



RESEARCH ARTICLE

REVISED Results of early warning indicators for HIV/AIDS in 42 outpatient clinics in 25 northern provinces of Vietnam [version 5; referees: 2 approved, 1 approved with reservations]

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Abstract

Background: The emergence of HIV drug resistance (HIVDR) is an unavoidable consequence of antiretroviral therapy (ART), and HIVDR early warning indicators (EWIs) could specifically assess factors at individual clinics associated with HIVDR. Thus, the present study aimed to collect data on EWIs for HIV/AIDS at 42 outpatient clinics (OPCs) in 25 northern provinces and cities of Vietnam in 2012.

Methods: A retrospective cohort study was conducted. Data was collected from 42 OPCs in 25 northern provinces between October and December 2012. The information was collected retrospectively from outpatient records from 2008 to 2011.

Results: In total, 99.8% ART patients were prescribed the correct regimen when starting ART treatment. All facilities met the target of under 20% patients lost to follow-up at 12 months. A total of 31/42 facilities reached the goal for on-time appointment keeping and 37/42 facilities achieved the target of first-line retention after 12-month ARV treatment.

Conclusions: EWIs should be performed routinely in HIV/AIDS facilities. The data collected will contribute to monitoring, supervision, periodic assessment, and future plans for HIV/AIDS care and treatment programs in the area.

Keywords

ARV, HIV drug resistance, outpatient clinics, early warning indicators


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REVISED Amendments from Version 4

We have revised the manuscript's Introduction, Methods, Results and Discussion sections based on Dr. Mukui's comments. In addition, we add a new author, Quynh Ngoc Hoang Le, to our manuscript as they have been involved in the conceptualisation and design of the study, supervising data collection and commenting on the manuscript.

See referee reports

Introduction

According to UNAIDS, the number of people living with HIV/AIDS globally has continuously increased and reached to approximately 33 million at end of 2009. The number of new infections in 2009 was 2.6 million, and the number of people living with HIV (PLHIV) rose from 8 million in 1990 to 33 million in 2009¹. Fortunately, the number of new infections and deaths caused by AIDS has significantly reduced thanks to antiretroviral treatment (ART). According to the World Health Organization, at the end of 2008, an estimated 4 million PLHIV were receiving ART in low-income and middle-income countries. Worldwide, ART coverage has increased from 7% in 2003 to 42% in 2009².

In recent years, the Vietnam Government has performed many solutions to respond the HIV epidemic¹. As of December 2011, there was a total of 318 antiretroviral (ARV) treatment facilities nationwide, including 287 outpatient clinics (OPCs) for adults and 118 ARV treatment facilities for children. The total number of HIV infected persons on antiretroviral therapy increased to 60,000 in December 2011, a 25 fold increase compared to the end of 2005^{3,4}.

According to the national plan regarding preventing and monitoring HIV drug resistance (HIVDR) in 2008–2012, Vietnam collects early warning indicators (EWIs) for HIVDR annually. This important activity not only contributes to the prevention and monitoring of HIVDR, but also supports the usage of available data to monitor and evaluate HIV/AIDS care and treatment programs, in order to improve the quality of service delivery. In this study, we collected and analyzed data on HIVDR EWIs in 42 HIV/AIDS treatment facilities in 25 northern provinces of Vietnam in 2012. The results of this study evaluate HIV/AIDS treatment effectiveness based on care and treatment national indicators.

Methods

Study design and settings

A cross-sectional study was conducted between October and December 2012 in 25 northern provinces, including: Bac Giang, Bac Kan, Bac Ninh, Cao Bang, Dien Bien, Ha Giang, Ha Nam, Ha Noi, Hai Duong, Hai Phong, Hoa Binh, Hung Yen, Lang Son, Nam Dinh, Ninh Binh, Nghe An, Phu Tho, Quang Ninh, Son La, Thai Binh, Thai Nguyen, Thanh Hoa, Tuyen Quang, Vinh Phuc and Yen Bai. OPCs met the following inclusion criteria would be included in the study:

- Regarding administrative units: included urban and rural facilities.

- Regarding patients at the facilities: included adults and children.
- Regarding care and treatment supported agencies: included institutions under the National target programs; Global Fund and President's Emergency Plan for AIDS Relief (PEPFAR) funding.

