

# Redefining the technical and organizational competences of children vaccination clinics in order to improve performance. A practical experience at the ULSS 12 Venetian Public Health and Hygiene Service

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## Key words

Vaccination • ULSS • Children vaccination clinics

## summary

**Introduction.** Since Regione Veneto suspended compulsory vaccination for children in 2008, and because of an increasing disaffection of parents to the vaccine practice, the vaccination rates have been slowly but steadily decreasing. The aim of this study was to analyze internal and external factors of immunization reduction and to implement potential solutions of the problem.

**Methods.** Servizio Igiene e Sanità Pubblica of ULSS 12 Veneziana (SISP – Hygiene and Public Health Service) analyzed and addressed both, the reasons of parents who do not vaccinate their children and the internal problems regarding vaccination clinics management, information to families, procedures and guidelines and, in general, the communication skills of the vaccination staff.

**Results.** A positive trend in vaccination rates was observed, especially in Venice historical centre. Moreover the staff reported a better working atmosphere and benefit from sharing common goals and procedures, even though the workforce was reduced of about 30% in terms of equivalent unit (EU).

**Discussion.** The continuous quality improvement method followed in this experience led to a steady increase in vaccination coverage in all territorial clinics, to a better adhesion of guidelines and standard operating procedures and to a general professional empowerment of SISP staff. The service now offered to the population is better and more efficient, since the workforce has been reduced. Future goals are to improve information about vaccinations among the population.

## Introduction

Given the current historical and cultural contingency that sees people wanting more and more to participate actively in decisions regarding their children's health (empowerment), which sometimes makes them question even the strongest scientific evidence and clinical experience – as in the case of vaccination – an analysis was conducted at the ULSS 12 Venetian Public Health and Hygiene Service (Servizio Igiene e Sanità Pubblica - SISP) on the reasons for the growing disaffection for vaccination with a view to containing the consequent small but steady reduction in vaccination coverage [1-7].

In a nutshell, the problem has two main causes: one concerns vaccination clinic accessibility and service management; the other relates to the socio-cultural sphere of people who call the whole vaccination system into question, in terms of their scientific authoritativeness, transparency, uniformity of action, and openness to confrontation [3, 4].

The aim of this study was to test some solutions for containing the reduction in vaccination coverage in the field, adapting the approach during the process if necessary. Both, internal service management issues and

external causes of opposition to vaccination due to misinformation or unjustified misgivings were approached in this study.

## Methods

### SITUATIONAL ANALYSIS

#### External factors

Scientific research on this topic has pinpointed some characteristics of the personal and socio-cultural background of people who do not have their children vaccinated.

The parents, and especially mothers, who do not have their children vaccinated can be defined as: vaccine-hesitant (they fear vaccination but tend to accept it in the end); late vaccinators (who accept some but not all the proposed vaccines, and tend to have vaccinations done later than at the age recommended by the health system); and rejecters (who refuse any kind of vaccination). Unlike the rejecters, the late vaccinators and vaccine-hesitant categories are might be influenced in their decisions concerning vaccinations [8].

In the Veneto Region (north-east Italy), non-vaccinators have a relatively high cultural and economic level by comparison with vaccinators, they are of Italian nationality, older, and have more than one child. It is interesting that health workers (especially mothers) tend to vaccinate less than the general population, thus confirming a widespread pseudo-knowledge and inadequate awareness about vaccination even among health professionals [3, 4].

In Italy, 80% of parents with children of immunization age use the internet, and the majority of them consult health sites [9]. It is easy to find false information about vaccines on the internet, and even for a person trying to use several different search engines and YouTube, the first sites to be listed are more likely to be anti-vaccination [10-13].

In the Veneto, the sources of information used by non-vaccinators are mainly web sites and blogs, but also various types of organization specializing in children's health and wellbeing, or word of mouth coming from parents whose children were presumed to have suffered vaccine-related damage [3, 4].

Generally speaking, family pediatricians rarely address this topic when routinely examining children who are well (and even if they do, this kind of intervention seems to be of scarcely influential in terms of changing or orienting parents' attitudes to vaccination) [3, 4].

A commonly-held opinion among non-vaccinators is that health personnel at vaccination clinics are neither very competent as regards vaccine-preventable diseases and vaccine safety, nor very willing to discuss these matters [3, 4].

