

ORIGINAL ARTICLE

CLINICAL-EPIDEMIOLOGICAL ANALYSIS OF THE CARE SERVICES AT A SPECIAL IMMUNOBIOLOGICAL REFERENCE CENTER IN THE AMAZON*

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ABSTRACT

Objective: to describe the clinical-epidemiological profile of the care service at the Reference Center for Special Immunobiologicals of Hospital in the Amazon.

Method: a descriptive study, of a quantitative approach and analyzed by means of the descriptive and inferential statistics. The Information System of the Reference Center for Special Immunobiologicals (former) and the Information System of the National Immunization Program (current) were the databases used, between 2006 and 2016.

Results: 77,077 doses of immunobiological vaccines were administered; 25.2% corresponded to the inactivated influenza vaccine; chronic renal failure was the main indication (19%). The current system recorded 18,267 doses of immunobiological vaccines administered between the years 2014 to 2016; 37.8% of which were inactivated influenza vaccines; 42.5% of the indications were not reported, with HIV/AIDS being 18.2%. Infectology was the specialty that most referred to vaccination (18,3%).

Conclusion: the data accuracy has been compromised by the incompleteness in the information systems. We observed underutilization of the service by the local population.

DESCRIPTORS: Public Health, Immunization; Immunization Programs; Vaccines; Immunoglobulins.


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ANÁLISE CLÍNICO-EPIDEMIOLÓGICA DOS ATENDIMENTOS EM UM CENTRO DE REFERÊNCIA EM IMUNOBIOLOGICOS ESPECIAIS NA AMAZÔNIA**RESUMO**

Objetivo: descrever o perfil clínico-epidemiológico do atendimento no Centro de Referência em Imunobiológicos Especiais de Hospital na Amazônia.

Método: descritivo de abordagem quantitativa e analisado por meio da estatística descritiva e inferencial. O Sistema de Informação do Centro de Referência para Imunobiológicos Especiais (antigo) e Sistema de Informação do Programa Nacional de Imunização (atual) foram as bases utilizadas, entre 2006 e 2016.

Resultados: foram administradas 77.077 doses de imunobiológicos; 25,2% corresponderam à vacina influenza inativada; insuficiência renal crônica foi a principal indicação (19%). O sistema atual registrou 18.267 doses de imunobiológicos administrados entre os anos de 2014 a 2016; sendo 37,8% correspondente à vacina influenza inativada; não foram informadas 42,5% das indicações, sendo HIV/AIDS 18,2%. Infectologia foi a especialidade que mais encaminhou para vacinação (18,3%).

Conclusão: a acurácia dos dados foi comprometida pela falta de completude nos sistemas de informação. Observou-se subutilização do serviço pela população local.

DESCRIPTORES: Saúde Pública, Imunização; Programas de Imunização; Vacinas; Imunoglobulinas.

ANÁLISIS CLÍNICO-EPIDEMIOLÓGICO DE LA ATENCIÓN EN UN CENTRO DE REFERENCIA EM INMUNOBIOLOGICOS ESPECIALES EM LA AMAZONIA**RESUMEN:**

Objetivo: describir el perfil clínico-epidemiológico de la atención brindada por el Centro de Referencia para Inmunobiológicos Especiales de un Hospital de la Amazonía.

Método: descriptivo con enfoque cuantitativo y analizado mediante estadística descriptiva e inferencial. El Sistema de Información del Centro de Referencia para Inmunobiológicos Especiales (antiguo) y el Sistema de Información del Programa Nacional de Inmunización (actual) se utilizaron como base de datos entre 2006 y 2016.

Resultados: se administraron 77,077 dosis de inmunobiológicos; el 25,2% correspondió a la vacuna inactivada contra la influenza; La insuficiencia renal crónica fue la indicación principal (19%). El sistema actual registró 18.267 dosis de inmunobiológicos administradas entre los años 2014 y 2016; siendo que el 37,8% correspondió a la vacuna inactivada contra la influenza; El 42,5% de las indicaciones no fueron informadas, y el porcentaje informado de VIH / SIDA fue de 18,2%. La especialidad que más derivaciones realizó para vacunación fue la de infectología (18,3%).

