

# Availability of resources in Brazilian National Health System outpatient services for people living with HIV in Mato Grosso, Brazil, 2016

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Susi Astolfo<sup>1</sup> –  orcid.org/0000-0003-2707-7924

Ruth Terezinha Kehrig<sup>2</sup>

Lígia Regina de Oliveira<sup>2</sup>

<sup>1</sup>Ministério da Saúde, Núcleo Estadual, Cuiabá, Mato Grosso, Brasil

<sup>2</sup>Universidade Federal de Mato Grosso, Instituto de Saúde Coletiva, Cuiabá, Mato Grosso, Brasil

## Abstract

**Objective:** to evaluate the availability of Brazilian National Health System (SUS) outpatient services for people living with HIV in Mato Grosso state, Brazil. **Methods:** this is an evaluative study with descriptive cross-sectional design carried out in 2016; data were collected via the HIV Services Quality Assessment System in all 15 outpatient services; data were analyzed by frequency of answers. **Results:** five of the 15 services had a sufficient number of physicians; antirretroviral drugs were out of stock for more than seven days in half of the services; other medications for sexually transmitted infections, opportunistic infections, Hepatitis B and C, and metabolic disorders were available in less than 1/3 of the services within the recommended timeframe. Conclusion: resources were found to be deficient in services for people living with HIV in Mato Grosso, mainly regarding the availability of professionals and drugs.

**Keywords:** Acquired Immunodeficiency Syndrome; HIV; Health Evaluation: Epidemiology, Descriptive; Health Services Research.

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## Correspondence:

Susi Astolfo – Av. Getúlio Vargas, No. 1426, 5º andar, Centro, Cuiabá, MT, Brazil. CEP: 78045-901

E-mail: susi.astolfo@saude.gov.br

## Introduction

In the early days of HIV/aids care in Brazil in the 1990s, work processes were organized by specialized health care service programmes.<sup>1</sup> Under this model, clinical care operates according to the plan proposed by the programme, taking on the form of a programmatic action or practice.<sup>1</sup>

From the outset, the care model implanted in Brazil for people living with HIV/aids was based on defending the right to citizenship, including universal access to treatment.<sup>2</sup> In a manner coherent with this care policy, service organization followed the guidelines of the Brazilian National Health System (*Sistema Único de Saúde* -SUS), with emphasis on integral actions and interaction between patients and health service providers.<sup>2</sup>

As HIV became a chronic condition, as a result of progress made with care and antiretroviral treatment, the model centred solely on specialized services showed itself to be insufficient.<sup>3</sup> In order to align care for people with HIV with the new epidemiological reality of the disease, The Ministry of Health incorporated Primary Health Care (PHC) as part of this integrated and articulated network of care services for people living with HIV, providing them with greater access to health services.<sup>3</sup>

*The complexity of managing the health of an HIV-positive person implies adopting different promotion, prevention and care strategies, incorporating new strategies, in addition to providing follow-up and continuous care.*

In 2013 Brazil was the first developing country – and the third in the world – to recommend treatment as prevention for all people living with HIV, with antiretroviral treatment being begun regardless of CD4 T-cell count. The measure was yet another innovative step forward in response to the HIV/aids epidemic.<sup>4</sup> In effect, implementing the new recommendations implies ensuring the immediate availability of testing and treatment of infection, as well as treatment continuity, ensuring patient monitoring and treatment.<sup>5</sup>

Health care depends on structural resources, including good working conditions and resource availability, in

addition to the organization of management and health care actions.<sup>6</sup> Regardless of local and institutional characteristics, services should have, at the least, the structural conditions needed to achieve an acceptable level of quality.<sup>7</sup>

The complexity of managing the health of an HIV-positive person implies adopting different promotion, prevention and care strategies, incorporating new strategies, in addition to providing follow-up and continuous care. In the case of health care, an evaluation needs to be made as to whether the services responsible for these activities are organized in such a way as to meet the expected quality requirements for the care provided to people living with HIV.<sup>2</sup>

There is a scarcity of publications on the quality of SUS services for people with HIV with national data disaggregated to regional or local level. With regard to the state of Mato Grosso, only one study on the same issue was found,<sup>8</sup> and it had not been published.

