

Original Article

Evaluation of the incompleteness of admission forms for people living with HIV assisted at a Counseling and Testing Center in the countryside of the state of Bahia*Avaliação da completude de formulários de admissão de pessoas vivendo com HIV em um Centro de Testagem e Aconselhamento do interior da Bahia*

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ABSTRACT: *Introduction:* The admission forms for people living with human immunodeficiency virus (PLHIV), assisted at a Counseling and Testing Center (CTC), represent important sources of strategic information that, when properly completed, can contribute to policy planning and adequate allocation of public resources. *Objective:* To evaluate the completeness of PLHIV admission forms, assisted at a CTC located in the interior of state of Bahia from 2003 to 2019. *Method:* This is a retrospective, descriptive analytical study, based on secondary data. *Results:* Three hundred five forms of PLHIV were analyzed. Of the 29 variables analyzed, only eight (27.6%) presented completeness of “excellent” or “good” quality. However, the general mean of non-completion was 39.9% ± 11.3%, showing a “bad” quality. All behavioral characteristics showed “very bad” quality of completeness. The clinical-laboratory category also demonstrated a “bad” quality for the variables T CD4⁺, T CD8⁺ and T CD45⁺ lymphocytes. *Conclusion:* Greater investments are needed in the training of health professionals, aiming to carry out a complete, valid, high coverage and reliable record with the potential to support assistance, administrative and managerial decisions.

Keywords: Acquired immunodeficiency syndrome; HIV; Health evaluation; Health information systems.

RESUMO: *Introdução:* Os formulários de admissão de pessoas vivendo com o vírus da imunodeficiência humana (PVHIV), assistidas em um Centro de Testagem e Aconselhamento (CTA), representam importantes fontes de informações estratégicas que, quando bem preenchidos, podem contribuir com o planejamento de políticas públicas e alocação adequada de recursos públicos. *Objetivo:* Avaliar a completude dos formulários de admissão de PVHIV, assistidas em um CTA localizado no interior do estado da Bahia, durante o período de 2003 a 2019. *Método:* Trata-se de um estudo retrospectivo, descritivo analítico, baseado em dados secundários. *Resultados:* Analisou-se 305 formulários de PVHIV. Das 29 variáveis analisadas, oito (27,6%) apresentaram completude de qualidade “excelente” e “boa”. No entanto, a média geral de não preenchimento foi de 39,9% ± 11,3%, evidenciando uma qualidade “ruim”. Todas as características comportamentais apresentaram qualidade de completude “muito ruim”. A categoria clínico-laboratorial também demonstrou uma qualidade “ruim” para as variáveis linfócitos T CD4⁺, T CD8⁺ e T CD45⁺. *Conclusão:* Faz-se necessário maiores investimentos na capacitação dos profissionais de saúde, visando a realização de um registro completo, válido, de alta cobertura e confiabilidade com potencial para subsidiar decisões assistenciais, administrativas e gerenciais.

Descritores: Síndrome da imunodeficiência adquirida; HIV; Avaliação em saúde; Sistema de informação em saúde.

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INTRODUCTION

Health information is a fundamental resource to understand the socio-epidemiological reality of users assisted by health services, ensuring the planning of actions, programs, and public policies that are more assertive in supplying the population's demands¹. When well structured and used by managers and health professionals, it provides support for decision-making, facilitating the identification of priorities, improving the quality of assistance, and also the development of scientific knowledge through studies and research².

However, poor quality information can make the entire planning process unfeasible, leading to errors in decision-making. To this end, numerous criteria have already been proposed to assess the quality of information sources. According to Correia et al.³ the coverage capacity, reliability and completeness of the data are fundamental elements for a piece of information to have its quality assured. On the other hand, Lima et al.⁴ also consider validity, consistency, accessibility, and non-duplication as essential criteria for analyzing the quality of data and information generated. Even in the face of different types of indicators associated with data quality, the studies are unanimous in defending the completeness of information as one of the main tools in monitoring collection instruments and/or database^{2,5-7}.

