

# Factors related for reducing children's vaccine goals

**RESUMO** | Objetivo: investigar os fatores relacionados para a redução das metas vacinais infantis. Método: revisão integrativa da literatura embasada no checklist Preferred Reporting Items for Systematic Reviews and Meta-Analyses. As bases de dados consultadas foram Literatura Latino-Americana e do Caribe em Ciências da Saúde, Banco de Dados de Enfermagem em março de 2021. Foram incluídos artigos originais, nacionais e disponíveis na íntegra, publicados no período de 2016 a 2021. Resultados: a amostra compreendeu 10 artigos. A falta de tempo dos pais para levar os filhos às unidades de saúde para serem vacinadas foi evidenciado em 4 (40%) estudos, 2 (20%) mostraram a dificuldade de acesso as unidades por motivos de locomoção e outros 2 (20%) citaram as salas de vacinas com falta de imunobiológicos. Conclusão: a redução das metas vacinais infantis está relacionada à falta de tempo dos pais, deslocamento e falta de insumos nas unidades de saúde.

**Descritores:** Vacinas; Cobertura Vacinal; Epidemiologia Descritiva; Saúde da Criança; Criança.

**ABSTRACT** | Objective: to investigate the factors related to the reduction of childhood vaccination goals. Method: integrative literature review based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses checklist. The databases consulted were Latin American and Caribbean Literature on Health Sciences, Nursing Database in March 2021. Original, national and available articles published in the period from 2016 to 2021 were included. Results: the sample comprised 10 articles. The lack of time for parents to take their child to health unit to be vaccinated was evidenced in 4 (40%) studies, 2 (20%) showed difficulty in accessing the units for reasons of locomotion and another 2 (20%) cited vaccine rooms with a lack of immunobiologicals. Conclusion: the reduction of childhood vaccination targets is related to the lack of time of parents, displacement and lack of supplies in the health units.

**Keywords:** Vaccines; Vaccination Coverage; Epidemiology, Descriptive; Child Health; Child.

**RESUMEN** | Objetivo: investigar los factores relacionados con la reducción de las metas de vacunación infantil. Método: revisión integrativa de la literatura basada en la lista de verificación Elementos de informe preferidos para revisiones sistemáticas y metanálisis. Las bases de datos consultadas fueron Literatura Latinoamericana y del Caribe en Ciencias de la Salud, Base de Datos de Enfermería en marzo de 2021. Se incluyeron artículos originales, nacionales y disponibles publicados en el período de 2016 a 2021. Resultados: la muestra estuvo compuesta por 10 artículos. La falta de tiempo de los padres para llevar a sus hijos a las unidades de salud para ser vacunados se evidenció en 4 (40%) estudios, 2 (20%) mostraron dificultad para acceder a las unidades por motivos de locomoción y otros 2 (20%) citaron vacuna salas concarencia de inmunobiológicos. Conclusión: la reducción de las metas de vacunación infantil está relacionada con la falta de tiempo de los padres, el desplazamiento y la falta de insumos en las unidades de salud.

**Palabras claves:** Vacunas; Cobertura de Vacunación; Epidemiología Descriptiva; Salud del Niño; Niño.

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## INTRODUCTION

Immunization is the main way to prevent vaccine-preventable diseases, starting with the newborn and covering all age groups, such as children, adolescents, the elderly, pregnant women and indigenous people. <sup>(1)</sup> Since 1973, immunizations have been implemented and organized by the National Immunization Program (PNI - Programa Nacional de Imunização). This is one of the greatest and safest strategies for preventing infectious diseases. <sup>(2,3,1)</sup>

The immunization process has contributed to the elimination of some diseases such as polio, yellow fever, smallpox eradication, as well as other vaccine-preventable diseases. <sup>(4)</sup> Since 1990, vaccination coverage in children under one year of

age has been above 95%.<sup>(5)</sup> This milestone of the vaccine goal results in the control of transmission and, if sustained in populations, contributes to the eradication of diseases. This is demonstrated in the literature by proving the relationship between the increase in vaccination coverage and the decline in registered deaths from vaccine-preventable diseases.<sup>(6)</sup>

On the contrary, in situations of difficulty in maintaining the vaccination targets recommended by the PNI, there is an increase in cases of sick people, hospitalizations, deaths and an increase in public health expenditures. This reality took place in Roraima, where the measles virus spread, which began to circulate mainly in the states of the northern region of the country, reaching more than 10,000 confirmed cases in 2018.<sup>(6)</sup>

