Experience report

Family Health Strategy team action against the measles epidemic in Fortaleza, Ceará, Brazil

doi: 10.5123/S1679-49742020000300001

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Abstract

Objective: to report on Family Health Strategy action at a Primary Health Care Unit in addressing the measles epidemic in Fortaleza, CE, Brazil. **Methods:** the actions were carried out between September 2013 and December 2015; nineteen suspected measles cases were registered, three of which were confirmed: two children under 1 year old and one 27-year-old man. **Results:** 16,726 people between 5 and 29 years old were vaccinated, vaccination coverage in the target population was 82.6%; 101% coverage was achieved among children aged 5 to 11 and 76.8% coverage of people aged 12 to 29. **Conclusion**: the strategies used contributed to achieving the vaccination coverage target in the target population, resulting in the population registered in the Health Unit catchment area falling into the category of low risk of measles transmission.

Keywords: Measles; Epidemics; Surveillance; Immunization; Family Health Strategy.

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Introduction

Measles has been a compulsorily notifiable disease in Brazil since 1968. The largest number of measles cases was notified in 1986 (n=129.942), when the incidence rate was 97.7 cases per 100,000 inhabitants. By 1991 the country had faced nine epidemics, or approximately one epidemic every two years. Between March 2013 and March 2014, 224 measles cases were confirmed in the state of Pernambuco. Between December 2013 and May 2014, 174 measles cases were confirmed in the state of Ceará. In 2014, there were 114,900 deaths due to complications arising from measles worldwide, i.e. around 314 deaths/day or 13 deaths/hour.[1]

While measles was eliminated in the Americas in 2016, it continues to be a Public Health problem, especially in Europe and Asia, where its occurrence is endemic and outbreaks are frequent. This epidemiological scenario imposes the need to maintain high and homogenous vaccination coverage and constant epidemiological surveillance, even in countries where the virus no longer circulates.[2]

> *The reemergence of measles was a big setback for Public Health, showing that the disease continues to be a real threat that requires continuous surveillance and new forms of response.*

It is important to note that, in 2012, vaccination coverage was at its lowest level for ten years, namely 84.9%, this being below the target set by the health authorities, making the country susceptible to virus transmission.[3] The intense flow of people circulating in the Brazilian territory may have contributed to the reemergence of the disease, which had not been registered in Ceará since 1998.[4]

The first new case of measles notified in Ceará happened in the municipality of Fortaleza in December 2013. In the same period, 38 of Ceará's 184 municipalities recorded at least one confirmed case. Three of them stood out in terms of the number of cases: Fortaleza (395), Massapê (129) and Caucaia (91). Another noteworthy point was the incidence of infection among children under one year old (40% of cases), the majority of which were concentrated in neighborhoods located within the catchment area of Fortaleza's 5th Regional Health Coordinating Body (CORES V), which is the object of this study.[5]

Between December 2013 and September 2015, The Ceará State Health Department's epidemiological surveillance system notified 4,631 suspected measles cases, 23% (1,052) of which were confirmed and 77% (3,559) were ruled out. The highest incidence rates were recorded between March and November 2014, with 8.6 cases/100,000 inhab. The measles virus was identified in 38 (20.7%) of the state's 184 municipalities and transmission continued for 20 months.[1]

The reemergence of measles was a big setback for Public Health, showing that the disease continues to be a real threat that requires continuous surveillance and new forms of response in order for it not to be once more, as it was in the 1970s, the leading cause of death among vaccine-preventable diseases in childhood.[6]

Of noteworthy importance is the Family Health Strategy, as the entry point to the health system, with regard to prevention of vaccine-preventable diseases and promotion of health education and disease surveillance within its catchment area. The Family Health team must be capable of identifying measles, notifying it to higher levels of management and offering adequate treatment when possible.

This article reports on the actions of the Family Health Strategy at a Primary Health Care Unit aimed at overcoming the measles epidemic in the municipality of Fortaleza, Ceará, between December 2013 and September 2015.

Context

The city of Fortaleza is divided into seven Regional Departments – I, II, III, IV, V, VI and Center –, comprised of continuous geographical spaces, delimited by neighborhoods and characteristics related to the territory which each of them occupies. The municipal health service is organized according to administrative coordinating bodies responsible for planning, organizing and implementing actions to promote the population's health.

The José Paracampos Primary Health Care (PHC) Unit is located within the 5th Regional Coordinating Body (CORES V), and is the city's second largest CORES after CORES VI in terms of geographic size. However, CORES V has the densest population, namely 83.5 inhab./ha,[1] and has one of the city's lowest human

development indices (HDI): 0.44. CORES V covers 18 official neighborhoods and in relation to measles it is important to note that it has the highest proportion of young people, with 44% of its residents being under 20 years old.[7]

At the time, the PHC Unit in question had five Family Health teams, four of which were complete – having a doctor, nurse, dentist, nursing and oral health auxiliaries and 39 community health agents – while the fifth team was incomplete. The Unit's catchment territory had 31,417 inhabitants distributed over 39 micro areas, eight of which were not covered by community health agents.