The objective of our study was to assess the availability of SUS outpatient service resources for people living with HIV in the state of Mato Grosso, Brazil.

## Methods

This is a cross-sectional health services evaluation conducted in the state of Mato Grosso in 2016.

In 2016 there were 15 services comprising the HIV care network in Mato Grosso. State-wide there were four distinct configurations: five of the state's health regions had no service at all (Água Boa, Colíder, Pontes e Lacerda, Peixoto de Azevedo and São Félix do Araguaia); others had one service per health region (Alta Floresta, Barra do Garças, Cáceres, Confresa, Diamantino, Juara, Juína, Rondonópolis and Tangará da Serra); one health region had two services (Sinop and Sorriso); whilst the central region of Baixada Cuiabana had four services.

The 15 specialized SUS HIV/aids care services were invited to take part in the study, as confirmed by the Mato Grosso State Health Department (SES/MT). The following inclusion criteria were applied to the services: having among their activities the prescription of antiretroviral drugs and follow-up of patients receiving them at the health service itself. HIV testing and counselling services or HIV/aids hospitalization services were not eligible for the study.

HIV Services Quality Assessment System data were used. This system is known as the Qualiaids System.<sup>2,6</sup> It is used to evaluate, monitor and improve the quality

of outpatient services provided via SUS to people living with HIV. The first system evaluation occurred between 2001 and 2002, in 322 services in seven Brazilian states.<sup>6</sup> In 2007 and 2010, the Qualiaids evaluation covered all the country's federative units,<sup>2</sup> including Mato Grosso.<sup>8</sup> In 2016, a new evaluation was conducted in Mato Grosso – corresponding to this study –, as well as a study<sup>9</sup> in the states of São Paulo and Santa Catarina. In 2017, Qualiaids was applied once more in the remaining federative units (<http://www.qualiaids.fm.usp.br/>).

The data used as the basis for this paper were collected using a structured and validated questionnaire comprised of multiple choice questions covering three dimensions: resource availability; technical management of the work; organization of the health care process. The researchers used a 'Good Practices Recommendations Booklet' prepared to serve as a reference for the questionnaire<sup>10</sup> as a guide to good practices for the services, containing the norms, criteria, indicators and the variables comprising the construct of quality in HIV/aids outpatient care. Developed by the Qualiaids Research Team, coordinated by Nemes,<sup>2</sup> a professional from the Department of Preventive Medicine of the University of São Paulo Faculty of Medicine, this same recommendations booklet has been used since 2008 by the Ministry of Health and its Department for the Surveillance, Prevention and Control of Sexually Transmitted Infections, HIV/aids and Viral Hepatitis, as a reference for SUS HIV/aids outpatient care.<sup>2,10</sup>

The SES/MT STD, Aids and Viral Hepatitis Programme was responsible for conducting the evaluation, in partnership with the state's SUS health services evaluation research centre, which has developed Qualiaids evaluation projects in conjunction with the Federal University of Mato Grosso Public Health Institute.

Data collection took place during August 2016. The web version of the Qualiaids questionnaire was used to be self-administered by the service manager/coordinator or the technical staff member designated by them, after having been trained regarding the methodological procedures and the importance of evaluation via web conference with the national Qualiaids coordinator and local team.

The Qualiaids questionnaire<sup>11</sup> is comprised of 81 questions, eight of which are descriptive and have

no score, while the remaining 73 questions have 76 scored indicators, classified according to a standard score reference ranging from 0 to 2: unacceptable (0); acceptable (1); and expected (2), whereby the latter is the recommended standard.<sup>6,12</sup>

The study evaluated 'resource availability',<sup>11</sup> comprising 21 scored indicators distributed over four domains: physical structure (two indicators); availability of health professionals for the minimum team (five indicators); medication, commodities, tests and referral (13 indicators); and health professional training and experience (one indicator). The answers to three descriptive questions were also evaluated. The indicators (variables), according to each of the four domains, are described as follows.

