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Normative evaluation of vaccine rooms in the western region of the state of Minas Gerais, October 2015 to August 2016

Avaliação normativa das salas de vacina da região Oeste do estado de Minas Gerais, de outubro de 2015 a agosto de 2016

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ABSTRACT

Introduction: Vaccination is a relevant measure in the prevention of diseases, of low complexity and great impact on the general health conditions of the populations. **Objective:** This is a normative evaluation carried out through a cross-sectional study, with the objective of evaluating the conformity of vaccine rooms in the western area of Minas Gerais, according to the technical standards of the National Immunization Program, from October 2015 to August 2016. **Method:** In order to know the ideal functioning of the program, the logical model proposed by Donabedian was built, using the components: structure, process and result. From the model, the matrix of analysis and judgment, capable of punctuating the adequacy of the rooms, was created. The data source was the Health's Ministry's PAISSV instrument. Simple descriptive and bivariate analyses were performed. **Results:** Sixty percent (223) of the vaccine rooms in the region were evaluated, the majority (83,0%) being inadequate, both in the structure and in the general process. The absence of refrigerated chamber and air-conditioned room in most municipalities were the worst evaluated items in the structure dimension. Continuing education was the most critical process in 56.5% (126) of the vaccine rooms, demonstrating lack of training by the staff. **Conclusions:** This study contributed to the knowledge of the vaccine's room's structure and organization for promoting their effectiveness.

KEYWORDS: Primary Health Care; Immunization; Nursing; Health Services Evaluation

RESUMO

Introdução: A vacinação é uma medida relevante na prevenção de doenças, de baixa complexidade e grande impacto nas condições gerais de saúde das populações. **Objetivo:** Trata-se de uma avaliação normativa realizada por meio de um estudo transversal, com o objetivo de avaliar a conformidade das salas de vacina da região Oeste de Minas Gerais, de acordo com as normas técnicas do Programa Nacional de Imunizações, de outubro de 2015 a agosto de 2016. **Método:** Para conhecer o ideal funcionamento do programa, foi construído o modelo lógico, utilizando os componentes: estrutura, processo e resultado, proposto por Donabedian. A partir do modelo, foi criada a matriz de análise e julgamento, capaz de pontuar a adequação das salas. A fonte de dados foi o instrumento PAISSV, do Ministério da Saúde. Foram realizadas as análises descritiva simples e bivariada. **Resultados:** Avaliou-se 60,0% (223) das salas de vacina da região e a maioria (83,0%) estava não adequada, tanto na dimensão estrutura quanto no processo geral. As ausências de câmara refrigerada e de sala climatizada na maioria dos municípios foram os piores itens avaliados na dimensão estrutura. A educação permanente foi o processo mais crítico em 56,5% (126) das salas, demonstrando falta de capacitação dos trabalhadores. **Conclusões:** Este estudo contribuiu para o conhecimento das fragilidades na estrutura e no processo das salas de vacina para, a partir disso, favorecer a sua adequação.

PALAVRAS-CHAVE: Atenção Primária à Saúde; Imunização; Enfermagem; Avaliação de Serviços de Saúde

INTRODUCTION

Vaccination is a relevant measure in the prevention of diseases. It has low complexity but great impact on the general health conditions of the population. It is estimated that more than 30 vaccine doses are administered globally every second and no other health intervention reaches so many people or is capable of preventing such a wide range of public health problems[1].

In Brazil, the National Immunization Program (PNI) is established as an important coordinator of public health interventions for reducing the profile of morbidity and mortality due to communicable diseases. It is a world reference program due to its high effectiveness, wide acceptance and population adherence[2]. On the other hand, it needs strict monitoring for the maintenance of the quality of the immunobiological agents administered to the population[3].

Nevertheless, Brazilian and foreign studies list several divergences regarding the structure and process of immunization programs. The results of these investigations point to failures in the conservation, storage and transportation of immunobiological agents[3,4,5,6,7,8,9]; in the continued education of workers in the vaccine room[5,10,11]; in the supervision of vaccine rooms[12,13]; in addition to identifying barriers related to access in vaccine rooms[14]. Although Brazilian publications on the dynamics of vaccine rooms have increased in recent years, there are few investigations that use the evaluative approach[15] in the conduction of these studies.