We involved all OPCs that met the inclusion criteria. The study sites were selected using proportional-to-size sampling method. We developed a list of sites at 2 stratas: provincial and districts and randomly selected the sites within each strata. A total of 42 OPCs in these provinces were selected.

Variables and measurements

EWI systems has been implemented according to the guidelines of the Vietnam Authority of HIV/AIDS Control (VAAC), Ministry of Health⁵. EWI data was extracted by the research team using a data collection form that was developed by VAAC (Supplementary File 1). HIV drug resistance EWIs collected in the present study, from the OPCs, included: percentage of patients that were prescribed the correct regimen when starting ART treatment; percentage of ART patients that were lost to follow-up after 12 months; percentage of patients that arrived on time for a doctor's appointment; and percentage of patients that retained first-line ART after 12 months of treatment.

Statistical analysis

Excel 2010 software (Microsoft Corp.) was used to clean and analyze the data. Descriptive statistical analysis, including frequency and percentage, was used to analyze the data.

Ethical approval

The study received ethical approval from VAAC, Ministry of Health. Data collection procedures and the use of data for analysis were also approved by the directors of the OPCs. No personal patient data was collected in this study.

Results

Table 1 describes EWIs in 42 HIV/AIDS facilities in 2012. Regarding the percentage of patients that were prescribed the correct regimen when starting ART treatment, EWIs for HIVDR showed that 7/42 facilities did not reach the target of patients receiving prescriptions for ART, congruent with national guidelines⁵. Regarding patients that abandoned ART treatment after 12 months, only Cao Bang Hospital had a relatively high proportion (15.79%). All facilities (100%) reached the target of <20% of patients lost to follow-up after 12 months of treatment.

Some facilities had very low rate of patients arriving on time for appointments, such as Pho Yen, Thai Nguyen, Cao Loc - Lang Son (Table 2). Data regarding patient appointments could not be collected at Yen Hung Hospital, Quang Ninh, because this hospital did not make appointments with patients. Regarding the rate of patients retaining on a first line ARV regimen after 12 months of treatment, only a few facilities did not achieve its objectives, including Dai Tu, Thai Nguyen, Hung Yen provincial AIDS center, Thanh Hoa hospital.

Table 1. Description of early warning indicators in 42 HIV/AIDS facilities in 2012 regarding receiving correct ART regimen when starting treatment and loss to follow-up after 12 months.