- 1) Physical structure
  - availability of rooms for service provision; and
  - accessibility.
- 2) Availability of health professionals for the minimum team
  - doctor's hours/number of individuals;
  - number of social workers /number of individuals;
  - number of nursing auxiliaries or technicians /number of individuals;
  - number of nurses/number of individuals; and
  - number of psychologists/number of individuals.
- 3) Medication, commodities, tests and referrals
  - antiretroviral drugs;
  - medication for metabolic disorders;
  - medication for primary prophylaxis for non-mycobacterial opportunistic infections;
  - medication for non-mycobacterial secondary prophylaxis for opportunistic infections;
  - medication for mycobacterial infections;
  - medication for sexually transmitted infections (STI);
  - medication for treatment of hepatitis B and C;
  - availability of commodities;
  - networking – health care modalities;
  - sample testing;
  - networking – initial assessment and follow-up tests;
  - networking – tests for complication and comorbidity diagnosis and follow-up; and
  - networking – specialist doctors and other professionals.
- 4) Health professional training and experience
  - professionals responsible for packaging contaminated waste.

These are variables comprised of multiple categories. The answers to them can either be single or several alternatives.

The expected standard value for availability of health professionals is up to 150 individuals for 20 doctors' hours a week, up to 180 individuals per nursing auxiliary or technician, 230 individuals per nurse and per psychologist, and 280 per social worker.<sup>11</sup>

The standard reference for medication availability is:

- a) lack of medication for up to seven days:
  - antiretroviral drugs,
  - mycobacterial medication,
  - STI medication, and
  - primary prophylaxis for non-bacterial opportunistic infections;
- b) lack of medication for less than 48 hours for:
  - metabolic disorders and
  - secondary prophylaxis for non-bacterial opportunistic infections; and
- c) permanent availability of medication for hepatitis B and C.<sup>11</sup>

Test results should be made available in up to seven days for:

- a) tuberculosis test;
- b) total cholesterol and fractions, triglycerides;
- c) CD4 T lymphocyte count;
- d) cervical cytology (Papanicolaou); and
- e) HIV viral load.

Results should be available in up to 15 days for:

- a) sputum smear microscopy;
- b) nontreponemal test (VDRL or RPR);
- c) chest x-rays;
- d) faecal parasitology;
- e) glycaemia;
- f) haemogram;
- g) hepatitis B and C serology;
- h) liver and kidney assessment;
- i) toxoplasmosis serology; and
- j) molecular tuberculosis test (GeneXpert).

Sputum culture results should be ready in up to 30 days.<sup>11</sup>

Descriptive analysis was undertaken with the aid of Microsoft version 2010, based on reply frequency per service considering the respective standard replies; the results were therefore presented as the proportions of services that did or did not achieve the expected standard (score of 2) per evaluated indicator. The scored version of the QualiAids questionnaire, containing all the values found for each answer, was used to guide data analysis.

The study was submitted to the Júlio Müller University Hospital Research Ethics Committee and

approved on February 21st 2016 (Process No. 527292/CEP-HUJM/2015; CAAE 52729215.6.0000.5541).

The health professionals who were interviewed received prior clarification as to the methodological procedures – via web-conference or e-mail –, this being a condition for them to decide whether or not to take part in the study. Each professional that agreed to answer the QualiAids questionnaire signed a Free and Informed Consent form, which they forwarded by e-mail after signing and digitizing it.

## Results

All 15 existing services were included in the evaluation as they all met the minimum required percentage of replied questionnaire questions (90%), according to the standard used by the QualiAids teams in the 2007 and 2010 evaluations.<sup>12</sup> Thirteen of the services were managed by municipal governments and were outpatient services specialized in HIV/aids, sexually transmitted infections and viral hepatitis. The other two services comprised a state government managed multiple speciality outpatient service and a federal government managed public university hospital outpatient service (Table 1).

Most of the services (9/15) were located in municipalities with fewer than 100,000 inhabitants, three were located in municipalities with between 100,000 and 400,000 inhabitants and the other three were located in large municipalities with over 400,000 inhabitants. Most of the services were either medium-sized (6/15) or large-sized (7/15). Six services had all types of rooms needed for attending to people living with HIV/aids and one of them had adequate accessibility for people with special needs.

In three of the services contaminated waste packaging was done by a professional with medium level qualifications, either employed by the service or outsourced, duly trained and supervised by a university level professional. On-site sample testing was done at four services; the remaining services sent most or all samples to the State reference laboratory (Table 2).