Data sources

The study used the following instruments: weekly schedule of actions against measles for each team; weekly negative notification; daily monitoring of the number of vaccinated people; compulsory notification of suspected cases; rapid monitoring of vaccination coverage. Using a whiteboard in its health situation room, the Health Unit opted to scale up daily monitoring of the vaccination target for each team. In this way, all the teams could track their performance in relation to their target.

Rapid monitoring of vaccination coverage involved sampling children between 6 months and 5 years old. This was done by an external team at the request of the Municipal Health Department. Sampling took place in places where household visits in entire neighborhoods had taken place, with the aim of verifying vaccination coverage homogeneity and finding children who might not have been vaccinated.

The data obtained were recorded daily in the Health Unit's situation room and were analyzed by means of descriptive statistics.

Strategies used

The main strategy introduced by the State and Municipal Health Departments consisted of intensifying vaccination of the population aged 5 to 29 years with measles-rubella combination vaccine. Some 70 health workers including community health agents, nurses, nursing technicians, among others, were involved directly or indirectly in this process. In particular at that time in addition to the existing teams there were also flying nurses whose role was to assist with household visits in neighborhoods, lockdowns and systematization of vaccination outside of the Health Unit.

Each team had a weekly schedule of actions against measles, such as: daily vaccination; weekly negative notification; daily monitoring of the number of vaccinated people; compulsory notification of suspected cases; and rapid monitoring of vaccination coverage.

The actions began with training and refresher courses about measles and the basic national immunization schedule. Following this, the nurses joined the efforts to coordinate and supervise the following actions carried out by nursing technicians and community health agents:

a) house-to-house visits in 100% of the micro-areas (including those not normally covered by community health agents);
b) selective vaccination of all people aged 5 to 29;
c) encouragement of maternal breastfeeding of babies under 6 months old;
d) booster dose for infants aged 6 to 11 months old (single dose – Ministry of Health recommendation as per its Informative Note n° 19/2014);
e) referral to the Health Unit and immediate notification of identified and suspected cases;
f) timely lockdown, within 72 hours, of suspected index cases;
g) early collection of material for serology, within four days from the first day of exanthema, with second collection after 20-25 days;
h) confirmed case monitoring until cured; and
i) verification of the vaccination status of the remaining age groups within the Health Unit territory.

The important work of the community health agents is noteworthy: (i) a nominal roll of all children under 5 years old on a specific spreadsheet recording the address and vaccination status of every child; (ii) accompanying all household visits; participation in mass actions in social service and/or commercial facilities; and (iii) scheduled visits to households refusing to take part.

Based on data provided by the Brazilian Institute of Geography and Statistics (IBGE), the Primary Health Care Unit had a target of 20,249 people to be vaccinated in approximately 22 days (1,000 doses/day). Local planning included the decision to work seven days a week, including public holidays and in the evening, with the aim of reaching young people who were at

work during the day, as well as to reach places the main opening hours of which were at night or at the weekend.

In view of the target of 1,000 people to be vaccinated each day, nursing staff (nurses and nursing technicians) took part in mass and they were the vaccinators. The support provided by the community health workers was essential, since they took the vaccination teams to the hardest to reach places.

In order to reach young people in the 12-29 age range, in which vaccination coverage was lower, the teams provided vaccination in the most diverse places, schools and universities, companies and factories, supermarkets and small stores, residents associations etc., seeking to reach them where they studied and worked. These were the main challenges to carrying out the vaccination actions.

Help was also received through community spaces being made available for vaccination to take place. The community took on joint responsibility, along with the health teams, in facilitating the entire work process in combating the epidemic.

Another important highlight was the articulation between the epidemiological surveillance service and the Family Health teams, this being a fundamental measure for timely decision making.[8]

Results

The number of people vaccinated per day varied between 36 and 547 per team and was directly related to the number of teams working. The result of this could be seen on the vaccination coverage monitoring chart used during the epidemic, the objective of which was to accompany intensification of measles-rubella combination vaccination, people who still needed to be vaccinated, cumulative daily target and team performance per hour. This chart also showed the number of vaccine doses administered per day in the 5-29 age range and the number of teams doing vaccination; the remaining rows of the chart were filled in automatically (Table 1).

