

Assessment of Vaccination coverage in France: Current Sources and Data

JP. Guthmann, L. Fonteneau, D. Lévy-Bruhl
French Institute for Public Health Surveillance

BACKGROUND

“Vaccination coverage refers to the ratio of immunized people in a population at a given moment.”

Vaccination coverage refers to the percentage of a target population that has been vaccinated. Knowledge and follow-up on vaccination coverage over time helps find out if immunization programs are being properly enforced. A vaccination coverage that is sufficiently high will protect against a specific disease, but conversely, insufficient coverage may lead to the persistence of a disease or even to outbreaks. Vaccination coverage is seldom assessed for the entire population, as it more often involves population groups targeted by immunization recommendations.

Assessing the vaccination coverage should take place on a regular basis and be adjusted to changes in immunization recommendations, which are revised every year by the French Public Health Council and published in the Weekly Epidemiological Bulletin (BEH)¹ once they have been approved by the Ministry in charge of Health.

According to the Act dated 9 August 2004 pertaining to public health policy, the French Institute for Public Health Surveillance (InVS) is in charge of monitoring and assessing the vaccination coverage for all vaccines and in all population groups targeted by the immunization program. This task is carried out in cooperation with a number of partners (see box) and involves collecting routine data as well as data stemming from ad hoc surveys. Results are made available to the health authorities.

KEY PARTNERS IN ASSESSING THE VACCINATION COVERAGE

Directorate for Research, Studies, Evaluation and Statistics (Drees) and the Directorate-General of Health (DGS), both at the Ministry in charge of Health; the Directorate-General for Schools (Dgesco) and the Department of Evaluation, Forecasting and Performance (DEPP), both at the Ministry of National Education; the National Health Insurance Fund for Salaried Workers (CnamTS), District Maternal and Child Health (MCH) Services within District Councils; the Partnership to Collect and Prepare Statistics (Gers), etc.

1. French Public Health Council (*Haut conseil de la santé publique*). *Immunization schedule and Recommendations for Immunizations*, 2012. *Weekly Epidemiological Bulletin*. 2012 ; 14-5.

“Vaccination coverage allows to check whether immunization programs are operational.”

OVERALL APPROACH UNDERLYING THE REPORT'S DEVELOPMENT

The approach implemented by the InVS involved two steps:

- Identifying and analyzing available data sources that can be used to assess the vaccination coverage, as well as a selection of the most appropriate sources for each age group;
- Compiling recent data at national, regional, and district level for each vaccine, for the various age groups.

This approach helped to identify population groups in which coverage for a specific vaccine needs to be improved. It also helped to draw lessons and issue practical recommendations aimed at improving the quality of sources and reliability of data.

“Vaccination coverage is assessed in population groups targeted by immunization recommendations.”

The pros and cons of the main sources of data available to assess the vaccination coverage (children's health certificates, school surveys, vaccine reimbursements, etc.) have been studied in the light of criteria such as their geographic or temporal description, and how easy they were to obtain as well as their cost. The description of vaccination coverage data at national and regional level took account of historic data (when such data were available) up to the most recent data. At district level, only the most recently validated data has been presented.

The new sources of data analyzed include the following: vaccines purchased by pharmacies and public institutions, prescriptions by physicians, sales data provided by pharmacies and reimbursement data provided by the National Health Insurance System. Although most of these sources do not provide an assessment of the vaccination coverage, some did prove useful for the reactive monitoring of immunization activities.

DATA SOURCES: PROS AND CONS

Children and Teenagers

Among children and teenagers (0-15) assessing the vaccination coverage is achieved based on two sources that are specific to

these age groups: health certificates (0-2) and school surveys (2-15). A third source, the General Sample of Health Insurance Beneficiaries (Echantillon Généraliste des Bénéficiaires, EGB), provides data in a more reactive manner following changes made to the vaccination schedule.

