

# Analysis of factors influencing vaccine uptake: perspective from Spain

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## Abstract

Although each of the 17 Autonomous Regions in Spain has their own vaccination policies, factors influencing vaccine uptake do not differ considerably among them. Knowledge of vaccine preventable diseases, awareness that the diseases prevented by vaccinations are serious or very serious, awareness that vaccinations are not generally associated with serious adverse events, cost-free status and satisfaction with our computerised immunization registry, are the elements which influence vaccine uptake in our country. © 2001 Elsevier Science Ltd. All rights reserved.

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## 1. Introduction

Spain is a member country of the European Union with a population of almost 40,000,000 inhabitants, of which approximately 18% are children aged under 14 years. The country is divided into 17 Autonomous Regions, each with their own Public Health Authority, which of course deals, among other things, with vaccination policies. Although the Ministry of Health and Consumer Affairs establishes annually a recommended Vaccination Schedule, approved by all the Autonomous Regions, each region uses its own calendar, in general, it does not differ considerably from the recommended model.

No vaccine is compulsory, but all are recommended. They are free of charge for everyone and most are administered through the public health service. Acceptance of the Vaccination Programmes is very high, as is the satisfaction of those who participate, and we can say that there are no major “anti-vaccine movements”. Generally there is no excessive worry about vaccine safety, however, most people admit the possibility of adverse reactions to the primary series of vaccines. Vaccines are bought annually by public tender, which is attended by the pharmaceutical companies that market the corresponding products.

## 2. Spanish vaccination schedule

The schedule approved for the year 2000 [1] begins vaccination at the age of 2 months with the administration of

vaccines against diphtheria, tetanus, pertussis, poliomyelitis and *Haemophilus influenzae* type b; in November 2000, the vaccine against *Neisseria meningitidis* serogroup C was introduced for children aged under 6 years. Some Autonomous Regions begin vaccination against hepatitis B at birth and others at 2 months, but all of them vaccinate pre-adolescents and newborns with a risk of hepatitis B after systematic screening of mothers-to-be. At 4, 6 and 15–18 months these vaccinations are repeated, except hepatitis B; at 12–15 months the vaccine is given for measles, rubella and mumps, at 3–6 years boosters for polio, measles, rubella, mumps, diphtheria, tetanus and pertussis, and at 12–14 another booster for tetanus and diphtheria. The preparation for poliomyelitis is the live, attenuated oral vaccine, the acellular preparation for pertussis is used in boosters, and there is a tendency to use combined vaccines to decrease the number of injections and improve acceptance of the Vaccination Programme (Table 1). The cost of the vaccines between birth and the age of 14 years is approximately US\$ 125.

## 3. Vaccine coverage

The method for calculating vaccine coverage is the relationship between the population and the vaccines declared as administered, although some regions have a computerised vaccination registry which allows nominal calculation of the coverage. The denominators vary according to age and Autonomous Region, such that the number of newborn babies might come from the Record Office, from maternity hospital births, from neonatal vaccination against hepatitis B, screening for endocrino-metabolic pathologies, newborn hearing screening or from Individual Health Cards, and the

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Table 1  
Types of vaccine in the first 6 years of life<sup>a</sup>

Vaccines	Age					
	2 months	4 months	6 months	15 months	18 months	6 years
DTP/Hb/Hib <sup>b</sup>	×	×	×			
McC	×	×	×			
OPV	×	×	×		×	×
MMR				×		×
DtaP/Hib <sup>b</sup>					×	
DtaP						×

<sup>a</sup> Murcia (Spain), 2000.

<sup>b</sup> One shot.

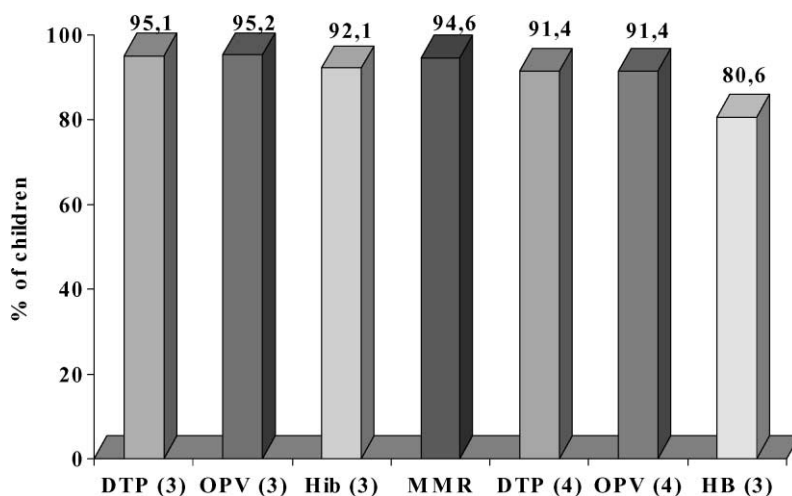


Fig. 1. Vaccination coverage among children (DTP/OPV/Hib/MMR) and adolescents (HB) (Spain, 1999).

number of schoolchildren might be provided by the Ministry of Education and Culture or the Population Censuses. Coverage is generally excellent for the primary series and second-year boosters [2], but decreases among children of school age (Fig. 1).