The immunization program is characterized by an extremely dynamic context and includes a number of aspects that need to work properly in order to promote a successful action, requiring ongoing implementation. It is necessary to maintain a periodic update and a permanent evaluation so as to enable the program to succeed. In this sense, evaluation and monitoring actions are relevant and a useful management tool to improve the operation of the program, since they enable us to know its elements and thus make more informed decisions based on value judgment[16].

The model proposed by Donabedian attributes three dimensions to the evaluation: structure, process and result. The structure represents the physical, human, and organizational conditions in which care is provided; the process refers to the dynamics of care and the result is the final product of the care. Normative evaluation therefore consists of judging an intervention by comparing its structure, process and result obtained with the existing criteria and norms. It can be considered an important approach to evaluate the conformity of health services[15,17].

The PNI is an important public health program that requires evaluation so that we can ensure that its purposes will be achieved. In view of the epidemiological impact of immunization and considering possible interference in its efficacy, it is important to identify the fidelity of all aspects that involve immunization at the local healthcare level according to certain technical standards.

With that in mind, this study aimed to evaluate the conformity of vaccine rooms, according to the technical standards of the PNI, in the western region of the state of Minas Gerais, Brazil, in 2016.

METHOD

This is a normative assessment based on the Donabedian triad[17]. It was carried out by means of a cross-sectional study. We attempted to compare the structure and the process of the vaccine rooms in western Minas Gerais with the norms and guidelines recommended by the PNI[18,19] and thus assess its degree of conformity.

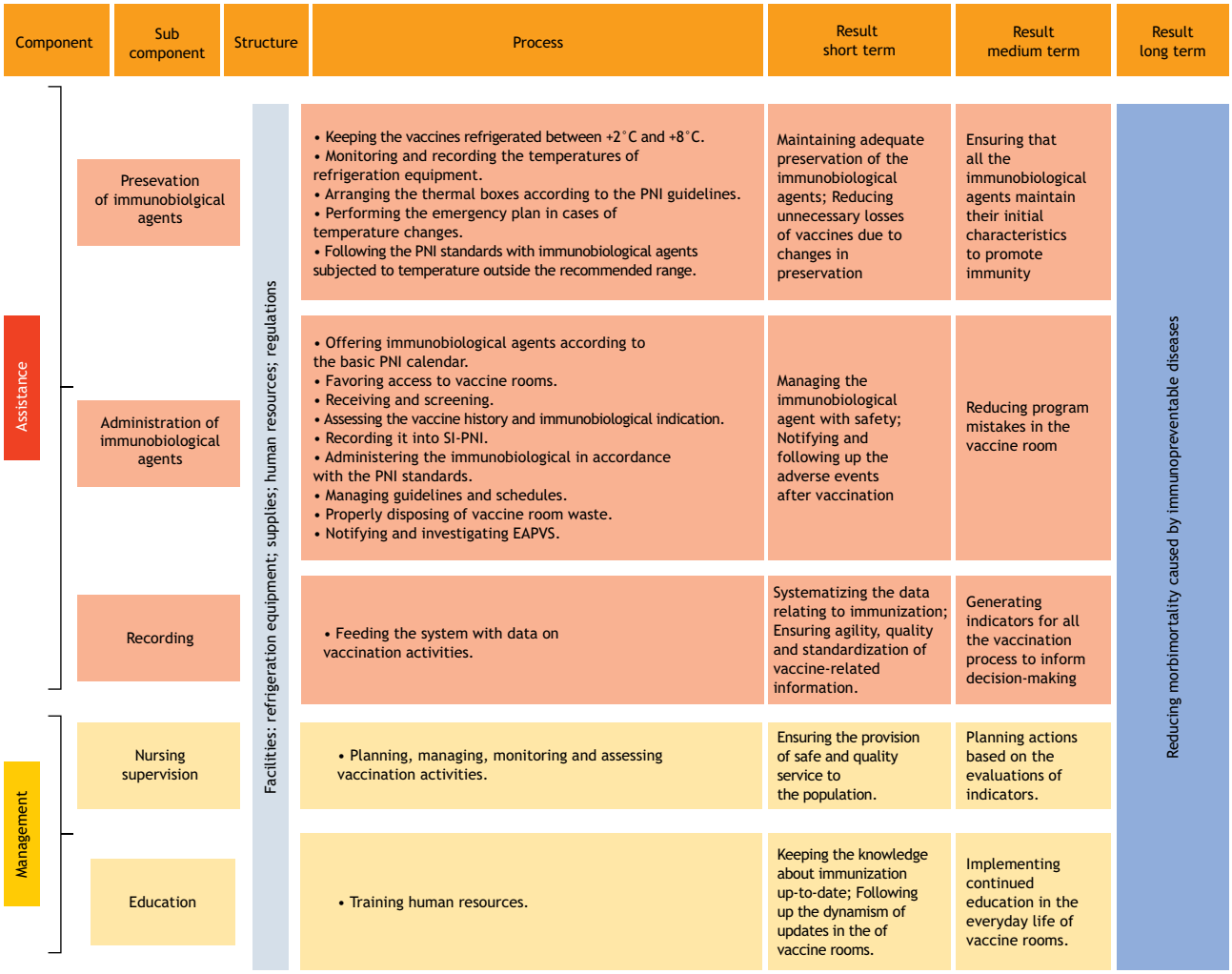
The western region of Minas Gerais represents one of the 13 health regions of the state and has 54 municipalities grouped into six micro-regions: Bom Despacho, Formiga, Itaúna, Pará de Minas, Santo Antônio do Amparo and Santo Antônio do Monte/Divinópolis (core municipality of the health region). A total of 370 vaccine rooms are distributed in it[20].

