

Mandatory vaccination for measles: does it work?

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Countries that recently introduced mandatory vaccinations

- California – [Law Senate Bill 277 \(June, 2015\)](#)
- Australia – [“No Jab, No Pay” Social Services Legislation Amendment \(January, 2016\)](#)
- Italy – [Law 119/2017 \(July, 2017\)](#)
- France – [Decree No. 2018-42 \(January, 2018\)](#)
- Romania – [\(draft law\)](#)
- Germany – [\(under discussion\)](#)



The NEW ENGLAND JOURNAL of MEDICINE

Perspective

AUGUST 27, 2015

Shifting Vaccination Politics — The End of Personal-Belief Exemptions in California

Michelle M. Mello, J.D., Ph.D., David M. Studdert, L.L.B., Sc.D., and Wendy E. Parmet, J.D.

It's not often that California, West Virginia, and Mississippi are politically aligned, but that unlikely trio formed on June 25, 2015, when California Governor Jerry Brown signed into law Senate Bill (SB) 277,

substantially narrowing exceptions to school-entry vaccination mandates. With that law, California becomes the third state to disallow exemptions based on both religious and philosophical beliefs; only medical exemptions remain. The move represents a stunning victory for public health that affects not only California schoolchildren but also the prospects for strengthening vaccination requirements nationwide.

In 2014, California tightened its personal-belief exemption by requiring parents seeking such exemptions to obtain a physician's attestation that they had received information about vaccine-preventable illnesses and the benefits and risks of immuniza-

tion. Just 18 months later, the legislature decided that that wasn't sufficient. The new law applies to elementary and secondary schools and day-care centers both public and private, exempting only home-schooled students. It prohibits these institutions from unconditionally admitting children who are not up to date on vaccinations against a prescribed list of diseases (see box) unless they have a medical exemption. The law also allows the state Department of Public Health (DPH) to add diseases to the list but, anomalously, permits personal-belief exemptions for any such additions.

The passage of SB 277 was anything but a foregone conclusion.

Although California's predominantly liberal populace generally tolerates assertive public health policies, a vocal libertarian minority ardently opposes vaccination mandates. The bill's opponents mobilized fiercely against it, attending hearings with toddlers in tow and organizing strident protests. The pediatrician-senator who sponsored the bill received death threats.

Nevertheless, four factors converged to enable its passage. First, legislative supporters showed extraordinary backbone in resisting pressure to abandon the measure. Second, the DPH publicized data showing that rates of personal-belief exemptions in California have doubled since 2007,¹ and analysts noted that vaccination coverage is low enough to jeopardize herd immunity in a quarter of schools.² Third, the widely publicized Disneyland measles outbreak brought home the risks

and marginalize opposition? Time will tell. What is clear is that California's experience will be closely watched. Fewer vaccination exemptions and vaccine-preventable illnesses would be accomplishments that other states would find difficult to ignore.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

From Stanford Law School and Stanford University School of Medicine — both in Stanford, CA (M.M.M., D.M.S.); and Northeastern University School of Law, Boston (W.E.P.).

This article was published on July 22, 2015, at NEJM.org.

1. Immunization levels in child care and schools. Sacramento: California Department of Public Health (http://www.cdph.ca.gov/programs/immunize/pages/immunization_levels.aspx).

2. Bloch M, Keller J, Park H. Vaccination rates for every kindergarten in California. New York Times. February 6, 2015 (<http://www.nytimes.com/interactive/2015/02/06/us/california-measles-vaccines-map.html>).

3. Majumder MS, Cohn EL, Mekaru SR, Huston JE, Brownstein JS. Substandard vaccination compliance and the 2015 measles outbreak. JAMA Pediatr 2015;169:494-5.

4. White JB. Tim Donnelly files referendum to overturn California vaccine bill. Sacramento Bee. July 1, 2015 (<http://www.sacbee.com/news/politics-government/capitol-alert/article26005486.html>).

5. Wang E, Clymer J, Davis-Hayes C, Buttenheim A. Nonmedical exemptions from school immunization requirements: a systematic review. Am J Public Health 2014;104(11):e62-e84. DOI: 10.1056/NEJMp1508701

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decisions would not thwart one goal of SB 277 — keeping schools and day-care centers safe for children too young or medically fragile to be fully vaccinated. Such choices might, however, undercut the goal of safeguarding the population's herd immunity.

California's legislative victory may embolden other states to eliminate philosophical and religious exemptions or increase the barriers to obtaining them. Eighteen states allow both types of exemptions, and legislation has been introduced in many to tighten the requirements. Although California politics may be distinctive, its experience with SB 277 indicates that even strong opposition can be overcome with the right combination of astute public education, political strategy, and legislative fortitude.

There is persuasive evidence that stringent vaccination mandates reduce the risk of vaccine-preventable illness.³ Less clear is the effect California's move will have on the politics of vaccination. Will it fortify antivaccination sentiment, leading objecting parents to more extreme tactics to shield their children? Or will it serve to normalize vaccination

and marginalize opposition? Time will tell. What is clear is that California's experience will be closely watched. Fewer vaccination exemptions and vaccine-preventable illnesses would be accomplishments that other states would find difficult to ignore.

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The study of the Italian Health Care System may be interesting because ... (IV)

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World Health Organization

World Health Organization Assesses the World's Health Systems

World Health Organization Assesses the World's Health Systems

The World Health Organization has carried out the first ever analysis of the world's health systems. Using five performance indicators to measure health systems in 191 member states, it finds that France provides the best overall health care followed among major countries by Italy, Spain, Oman, Austria and Japan.