Conclusión: la precisión de los datos se vio comprometida por la falta de integridad en los sistemas de información. Se observó la subutilización del servicio por la población local.

DESCRIPTORES: Salud Pública, Inmunización; Programas de Inmunización; Vacunas; Inmunoglobulinas.

INTRODUCTION

The expansion of basic sanitation and the advent of vaccination have significantly reduced the incidence of infectious diseases. Vaccination, specifically, has contributed to reducing morbidity and mortality from vaccine-preventable diseases to such an extent that the practices of these important public health strategies have had an impact on improving the living conditions of the world's population over the past sixty years⁽¹⁾.

The National Immunization Program (*Programa Nacional de Imunizações*, PNI), created in 1973, is considered an internationally recognized public policy and strengthened for having followed the basic universality principle of the Unified Health System (*Sistema Único de Saúde*, SUS). The expansion of this program was marked by the inclusion of other vaccines and by the initiative of implementing, in 1993, the Reference Centers for Special Immunobiologicals (*Centros de Referência para Imunobiológicos Especiais*, CRIE). The CRIEs are made up of specific logistics designed to assist individuals with special clinical conditions that are susceptible to diseases preventable by high-cost vaccines that are not in the routine calendar⁽²⁾.

The first CRIEs units were implemented in São Paulo, Paraná, Ceará, the Federal District, and Pará. There are currently 47 CRIEs in the country, and two in Pará^(2,3).

There are few evaluation studies of the CRIEs in Brazil. In order to perform this one, searches were made in databases such as Latin American and Caribbean Health Sciences Literature (*Literatura Latino-Americana e do Caribe em Ciências da Saúde*, LILACS), Scientific Electronic Library Online (SciELO) e Medical Literature Analysis and Retrieval System Online (MEDLINE), and only two publications were found that described the profile of users seen in the CRIEs, one in the southern region, carried out by Scheidt e Boing⁽⁴⁾, and another, in the Northeast region, by Muniz⁽⁵⁾.

No research was found on the evaluation of care in the CRIEs in the Brazilian Amazon, especially in the State of Pará. This knowledge is important because it collaborates with the PNI's actions, and contributes to the improvement of the service from a study on a CRIE's activities in the northern region of Brazil, leaving questions open: what is the demand for this service? What information is produced regarding the care service for special population groups of a center in the northern region of Brazil?

This study fills the knowledge gap on users' access to CRIEs in the State of Pará. Thus, the objective was to analyze the clinical-epidemiological profile of users assisted at the CRIE-PA of the Ophir Loyola Hospital (*Hospital Ophir Loyola*, HOL) from 2006 to 2016.

METHOD

It is a descriptive and retrospective study of a quantitative approach, based on secondary data contained in the information systems used in the CRIEs. The study was conducted at CRIE-PA, located at the HOL's ambulatory.

Data were collected from June to December 2017 at the HOL's CRIE unit. We collected data from the period of 2006 to 2016, and they were extracted from both the following information systems: Information System of the Reference Center for Special Immunobiologicals (SI-CRIE), the former, and the Information System of the National Immunization Program (SI-PNI), implemented in this unit in 2014. SI-CRIE was the system used in the period from 2006 to August 2014, after this period this system was extinguished and still in 2014 SI-PNI was instituted. It is important to point out that there is no month without registration.

The variables analyzed were: demographic data, number of administered doses,

immunobiological recommended, indication reason and source of referral. It should be noted that SI-CRIE had limitations and did not offer data on the variables referring to demographic data and source of referral since these were not recorded. For this reason, we chose for the initial presentation of the SI-PNI, as it has the registered demographic data. Later, we bring the global analysis of the data in which the variables are coincident in both systems. We stress this description was due to the management for the extensive data analysis since these data represent health indicators.