Infection by the human immunodeficiency virus (HIV) is considered one of the biggest public health problems in the world and is set as being a pandemic difficult to control with high morbidity and mortality. It is also revealed an epidemic of multiple dimensions that have been different in terms of epidemiological profile over time. According to studies of Brito et al.⁸, Cabral et al.⁹ and Silva et al.¹⁰ there is a significant change in the socio-epidemiological patterns of people living with HIV (PLHIV), such as the phenomena of feminization, interiorization, pauperization and heterosexualization, conditions that need to be evaluated at the local level. These changes require health managers and workers to make constant efforts to identify the care profile, and specificities for the restructuring of public policies and the provision of health actions and services so that they can meet current needs and demands¹¹.

Thus, it is imperative to assess the quality of information available in medical records and/or admission forms for services that serve PLHIV in the Unified Health System (UHS), which can be measured indirectly by analyzing the validity of the information, as well as by evaluating the completeness of the fields for filling in the referred data collection instruments¹².

In the Health Care Network (RAS) from the UHS,

the Counseling and Testing Center (CTC) have as their main actions universal access to testing and counseling on HIV/AIDS, sexually transmitted infections (STIs), and viral hepatitis (VH), as well as strengthening combined HIV prevention interventions and health education for all service-seekers. In this logic, the CTCs are configured as specialized care services for people with HIV/AIDS, STIs, and VH, which carry out preventive, diagnostic, and therapeutic actions aimed at referenced individuals and/or those who seek care on demand¹³.

When analyzing the completeness of PLHIV clinical records assisted in a CTC, different possibilities and strategic elements can be created to improve the planning, implement and evaluate the actions taken in the service. Thus, studies of this nature contribute to optimizing data collection and recording, by raising awareness and training the professionals involved as a way to provide greater appreciation and commitment of operators in filling out the forms. In this context, the present study aimed to evaluate the completeness of PLHIV admission forms assisted in a CTC in the countryside of the state of Bahia.

METHODS

This is a retrospective, descriptive and analytical study, based on secondary data from the physical records of users registered at the Counseling and Testing Center/Specialized Assistance Service (CTC/SAE) in the municipality of Paulo Afonso, Bahia, Brazil.

Paulo Afonso is a medium-sized town located in the countryside of Bahia, 480 km from the capital Salvador, with an estimated population of 118,526 inhabitants¹⁴. It is part of the Mesoregion Vale do São Francisco and borders several small towns, whose residents depend directly on the region's health services, including the specialized HIV care service provided by the CTC/SAE¹⁵. A recent study showed that in the respective municipality, between 1996 and 2019, 301 PLHIV were identified, with an average of 12.5 ± 9.6 cases/year¹⁶.

The study population consisted of all PLHIV registered and assisted at the CTC/SAE in the municipality of Paulo Afonso, Bahia, from 2003 to 2019, aged over 18 years old. All users were considered for analysis, and no exclusion criteria were applied. To assist in the collection and compilation of data, a collection instrument was created based on the admission forms of users assisted by the CTC/SAE. This instrument contained all the variables present in the forms that make up the admission form for the service, grouped into categories named: sociodemographic, behavioral and clinical laboratory. Admission forms include a "clinical form", and a form referring to "laboratory data", consisting of 29 variables, whose completeness is

mandatory, regardless of the variable. Regarding handling and flow, the forms are standardized and distributed by the Bahia State Health Secretary (SESAB) to all CTC/SAE present in all registered municipalities in the state. Regarding the CTC/SAE located in Paulo Afonso, the forms are filled out when people are admitted to the service and can be performed by the professional nurse, nursing technician or pharmacist. Subsequently, these forms are attached to the physical records, which are kept in cabinets, and a copy is sent to the municipal epidemiological surveillance, which notifies the case to the Information System for Notifiable Diseases (Sinan).

Data collection took place between November 2019 and February 2020 and was carried out in rooms reserved at the CTC/SAE by two observers. The time spent observing each medical record ranged from five to ten minutes. All information, records and test results were considered.

To assess the completeness of the admission forms, the classification proposed by Romero and Cunha¹⁷ was used as a reference, which is based on the percentage of missing or ignored information. For these authors, the degree of completeness is classified as excellent (< 5%), good (5 to 10%), regular (10 to 20%), bad (20 to 50%) and very bad ($\geq 50\%$), according to the proportion of missing data. The term completeness refers to the degree of completion of the analyzed field, measured by the proportion of notifications with a field filled in with a category different from those indicating the absence of data¹⁸.

