

of susceptible women of childbearing age (1, 3-6). However, these two approaches are frequently combined. In Romania, the selective vaccination of only a few cohorts of adolescent girls implemented in 1998 and 2002 resulted in a significantly lower incidence among girls in the target age cohorts in Bucharest, compared to that among the boys of the same age group. In the light of the recent outbreak, the Romanian MoH is considering making a long term commitment to finance routine vaccination against rubella to prevent CRS. Beginning in May 2004, MoH will introduce combined measles-mumps-rubella (MMR) vaccine for routine vaccination of children aged 12 to 15 months and continue rubella vaccination of girls in the 8th grade (aged 13-14 years). Ongoing routine vaccination of all young children appears to be feasible in view of consistently high routine vaccination coverage with other antigens in Romania.

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## ORIGINAL ARTICLES

### Outbreak report

# NEW FEATURES OF RUBELLA IN SPAIN: THE EVIDENCE OF AN OUTBREAK

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In most of western Europe the rubella vaccine coverage is high. However, prior to the introduction of the vaccine in Latin America, rubella susceptibility in women of childbearing age was 10-25%. Forty one (93%) countries in Latin America have adopted the rubella vaccine since 2002. The adult immigrant population in Spain constitutes a group of susceptibles.

In February 2003, the Madrid Community Measles Elimination Plan detected an increase in rubella notifications in women who had been born in Latin America. A descriptive study was undertaken to characterise the outbreak. A confirmed case was a person with

fever or rash and a positive IgM serology, and living in Madrid, between 1 December 2002 and 31 March 2003. The secondary attack rate (SAR) per household was calculated.

A total of 19 cases of rubella were identified, 15 were confirmed and four were probable cases. Fourteen (73.7%) cases were women at childbearing age. The mean age was 25.1 years. One pregnancy was diagnosed with a voluntary termination. Eleven (57.9%) cases were from Ecuador. The mean time of residence in Spain was 41 months. None of the cases or the 54 (78.3%) household contacts had been vaccinated against rubella. The SAR was 9.1%.

This study showed the spread of rubella in the susceptible Latin American Community that is resident in Madrid. The interventions proposed were a vaccination programme towards immigrants, a health education campaign to prevent congenital rubella, and a health professional training programme case management.

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**Key words :** Rubella, Spain, Latin American community, pregnancy

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## Introduction

### Immunisation strategy

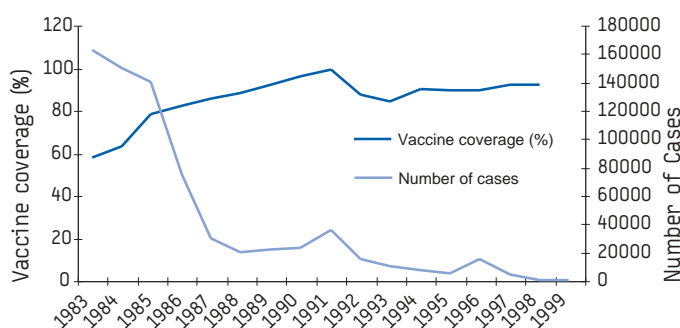
Rubella immunisation was introduced in Spain in 1979, and given to 11 year old girls. In 1981, the measles, mumps and rubella (MMR) vaccine was included in the national immunisation schedule for children of both sexes at 15 months of age. In 1995, a booster dose of MMR vaccine was introduced for both sexes at age 11 to 13 years.

In 1996, results of a serological survey suggested that antibody prevalence against rubella was higher than 95% [1]. Later, the MMR schedule was changed, and the booster dose was brought forward to pre-school age children (3 to 6 years old).

The MMR vaccine is currently part of the childhood immunisation programme, which includes a first dose at 12-15 months and a booster at 3-6 years. If a child has not received the second dose of rubella vaccine by the age of 11-13 years, a booster dose is offered. [FIGURE 1]

FIGURE 1

Number of reported cases of rubella and vaccine coverage - Spain, 1983-1999



Since 1985, high vaccine coverage has helped to achieve a dramatic drop in rubella incidence. In 1999 the annual incidence rate was 1.4 cases per 100 000 inhabitants. However, higher incidences still exist in some regions, such as the Canary Islands (10.8/100 000), Ceuta (26/100 000) and Melilla (54.2/100 000).

### Incidence of congenital rubella syndrome

In 1998, there were seven cases of CRS detected in Spain (2 per 100 000 live births).

