

## REVIEW ARTICLE

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## SUMMARY

Descriptive analytical study on scientific production on the vaccination coverage of adolescents in Brazil, using the integrative review method through research in the Pubmed Central, LILACS (Latin American and Caribbean Literature in Health Sciences) and ADOLEC databases. The selected sample was 07 articles, which were inferred quali and quantitatively. As a conclusion, it was obtained that there is satisfactory vaccination coverage for adolescents aged 10 to 14 years and reduced percentage for adolescents aged 15 to 19 years. It is concluded that there is a gap in the CV of adolescents due to misinformation or the strategies used by the PNI (National Immunization Program), in this range are not contextualized for this public, and there is a need for deepening effective strategies for the 15 to 19 year old age group.

Keywords: Vaccination, adolescents, vaccination coverage, Brazil.

## INTRODUCTION

At the end of the 20th century, concern stumbers began with the vaccination coverage of the adolescent public, due to the vaccination goals of the countries' routine to reach numbers below the 95% vaccination target, recommended by the World Health Organization (WHO) for the population aged 10 to 19 years (PAHO, 2012).

Currently in Brazil, vaccines are available to adolescents: Hepatitis B (VHB), Double adult (dT) and Triplice Viral (SCR), for adolescents in addition to the previous ones, the human papilloma virus vaccine (HPV 6,11,18) is available.

At the time of non-vaccination during childhood, adolescents of both sexes should also be vaccinated against yellow fever (FA), and all vaccination records should preferably be recorded on the adolescent's vaccination card and information system of the National Immunization Program (Si-PNI) (BRASIL, 2015).

Vaccination programs are an efficient preventive health action, if well implemented, can reveal good results in the short term and at less cost to the country. In Brazil the National Immunization Program (PNI) is regulated by law 6259/75 and decree 78231/76. (BRASIL, 2014).

At the age of 40 in 2006, the Brazilian PNI celebrated positive results, because internationally it emerges as an example of successful public policy, due to differentiated vaccination strategies and social mobilization capacity for vaccination support in campaigns and mainly due to the large number of routine vaccination rooms, in addition to the computerization of the registration of vaccinated. (SILVA JÚNIOR, 2013)

The decentralization and integrated articulation of the actions developed by the PNI reduce social and regional inequalities in the face of vaccination, because it makes it accessible to all Brazilians, an example of this being the elimination of infectious diseases such as Measles and Rubella and control of diseases such as Meningitis and influenza type b. (DOMINGUES; TEIXEIRA; CARVALHO, 2013).

Vaccination coverage in Brazil has high rates, but not uniform, because they differ by age group and socioeconomic levels, and there is a need to homogenize with mass immunization, especially in vulnerable groups.

Regarding vaccination coverage despite the advance, especially when compared to the 1980s and 1990s, according to Francisco et. al. (2015), the adolescent public aged 10 to 14 years maintains the high vaccination rates already in the ranges of 15 to 19 years the proportion of abandonment becomes higher for multi-dose vaccines such as Hepatitis B, showing the relevance of the study on the bibliographic production in relation to vaccination coverage of adolescents in Brazil.

## MATERIALS AND METHODS

The study is descriptive analytical with qualitative and quantitative approach, through the analysis of scientific articles with the outcome of interest.

The articles used in the study were collected from April to May 2016, establishing as a parameter the productions of the years 2011 to 2015, in virtual databases, such as: the bases of Latin American and Caribbean Literature on Health Sciences (LILACS), Virtual Library in Adolescent Health (ADOLEC) and National Library of Medicine of the United States (Pubmed Central - PMC) , addressing for this study the main question: What is the scientific production on the vaccination coverage of adolescents in Brazil?

From this question, the steps were carried out for the elaboration of the integrative review, and after the research in the databases, with exploratory reading, articles were chosen, available for full reading, in Portuguese or English that best fit the theme of interest, excluding institutional documents, intervention projects and articles with vaccination coverage in the elderly, adults and children.

