Health workers' perspectives on the outcomes, enablers, and barriers to the implementation of HIV "Treat All" guidelines in Abuja Nigeria

Solomon Odafe^{1*}, Kristen A. Stafford², Aliyu Gambo², Dennis Onotu¹, Mahesh Swaminathan¹, Ibrahim Dalhatu¹, Uzoma Ene¹, Ademola Oladipo¹, Ahmed Mukhtar¹, Ramat Ibrahim², Akipu Ehoche², Henry Debem¹, Andrew T. Boyd³, Sunday Aboje⁴, Bola Gobir², Manhattan Charurat²

1. Division of Global HIV/AIDS, Center for Global Health, U.S. Centers for Disease Control & Prevention, Abuja, Nigeria
2. Department of Epidemiology and Public Health, University of Maryland School of Medicine
3. Division of Global HIV/AIDS, Center for Global Health, U.S. Centers for Disease Control & Prevention, Atlanta, USA
4. National AIDS & STIs Control Program, Federal Ministry of Health, Abuja, Nigeria

*Corresponding author, Email: wsp7@cdc.gov (SO)

Abstract

Introduction

To improve access to lifesaving treatment for all people living with HIV (PLHIV), Nigeria implemented the Treat All guidelines in 2016. However, health workers' perspectives on the implementation of the guidelines have not been evaluated.

Methods

We conducted in-depth interviews to explore health workers' perspectives on the Treat All guidelines. Using purposive sampling, 20 health workers providing HIV patient care were recruited from six primary health care hospitals in Abuja to participate in semi-structured interviews. Data exploration was conducted using thematic content analysis.

Results

The five main themes that emerged were (1) the perceived benefits of guidelines use, (2) the perceived disadvantages of using the guidelines, (3) reported patients' response to guideline change, (4) perceived barriers/enablers to guideline use and (5) health workers' recommendations for improvement. Health

workers perceived that the implementation of the Treat All guidelines has considerably improved patient care, particularly in increasing access to skilled health care, reducing stress on patients, and increasing hope for a better health outcome among patients. Other perceived benefits were reduced mortality, reduced pre-treatment attrition, reduction in delays between case detection and initiation on treatment. Perceived major disadvantages were increased workload and overcrowded clinics. Health workers reported that most patients were willing to start treatment early. Perceived key factors enabling guidelines use were health workers' interest, patient benefits, training and availability of tools for implementation of guidelines, government supervisory visits and hospital management support. Perceived key barriers were poverty, inadequate human resources, lack of familiarity with guidelines, and lack of consistent supply of HIV test kits at some sites.

Conclusions

Implementation of the Treat All guidelines led to perceived improvement in patient care. Further improvements could be achieved by implementing an efficient supply chain system for HIV rapid test kits, and through guidelines distribution and training. Additionally, implementing differentiated approaches that decongest clinics, and programs that economically empower patients could improve access to treatment.

Keywords: HIV/AIDS, Test and Treat, Treat All guidelines, health workers' perceptions, barriers and enablers

Abstract word count: 300

Introduction:

HIV/AIDS continues to be a major public health disease accounting for 35 million deaths across the world [1]. In 2016 alone, there were 1.8 million new HIV infections and 1 million deaths worldwide [1]. At the end of 2016, there were approximately 36.7 million people living with HIV (PLHIV) including 2.1 million

52 children worldwide [1]. Since the introduction of antiretroviral therapy (ART), there has been a 43%
 53 reduction in annual deaths due to HIV/AIDS globally [2]. By mid-2017, there were approximately 20.9
 54 million PLHIV including 120,000 children receiving lifesaving ART; this number represents only 57% of
 55 the total PLHIV globally [3]. Africa remains the worst hit continent by HIV/AIDS, accounting for 25.6
 56 million (70%) of PLHIV globally [1]. The United Nations General Assembly Special Session 2001
 57 (UNGASS-HIV) has committed to ending the AIDS epidemic by 2030 [2]. In June 2016, UNGASS signed
 58 on to a political declaration of the 90-90-90 strategy, with the objectives to identify 90% of individuals
 59 who are HIV positive, treat 90% of all identified individuals who are HIV positive and achieve viral
 60 suppression in 90% of those on treatment by 2020 [4]. A key strategy for achieving epidemic control is
 61 increasing access to lifelong ART [2]. In order to improve access to ART, in June 2016, the World Health
 62 Organization launched the implementation of the “Treat All” guidelines, which recommend the immediate
 63 treatment of all individuals who test positive for HIV [1].