The analyzed results are presented in tables containing absolute and relative values. For the construction of the database and tables, the 2007 Word and Excel program versions were used. The collected data were tabulated, processed, analyzed and interpreted by means of descriptive and inferential statistics.

This study was submitted to and approved by the Ethics and Research Committee in the Evandro Chagas Institute of the Health Surveillance Secretariat, Ministry of Health of Brazil, under opinion no. 65769617.9.0000.0019. At the same time, the study was reviewed and approved by the Research Ethics Committee of Ophir Loyola Hospital under the opinion n° 2,041,557.

RESULTS

The demographic data entered in the SI-PNI (implemented as of 2014, the NIP milestone), showed that 18,267 users were assisted by the service. Of which, 9,359 (51.2%) were male. As for the age group, 5,334 (29.2%) of the users were between 40 and 59 years old. Regarding the users' origin, 14,742 (80.7%) come from the metropolitan region of Belém (RMB). Among the ones coming from other states 36 (0.2%), the states that looked most for the CRIE/HOL were: Amapá (30 users), Maranhão (3), Amazonas (2), and Piauí (1) (Table 1).

Table 1 - Demographic data of the HOL's CRIE users from 2014 to 2016, from the SI-PNI. Belém, PA, Brazil, 2018 (continues)

Demographic data	N (18.267)	Percentage (%)
Gender		
Female	8,655	47.4
Male	9,359	51.2
Not informed	253	1.4
Age Group (years)		
Less than 1	859	4.7
1 to 9	3,087	16.9
10 to 19	1,448	7.9
20 to 39	4,577	25.1
40 to 59	5,334	29.2
60 or more	2,962	16.2
Origin		

RMB*	14,742	80.7
Upstate	3,489	19.1
Other States	36	0.2

Source: SI-PNI/PNI/MS, 2018.

*RMB: metropolitan region of Belém

The total number of immunobiologicals' doses administered in the SI-CRIE and SI-PNI systems was 95,344. We identified that, throughout the study period, the vaccines: inactivated influenza, hepatitis B, polysaccharide pneumococcal 23-valent (pneumocócica 23-valente polissacarídica), and the vaccine against hepatitis A were the most administered (Table 2).

Table 2 - Time series of the number of vaccine doses administered per year in the HOL's CRIE from 2006 to 2016, from SI-CRIE and SI-PNI by immunobiological type. Belém, PA, Brazil, 2018

Immunobiological		2006	2007	2008	2009	2010	2011	2012	2013	2014*	2015*	2016*	Total
Inactivated Influenza	N	1774	1899	2122	3916	2983	2597	1182	2928	1855	1974	3078	26308
	%	23.9	26.4	24.6	33.79	30	25.58	12.5	27.37	25.2	36.5	41.3	27.59
Hepatitis B	N	2276	2061	2087	2230	2166	2279	2387	2940	1502	584	916	21428
	%	30.6	28.7	24.2	19.24	21.8	22.44	25.2	27.48	20.4	10.8	12.3	22.47
23-valent Pneumococcus	N	1129	880	741	979	979	1326	2951	1261	1455	918	1403	14022
	%	15.2	12.2	8.6	8.448	9.84	13.06	31.1	11.79	19.8	17	18.8	14.71
Hepatitis A	N	420	490	749	917	772	943	1055	1108	1086	1198	880	9618
	%	5.65	6.81	8.7	7.913	7.76	9.287	11.1	10.36	14.7	22.2	11.8	10.09
Haemophilus influenza type b	N	208	400	466	598	685	940	358	825	303	180	302	5265
	%	2.8	5.56	5.41	5.161	6.88	9.257	3.77	7.712	4.11	3.33	4.05	5.522
Conjugated meningococcal C	N	194	305	632	1090	602	0	0	350	149	124	141	3587
	%	2.61	4.24	7.34	9.406	6.05	0	0	3.272	2.02	2.29	1.89	3.762
DTPa	N	238	156	214	359	309	318	346	192	334	170	146	2782
	%	3.2	2.17	2.48	3.098	3.1	3.132	3.65	1.795	4.53	3.14	1.96	2.918
Varicella	N	196	205	290	339	319	409	115	176	185	48	205	2487
	%	2.64	2.85	3.37	2.925	3.21	4.028	1.21	1.645	2.51	0.89	2.75	2.608
**Others	N	1001	795	1311	1160	1137	1342	1092	917	498	210	384	9847
	%	13.5	11.1	15.2	10.01	11.4	13.22	11.5	8.572	6.76	3.88	5.15	10.33
Total		7436	7191	8612	11588	9952	10154	9486	10697	7367	5406	7455	95344