Vaccination coverage has been falling in the target of the children's calendar in the last five years, as evidenced in the year 2018, where the targets reached in childhood immunization were 99.7% for the BCG vaccine and 91.3% for the human rotavirus. It is noteworthy that the corresponding targets are greater than 90% of the target audience for the two vaccines. And, in 2019 and 2020, coverage for these vaccines declined, reaching between 63.8% and 80% of children.<sup>(2)</sup>

Following the fall in vaccination coverage, still in 2020, according to the National Immunization Program, the highest childhood vaccination coverage achieved was the Pneumococcal vaccine with 71.8%.<sup>(2)</sup> All this evidence puts at imminent risk of new outbreaks and/or epidemics affecting the entire population on a global scale.<sup>(7)</sup>

In this study, the vaccination status of children from zero to four years will be portrayed, this age group, in which most vaccines are offered because they are organisms in the development of the immune system, that still need to acquire immunity to grow and develop healthily. Children are prone to serious illnesses such as infantile paralysis, hepatitis, diarrheal diseases and bacterial and viral in-

fections that could stunt growth and cause death if not immunized.<sup>(3)</sup> Given the above, this work was motivated by the guiding question: what are the associated factors for the reduction of childhood vaccination goals established by the National Immunization Program? Thus, the objective was to investigate the factors associated with the



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reduction of childhood vaccination goals.

#### METHOD

Given the above, this work was motivated by the guiding question: what are the associated factors for the reduction of childhood vaccination goals established by the National Immunization Program? Thus, the objective was to investigate the

factors associated with the reduction of childhood vaccination goals.<sup>(8)</sup> Therefore, following the order of these steps, this review was guided by the research question: What are the associated factors for the reduction of childhood vaccination goals established by the National Immunization Program?

The databases consulted were Latin American and Caribbean Literature on Health Sciences (LILACS), Nursing Database (BDENF) in March 2021, using the Health Sciences Descriptors (DeCS): Vaccines (Vacinas); Vaccination Coverage; (Cobertura Vacinal); Descriptive Epidemiology (Epidemiologia Descritiva); Immunization Program (Programa de Imunização); Child Health (Saúde da Criança); Child (Criança), only in the Portuguese language because it is a search for national studies that addressed the difficulties of achieving the childhood vaccination goals established by the National Immunization Program. Four search strategies were carried out, namely: i) (Vacinas) AND (Cobertura Vacinal) AND (Epidemiologia Descritiva) AND (Programas de Imunização) AND (Saúde da Criança); ii) (Vacinas) AND (Cobertura Vacinal) AND (Epidemiologia Descritiva) AND (Programas de Imunização) AND (Criança); iii) (Cobertura Vacinal) AND (Criança) AND (Programas de Imunização) e iv) (Cobertura Vacinal) AND (Saúde da Criança) OR (Programas de Imunização).

Inclusion criteria were national articles published in the last five years in the period from 2016 to 2021 and studies available in full. Reviews, dissertations, thesis and experience reports were excluded.

Two authors individually and independently read the title, objective and abstract to investigate studies that met the inclusion criteria. In a situation of disagreement between the authors, a third reviewer participated in this process to confirm the eligibility criteria. Continuing the evaluation of the selected studies, the next step was to read them in full and in detail. Articles were excluded when the authors

