

Factors influencing the implementation of immunization programs: the role of experts and of contextual factors

Traditionally, the assessment of the value of a new vaccine or a new immunization program has been based on 3 main criteria: disease burden, vaccine safety and effectiveness. In Quebec, a more comprehensive analytical framework was proposed by Erickson and coworkers in 2005. It was adopted by the Quebec Immunization Committee, largely by the industry and, with minor modifications, by the (Canadian) National Advisory Committee on Immunization. In this framework, 13 dimensions are considered, including the burden of disease, vaccine characteristics and immunization strategy, cost-effectiveness, acceptability, feasibility, and evaluability of program, research questions, equity, ethical, legal and political issues. The systematic use of this framework to prepare statement regarding new vaccines, new programs or program changes lead to more transparency in decision-making processes.

Quebec is internationally recognized for the originality of its immunization programs. This jurisdiction was the first in the world to introduce a one-toddler-dose meningococcal conjugate vaccine schedule instead of 3-dose recommended by manufacturers and to introduce a 2+1 pneumococcal conjugate vaccine schedule for children instead of the then authorized 3+1 schedule. It was also among the first to introduce a 1+1 and now a one-dose HPV schedule for school-age children, as well as a one-dose hepatitis A schedule, to name a few. These recommendations were always based on scientific evidence but also on well-established principles of vaccinology in a cost-effectiveness perspective. To facilitate the adoption of recommendations, surveys and consultations with stakeholders are systematically conducted prior to the finalization of statements to identify potential obstacles to the implementation of a specific program. At the Health Ministry level, a specific budget is reserved for immunization programs planning, evaluation and monitoring. This has a huge impact on confidence in decisions taken. The facts that most members of the Quebec Immunization Committee are involved in clinical and public health research on vaccine-preventable diseases and not merely representatives of an organization is also an enormous asset.

The decision to adopt an enlarged interval between the two primary COVID-19 vaccine doses in the context of very limited supply in December 2020 is a good illustration of the Quebec approach. With a few other jurisdictions in Canada and the United Kingdom, this decision was in line with the ethical value of equity, was based on limited scientific evidence but in accordance with vaccinology principles. Ultimately, the extended interval proved to be highly effective, particularly safe and had a marked impact on the COVID-19 epidemiology, saving many lives. Progressively, a similar recommendation was adopted by other jurisdictions, including the very conservative CDC.

There is a very large variation in immunization programs in high-income countries that is not entirely explained by the epidemiologic situation and health services organization

constraints. The programmatic diversity in Canada and also in Europe with influenza, HPV, rotavirus, meningococcal and pneumococcal programs is an illustration of this and it means that factors outside the purely scientific domain are influencing the implementation of immunization programs. Publicly-funded immunization programs are by definition governmental health policies. John Kingdon's 'Multiple Streams Framework' has been extensively used to analyze how and why governmental policies were adopted. Ideas that will ultimately end up in a proposal for a new immunization program develop gradually along three main streams: (i) the problem stream, which focuses on a particular vaccine- preventable disease and its perception by stakeholders; (ii) the policy stream, which is centered on experts' views on the optimal use of available vaccines; and (iii) the politics stream, which consists of socio-political factors, including budgetary constraints. Ideas are progressively shaped by policy entrepreneurs into a proposal with concrete implementation strategies. The three streams then converge within a policy window, during which adoption is especially likely to occur. To survive, the proposed program should be operationally feasible, consistent with mainstream social values, and financially affordable. The timing of the policy window is usually unpredictable and of short duration. The 'Multiple Streams Framework' helps in explaining programmatic diversity by enlarging the scope of the analysis into societal values and the political arena.