Source: SI-CRIE /SI-PNI/PNI/MS (2018).

*The use of vaccines registered by SI-PNI refers to the years 2014/2015/2016.

**Others: 49 (0.1%) Tetravalent (DTP+Hib); 187 (0.2%), Measles, Mumps, and Rubella (Triple Viral Vaccine); 408 (0.5%) Yellow Fever; 1851 (1.9%), VIP; 9 (0.0%); Typhoid Fever; 796 (0.8%), Immunoglobulin. Hep B; 16 (0.0%) Tetanus Immunoglobulin; 50 (0.0%) Rabies Immunoglobulin; 831 (0.9%); Varicella zoster immunoglobulin; 50 (0.0%) Cell/Vero culture Rabies (Raiva cultivo celular/vero); 2 (0.0%) Fuenzalida Rabies; 141 (0.1%) Infant double; 4 (0.0%) Pentavalent; 8 (0.0%) Quadrivalent HPV; 8 (0.0%) Pneumococcal 10V; 2 (0.0%) Influenza H1N1.

We can verify that among the specific immunoglobulins, the Human anti-hepatitis B immunoglobulin (Imunoglobulina humana antihepatite B, IGHAB) and the Human anti-varicella-zoster immunoglobulin (Imunoglobulina humana antivaricela-zoster, IGHAVZ) were the main immunoglobulins administered with a mean dose of 72 ($\mu=72.3$) and 76 ($\mu=75.5$) respectively (Table 3). While Table 4 shows the main reasons for indicating immunobiologicals for CRIE/HOL users.

Table 3 - Number of doses of immunoglobulins administered per year in the HOL's CRIE from 2006 to 2016, from SI-CRIE and SI-PNI. Belém, PA, Brazil, 2018

Immunoglobulins		2006	2007	2008	2009	2010	2011	2012	2013	2014*	2015*	2016*	Total
Anti-varicella-zoster	N	50	77	60	68	110	160	91	67	84	17	47	831
	%	50.0	49.0	42.3	46.3	59.5	98.8	36.3	37.6	58.7	22.1	31.1	49.1
Anti-hepatitis B	N	43	75	77	71	75	0	157	81	58	58	101	796
	%	43.0	47.8	54.2	48.3	40.5	0.0	62.5	45.5	40.6	75.3	66.9	47.0
Anti-rabies	N	5	4	4	7	0	1	2	23	1	2	1	50
	%	5.0	2.5	2.8	4.8	0.0	0.6	0.8	12.9	0.7	2.6	0.7	3.0
Anti-tetanus	N	2	1	1	1	0	1	1	7	0	0	2	16
	%	2.0	0.6	0.7	0.7	0.0	0.6	0.4	3.9	0.0	0.0	1.3	0.9
Total	N	100	157	142	147	185	162	251	178	143	77	151	1693
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: SI-CRIE/SI-PNI/PNI/MS, 2018.

*The use of immunoglobulins registered by SI-PNI refers to the years 2014/2015/2016.