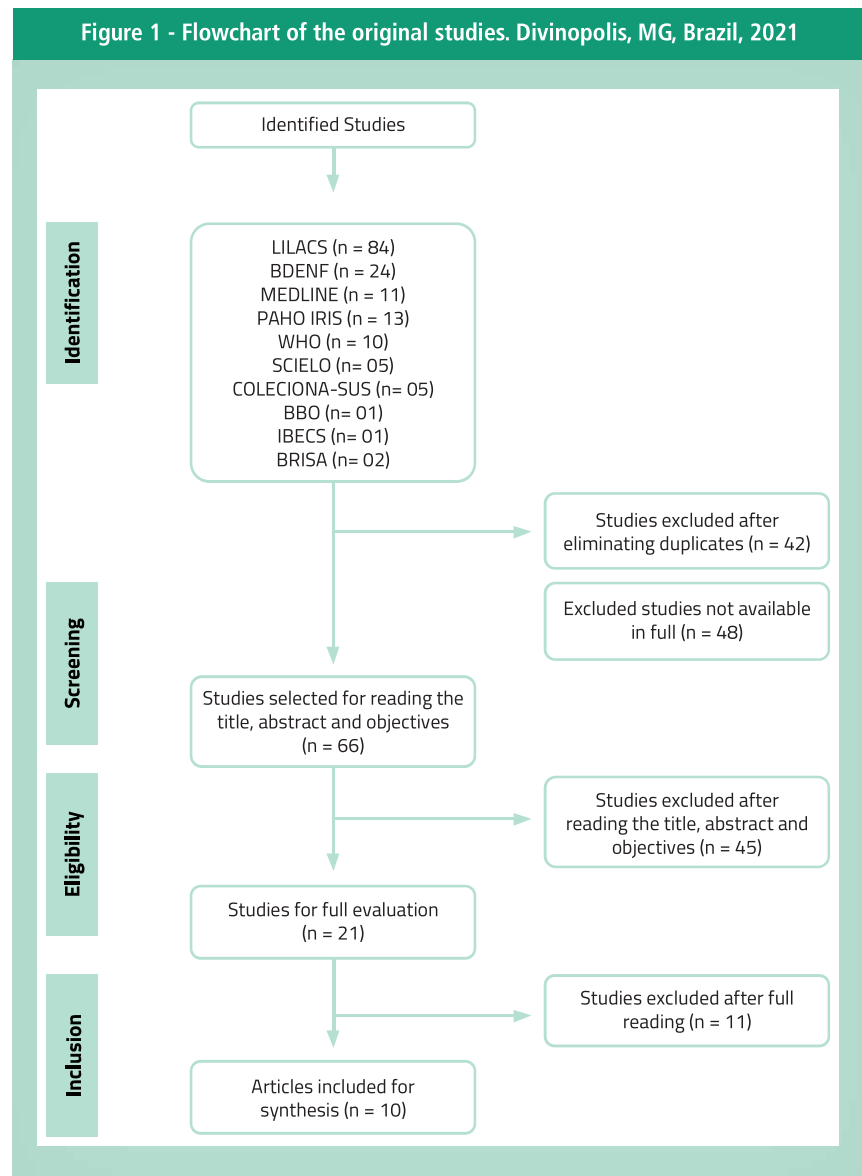
understood that the studies performed an analysis that did not allow the identification of factors related to the difficulty of achieving childhood vaccination goals, Figure 1.

For the stage of synthesis of the selected articles, a table was built for the extraction of data from the final sample as a way of organizing the variables collected and analyzed, as follows: a) general characteristics: title of the article; year; type of study, general objective, main results and level of evidence, Table 1 and b) information on the reduction of childhood vaccination targets: related factors; strategies to minimize low coverage and government actions to encourage immunizations, Box 2.

In order to guarantee the methodological rigor of the evaluation of the studies, four levels of evidence were adopted. In the production of scientific knowledge in nursing, evidence classification systems stand out as suggested by the Collaborating Center of the Joanna Briggs Institute.<sup>(9)</sup> Following this reference, the final sample was evaluated, namely: level I – evidence from a systematic review of randomized controlled clinical trials; level II – evidence based on a randomized controlled clinical trial; level III.1 – evidence obtained through controlled clinical trials, without randomization; level III.2 – evidence acquired from well-designed cohort or case-control studies; level III.3 – evidence based on multiple time series, with or without intervention and dramatic results in uncontrolled experiments and, finally, level IV – opinions of authorities based on clinical criteria, descriptive studies or expert committee reports.

## RESULTS

The final sample comprised 10 articles. Among the studies found, three (30%) correspond to the year 2016, one (10%) from 2018, two (20%) from 2019, three (30%) from 2020 and one (10%) from the year 2021. Regarding the methodological design, three (30%) were



Source: Authors, 2022.

descriptive epidemiological studies, one (10%) were ecological, two (20%) were historical series studies, one (10%) quantitative retrospective, one (10%) population-based cross-sectional, one (10%) holistic-quantitative multiple case study and one (10%) qualitative exploratory. Therefore, according to Peters' classification (2017), the corresponding levels of evidence were III and IV.

