

# Applying Lessons from Early-Stage Voluntary Counseling and Testing Services to End the HIV/AIDS Epidemic in Nigeria by 2030

Emmanuel Chukwuma Obiano<sup>1,\*</sup>, Joel Ubandoma Rimmande<sup>2</sup>, Babylon Philemon<sup>2</sup>

<sup>1</sup>Department of Environmental Health Science, Faculty of Health Sciences and Technology, NnamdiAzikiwe University, Awka, Nigeria

<sup>2</sup>Department of Public Health, Faculty of Health Sciences, Taraba State University, Jalingo, Nigeria

## Email address:

ecobiano@yahoo.com (Emmanuel Chukwuma Obiano)

\*Corresponding author

## To cite this article:

Emmanuel Chukwuma Obiano, Joel Ubandoma Rimmande, Babylon Philemon. Applying Lessons from Early-Stage Voluntary Counseling and Testing Services to End the HIV/AIDS Epidemic in Nigeria by 2030. *International Journal of HIV/AIDS Prevention, Education and Behavioural Science*. Vol. 9, No. 1, 2023, pp. 20-24. doi: 10.11648/j.ijhpebs.20230901.13

Received: March 14, 2023; Accepted: April 4, 2023; Published: April 20, 2023

**Abstract:** Nigeria has waded through the HIV/AIDS epidemic for more than 35 years now since 1986. Response efforts are down-grading the epidemic from a peak of 5.8% prevalence in 2010 to a decline of 1.4% prevalence in 2019. Nigeria is desirous of ending the HIV/AIDS epidemic by 2030, but the terrain is challenged by bleak economic outlook and socio-political shocks that impose vulnerability including insurgency. This study explores the feasibility of Nigeria ending the HIV/AIDS epidemic by the year 2030, applying evaluation, management by objective (MBO), content analysis and the deductive model to assess early stage Voluntary Counseling and Testing (VCT) services in Anambra State, South-East Nigeria for the period 2006 - 2011. Secondary data were collected comprising summary of client flow activities of all 117 VCT centers in the State. Content analysis and deductive model were applied on the data to derive lessons learnt. The study found that: (i) VCT services were beneficial to about 1.9% of the State population, though with gross capacity under-utilization of VCT centers at 2.7 clients/day and the under-utilization of counselors at 0.6 clients served/day arising from low client flow; (ii) counseling process was effective and efficient in persuading consent to test; (iii) routine and mass HIV testing were cost-effective in detecting HIV positive sero-status; (iv) the synergy arising from counseling, testing and referral effectively mobilized Persons Living with HIV/AIDS for improved knowledge, attitude and practice (KAP) including formation of support groups averaging approximately 2 support groups per Local Government Area. The study recommends that VCT be adapted to a universal counseling and testing paradigm that includes, among others, outreach counseling and testing sessions, on-line counseling, and help-line supported self-testing. The study concludes that with necessary adjustment in counseling and testing, as well as necessary adjustments in other HIV/AIDS prevention, care and support services, the objective of ending the HIV/AIDS epidemic in Nigeria by 2030 will be attained.

**Keywords:** Client Flow, Disease Prevalence, Epidemic Response, HIV/AIDS, Nigeria, PLWHA Support-Group, SDGs, VCT

## 1. Introduction

On March 14, 2019, at the occasion of the launch of Nigeria's Revised National HIV and AIDS Strategic Framework 2019 - 2021, held in Abuja, the President of Nigeria, His Excellency, Muhammadu Buhari (GCFR) was quoted by UNAIDS Press Release to have said:

For the first time, the end of AIDS as a public health threat by 2030 is truly in sight for our country. I urge all of us not to relent but to increase the momentum. Let us work

collectively and push for the last mile<sup>[1]</sup>.

The President's reference to 2030 implies Nigeria's possible attainment of Target 3 of Goal 3 of Sustainable Development Goals as shown hereunder [2]:

*Goal 3: Ensure healthy lives and promote well being for all at all ages.*

*3 (3): By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.*

The basis of the President's hope of eliminating the AIDS

epidemic by 2030 came from the gradual but steady decline in HIV prevalence in Nigeria from a peak of 5.8% in 2001 to a stabilization of 4.1% in 2010, and to a decline of 1.4% in 2019 [3, 4]. However, it must be pointed out that this reported progress did not come easy but with 35 years of dogged efforts. But then, 2030 is only 11 years away.