Subsequently, the selection of articles for the study was made, readings and analyses of the texts were performed and for better understanding an instrument was elaborated containing the identification of the article: title of the paper, publication journal, year, objectives, results found, conclusion in addition to the descriptors used (MASCARENHAS, 2016; GOMES, 2016; RODRIGUES, 2016).

In the composition of the sample, the terms mesh was used: mass imunization, mass vaccination, adolescent and Brazil, and because it is a national theme but of worldwide relevance, the terms of the descriptors in health (Decs) were used: vaccination coverage, immunization, vaccination, adolescents and Brazil. Subsequent searches were performed using Boolean terms with the descriptor vaccination coverage, making combinations with the cast of all descriptors.

After analysis, 32 articles addressing vaccination coverage in Brazil were selected for the study, 26 scientific articles, 01 intervention project and 05 technical reports. Of the 26 articles selected for the sample after rereading, it was observed that there was a predominance of studies on divergent vaccination coverage in the ranges of the population from 10 to 19 years, highlighting 07 articles with relevant characteristics for the study.

After data collection, we proceeded to thorough reading focusing on the set of the main information contained therein, seeking the essence of each study, followed by the singularities of the articles, the organization in tables and graph scans performed in the Excel and Word 2010 programs, to better understand qualitative and quantitative inferences.

## RESULT AND DISCUSSION

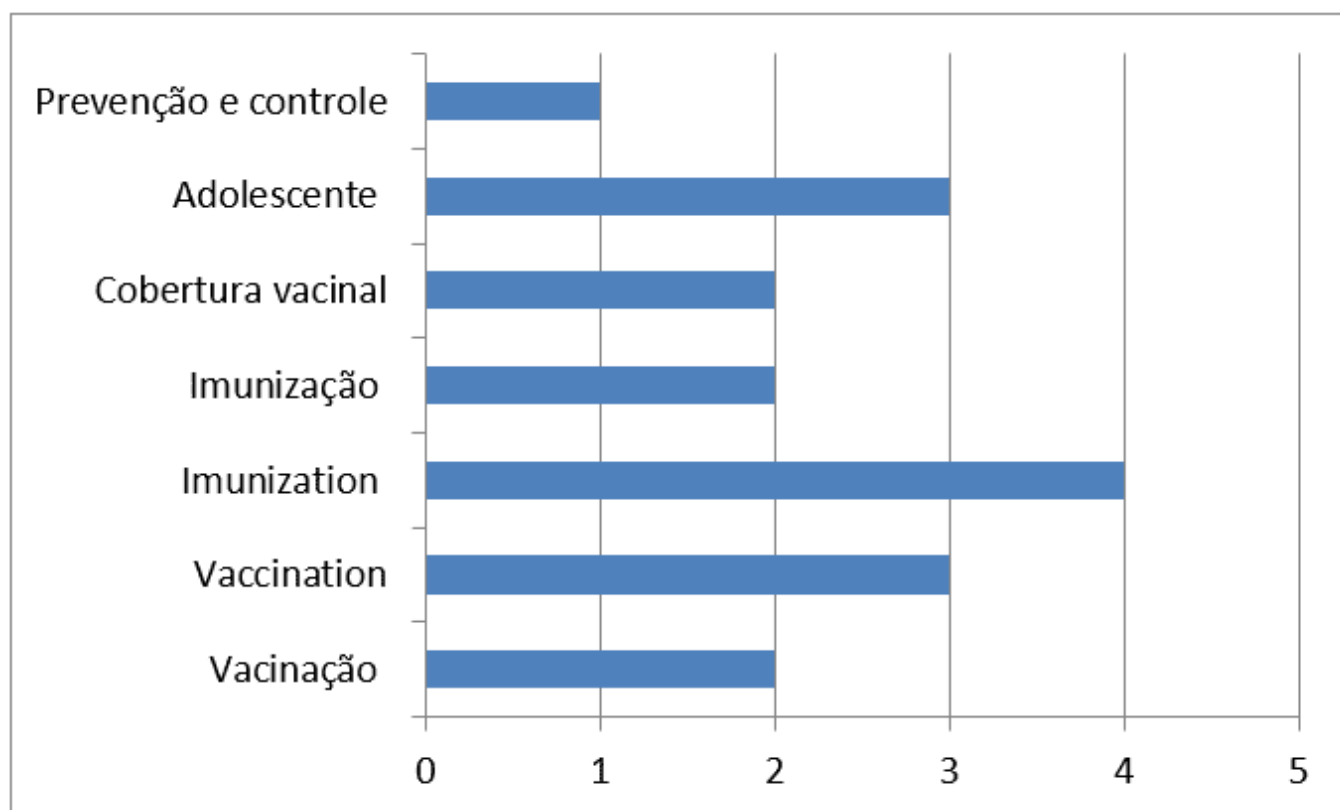
Vaccination coverage (CV) rates are directly related to the proportion of abandonment (PA). The individual is undergoing complete vaccination coverage when he/she has an appropriate vaccination schedule according to the recommended vaccination schedule. (BRASIL, 2014).