The factors associated with the reduction of childhood vaccination goals were presented in Table 2 according to the organization's criteria and among them, the most cited among the studies stand out: the lack of time for parents to take their children to the health units to be vaccinated was evidenced in four (40%) studies, two (20%) showed the difficulty of accessing the units for reasons of locomotion and another two (20%) pointed out

Table 1 - Summary of information from the studies. Divinópolis, MG, Brazil, 2021

Title of the article	Year	Type of study	Objectives	Results
A1- Assessment of rapid monitoring of vaccination coverage in the Expanded Health Region of Western Minas Gerais, 2012. (Avaliação do monitoramento rápido de coberturas vacinais na Região Ampliada de Saúde Oeste de Minas Gerais, 2012.) <sup>(10)</sup>	2016	Descriptive Study	Evaluate monitoring results in the West Extended Health Region of Minas Gerais, in 2012	A total of 7,728 children from six months to under five years of age participated. All the microregions had at least one immunocompromised with vaccination coverage lower than recommended by the Ministry of Health.
A2- Situation of Immunological Vaccination Coverage in the period 2009-2014. (Situação da Cobertura Vacinal de imunológicos no período de 2009-2014.) <sup>(11)</sup>	2016	Historical Series Study	Check the situation of vaccination coverage in the three political-administrative spheres in the period 2009-2014	In Brazil, it was found that the coverages are stable, keeping the immunologicals above the target during the period. In the state, there was an increase in vaccination coverage of all immunologicals from 2013.
A3- Risk classification of transmission of vaccine-preventable diseases based on indicators of vaccination coverage in Brazilian municipalities. (Classificação de risco de transmissão de doenças imunopreveníveis a partir de indicadores de coberturas vacinais nos municípios brasileiros.) <sup>(7)</sup>	2016	Descriptive Epidemiological Study	To describe the risk classification of vaccine-preventable diseases in Brazilian municipalities..	Of the 5,570 Brazilian municipalities, 12.0% were classified as very low risk, 29.6% as low risk, 2.2% as medium risk, 54.3% as high risk and 1.8% as very high risk.
A4 - Vaccination status in preschool children against Human Rotavirus. (Situação vacinal em crianças da educação infantil contra o Rotavírus Humano.) <sup>(12)</sup>	2018	Epidemiological, descriptive, retrospective study with a quantitative approach	To analyze the Human Rotavirus vaccination status in preschool children.	Of the 78.4% analyzed cards were classified as complete vaccination schedule when they had two doses of the vaccine and 1.9% had incomplete vaccination schedule when they had only one dose and another 9.7% classified as unvaccinated when they did not have this vaccine record
A5 - Analysis of the vaccination coverage status of children under three years of age in the city of Fortaleza, in 2017. (Análise do estado de cobertura vacinal de crianças menores de três anos no município de Fortaleza, em 2017.) <sup>(13)</sup>	2019	Cross-sectional population-based research with random sampling	To analyze the current status of vaccination coverage for children under three years of age in the city of Fortaleza, CE, and its relationship with the socioeconomic status of families.	It was observed that 45.2% of the children studied had the vaccination coverage recommended by the Ministry of Health. It was verified that socioeconomic factors determine vaccination coverage and that areas uncovered by community health agents present worse coverage.
A6 - Daily life in the vaccination room: experiences of nursing professionals. (O cotidiano na sala de vacinação: vivências de profissionais de enfermagem.) <sup>(14)</sup>	2019	Holistic-qualitative multiple case study	Understanding daily life in vaccination rooms from the perspective of the Nursing professional	The lack of vaccine, computerization, communication and the opening hours of the vaccination room interfere in the daily life and in the assistance provided to the service user.
A7 - Media and Health: coverage of the 2019 measles epidemic in Brazil. (Mídia e Saúde: a cobertura da epidemia de sarampo de 2019 no Brasil.) <sup>(15)</sup>	2020	Qualitative, exploratory research	To evaluate the media content that is being produced about the current epidemiological scenario of measles in Brazil	The search returned results from the five regions of the country, all with a pro-vaccine stance. Primary Health Care was mentioned in practically all the results found, which emphasized the availability of the vaccine free of charge at this level of care.
A8 - Vaccination status of Meningococcal C and Pneumococcal 10 valent in children enrolled in early childhood education. (Situação vacinal de Meningocócica C e Pneumocócica 10 valente em crianças matriculadas na educação infantil.) <sup>(16)</sup>	2020	Epidemiological and retrospective research with a quantitative approach	To analyze the vaccination status of children enrolled in municipal Early Childhood Centers in the South Zone of Natal (RN), for the 10-valent pneumococcal and meningococcal C vaccines.	The findings point to a vaccination situation below the target established by the National Immunization Program.
A9 - Areas with falling vaccine coverage for BCG, polio and MMR in Brazil (2006-2016): maps of regional heterogeneity. (Áreas com queda da cobertura vacinal para BCG, poliomielite e tríplice viral no Brasil (2006-2016): mapas da heterogeneidade regional.) <sup>(3)</sup>	2020	Ecological Study	To highlight areas with a decline in BCG, polio and MMR vaccine coverage in Brazil.	A downward trend in the number of immunizations was observed in Brazil, with declines of 0.9%, 1.3% and 2.7% per year for BCG, poliomyelitis and MMR, respectively.