In the latter's defense, it has to be said that it takes time to establish a constructive exchange of opinions, for which these operators would need to have very solid scientific grounds and, even more difficult, very good listening and counseling skills - such expertise demands constant updating and the acquisition of a working method that is still little used in public health services.

#### *Internal factors*

The organizational problems emerging from our survey can be summarized as follows.

In the Veneto Region, most of the local public health services organize children's vaccination services centrally, under the direct authority of a Public Health and Prevention department [14, 15].

At the Venetian ULSS 12, however, this activity has been shared for historical and organizational reasons between territorial branches of the health service dedicated to primary health care called districts, or *Distretti Socio Sanitari* [16, 17]. The SISP interfaces directly with the Veneto Regional Authority, reporting on vaccination coverage in the population and providing technical and scientific support for the various vaccination clinics, but it does not organize and control their activities directly. Information for families differed from one territorial clinic to another: some of the personnel either suggested or at least did not oppose parents' requests for personalized vaccination schedules instead of those recommend-

ed in the official Vaccination Plan issued by the Regional Authorities [18, 19]. In particular, some vaccinations that are usually administered together were separated and administered at subsequent visits, thus delaying the protection of the child concerned and of the population as a whole. Some vaccines were not promoted, or even openly discouraged, by some health professionals because the disease was considered relatively benign (e.g. chicken pox), or because the vaccine was considered unsafe (e.g. measles). In some circumstances, little attention was paid to the guidelines on the contraindications to vaccination (e.g. the need to delay administering vaccines after even mild diseases, to reject children for vaccination if not been examined recently by the family pediatrician, etc.).

Organizing training and refresher courses for the personnel proved difficult and time-consuming because of the need to have their participation authorized by the complex hierarchical management of the territorial public health unit. Also, because the public health department did not have direct control over the vaccination clinics' activities, putting into practice any new recommendations was usually delayed and little encouraged.

The various territorial clinics had different opening hours and accessibility issues. There were too many local branches, with an excessive distribution of the personnel that did not meet the population's real needs. At most of the clinics there were no activities designed to invite 5- to 14-year-old children to be vaccinated.

The collection of the children's medical histories was redundant and not always the same at the various vaccination clinics.

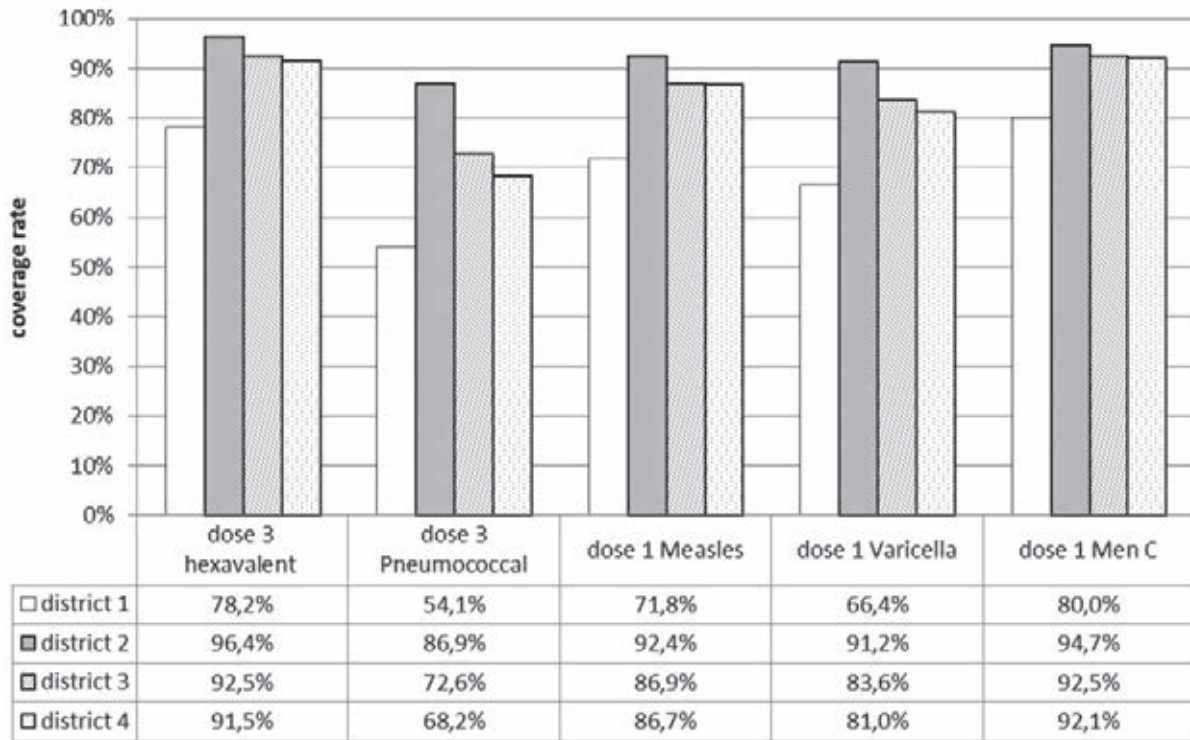
There was no standardization of the administrative procedures handled by the clinics, e.g. the electronic vaccination register and the telephone booking system.