There is consensus among the authors that before the age of 20 there is heterogeneity in CV; the follow-ups from 15 to 19 years are those with the lowest rates, and there is a need for vaccine strategies that address the peculiarities of this public. (FREITAS; OKANO; PEREIRA, 2011).

The creation of a mathematical model requires prior knowledge of the reality of the daily life of the PNI, and configures as an epidemiological tool little used, due to some obscurities in epidemiology, yet it is possible to establish statistical measures that indicate the most appropriate age for strengthening multi-dose vaccines, such as hepatitis B, as pointed out in Freitas' study; Okano and Pereira (2011), the correct age for reinforcement would be the age

of 12 years.

Graph 1. Distribution of articles regarding the main descriptors (mesh and Decs) used, Teresina - PI - 2016.



Source: direct search.

The terms vaccination and immunization are highlighted as descriptors of the studies, although it is a question of establishing a primary prevention few articles relate immunization or vaccination with vaccination coverage, and it is up to the author to make this correlation during the reading of the articles.

Adolescent health, although incipient, when compared to other areas of medicine, has been highlighted by studies in the 11 to 14 year age ranges, still remaining unknown about the health of adolescents between 15 and 19 years of age (Table 1). In Brazil, vaccination coverage despite the efforts of the Ministry of Health (MS) to demystify the gap that is in the 10 to 19 year age group, low CV rates still persist, especially in the 15-19 age group. In

Bueno's study; Matijasevich (2011) this group reached a maximum of 66% of the CV against hepatitis B in all municipalities of the State of Rio Grande do Sul.

Table 1. Characterization of scientific articles regarding the method, year of publication and place of study - Teresina, PI - Brazil - 2016.

Author	Location/ Year	Journal of publication/year	Published language	Method	Sample
Freitas, Okano, Pereira	São Paulo	Rev. Saud. Publ. 2011	English	Statistician with realistic approach.	No
Bueno, matijasevich	Rio Grande do Sul	Epidemyol. Serv. Health 2011	Portuguese	Analytical ecological study	No
Domingues; Teixeira	Brazil	Epidemyol. Serv. Health 2013	Portuguese	Descriptive ecological	No
Pereira et.al	Belo Horizonte	Rev.Med.Minas Gerais 2013	English	Epidemiological study by conglomerate	210 teens
Francisco et.al	Campinas	Rev. Bras. Epidemyol. 2015	Portuguese	Population-based cross-sectional	702 teens
Domingues ; Teixeira	Brazil	Rev. Inst. Med. Hosp. São Paulo 2012	English	Exploratory descriptive study of ecological nature	No
Francisco et al	São Paulo	Cad. Public Health RJ 2013	Portuguese	Population-based cross-sectional	778 women of childbearing age

Source: Direct search.

Table 2. Distribution of scientific articles when to the objectives and main results found, Teresina - PI, 2016.