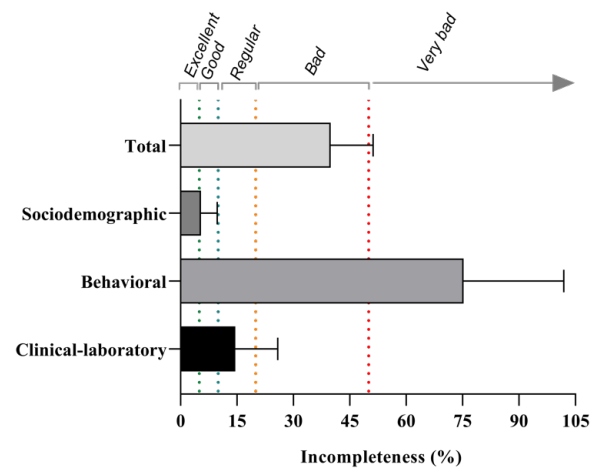
The collected data were tabulated in the Microsoft® Office Excel 2003 program and analyzed in *software* GraphPad Prism v.9 (GraphPad Software, San Diego, CA, EUA). Quantitative variables were described as mean $\pm$ standard deviation (mean $\pm$ SD). The association between the percentage of the incompleteness with the study period was analyzed using the Pearson correlation coefficient. Differences were considered statistically significant for values of $p < 0.05$.

This study is an excerpt from a broader work on the profile of PLHIV in the municipality of Paulo Afonso, Bahia¹⁶. The research was approved by the Research Ethics Committee (CEP) of the Federal University of São Francisco Valley (UNIVASF), in July 2019, under opinion n° 3,451,026, in compliance with Resolution N° 466/12 of the National Health Council.

RESULTS

Out of the 305 forms of PLHIV assisted at the CTC/SAE in the municipality of Paulo Afonso, 180 (59%) were for males and 125 (41%) for women. The average completeness of admission forms, in general, was 39.9% (SD: $\pm 11.3\%$), ranging from 14.9% to 56.6% in 2007

and 2017, respectively (Figure 1). Furthermore, over the study period there was a significant reduction in data incompleteness ($r = -0.53$, $p = 0.029$, Figure 2A).



Source: Prepared by the authors, 2021.

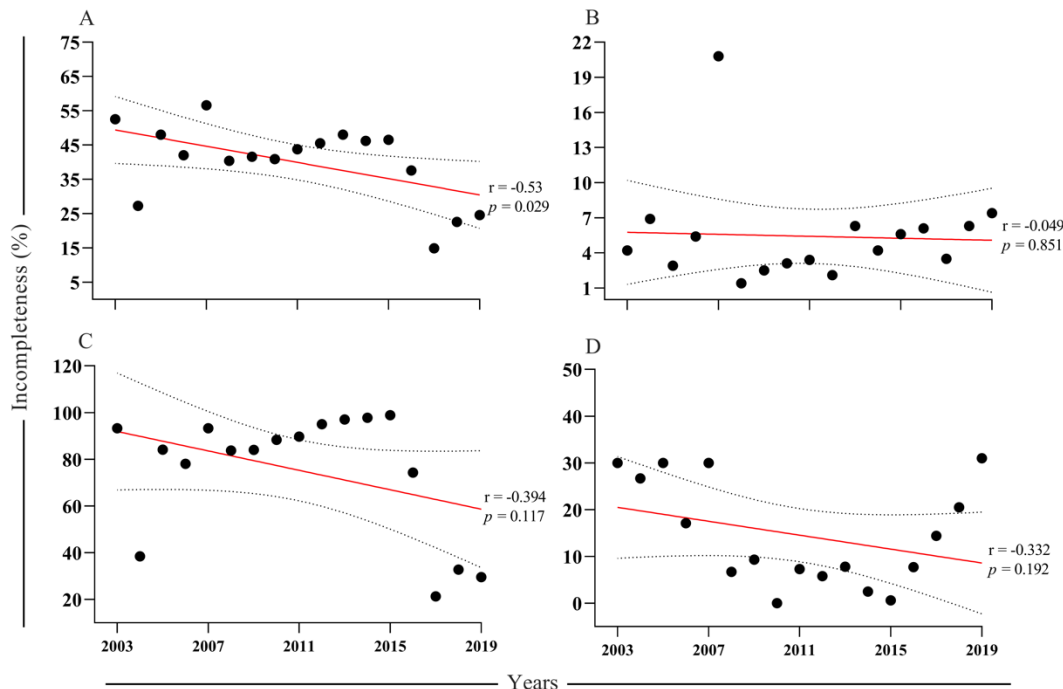
Figure 1 – Percentage variation of general incompleteness and stratified by categories in the PLHIV admission forms, assisted by the CTC/SAE of the municipality of Paulo Afonso, Bahia