For Nigeria, the road to ending AIDS epidemic by 2023 is littered with a host of challenges. First, despite modest reduction in HIV prevalence, the toll is still high at 103 404 annual new infections; 44 830 annual deaths; and 1.8 million people living with HIV/AIDS [5]. Secondly, HIV/AIDS response in Nigeria is heavily donor-supported. But the economies of major donor countries have contracted in recent time [6], with COVID-19 pandemic and the Russia-Ukraine war adding to the distress. For Nigeria and Nigerians, declining revenue yields, choking debt burden, galloping inflation, etc, continue to reinforce bleak economic outlook. Moreover, militancy, insurgency and banditry worsen the situation by displacing large populations from their homes and forcing children out of school [7, 8]. These economic and social stresses, in concert, increase Nigerians vulnerability to HIV/AIDS.

If ending HIV/AIDS epidemic by 2030 is to be feasible for Nigeria, the strategy must be planned from the standpoint of increasing effectiveness and efficiency at constant or possible declining funding. If, fortunately, more funds become available, it will amount to more impetus. This study explores the strategy of ending AIDS epidemic in Nigeria by 2030 from the standpoint of resource-constraint. If an appropriate strategy is devised, it will add to guarantee the attainment of the goal of ending HIV/AIDS by 2030. If HIV/AIDS epidemic is eliminated by 2030, its negative toll will reduce, and huge resources expended on HIV/AIDS epidemic response will be freed and re-deployed to other areas of priority needs for national development.

## 2. Method

Exploratory and evaluation research were adopted, applying the tools of management by objective (MBO), content analysis and the deductive model.

- 1) Achieving an end to the HIV/AIDS epidemic by 2030 was set as a desired objective, an irreducible minimum that must be attained in the next eight years, even if funds remain constant or decline.
- 2) The management strategy that will achieve the set objective was sought by providing appropriate answers to the following management question templates:
  - a) What can be done better?
  - b) What can be done different?
- 3) To obtain appropriate answers to the above management questions, an evaluation was conducted on the early stage Voluntary Counseling and Testing (VCT) services in Anambra State, South East Nigeria, for the period 2006 - 2011, to learn useful lessons.
- 4) To evaluate the VCT services, secondary data were collected from the Anambra State AIDS Control Agency (ANSACA) that receives reports from all VCT centers in the State. Content analysis and deductive model were applied on the data to derive important lessons.
- 5) The important lessons learnt from evaluating the VCT services were re-applied to devise appropriate adapted strategies that will guarantee the attainment of the set objective of ending HIV/AIDS epidemic in Nigeria by 2030.

## 3. Result

Table 1: Integrated Summary of Transactions of Services at the 117 VCT Centers in Anambra State (2006 – 2011).

*Table 1. Integrated Summary of Transactions of Services of 117 VCT Centers in Anambra State (2006 – 2011).*

| Nature of Service                                   | 2006      | 2007      | 2009      | 2010      | 2011      | Total      | Average *                         |
|---|-----------|-----------|-----------|-----------|-----------|------------|-----------------------------------|
| No. of clients pre-test counseled                   | 67 449    | 54 854    | 107 922   | 102 789   | 83 305    | 415 319    | 83 064                            |
| No. of clients tested for HIV                       | 62 633    | 50 120    | +         | +         | +         | 112 753    | 56 377                            |
| No. of clients counseled and tested for HIV         |           |           |           | 101 127   | 82 967    | 184 094    | 92 047                            |
| No. of clients post-test counseled                  | 61 031    | 48 841    | 107 304   | 100 930   | 82 958    | 401 065    | 80,213                            |
| No. of clients who receive their results            | 61 147    | 48 897    | 131 556   | 101 251   | 82 803    | 425 654    | 85,131                            |
| No. of clients who test HIV negative                | 52 450    | 43 645    | 114 641   | 98 564    | 76 859    | 386 159    | 77,232                            |
| No. of clients who test HIV positive                | 9 243     | 6 173     | 10 554    | 8 827     | 7 785     | 42 582     | 8,516                             |
| No. of clients referred for care & support services | 6 082     | 5 115     | 16 476    | 14 593    | 8 293     | 50 559     | 10,112                            |
| No. of self referrals for C & T                     | 38 358    | 22 736    | 32 527    | 39 338    | 17 971    | 150 930    | 30,186                            |
| No. of medical referrals for C & T                  | 17 992    | 13 396    | 1 291     | 5 422     | 2 474     | 40 575     | 8,115                             |
| Population of Anambra State                         | 4 055 048 | 4 127 644 | 4 418 166 | 4 546 293 | 4 678 135 | 21 825 286 | 4 365 057                         |
| No. of Support Groups in 21 LGAs - 36               | -         | -         | -         | -         | -         | -          | 1.71                              |
| Capacity utilization for 117 VCT Centers            |           |           |           |           |           |            | 710 clients/yr<br>2.7 clients/day |
| Capacity utilization for 530 counselors             |           |           |           |           |           |            | 157 clients/yr;<br>0.6 client/day |