64 The Federal Republic of Nigeria is located in West Africa and has a population of approximately 191
 65 million people [5]. The country has the second largest HIV burden in the world with estimated 3.1 million
 66 PLHIV [6]. In 2017, there were about 210,000 new cases of HIV infections and about 150,000 new AIDS-
 67 associated deaths in Nigeria [6]. In 2017, an estimated 1,039,520 PLHIV were receiving ART in the
 68 country [6]; thus, only one-third of the persons living with HIV in the country received ART [6].
 69 Subsequent to the release of the UNAIDS treatment target within the 90-90-90 strategy, the President’s
 70 Emergency Plan for AIDS Relief (PEPFAR) in Nigeria piloted the Treat All approach in clinical
 71 management of PLHIV in 32 local government areas (LGAs) between March 2016 and December 2016
 72 [7]. In December 2016, the government of Nigeria, through its Federal Ministry of Health (FMOH),
 73 published the guidelines to treat all individuals testing HIV positive in the country to help improve access
 74 to lifesaving ART [8]. However, there are currently shortages of human resources across all cadres of
 75 health staff in Nigeria due to increasing migration of health care workers to areas offering higher

compensation, poorly motivated health workforce, and mal-distribution of health staff [9]. Consequently, there have been concerns that the new HIV Treat All guidelines will increase the burden on an already overstretched health system and potentially compromise care for PLHIV. Additionally, since HIV treatment program managers plan to scale up implementation of the Treat All approach nationally, knowing health workers' perspective on potential enablers and barriers to implementation is necessary for devising effective implementation strategies. Thus, this study aimed to understand health workers' perspectives on the implementation of the Treat All guidelines for HIV treatment in Nigeria, specifically their perceptions of the guidelines' impact on the quality of patient care, outcomes for PLHIV, and of potential enablers and barriers of effective guideline implementation.

Materials and Methods

Study Design:

This was a qualitative study of health workers' perceptions using an in-depth interview approach. We utilized an interpretivist epistemological approach, reinforced by a social constructivist standpoint, to obtain the perspective of participants on the research topic [10]. By using this approach, researchers were able to explore participants' understanding and perceptions on the implementation of Treat All guidelines at their various clinics [10].

Study setting:

The study was conducted in six health facilities in Abuja Municipal Area Council in the Federal Capital Territory (FCT), Abuja, Nigeria. Abuja is the administrative capital of Nigeria and has a projected population of 3.56 million [11]. The FCT Abuja has approximately 80,000 PLHIV with an HIV prevalence of 5.8% [12]. As of June 2017, there were approximately 43,000 HIV-positive individuals receiving ART in FCT Abuja [13].

98 Sampling and inclusion/exclusion criteria:

99 Health worker interviews were conducted at six hospitals between February and March 2018 within LGAs
 100 in FCT Abuja where the Treat All guidelines had been piloted between March and December 2016 [7].
 101 Health workers were purposefully selected for interview [14]. Study population inclusion criteria included
 102 1) health worker, who may have been a doctor, pharmacist, nurse, laboratory scientist, record officer, or
 103 data analyst or program manager; 2) working at the HIV treatment program and 3) has knowledge about
 104 the HIV Care and Treatment program, determined by a minimum of three years of experience working in
 105 the HIV program. All individuals who either did not meet inclusion criteria or refused to give consent
 106 were excluded from study.

107 Data collection methods:

108 All interviews were conducted at the study site, in environments familiar to the participants. The
 109 researchers sought permission from each participant before digitally recording interview sessions.
 110 Additionally, a record of important statements made or activities observed during the fieldwork was kept
 111 as notes from the sessions.

112 Study Instrument:

113 The study used a specially developed interview guide based on a previous study which evaluated
 114 guidelines among health workers in Kenya [15]. All interviews were conducted in English. The
 115 interview guide covered knowledge about the health workers' experience using the Treat All guidelines,
 116 the care and outcomes of patients since the introduction of the Treat All guidelines, and perceived
 117 enablers or barriers to using the guidelines in clinical care. The interview guide was piloted with three
 118 health workers each from one of three different departments at a comprehensive HIV treatment center in
 119 Abuja.

120 Data Analysis:

121 The researchers utilized thematic content analysis to explore the data collected during the interviews [16].
 122 After the interview, participants' responses were transcribed verbatim and the lines of text numbered. All
 123 transcripts were anonymized to ensure confidentiality. The transcription process was followed by coding
 124 of the transcripts. One qualitative coder manually reviewed all transcripts. An inductive approach in which
 125 codes emerged from the content of the raw data rather than a preconceived theory was used during data
 126 analysis [17]. In addition, respondent validation and peer review were utilized to avoid coding bias [18].
 127 Initial descriptive codes created after review of all transcripts were recoded into analytic codes based on
 128 emerging themes from all transcripts. A codebook containing both descriptive and analytic codes that
 129 related major themes and sub-themes guided the development of the study discussion and conclusion. To
 130 ensure trustworthiness, after transcribing audio recordings, the researchers reviewed transcripts with
 131 respondents to ensure the content captured what participants intended and used appropriate quotes during
 132 reporting [18].

133 [Ethical consideration:](#)

134 Ethical approvals were obtained from the National Health Research Ethics Committee of Nigeria and the
 135 U.S. Centers for Disease Control and Prevention institutional review board (IRB). An informed consent
 136 was obtained from all participants interviewed. Information provided during the interview did not
 137 include personally identifiable information and only aggregated data and unlinked quotes were used for
 138 the study reports. All participants' names were replaced with numbers in the transcripts, during analysis
 139 and reporting [19].