Out of the three categories evaluated, the behavioral variables showed “very bad” quality completeness, with an average of incomplete data of 75.3% (SD: $\pm 26.6\%$), reaching 98.9% in 2015 (Figure 1, Figure 2C). On the other hand, the sociodemographic and clinical-laboratory categories showed “good” (mean $\pm$ SD: 5.4% $\pm$ 4.4%) and “fair” (mean $\pm$ SD: 14.6% $\pm$ 11.3%) quality, respectively, that is, with little or incomplete intermediate data (Figure 1). The highest incompleteness rates were observed in 2007 and 2019, respectively (Figure 2B, 2D). Although it is possible to observe an inversely proportional relationship between the frequency of overall incompleteness over the study period (Figure 2A), no correlation was observed in the categories when stratified by variables of interest (Figure 2B-D).

Regarding the incompleteness of data regarding sociodemographic variables, when evaluating variable by variable, it was observed that the variables: patient name, gender, age, municipality and education had the lowest level of inconsistency, ranging from zero to 3.6% and, therefore, is classified as “excellent” quality, regardless of the period/year analyzed. In turn, the variables occupation and neighborhood were those that had the highest rate of non-completion with 12.8% and 17%, respectively, signaling a “regular” quality of completeness (Table 1). Despite the small variations over the years, the correlation

result showed that there were no significant differences in the incompleteness of data referring to occupation, neighborhood, municipality and education (Figure 3A-

D, $p > 0.05$). On the other hand, it is observed that the incompleteness of the marital status variable significantly decreased over the years ($r = -0.55$, $p = 0.022$, Figure 3E).



Source: Prepared by the authors, 2021.

Figure 2 – Correlation of the percentage of the incompleteness of PLHIV admission forms, assisted at the CTC/SAE in the municipality of Paulo Afonso, Bahia, general (A) and stratified by sociodemographic (B), behavioral (C) and clinical-laboratory (D) category in regarding the study period

The analysis of behavioral variables revealed a precariousness of information in the clinical record in general. All data referring to this category had a completeness quality classified as “very bad” ($\geq 50\%$). The worst levels of completion were observed in the variables number of partners, contact with PLHIV and sexual practice, with 91.1% ($n=278$), 70.2% ($n=214$) and 66.2% ($n=202$), respectively. In the stratification by year, although there is a tendency towards a negative correlation, it is possible to verify that there is no significant correlation between the behavioral variables analyzed and the years analyzed. However, it was observed that in recent years the evaluation score of all variables included in the behavioral category changed from “very bad” to “poor” (Figure 3F-K).

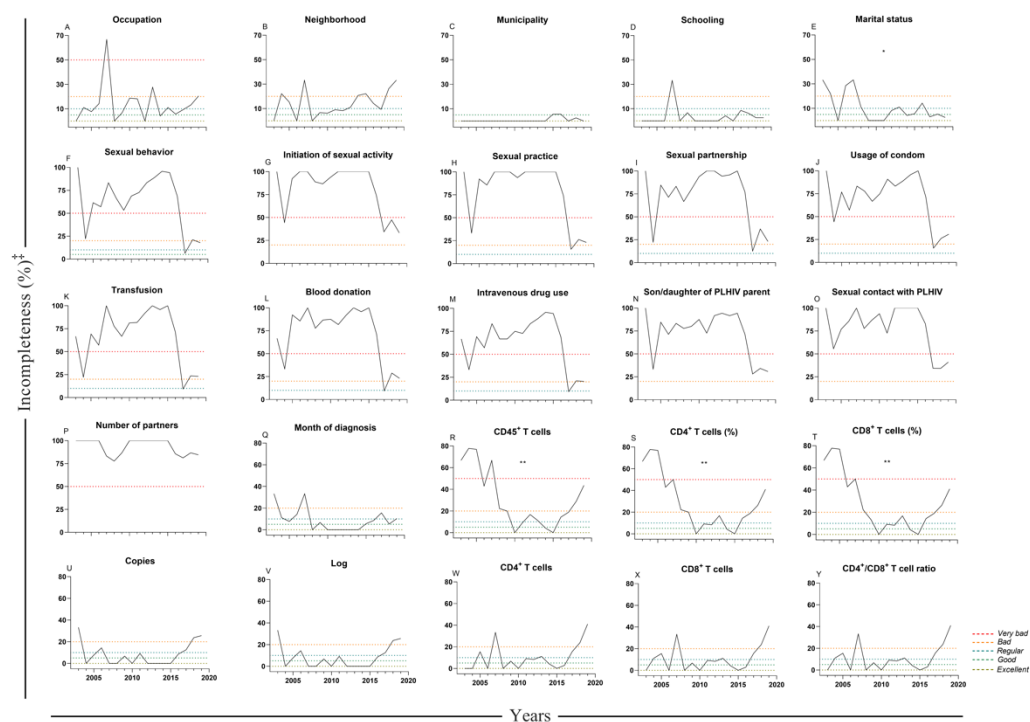
Regarding clinical and laboratory variables, the year of diagnosis was considered the variable with the best completion, being classified as “excellent” completeness quality, regardless of the year. Similar results can be