Source: Anambra State AIDS Control Agency (ANSACA).

NB:

\*The data were collected in the format of separate annual rendition for each year. This Integrated Summary Table as averages was adapted by the author.

+ There was a slight variation in reporting format as from 2009 upwards.

Few inconsistencies exist in some data figures that 'mis-match' with supposedly related entries especially from 2009 upwards. This arose from changes in some policy directives such as a circular letter issued in 2009 which allowed certain categories of emergency cases (such as critical accident victims) to be tested without counseling. Hence, such special cases brought a mis-match between some related data entries.

Data were not available for year 2008 owing to operational review and re-organization of ANSACA.

## 4. Analysis, Findings and Discussion

### 4.1. Analysis

#### 4.1.1. Summary Analysis of the Data in Form of Percentages

- 1) Percentage of the average number of clients post-test counseled to average population of Anambra State – 1.9%.
- 2) Percentage of the average number of clients who took HIV test to average number of clients pre-test counseled (2006 - 2007) – 92.19%.
- 3) Percentage of clients medically referred for counseling and testing to average clients post-test counseled – 9.7%.
- 4) Percentage of clients self-referred for counseling and testing to clients pre-test counseled – 36.34%.
- 5) Percentage of clients who tested HIV positive to total clients referred to other care and support services – 84.21%.
- 6) Percentage of clients who tested HIV positive to total clients pre-test counseled – 10.25%.
- 7) Percentage of clients who tested HIV positive to total clients tested (2006 - 2007) - 11.47%; (2010 - 2011) - 9.25%.

#### 4.1.2. Comparison

- 1) Comparing number of self-referrals to counseling and testing for the five years 2006 - 2001 shows consistent stable trend.
- 2) Comparing number of medical referrals to counseling and testing for the five years 2006 -2011 shows a progressive decline.

### 4.2. Findings

For the years under study:

- 1) About 1.9% of the population of Anambra State patronized the VCT centers for counseling and testing. This resulted in gross under-utilization of VCT centers at 2.7 clients attending per day and the under-utilization of trained counselors at 0.6 clients served per counselors per day.
- 2) Of all the clients that received pre-test counseling, 92.19% consented and took HIV test. This demonstrates that the counseling process is highly effective and efficient in achieving persuasion to take HIV test.
- 3) Of all HIV tests performed, between 9.25% and 11.47% resulted in HIV positive outcome. This implies that HIV testing, even random HIV testing of the population, is cost-effective in detecting HIV carriers.
- 4) All HIV positive clients were referred to other HIV/AIDS care and support services. This implies that post-test counseling in particular and counseling in general are very efficient platform for appropriate referral.
- 5) Medical referrals to VCT services were low compared to self referrals. Though, medical referral is supposedly at the discretion of the attending medical officer.

- 6) HIV positive clients referred to care and support services formed 36 PLWHA support groups in the State, averaging 1.71 (approximately 2) support groups per Local Government Area of the State. This demonstrates effective mobilization for knowledge, attitude and practice (KAP).

### 4.3. Discussion

#### 4.3.1. Voluntary Counseling and Testing: Benefits to Attendees

There are five dimensions of benefits derived by attendees of VCT centers. About 1.9% of the population of Anambra State (80 213) who patronized the VCT centers annually benefited from pre-test counseling, post-test counseling and ongoing follow-up counseling. According to the Federal Ministry of Health [9] these counseling processes offer the following specific benefits to attendees: determine client's knowledge and correct existing misconception; give necessary information; conduct a personalized risk assessment; develop a personalized risk reduction plan; demonstrate appropriate condom use; assess client's capacity and ability to cope; provide psychological and emotional support; and offer appropriate referrals. With these benefits, the VCT attendee (without prejudice to HIV sero-status) is empowered with information and knowledge and mobilized for positive attitude and practice, not only for self, but also to transmit same to other members of the family and community.