Now that vaccination is no longer mandatory, new vaccines have been included in the vaccination schedule and a wider population could benefit from them, some diseases are reappearing as a result of lower vaccination rates, and the population is increasingly distrustful of the health authorities, the vaccination services have important challenges to meet that demand rapid, unambiguous, evidence-based responses [3-5, 20-22].

To meet the demands of a changing world, it has therefore become necessary to reshape the organizational model of vaccination clinics to make them more effective and efficient in programming and modulating their activities.

All these considerations are supported by a look at the very different vaccination rates seen in various areas of the ULSS 12 considered here: while the Distretto 2 (Lido di Venezia, Cavallino Treporti and lagoon islands) had very high rates, the Distretti 3 and 4 (Mestre, Marcon and Quarto d'Altino) had intermediate rates, and the Distretto 1 (Venice historical town) had low rates, especially for some vaccinations (pneumococcus, chicken pox and measles). This difference was not without its consequences: in the winter of 2010-11 there was a small epidemic of measles in Venice city center, that involved 11 unvaccinated children aged 0-14 (Fig. 1).

Fig. 1. Vaccination rates in children born in July – December 2009 (survey conducted in March 2011).



**AIM OF THE EXPERIMENTAL PROJECT AND OPERATIONAL STEPS**

To improve the manageability and flexibility of the local vaccination clinics and increase the population’s adherence to vaccination programs, we designed an experimental project that involved centralizing the management of about half of the clinics under the SISP (as a first step preparatory to the transfer of all the vaccination clinics under the SISP).

Some practical goals were defined to change the way vaccination is promoted and to implement a continuing improvement of the organization:

- to establish targets shared by the SISP and the territorial vaccination clinics;
- to create a working group with frequent email exchanges between the SISP, general practitioners, family pediatricians and doctors at the vaccination clinics to promote the circulation of information and discuss common strategies to make the population aware of the importance of vaccination;
- to set up a regular information flow on the vaccination rates between the ULSS vaccination coordinator and the local doctors in the field in order to react promptly in the event of problems occurring in a given area;
- to extend the existing ‘*Vaccinare Informati*’ (Vaccinating well informed) freephone service (activated in 2009 to deal with an outbreak of influenza A [H1N1] virus) to extend the provision of support and information to the population about vaccina-

tion generally, health precautions and prophylaxis for international travelers, preventive recommendations in the event of outbreaks of infectious diseases (meningitis, flu, measles, scabies, etc.);

- to organize training meetings and refresher courses for all personnel;
- to define standard procedures for managing vaccination clinics (inviting parents to attend, collecting children’s medical histories, coadministering vaccines, adverse reactions, informative leaflets for parents, vaccine storage, etc.);
- to have vaccines supplied directly to the local clinics, instead of through the SISP;
- to centralize at the SISP the planning and management of some vaccination programs, e.g. for HPV (human papilloma virus) in adolescent girls, or booster doses at 14 years of age, or catch-up doses for those not vaccinated against meningococcus C, and second doses of MMR (measles mumps rubella) vaccine between age 5 and 14.