observed in the variable month of diagnosis, whose completeness quality was classified as “good”, but with variations over the analyzed period (Figure 3Q). The variables CD45⁺ T lymphocytes, CD4⁺ T lymphocytes (%) and CD8⁺ T lymphocytes (%) had the lowest levels of filling, signaling a “poor” quality completeness, with percentages of non-completion of 24.9% ($n=76$), 23.9% ($n=73$) and 23.6% ($n=72$), respectively. Interestingly, when observing the temporal trend of incompleteness of these variables, it can be seen that the interval from 2011 to 2015 had the best levels of filling, even surpassing the values found in more recent years (CD45⁺ T lymphocytes: $r = -0.62$, $p = 0.008$; CD4⁺ T lymphocytes (%): $r = -0.63$, $p = 0.007$ and CD8⁺ T lymphocytes (%): $r = -0.62$, $p = 0.008$; Figure 3R-T). In turn, the variables copies, log, CD4⁺ T lymphocytes, CD8⁺ T lymphocytes, CD4⁺/CD8⁺ T cell ratio showed completeness of “regular” quality, remaining constant over the years and showing a trend of growth in recent years (Table 1, Figure 3U-Y).

Table 1 – Classification and percentage of the incompleteness of PLHIV admission forms, assisted by the CTC/SAE of the municipality of Paulo Afonso, Bahia, 2003-2019 (N=305)

Variable	n (%)	Score of evaluation
Sociodemographic		
Name	-	<i>Excellent</i>
Sex	-	<i>Excellent</i>
Age	-	<i>Excellent</i>
Occupation	39 (12.8)	<i>Regular</i>
Neighborhood	52 (17)	<i>Regular</i>
Municipality	4 (1.3)	<i>Excellent</i>
Marital status	22 (7.2)	<i>Good</i>
Schooling	11 (3.6)	<i>Excellent</i>
Behavioral		
Sexual behavior	162 (53.1)	<i>Very bad</i>
Initiation of sexual activity	201 (65.9)	<i>Very bad</i>
Sexual practice	202 (66.2)	<i>Very bad</i>
Sexual partnership	194 (63.6)	<i>Very bad</i>
Number of partners	278 (91.1)	<i>Very bad</i>
Usage of condom	184 (60.3)	<i>Very bad</i>
Transfusion	178 (58.4)	<i>Very bad</i>
Blood donation	190 (62.3)	<i>Very bad</i>
Intravenous drug use	168 (55.1)	<i>Very bad</i>
Son/daughter PLHIV parent	194 (63.6)	<i>Very bad</i>
Sexual contact with PLHIV	214 (70.2)	<i>Very bad</i>
Clinical-laboratory		
Month of diagnosis	22 (7.2)	<i>Good</i>
Year of diagnosis	-	<i>Excellent</i>
Viral charge (copies)	31 (10.2)	<i>Regular</i>
Log	31 (10.2)	<i>Regular</i>
CD4 ⁺ T cells (absolute n°)	41 (13.4)	<i>Regular</i>
CD4 ⁺ T cells (%)	73 (23.9)	<i>Bad</i>
CD8 ⁺ T cells (absolute n°)	42 (13.8)	<i>Regular</i>
CD8 ⁺ T cells (%)	72 (23.6)	<i>Bad</i>
CD4 ⁺ /CD8 ⁺ T cell ratio (absolute n°)	42 (13.8)	<i>Regular</i>
CD45 ⁺ T cells (absolute n°)	76 (24.9)	<i>Bad</i>

PLHIV = people living with HIV/AIDS; CTC/SAE = Counseling and Testing Center/Specialized Assistance Service; n° = number; T = lymphocytes T.
Source: Prepared by the authors, 2021.