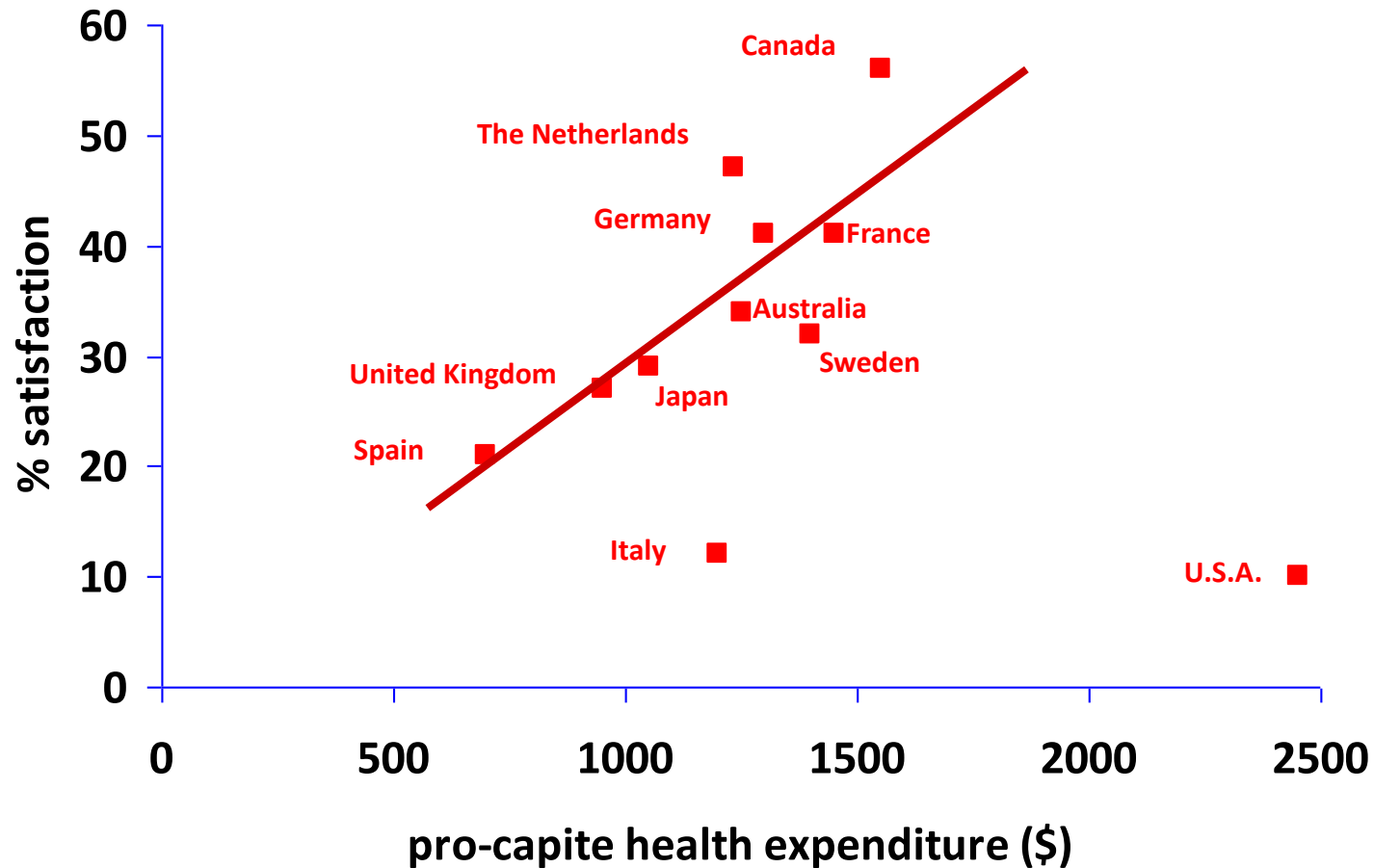
The findings are published today, 21 June, in The World Health Report 2000 – Health systems: Improving performance*.

*Copies of the Report can be ordered from bookorders@who.ch.

The U.S. health system spends a higher portion of its gross domestic product than any other country but ranks 37 out of 191 countries according to its performance, the report finds. The United Kingdom, which spends just six percent of GDP on health services, ranks 18 th . Several small countries – San Marino, Andorra, Malta and Singapore are rated close behind second-placed Italy.

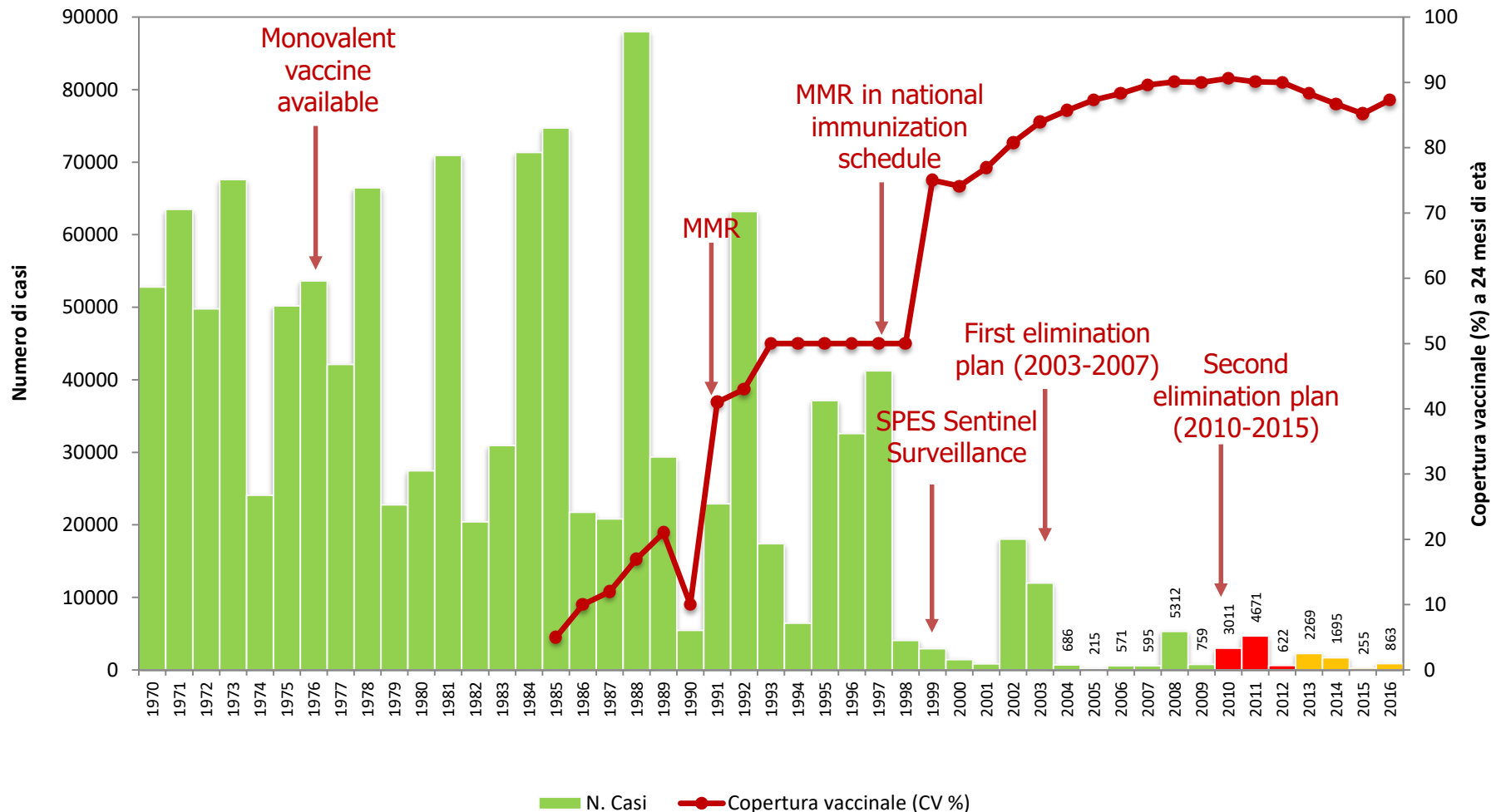
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Satisfaction with health care systems in ten nations