**Results**

The reorganization of the vaccination clinics for children was based on a continuous quality improvement approach, introducing the changes gradually. It began in March 2011 in the two districts with the worst performance (4 of the 14 vaccination clinics in districts D1 and D4). Results were assessed as the work proceeded,

**Tab. I.** Vaccination rates (%) in the 4 districts considered from March to September 2011 for children born in 2009.

Vaccine	District 1			District 2			District 3			District 4		
	March (CI 95%)	September (CI 95%)	Difference (CI 95%)	March (CI 95%)	September (CI 95%)	Difference (CI 95%)	March (CI 95%)	September (CI 95%)	Difference (CI 95%)	March (CI 95%)	September (CI 95%)	Difference (CI 95%)
Hexavalent	75.5 (69.8-81.2)	85.8 (81.2-90.4)	10.3 (6.3-14.3)	94.7 (91.3-98.1)	97.0 (94.4-99.6)	2.3 (0-4.6)	91.8 (89.5-94.1)	92.5 (90.3-94.7)	0.7 (0.0-1.4)	89.2 (86.2-92.2)	93.4 (90.9-95.9)	4.2 (2.2-6.2)
Pneumococcus	50.9 (44.3-57.5)	70.8 (64.8-76.8)	19.9 (14.6-25.2)	84.7 (79.3-90.1)	92.2 (88.1-96.3)	7.5 (3.5-11.5)	67.7 (63.7-71.7)	86.1 (83.2-89)	18.4 (15.1-21.7)	62.1 (57.3-66.9)	82.2 (78.4-86)	20.1 (16.2-24)
Measles	69.1 (63-75.2)	81.3 (76.1-86.5)	12.2 (7.9-16.5)	92.4 (88.4-96.4)	97 (94.4-99.6)	4.6 (1.4-7.8)	84.0 (80.9-87.1)	90.3 (87.8-92.8)	6.3 (4.3-8.3)	82.7 (79-86.4)	91.6 (88.9-94.3)	8.9 (6.1-11.7)
Varicella	64.1 (57.8-70.4)	76.3 (70.7-81.9)	12.2 (7.9-16.5)	91.2 (86.9-95.5)	96.4 (93.6-99.2)	5.2 (1.8-8.6)	80.6 (77.3-83.9)	86.3 (83.4-89.2)	5.7 (3.7-7.7)	76.9 (72.8-81)	85.2 (81.7-88.7)	8.3 (5.6-11)
Meningo C	79.1 (73.7-84.5)	84.9 (80.2-89.6)	5.8 (2.7-8.9)	94.1 (90.6-97.6)	97.0 (94.4-99.6)	2.9 (0.4-5.4)	91.6 (89.3-93.9)	92.7 (90.5-94.9)	1.1 (0.2-2.0)	89.4 (86.4-92.4)	93.1 (90.6-95.6)	3.7 (1.8-5.6)

adapting the solutions to each territorial clinic. By May 2012, all the clinics were being run by the SISP.

Contact between the local vaccination clinics, the SISP coordinating group, and family pediatricians and general practitioners increased, especially in the more complex situations (involving children with rare diseases, immigrants, high-risk vaccinations, etc.).

Standardized working procedures and materials at the vaccination clinics, and shared protocols and guidelines were introduced in the spring of 2011 as part of an institutional quality accreditation process. This included aspects of vaccine storage, the letters of invitation for vaccination, informative leaflets, and the forms used to record children's medical history, which were concise and the same for all the clinics. Opening hours were also standardized (8:30-12:30) at all the vaccination clinics. The vaccination management software (ONVAC) introduced at our ULSS as a pilot project in 2010 eased the process of standardizing working procedures.

Training meetings with the personnel were organized once a month and concerned the definition and acquisition of standard working procedures covering all aspects of their work, from vaccine storage to vaccine administration, contraindications and adverse reactions to vaccination, counseling for parents opposing vaccination, immunization recommendations for people traveling to high-risk countries, and the management of vaccination schedules for immigrant children. This facilitated the personnel's adherence to the new working procedures, protocols and guidelines, their acquisition of expertise and their self-confidence in managing precautions, contraindications, adverse reactions and parental counseling.

The supply of vaccines directly to the local clinics (without the SISP's intermediation) began in spring 2011; it sustained the personnel's empowerment concerning the proper planning of their activities and vaccine storage.

The freephone service and telephone contact was reorganized: two call centers were created, one for the mainland area and one for Venice city center and its lagoon area. The availability of the service was extended to 25 hours/week instead of the few hours a week under the previous arrangements, and its scope

was expanded to provide general recommendations on health and vaccine-related issues. It also became possible to better coordinate activities in the field by assigning vaccination appointments to the various clinics according to need.