TABLE 1 I

Main sources of data that can be used to assess the vaccination coverage

Type of source	
New sources	Traditional sources
Purchases of vaccines by pharmacies (Gers)	Children's health certificates
Purchases of vaccines by public institutions (pharmaceutical laboratories)	School surveys
Vaccines prescribed by physicians (EPPM IMS-Health, Thalès)	Population surveys
Vaccine sales by pharmacies (IMS-Health)	Ad hoc surveys
Reimbursement of vaccines by the health insurance system (Sniir-AM)	

Sniir-AM : Système national d'information inter-régime de l'Assurance maladie (Inter-Scheme National Information System within the National Health Insurance System)

- **Children's health certificates:** Health certificates are issued during the mandatory preventive health check-ups for children; these take place at key ages in terms of development (8 days, 9 months and 24 months). Certificates are filled in by attending physicians, who then send them to the district services for mother and child protection (Protection Maternelle et Infantile, PMI), which are within the districts councils. The health certificates issued when infants are 24 months old (CS24) serve as an excellent tool to assess vaccination coverage among infants. As district data are not available for all districts within a region, region-based estimates can only be carried out in 50% of the regions. The participation of doctors and families in this data collection system is insufficient, as is the participation of certain districts, though over the past two years there has been an increase in the number of districts that have provided CS24s, from 74 in 2006 to 84 in 2010. One of the drawbacks of this source is its lack of reactivity to changes in the vaccination schedule because of the amount of time required before having access to this data.
- **School surveys in children and teenagers:** These surveys are now carried out every two years (every year up until 2009) on an alternating basis among children in the last year of nursery school (Grande section de maternelle, GSM) (6 years old), fifth graders (11 years old) and ninth graders

(15 years old), in partnership with the Ministry of National Education (Dgesco and DEPP) and the InVS. Coordinated by the Drees, the surveys are carried out in the field by nurses and physicians from the Promotion of Child Health services of the Ministry of Education. Though such surveys provide an excellent estimate of the vaccination coverage among school-age children, this is a cumbersome mechanism that mobilizes stakeholders in the field who are already busy with many other activities. However, they do not usually provide estimates at regional level, and the timeframe before having access to this data remains rather long.

“Among infants, assessing the vaccination coverage can only currently be carried out in 85% of France's districts. Among children after two years of age, regional estimates are possible only among children in the last year of nursery school.”

- **General Sample of Health Insurance Beneficiaries (EGB):** EGB is a permanent representative sample of the population benefiting from health insurance schemes (general insurance fund and all insurance funds since 2009). This sample allows to carry out studies and piece together the entire individual healthcare history over a long period of time (office-based or hospital-based). Vaccine reimbursement data stemming from the EGB makes it possible to estimate the child's vaccination coverage at any age, and with greater reactivity compared to other sources after changes to the vaccination schedule, and with excellent representativeness at national level. There are two limitations to this sample: sub-national estimates are not possible, and vaccinations carried out in those MCH centers that do not have an agreement with their local health insurance fund (CPAM) for the reimbursement of vaccines on an individual basis, are not taken into consideration. InVS's access to Sniir-AM data (comprehensive database on inter-scheme health insurance consumer data (DCIR)) as of late 2012, combined with the widespread use of MCH-CPAM agreements, should help to quickly overcome these problems.

Adults

There is no routine data collection system for vaccinations among adults, and vaccination coverage data for the adult population is scarce.

- **General Sample of Health Insurance Beneficiaries (EGB):** EGB is only of limited interest when assessing vaccination coverage among adults, as a significant proportion of vaccinations given to adults takes place outside this mechanism, as they are sometimes performed within occupational health services, in vaccination centers for travelers or in public vaccination centers, and are not reimbursable on an individual basis.
- **Other data sources currently being assessed:** Assessing the vaccination coverage in this population group will rely on new tools that are currently being assessed (or will be assessed) and which will require specific developments. Such sources will normally include individual data on vaccination status

collected by physicians during the medical consultation (personal medical files (DMP), a new generation of the national health insurance card, electronic vaccination card).

“Among adults, there is no system for the collection of routine data, and vaccination coverage data for this population group are insufficient.”

Specific populations

Several population groups are targeted by immunization recommendations: health care professionals, individuals affected by certain chronic diseases, young adults likely to become parents, etc.

These recommendations are made for groups such as medical and paramedical professions, early childhood personnel (personnel working in day care centers, nursery assistants), seagoing personnel, flight crews, personnel working in the travel industry, as well as other specific occupations including sewage workers, fishers and professional divers, fishery guardians, etc. These recommendations are updated on an annual basis and published every year in the vaccination schedule².