N. of reported measles cases and measles vaccination coverage (in 24 month-old children), by year. Italy, 1970-2016.

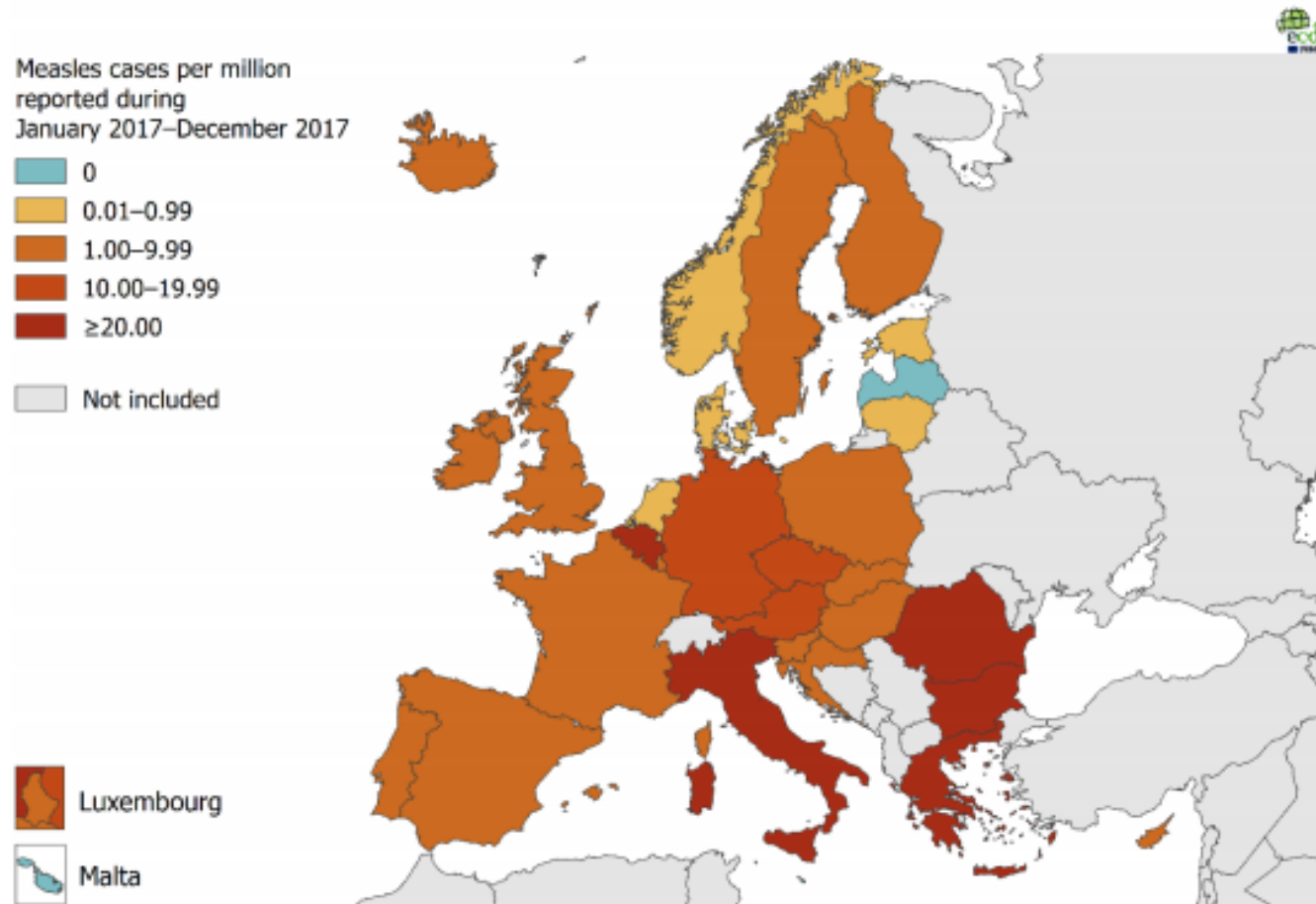
- 1970-2009 Ministero della Salute, Sistema di notifica delle malattie infettive
- 2010-2012 Istituto Superiore di Sanità - CNESPS, Sistema di Sorveglianza speciale del morbillo
- 2013-2016 Istituto Superiore di Sanità - CNESPS, Sistema di Sorveglianza integrata del morbillo e della rosolia
- 1985-2016 Ministero della Salute



Measles

January–December 2017

Figure 1. Measles notification rate per million population by country, 1 January 2017–31 December 2017, EU/EEA countries



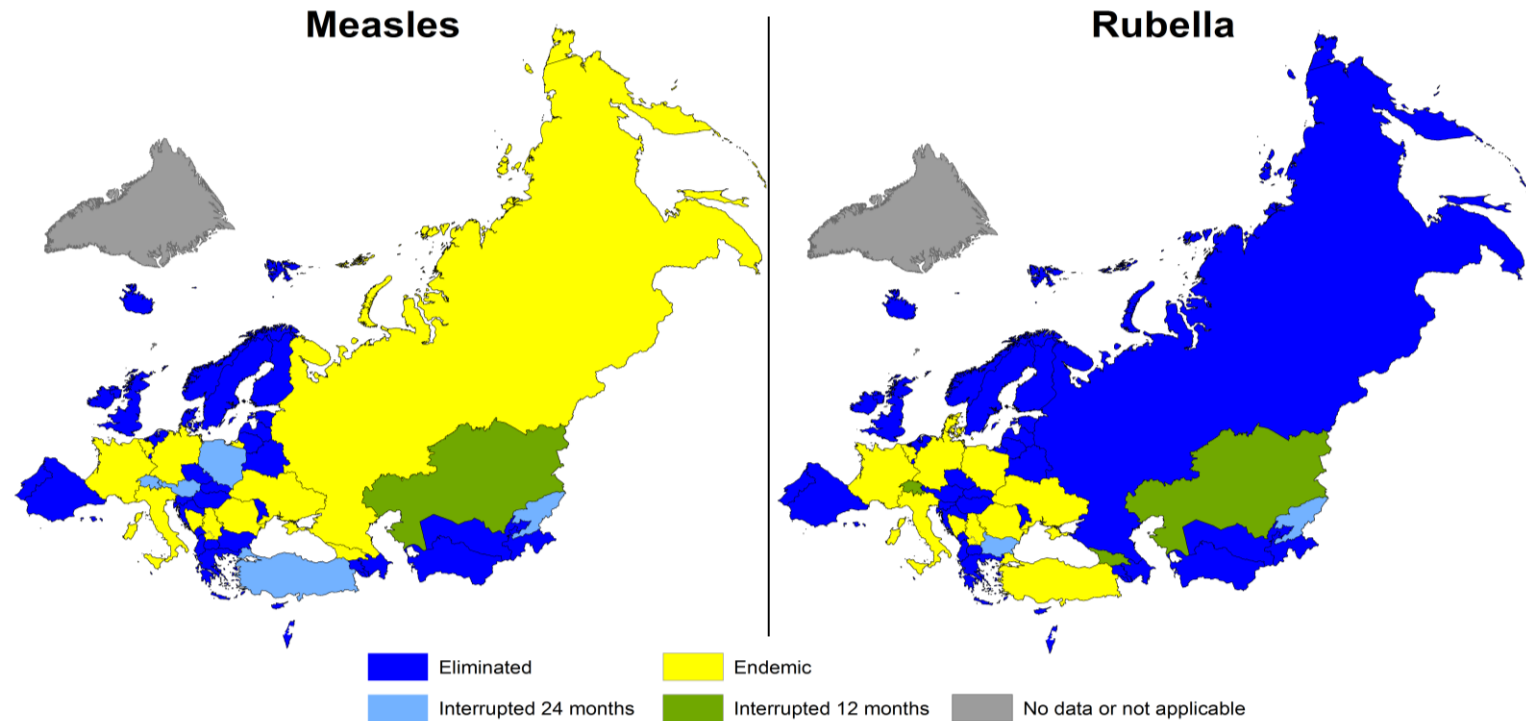
ECDC. Map produced on: 01 Feb 2018
ECDC map maker: <https://emma.ecdc.europa.eu>