Targeting for the Vaccination Programme varies from region to region. Some Autonomous Regions target mothers when they take their babies to the Health Centre for the newborn check-up, others when the nurse visits their home, others by instructing mothers to take their children to the Vaccination Centre at one month to receive the second dose of hepatitis B, and others through neonatal metabolic screening.

#### 4. Vaccine uptake through a computerised immunization registry

The Autonomous Region where I carry out my professional activity (Murcia; 1,200,000 inhabitants) has had a Computerised Vaccination Registry [3] since 1991, enabling us to include >99% of children born in the region. The rest of the Autonomous Regions, following the recommendations of the Ministry of Health and Consumer Affairs,

are designing or have already implemented computerised registries, which, although they vary with respect to the targeting system (hospital doses of hepatitis B vaccine), have the same objectives as the registry in my region. As far as the immigrant population of our region is concerned, targeting for the Vaccination Programme depends on the age of the child. On the one hand, maternity hospitals send our Department a list every month of newborn children of foreign parents, with their corresponding postal address; on the other hand, schools send us a yearly list of the schoolchildren of non-Spanish parents.

The Computerised Vaccination Programme currently used in the Murcia Region is an improved version of the 1991 programme. The current application was done in Centura, in a Windows environment, which acts as an engine for the database. The database is centralised with a Server in the Directorate General of Public Health, and management of the application is done in “client-server” mode, i.e. the application software is installed with each of the servers of the Data Management Centres, which are connected to the server of the Directorate General by a point-to-point telephone line.

The objectives met by the Registry are as follows: (1) to show to what extent the present or future vaccination

schedule is followed in children and/or adults born and/or living in Murcia; (2) to enable immediate determination of vaccine coverage by name, age, type of dose, region, municipality, health centre, neighbourhood and doctor; (3) to show any adverse reactions to a particular type of vaccine; (4) to show the recipients of any faulty batch of vaccines, and (5) to show the management (supplies, depletion, stocks) of vaccines per vaccination centre.

Targeting is done through metabolic screening, which accounts for about 99% of newborn babies. The Biochemistry Laboratory, which is responsible for the whole Region, is connected to the Regional Corporation Network, such that at 10 days all the baby's particulars have been entered on our Registry. At 20 days parents receive a letter of introduction, a vaccination booklet and a card with a barcode for each vaccine the baby receives over the first 2 years. Each time the baby is brought in, a note is made on the card of the vaccine administered, together with laboratory, batch, manufacturer and identification code of the vaccination centre. The card is sent to the Data Management Centres to be entered on the registry. This registry provides: (1) a list of properly vaccinated persons; (2) a list of insufficiently vaccinated persons, who are periodically reminded by letter or by telephone of the convenience of keeping up to date with the schedule; and (3) a certificate of vaccination status.

## 5. Acceptance and knowledge of the vaccination programme

Both acceptance and knowledge of the programme have been shown in a random postal survey, which was conducted in early 2000 on a representative sample of parents in the Autonomous Region of Murcia with children aged between 18 and 24 months [4]. A total of 746 surveys with 35 questions were sent. We received 376 of which all except one were valid (response rate: 50.4%; CL: 95%; accuracy:  $\pm 5\%$ ). The results revealed an average of 4.38 diseases

known to be vaccine preventable and showed that 52.8% remembered 4 or 5 of the vaccines administered up to the age of 18 months and that 77.3% considered vaccines to protect against serious/very serious diseases. About 98.9% regarded them as necessary, 83.7% considered they should be compulsory, and 87.2% understood that routine vaccinations caused mild reactions. The most important sources of information they had were the paediatrician (69%) and the Directorate General of Health (45.6%). About 55.4% of the respondents believed they had sufficient information on vaccinations, and 82.6% were highly satisfied with the Computerised Registry. About 55.2% said they had received all the vaccinations in the buttocks, and 92.8% were recommended antipyretics in the event of post-vaccination malaise or fever. In our opinion, therefore, knowledge of vaccine preventable diseases, awareness that the diseases prevented by vaccination are serious or very serious, awareness that vaccinations are not generally associated with serious adverse reactions, and amount of information received, are the factors which, together with cost-free status and satisfaction with our registry system, influence vaccine uptake in our region, and we believe that to a greater or lesser extent they can be extrapolated to the rest of Spain's Autonomous Regions.

## References

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