Source: Prepared by the authors, 2021.

Figure 3 – Linear correlation of the percentage of incompleteness of PLHIV admission forms, assisted by the CTC/SAE in the municipality of Paulo Afonso, Bahia, stratified by variable over the period 2003 to 2019. The correlation between variables and the year was performed by the Pearson test. Significant differences were considered at $p < 0.05$ and $p < 0.01$ represented by * and **, respectively. ‡The 100% completeness variables were not included in this result. PLHIV = people living with HIV; T = lymphocytes T

DISCUSSION

The admission forms for PLHIV assisted at the CTC/SAE in Paulo Afonso, Bahia, presented, in general, quality of completeness classified as “poor” and, therefore, presented a low possibility of obtaining qualified information. The study to Lirio et al.¹⁹ involving 11 municipalities in Bahia, from 2001 to 2010, corroborates this result, pointing out that completeness in the fields of HIV and AIDS in all tuberculosis notification forms was below what was expected and desired by the Brazilian health authorities at the present time.

Despite the important advance in filling in the data over the years, observed in the CTC/SAE of this study, certain variables, notably those related to the behavioral characteristics of users, are still little questioned and worked on by the health professionals of the service, which, according to Luz et al.² and Bonilha et al.²⁰ it can seriously compromise the assistance to these users and the clinical-epidemiological research in health.

When observing the sociodemographic variables of the users assisted in the study, it is noted that the majority (75%, 6/8), obtained an adequate degree of completion, classified as “excellent” (83.3%) and “good” (16.7%).

Results converging with the study by Lino et al.²¹ in the state of Rio de Janeiro on live births and neonatal deaths from 1999 to 2014, in which, using a similar methodology, 80% of the sociodemographic variables were categorized as “excellent”. On the other hand, variables such as neighborhood and occupation showed a “regular” level of completeness of quality, absent in approximately 17% and 12.8% of the files, respectively. According to Braz et al.²² such information is important to know the risks involved in the work of these individuals, as well as to know if they come from areas with higher rates of cases, knowledge that will also subsidize actions to control the internalization of the HIV/Aids epidemic. Furthermore, not filling in these variables makes it difficult to analyze social inequalities as important predictors of HIV infection.

The importance of these variables can be evidenced in the study to Lino et al.²¹ in which knowledge about the social, demographic and economic aspects available in the bases of the Information System on Live Births (Sinasc) and the Mortality Information System (SIM) of the state of Rio de Janeiro, were essential for understanding the health process-disease and, therefore, to plan preventive and therapeutic actions that can act more assertively and effectively in this cycle.

The investigation of the behavioral characteristics of PLHIV allows for a survey related to the main ways of dissemination of the virus in each region, enabling the development of more efficient actions to prevent and control the transmission of the disease²³. However, in the present study, the users' behavioral characteristics showed a significant deficiency in filling them out, achieving a "very bad" quality completeness assessment in all the variables evaluated. The same was observed in the work by Glatt et al.¹² in which 47%, 52% and 22% of incompleteness was observed in the Sinan notification forms, especially in behavioral characteristics: sexual relations with PLHIV, sexual partnership and injecting drug use, respectively.

This deficiency observed among behavioral variables can be explained by the difficulties reported by health professionals in addressing issues related to sexuality or sexual behaviors, since these issues still represent a social taboo²⁴. In addition to this understanding, small and medium-sized municipalities, such as Paulo Afonso, are even more affected because of the contact networks where everyone knows each other, characteristics that constitute obstacles to an open and natural discussion between health professionals and users^{25,26}. Thus, the fear of causing embarrassment and blocks in users compromises the carrying out of a more reliable behavioral investigation and, therefore, the provision of more qualified assistance²⁷.