Between 1 January 2017 and 31 December 2017, the EU/EEA Member States reported **14 451** cases of measles

Romania 5560 (38%)
Italy 5404 (35%)
Greece 967 (7%)
Germany 929 (6%)

Measles and Rubella Elimination Status 2017

WHO European Region*



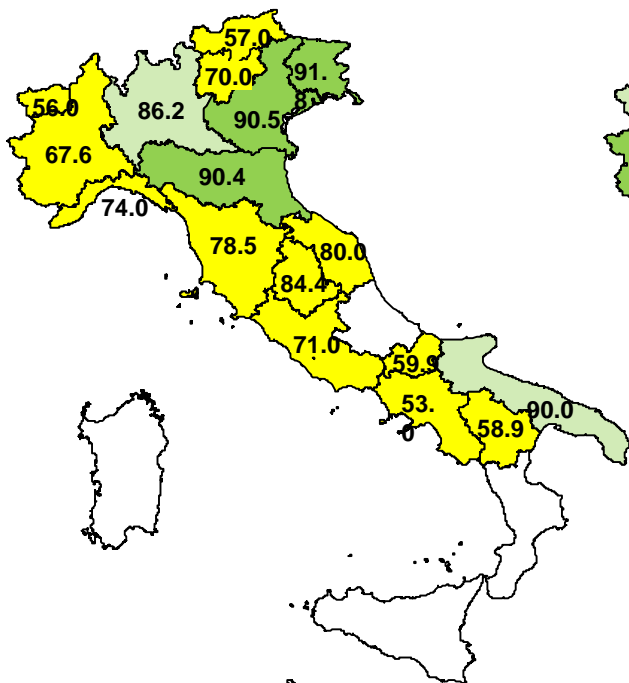
**Data source: RVC report 2017*

Source: WHO Regional Office for Europe. Monthly Measles Update, August 2018.

Vaccination coverage for the 1st dose of measles-containing vaccine, in 24-month-old children, by Region.