140 [Results:](#)

141 A total of 20 health workers were interviewed in the study, comprising 8 medical doctors, 5 nurses/
 142 counsellors, 4 laboratory scientists, 2 monitoring and evaluation (M&E) officers and one data analyst.
 143 From the qualitative analysis of their interview responses, we identified five major themes of importance
 144 describing (1) the perceived benefits of guidelines use, (2) the perceived disadvantages of using the

145 guidelines, (3) reported patients' response to guidelines change, (4) perceived barriers/enablers to
 146 guidelines use and (5) health workers' recommendations for improvement. Table 1 summarizes the
 147 themes, sub-themes, and codes from the analysis of the transcripts from the interviews. These themes and
 148 sub-themes were then reorganized into principles within four domains: perceived benefits of the change
 149 in guidelines on clinical practice, reported patients' response to guidelines change, perceived patient
 150 outcomes with the guidelines, and factors affecting guidelines use.

151 Table 1: Coding scheme from thematic content analysis

Main themes	Sub- themes	Codes
Perceived benefits of the guidelines change on clinical practice	Understanding perceived benefits of the guidelines change on clinical practice	1.1 No delays before treatment start 1.2 Improved perceived patient outcomes 1.2.1 Improved Viral suppression 1.2.2 Reduced Mortality 1.2.3 Reduced pre-treatment losses 1.3 Reduced stress on the patient 1.4 Complete patient records 1.5 Removes patients fears and gives health workers hope 1.6 No more repetitive visits prior to starting treatment
Perceived disadvantages of the guidelines change on clinical practice	Understanding perceived disadvantages of the guidelines change on clinical practice	2.1 Reduced time for patient education prior to starting treatment 2.2 Increased workload for health workers 2.3 Overcrowded clinic & increased waiting 2.4 Increased on-treatment lost to follow up 2.4.1 Factors responsible for attrition
Reported patients' response to guidelines change	Understanding patients' response to guidelines change, what they liked or disliked	3.1 Willing to start treatment early 3.2 Late responder 3.2.1 Depression & Discouragement 3.2.2 Require repeated counseling 3.2.3 Refusal to share contact details
Factors affecting guidelines use	Understanding enablers and barriers to guideline implementation	4.1 Enablers 4.1.1 Training on guideline use 4.1.2 Health worker passion and interest 4.1.3 Availability of tools: Job aids, guidelines 4.1.4 Government supervisory visits 4.1.5 Management support 4.2 Barriers 4.2.1 Poverty of patients 4.2.2 Stock-outs of test kits 4.2.3 Insufficient guidelines copies for health workers

4.2.4 Challenges in TB/HIV integration
4.2.5 Inadequate training on new guidelines for junior doctors
4.2.6 Inadequate human resources for implementation

How to improve perceived barriers	How to improve perceived barriers	4.3 How to improve perceived barriers
		4.3.1 Financial Assistance
		4.3.2 Improved patient education
		4.3.3 Advocacy for more clinicians and laboratory staff
		4.3.4 Improved support for TB/HIV services
		4.3.5 Provision of sufficient guidelines copies
		4.3.6 Implement differentiated service delivery approach to treatment

152

153 [The perceived benefits of the Treat All guidelines:](#)

154 Perceived benefits experienced due to the introduction of the new national Treat All guidelines were
155 described at two broad levels, benefits to the patients and benefits to the health worker or the health system.
156 The following sections describes the benefits of the Treat All guidelines to these broad stakeholders.

157 [The perceived benefits of the Treat All guidelines to the patients](#)

158 The majority of health workers interviewed in the study believed that the Treat All approach has been of
159 tremendous help in improving patient care. The most important benefit described was early initiation on
160 ART. Starting treatment early means doctors no longer wait until patients' health deteriorates before
161 commencing ART. Furthermore, health workers also perceived that the new approach may have helped
162 in retaining more persons previously tested HIV positive but waiting to be started on treatment:

163 *(Counsellor): "It is helping also to initiate treatment early and of course help to retain patients in care*
164 *before starting treatment. In the past, we delayed patient treatment and they go away"*

165 Additionally, starting treatment immediately after testing means the need for repetitive follow-up visits,
166 delay in treatment start and risk of losing the patient between the time of test and time of treatment
167 initiation are reduced.

168 *(Counsellor): “we take them round and round, they go and come before they receive their treatment but*
169 *with the test and treat [Treat All] we are able to give them the treatment and they go and they are happy*
170 *for it”*

171 *(Clinician): “The initial loss after diagnosis has greatly reduced. You know the way our society is*
172 *structured, sometimes when they go they never come back. They end up in the churches and some in other*
173 *places.”*

174 Another important benefit of the Treat All approach was a perception of improvement in patients’ health
175 outcomes. The majority of respondents reported that since the start of the guidelines, there have been
176 increased testimonies from patients that they were doing much better:

177 *(Clinician): “The testimony we have is some of them returning to say (...) Doctor since we started this*
178 *drug I am getting much better”*

179 *(Clinician): There has been great advantage, because it is a disease we cannot cure. But, if you are*
180 *starting treatment immediately it makes the patient live healthier and longer”*

181 Moreover, the majority of the participants reported that among patients who had their viral load test done,
182 they observed an improved viral suppression rate since the implementation of the Treat All guidelines.
183 One perceived reason for the improvement was that patients do not wait until they are very sick before
184 starting ART:

185 *(Clinician): “By the time we do their viral load test after six months we find out that they are virologically*
186 *suppressed. (...) I will see those with test and treat [Treat All] are actually doing better”*

187 Consequently, there has been a perceived reduction in the incidence of opportunistic infections (OIs) and
188 mortality:

189 *(Clinician): “(...) you tend not to have more OIs, mortality is being reduced, and transmission rates also*
190 *reduce”*

191 Additionally, the majority of the health workers believed that there have been mostly HIV negative babies
192 born to HIV infected mothers since the implementation of the new guidelines:

193 *(Clinician): “We have not had any positive child since we started implementing the guideline[s] (...)”*

194 A common perception among respondents was that the implementation of the previous HIV treatment
195 guidelines was very stressful for the patients. It required multiple clinic visits, frequent blood draws for
196 CD4 investigation, and long hours of repeated counselling sessions before treatment was initiated. The
197 process required multiple interactions between patients and health workers, some of which could be
198 perceived as unnecessary, time wasting and stressful. However, the implementation of the Treat All
199 guidelines has simplified the process and reduced the stress on the patient. Furthermore, participants
200 explained that HIV patients’ frequent visits to the clinic for drug pick up usually raises questions in the
201 community. Community members often want to know why patients visit the clinics so frequently. Some
202 patients stayed away from clinic to avoid being stigmatized:

203 *(Clinician): “Some actually call me to bring their drugs to certain places. They don’t want to be coming*
204 *to the facility always.....Their coming here regularly is raising questions in the community”*

205 Another perceived benefit reported by a minority of participants was that the early initiation of treatment
206 under the new guideline has taking away the patients’ fear of dying:

207 *(Administrator): “So, that fear has been taking away. Immediately, I am tested, I am started on drugs”*

208 The perceived benefits of the Treat All guidelines to the health worker and the health system

209 The majority of the respondents reported that there have been significant benefits to the health workers
210 and the health system since the introduction of the Treat All guidelines. For example, record keeping has
211 improved because health workers were able to obtain complete records from patients because all activities
212 relating to patients' test and treatment were concluded on the same day:

213 *(Clinician): Okay, the promptness of it. And then the reduction in the stress on the part of the patient.*
214 *And then even on the side of the health workers, there are advantages because it helps us get all the*
215 *recordings the same day.*

216 *(Counsellor): "On our own side (health worker) it has increased our hope of recovery for the patient"*

217 A major perceived benefit to the health system was a reduction in perceived pre-treatment attrition. All
218 respondents agreed that there has been a reduction in the initial patient loss between when patients tested
219 HIV positive and when they started ART because there is essentially no more delays in starting treatment.
220 However, there was a division of opinion on the attrition after patients started ART. The findings appeared
221 to vary by treatment centre but no difference in opinion by health worker type. A majority of health
222 workers interviewed in primary and secondary health centres perceived that there has been no change in
223 lost to follow up among patients who have already started ART:

224 *(Clinician): "I wouldn't say that has changed because most of the causes of lost to follow up in our*
225 *environment is financial problems basically. So, I think it's about the same"*

226 Whereas, respondents from tertiary health centres were of the opinion that lost to follow up has increased
227 since the implementation of Treat All:

228 *(Clinician): "But, talk about lost to follow up, I think we have more lost to follow-ups since we started*
229 *test and treat [Treat All]"*

230 Yet again, a minority of health workers in primary health setting perceived that there might actually be a
231 reduction in lost to follow up among patients on ART since the commencement of Treat All:

232 *(Clinician): "There is no lost to follow up again because they already know they are on drugs (...) Lost*
233 *to follow up is reduced to the barest minimum if there is any"*

234 Perceived disadvantages of the Treat All guidelines:

235 Respondents identified some drawbacks due to the implementation of the new Treat All guidelines at the
236 patient and level of the health worker/health system. The following section described health workers
237 perceived disadvantages of the treat all guidelines.

238 The perceived disadvantage of the Treat All guidelines to the patients

239 Health workers reported that a major success from the previous HIV treatment guidelines was a three
240 weeks' treatment preparation in which patients received an intensive education and counselling session,
241 which stood out from other pre-treatment requirements as being useful and well-liked. The treatment
242 preparatory class not only educated the patients but also created a platform for interaction between patients
243 and health workers and patients with other patients. However, with the implementation of the new
244 guidelines the treatment preparatory class is no longer available:

245 *(Administrator): "unlike the previous guidelines whereby you get to know your status and you are taken*
246 *on a three weeks treatment preparatory class for you to get an understanding of all it takes to be positives*
247 *and living with the virus. But, now your get tested immediately and you are started on drugs"(...) they*
248 *might not really appreciate what it takes to be living with the virus"*

249 The perceived disadvantage of the Treat All guidelines to the health worker and the health system

250 The majority of respondents expressed concerns that the new guidelines have increased workload because
251 under new guidelines standards, all PLHIV not currently receiving treatment must be offered treatment,
252 and all newly-diagnosed PLHIV must start treatment immediately. The health workers explained that

253 since the implementation of the Treat All guidelines, the number of patients eligible to start treatment has
 254 increased without a corresponding increase in the number of health workers providing health care.
 255 Consequently, the clinics have been crowded, increasing patient waiting time. Moreover, patients are often
 256 wary of coming to clinics if they perceive that they will spend a long time waiting.