The average annual number of clients that accessed HIV testing (79 389) benefited from free and reliable HIV testing compared to what obtains outside VCT centers and affiliate /associated health facilities. This advantage is assured by the national guidelines that prescribe cost-free counseling and testing, as well as strict standardization in test reagents and testing procedures<sup>[10]</sup>.

On an annual basis, the 8 516 clients that tested HIV positive benefited further by knowing their HIV sero-status. By knowing their HIV positive sero-status, they were better placed to disclose their status to their partners and relations as the case may be. They were better placed for early commencement of healthful living practices including rest, exercise, diet, early treatment of opportunistic infections and reduction of risky health behavior. Moreover, they received prompt referral to appropriate HIV/AIDS prevention, care and support services. Most important, they benefited from first line access to free anti-retroviral therapy [11].

Ultimately, HIV positive clients demonstrate the empowerment and mobilization gained from interface with VCT centers by the formation of support groups of persons living with HIV (PLWAs). As at the terminal period of study (2011), there were 36 support groups of PLWAs in the 21 Local Government Areas (LGAs) of the State, averaging 1.7 (approximately 2) support groups per LGA. As a general rule, whether in Nigeria or elsewhere, these support groups are well structured democratic organizations that provide wide ambit of participation for members [12, 13] including psycho-social, economic and legal supports. They play also

very effective countervailing force against stigma and discrimination. Other scholars have found these support groups useful in some specialized ways including programme implementation and research [14].

#### 4.3.2. About Observed Shortcomings

Low capacity utilization of both the VCT centers and trained counselors arose from the low client flow recorded at the VCT centers. The factors responsible for low client flows at VCT centers in Nigeria are attributable to what may be called defective modeling of the VCT program; negative perceptions and attitudes of the people and stiff competition from Traditional, Complementary, and Alternative Medical (TCAM) services including faith healing practices. These reasons notwithstanding, it remains a cause for concern that such serious low capacity utilization is a gross waste of resources.

Observed low rate of medical referrals, in comparison with self-referrals, should be approached with caution, since medical referral to VCT services is at the discretion of the physician attending to the client. Nevertheless, the physician's decision for referral or otherwise may be influenced by considerations for proximity and cost on the client. This is more relevant when the attending health facility does not have a VCT center on-site; and/or is not a VCT affiliate or partnering health facility.

## 5. Conclusion

VCT service is beneficial in providing access to service; in generating HIV testing and knowledge of sero-status; in up-scaling correct KAP that suppress the spread of HIV/AIDS; and in mobilizing the formation and operation of support groups for PLWHAs. However, VCT is challenged by gross capacity under-utilization arising from very low client flow which makes the service inefficient. Considering that we are at a critical stage of count-down to achieving the elimination of the HIV/AIDS epidemic by 2030, just a few years away, such inefficient service is obviously antithetical to the urgent needs of the time. This article addressed this urgent need by establishing the actual deficiencies of VCT service delivery and suggesting remedies that will expand catchment, increase client flow, accelerate and guarantee Nigeria's attainment of the goal of eliminating HIV/AIDS epidemic in the country by 2030.

Further research can take a cue by appraising other related HIV/AIDS services to determine their alignment with the objective of achieving the elimination of HIV/AIDS by 2030. Particularly critical HIV/AIDS services in this regard include: Preventing Mother to Child Transmission (PMTCT); and Tuberculosis and Sexually Transmitted Infections (TB/STIs). If recommended adjustments are implemented, and if similar research and adjustments are made in other sister HIV/AIDS program interventions, the goal of ending the HIV/AIDS epidemic in Nigeria by 2030 will be attained.

## 6. Recommendation

*What can we do differently, what can we do better?*

The objective set is to end the HIV/AIDS epidemic in Nigeria by the year 2030. Only 8 years remain to pursue this objective within a resource-constrained setting, with funding projected to remain constant or slightly decline. At present, NACA [5] summarizes the Nigerian HIV/AIDS situation as follows: 103 404 estimated number of annual new infections; 44 830 estimated number of annual deaths; and 1 800 000 estimated number of persons living with HIV/AIDS. It follows, therefore, that to end the HIV/AIDS epidemic in Nigeria by 2030, the number of new infections must be brought to zero.