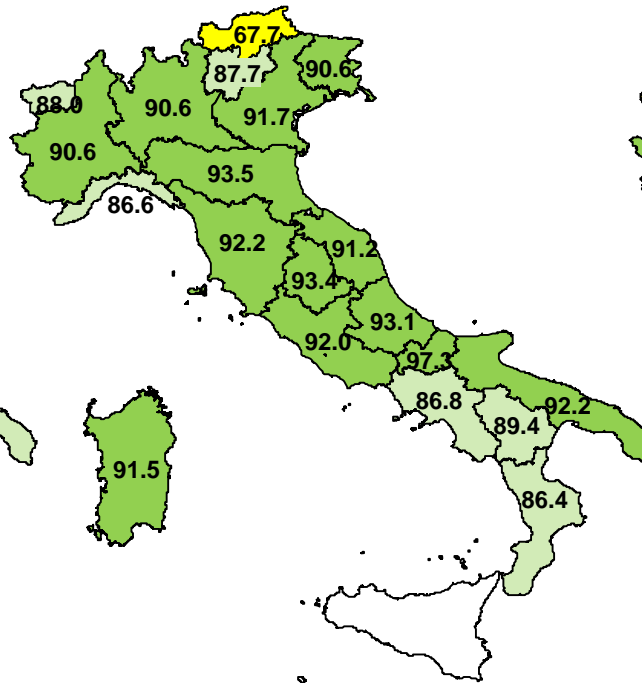
Italy: 2000, 2007 and 2013

2000



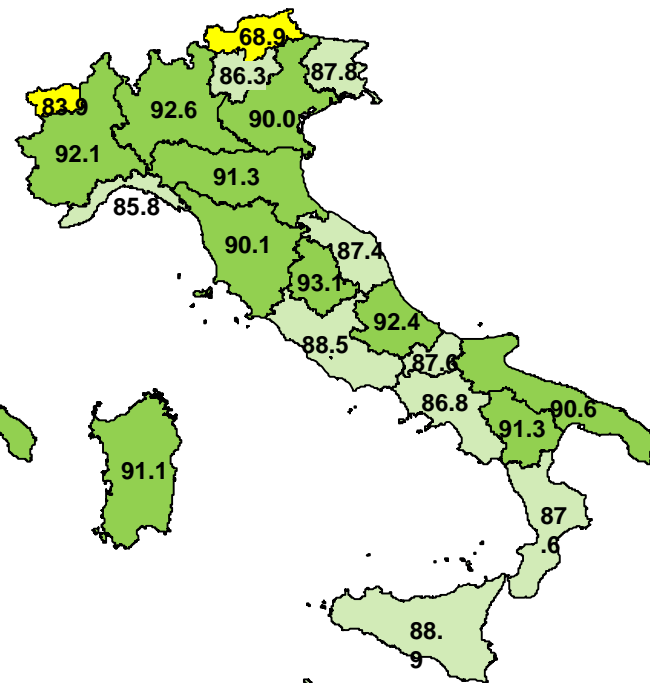
Italy: **74.1%**

2007

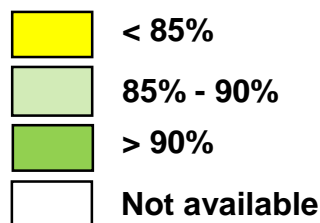


Italy: **89.6%**

2013



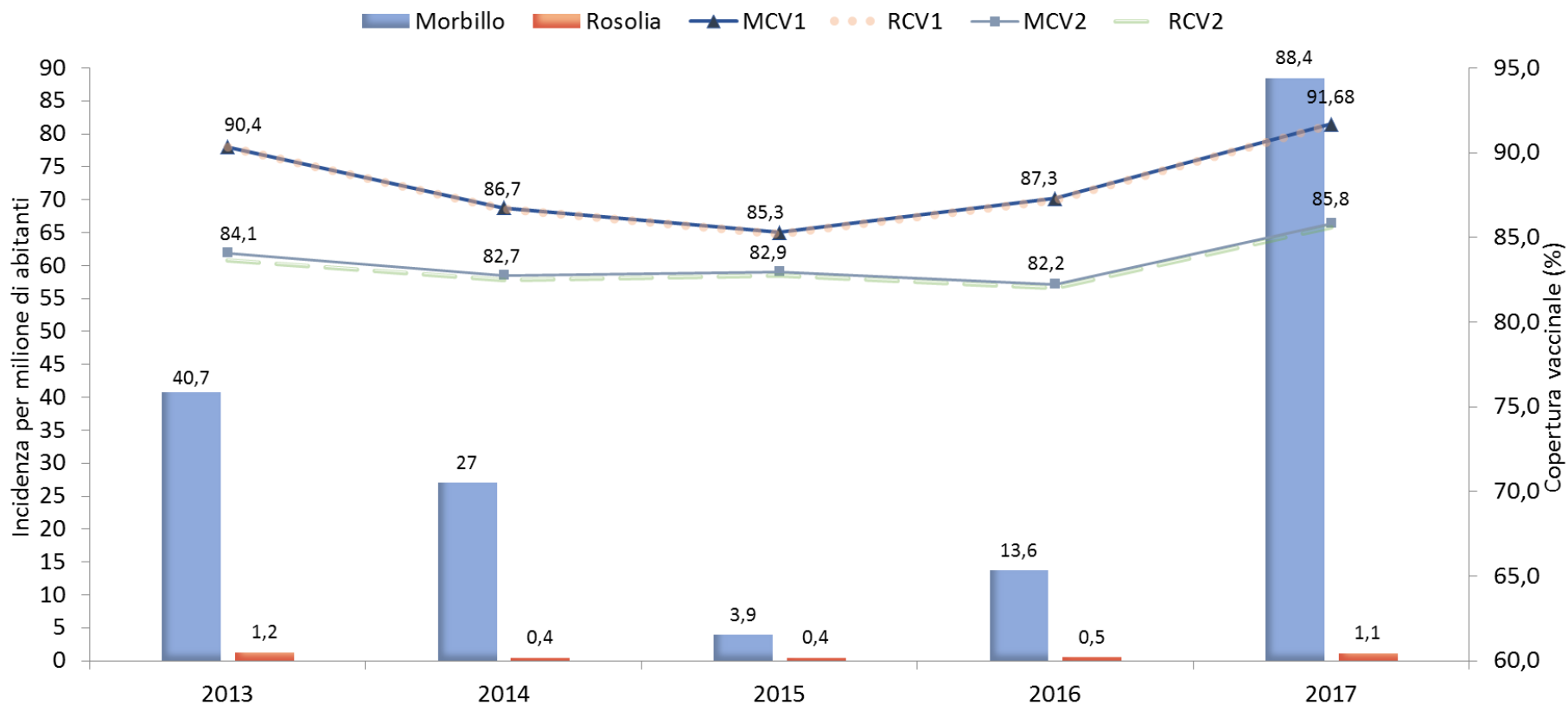
Italy: **88.3%**



Source: Italian Ministry of Health

Incidence and vaccination coverage for measles and rubella

National trend 2013-2017



Source: Italian MR Annual Status Updates for the years 2013, 2014, 2015, 2016, 2017

*It is well known that prevention loses consideration
in time of economic crisis*

The European

European Journal

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doi:10.1093/eurpub/ckv015

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The new

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Table 1 Results of multiple logistic regression analyses investigating the impact of recovery plans and other covariates on selected quality items of projects included in RPPs

Variable	Regions with low GDP			Regions with high GDP		
	OR	95% CI	P value	OR	95% CI	P value
Coherence of projects with the regional epidemiological context						
Recovery plans	0.62	0.42–0.90	0.013	0.71	0.35–1.44	0.344
Macroarea of intervention						
Universal prevention (referral)	1	–	–	1	–	–
Predictive medicine	1(omitted)	–	–	0.21	0.04–1.04	0.056
Prevention in high risk groups	0.87	0.40–1.90	0.736	0.47	0.25–0.88	0.019
Tertiary prevention ^a	1.17	0.11–12.94	0.899	0.98	0.30–3.13	0.969
Geographic area						
North (referral)	1	–	–	1	–	–
Centre	0.46	0.26–0.79	0.005	2.43	0.91–6.49	0.075
South and islands	0.20	0.19–0.20	<0.001	1(omitted)	–	–
Coherence of projects with the regional health plan or other regional health programs/policies						
Recovery plans	2.13	1.31–3.46	0.002	1.31	0.29–5.96	0.725
Macroarea of intervention						
Universal prevention (referral)	1	–	–	1	–	–
Predictive medicine	0.46	0.07–2.94	0.412	0.66	0.11–4.11	0.658
Prevention in high risk groups	0.28	0.13–0.60	0.001	0.85	0.48–1.50	0.585
Tertiary prevention ^a	1.35	0.27–6.68	0.717	0.95	0.37–2.45	0.919
Geographic area						
North (referral)	1	–	–	1	–	–
Centre	0.20	0.18–0.22	<0.001	10.35	2.68–39.97	0.001
South and islands	0.09	0.07–0.11	<0.001	1(omitted)	–	–
Evidence reporting on the effectiveness of the interventions proposed in the projects						
Recovery plans	0.51	0.20–0.90	0.026	1.17	0.69–1.99	0.568
Macroarea of intervention						
Universal prevention (referral)	1	–	–	1	–	–
Predictive medicine	0.83	0.28–2.43	0.740	2.27	0.30–17.14	0.568
Prevention in high risk groups	2.11	1.25–3.58	0.005	3.75	1.54–9.12	0.004
Tertiary prevention ^a	0.29	0.07–1.15	0.078	1.44	0.37–5.59	0.601
Geographic area						
North (referral)	1	–	–	1	–	–
Centre	1.54	0.88–2.71	0.132	3.28	1.89–5.70	<0.001
South and islands	1.46	0.95–2.25	0.081	1(omitted)	–	–
Considerations on the project's sustainability						
Recovery plans	0.06	0.03–0.16	<0.001	0.73	0.16–3.31	0.680
Macroarea of intervention						
Universal prevention (referral)	1	–	–	1	–	–
Predictive medicine	0.82	0.19–3.51	0.792	1(omitted)	–	–
Prevention in high risk groups	1.33	0.55–3.23	0.522	2.03	0.38–10.87	0.410
Tertiary prevention ^a	2.12	0.59–7.63	0.252	1(omitted)	–	–
Geographic area						
North (referral)	1	–	–	1	–	–
Centre	0.49	0.01–0.22	<0.001	2.16	0.76–6.11	0.148
South and islands	0.51	0.25–1.03	0.062	1(omitted)	–	–
All regions						
Consideration of the cost-effectiveness of the intervention proposed						
Recovery plans	0.23	0.12–0.41	<0.001			
Macroarea of intervention						
Universal prevention (referral)	1	–	–			
Predictive medicine	3.21	1.36–7.59	0.008			
Prevention in high risk groups	3.15	1.67–5.95	<0.001			
Tertiary prevention ^a	2.53	0.51–12.44	0.253			
Geographic area						
North (referral)	1	–	–			
Centre	2.03	0.88–4.67	0.096			
South and islands	2.59	1.51–4.42	0.001			
Considerations on the project's feasibility						
GDP pro capita	0.06	0.02–0.15	<0.001			
North	5.54	3.06–10.05	<0.001			

Notes: Variables were kept in the model if they reach statistical significance in at least one of the two stratified models.

a: Prevention of complications and recurrence of chronic diseases.