A10 - Vaccination coverage of Pentavalent and the Family Health Strategy. (Cobertura vacinal da Pentavalente e da Estratégia de Saúde da Família.) <sup>(17)</sup>	2021	Historical Series Study	To evaluate the pentavalent vaccination coverage in children under one year of age in Brazilian regions and capitals and the coverage of the Family Health Strategy.	Brazilian regions have maintained pentavalent vaccination coverage below 95% since 2017.
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Source: Authors, 2021.

**Table 2 - Description of the characteristics of the studies included in the final sample: factors related to the reduction of childhood vaccination targets, strategies to minimize low coverage and governmental actions involved to stimulate immunizations. Divinópolis, MG, Brazil, 2021**

Factors related to the reduction of vaccination goals	Strategy to minimize the reduction in vaccination coverage	Government actions to encourage immunizations
A1- Lack of time; difficulty going to the vaccination post; medical contraindication. (2016)	Rapid monitoring of vaccination coverage, relevant for allowing verification of the vaccination status of a given population, in a short period of execution to propose actions to tackle to achieve greater vaccination coverage.	Investment by the Ministry of Health in partnership with the State (SES - Secretarias de Estado) and Municipal Health (SMS - Secretaria Municipais de Saúde) secretariats, in immunization actions, with the expansion of the vaccination network and the entire PNI structure.
A2- Non-involvement of users in attending the health service to receive vaccines due to: the difficult access to the health unit due to work of the children's mothers, or illness of a family member, rainy days, lack of immunobiologicals in the units and medical indication to postpone the application. (2016)	Systematic monitoring of vaccination coverage by the nursing teams of the health units.	Investment by the federal and municipal spheres for continuing education of nursing health professionals involved in the supervision of activities in the vaccine room,
A3 - Areas where some health units are located are sometimes characterized by violence, lack of parents' availability of time to drive their children and the health post being closed. (2016)	Systematic assessments and recommendations to corrective action managers, prioritizing municipalities according to the classification of the risk situation. Pay attention to the updating of data in the Information System of the National Immunization Program (SI-PNI), local and national, with correction of vaccine coverage and atypical abandonment rates and rapid monitoring of coverage.	Include immunization actions and targets in the Annual Health Program (PAS - Programação Anual de Saúde) and in the Multiannual Plan (PPA - Plano Plurianual) of states and municipalities, to increase governance over the improvement of coverage.
A4- Resistance of families to a new vaccine, high number of vaccines to be administered to children between two months and four years old; lack of adequate knowledge about the prevention of vaccine-preventable diseases; in addition to the loss of opportunity for vaccination by health services; strict recommendation for the age group; children with a history of prolonged periods of neonatal hospitalization may not be vaccinated. (2018)	Availability of the Rotavirus vaccine in children under five years of age at Municipal Early Childhood Education Centers.	Increase vaccine campaigns to combat etiological agents through mass vaccination.
A5- Mothers with high school and higher education; possible unpreparedness of Community Health Agents. (2019).	Family Health Strategy Teams, praising the work of community health agents in checking vaccination records and actively searching for absent children during home visits.	Increase vaccine campaigns to combat etiological agents through mass vaccination.
A6- The absence of a vaccination room as well as the inadequate physical structure of these environments can compromise the effectiveness of the PNI, as well as the lack of immunologicals, (the absence of vaccines compromises the active search and contributes to vaccine delay. (2019)	Active search must be part of the daily life of professionals. Among them, the community health agent who plays an important role in the active search to be closer to the population.	Conducting surveys and surveys in order to monitor vaccine coverage and assess compliance with established targets.
A7- Individual issues; eradication made people forget its gravity; misinformation. (2020).	Wide-ranging measles vaccination campaigns.	Improve information and communication technologies to optimize work with vaccines and ensure the quality of care.

A8- A significant number of registration failures, the process of continuing education of professionals working in vaccine rooms (2020)

Introduction of routine vaccination actions; institution of the PNI.

Create national strategies to adapt educational and political actions to increase the recommended goals.

A9- Difficulty that the country has in guaranteeing the necessary supplies for vaccination; lack of immunologicals. (2020)

Monitoring and evaluation systems that allow the development of surveillance of vaccination services.