The research data source was the Vaccine Room Monitoring Instrument Evaluation Program (PAISSV), created by the Ministry of Health (MS) to evaluate Brazilian vaccine rooms. The PAISSV was sent to the 370 vaccine rooms of the region, through the technical references on immunization of the 54 municipalities, in October 2015.

By August 2016, of the 370 questionnaires sent, 232 questionnaires were returned to the Regional Health Superintendency (SRS), even after several telephone contacts and extension of the deadline. Of these 232 questionnaires, nine questionnaires referring to the rooms used for the municipal stock of immunobiologicals or those linked to hospitals and prompt care were excluded, as they did not require the same team, nor did they perform the same actions as the other rooms. Thus, 223 rooms distributed in 49 municipalities were included in the study, since five municipalities did not send evaluation questionnaires about their vaccine rooms.

In order to recognize the propositions of the ideal functioning of vaccine rooms, we built a logical model (Figure) based on the latest normative manuals available up to the time of study: Manual of Norms and Procedures for Vaccination, of 2014[19], and Cold Network Manual of the National Immunization Program, of 2013[18]. The model subsidized the definition of evaluative questions and, based on these, the criteria used in the analysis of the dimensions of structure and process. The questions were classified as to their priority, usefulness, if they generate important information and feasibility[21]. Those that met all these criteria were chosen to compose the matrix of analysis and judgment, which enabled us to rate the vaccine rooms according to their compliance with the program.

In the matrix, the most valued items (maximum of five points) in the structure dimension were those deemed essential for the proper functioning of the PNI in the municipalities: exclusive room, air conditioned and with refrigerated room, adequate conditioning of the piercing material, existence of a nurse. The ideal vaccination team has the presence of two nurses or a nurse plus two nursing technicians/assistants working in the vaccine room.



EAPVS: post-vaccination adverse events; PNI: National Immunization Program; SI-PNI: Information System of the National Immunization Program.

Figure. Logical model of the PNI, 2016.

In the process dimension, three components were evaluated: "Conservation of immunobiological agents", "Administration of immunobiological agents" and "Continued education". In the conservation of the immunobiological agents, the following parameters were analyzed: 2x/day refrigeration equipment temperature recording, recyclable ice coil setting, thermal box temperature monitoring, communication to the upper instance in cases of temperature change, filling of the deviation form, maintenance of refrigerated vaccines until the decision of the higher instance.

In the administration component of the immunobiological agents, we evaluated the functioning of the vaccine room in the two shifts, notification and investigation of Adverse Events after Vaccination (EAPV), treatment of live vaccines before disposal and administration of all routine vaccines of the basic PNI valid at the time of data collection.

In the continued education component, we investigated whether there was training in the last two years for at least one of the vaccine room team members.

The analysis and judgment matrix was defined by consensus, based on discussions with internal and external stakeholders, like: researchers, Technical Reference on Immunization of SRS, and technical references of the PNI of three municipalities.