All services were found to have at least one doctor, nurse and psychologist; and 13 services were found to have at least one social worker, a nursing auxiliary/technician and a pharmacist (Table 3). The number of doctors and social workers in keeping with the expected standard was found in five services; the

expected standard psychologists was found in seven services; and the expected standard for nurses and nursing auxiliaries/technicians was found in six services (Table 3).

Access to health professionals within up to seven days occurred in 11/15 services in relation to gynaecologists, 10/15 services in relation to obstetricians, 13/15 services in relation to psychologists and 14/15 in relation to social workers. Nine services provided access to dentists within 15 days (expected standard). Specialities such as proctology (7/15), haematology (6/15) and endocrinology (5/15) were not available at the services either internally or externally (Table 3).

Fourteen of the fifteen services dispensed antiretroviral medication. Half of them had either had no problem with lack of antiretroviral drugs in the six

months prior to the evaluation, or stocks had been replaced within seven days; i.e., only 7/14 services met the expected standard for antiretroviral drug availability (Table 4). Lack of medication for primary prophylaxis of non-mycobacterial opportunistic infections occurred for more than seven days in 12/15 services; in the other three services there was no lack of this medication or it was replaced within seven days (expected standard). Eleven services either did not have immediate availability of medication for sexually transmitted infections or it was not available within seven days. Thirteen services did not have medication for secondary prophylaxis for opportunistic infections (non-mycobacterial), and therefore did not meet the expected standard. Medication for hepatitis B and C was lacking in 12/15 services and medication for the

**Table 1 – Number of care services for people living with HIV/aids (N=15) by type, service municipality population size and service size, Mato Grosso, 2016**

Characteristic	N
<b>Type of service</b>	
Specialized health care service	13
Multiple specialty outpatient service	1
Hospital outpatient service	1
<b>Municipality population size</b>	
>400,000 inhabitants	3
100,000 400,000 inhabitants	3
<100,000 inhabitants	9
<b>Service size</b>	
>500 individuals – large	7
101 - 500 individuals – medium	6
<100 individuals – small	2

**Table 2 – Number of care services for people living with HIV/aids (N=15) within the expected standard for resource availability, Mato Grosso, 2016**

Domains and indicators	Services within expected standard (N)
<b>Physical structure</b>	
Doctor's consulting room + nurses room + room for individual sessions with other university level professionals + room for group sessions	6
Wide doorways and corridors, ramps, accessible toilets and routes, level non-slip floor, visual and tactile signs	1
<b>Health professional training and experience</b>	
Health professional responsible for packaging contaminated waste with medium level qualifications – employed by the service or outsourced –, trained, supervised by a nurse or other university level professional	3
<b>Medication, commodities, tests and referral</b>	
All tests performed at the service	4

**Table 3 – Number of care services for people living with HIV/aids (N=15) within the expected standard for health professionals by category and access to specialties, Mato Grosso, 2016**

Professional category	Services within expected standard (N)	No. of individuals per recommended professional
Psychologist	7	≤230
Nurse	6	≤230
Doctor	5	≤150
Nursing auxiliary or technician	6	≤180
Social worker	5	≤280
Pharmacist	–	–
Nutritionist	–	–
Dentist	–	–
Other	–	–

**Table 4 – Number of care services for people living with HIV/aids (N=15) within the recommended standard for medication and commodity availability in the six months prior to the study, Mato Grosso, 2016**

Availability	Type of medication	Services within expected standard (N)
Not lacking or replaced in up to 7 days	Antiretroviral (N=14)	7
	Primary prophylaxis for opportunistic infections	3
	Mycobacteria	7
	Sexually transmitted infections	4
Not lacking or replaced in up to 48 horas	Metabolic disorder	4
	Secondary prophylaxis for opportunistic infections	2
Not lacking	Hepatitis B and C	3

treatment of metabolic disorders was lacking in 11/15 services (Table 4). Male condoms and rapid HIV tests were available in 14/15 services in the previous six months (expected standard).

Taking total initial assessments and follow-up test results, eleven services did not meet the expected standard. The three initial assessment and follow-up tests for which most services met the expected standard regarding result availability in up to seven days were (i) tuberculosis tests (13/15), and (ii) total cholesterol and fractions and triglycerides tests (12/15). Sputum smear microscopy results within up to 15 days was achieved by 11 services (Table 5). With regard to test results for complications and comorbidity diagnosis and follow-up, HIV genotyping was provided within the expected standard by the majority of services (13/15); while the expected standard for the results of tests such as urine culture and ultrasound within up to seven days was not met by 12/15 services; the same can be said of computerized tomography results (14/15) and upper gastrointestinal endoscopy results, whereby the latter was not available at any of the services taking part in this study.