257 *(Clinician): “Because the test and treat [Treat All guidelines] have increased the workload. So making*
 258 *the clinic a busy one for the clinicians”*

259 *(Clinician): “They are not waiting for you to waste their time anymore”*

260 **Reported patients’ response to Treat All guidelines:**

261 The majority of health workers elucidated that patients were generally happy with the change in the Treat
 262 All guidelines and were willing to start treatment early:

263 *(Administrator): “They are happy because many of them I come in contact with the first question they ask*
 264 *is where is the drug?”*

265 *(Counsellor): “There is a lot of enthusiasm now, patients now come and before you are done they are*
 266 *looking at you. They are expecting that they will be placed on treatment”*

267 Because Treat All was initially piloted in only 32 out of the 774 LGAs in Nigeria, respondents highlight
 268 instances where patients changed from health care providers who were yet to implement the new
 269 guidelines to those who had started implementing the guidelines. The primary reason for the change was
 270 because patients were not interested in wasting their time waiting before starting treatment:

271 *(Clinician): “we have seen patients changing from their places to come to us. Because, they heard that*
 272 *once you do the test today, you don’t have to waste time.”*

273 Factors affecting guidelines use, perceived enablers:

274 The factors identified by all of health workers interviewed as enablers were all health systems related
 275 factors. Health workers report that an important enabler in implementation of Treat All was training on
 276 the use of the guidelines. Participants explained that training gave the capacity to utilize the guidelines.
 277 Therefore, all health workers trained were willing to start using the guideline after receiving training:

278 *(Clinician): “They educated every person that participated actively in this program. You understand?*
 279 *And once they understood, it was easy for them to follow up”*

280 Participants further explained that there has been a variety of factors enabling the use of the Treat All
 281 guidelines at the various hospitals. The factors enabling guidelines use include the passion and interest of
 282 the health worker in caring for patients:

283 *(Clinician): “Okay, number one for me is the passion of the health workers”*

284 Another important enabler to the use of the guidelines was the availability of tools required to work, such
 285 as medications, test kits, job aids, and the written guidelines themselves in most clinics. Respondents
 286 further explained that health workers were likely to implement the Treat All guidelines in hospitals where
 287 the staff have sufficient supply of test kits and drugs. Furthermore, the availability of job aids and
 288 guidelines makes it easy for referencing and utilization of policy direction in the guidelines.

289 *(Administrator): “Hmmm, (...) the availability of the tools (...) they also brought job aids, It has helped*
 290 *(...) at least to refresh on the knowledge from the training”*

291 *(Clinician): “Because if we didn’t have drugs that will mean the clients will come and we will not be able*
 292 *to start their treatment”*

293 Respondents further explained that good management support and regular government supervisory visits
 294 were added motivation for implementing the guidelines.

295 *(Administrator): “since the supervisory visit is regular, they give you an update or give you a step-down*
 296 *and say this is how it should be or do it this way”*

297 Factors affecting guidelines use, perceived barriers:

298 The factors perceived as barriers were outlined into two broad categories, at the levels of the patient and
 299 the health system. The following sections describe the barriers by patient and health system levels.

300 Factors serving as barriers at the patient level

301 Participants highlighted several factors that made it difficult to implement the Treat All guidelines.
 302 However, the most important barrier that cut across nearly all study sites was poverty. The patient’s
 303 inability to pay for transportation to site or for baseline investigations was a major barrier to the
 304 implementation of the test and treat guidelines.

305 *(Clinician): “A patient comes in and obviously you just see anemia, why are you not eating what was*
 306 *recommended? They will say they don’t have money”*

307 *(Counsellor): “so out of about five of them I saw this morning only one assured me that he will come to*
 308 *the meeting the other one said mummy no transport”*

309 Factors serving as barriers on the health workers/health system level

310 A minority of respondents identified stock out of test kits, which occurs occasionally, as another barrier.
 311 The stock out of test kits makes it impossible to test new patients for HIV in affected hospitals. Some
 312 health workers also cited a lack of sufficient copies of guidelines for staff review as a barrier to effective
 313 implementation.

314 *(Clinician): Though sometimes we run short of test kits. It is important that everything we need to work is*
 315 *available. Sometimes there we [are] short of supplies.*

316 (Clinician): “Yes, another barrier is if you don’t have enough copies of the guideline for everybody (health
317 workers) to have. In this facility doctors change frequently so the two or three copies they brought is not
318 enough”

319 Additionally, a lack of a dedicated space to provide treatment for tuberculosis, which is considered the
320 most common opportunistic infection among PLHIV in Nigeria, and more generally a lack of integration
321 of TB care with HIV care, may constitute a barrier to ensuring comprehensive care among PLHIV in some
322 clinics.

323 (Administrator): We have a challenge with the DOT clinic, our TB/HIV integration is not doing so well.

324 Furthermore, the level of training may be a barrier because younger doctors do not have enough
325 information about the guidelines and may require more training to come up to speed about the change.