Upon receiving the PAISSV questionnaire, the researchers selected the items that would answer the questions from the analysis and judgment matrix to identify the rating of each vaccine room. Each item was rated from 0.0 to 5.0 points. The maximum rating of the matrix was 95 points, 40 points referring to the structure dimension and 55 points to the process dimension. The process rating (55) was subdivided into: 30 points for the "Conservation of immunobiologicals" component, 20 points for "Administration of immunobiologicals" and five points for the "Continued education" component. The processes of the subcomponents "Recording" (from the "Assistance" component) and "Nursing Supervision" (from the "Management" component), included in the logical model, are not contained in the analysis and judgment matrix because there are no PAISSV items capable of responding to their main attributions. They will be evaluated in future research.

Next, we proceeded to the ratings of the degree of conformity, considering two steps. In the first moment, the observed values (Σ of the points of the indicators) were determined and the degree of conformity (observed Σ of the maximum points X 100) was calculated for each component. Afterward, we did the sum of the components for the calculation of the degree of compliance. The classification of the degree of total compliance was the same as that used in a study carried out in Minas Gerais[10], which categorized it as: (1) critical: <60.0%; (2) not adequate: ≥ 60.0% and <90.0%; (3) adequate: ≥ 90.0%.

In addition to the descriptive analysis, represented by the frequency calculations, a bivariate statistical analysis was performed. Pearson's chi square test was used to analyze the association between the degree of compliance of the vaccine rooms with the exposure variables: population size and estimated coverage of the Family Health Strategy (ESF) in the municipality. The level of significance was set at 5%.

The population size of the municipalities was classified as: small size I (≤ 20,000 inhabitants); small size II (> 20,000 to ≤ 50,000 inhabitants); medium size (> 50,000 to ≤ 100,000 inhabitants); and large (> 100,000 inhabitants)[22]. Regarding the ESF coverage, the municipalities were divided into municipalities with 100% coverage and municipalities with a coverage of less than 100%.

The information was typed in double entry in Epi-data 6.0 to eliminate possible typos and analyzed in Stata 12.0.

This study was approved by the Committee of Ethics in Research with Human Beings of the Federal University of São João del-Rei, under n. 1.231.140, of September, 2015.

RESULTS

Of the 370 vaccine rooms in the western region of Minas Gerais, 232 sent the questionnaire to SRS. However, according to the inclusion criteria, 223 (60.0%) of them were analyzed. Because it was not feasible to describe 223 vaccine rooms evaluated in the study, the results were consolidated by microregion. These are: Microregion A (21 rooms), Microregion B (52 rooms), Microregion C (45 rooms), Microregion D (30 rooms), Microregion E (26 rooms) and Microregion F (49 rooms).

We verified that 63.0% (141) of them were distributed in ESF units, 26.0% (58) in traditional Basic Health Units and in 11.0% (24) we did not identify the type of service to which they were linked.

Most of the rooms we analyzed (82.0% – 182) served the urban population, 11.0% (24) served the rural population and 3.0% (six) received both rural and urban population; in 5.0% (11) the type of population served was not identified. Of the rooms in the region, 70.0% (157) were open eight hours or more, 25.0% (55) six hours and 5.0% (11) four hours a day.

Table 1 presents all the items that made up the analysis and judgment matrix, including the structure and process dimensions for each (sub) component (see logical model).

Regarding the structure, the small number of rooms (54) that maintains the recommended temperature between + 18ºC and + 20ºC is noteworthy. In addition, only 23.0% (51) have a refrigerated chamber, which is the currently recommended refrigeration equipment. The predominant refrigeration equipment is still the domestic refrigerator (77.0%).

In the evaluation of the composition of the ideal team in the vaccine room, just over half (119) of the rooms reached the maximum rating, which considered the existence of two nurses or one nurse plus two nursing technicians/assistants.

About the immunobiological agent administration process, less than half of the rooms (109) administered all vaccines of the basic national calendar in force during the period of the survey during the whole period of the room's operation, and only 56.5% (126) treat live vaccines prior to their disposal.

In the "Continued Education" process, only 43.0% (97) of the rooms presented at least one staff member trained in the last two years. This period was considered because of the latest updates in immunization provided for in the Manual of Norms and Procedures for Vaccination of 2014.