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Austerity, measles and mandatory vaccination: cross-regional analysis of vaccination in Italy 2000–14

Veronica Toffolutti ^{1,2}, Martin McKee ², Alessia Melegaro^{1,3}, Walter Ricciardi⁴, David Stuckler^{1,2,3}

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Background: Italy has experienced a resurgence in measles since 2015. Although much emphasis has been placed on the role of individuals opting out of vaccination, here we test the hypothesis that large budget reductions in public health spending were also a contributing factor. **Methods:** Multi-variate statistical models were used to assess the relationship between measles, mumps and rubella (MMR) coverage and real public health expenditure per-capita across Italy’s 20 regions covering the period 2000–14. **Results:** Between 2010 and 2014 Italy’s public health expenditure fell by over 2%, although varying among regions. Fixed effects models estimate that each 1% reduction in per-capita public health expenditure was associated with a decrease of 0.5 percentage points (95% CI: 0.36–0.65 percentage points) in MMR coverage, after adjusting for time and regional-specific time trends. The consequences can be illustrated by comparing two regions, Lazio, where public health spending fell by 5% and MMR coverage by over 3 percentage points, and Sardinia, a historically deprived region, where public health spending partly rose and MMR rates remained approximately steady. **Conclusion:** Adoption of austerity policies in the Italian health system was found to be significantly associated with declining vaccination rates for MMR. However, the recent introduction of mandatory vaccination for Italian children may help counteract this trend.

Compulsory vaccination and rates of coverage immunisation in Europe

Introduction

High rates of vaccination coverage in childhood are main indicators for public health. However, reaching and maintaining such a target is not always an easy task for public health institutions, and the spread of vaccine refusal and hesitancy is making this even harder.

Enforcing mandatory vaccinations is one of the strategies that some countries adopted and others are considering in order to face this issue. Depending on local legislations, legal consequences for those who do not accept the uptake can be very different,

ASSET performed an analysis on the issue, comparing coverage rates of immunisation against polio (Pol3), measles (MCV1) and pertussis containing vaccines (DTP3)* in European Union/European Economic Area (EU/EEA) countries, where, according to different policies, these vaccinations are either mandatory or recommended.

This comparison cannot confirm any relationship between mandatory vaccination and rates of childhood immunization in the EU/EEA countries.

Methods

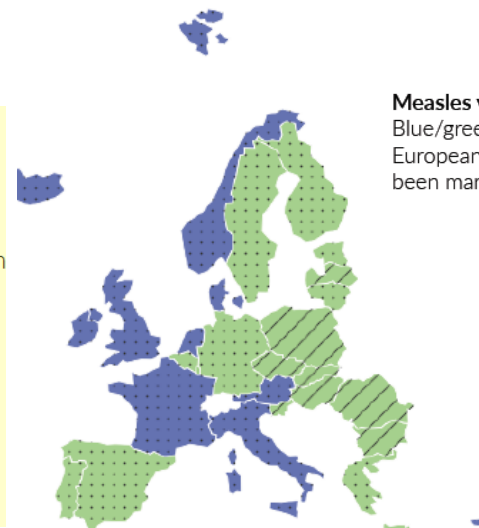
As defined by VENICE project, vaccinations are recommended when included in the national immunisation programme for all or some specific groups independent of being funded or not. A vaccine is defined as mandatory if every child must receive it by law without the possibility for the parent to choose to accept the uptake or not, regardless of whether a legal or economical implication exists for the refusal.

Conclusion

This analysis has some limits. One is the lack of information on possible changes in national vaccination policies (recommended or mandatory) over the years, so preventing the possibility to understand if, in any case, a different approach could have influenced trends of immunisation. Thus, gathering these data will be a key step for future analysis. We analysed data from only three relevant childhood vaccinations, assuming that they can reflect a general situation of immunisation rates in the EU/EEA countries. Anyway, the analysis could be extended to other vaccinations in the future.

Even if this data visualization cannot provide full evidence of the efficacy or inefficacy of mandatory vaccinations on immunisation rates, it shows that this approach does not appear to be relevant in determining childhood immunisation rate in the EU/EEA countries.

Further analysis of maps and graphs could suggest new directions for further investigation.



Measles vaccination coverage in EU/EEA.
Blue/green countries are below/above the European average. Mandatory vaccination has been marked with a lined background.



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Systematic review of the effect of immunization mandates on uptake of routine childhood immunizations

Cecilia Lee, Joan L. Robinson*



Summary *Purpose:* The efficacy of immunization mandates for childcare or school entry is a long-standing controversy. The United States (US) adopted school entry immunization mandates in the 1800s, while most countries still do not have mandates. The objective of this systematic review was to analyze the evidence that immunization uptake increases with mandates.

Methods: A search was conducted for studies that compared immunization uptake in a population prior to and after mandates, or in similar populations with one group having and the other not having mandates. Data were extracted and synthesized qualitatively due to the heterogeneity of study design.

Results: Eleven before-and-after studies and ten studies comparing uptake in similar populations with and without mandates were included. Studies were from the US ($n = 18$), France ($n = 1$) and Canada ($n = 2$). Eleven of the 21 studies looked at middle school mandates. All but two studies showed at least a trend towards increased uptake with mandates. Higher uptake was associated with a more long-standing mandate.

Conclusions: Immunization mandates have generally led to increased short-term and long-term uptake in the group to whom the mandate applies. Many studies have centered around middle school mandates in the US and there is a paucity of studies of childcare mandates or of studies of mandates in other countries or in settings with relatively high baseline immunization uptake.

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Methods and materials

Study design

The systematic review protocol was developed based on the Preferred Reporting Items for Systematic Reviews and Met-Analyses (PRISMA) statement.⁸

Inclusion criteria

Studies were included if they compared immunization rates in a population before and after either a new immunization mandate or improved enforcement of an existing mandate. Studies were also included if they compared uptake in similar populations with and without a mandate. A mandate was defined as a legal requirement that a child have any routine immunization prior to entering childcare or school even if medical or non-medical exemptions were allowed. All study designs were included.

California

Table 1: Kindergarten Immunization Assessment, 2015-2016 and 2016-2017 School Years

	2016-17			2015-16			1-Year Percentage Point Change		
	All	Public	Private	All	Public	Private	All	Public	Private
Number of Schools Reporting Kindergarten Students	7,820	5,967	1,853	7,873	5,971	1,902			
Number of Kindergarten Students	562,924	520,626	42,298	551,123	508,458	42,665			
All Required Immunizations	95.6%	95.9%	91.6%	92.8%	93.2%	88.2%	2.8%	2.7%	3.4%
Conditional Entrants	1.9%	1.8%	3.5%	4.4%	4.3%	6.4%	-2.5%	-2.5%	-2.9%
Permanent Medical Exemptions	0.5%	0.4%	1.4%	0.2%	0.2%	0.3%	0.3%	0.3%	1.1%
Personal Belief Exemptions	0.6%	0.5%	1.4%	2.4%	2.2%	4.9%	-1.8%	-1.7%	-3.5%
Others Lacking immunizations*	0.5%	0.5%	0.4%	(New category for 2016-2017)			0.5%	0.5%	0.4%
Overdue^	1.0%	1.0%	1.7%	0.2%	0.2%	0.1%	0.8%	0.8%	1.5%
4+ DTP	96.9%	97.1%	94.3%	94.2%	94.5%	90.4%	2.7%	2.6%	3.9%
3+ Polio	97.3%	97.6%	94.1%	94.7%	95.0%	90.7%	2.6%	2.6%	3.4%
2+ MMR	97.3%	97.6%	94.4%	94.5%	94.9%	90.5%	2.8%	2.7%	3.9%
3+ Hep B	97.8%	98.0%	95.4%	95.8%	96.1%	92.8%	2.0%	1.9%	2.6%
1+ Var (or physician-documented disease)	98.5%	98.7%	96.1%	96.3%	96.6%	93.2%	2.2%	2.1%	2.9%

*Includes students reported as attending independent study without classroom-based instruction or home-based private schools or receiving IEP services.