The SI-PNI Information System, implemented in 2010, can improve the quality of this information, given that the system uses nominal information from vaccinated individuals.

10 - Dissemination of fake news, Brazilian capitals with insufficient FHS coverage, reprimand that parents or guardians fear receiving from the health team due to possible delays in the vaccination of children. (2021).

Expand the Family Health Strategy, the main tool for vaccination coverage in Brazil.

Government authorities organize actions to combat the spread of fake news. Answer any doubts, ensure the promotion and protection of the population.

Source: Authors, 2022

the lack of certain immunobiologicals in vaccine rooms. For all other factors associated with the reduction of vaccination goals, these were not repeated between the studies, Table 2. And it was still possible to identify governmental strategies and actions proposed by the authors to improve childhood vaccination coverage, also summarized in Table 2.

## DISCUSSION

The characterization of the results revealed that the factors related to the reduction of vaccination goals most cited in the studies were the lack of time of parents to take their children to health units, difficulty in accessing the units for reasons of locomotion and vaccine rooms with a lack of immunobiologicals. Study carried out by UNICEF<sup>(18)</sup> and by Santos and collaborators<sup>(10)</sup> reports that socioeconomic aspects and housing conditions contribute to the child not being able to reach a vaccination unit. In this scenario, considering that the National Immunization Program has a target of 95% vaccination coverage, the Ministry of Health has made investments, in partnerships with the State (SES) and Municipal Health (SMS) secretariats, in immunization actions, expansion of the vaccination network and the entire PNI structure.<sup>(10)</sup> Even with all the government efforts, there are still problems regarding adherence to immunizations and an important strategy to help improve childhood vaccination goals can be the

partnership between public health and education networks, expanded access to the opening hours of the service units and permanent training of staff in the vaccine rooms.<sup>(18,10)</sup>

In relation to the other results pointed out in this review, such as lack of time, difficulty in going to vaccination posts, misinformation, working mothers, location of units in areas of violence, resistance to a new vaccine, are shown as situations that require an efficient and regular active search for Primary Health Care. The literature points out that the active search provides an opportunity to increase immunization opportunities through specific actions for populations, seeking to clarify and encourage them about the need to systematically update the vaccination status of children.<sup>(19)</sup> The articles found in this review emphasize that the active search must be part of the daily life of health units with vaccine rooms and it is first necessary to plan and systematize this action to effectively reach the target audience.

These reasons are corroborated by a study that showed similar reasons as well as the resistance of some parents to a new vaccine.<sup>(10,20)</sup> Added to these factors is the lack of immunologicals in the units, which in turn can lead to distrust of health services.<sup>(20)</sup> Thus, the lack of immunologicals may represent one of the main reasons for vaccine coverage failures. As well as the lack of materials needed to perform the procedure.<sup>(21)</sup>

The other factors related to the re-

duction of vaccination goals cited by the studies of the final sample were the lack of knowledge about the prevention of vaccine-preventable diseases, children with a history of prolonged hospitalization, unpreparedness of community health workers to advise on the vaccination schedule, failures in information records and the lack of an adequate and exclusive vaccination room. In an attempt to minimize and prevent all these problems, the studies found in this review focus on government actions aimed at the continuing education of health professionals, technical updates, and, above all, technologies to improve records in vaccine rooms.

The studies also recognized that expanded dissemination with the support of various communication vehicles and the help of influential people in the community can favor greater adherence by the population. Along with the expansion of information, the need to combat false news and myths about immunizers is highlighted. A study revealed that objective and direct information offered by health professionals improves adherence to vaccines.<sup>(22)</sup>

It was possible to verify in this review that the reasons for parents not to vaccinate their children are intensified according to regions, socioeconomic, educational, cultural situation, among others. It also observed the lack of nurses in the vaccine room to support the team. The study shows the overload and accumulation of administrative and care functions of nur-

ses and proposes to reverse this reality with adequate supervision of nurses in the vaccine room.<sup>(23)</sup>

This research has as limitations the fact of considering the results found only in a specific search period and for presenting data from the last five years. Studies that were published later may bring new developments to the investigation. The reflections and observations open the pers-

pective for future work, such as creating a "test strategy" to strengthen actions to promote childhood immunizations throughout the national territory.

#### CONCLUSION

The reduction in childhood vaccination targets is related to lack of time for parents, displacement and lack of supplies

in health units. To improve this reality, it is important that government actions aimed at the continuing education of health professionals and, above all, implementing strategies to strengthen the unit with the user makes it possible to restructure the work process with vaccines as well as guarantee access and quality of care.

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