| | Outpatient clinic | Received correct ART regimen when starting treatment | | | Loss to follow-up after 12 months | | |
|---------------|-----------------------------------------------------|------------------------------------------------------|----------------|-------------|-----------------------------------|----------------|-------------|
| | | 1–12/2011 | | | 1–12/2011 | | |
| | | Target = 100% | | | Target ≤ 20% | | |
| | | N ^a | N ^b | % | N ^c | N ^d | % |
| 1 | Bac Giang AIDS Center | 53 | 53 | 100 | 1 | 14 | 7.1 |
| 2 | National Hospital of Tropical Diseases | 262 | 264 | 99.3 | 6 | 194 | 3.1 |
| 3 | National Pediatric Hospital | 93 | 94 | 100 | 0 | 95 | 0.0 |
| 4 | Dong Da Hospital, Hanoi | 167 | 168 | 100 | 3 | 125 | 2.4 |
| 5 | Dong Anh, Hanoi | 94 | 94 | 100 | 4 | 106 | 3.8 |
| 6 | Tu Liem, Hanoi | 46 | 46 | 100 | 0 | 52 | 0.0 |
| 7 | Long Bien, Hanoi | 59 | 59 | 100 | 1 | 53 | 1.9 |
| 8 | Hai Duong AIDS Center | 139 | 139 | 100 | 14 | 144 | 9.7 |
| 9 | Viet Tiep Hospital, Hai Phong | 153 | 153 | 100 | 10 | 215 | 4.7 |
| 10 | Hai Phong Padiatric Hospital | 16 | 17 | 100 | 0 | 25 | 0.0 |
| 11 | Le Chan, Hai Phong | 63 | 63 | 100 | 0 | 83 | 0.0 |
| 12 | An Duong, Hai Phong | 27 | 27 | 99.2 | 0 | 32 | 0.0 |
| 13 | Hung Yen AIDS Center | 36 | 36 | 99.8 | 2 | 23 | 8.7 |
| 14 | Cao Loc, Lang Son | 32 | 32 | 99.4 | 3 | 40 | 7.5 |
| 15 | Giao Thuy, Nam Dinh | 26 | 26 | 100 | 0 | 18 | 0.0 |
| 16 | Ninh Binh AIDS center | 114 | 114 | 100 | 0 | 74 | 0.0 |
| 17 | Nghe An General Hospital | 232 | 232 | 100 | 6 | 217 | 2.8 |
| 18 | Nghe An Pediatric Hospital | 12 | 12 | 100 | 0 | 16 | 0.0 |
| 19 | Phu Tho Health Commune, Phu Tho | 69 | 69 | 100 | 3 | 75 | 4.0 |
| 20 | Vietnam Sweden Uong Bi General Hospital, Quang Ninh | 33 | 33 | 94.1 | 2 | 62 | 3.2 |
| 21 | Quang Ninh General Hospital | 129 | 129 | 100 | 8 | 165 | 4.8 |
| 22 | Yen Hung, Quang Ninh | 32 | 32 | 100 | 1 | 35 | 2.9 |
| 23 | Mai Son, Son La | 161 | 161 | 100 | 15 | 111 | 13.5 |
| 24 | Pho Yen, Thai Nguyen | 74 | 74 | 100 | 5 | 97 | 5.2 |
| 25 | Dai Tu, Thai Nguyen | 67 | 67 | 100 | 8 | 82 | 9.8 |
| 26 | Thanh Hoa General Hospital | 10 | 10 | 100 | 2 | 17 | 11.8 |
| 27 | Vinh Phuc AIDS center | 108 | 108 | 100 | 2 | 62 | 3.2 |
| 28 | Yen Bai General Hospital | 20 | 20 | 100 | 0 | 27 | 0.0 |
| 29 | Cao Bang General Hospital | 21 | 21 | 100 | 6 | 38 | 15.8 |
| 30 | Cho Moi, Bac Can | 16 | 16 | 100 | 0 | 15 | 0.0 |
| 31 | Bac Ninh General Hospital | 73 | 73 | 100 | 0 | 64 | 0.0 |
| 32 | Tuan General Hospital | 181 | 181 | 100 | 26 | 232 | 11.2 |
| 33 | Ha Giang HIV/AIDS prevention center | 83 | 84 | 98.8 | 1 | 7 | 14.3 |
| 34 | Ly Nhan Health Center, Hanoi | 23 | 23 | 100 | 0 | 8 | 0.0 |
| 35 | Ha Dong Hospital, Hanoi | 90 | 90 | 100 | 0 | 122 | 0.0 |
| 36 | Tay Son Hospital, Hanoi | 46 | 46 | 100 | 2 | 38 | 5.3 |
| 37 | Chi Linh Health Center | 9 | 9 | 100 | 1 | 12 | 8.3 |
| 38 | Hoa Binh General Hospital | 143 | 144 | 99.3 | 5 | 124 | 4.0 |
| 39 | Health Center, Nam Dinh City | 13 | 13 | 100 | 0 | 9 | 0.0 |
| 40 | Health Center, Kien Xuong District | 35 | 35 | 100 | 1 | 21 | 4.8 |
| 41 | Health Center, Ngoc Lac District | 77 | 77 | 100 | 3 | 81 | 3.7 |
| 42 | Health Center, Yen Son District | 25 | 25 | 100 | 0 | 7 | 0.0 |
| Totals | | 3162 | 3169 | 99.8 | 141 | 3167 | 4.45 |

a: Number of patient received correct ART regimen when starting treatment; b: Number of patients starting treatment; c: Number of patients lost to follow-up after 12 months of treatment; d: Number of patients registered in the cohort

Table 2. Description of early warning indicators in 42 HIV/AIDS facilities in 2012 regarding patients arriving on time for appointments in in the last quarter of 2011 and retaining on first-line ARV regimen after 12 months of treatment.