At the end of the campaign a total of 16,726 people aged 5-29 had been vaccinated and the 82.6% vaccination coverage target stipulated by the Health Unit had been achieved. Children 5-11 years old accounted for 4,980 of the total of vaccinated people, achieving 101% coverage; 11,770 were young people aged 12-29, whereby 76.8% coverage was achieved in this age range (Table 1). The vaccination campaign resulted in the Primary Health Care Unit catchment area being categorized as a low risk area.

Five of the twenty Primary Health Care Units in the CORES V region had a population similar to the Unit described in this study, estimated as being between 17,500 and 21,500 inhab., with an average of 19,607 inhab.; the Unit described in this study achieved the second best vaccination coverage.

It is important to highlight that, the 2015/2 rapid monitoring of vaccination coverage of measles, mumps and rubella vaccine (MMR) achieved 95% among children who had received the first vaccine dose on the due date (D1), and achieved 100% among children who had had two doses administered (D2).

Moreover, in 2014 and 2015, nineteen suspected measles cases were registered in the Health Unit's catchment area, three of which were confirmed: two were children under 1 year old and the other was a

Table 1 – Target, daily and cumulative doses of vaccination with measles-rubella combination vaccine at the José Paracampos Primary Health Care Unit, by age group, Fortaleza, Ceará, December 2013 to September 2015

Variables	Age group (in years)		Total
	5 - 11	12 - 29	
Target (number of doses)	4,931	15,318	20,249
Maximum daily doses administered (N)	574	976	1,550
Cumulative doses (N)	4,980	11,770	16,726
Vaccination coverage (%)	101	76.8	82.6
Population not vaccinated (N)	–	–	3,523
Teams (M)	–	–	5
Number of doses administered per team, per day (N)	–	–	133
Number of doses administered (N)	–	–	17

27 year-old adult. Data were monitored and updated daily by the CORES V Epidemiological Surveillance service and provided to the Health Units, paying special attention to suspected new cases, so that the following day's actions were retargeted with the aim of breaking the measles transmission chain in a timely manner.

Discussion

The strategies used contributed to achievement of vaccination coverage among the target population, resulting in the population registered in the Primary Health Care Unit's catchment area becoming at low risk of measles transmission.

Scarcity of literature about the work of Family Health Strategy teams in crisis situations was a factor that hindered the challenges faced from being overcome. Jointly with the municipal and state coordinating bodies, the teams had to create their own strategies in order to address the epidemic.

Differently to what happened in the state of Ceará, a study conducted in the state of Pará about the measles outbreak found that the high rates of vaccination coverage achieved through routine vaccination or previous campaigns contributed to containing the outbreak in that region, given that few doses were administered during the outbreak and lockdowns and intensified actions were targeted.[9]

After 20 weeks of the epidemic, in September 2015, the state of Ceará declared that measles virus transmission had been interrupted. It is important to note that, in the state as a whole, the majority of the population aged between 6 months and 29 years old had not been vaccinated against measles. This was found in over 90% of confirmed cases and 40% of suspected cases, indicating that vaccination coverage above 95% was merely administrative and had not effectively happened.[1]

The reemergence of the epidemic points to the continuing challenge of promoting (i) epidemiological surveillance that is receptive to and adequate for detecting suspected cases, (ii) active tracing by health teams of suspected and/or confirmed cases at silent health units, and (iii) awareness raising of public and private health service workers with regard to compulsory notification being obligatory.[9]

In recent years the National Immunization Program has made considerable progress, including with its Information System. This system enables the vaccines administered to each individual to be recorded, as well as their origin, thus permitting more trustworthy assessment of this information, as well as aiding vaccination coverage estimates, the impact of which can go beyond the administrative sphere.[1]

It is expected that periodic vaccination campaigns, along with routine vaccination, will continue to ensure the population's immunity, minimizing the risk of new epidemics occurring. Their success will depend on the efforts of all people, not just the Health sector but also society in general, the support of which has shown itself to be crucial for elimination measles in Brazil and in the Region of the Americas.[9]

Standing out among what has been presented here is the competent and responsible involvement of those who work in Family Health Strategy teams, essential for the development, organization and implementation of plans founded on the definition of objectives and action strategies that are both complex and rapid in preventing and controlling epidemics, such as measles for instance. Joint responsibility and community involvement, together with institutional support and commitment in putting these strategies into place are essential for their success.

Authors' contributions

Faria SCRB contributed to the study concept and design, data analysis and interpretation and drafting the first version of the manuscript. Moura ADA contributed to data analysis and interpretation and critical review of the manuscript. Both authors have approved the final version of the manuscript and are responsible for all aspects of this work, including the guarantee of its accuracy and integrity.

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Received on 18/12/2018
Approved on 24/03/2020

Associate editor: Doroteia Aparecida Höfelmann - orcid.org/0000-0003-1046-3319