Among the clinical-laboratory characteristics, an inappropriate filling of the data was also observed, showing that 80% (8/10) of these variables presented completeness ranging from "fair" to "poor" quality. Only a single variable was present in 100% of the laboratory data, with a completeness score classified as "excellent". A study proposed by Maia et al.²⁸ showed similar results on the quality of the Prenatal Information System in Vitória, Espírito Santo state. In the study, the variables related to laboratory tests were considered to have "bad" completeness, which reinforces and highlights the need for awareness and training on the part of health professionals responsible for recording and collecting data. It is important to emphasize that the information described in the laboratory aspects of PLHIV are extremely important for monitoring the clinical response to antiretroviral therapy, which allows evaluating whether the treatment is being effective or whether it is necessary to change or introduce new drugs¹².

Regarding the temporal analysis, there was a trend towards improvement in filling out all variables, significantly in the variables marital status, CD45⁺ T lymphocytes, CD4⁺ T (%) and CD8⁺ T (%), which demonstrates a subtle advance in the completeness of the forms over the years. Discordant results were found in the study by Souza et al.²⁹ carried out in a women's health reference center, in which only a single variable

tended to decrease in its incompleteness. Because of this, it is important to consider that the incompleteness of the instruments may reflect the lack of care, the little importance given by professionals and/or authorities/managers given of the potential use of these data in the management and planning of actions. Regarding the quotes from Luz et al.², Bonilha et al.²⁰ and Braz et al.²² for health professionals, admission forms represent only bureaucratic documentation, without any impact on the functionality of the health system.

However, the low methodological clarity can also favor the non-completion of data in the respective collection instruments. According to Luz et al.² health professionals report difficulties regarding the interpretation of certain variables, which favors not completing the instruments. Similarly, the absence of clear results in laboratory tests can compromise their transcription to the admission forms. On the other hand, having clear and standardized instructions is not a guarantee of quality information either. In this sense, all health professionals involved in the process must be properly trained and made aware of the importance and valuing of data quality³.

Possibly, some of the factors described above may have contributed to the incompleteness of the data in this study, regardless of the year, which leads to rethinking about new mechanisms to acquire more consistency in the registered data. In turn, routine assessments are essential to ensure more efficient monitoring of problems identified in the completeness of the data. From this perspective, the correct use of the information generated by data analysis can define the health situation of this population group at a regional level, in addition to guiding public policies and monitoring their effectiveness, as well as subsidizing specific studies and research.

Although there is a significant increase in the scientific literature on the assessment of the completeness of health information systems, it is one of the dimensions of quality that is little explored in the CTC/SAE in the municipality and/or in other regions. Regarding this observation, this is the first study involving analysis of the completeness of admission forms for a CTC/SAE carried out in Brazil. This situation points to the need for more studies in the area so that they can contribute to regional specificities, bringing new knowledge and improving the quality of information.

In summary, the assessment of only one quality dimension – completeness – stands out as a limitation of the study. It is known that quality assessment involves multidimensional aspects. However, the large amount of missing or ignored data can compromise other dimensions of health information, such as reliability, accuracy and relevance. Another important aspect refers to the fact that the data were registered in physical records, which made

it difficult to understand the records at certain times. It is necessary to recognize in the study that the completeness has been improving effectively over the years, however, its improvement constitutes a continuous process of evaluations and adjustments.

CONCLUSIONS

This study analyzed the completeness of admission forms for PLHIV assisted at the CTC/SAE in the municipality of Paulo Afonso, Bahia, over a period of 17 years. It was observed that the forms of admission of PLHIV assisted at the CTC/SAE in Paulo Afonso, Bahia, presented, in general, quality of completeness classified as “poor”. Although some variables have shown, over the

years, important advances in terms of filling them out, the results showed that they still fall short of what was expected to guarantee qualified health information.

Considering the importance of the quality of information for the planning of public policies, allocation of public resources, improvement of care in health services and the development of preventive actions, managers and health professionals must be alert to the relevance of quality records in the CTC/SAE studied, especially regarding the behavioral characteristics of users assisted in this service. For this, it is necessary to train health professionals, aiming to carry out a complete, valid, high coverage and reliable record with the potential to support care, administrative and management decisions, thus contributing to the improvement of the quality of life and care of PLHIV.

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