326 (Clinician): “The level of training may be a barrier, we have younger doctors, house officers, youth
327 corpors, they are here for just one year”

328 Finally, respondents explained that inadequate human resources, specifically, low numbers of health staff,
329 is a major barrier to implementation of the new guidelines. As the number of patients continue to increase,
330 respondents felt that there needs to be a corresponding increase in number of health workers to ensure
331 quality of care is not compromised.

332 (Clinician): “Then another barrier is manpower. Because the test and treat [Treat All] has increased the
333 workload. So making the clinic a busy one for the clinicians”

334 Other findings

335 The following section outlines incidental findings that were outside of the primary purpose of our study,
336 but were nonetheless important and of value.

337 Factors contributing to lost to follow among patients on ART

338 Although not the main focus of the project, through the discussions participants described what they
 339 perceived to be factors associated with loss to follow-up. Health workers reported that there were multiple
 340 issues affecting lost to follow up among patients initiated on ART. Factors contributing to lost to follow
 341 up include financial challenges, making the patients who live far away from clinics unable to afford
 342 transportation to clinics or pay for investigations not covered by the program:

343 *(Clinician): “if we hammer on the need for an investigation that the patient needs and cannot afford, the*
 344 *patient might become afraid and not show up anymore (.....) Another thing is proximity; some may be*
 345 *eager to start but won’t tell you that they stay far away from the facility (.....) we say the patient is lost to*
 346 *follow up not knowing that the patient actually self-transferred”*

347 Other factors reported by health workers contributing to attrition include religious/traditional belief,
 348 stigma and denial, lack of education, and self-transfer:

349 *(Administrator): “Experience of lost to follow up is due to several factors. Number one is transportation,*
 350 *number two is location. Some of them choose to go on their own, self-transfer”*

351 *(Clinician): “Religious rulers are affecting (...) because we almost lost one patient last year. Because*
 352 *according to her the pastor prayed for her and told her that all is well that she should stop the drugs”*

353 *(Clinician): “Because most educated people agree, they will take it and you will see them coming back”*

354 Respondents report that patients were also not satisfied with the repeated hospital visits without receiving
 355 medications all because they were not eligible to start treatment by the standards of the previous
 356 guidelines. Consequently, some indigent patients stop coming to the hospital and are lost to follow up
 357 after many repeated unfruitful visits to the clinic:

358 *(Clinician): “But you know sometimes when you come today, come tomorrow, (...) the patients, some*
 359 *don’t have the means of coming back”*

360 Late responders

361 A minority of respondents reported that although most patients were perceived to be willing to start
 362 treatment early, there were some patients who were not willing to start treatment early. Health workers
 363 perceive that this category of patients is composed of ‘late responders’ who need more time to make up
 364 their minds to start ART. When informed that they are HIV positive they have a strong negative
 365 reaction. Participants further explained that during counseling this kind of patients can be identified by the
 366 following characteristics: denial, self-stigmatization, depression, and discouragement. These patients are
 367 not enthusiastic about starting treatment and some may refuse to give contact details and therefore cannot
 368 be contacted if they default in attending their clinical appointment:

369 *(Administrator): “those that want to live in denial and want to say(...) ha! I don’t have the virus! Because*
 370 *they look healthy, they feel that (...) I am not sick, I am doing fine so why should I go on therapy”*

371 If started on treatment immediately, these “late responders” fail to return for further follow-up visits:

372 *(Clinician): “And by the time I finish everything, she was given the drug for two weeks but because there*
 373 *was no phone number no place to trace her. Because I just couldn’t trace her, I tried...”*

374 The “late responders” may require several follow up counseling sessions before they eventually make up
 375 their minds to be committed to treatment:

376 *(Counsellor): “But, some of them (...) ha!(...) I don’t like drugs. You can’t just push me into drugs*
 377 *immediately... give me some time”*

378 How to improve perceived barriers:

379 Interviewed participants provided some very important ideas for improving on some of the barriers
 380 identified during the study, in order to improve and scale up implementation of the Treat All guidelines

381 nationwide. A major recommendation was for the government to introduce some form of financial
382 assistance scheme to support patients who could not afford to transport themselves to clinics or pay for
383 required laboratory investigations.

384 *(Counsellor): "Some of them have problem of coming here with their TP (....) [Transportation] ... for*
385 *some of them feeding problems and all that. (.....). At each of their visit if we can give a little thing, a*
386 *little token to help them so they can come back next time for their visit"*

387 The Treat All guidelines pilot implementation team could help improve and scale up implementation
388 through advocacy to the government on the need to provide additional clinical staff to support the growing
389 number of patients at the clinics. The implementation team can also advocate for laboratory staff at the
390 laboratory to reduce processing time for the additional viral load tests.

391 *(Clinician): "I think there is still need for more advocacy for some clinicians"*

392 *(Administrator) "it is to involve the lab. We need to get them together and tell them the implications of*
393 *not starting the patients on treatment"*

394 Another area that a government intervention will help with is in improved support to assist TB/HIV
395 integration to ensure comprehensive care for PLHIV.