^Overdue for one or more required immunizations.

Source: California Department of Public Health, Immunization Branch. 2016-2017 Kindergarten Immunization Assessment – Executive Summary.

Australia

Children who were fully immunised, Australia

Children aged 1, 2 and 5 years who were fully immunised from 2011–12 to 2016–17

Explanatory notes:

The data reported are for children aged 1, 2 and 5 years for the period 1 April to 31 March, assessed as at 30 June.

N/A: Counts were not reported

Source: AIHW analysis of Department of Human Services, Australian Immunisation Register statistics (see dates of data extraction on the table of contents (TOC) tab).

[For more details on the diseases and immunisations see Immunise Australia Program, Diseases and Programs A - Z. www.immunise.health.gov.au](http://www.immunise.health.gov.au)

[For more information please refer to the technical note available at http://www.myhealthycommunities.gov.au/our-reports](http://www.myhealthycommunities.gov.au/our-reports)

What does fully immunised at 5 years mean?

Fully immunised at 5 years means that a child has received four doses of diphtheria, tetanus and whooping cough vaccine, four doses of polio vaccine and two doses of measles, mumps and rubella vaccine.

It is assumed that all previous vaccinations were received.

All Children					
Reporting Year	Age group	Number of registered children	Number fully immunised	Number not fully immunised	Percent fully immunised (%)
2011–12	1 year	297.338	272.978	24.360	91,8
2011–12	2 years	301.683	279.349	22.334	92,6
2011–12	5 years	299.352	269.277	30.075	90,0
2012–13	1 year	302.288	276.058	26.230	91,3
2012–13	2 years	300.042	277.329	22.713	92,4
2012–13	5 years	307.624	281.592	26.032	91,5
2013–14	1 year	309.964	280.247	29.717	90,4
2013–14	2 years	304.607	281.307	23.300	92,4
2013–14	5 years	308.947	284.081	24.866	92,0
2014–15	1 year	307.342	280.671	26.671	91,3
2014–15	2 years	310.770	277.089	33.681	89,2
2014–15	5 years	312.369	288.150	24.219	92,2
2015–16	1 year	307.499	285.972	21.527	93,0
2015–16	2 years	307.512	278.898	28.614	90,7
2015–16	5 years	312.099	289.971	22.128	92,9
2016–17	1 year	308.750	289.579	19.171	93,8
2016–17	2 years	311.777	283.293	28.484	90,9
2016–17	5 years	318.004	297.480	20.524	93,5

Source: Australian Government – Australian Institute of Health and Welfare. Web update: Immunisation rates for children in 2016–17. 22 March 2018

Italy

Table 1. Vaccination coverage by year and vaccine, Italy, 2011 – 2017

	Number of doses	Year						
Vaccine		2011	2012	2013	2014	2015	2016	2017
Vaccination coverage (%) at 24 months								
Polio	3	96.1	96.1	95.7	94.7	93.4	93.3	94.5
Diphtheria	3	96.3	96.2	95.8	94.7	93.4	93.6	94.6
Tetanus	3	96.3	96.2	95.8	94.8	93.6	93.7	94.6
Pertussis	3	95.8	96.0	95.7	94.6	93.3	93.6	94.6
Hepatitis B	3	96.0	96.0	95.7	94.6	93.2	93.0	94.3
Hib	3	95.6	94.8	94.9	94.3	93.0	93.1	94.2
Measles	1	90.1	90.0	90.4	86.7	85.3	87.3	91.7
Mumps	1	89.9	89.2	90.3	86.7	85.2	87.2	91.6
Rubella	1	89.9	89.2	90.3	86.7	85.2	87.2	91.6
Varicella	1	-	-	33.2	36.6	30.7	46.1	45.6
Meningococcal C	1	-	-	77.1	73.9	76.6	80.7	83.1
Pneumococcal 13v	1	-	-	86.9	87.5	88.7	88.4	90.8
Vaccination coverage (%) at 36 months								
Polio	3	-	-	96.3	95.7	95.4	94.1	95.1
Measles	1	-	-	92.3	90.7	89.2	88.0	92.4
Vaccination coverage (%) in their 7th year of life								
Polio	4	-	-	90.9	89.2	87.6	85.7	88.7
Measles	2	-	-	83.5	82.7	83.0	82.2	85.8

Source: Italian Ministry of Health.

Source: D'Ancona Fortunato, D'Amario Claudio, Maraglino Francesco, Rezza Giovanni, Ricciardi Walter, Iannazzo Stefania. Introduction of new and reinforcement of existing compulsory vaccinations in Italy: first evaluation of the impact on vaccination coverage in 2017. Euro Surveill. 2018;23(22).

Mandatory vaccinations: technical choice vs political choice

- In Italy, with the law 119/2017 10 vaccinations for infants became mandatory (center-left government)
- Some debate in Germany and Romania
- Similar policy adopted in France (mandatory vaccinations for 11 diseases) starting in 2018 (Emmanuel Macron)
- In Greece, Syriza-led government proposed that parents be able to opt out of vaccinating their children in May 2017
- The new Italian government Lega-Five Stars Movement now opens the door to revisions of the vaccine mandatory law (even if the obligation will be maintained for measles)
- In Italy, vaccine mandate was an important political issue discussed during the pre-election campaign for the March 2018 vote
- The populist and antiestablishment character of parties/movements may have a role, and vaccine scepticism is part of a broad mistrust of the State, established political parties, and experts

NVC recommendations (National Verification Committee for Italy)

- Strengthen the outbreak reporting system
- Maintain the network of regional proficient laboratories compliant with WHO measles and rubella LabNet standards
- Increase the number of supplemental immunization activities
- Enhance vaccination services
- Maintain the regional monitoring for measles and rubella elimination
- Design effective communication strategies



European
Commission

STATE OF VACCINE CONFIDENCE IN THE EU 2018

A report for the European Commission by
**Prof. Heidi Larson, Dr. Alexandre de Figueiredo,
Emilie Karafillakis and Mahesh Rawal**