| | Outpatient clinic | Patients arriving on time for appointments in last quarter of 2011 | | | Retaining on first-line ART regimen after 12 months of treatment | | |
|----|-----------------------------------------------------|--------------------------------------------------------------------|----------------|-------------|------------------------------------------------------------------|----------------|-------------|
| | | 10–12/2011 | | | 1–12/2011 | | |
| | | Target ≥ 80% | | | Target ≥ 70% | | |
| | | N ^a | N ^b | % | N ^c | N ^d | % |
| 1 | Bac Giang AIDS Center | 100 | 100 | 100.0 | 12 | 14 | 85.7 |
| 2 | National Hospital of Tropical Diseases | 141 | 187 | 75.4 | 193 | 194 | 99.5 |
| 3 | National Pediatric Hospital | 120 | 130 | 92.3 | 67 | 95 | 70.5 |
| 4 | Dong Da Hospital, Hanoi | 152 | 155 | 98.1 | 117 | 125 | 93.6 |
| 5 | Dong Anh, Hanoi | 153 | 155 | 98.7 | 97 | 106 | 91.5 |
| 6 | Tu Liem, Hanoi | 151 | 153 | 98.7 | 46 | 52 | 88.5 |
| 7 | Long Bien, Hanoi | 101 | 110 | 91.8 | 42 | 53 | 79.2 |
| 8 | Hai Duong AIDS Center | 126 | 144 | 87.5 | 115 | 144 | 79.9 |
| 9 | Viet Tiep Hospital, Hai Phong | 150 | 176 | 85.2 | 170 | 215 | 79.1 |
| 10 | Hai Phong Padiatric Hospital | 74 | 100 | 74.0 | 24 | 25 | 96.0 |
| 11 | Le Chan, Hai Phong | 123 | 125 | 98.4 | 80 | 83 | 96.4 |
| 12 | An Duong, Hai Phong | 100 | 100 | 100.0 | 32 | 32 | 100.0 |
| 13 | Hung Yen AIDS Center | 49 | 51 | 96.1 | 11 | 23 | 47.8 |
| 14 | Cao Loc, Lang Son | 39 | 125 | 31.2 | 36 | 40 | 90.0 |
| 15 | Giao Thuy, Nam Dinh | 83 | 94 | 88.3 | 15 | 18 | 83.3 |
| 16 | Ninh Binh AIDS center | 95 | 102 | 93.1 | 71 | 74 | 95.9 |
| 17 | Nghe An General Hospital | 118 | 160 | 73.8 | 179 | 217 | 82.5 |
| 18 | Nghe An Pediatric Hospital | 60 | 63 | 95.2 | 14 | 16 | 87.5 |
| 19 | Phu Tho Health Commune, Phu Tho | 94 | 110 | 85.5 | 64 | 75 | 85.3 |
| 20 | Vietnam Sweden Uong Bi General Hospital, Quang Ninh | 130 | 131 | 99.2 | 57 | 62 | 91.9 |
| 21 | Quang Ninh General Hospital | 174 | 175 | 99.4 | 132 | 165 | 80.0 |
| 22 | Yen Hung, Quang Ninh | | NA | | 28 | 29 | 80.2 |
| 23 | Mai Son, Son La | 92 | 119 | 77.3 | 89 | 111 | 80.2 |
| 24 | Pho Yen, Thai Nguyen | 56 | 129 | 43.4 | 79 | 97 | 81.4 |
| 25 | Dai Tu, Thai Nguyen | 101 | 110 | 91.8 | 57 | 82 | 69.5 |
| 26 | Thanh Hoa General Hospital | 81 | 83 | 97.6 | 8 | 17 | 47.1 |
| 27 | Vinh Phuc AIDS center | 119 | 120 | 99.2 | 48 | 62 | 77.4 |
| 28 | Yen Bai General Hospital | 69 | 72 | 95.8 | 22 | 27 | 81.5 |
| 29 | Cao Bang General Hospital | 75 | 75 | 100.0 | 26 | 38 | 68.4 |
| 30 | Cho Moi, Bac Can | 33 | 33 | 100.0 | 15 | 15 | 100.0 |
| 31 | Bac Ninh General Hospital | 93 | 112 | 83.0 | 59 | 64 | 92.2 |
| 32 | Tuan General Hospital | 84 | 120 | 70.0 | 158 | 232 | 68.1 |
| 33 | Ha Giang HIV/AIDS prevention center | 30 | 43 | 69.8 | 2 | 7 | 28.6 |
| 34 | Ly Nhan Health Center, Hanoi | 58 | 63 | 92.1 | 8 | 8 | 100.0 |
| 35 | Ha Dong Hospital, Hanoi | 102 | 140 | 72.9 | 110 | 122 | 90.2 |
| 36 | Tay Son Hospital, Hanoi | 73 | 82 | 89.0 | 28 | 38 | 73.7 |
| 37 | Chi Linh Health Center | 42 | 75 | 56.0 | 9 | 12 | 75.0 |
| 38 | Hoa Binh General Hospital | 142 | 143 | 99.3 | 99 | 124 | 79.8 |
| 39 | Health Center, Nam Dinh City | 102 | 102 | 100.0 | 9 | 9 | 100.0 |
| 40 | Health Center, Kien Xuong District | 55 | 61 | 90.2 | 21 | 21 | 100.0 |
| 41 | Health Center, Ngoc Lac District | 92 | 111 | 82.9 | 67 | 81 | 82.7 |
| 42 | Health Center, Yen Son District | 43 | 43 | 100.0 | 6 | 7 | 85.7 |
| | Totals | 3875 | 4482 | 88.1 | 3034 | 2522 | 83.1 |