The calculation of the degree of compliance of vaccine rooms in the western region of Minas Gerais allowed the classification of rooms according to the established system of scores. The degree of compliance was found to be adequate in 14.7% (33) of the vaccine rooms evaluated (Table 2).

Region A presented the highest number of adequate rooms (11). Regions C, D and E were those with rooms evaluated as having a critical degree of conformity. The majority of the rooms (83.0%) were classified as not adequate, and this classification is more significant in regions B (20.6%) and F (21.1%).

The rooms that sent the PAISSV questionnaire and were therefore included in the analysis belonged to 49 municipalities in the western region of Minas Gerais. Nine of them had up to 20,000 inhabitants, 34 between 20,001 and 50,000 inhabitants, five had 50,001 to 100,000 inhabitants and one had more than 100,000 inhabitants. Most municipalities (36) had an estimated ESF coverage of 100.0% and the other (13) had an estimated ESF coverage of less than 100.0%.

In order to facilitate the calculation of association between the degree of compliance with the population size and the estimated ESF coverage, the rooms were grouped according to their location in the participating municipalities.

We verified that there was no statistically significant association between ESF and the population size of the municipality with the degree of compliance of the vaccine rooms (Table 3). Therefore, neither the ESF coverage nor the population size interfered in the adequacy of vaccine rooms in the western region of Minas Gerais.

It was also demonstrated that most rooms have inadequate structure (77.6%) and general processes (80.3%) (Table 4).

Table 1. Percentages of data related to the structural and process dimensions of vaccination rooms in the western region of Minas Gerais, from October 2015 to August 2016.

Components	n	%
Structure		
Exclusive room for immunization	188	84.3
Room temperature between + 18º C and + 20º C	54	24.2
Presence of refrigerated chamber	51	23.0
Presence of domestic refrigerator	172	77.0
Existence of maximum and minimum thermometer in the refrigerator	206	92.0
Proper disposal of piercing material	211	94.6
Sufficient amount of thermal boxes	202	90.1
Ideal vaccination team*	119	53.3
Presence of a nurse in the service	218	97.8
Process		
Conservation of immunobiological agents		
Temperature recording of refrigeration equipment 2x/day	217	97.3
Setting of the ice coils	209	93.7
Thermal box temperature monitoring	202	90.6
Communication to the higher instance in cases of temperature change	221	99.1
Completion of the quality variance form	220	98.6
Maintenance of refrigerated vaccines until decision of the upper instance	220	98.6
Administration of immunobiological agents		
Administration of all vaccines in the basic PNI schedule**	109	48.9
Room functioning in two shifts	213	95.5
Notification of post-vaccination adverse events	209	93.7
Treatment of live vaccines prior to disposal	126	56.5
Continued education		
Training in the last two years of at least one of the vaccine room team members	97	43.5

*The ideal vaccination team was considered as the presence of two nurses or one nurse plus two nursing technicians/assistants working in the vaccine room; ** The analysis of this item considered the current vaccination schedule at the time of data collection.

Table 2. Degree of conformity of vaccine rooms by microregions of the western region of Minas Gerais/Brazil, from October 2015 to August 2016.

Microregions of health	Degree of conformity					
	Adequate		Not adequate		Critical	
	n	%	n	%	n	%
A	11	5.0	10	4.5	0	0.0
B	6	2.7	46	20.6	0	0.0
C	5	2.2	38	17.0	2	0.9
D	5	2.2	24	10.8	1	0.5
E	4	1.8	20	9.0	2	0.9
F	2	0.9	47	21.1	0	0.0
Total	33	14.7	185	83.0	5	2.3

Table 3. Degree of conformity of vaccine rooms according to the Family Health Strategy (ESF) coverage and population size of municipalities in the western region of Minas Gerais, Brazil, from October 2015 to August 2016.

Variáveis de exposição	Grau de conformidade					
	Adequado		Não adequado		Crítico	
	n	%	n	%	n	%
Cobertura ESF[1]						
100%	6	12,0	30	61,0	0	0,0
< 100%	1	2,0	11	22,0	1	2,0
Porte populacional[2]						
Pequeno I	6	12,0	28	57,0	0	0,0
Pequeno II	1	2,0	8	16,0	0	0,0
Médio	0	0,0	4	8,0	1	2,0
Grande	0	0,0	1	2,0	0	0,0

[1] *Pearson* X^2 (ESF Coverage) = 3.3096 (p = 0.191); Pearson[2]X^2 (population size) = 10.0658 (p = 0.122).