Table 4 - Distribution of users seen in the CRIE of the HOL, according to the reasons for indicating users for the use of immunobiologicals, from 2006 to 2016, from the SI-CRIE and SI-PNI. Belém, PA, Brazil, 2018 (continues)

Indication reason	Quantity	Percentge (%)
HIV	15,284	16
Chronic renal failure	14,836	15.5
Risk situation ⁽¹⁾	12,142	12.7
Pneumopathy	8,051	8.4
Not informed	7,764	8.1
Immunocompromised other causes ⁽²⁾	5,176	5.4
Hemoglobinopathy	4,025	4.2
Hepatopathy	3,889	4.1
Adverse Event ⁽³⁾	3,346	3.5
Congenital immunodeficiency	3,344	3.5
Asplenia	3,086	3.2
Others ⁽⁴⁾	3,036	3.2

Newborn	2,863	3
Transplanted ones ⁽⁵⁾	2,291	2.4
Nephropathies	1,898	2
Cardiopathy	1,687	1.8
Therapeutic immunodeficiency	723	0.8
Therapeutic immunodepression	466	0.5
Diabetes mellitus	398	0.4
Neoplasms	220	0.2
Individuals living with immunosuppressed individuals	212	0.2
Neurological diseases	206	0.2
Trisomies	156	0.2
Nephrotic Syndrome	111	0.1
Hypersensitivity	58	0.1
Cystic Fibrosis	39	0.1
Chronic neurological	37	0
Total	95,344	100

Source: SI-CRIE/SI-PNI/PNI/MS (2018).

(1) sexual abuse, percutaneous accident, outbreak blockage, sexual communicators, AgHbs+ home contact, VZ hospital contact, VZ home contact, AgHbs+ sexual contact, polytransfused patient, health professional, NB of HBsAg+ mother, (exposed), (2) immunocompromised for undefined causes, (3) had an adverse reaction to the conventional vaccine, (4) pregnant ones, liquoric fistula, puerperal woman, routine and other causes, (5) undergone bone marrow transplant, and organ transplant.

It was identified that, in the period from 2014 to 2016, from the SI-PNI system, the three health professionals who referred the most to the HOL's CRIE were: medical professionals of the specialties: infectology 3,342 (18.3%), nephrology 1,532 (8.4%), hematology 989 (5.4%). In 7,135 cases (39.1%), there was no information on the source of the referral (Table 5). We highlight that only the SI-PNI system includes information on the referral source.

Table 5 - Distribution of the professional referrer of the users seen at the HOL's CRIE in the period from 2014 to 2016, from SI-PNI. Belém, PA, Brazil, 2018 (continues)

Referrer professional	No.	%
Not informed	7,135	39.1
Infectology	3,342	18.3
Nephrology	1,532	8.4
Hematology	989	5.4
Pneumology	939	5.1
Pediatric service	910	5
General Medicine	735	4
Immunology Service	732	4

Oncology Service	648	3.5
Rheumatology	437	2.4
Neurology	397	2.2
Cardiology service	112	0.6
General Surgery Service	99	0.5
Otolaryngology	59	0.3
Neonatology	41	0.2
Resident physician	31	0.2
Allergist Service	17	0.1
Endocrinology Service	15	0.1
Pediatric Surgery Service	13	0.1
Nurse	12	0.1
Geriatrics	12	0.1
Gynecology	12	0.1
Digestive Surgery Service	11	0.1
Neurosurgery	10	0.1
Cardiovascular service	7	0
Gerontology	4	0
Leprology	4	0
Judicial recommendation	4	0
Odonto-pediatric dentist surgeon	2	0
Obstetrics	2	0
Family health	2	0
Dental surgeon	1	0
Dermatology	1	0
Total	18,267	100

Source: SI-PNI/PNI/MS, 2018.

DISCUSSION

Regarding the SI-CRIE, the lack of training of professionals to handle the tools for updating and indexing data reflected in this survey when it was not successful in collecting variables such as: number of registered users, gender, age group, origin, and referrer. Another obvious shortcoming in relation to both information systems was the inexistence of information as to the source of the referrer, and we can only infer that the majority of users came from HOL.

The SI-PNI was only deployed in CRIE/HOL as of 2014 when SI-CRIE was phased out of the information system. The systems transition may reflect a loss of information observed in the analysis of this study, since the transition of information systems may cause data loss in any condition. Besides the difficulty of planning the service for training professionals in handling new tools for updating and indexing data, which are crucial for conducting studies

that reflect the best functioning of the service, and that can more faithfully demonstrate the indicators of interest to the PNI.