From the deductions made earlier and the lessons learnt from their further discussion, there are many things that can be done differently or better, from the standpoint of VCT program, to end the HIV/AIDS epidemic by 2030 as set.

- a) Counseling and testing (C&T) should be made a dual complementary package of services: one, the existing client-initiated Voluntary Counseling and testing (VCT), and the other, a provider-initiated universal counseling and testing (UCT). This latter package will enable under-utilized counselors and testers at VCT centers to engage in outreach services, home visits and mass counseling and testing sessions. Mobile outreach counseling and testing services have been shown to be very effective [15]. From our list of deductions made earlier, the high testing rate as well as the 9.25 - 11.47% of HIV-positive catchment it may generate are cost-effective.
- b) The location of C & T centers should be liberalized to include not only health facilities, but also other high client catchment sites such as government secretariats, stadia, parks, markets/shopping malls, ports and educational institutions as universities. For cost and efficiency considerations, 20 - 30% of the most under-utilized VCT centers in health facilities may be relocated to such other high client catchment sites.
- c) The corridor for medical referral to counseling and testing services should be expanded. This may be achieved by inclusion of HIV testing in Routine Medical Examination (RME). Through policy, operating guidelines or standing order, it should be prescribed that any client that has not done HIV test for the past one year must be medically referred for HIV test at the earliest interface with a medical practitioner.
- d) Maximum advantage should be taken of the current trend in information and communication technology (ICT). To the extent and success that technology is applied in contact tracing [16], it can also be applied in HIV/AIDS counseling and testing. Online counseling and support groups are already thriving in other countries [17]. They will also thrive in Nigeria. Real time, phone-in radio and television programs are modest starting points. Further expansion can be achieved using various smart-phone and computer-based interactive applications and platforms.
- e) Efforts should be scaled up to facilitate the establishment of more support groups of PLWHAs, targeting at least one support group per community.

This will provide needed proximity and easy access that will promote affiliation and participation of all PLWHAs within that constituency.

- f) The advancement made in HIV self-testing technology is a big boost. Interestingly, Nigeria has approved use of HIV self-test kits [18] which will provide accurate result in 20 minutes in the comfort of one's home. Depending on cost and affordability, this self-testing kit will accelerate the knowledge of HIV positive sero-status component of UNAIDS's 90-90-90 target. However, it cannot guarantee positive attitude change. But it can be improved upon to yield greater benefit by requiring an inscription on the test kit that provides link to a toll-free help-line. Such help-line will persuade the client to contact a nearby counselor, support group or medical practitioner for necessary follow-up actions.