In the analysis of each component of the process, continued education is the most critical event in the majority (56.5%) of the vaccine rooms, proving to be the greatest obstacle among them, followed by administration of immunobiological agents (36.7%). Most of the rooms carry out the conservation of vaccines satisfactorily, and this process is classified as adequate in 83.9% (187) of them.

DISCUSSION

The PNI still faces challenges for its consolidation, even after more than 40 years of its creation. Vaccine rooms in the western region of Minas Gerais are, for the most part, inadequate as proposed by the program. The immunobiological conservation subcomponent was the best evaluated and the continued education

Table 4. Distribution of the number of vaccination rooms in the western region of Minas Gerais, Brazil, regarding their degree of conformity according to the dimensions, from October 2015 to August 2016.

Evaluation dimensions	Degree of conformity					
	Adequate		Not adequate		Critical	
	n	%	n	%	n	%
Structure	43	19.3	173	77.6	7	3.1
General process	39	17.5	179	80.3	5	2.2
Preservation of immunobiological agents	187	83.9	35	15.7	1	0.4
Administration of immunobiological agents	84	37.7	57	25.6	82	36.7
Continued education	97	43.5	0	0.0	126	56.5

Source: Questionnaire of the Vaccine Room Supervision Instrument Evaluation Program - PAISSV/PNI, 2016.

subcomponent of the workers still remained not very significant in the process of vaccine rooms.

Studies evaluating the PNI at the local level revealed the need for structural and operational improvements for a satisfactory setup[3,4,10]. With regard to the structural aspects of the vaccine room, highlights to the small number of rooms that are air-conditioned and equipped with refrigerated chambers. The World Health Organization (WHO) does not recommend the use of domestic refrigerators because of their inability to maintain the internal temperature for a minimum time in cases of power outages. The chamber should be used because of its better thermal distribution and greater stability, i.e. its ability to maintain the same temperature throughout the equipment, avoiding the exposure of vaccines to undesired extreme temperatures. It is known that correct storage is a prerequisite for the maintenance of the quality and safety of immunobiological agents[23,24,25].

Although in this study the conservation of immunobiological agents has been better evaluated, these results may have been influenced by an evaluation carried out in the region between 2010 and 2011, which analyzed the cold chain of vaccine conservation and identified critical maintenance conditions in most municipalities[10]. They may also reflect a limitation of the data collection instrument, since the direct observation of the evaluated items was not explored.

It is important to emphasize that this study was requested by the Western Region SRS immunization sector in order to evaluate the vaccination rooms, after interventions in the region, as a result of the results obtained in the previously mentioned vaccine conservation study.

Vaccine conservation is one of the necessary measures to maintain the quality of immunobiological agents and should therefore be monitored[19]. Failure to maintain the temperature may lead to the loss of power of the vaccine, resulting in failure to immunize and exposing people to the risk of disease, in addition to increasing the risk of EAPV[11].

Studies in Brazil and in several countries point to very similar failures in this area, such as the lack of proper setting of ice coils, lack of equipment maintenance in the recommended temperature range for vaccine conservation, lack of temperature monitoring devices, insufficient procedures in the receipt of vaccines, the use of domestic refrigerators for the storage of immunobiological agents, in addition to equipment that is worn out and in need of replacement[3,4,5,6,7,9,26].

In order to remedy problems in the cold chain, some countries have been doing studies on autobiomineralized vaccines, which are capable of withstanding the temperature of + 26° C for more than nine days and of + 37° C for approximately one week. Because they can be stored at room temperature, they reduce the need for the cold chain and, consequently, the high costs of maintaining the refrigeration of vaccines, providing an economically feasible alternative[27,28].

In addition to preservation, aspects relating to the administration of immunobiological agents, especially with regard to live vaccines, which constitute an infectious residue, deserve attention, therefore requiring treatment before disposal[19]. Even though we know of the need to apply this technique to reduce or eliminate the risk of contamination, occupational accidents or damage to the environment, just over half the rooms perform this procedure. Furthermore, it is essential that the piercing materials be packed in accordance with biosafety standards in order to avoid accidents[4]. In this sense, the Health Services Waste Management Plan (PGRSS) is particularly important, since it is a mandatory document for every health service and determines the correct management of the waste generated, according to its characteristics and risks[29].

