants concurred, however, that government may commit to long-term financial planning when they rated the probability that this May happen with a mean score of 3.5	During the 2nd round of the Delphi process, more than 30% of informants believed that it was most likely that the South African government will make long-term financial plans for the ART programme, with 55% believing that it was likely that government may make such long term plans, although 13% of informants believed that it was least likely that the government of South Africa may make long-term financial plans for the ART programme. Overall, informants were not convinced that government will make long-term financial plans for the ART programme, as they rated the probability that this will occur with a mean score of 3.1.

	More than 40% of 1st round Delphi informants believed that it was most likely that there will be no shortages in human resources required to man the NIMART programme, with another more than 40% believing that it was likely that there will be no human resource shortages. Two informants either did not know whether there will be any human resource shortage, or did not comment. Overall, 1st round informants rated the probability that there will be no human resource shortages to man the NIMART programme with a mean score of 3.1	
Access to laboratory monitoring of ART toxicity and efficacy is considered by some workers as a defeating factor for the ART programme in resource-constrained settings. Routine toxicity and efficacy monitoring by laboratory methods is in itself expensive. They (informants) desired that HIV-related spending should be reduced by employing cost-minimization strategies such as reducing laboratory-based treatment outcomes methods as well as introducing "treatment-holidays" strategies in which clients with low CD4 counts are initiated on treatment, monitored until their CD4 count rises to a given value, at which stage the client is put on a "treatment-holiday" programme, his/her CD4 count monitored until it reaches a certain pre-determined value, then re-initiated.	Almost 30% of informants were of the view that reduced laboratory-based treatment outcomes monitoring was likely to be employed as a cost-minimization strategy, while less than 20% were of the view that this cost-minimization strategy was most likely to be employed. Thirty percent of informants were of the view that this strategy was least likely to be employed, and almost 20% were of the view that it was unlikely that laboratory-based treatment monitoring would be reduced as a cost-minimization strategy. The overall more score for this scenario as rated by informants was 2.7 Almost 45% of in formants were of the view that CD4 based treatment holidays was likely to be implemented as a cost-minimization strategy. Only 20%% of informants were of the view that CD4 count-based treatment holidays was most likely to be implemented, while 12% and 24% were of the view that this cost-minimization strategy was less likely and least likely to be implemented respectively. Informants rated the probability of the implementation of this cost-minimization strategy with a mean score of 2.6, with 9 informants indicating that they either did not know whether this strategy may be implemented, or chose not to comment.	
Sub-theme C: The NIMART programme should lead to ART-literacy for PLHIV, which should translate to increased adherence		
Clients initiated on ART need to take these drugs for the rest of their lives. There exist need for t clients to be ART-literate, so that they should understand these drugs, their side effects and that they are not a cure for HIV, and hence needs to be taken lifelong. Highly Active Antiretroviral Treatment (HAART), if taken over a long time, may result in viral suppression with improvement in the quality of life and less viral resistance, but generally, patients stop taking ART due to drug toxicities. Patients usually miss doses During the EFR stage of this study, informants indicated a desire that NIMART should lead to ART literacy, which should in turn lead to increased adherence	More than 40% of informants were of the view that it was most likely that clients on ART will become treatment-literate, and hence will not default treatment, while just under 40% were of the view that this was likely to be the case. The overall mean score as rated by informants for this scenario was 3.2	An over-whelming majority (87%) of informants were of the view that it was likely that clients on ART will be become treatment-literate, and will thus not default treatment, with 13% of informants being of the view that this was least likely to be so. Second round Delphi informants were generally of the view that treatment-literacy will not automatically lead to adherence, as they rated the probability that treatment literacy will lead to adherence with a mean score of 2.7.

was reported by Mugyeni and colleagues, who reported that ART can be delivered safely without such laboratory-based toxicity and efficacy monitoring [27], but confirms the report by Peter et al that the DART project's findings were actually misleading, and that it is not safe not to use laboratory-based toxicity and efficacy monitoring [28].

NIMART will also improve treatment outcomes and the quality of life for PLHIV, according to the findings of this study. This finding confirms earlier findings that nurse managed HIV programmes are not in any way inferior to doctor managed programmes [29]. This study also found that NIMART will increase ART-literacy among both PLHIV and the general public. Treatment-literacy will lead to ART-adherence. This finding confirms what was earlier reported by the UNAIDS [30].

In conclusion, the authors argue that NIMART will benefit PLHIV, and that the ART programme will be sustainable, though cost-minimization strategies such as reducing laboratory-based toxicity and efficacy monitoring will not be implemented.

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