Vaccine xxx (2018) xxx–xxx

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Review

# A report on the status of vaccination in Europe

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ARTICLE INFO

*Article history:*
Received 14 December 2017
Received in revised form 14 June 2018
Accepted 15 June 2018
Available online xxxx

*Keywords:*
Vaccination
Europe
Policy
Decision-making
Coverage
Performance

ABSTRACT

Vaccine policy, decision processes and outcomes vary widely across Europe. The objective was to map these factors across 16 European countries by assessing (A) national vaccination strategy and implementation, (B) attributes of healthcare vaccination systems, and (C) outcomes of universal mass vaccination (UMV) as a measure of how successful the vaccination policy is.

A. Eleven countries use standardised assessment frameworks to inform vaccine recommendations. Only Sweden horizon scans new technologies, uses standard assessments, systematic literature and health economic reviews, and publishes its decision rationale. Time from European marketing authorisation to UMV implementation varies despite these standard frameworks. Paediatric UMV recommendations (generally government-funded) are relatively comparable, however only influenza vaccine is widely recommended for adults.
B. Fourteen countries aim to report annually on national vaccine coverage rates (VCRs), as well as have target VCRs per vaccine across different age groups. Ten countries use either electronic immunisation records or a centralised registry for childhood vaccinations, and seven for other age group vaccinations.
C. National VCRs for infant (primary diphtheria tetanus pertussis (DTP)), adolescent (human papillomavirus (HPV)) and older adult (seasonal influenza) UMV programmes found ranges of: 89.1% to 98.2% for DTP-containing vaccines, 5% to 85.9% for HPV vaccination, and 4.3% to 71.6% for influenza vaccine. Regarding reported disease incidence, a wide range was found across countries for measles, mumps and rubella (in children), and hepatitis B and invasive pneumococcal disease (in all ages).

*Abbreviations:* BCG, Bacillus Calmette-Guerin; CR, centralised registry; DTP, diphtheria tetanus pertussis; ECDC, European Centre for Disease Prevention and Control; EIR, electronic immunisation record; EMA, European Medicines Agency; EU, European Union; HPV, human papillomavirus; IPD, invasive pneumococcal disease; HTA, health technology assessment; IPD, invasive pneumococcal disease; KPI, key performance indicator; Men, meningitis; MMR, measles, mumps, rubella; NITAG, National Immunization Technical Advisory Groups; OOP, out-of-pocket; QIV, quadrivalent influenza vaccine; TIV, trivalent influenza vaccine; UK, United Kingdom; UMV, universal mass vaccination; VCR, vaccination coverage rate; WHO, World Health Organization.

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https://doi.org/10.1016/j.vaccine.2018.06.044
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Please cite this article in press as: Sheikh S et al. A report on the status of vaccination in Europe. Vaccine (2018), https://doi.org/10.1016/j.vaccine.2018.06.044

These findings reflect an individual approach to vaccination by country. High VCRs can be achieved, particularly for paediatric vaccinations, despite different approaches, targets and reporting systems; these are not replicated in vaccines for other age groups in the same country. Additional measures to improve VCRs across all age groups are needed and could benefit from greater harmonisation in target setting, vaccination data collection and sharing across EU countries.

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## 1. Introduction

Although national immunisation strategies have traditionally focussed on infants and children, policymakers increasingly seek to protect the wider population against infectious diseases by moving towards a life-course immunisation approach [1]. At the same time, there is greater public interest and debate about the role of immunisation and the safety and regulation of vaccines [2]. Financial and social pressures on healthcare systems in Europe have also contributed to the increased adoption of evidence-based evaluation of vaccines in order to maximise their benefits in a given population [3]. Decision-making for vaccination policy varies widely, with different processes and outcomes in each country. Countries need to improve their immunisation strategies using evidence-based, transparent and sustainable processes [2,3]. Recommendations and vaccination policies are different across European countries, as decision-making remains country-specific [4] reflecting varying epidemiology as well as country-specific differences in healthcare systems, level of evidence, vaccine acceptability and financing [3]. The World Health Organization (WHO) Regional Office for Europe (WHO-Europe) defined priority areas for action, as well as indicators and targets for vaccination, in order to meet its vision of all countries being able to provide equitable access to high-quality, safe, affordable vaccines and immunization services throughout the life course in its European Vaccine Action Plan (EVAP) 2015–2020 [5]. Additionally the EU now believes that vaccination programmes are increasingly fragile; in the face of low uptake of vaccines, vaccine hesitancy, the increasing cost of new vaccines and shortages in vaccine production and supply in Europe.

The objective of this research was to map the status of vaccination across Europe by considering together the national vaccination strategy, attributes of healthcare systems and the vaccine coverage rate (VCR), and assessing the outcomes of universal mass vaccination (UMV) using the VCR.

## 2. Methods

Countries use multidisciplinary groups of independent national experts (National Immunization Technical Advisory Groups, NITAGs) to assess evidence and advise their governments on immunisation policies (e.g., both on choice of new vaccines and adjustments required to existing strategies and schedules). A healthcare systems approach was applied to examine the relationship between NITAG decision-making, attributes of the healthcare system (where the NITAGs may or may not have an influence), and outcomes of the UMV (i.e., using VCR) (Fig. 1). Research questions, to address each point in Fig. 1, were formulated to assess whether and how different aspects of vaccination policy (NITAG decision-making, monitoring and surveillance) impact on UMV.

A total of 16 European countries (i.e., Austria, Belgium, Bulgaria, Croatia, Finland, France, Germany, Greece, Italy, the Netherlands, Poland, Romania, Spain, Sweden and the United Kingdom (UK), in the EU, and Switzerland) were included. This was for the increased feasibility of working with a limited number of countries and being able to conduct the research in a timely fashion. Countries included were predominantly the most populous European countries with a mixture of payment models (e.g., vaccines provided via individual prescriptions reimbursed by insurance or with a co-payment, or, purchased through government tenders and essentially free of charge to the patient).

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