The unavailability of vaccines, either because of the unit's operating hours or because of the non-administration of all PNI routine vaccines, leads to missed immunization opportunities, which contribute to the low coverage and delays in the vaccination schedule[14,30].

Although almost all vaccine rooms operate in two shifts, less than half of them administered all the vaccines provided for in the basic PNI routine schedule in the year of the survey. It should be noted that there is no point in introducing new vaccines if access to immunization activities is hampered. Vaccine rooms, which normally operate during business hours and do not provide alternative schedules, limit access, especially for people who work during business hours[31].

The rareness of continued education initiatives stands out in this study. Changes in the context of immunization are constant and range from extending the vaccination schedule to new equipment and vaccine technologies[7,27], requiring all professionals involved in these processes to be up to date[6,32].

The lack of knowledge of the professionals working in the vaccine room is perceived not only in innovations, but also in everyday situations, like in the case of the impact of temperature changes on immunobiological agents[5] and the technical standards of

immunization programs. Immunization experts have identified lack of supervision, education, training for vaccinators, and the lack of consistent standards involving all vaccine transportation processes[33]. Continuous supervision with the health professionals involved in immunization has had positive results in their knowledge and consequently in the quality of this service as a whole[12].

Traditional methods of teaching are prevalent in various contexts of decentralization and end up interfering with the effectiveness of changes in work processes. Reflection spaces are necessary for a meaningful learning and concrete labor incorporation[34].

It is understood that vaccine rooms need to be transformed into everyday education spaces so that healthcare professionals can discuss, learn and update themselves and extend a quality immunization service for the population[35].

Population size and ESF coverage were not associated, in opposition to research done in the same region[10] in the period between 2010 and 2011. We assume that the lower number of rooms evaluated (60%) may have influenced the results.

The demands for updating are diverse and should not be restricted to the human resources involved. Assessment tools also need to be up-to-date with the latest immunization recommendations to continue to be able to assess the full extent of what is intended. This continuous suitability of the instrument will allow the evaluation to take place in a valid, reliable and useful manner[36]. Stein[37] relates the reliability of the health services' assessment with the use of validated instruments.

It is known that the PAISSV is the MS instrument indicated to evaluate vaccine rooms. It is a valid and reliable method for its purpose and has been improved over time throughout the country. However, its last edition was made available in 2004, and some items related to vaccine conservation have already changed. Therefore, the use of PAISSV as a data collection instrument can be considered a limitation of the study. Nevertheless, the variables selected to compose the vaccine preservation subcomponent were those that did not undergo any changes, minimizing the possibility of compromising the internal validity of the study because of this question.

Another limitation was the approach used in the application of the instrument, which in some rooms was limited only to what was said by the workers in the vaccine room, that is, no direct observation was made. This may have overestimated the correct assertions of some items, such as the setting of recyclable ice coils, EAPV notification, and the conduct adopted in response to temperature changes in the refrigeration equipment.

On the other hand, the study provided elements on the critical events in vaccine rooms, allowing for better knowledge about the matter and pointing out the shortcomings that must be controlled. It also pointed out possible factors that should be better investigated in future research, such as access to vaccine rooms, insufficiently trained workers, and the need for the construction and validation of instruments that can evaluate the various dimensions of the vaccine room process.

It was also given the opportunity for the technical reference body in immunization of the municipality to collect and learn the strengths and weaknesses of vaccine rooms under their responsibility, thus instituting the practice of evaluation in the service.

CONCLUSIONS

Vaccine rooms in the western region of Minas Gerais are, for the most part, not adequate to the norms and guidelines of the PNI in relation to structure and process. The absence of refrigerated chamber and air-conditioned room in most municipalities were the worst items evaluated in the structure dimension.

In the process dimension, the subcomponent of continued education identified absence of training of workers in vaccine rooms. The list of vaccines currently in the national vaccination calendar and progress in the area require ongoing updating of the professionals involved in order to extend a quality immunization service for the population.

Evaluating the health services enables the acquisition of important information for better planning, execution, monitoring and control of the activities performed. This study can support managers and healthcare professionals in improving immunization services and, consequently, the quality of life of the population, by making informed decisions.

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Conflict of Interest

Authors have no potential conflict of interest to declare, related to this study's political or financial peers and institutions.