Authors	Title	Goals	Top Results Found
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Freitas, Okano, Pereira(2011)	Pertussis booster vaccine for adolescents and young adults in São Paulo, Brazil.	Develop a statistical model to improve CV for whooping tustosis. Achieve possible booster strategies for whooping.	The proposed model with the highest rate for DTP ad to be at 12 years of age. Associating dT with P decreases the incidence of pertussis in adolescents.
Bueno; matijasevich (2011)	Evaluation of vaccination coverage against hepatitis B in children under 20 years of age in municipalities in the State of Rio Grande do Sul, Brazil.	Evaluate coverage of hepatitis B virus vaccine in the population under 20 years of age in the 22 municipalities of the third regional health coordination of the State of Rio Grande do Sul in 2007.	Municipalities smaller than 20,000 inhabitants have coverage above 100%. There's heterogeneity. The group aged 11 to 14 years had CV <95% only in 1 municipality, the other ranged from 42 to 50% The group from 15 to 19 years reached a maximum of 66% in all municipalities, with a heterogeneity of 90%.
Domingues; Teixeira (2013)	Vaccine coverage and immunopreventable diseases in Brazil 1982-2012:advances and challenges in the national immunization program	Describe the CVs; Proportion of abandonment (BP) and homogeneity of CV and incidence of immunopreventable diseases selected in Brazil.	CV of adolescents differ from children's CV, under 15 years of age, with CV close to 100%, with a decrease with increasing age(15 to 19 years). In 2010, the 15 to 19 year CV reached 60.7% in 2012 70.1%.
Pereira et.al (2013)	Vaccination coverage among teens in the areas surrounding the cachoeirinha health center in the northe astern region of Belo Horizonte - MG	Identify adolescents with a complete vaccination schedule Analyzing with adolescents, parents or guardians comprise vaccination for immunopreventable diseases.	Parents know about rubella and tetanus, but are unaware of hepatitis B with STIs (sexually transmitted infection). Parents are unaware or know little about vaccine or vaccine-preventable diseases (tetanus, rubella hepatitis B) Adolescents from BH know about FA and know the need for vaccination (outbreak in 2002).

Domingues; Teixeira (2012)	National immunization Program: vaccination, compliance and Pharmacovigilance.	Narrate the vaccines available in Brazil Study CV in Brazil Discuss post-vaccine adverse events (EAPV) as a non-aforepum factor.	To achieve CV, the PNI has different strategies such as routine immunization and vaccination campaigns The maintenance of the success of the PNI depends on the homogeneity of vaccination and surveillance of adverse events to intervene in a timely manner.
Francisco et.al (2013)	Rubella vaccination in women of reproductive age in the city of Campinas, São Paulo, Brazil.	Evaluate the prevalence of rubella vaccination in women; Identify associated factors and reasons for non- membership.	The prevalence of rubella in adolescents is lower (75%) The women had “insufficient age” to be vaccinated, evidencing lack of information and lack of knowledge about the supply of vaccine and capanhas.
Francisco et.al (2015)	Hepatitis B vaccination in adolescents living in campinas, São Paulo, Brazil	Estimate hepatitis CV well adolescents living in Campinas, São Paulo Check the associated factors Identify the reasons for not adhering to the vaccine.	Unvaccinated adolescents came from other locations, guidance from the health professional was positive, despite not knowing the need for the 3 doses to represent 63% among those who were not vaccinated, pointed to the forgetfulness or ignorance of the 3 doses in 25% and 13% not because they did not consider the vaccine necessary.

Source: direct research, translation of authors.

Francisco et. al. (2013) lists vaccination coverage in a specific group as women of reproductive age, later in their work 2015 turned to the adolescent public, confirming that there is a need to deepen studies on vaccination coverage in the ranges of 15 to 19 years.

The authors point to the commitment of the Family Health team (eSF) as paramount for the early capture of adolescents at the time of the first visit to the post or through school. (PEREIRA et. al., 2013; FRANCISCO et. al., 2015).



In 2008, the Brazilian federal government created the School Health Program (PSE), with the idea of giving a resolution to some specific problems for the adolescent public and to provide health surveillance in the school environment. (BRASIL, 2009).