a: Number of patients arriving on time for appointments in last quarter of 2011; b: Number of patients having appointments in last quarter of 2011; c: Number of patients retaining ART after 12 months of treatment; d: Number of patients registered in the cohort

Dataset 1. Raw data used in the construction of Table 1 and Table 2

<http://dx.doi.org/10.5256/f1000research.11010.d157508>

Datasets from early warning indicator systems detailing number of patients starting ART; number of patients in cohort; number of patients lost to follow-up; number of patients retaining ART treatment; number of patients receiving correct regime; number of patients having appointments in last quarter of 2011; and number of patients keeping appointments. on-time.

Discussion

This study aimed to interpret results after collecting HIVDR EWIs at 42 HIV/AIDS treatment facilities in 25 northern provinces of Vietnam in 2012. The findings indicate that 35/42 (83.3%) of facilities reached the goal for patients receiving prescriptions for ART congruent with national guidelines, and 100% of facilities reached the target of <20% of patients lost to follow-up after 12 months. In addition, 31/42 (73.8%) facilities reached the goal for patients arriving on time for appointments, 1/42 (2.38%) facilities had no data (NA) for patients arriving on time for appointments and 37/42 (88.1%) facilities achieved the target for first line retention after a 12-month ARV treatment. These figures are higher in comparison with other Asian countries, found in a multi-country survey by the WHO - among 1048 clinics, 64–80% reached the goals of the EWIs⁶.

Several implications are drawn from this study. First, since the data about EWIs could be used to optimize the ART program⁶, based on the result of this study, clinics that have a low performance should identify their weaknesses and find corresponding solutions to improve their services. Second, several achievements that were reported in this study should be maintained by the OPCS, including maintaining that all patients receive correct ARV regimens on admission, and continuing a patient roll-out rate of $\leq 20\%$. Finally, all facilities should regularly review treatment-related data regarding treatment monitoring and EWIs of HIVDR, and issuing data collection activity of HIVDR EWIs should become a routine activity in clinics. Health care providers should address the reasons patients dropped out of treatment regimens, and why patients did not come to follow-up appointments. This could help to improve the quality of service delivery and optimize the benefits of ARV treatment.

Supplementary material

Supplementary File 1: Data collection form developed by Vietnam Authority of HIV/AIDS Control, used to collect data about early warning indicators from outpatient clinics.

[Click here to access the data.](#)

The recording, management and writing of medical records during the data collection processes in old facilities (facilities collecting data from 2011 and earlier) has improved greatly. However, there are several problems related to arranging and writing medical records in facilities collecting data from 2012 and onwards. Therefore, finding data entries and medical records is very difficult and this could affect the quality of services.

Conclusions

Our study suggests that two in four outcomes measured in the OPCs reached standard goals, according to national guidelines, including: percentage of patients that were lost to follow-up after 12 months and percentage of patients that retained on first-line ART regimen after 12 months of treatment. These remarkable achievements should be maintained. In addition, other two indicators should be improved by identifying the reasons in both the provider and patient's perspectives.