At present, there are no routine mechanisms to assess the vaccination coverage in each of these population groups, or to track the impact of recommendations. Ad hoc estimates through specific surveys, such as the health barometer of the National Institute for Prevention and Health Education (Inpes) as well as other specific surveys are the only instruments providing such data, in particular for healthcare professionals. Estimates of influenza vaccination coverage are based on the number of free vaccination vouchers sent by the health national insurance system to individuals targeted by this vaccination that were returned.

VACCINATION COVERAGE DATA

This includes the most recently validated vaccination coverage data, obtained from the various aforementioned sources, at different time periods (depending on the availability of data) in the main target groups (see table).

PUBLIC HEALTH OBJECTIVES FAR FROM BEING REACHED FOR MOST VACCINATIONS...

Vaccination coverage objectives set forth by the public health act (at least 95% for all vaccinations and 75% with regard to influenza) fail to be reached for most vaccinations. For vaccinations included in the vaccination schedule, four major groups can be identified:

- High vaccination coverage (public health objectives reached): diphtheria, tetanus, poliomyelitis (DTP), pertussis, *haemophilus influenzae b* among children;
- Insufficient but stable vaccination coverage: HPV vaccine among young girls, booster vaccination against pertussis among teenagers, first dose of measles, mumps and rubella vaccine, ten-year booster DTP vaccinations among adults. BCG among children at high risk of tuberculosis can be included in this group, but this is a special case due to the recent changes in the vaccination policy for this vaccine;
- Insufficient and decreasing vaccination coverage: seasonal influenza;
- Insufficient and increasing vaccination coverage: second dose of measles, mumps and rubella vaccine, hepatitis B; two other vaccines recently introduced in the vaccination schedule can be included in this group: the pneumococcal conjugate vaccine, and to a lesser extent, the meningococcal C vaccine.

Furthermore, with regard to population groups targeted by more specific vaccination recommendations (healthcare professionals, young adults and future parents for the pertussis vaccine, adults at high risk of hepatitis B infection, etc.) for which there is no routine data collection mechanism, ad hoc estimates of the vaccination coverage need to be generated.

...AND ESTIMATES THAT ARE STILL INSUFFICIENT AT REGIONAL AND DISTRICT LEVELS

Overall, the mechanism for the assessment of vaccination coverage at the regional level needs to be strengthened to be able to identify areas of under-immunization, in particular as part of the plan to eliminate measles and rubella.

In 2010, district vaccination coverage estimates for two-year-old children were not available in 17% of France's districts, and were available in less than half of the various regions (11 out of 27) due to lack of data in at least one of the region's districts. However, provisional data for 2010 indicates an increase in the districts' participation rate .

2. French Public Health Council (Haut conseil de la santé publique). Immunization schedule and Recommendations for Immunizations, 2012. Weekly Epidemiological Bulletin. 2012 ; 14-5.

I TABLEAU I

National vaccination coverage (%) by age group

Age group (in years)	2	6	11	15	17	Adults	65+
Year of most recent estimate	2010*	2005-2006	2007-2008	2003-2004	2011	2002	2011
BCG	78.2	96.5	97.7	99.8			
Diphtheria, tetanus, polio (DTP)							
3 doses	98.5						
4 doses	91.3	96.4					
5 doses			DT: 91.9; P: 88.5				
6 doses				80.5			
10-year booster vaccination						D: 29.1	
						T: 62.3	
						P: 36.1	
Pertussis							
3 doses	98.2						
4 doses	90.8	94.5	92.9				
5 doses				57.4			
HIB							
3 doses	97.3						
4 doses	89.2						
Pneumococcal conjugate vaccine							
1 dose**	96.3						
3 doses	88.6						
Hepatitis B							
3 doses	64.6	37.8	45.8	42.4			
Measles, Mumps, Rubella							
1 dose	89.2	93.3	96.6	93.9			
2 doses	60.9	44.3	85.0	65.7			
Meningococcal C***	51.5						
HPV (girls)							
1 dose					53.8		
3 doses					39.0		
Influenza							54.0

*: 2007 for BCG. Two-year provisional 2010 data; **: at 6 months of age, EGB data; ***: EGB source, data as of December 31, 2011.

For further information

Assessment of Vaccination Coverage in France. Current Data and Data Sources. Saint-Maurice: InVS. 2012. "Vaccination coverage" topic, available on InVS's web site: <http://www.invs.sante.fr/Dossiers-thematiques/Maladies-infectieuses/Maladies-a-prevention-vaccinale/Couverture-vaccinale>

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