Early capture and the educational process are evidenced in all articles, directly or indirectly, especially when they emphasize the performance of health professionals in health promotion, and one article describes as positive the guidance on immunization and vaccination, still points out; whereas this information, although successful, does not cover the multi-dose vaccine scheme, such as hepatitis B; like this; adolescents may be receiving information incompletely (BRASIL, 2013; FRANCISCO et. al., 2013; 2015).

The role of health professionals is secondary to the challenge of health managers to homogenize CV in Brazil, although the importance of these professionals is denoted in the studies, and do not really point to strategies that can favor this process of health education, especially for the adolescent public.

Income does not constitute a limiting factor for vaccination, positive guidance of professionals proved ineffective if worked alone, in this sense parents or guardians can increase CV in adolescents aged 15 to 19 years.

The study by Francisco et. al. (2013) showed that parents aged 40 to 49 years are unaware of hepatitis B as a sexually transmitted infection (IST), and do not guide vaccination for their children because they do not consider it important for adolescents, a fact also observed in studies on vaccination coverage in adolescent pregnant women, suggesting that health education practices should be given a family focus.

According to Pereira et. al. (2013) health education practices for adolescents in the school environment through the School Health Program (PSE) are ineffective, as it includes only the student and not the family group, requiring parents or guardians to raise awareness of the importance of adequate vaccination coverage for diseases preventable by immunization, and the peculiarity of each family should be respected.

Vaccination program are safe measures in public health that in Brazil has been emerge as a procedure that achieves excellent results, from routine and mass vaccination, of vulnerable

groups. There is investment in immunobiologicals, today making 44 available to the population free of charge, allowing excellent results; some immunization-preventable diseases have been eradicated, such as Poliomyelitis, congenital rubella has been controlled, and measles had the last case reported in 2000. (BRASIL, 2014).

Understanding the importance of developing an immunization program that reduces morbidity and mortality through vaccination in large groups of healthy individuals, offers the individual the minimum risk, so that there are no post-vaccination Adverse Events (EVPV), which was one of the reasons pointed out by the adolescent for non-ading according to a study by Domingues and Teixeira (2012).

It is noted that there is a predilection for the discussion about the effectiveness of mass vaccination or multivaccination campaigns, but the data consolidated in the SI-PNI, provide data of both routine vaccination and campaigns, and CV values above 100% can be found in municipalities smaller than 20,000 inhabitants.

Although the importance of the active search in the community for the maintenance of CV is undeniable, the knowledge of the population on the subject is a priority for the support of vaccines that still remain with low rates of support.

Studies that used samples had a local population base, and vaccination coverage in Brazil effectively worked by only 02 authors, although focusing on the general public and clipping for the public in the 10 to 19 years age group (Table 2).

The fact that there are few studies specifically focused on CV in adolescents in Brazil as a whole, in the literature, it is important to conduct multicentric studies with random probabilistic sampling, according to Oliveira (2009) even if they are less effective, these probabilistic studies are stratified, less accurate, but allow satisfactory cost and benefit for the adequacy of the sample for the adolescent public, so we could estimate the actual BP by strata of 10 to 14 years and 15 to 19 years in Brazil , and understand how to achieve optimal coverage of 95% also in these ranges.

## FINAL CONSIDERATIONS

With the review on vaccination coverage of Brazilian adolescents, we sought to be a relevant theme for Brazilian public health, because for Brazil it can contribute to direct primary care to the vaccination coverage of this vulnerable group and raise popular participation as a tool for improving public policies for immunization of adolescents.

The factors associated with non-vaccination in this range are controversial, but there is unanimity among the authors when they point out that to reach adolescents, it is necessary that managers, health professionals and families find the common denominator to plan strategic vaccination actions in the public network, and a healthy and democratic debate should be established about the benefits of immunization and maintenance of adequate vaccination coverage.

The Brazilian highlight is due to the success of the PNI in the groups under 10 years, justifies the international community's look at the Proportion of abandonment (PA) in the ranges of 10 to 19 years, especially 15 to 19 years; ratifying the little understanding of the factors associated with non-membership of this public despite the efforts of the Brazilian Ministry of Health.

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