Data availability

Dataset 1: Raw data used in the construction of Table 1 and Table 2. Datasets from early warning indicator systems detailing number of patients starting ART; number of patients in cohort; number of patients lost to follow-up; number of patients retaining ART treatment; number of patients receiving correct regime; number of patients having appointments in last quarter of 2011; and number of patients keeping appointments on-time. doi, [10.5256/f1000research.11010.d157508](https://doi.org/10.5256/f1000research.11010.d157508)⁷

Author contributions

HTL, LTLD, DKP, QNHL, HPD, HLTN conceived of the study, and participated in its design and implementation and wrote the manuscript. HTL, LTLD analyzed the data. All authors read and approved the final manuscript.

Competing interests

No competing interests were disclosed.

Grant information

The author(s) declared that no grants were involved in supporting this work.

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We would like to express our deepest gratitude for the great contribution of authorship to complete this study.

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[Reference Source](#)
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[Data Source](#)

Open Peer Review

Current Referee Status:   

Version 5

Referee Report 30 May 2018

doi:10.5256/f1000research.13922.r34000



Pham Minh Khue 

Hai Phong University of Medicine and Pharmacy, Haiphong, Vietnam

The manuscript, while very simply descriptive and short, provides interesting information on early warning indicators for HIV/AIDS in 42 outpatient clinics in 25 northern provinces of Vietnam.

The introduction provides sufficient understanding of the topic and orientates the reader to the pattern of HIVDR as well as EWIs in Vietnam. However, the background data should be up to date, the authors provided more data from 2009 to 2012 and we will publish nowadays on 2018.

The first paragraph on HIV epidemic in the world may be shortened to put the reader in the situation. However, the number of people who live with HIV in Vietnam should be cited to show the current state and the coverage of ART in Vietnam.

The discussion should be revised to compare results with other countries and the meaning of the results should be discussed more in depth, as it may show how the data would be useful for Vietnam, how this can be comparable with other countries, and why this needs to be published.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Referee Expertise: Public Health, HIV, HCV prevention, Drug use

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Referee Report 29 January 2018

doi:[10.5256/f1000research.13922.r27426](https://doi.org/10.5256/f1000research.13922.r27426)



Irene N. Mukui 

National AIDS & STI Control Program, Ministry of Health, Nairobi, Kenya

Thank you for responding to my review

The draft is improved. I however feel a number of areas were not addressed. For example multiple grammatical errors still exist and I recommend that a native English speaker reviews the final paper.

In addition the authors in some areas responded to my comments instead of integrating them into the paper e.g defining indicators was not added to the method section.

I still find some grammatical errors in the manuscript.

For example in the Introduction:

“In recent years, the Vietnam Government has performed many solutions to respond the HIV epidemic” > This statement would better read “ In recent years the Government has implemented / or put in place multiple interventions / or has put in place in multiple strategies to respond to the epidemic.”

Methods section

Do not start statements with abbreviations ... for example ... OPCs met the following criteria.. Instead write out OPCs in full..

Or statements starting with “EWI please write this in full.

Secondly, the statement on the criteria would read better ... for example “Outpatient clinics included in the sampling included rural and urban health facilities, clinics providing treatment to adults and children and clinics under the National target programs, those supported by the Global Fund and President’s Emergency Plan for AIDS Relief (PEPFAR) funding. (authors can use their own words however)

Results section

I still find this section deficient in the manner it is written.

4 EWIs were assessed

Data for the 4 EWIs should be presented consecutively and results summarized in the narrative. As currently presented the reader would have to download the results to understand what proportion of facilities met the target. In addition, the abstract talks about patients meeting targets, while results section talks about facilities only. The authors need to decide what to present and ensure consistency between abstract and results section.

Discussion

Results in the discussion should have been captured in the results section instead of discussion. The discussion should focus on elaborating what results mean, what have other similar studies observed, what are the implications of findings

Competing Interests: No competing interests were disclosed.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Version 4

Referee Report 01 September 2017

doi:10.5256/f1000research.13203.r25243



Irene N. Mukui 

National AIDS & STI Control Program, Ministry of Health, Nairobi, Kenya

There are some grammatical errors that need correction and other errors in the article that need to be addressed.