396 *(Administrator): So, I want to make a suggestion, if we can find a way to help to revitalize the DOT section*
397 *of the hospital*

398 Another area is ensuring more government support to sites through supervision to the hospitals and
399 provision of sufficient copies of the guidelines to all HIV clinics including more concise pocket versions
400 of the guidelines.

401 *(Clinician): "Yes, another barrier is if you don't have enough copies of the guideline for everybody. There*
402 *could be pocket versions of the guidelines that will make it easy to carry about"*

403 Lastly, hospitals could implement a more differentiated service delivery approach that takes services into
404 the communities to decongest the clinics.

405 *(Clinician): it has helped to decongest the clinic. For example, some of the patients don't need to come to*
406 *the clinic again they just go to the community pharmacy to pick up their drugs*

407 Discussion:

408 The implementation of Treat All guidelines in Nigeria was perceived to have significantly changed clinical
409 practice for care of PLHIV, bringing about reduction in delays before treatment start, reduction in stress
410 and increase in hope among patients. Additionally, because all events leading to treatment initiation are
411 completed on the same day, there are more complete records for patient follow-up. Empirical studies have
412 been used to evaluate outcomes following changes in treatment guidelines. A quantitative study conducted
413 in South Africa, evaluating the impact of a Treat All approach, used a mathematical modelling technique
414 and partial differential equations [20]. The study reported that there was sufficient evidence demonstrating
415 that doing more testing for HIV, followed by immediate treatment of persons found HIV positive, could
416 'eradicate' the HIV epidemic and reduce the cost for HIV medication in the long run [20]. Additionally, a
417 randomized control trial conducted at 215 sites in 35 countries among 2,359 HIV infected individuals
418 assessed outcomes using the Treat All approach [21]. The study reported that implementing the Treat All
419 guidelines led to better outcomes than delaying treatment [21]. Furthermore, a multicentre retrospective
420 cohort study conducted in four hospitals in Kenya analysed outcomes of pregnancies amongst 1,365 HIV+
421 pregnant women who received ART intervention using the Treat All approach. The study reported a 50%
422 reduction in HIV transmission from mothers to their children due to the Treat All approach [22]. The
423 reports from these empirical studies supported the perception of health workers in this study of better
424 patient outcomes using the Treat All guidelines.

425 Among health worker respondents, the perception was that the majority of patients were happy with the
 426 guideline change because of a perception of good health benefits when treatment is started early. Similarly,
 427 health workers were also willing to implement the new guidelines for related reasons. The study finding
 428 was consistent with reports by Nzinga *et al* and Odhiambo *et al*. Both studies observed that knowledge of
 429 the benefits from implementing guidelines was a major motivational factor to utilizing guidelines [15,23].
 430 The study results suggest that new public health initiatives such as guidelines or policy changes will
 431 require significant health worker and patient education to increase the chances of successful
 432 implementation and improved patient outcomes. Specifically in the Nigerian context, health workers
 433 perceive that the expansion of Treat All nationally will require patient education about the health benefits
 434 of starting treatment early. In contrast, the category of patients referred to as “late responders” were
 435 unwilling to start treatment early because they were still in denial and therefore not yet convinced of any
 436 benefit of starting treatment early. Obligating these patients to start treatment before they are ready may
 437 lead to these patients being lost to follow up. This finding reaffirms the need for screening for and
 438 establishing patient readiness before starting ART [24]. Thus, though the expansion of Treat All
 439 nationally in Nigeria will entail early initiation of the vast majority of PLHIV on ART, there should be
 440 support for identifying and working with PLHIV who may need longer to be ready to initiate ART, in
 441 order to avoid attrition.

442 Health workers perceived that the introduction of the Treat All guidelines led to a reduction in mortality
 443 and improvements in viral suppression and patient overall health. This perception was consistent with
 444 findings previously reported in the literature [21,22,25]. However, there was a perception that the Treat
 445 All guidelines alone cannot resolve lost to follow up in patients on ART. Health workers perceived that
 446 there were multiple factors responsible for lost to follow up among patients that started ART immediately,
 447 topmost among them was financial difficulties, making it challenging to afford transport to clinic and
 448 payment for investigations. This finding was consistent with those previously reported [26-28]. Maskew

449 *et al*, in their study in South Africa, conducted among 182 HIV positive patients who missed follow up
 450 appointments, and contacted through telephone calls, reported that a majority of their patients cited
 451 financial difficulties and inability to pay for transportation costs as major reasons for missed appointments
 452 [26]. Consequently, there are no guarantees that starting treatment early may lead to a reduction in lost to
 453 follow up. The implication of this finding is that program managers must adopt strategies that empower
 454 the clients to keep their clinic appointments and treatment approaches that take services closer to
 455 communities to reduce lost to follow up [29-31].