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VACCINE
CONFIDENCE
PROJECT™

Health



	Vaccines are important for children to have	The MMR vaccine is important for children to have	The seasonal influenza vaccine is important	Vaccines are safe	The MMR vaccine is safe	The seasonal influenza vaccine is safe	Vaccines are effective	Vaccines are compatible with my religious beliefs
Austria	90.5% (13)	87.8% (8)	40.4% (28)	82.7% (14)	86.1% (8)	55.8% (26)	88.1% (13)	85.1% (5)
Belgium	87.3% (22)	64.7% (27)	61.7% (14)	78.9% (20)	64.9% (27)	68.0% (13)	84.0% (21)	78.1% (14)
Bulgaria	78.4% (27)	74.6% (26)	50.2% (24)	66.3% (28)	65.6% (26)	56.1% (25)	72.7% (27)	70.8% (24)
Croatia	88.9% (17)	91.4% (4)	59.7% (17)	78.4% (22)	86.8% (6)	63.0% (17)	85.9% (19)	71.2% (22)
Cyprus	93.4% (6)	86.3% (12)	60.6% (16)	79.9% (19)	80.2% (16)	62.1% (18)	86.1% (18)	79.4% (11)
Czech Rep.	92.9% (8)	81.0% (19)	49.4% (26)	78.6% (21)	76.1% (21)	62.1% (19)	87.3% (15)	79.0% (13)
Denmark	95.6% (4)	86.6% (11)	42.6% (27)	94.0% (2)	84.2% (11)	72.7% (11)	94.6% (2)	77.8% (15)
Estonia	89.5% (16)	86.0% (15)	65.7% (9)	81.1% (16)	77.5% (18)	74.8% (9)	86.9% (16)	70.9% (23)
Finland	97.6% (2)	93.0% (2)	73.1% (7)	89.0% (6)	90.1% (3)	79.2% (4)	91.1% (5)	92.0% (2)
France	85.8% (24)	79.7% (22)	52.4% (21)	69.9% (26)	77.4% (19)	51.8% (28)	82.8% (23)	77.4% (16)
Germany	92.2% (11)	89.9% (5)	61.0% (15)	83.6% (13)	86.4% (7)	65.2% (16)	90.6% (6)	79.1% (12)
Greece	92.8% (9)	85.2% (16)	76.4% (5)	84.5% (11)	81.5% (14)	78.8% (5)	89.4% (10)	82.2% (6)
Hungary	95.3% (5)	92.8% (3)	62.0% (13)	91.4% (4)	90.4% (2)	66.4% (15)	90.5% (7)	76.7% (17)
Ireland	90.4% (14)	86.1% (14)	74.8% (6)	84.9% (10)	82.2% (13)	77.6% (7)	88.8% (12)	70.1% (26)
Italy	91.7% (12)	80.6% (20)	67.5% (8)	85.3% (9)	80.6% (15)	72.9% (10)	90.0% (9)	80.8% (9)
Latvia	85.8% (25)	74.7% (25)	54.0% (20)	68.2% (27)	68.4% (25)	55.2% (27)	70.9% (28)	81.9% (7)
Lithuania	87.0% (23)	86.1% (13)	50.1% (25)	81.0% (17)	78.0% (17)	60.6% (21)	81.4% (24)	92.2% (1)
Luxembourg	93.2% (7)	88.3% (7)	52.2% (22)	87.2% (8)	86.9% (5)	60.0% (23)	90.2% (8)	80.8% (10)
Malta	88.8% (18)	84.9% (17)	64.4% (10)	74.9% (23)	75.7% (22)	60.5% (22)	83.2% (22)	70.1% (25)
Netherlands	90.3% (15)	84.6% (18)	62.2% (12)	87.9% (7)	83.9% (12)	76.2% (8)	89.2% (11)	67.3% (27)
Poland	75.9% (28)	76.0% (23)	59.7% (18)	72.4% (25)	72.9% (23)	60.0% (24)	74.9% (26)	59.3% (28)
Portugal	98.0% (1)	97.2% (1)	77.9% (3)	95.1% (1)	95.8% (1)	79.2% (3)	96.6% (1)	89.0% (4)
Romania	88.1% (20)	87.2% (9)	81.0% (1)	82.2% (15)	85.5% (9)	78.2% (6)	85.2% (20)	74.8% (19)
Slovakia	85.5% (26)	75.9% (24)	50.5% (23)	74.7% (24)	70.5% (24)	61.0% (20)	80.2% (25)	73.7% (20)
Slovenia	88.1% (21)	80.3% (21)	56.8% (19)	81.0% (18)	76.9% (20)	68.4% (12)	86.8% (17)	76.6% (18)
Spain	96.1% (3)	88.8% (6)	77.5% (4)	91.6% (3)	88.1% (4)	79.6% (2)	94.0% (3)	90.7% (3)
Sweden	88.3% (19)	57.1% (28)	63.2% (11)	83.7% (12)	56.5% (28)	66.8% (14)	87.3% (14)	72.8% (21)
UK	92.7% (10)	86.6% (10)	80.7% (2)	89.9% (5)	85.4% (10)	85.4% (1)	92.0% (4)	81.6% (8)
EU average	90.0%	83.3%	61.7%	82.1%	79.8%	67.8%	86.5%	77.9%

I RAGAZZI DI PASTEUR

Una collana
per imparare la scienza
divertendosi!



La conoscenza per le nuove generazioni: i Ragazzi di Pasteur

Divulgare per **proteggere i cittadini del futuro**. È uno degli obiettivi dell'Istituto Pasteur Italia, che ha dato vita, in collaborazione con IBSA Foundation, a un **progetto molto speciale per i ragazzi delle scuole** affinché si avvicinino al mondo delle scienze fin da giovani e possano imparare a comprendere l'importanza della Ricerca per il futuro di tutti. Si tratta di **una collana di 11 libri dedicati a temi scientifici e biomedici**, curati da studiosi di fama internazionale. Ogni libro è strutturato attraverso **una storia a fumetti**, disegnata dalla **Scuola Romana dei Fumetti** e incoraggia la conoscenza in modo semplice e molto intuitiva per le nuove generazioni.

L'Istituto Pasteur Italia promuove da sempre la divulgazione scientifica nella società, soprattutto nei giovani. Ecco perché ogni anno organizza anche diversi incontri nelle scuole per ampliare le conoscenze scientifiche di bambini e ragazzi.

**1.****LE CELLULE STAMINALI**

a cura di Antonio Musarò

3.**IL SISTEMA NERVOSO**

a cura di Cristina Limatola

5.**STORIE DI VACCINI**

a cura di Andrea Grignolio

7.**COLESTEROLO: UFFA!**

a cura di Marcello Arca

9.**MALATTIE
SESSUALMENTE
TRASMISSIBILI**a cura di Barbara Suligoi e Maria
Cristina Salfa**11.****LA CELLULA IMPAZZITA**a cura di Alimonti, Musarò,
Pernigoni**2.****EPIGENETICA**

a cura di Alessandro Fatica

4.**GUARDIE E LADRI**a cura di Alberto Mantovani, Angela
Santoni e Monica Florianello**6.****IL MICROBIOTA**

a cura di Valerio Iebba

8.**LE DIPENDENZE**

a cura di Paolo Nencini

10.**PERCHÉ IL CONCETTO DI
RAZZA NON ESISTE**

a cura di Antonio Pizzuti

4

Angela Santoni
Alberto Mantovani
Monica Florianello

GUARDIE E LADRI

Storie di virus e batteri



5

Andrea Grignolio

STORIE SUI VACCINI

Dalle epidemie del passato
alle bufale in rete



COMUNQUE, FINO ALLA FINE DELL'800, L'UNICA MALATTIA INFETTIVA PREVENIBILE, CON LA VARIOLIZZAZIONE PRIMA E LA VACCINAZIONE POI, FU IL VAIOLO...



"TUTTO CAMBIÒ CON IL CHIMICO E MICROBIOLOGO FRANCESE LOUIS PASTEUR..."



"...CHE DIMOSTRÒ LA POSSIBILITÀ DI ATTENUARE ARTIFICIALMENTE E NON SOLO NATURALMENTE LA VIRULENZA DI ALTRI AGENTI PATOGENI PER L'UOMO..."