## References

- [1] UNAIDS (2019). New Survey Result Indicates That Nigeria Has HIV Prevalence of 1.4%. Press Release, March 14, 2019. The Joint United Nations Programme on HIV/AIDS (UNAIDS). UNAIDS: un-paged. [https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2019/march/20190314\\_nigeria](https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2019/march/20190314_nigeria). Accessed September 14, 2022 @ 16.00 WAT.
- [2] UN (2015). Transforming Our World: The 2030 Agenda for Sustainable Development. Sustainable Development Goals (2015). United Nations Department of Economic and Social Affairs. The United Nations (UN). <https://sdgs.un.org/2030agenda> Accessed December 19, 2021 @ 11.05 WAT.
- [3] FMOH (2010). Technical Report 2010. National HIV Seroprevalence Sentinel Survey Among Pregnant Women Attending Antenatal Clinics in Nigeria. Abuja: Department of Public Health, National AIDS/STI Control Program. Federal Ministry of Health (FMOH).
- [4] NACA (2022). From the Darkest of Days to a New Dawn. 35 Years of the Nigerian Response to HIV and AIDS. Abuja: National Agency for the Control of AIDS (NACA), 2022. <https://naca.gov.ng/35-years-of-the-nigerian-response-to-hiv-and-aids/> Accessed September 14, 2022 @ 16.30 WAT.
- [5] NACA (2022 b). NACA Coordinates HIV Activities in Nigeria. HIV/AIDS Factsheet. Abuja: National Agency for the Control of AIDS (NACA). <https://naca.gov.ng> Accessed September 13, 2022 @ 20.15 WAT.
- [6] NESG (2021). Review of the Nigerian Economy in 2020 and Key Priorities for 2021 and Beyond. NESG Research. EPR Journal HI 2021. Nigerian Economic Summit Group (NESG). Retrieved from African Journals Online. <https://www.ajol.info/index.php/epr/article/view/217900/205508> Accessed September 15, 2022 @ 22.12 WAT.
- [7] World Bank (2020). Nigeria's Economy Faces Worst Recession in Four Decades, Says New World Bank Report. Press Release June 26, 2020. The World Bank. <https://www.worldbank.org/en/news/press-release/2020/06/25/nigerias-economy-faces-worst-recession-in-four-decades-says-new-world-bank-report> Accessed September 18, 2022 @ 00.25 WAT.
- [8] Akani N (2019). Implications and Effects of Insurgency and Counter-insurgency in Nigeria. (2019). Retrieved from RESEARCHGATE @ [https://www.researchgate.net/publication/336653390\\_IMPLICATIONS\\_AND\\_EFFECTS\\_OF\\_INSURGENCY\\_AND\\_COUNTER-INSURGENCY\\_IN\\_NIGERIA](https://www.researchgate.net/publication/336653390_IMPLICATIONS_AND_EFFECTS_OF_INSURGENCY_AND_COUNTER-INSURGENCY_IN_NIGERIA). Accessed September 18, 2022 by 0.40 WAT
- [9] FMOH (2003). Training Manual on HIV/AIDS Voluntary Counseling and Testing Services in Nigeria 2003. Lagos: Federal Ministry of Health (FMOH).
- [10] FMOH (2003 b). National Guidelines for HIV/AIDS Voluntary Counseling and Testing. Lagos: Federal Ministry of Health (FMOH).
- [11] Armstrong-Mensah EA, Tetteh AK, Ofori E and Ekhosuehi O. (2022). Voluntary Counseling and Testing, Antiretroviral Therapy Access, and HIV-related Stigma: Global Progress and Challenges. International Journal of Environmental Research and Public Health, 2022 19 (11), 6597. <https://doi.org/10.3390/ijerph19116597>
- [12] NAPHAM (2012). People Living With HIV Support Group Manual: NAPHAM's Practical Guide for Successful Support Group Formation, Management and Activities. March 2012. National Association of People Living with HIV and AIDS in Malawi (NAPHAM). [http://pdf.usaid.gov/pdf\\_docs/PAOOK456.pdf](http://pdf.usaid.gov/pdf_docs/PAOOK456.pdf) Accessed October 6, 2022 @ 4.20 WAT.
- [13] Doherty F (2022). Joining a Support Group is Vital for HIV/AIDS Victims – Doherty. Vanguard, March 4, 2022. <https://www.vanguardngr.com/2012/03/joining-a-support-group-is-vital-for-hiv-aids-victims-doherty/> Accessed October 6, 2022 @ 4.10 WAT.
- [14] Mazambara F, Chagwena D, Mudzviti T, Sithole S, Monera-Penduka T, Maponga CC, and Morse GD (2022). Utility of HIV Support Groups in Advancing Implementation Research in Resource-limited Settings: Experience From an Urban-setting HIV Support Group in Zimbabwe. AIDS Research and Therapy 19, 7 2022. <https://doi.org/10.1186/s12981-022-00431-w>
- [15] GhAIN (2007). Nigeria's President Leads by Example, Goes for HIV Counseling and Testing. GhAINing Ground. A Newsletter of the Global HIV/AIDS Initiative Nigeria (GhAIN). April 2007. Abuja: GhAIN.
- [16] O'Neill PH (2022). Apple and Google are Building Coronavirus Tracking into iOS and Android. Tech Policy. MIT Technology Review, April 10, 2022. <https://www.technologyreview.com/2020/04/10/999213/apple-and-google-are-building-coronavirus-tracking-into-ios-and-android/> Accessed October 9, 2022 @ 04.50 WAT.
- [17] Mitra S and Globerman J (2014). Rapid Response Service. Online Counseling and Support Groups for People Living With or Affected by HIV/AIDS. Toronto, ON: Ontario HIV Treatment Network; April 2014. <https://www.ohtm.on.ca/online-counseling-and-support-groups-for-people-living-with-or-affected-by-hiv-aids/> Accessed October 7, 2022 @ 13.20 WAT.
- [18] Owoseye A (2019). Nigerian Government Approves HIV Self-test Kit. PREMIUM Times Nigeria. April 12, 2019. <https://www.premiumtimesng.com/health/news/325180-nigerian-govt-approves-hiv-self-test-kit.html> Accessed October 6, 2022 @ 16.40 WAT.