456 Factors previously identified as enablers of guidelines use included collaboration between facilities, peer
 457 support, and provider characteristics such as higher level of education, commitment, and knowledge of
 458 guidelines [32]. The major factors identified in the literature that serve as barriers to treatment guidelines
 459 implementation included human resource gaps, lengthy guidelines, inadequate supplies of medicines, and
 460 commodities [32]. This study found that training, availability of tools, government supervisory visits,
 461 hospital management support and health workers passion and interest enabled guidelines use. Identified
 462 barriers in this study included patient poverty, inadequate human resources, and stock-outs of tools,
 463 guidelines, and test kits. Thus, the identified enablers and barriers to guidelines use in this study were
 464 comparable to those previously reported [32]. The implication of these findings is that program managers
 465 must ensure that clinics have staff strength adequate for patient load, ensure adequate supervisory visits,
 466 provide adequate supplies of test kits and guidelines and implement innovative approaches that decongest
 467 clinics in order to improve the impact of the implementation of the Treat All guidelines. Each of these
 468 will need to be addressed as Nigeria scales up Treat All nationally.

469 Focusing specifically on patient poverty as a main barrier to Treat All implementation, the study revealed
 470 that patients' lack of capacity to pay for baseline investigation or transport services to clinics limited their
 471 ability to access treatment services. The results re-affirms the concept of a wider set of determinants for
 472 health and the important effect of socioeconomic factors in determining the health of individuals [33-35].

473 The study demonstrates that the presence of social support systems can influence an individual's health-
 474 seeking behaviours [36]. The study results suggest that to improve retention among the higher number of
 475 PLHIV on ART inherent in the Treat All approach, HIV programs in Nigeria may need to incorporate
 476 social support safety nets to help indigent patients.

477 Health worker respondents perceived that the challenges of patient access could be mitigated by
 478 implementation of patient empowerment schemes that increase patients' skills and empower them
 479 economically to provide for themselves and their households. An economically empowering scheme
 480 implemented in Kenya enabled HIV-positive persons through capacity building and provision of soft loans
 481 to become financially sufficient [37]. A similar approach in Nigeria may contribute to improved
 482 attendance at clinics as Treat All expands nationally. From the perspective of the health workers, patients
 483 still come from distant communities to access HIV care and treatment in big cities. This finding suggests
 484 that implementing community-based HIV treatment models that take services into communities using
 485 various approaches such as mobile clinics, community adherence clubs and community drug dispensing
 486 outlets may reduce the need for patients to travel far and further improve adherence to treatment
 487 [29,31,38].

488 Focusing specifically on inadequate health staff as a main barrier to Treat All implementation, the
 489 government could resolve this challenge by scaling up a variety of approaches including the use of six-
 490 month prescriptions that give stable patients up to six months' drug refills at a time, drastically reducing
 491 the frequency for clinic visits [39]. Moreover, the current treatment guidelines in Nigeria supports the use
 492 of multi-month scripting [8]. Additionally, Nigeria already has a policy on task shifting in HIV care and
 493 treatment, and reports suggests that these approaches are currently being implemented and are yielding
 494 good results in maintaining PLHIV on treatment [40-42]. Therefore, scaling up approaches such as task
 495 shifting and task sharing that build the capacity of nurses to provide clinical care and allow nurse

496 prescription of ART could further expand the existing human resource capacity for HIV services in
497 Nigeria [41,42].

498 The strengths of the study included the rigorous process to ensure conformity with established qualitative
499 research and ethical standards. Additionally, the use of the interview guide and appropriate probes ensured
500 that all participant were measured using similar standards [43], thus reducing measurement and social
501 desirability biases. To mitigate the role of positionality, the researchers ensured that their views were
502 bracketed by identifying their own preconceived assumptions and setting them aside during the interview
503 process [44,45]. A limitation of the study was the authors' inability to triangulate health workers'
504 perceptions to patients' reactions of the guideline changes because patients' perspectives were not
505 collected. A qualitative design that obtains the perspectives of the patients themselves could have
506 addressed this challenge and is a potential future area of research [46,47]. Additionally, health worker
507 perceptions of patient outcomes were not matched to actual patient outcomes, limiting the ability of this
508 study to comment on correlation of guidelines changes and any change in patient outcomes of interest,
509 including viral suppression and mortality [48]. Another major limitation of the study was the limited
510 cultural context of its findings since the study was conducted in one state in the country limiting the
511 transferability of its findings [49].

512 Conclusion:

513 According to participating health workers, the introduction of the Treat All guidelines in Nigeria improved
514 access to skilled HIV care and treatment services for PLHIV and were perceived to improve patients'
515 overall health. Specific areas perceived to have improved after guidelines change included viral
516 suppression, mortality, and waiting time at clinics. Factors enabling the implementation of the treat all
517 guidelines were training of health workers on guideline use, the passion and interest of health workers to
518 see patients get better, and the availability of tools, government supervisory visits and good hospital
519 management support. The identified barriers to successful guideline implementation were poverty,

inadequate human resource at clinics, and non-availability of tools, guidelines and test kits at some hospitals. Study findings suggest that the effective implementation and national scale up of the Treat All guidelines, with the intention of improving PLHIV clinical outcomes, could be further enhanced if the government provided support for indigent patients, more health worker staff, adequate supervisory visits, adequate supplies of test kits, and guidelines. In addition, implementing innovative approaches that decongest clinics by providing more services in communities would enhance effective implementation of the Treat All guidelines. In these ways, the Treat All approach can be effectively expanded nationally, thus giving all PLHIV in Nigeria timely access to comprehensive HIV care and treatment.

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