The centralized personnel management led to a greater uniformity of the procedures and meant that operators were interchangeable among the various clinics in the event of vacations or sick leave.

The vaccination rates were monitored from the baseline when the reorganization process began, revealing a positive trend for all vaccines in all the districts involved. As expected, the greatest improvement was seen in the districts where the reorganization process began (D1 and D4) (Tab. I).

The reorganization process also gave the personnel some spare time to contact families whose children had yet to be vaccinated, and to invest in their continuing education and training activities. Members of staff were also able to take part in some health promotion schemes such as the promotion of breastfeeding and vaccination in antenatal classes.

By May 1<sup>st</sup> 2012, all 14 vaccination clinics were under SISP management. This demanded the transfer of 28 of the 37 health professionals involved (70% of all the personnel – measured in terms of equivalent units [EU]), while the other 30% remained on the district's payroll involved in other territorial activities (postnatal support for new parents, in-school activities for children with chronic diseases, infant care). Specifically, 3 doctors and 6 nurses previously employed in vaccination activities were deployed to such other activities in the districts. It is worth noting that there was a kind of 'natural selection' amongst the personnel, that led the more motivated to work with the SISP, thus promoting a virtuous process of personal empowerment amongst the staff. We saw an increase in the vaccination activities for the population aged 0-17, as shown in Table II, with 2,124 more vaccines administered in one year while the reorganization process was underway (2011-2012), by comparison with the previous year. Once all the vaccination clinics had come under the SISP management (2012-2013), we recorded a further slight increase in the number of vaccines administered (+ 718), despite the 30% reduction in the workforce involved (Tab. II).



**Tab. II.** Number of vaccinations performed in children before, during and after reorganization the vaccination clinics.

	01.03.2010 – 28.02.2011		01.03.2011 – 28.02.2012		01.03.2012 – 28.02.2013	
	Vaccinations in 0-13 year-olds	Vaccinations in 14-17 year-olds	Vaccinations in 0-13 year-olds	Vaccinations in 14-17 year-olds	Vaccinations in 0-13 year-olds	Vaccinations in 14-17 year-olds
Venice and lagoon islands	7,446	493	8,042	568	7,163	491
Mestre and mainland area	17,992	3,118	19,272	2,197	20,626	1,737
SISP – central clinic	1,409	1,122	2,261	1,364	1,881	2,524
<b>Total</b>	<b>31,580</b>		<b>33,704</b>		<b>34,422</b>	
<b>Difference</b>			<b>+2,124</b>		<b>+718</b>	

## Discussion and conclusions

During the reorganization process, the personnel showed a better compliance with the guidelines and a greater sense of responsibility in their various activities.

The basic goal that has been reached is a greater uniformity and a continuous improvement in interfacing with the population that has improved the credibility of the SISP and, as a consequence, people's adhesion to vaccination programs. This result is confirmed by the higher vaccination rates and the better relations seen between the population and the vaccination clinic personnel and other health professionals.

An important consequence of the reorganization was an improvement in the working atmosphere between members of staff, who now share targets and protocols more and better, speaking the same language with the population and with other health professionals such as family practitioners and hospital staff.

Another important outcome is a greater efficiency, demonstrated by an increase in the number of vaccines being administered by a much reduced workforce (70% of the operators previously involved). This goes to show that standardized work processes and a centralized management of activities can strongly influence results, even more than the size of the labor force involved.

The centralized organization has also enabled the population to access any vaccination clinic, making the service offered more flexible to cope with parents' needs, as well as giving the personnel from different areas a chance to share their experiences.

We believe that the organizational changes implemented will also enable the SISP to provide the population with a better-quality information and improved communications in the field of vaccination. This better communication between the SISP and family pediatricians, standardized working procedures and guidelines, more overall training, and the acquisition of counseling skills will enable health professionals to deal more effectively with the late vaccinators and vaccine-hesitant.

As of 2014, as a next step, the SISP will start organizing group meetings between the parents of newborn, SISP medical staff and family pediatricians to deal with the population's fears and uncertainties concerning vaccination.

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■ Received on September 1, 2014. Accepted on September 29, 2014.

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