The Madrid Community serological survey carried out in 2000 indicated that 95% of all age groups were protected against rubella, and that 98.6% of women of childbearing age (16-45 years old) had protective antibodies [2]. Nevertheless, CRS cases were declared in Madrid in 1998, 1999 and 2001 [3].

Remaining susceptible individuals are probably the consequence of existing areas with low vaccine coverage and immunisation failures.

We describe here the latest rubella outbreak in Madrid in 2003, in which the population affected were unimmunised people living in Spain who had been born in Latin America.

In February 2003, the surveillance system for measles, within the framework of the Madrid community measles elimination plan [4], detected an increase in the notification of cases of rubella. Under the measles elimination plan protocol, all suspected patients presenting fever and exanthema must undergo a serologic screening for measles, rubella and parvovirus B19.

The affected population were mostly women of reproductive age who were born in Ecuador, Colombia, the Dominican Republic and Argentina.

We conducted a descriptive study to characterise the magnitude of the outbreak, define the transmission patterns and recommend control measures.

## Methods

Applying the European case definition, the cases were classified as confirmed or probable. A confirmed case of rubella was defined as a person with rash and fever (more than 38.5°C), who had been born in Latin America or was a family member of such a person, with a positive serology (IgM) confirmed by the regional public health laboratory, and who was resident or had visited Madrid, between 1 December 2002 and 31 March 2003. A probable case was a person with symptoms of rubella, and with an epidemiological link to a confirmed case but without laboratory confirmation.

A contact was defined as a person who was a family member of, working with, or had a social relationship with a case, and who was a resident of or visitor to Madrid during the same study period.

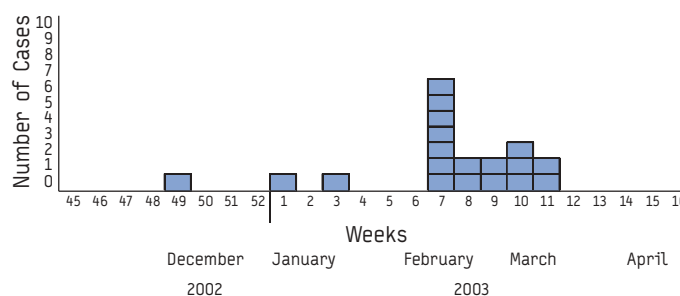
The household secondary attack rate (SAR) was defined as the number of secondary cases occurring in susceptible contacts of an index case in a family. A susceptible contact was someone with no history of rubella vaccination, who had not undergone a serologic test. A secondary case was a case occurring in the 21 days following contact with an index case.

## Results

By active case finding, review of the notifiable disease register and by interviewing the cases, 19 cases of rubella were identified. Eleven cases suspected to have measles were found to have rubella by IgM serology. Three other suspected rubella cases were confirmed by positive IgM serology, and all 14 cases had low IgG avidity test [5]. Furthermore, during case finding, a probable case detected in January was confirmed by rubella IgG serology. The four remaining cases were classified as probable. The 19 cases were grouped within twelve household units: fourteen were considered to be primary cases and five were secondary. [FIGURE 2]

FIGURE 2

Distribution of reported cases of rubella per week, date of onset, Madrid - Spain, December 2002 to March 2003



Fourteen cases (74%) were in women of childbearing age (mean age 25 years, range 15 - 38 years). A pregnancy was diagnosed in one of the cases and a voluntary termination of the pregnancy was carried out. The health districts most affected were Centre West, South II, Southeast and North: 80% of the cases were found in these districts. Ecuador was the country of origin of 11 patients (58%); the other patients had been born in Argentina, Colombia and the Dominican Republic. The mean time of residence in Spain was 41 months (range 4-132 months). Previous rubella vaccination was not reported for any of the cases.

In the case-contact study, we identified a total of 93 contacts who had rubella infection during the period of infectiousness of the 19 rubella cases. Of those, 73 (78%) had not been vaccinated against rubella and 40 (43%) contacts were women of reproductive age. Overall, 69 contacts were considered to be household contacts. The SAR<sup>a</sup> was 9.3%.

## Discussion

Our study suggests that the Latin American community in Madrid represents a new group which is susceptible to rubella infection. The resurgence of rubella infection in the population of people born outside Spain is a serious public health problem and a drawback to the measles elimination plan and the rubella control program.