A particular analysis of demographic data was performed through SI-PNI, with the most observed age range being that of the population between 20 and 39 and 40 to 59 years of age; users aged 60 and over (Table 1). These data were similar to those found in the study that described the profile of care in the CRIE of Santa Catarina from 2001 to 2007⁽⁴⁾. These findings may be related to the demographic transition process, where increased life expectancy raises the prevalence of having a chronic disease⁽⁶⁾.

Regarding the origin of the users, most of them were concentrated in the metropolitan region of Belém 14,742 (80.7%) (Table 1), constituted by five municipalities: Ananindeua, Belém, Benevides, Marituba, and Santa Bárbara do Pará⁽⁷⁾. This result may indicate the difficulty for other municipalities to access the CRIE in Belém.

Still on the origin, the interior of the state obtained the lowest percentage of access, with 3,489 appointments (19.1%), according to data in Table 1, not meaning that this population does not need the attention of the CRIEs. This fact may be related to the difficulty of displacement and access of the population living in remote areas of the state, and it is one of the factors for access to the immunobiologicals. Another factor would be the reduced number of user referrals to CRIEs, ratifying the underutilization of special immunobiologicals by users.

This finding may raise discussions to evaluate the implementation of new CRIEs units in remote areas in the Amazon, with conditions of service like those in the Amazonian municipalities that have technical-scientific support: colleges with the training of health professionals and services of high complexity⁽⁸⁾.

The inactivated influenza vaccine was the immunobiological vaccine with the highest number of doses administered, 26,308 doses (Table 2), which is relevant because, in general, inactivated vaccines are safe in immunocompromised patients and should be administered according to the recommendations in force in the country⁽⁹⁾. This great number is probably related to influenza vaccination campaigns that were initiated in 1998, focusing on the population over 60 years of age⁽¹⁰⁾.

Another immunobiological vaccine with high quantitative indication was the hepatitis B vaccine, which had 21,428 doses (Table 2), an important fact because the transmission of the hepatitis B virus (HBV) is extensive and can occur in different ways. Although the hepatitis B vaccine was highly recommended in this study, the hepatitis B specific immunoglobulin (IGHAB) had the second-highest indication amount: 796 doses administered over the period (Table 3), which is relevant because it reflects non-vaccination, or failure to carry out the complete scheme, and infers low adherence to or recommendation of the hepatitis B vaccine, and consequently, increased exposure of individuals to risk situations⁽²⁾.

In a survey with 506 health professionals in a city of the Recôncavo Baiano, the prevalence of vaccination for hepatitis B was evaluated, and a complete vaccination prevalence rate of 59.9% was demonstrated, indicating low coverage⁽¹¹⁾.

Another variable relevant to the condition of people living with HIV/AIDS, such as "the reason for the indication", presented (15,284) the highest number of indications for use of immunobiologicals in the CRIE (Table 4). The result is of great relevance because of the immunological changes that people living with HIV/AIDS are prone to, therefore, susceptible to vaccine-preventable diseases.

The Brazilian Society of Immunization (Sociedade Brasileira de Imunização, SBIIm) highlights that vaccine-preventable diseases are important causes of morbidity and mortality in people living with HIV/AIDS. Studies show that in this population there is a higher risk for invasive pneumococcal disease, even if the patient is under antiretroviral therapy. Another example is the greater chance of HBV infection developing into cirrhosis and hepatocarcinoma compared to the non-HIV-infected population⁽¹²⁾.

Chronic renal failure (14,836) was the second clinical condition that motivated the indication of special immunobiologicals in the CRIE/HOL (Table 4). This result may probably be related to the fact that the HOL is a reference in the treatment of chronic kidney disease (CKD) and kidney transplantation, being a hospital of high complexity wherein other areas are also contemplated in the care, such as oncology⁽¹³⁾. It is worth noting that hepatitis B is considered a public health problem, especially in populations of a high risk of contamination such as kidney transplant receivers⁽¹⁴⁾.