## Discussion

Resource availability in services providing health care to people with HIV/aids in Mato Grosso is insufficient when compared to expected standards, especially with regard to the availability of health professionals and medication, commodities, tests and access to referral services. This situation reveals an important loss in resource availability, when compared to that found by the 2010 national evaluation of HIV/aids services. In that year, practically all respondent services reported having at least one doctor, full provision of recommended CD4 T-cell and viral load tests, and above 80% of SUS services stated ensuring the uninterrupted supply of antiretroviral drugs.<sup>12</sup> Both the drugs that comprise first-line antiretroviral treatment and the related tests referred to above are supplied by the federal level of government.

This study has limitations. Although the questionnaire that was administered covers the organizational dimensions of the health care processes, the study restricted itself to the dimension relating to the

**Table 5 – Number of care services for people living with HIV/aids (N=15) within the recommended standard for availability of initial assessment test results, Mato Grosso, 2016**

Type of test	Recommended time (days)	Services within expected standard (N)
Tuberculosis test	≤7	13
Total cholesterol and fractions, triglycerides	≤7	12
CD4 T lymphocyte count	≤7	8
Cervical cytology (Papanicolaou)	≤7	7
HIV viral load <sup>a</sup>	≤7	6
Sputum smear microscopy	≤15	11
Non-treponemal test (VDRL <sup>b</sup> or RPR <sup>c</sup> )	≤15	10
Chest x-ray	≤15	10
Faecal parasitology	≤15	10
Glycaemia	≤15	9
Haemogram	≤15	8
Hepatitis B and C serology	≤15	7
Liver and kidney assessment (AST, <sup>d</sup> ALT, <sup>e</sup> Cr, <sup>f</sup> Na, <sup>g</sup> K, <sup>h</sup> urine)	≤15	6
Toxoplasmosis serology	≤15	5
Molecular tuberculosis test (GeneXpert)	≤15	–
Sputum culture	≤30	9
<b>Total for indicator (initial and follow-up assessment)</b>		<b>4</b>

a) HIV: human immunodeficiency virus.

b) VDRL: Venereal Disease Research Laboratory.

c) RPR: Rapid Test Reagin.

d) AST: Aspartate Aminotransferase.

e) ALT: Alanine Aminotransferase.

f) Cr: Creatinine.

g) Na: Sodium.

h) K: Potassium.

availability of resources needed to ensure service quality. With regard to the Donabedian three category model<sup>13</sup> for evaluating health care quality, the evaluation system used in this study examined structure and processes but did not examine the ensuing results. Another limitation of the study is the possibility of bias in data collection: the questionnaires are answered by the person in charge of each service, without the recommendable participation of the service's entire multiprofessional team and without in-service verification of the data provided. The small number of existing services hinders more robust statistical analysis, whereby the results are examined in a more descriptive manner.

When comparing the results of this evaluation with previous QualiAids evaluations in Mato Grosso in 2007 and 2010,<sup>8</sup> a worsening in resource availability can be seen. On the other hand, national evaluations reveal that the performance of the majority of the country's services improved between 2007 and 2010,<sup>12,14</sup> principally with regard to the dimension and the domains presented here.<sup>12</sup>

SUS's HIV/aids outpatient healthcare services are heterogeneous, whether in size or in terms of their organizational arrangements, with responsibilities shared between the federal government (adoption of clinical protocols and responsibility for the provision of antiretroviral medication and specific tests, such as viral load, immunity and genotyping) and the state and municipal governments, with the latter being responsible for providing and maintaining all the resources of these services under the SUS.<sup>14</sup>

The findings of this study have the potential to contribute to new evaluations and studies, as well as information to support service improvement, focusing on the indicators of the availability of resources evaluated as being inadequate.