The limitations of the outbreak study were possible misclassification bias introduced during ascertainment of cases and contacts, when some asymptomatic cases were considered to be susceptible contacts, and some immune contacts, due to previous asymptomatic infection, were classified as susceptible contacts. As a result of these misclassifications, the household SAR could be an underestimation of the reproductive rate of the disease. The SAR might have been much higher if all the asymptomatic cases had been identified, and all the immune contacts excluded.

If we accept a rubella reproductive rate ( $R_0$ ) of 6 to 16 [6], and 40-50% of the cases to be asymptomatic, we can estimate that the magnitude of the outbreak was larger, and that the surveillance system network only detected a few symptomatic cases. Additionally, as most of the cases were in women of childbearing age, the surveillance of CRS should be strengthened.

In the framework of the national health system [7] in Spain, the principle of universal access to healthcare services ensures that those who migrate to Spain, whether they reside there legally or illegally, have the right to the same healthcare as the rest of the population of Spain. Several regional initiatives have been developed to ensure special healthcare programmes for migrants. One example is the Plan Integral para la Inmigración en Andalucía (Andalusia Immigrant Healthcare Programme) [8], which is developing a healthcare strategy that takes into account the epidemiological characteristics of the country of origin. In the adult healthcare programme, it is recommended that all women of childbearing age be vaccinated against rubella at their first visit to the healthcare services.

In the 1990s, in Spain as in other western European countries, a new population phenomenon occurred with the arrival of large numbers of people from other countries. In Spain, people who were born in Latin America have tended to settle in the province of Madrid. In 2001 [9], there were 210 000 Madrid residents who had been born in Latin America, representing 3% of the total population of Madrid.

To better understand this new public health problem, a serologic surveys panel, used by the Pan American Health Organization (PAHO) to estimate rubella susceptibility in women of childbearing age in Latin America countries, was reviewed prior to the introduction of rubella vaccine. The rubella susceptibility ranged from 10-25% [10], with large variability both between and within different countries.

Rubella vaccine has been progressively introduced in Latin America [11] since 1998. In 2002, 41 (93%) of the 44 countries and territories in the Americas Region had included MMR or measles-rubella (MR) vaccine in their childhood immunisation programmes. The remaining three countries, the Dominican Republic, Haiti, and Peru, plan to follow in 2003-2004 [12].

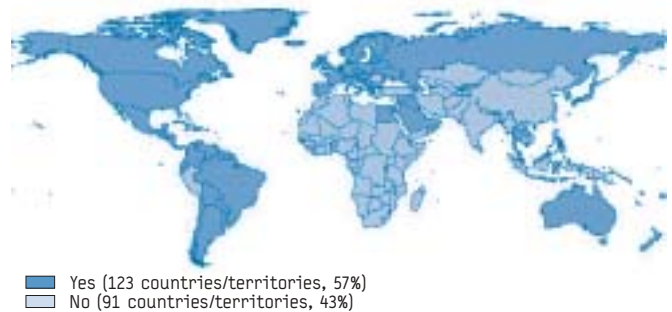
With reference to the previous information we can assume that a large proportion of the Latin American born adults in Madrid were not protected against rubella infection by natural or vaccine induced immunity.

## Conclusion

We detected the spread of rubella infection in the susceptible Latin American community in Madrid. A large proportion of this community are women whose fetuses are at high risk of developing CRS if infected during pregnancy [FIGURE 3].

FIGURE 3

Countries/territories with rubella vaccine in the national immunization system, 2002



Source : WHO Department of Vaccines and Biologicals, December 2002

The measles elimination plan surveillance system was able to detect the occurrence of suspected cases of rash and fever in adults, which by differential diagnosis were found to be rubella infections.

In response to this emerging situation, the interventions proposed to prevent new outbreaks are the development of a combined immunisation programme aimed at the community of Latin American born people resident in Spain. The strategy rests on the creation of an adult immunisation programme, together with the MMR vaccine schedule in the childhood immunisation programme.

Additionally, as part of the CRS prevention strategy, all women of childbearing age who were born in Latin America should undergo rubella serology at their first visit to healthcare services. Women found to be susceptible to rubella infection should be systematically vaccinated.

These intervention activities should be carried out alongside a health education campaign to mobilise the participation of the Latin American community, through their associative organisations, such as the immigrant forum, NGOs, churches and sport clubs. Healthcare professionals should be trained in the measles elimination and rubella control protocol.

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