The risk situation that also includes health professionals was another important condition in the data analysis, being indicated to 12,142 of the referred users (Table 4). Health professionals offer care to immunosuppressed individuals, thus they are exposed to care-associated diseases, as well as the susceptible population; the site of this study is a reference in the care of patients with special conditions, however, the use of immunobiologicals has been reduced⁽¹⁵⁾.

The reasons for the indication highlight the uninformed data, which obtained 7,764 of the indication records in both information systems (Table 4). This reflects the fragility of data completeness in information systems, which echoes in the accuracy of the presented data analysis. However, one must take an altruistic look at such results, as they will certainly contribute to the strengthening of the service⁽¹⁶⁾.

Regarding the reasons for the indication of immunobiologicals that has a low number in this study, it is worth mentioning the carriers of neoplasms (220 indications) (Table 4). This low percentage contrasts with the specificity of care observed in the HOL, considered a reference in oncology⁽¹³⁾.

We observed that the low number of oncologic users in the CRIE is related to the few medical referrals. This problem is corroborated by a study carried out in 2015, which reveals the delay in establishing the diagnosis and starting the oncologic treatment, which is a problem present in the various levels of health care and has aspects related to both users and health professionals and services⁽¹⁷⁾.

Persons living with immunosuppressed individuals represented another indication barely referred to the CRIE/HOL, with only 212 indications made to this group (Table 4). The SBIm⁽¹⁸⁾ recommends that these users need to be among the least indicated to perform immunobiological care. This can be considered a health problem because, especially in the case of immunosuppressed people, vaccination of contacted ones reduces the risks of infection to which they are exposed to.

The highest percentage of users referred to the CRIE/HOL was not informed (39.1%) (Table 5), and it should be noted here that this variable is only contemplated by SI-PNI. Among the limitations of computerized immunization records are problems like completeness, data quality, and under-registering, facts that may decrease their efficiency in vaccine monitoring⁽¹⁹⁾.

This study revealed little use of special immunobiologicals, which is consequently related to the reduced number of referrals by health professionals (Table 5), who develop their activities directly with the patient, especially the medical professional and the nurse, since nursing care integrates guidelines on prevention, mainly vaccination. From this, we can perceive the need to improve daily practices in order to increase adherence to the vaccination of special populations through health professionals.

Another aspect is that the HOL is also recognized as a teaching hospital, so it provides in-service training to health professionals enrolled in its residency programs. Only 31 resident doctors referred their patients to the aforementioned CRIE⁽¹³⁾. One of the strategies to increase the adherence of these in-training professionals would be the mandatory inclusion of immunization in the scientific discussions of the curricula of the medical and multi-professional residency programs offered by the HOL.

Other strategies, such as continuing education programs, recognized as a

transformative strategy for good practice in health services, should be part of the CRIEs' planning agenda and actions, in order to contemplate the comprehensive dissemination, importance, and adherence to the day-to-day practices of these centers, since knowledge about vaccination is constantly changing, a complex condition that also characterizes CRIEs⁽²⁰⁾.

The process of change from the SI-CRIE to the SI-PNI influenced the completeness of the data presented in this study, this being its main weakness since such information reflects the indicators of interest to the PNI.

FINAL CONSIDERATIONS

The study analytically described the clinical-epidemiological aspects and access to a CRIE in the Amazon, showing a restricted scope and distribution of the special immunobiologicals by the service to the target population.

The results showed limited access of the population to the CRIEs and consequent underutilization of special immunobiologicals in the Amazon region. These findings echo in repercussions to the population health conditions, marked by the persistence of vulnerability of individuals with special conditions to vaccine-preventable diseases that are available free of charge in the CRIEs.

There is a need for a review of the processes, which include capacity building, infrastructure, and logistics, articulated with the planning of coordinated actions involving the management spheres, capable of complying with the basic principles of universality and equity of the Unified Health System reaching the remote areas of Brazil, such as the Amazon region.

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