- In the Introduction " Although Vietnam is among the most-at-risk countries for HIV1, the government has responded to HIV epidemics" .. it is not clear whether this statement was meant to mean that the Government has responded well or appropriately to the Epidemic, kindly relook at this statement and also delete 'S' from epidemic unless you meant multiple
- "The total number of HIV infections treated with ARV was increased to 60.000, an increase of 25 times compared to the end of 2005". I would recommend rewording this statement to something like "The total number of HIV infected persons on antiretroviral therapy increased to 60,000 in December 2011, a 25 fold increase compared to the end of 2005.
- Last statement in the Introduction: Within the framework of the Global Fund supported project on HIV/AIDS, we conducted this study to interpret results after collecting HIVDR EWIs at 42 HIV/AIDS treatment facilities in 25 northern provinces of Vietnam in 2012. The results of this study evaluate HIV/AIDS treatment effectiveness based on care and treatment national indicators. Recommend that you reword this statement for better clarity..... for example, "We collected and analyzed data on HIVDR EWIS in 42 HIV/ AIDS treatment facilities in 25 northern provinces of Vietnam in 2012. The results of.... "

Methods section

- How were study facilities selected? Of the over 300 ART sites, how did you select 42 sites? Was it random, was there some form of stratification? Were there nationally representative? Please describe this

- Ethical approval: was given by Vietnam Authority of HIV/AIDS Control (VAAC). For my own purposes just clarifying that this provides ethical approval for studies?
- Variables and measurements: I think this section should be clearly on definition of some of the indicators e.g what did arriving on time for doctors appointment mean? Did it mean attending appointments on or before the appointment date or was there some allowance of some time or grace period after appointment date. Secondly why is the data analysed only for one quarter and not for the entire study period for this indicator and not over 12 months as two of the other indicators or is this how data was collected.

Results section

- I am not clear why the data is presented in Table 1 and 2 because both refer to clinic performance
- Secondly there is inconsistency between the methods section and results section. The methods section talks about 5 indicators including "availability of antiretroviral drugs in facilities" but no clear data is presented for this indicator in the table. How was this indicator defined? If the team was using WHO EWI indicators, these are clearly defined and they should make a reference to that
- The second statement in results section is confusing: " Regarding the availability of antiretroviral drugs, EWIs for HIVDR showed that 7/42 facilities did not reach the target of patients receiving prescriptions for ART, congruent with national guidelines". It is unclear what results this section is referring to ... does availability mean stock outs? If so what does patients receiving prescriptions for ART mean - this suggest correct 1st line regimen? I suggest that you define in the methods section what you mean by each indicator and then be systematic in presentation of results from 1st to last EWI as per table flow. I still cannot find the results for availability of ART at health facilities.

Discussion section

- Paragraph 2 " Third, health care providers in ARV facilities should ensure that there are no ARV drug shortages in order that patients are sufficiently provided. It is important to ensure a minimum of 80% of patients receive ARV drugs as scheduled. This could be performed by enhancing outpatient records to track medication dispensing history" ... This does not seem to be supported by any data presented in the results section. Recheck , there is no data presented on stock outs and neither do the presented results suggest there were stock outs. As such it doesn't seem to me that this point is very relevant to the discussion. Keep the discussion to your findings

Conclusion

- The conclusion suggests that all targets were met by the OPCs , however this is not supported by the data.
- Target for prescribing according to guidelines is 100- only 83% of clinics met target
- Target for patients arriving on time for appointments is > 80 %- only 73% of clinics met this target

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Not applicable

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 04 Oct 2017

Huyen Phuc Do, Duy Tan University, Vietnam

Dear Dr. Mukui,

Thank you very much for your suggestion. We have amended the manuscript according to your comments:

- **In Introduction section:** We have revised the sentence as your suggestion to make them more clearly.

- **In Method section:**

+) The study sites were selected using proportional-to-size sampling method. We developed a list of sites at 2 stratas: provincial and districts and randomly selected the sites within each stratas.

+) The ethical approval was provided by the IRB of VAAC

+) The definitions of variables have followed the instruction of World Health Organization. For example, the variable "arriving on time for doctors appointment" mean that the patients did not late the appointment date. This indicator was assessed in the period from Oct to Dec because at this time, this indicator was first implemented in Oct 2011, therefore we only had data from Oct to Dec.