The low number of services with a sufficient amount of doctors and other professionals can compromise the quality of health care provided. The 2007 national evaluation of HIV/aids services showed that at that time the insufficient number of doctors or other health professionals in these services could be related to the short duration of medical consultations.<sup>15</sup>

The recommendation for health care provided by these professional categories is based on an acceptable proportion, calculated using the empirical results obtained from conducting the 2010 Qualiaids national evaluation system, taking the average number of individuals per health professional based on the data for that group of services which achieved the best scores in that year. The questionnaire validation process was also taken into account, bearing in mind that the version used in 2016 was reviewed and updated in 2011.<sup>14</sup> The quality criteria adopted<sup>10</sup> recommend that each professional attends to at least 300 individuals, although some services in the state have more than 1,000 individuals being attended to by professionals in these categories. This is what is revealed by the database used for this study. Doctors are recommended to see at least 150 individuals during their 20-hour working week; however, only one third of the services evaluated reported having a number of doctors sufficient to meet this standard.

In relation to the set of new combination prevention strategies, apart from post- and pre-exposure prophylaxis,<sup>5</sup> condom use is still the best strategy for preventing HIV infection.<sup>16</sup> This study revealed that a strong point of resource availability in the services providing health care to people living with HIV is the indicator of commodity availability, such as rapid tests and condoms (singly), which stands out among the other indicators of this domain and dimension. Guaranteeing rapid tests and condoms contributes to the effective implementation of the new recommendations. It must be emphasized that the responsibility for providing these commodities lies with the federal government, as does that of other strategic commodities, such as antiretroviral drugs, for instance.<sup>17</sup>

According to previous Qualiaids evaluations, regular availability of antiretroviral drugs was high, both in Mato Grosso state<sup>8</sup> and in Brazil.<sup>12</sup> Currently, lack of antiretroviral drugs in health services is related to difficulties concerning logistics and medication distribution and control, along with complications during the purchasing, importing and or delivery process of these drugs, which may impose the need to ensure stock management.<sup>18</sup>

Other complementary drugs used in HIV treatment have even lower availability, in Mato Grosso state, and can lead to health care interruption. Purchasing

medication for sexually transmitted infections and opportunistic infections is the responsibility of the state and municipal governments and has to be agreed in the Bipartite Inter-Management Commission (state/municipality).<sup>19</sup> The results of this study show that despite the agreement of responsibilities between the federative entities,<sup>19</sup> the state of Mato Grosso has not been complying with its role with regard to care for people living with HIV. It is noteworthy that several states have faced difficulties in purchasing other drugs, such as penicillin for treating syphilis, and has led to the Ministry of Health having to fill these gaps.<sup>20</sup>

Provision of medication is one of the essential elements of health care quality.<sup>21</sup> One of the biggest challenges faced by Brazil consists of removing barriers to accessing antiretroviral therapy. The strategies for minimizing this problem include implanting medication dispensation units needed to meet local demand, with the objective of avoiding people having to travel to other municipalities, which are often distant, in order to get medication.<sup>5</sup>

Availability of viral load tests and CD4-T cell counts was seen to have improved in Mato Grosso when compared to the 2010 evaluation,<sup>8</sup> since a further five services achieved the expected standard, although availability is still inadequate: less than half the services provide the results of these tests in up to seven days. In 2007, a study which evaluated services for people living with HIV/aids in all 27 Federation Unit found an important improvement in the availability of the above mentioned tests in the states and at national level.<sup>15</sup>

The outpatient services providing health care for people living with HIV in Mato Grosso showed weaknesses in resource availability. Improving the practices evaluated implies the need to institutionalize analysis, in the sense of monitoring and evaluating the organizational quality of these services, which must have the minimum structure to ensure health care for people living with HIV.

The return rounds of this evaluation, held in an articulated manner with the SES/MT STD, AIDS and Viral Hepatitis Programme, involved the municipal Programme coordination teams in the analysis and discussion of the results found, thus being able to contribute to the organizational enhancement of both health care and management of the HIV outpatient services in the state of Mato Grosso. This process provided conditions for changes in the respective levels of responsibility for the availability of resources that



ensure quality in work management and organization processes with regard to HIV health care.

There are still many challenges to be overcome with regard to resources that are essential for the quality of outpatient services for people with HIV/aids in Mato Grosso, especially those services which the indicators identified as being furthest away from the expected standard, such as the availability of doctors and other health professionals, as well as necessary medication, including antiretroviral drugs.

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