- **In Result section:**

+) The data is presented in Table 1 and Table 2 in order to make the table not having too much data, so the readers can easily follow the result.

+) We have removed the indicator "availability of antiretroviral drugs in facilities" because it did not relate to the manuscript

+) We have also removed the statement that was related to "availability of antiretroviral drugs in facilities" in the first paragraph of the result section

- In Discussion section:

+) We have checked and removed the sentences that were not appropriate.

- In conclusion

+) We have corrected the conclusion according to your suggestion.

Sincerely,

Authors

Competing Interests: No competing interests were disclosed.

Referee Report 21 July 2017

doi:10.5256/f1000research.13203.r24374



Nghia Van Khuu

Department for Disease Control and Prevention, Pasteur Institute Hochiminh City, Ho Chi Minh City, Vietnam

Competing Interests: No competing interests were disclosed.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 3

Referee Report 18 July 2017

doi:10.5256/f1000research.13114.r24089



Nghia Van Khuu

Department for Disease Control and Prevention, Pasteur Institute Hochiminh City, Ho Chi Minh City, Vietnam

The authors have addressed almost all my comments. However, there is still one mistake in abstract need to be corrected. i.e., Results: "...A total of 33/42 facilities reached the goal for on-time appointment keeping". The number should be 31/42 according to Table 2 and Discussion section.

I think this manuscript is ready for to be indexed after correcting one minor error as stated above.

Competing Interests: No competing interests were disclosed.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Author Response 18 Jul 2017

Huyen Phuc Do, Duy Tan University, Vietnam

Dear Dr. Nghia,

Thank you very much for your suggestion. We have amended the abstract according to your comment.

Sincerely,

Authors

Competing Interests: No competing interests were disclosed.

Version 1

Referee Report 13 June 2017

doi:[10.5256/f1000research.11871.r22968](https://doi.org/10.5256/f1000research.11871.r22968)



Nghia Van Khuu

Department for Disease Control and Prevention, Pasteur Institute Hochiminh City, Ho Chi Minh City, Vietnam

Strengths: The paper has described some early warning indicators (EWI) recorded at 42 outpatient clinics (OPC) in northern Vietnam, assisting on having better directions for minimizing risks for HIV drug resistance given the growing widespread of antiretro therapy (ART).

Weak points and suggestions for revision: the paper has some points in need of being re-considered:

- **Introduction:** paragraph 2, the authors wrote, "As of December 2011, (.....). The total number of HIV infections treated with ARV was increased to 600, an increase of 25 times..." The number 600 seems not to be correct because, as of 2011, more than 60,000 HIV cases were reported to get ART according to a VAAC report. The authors should check information and revise the number accordingly.
- **Methods:** There were inconsistencies between assessing indicators and outcomes. In the paragraph "Variables and measurements", the paper listed only four indicators, including (1) percentage of patients that were prescribed the correct regimen when starting ART treatment; (2) percentage of ART patients that were lost to follow-up after 12 months; (3) percentage of patients that arrived on time for a doctor's appointment; and (4) percentage of patients that retained first-line ART after 12 months of treatment whereas in RESULTS section, there is one additional indicator entitled "the availability of antiretroviral drugs". However, the latter indicator has not been described and discussed thereafter. The authors should provide additional information for this

indicator in the method, results and discussion sections.

- **Results:** Information described in the results section are not compatible with those in the data table. In paragraph 2 of Results section, the paper has the OPC name as “Quang Yen Hospital, Quang Ninh” whereas Table 2 reported the information as “Yen Hung, Quang Ninh”. Information in descriptive words and in the table should be consistent.
- **Discussion:** The authors wrote, “33/42 (78.6%) facilities reached the goal for patients arriving on time for appointments” but data in Table 2 revealed that only 31/42 OPC reached the goal for patients arriving on time for appointments and 1/42 OPC had no data (N/A). We suggest the authors review and revise information to correct this.

In short, the paper is not well-cohesive and information insufficient. The outcomes described in results section are quite simple, but few indicators unstated in the former sections have been discussed in DISCUSSION section. Moreover, the limitation section has been intertwined into the results section, making it more or less difficult for readers to follow through. The authors should re-structure information pieces to appropriate order to make the paper more cohesive.

Is the work clearly and accurately presented and does it cite the current literature?

Partly

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Not applicable

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

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