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Vaccine Monitoring Platform (VMP) research agenda

Background

The Vaccine Monitoring Platform (VMP) is a collaboration between EMA and ECDC for the timely generation of independent real-world evidence (RWE) on the safety and effectiveness of vaccines in use in EU/EEA immunisation programs.

Scope

The scope of this document is to provide a thematic prioritisation and a framework to guide the choice of VMP studies to be conducted. Importantly, the research agenda can generate supportive data for the decision-making processes by regulators and the Member States (MSs) in terms of study planning, immunisation programs and vaccination policy making.

The research agenda was initially drafted by EMA and ECDC based on six identified categories of research areas including: data gaps such as long term monitoring and population impact; changes in vaccine composition such as novel influenza vaccines; support to use during emergencies such as effectiveness and safety of mixed schedules; research breakthrough indicating potential regulatory submission; investigations of safety and effectiveness of novel vaccine platforms; and known safety or efficacy/effectiveness concerns such as waning of vaccine effectiveness.

This initial draft was presented and discussed at the first meeting of the Immunisation and Vaccine Monitoring Advisory Board (IVMAB) held in Amsterdam at EMA premises on December 6th and 7th 2022. As a result, a number of topics were suggested to be reprioritised and new items were proposed. Subsequently, the IVMAB members were requested to take part in a survey to prioritise the different research questions. There was a 70% response rate to the prioritisation survey (25/36 responded). Questions highlighted in green in the tables (see below) were given a score over 75% in the priority exercise and

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are therefore considered of highest priority at EU/EEA level and may be addressed first (taking into account resource availability and feasibility). Some of these questions are already addressed by ongoing studies under the VMP (e.g., ECDC Vaccine Effectiveness, Burden and Impact Studies - VEBIS project; EMA-coordinated real-world evidence - RWE studies).

The research agenda was formally endorsed in July 2023 by the VMP Steering Group. Implementation of the research agenda will take into account the advice of the IVMAB and each Agency's work planning, resources and management decisions. The research agenda is a 'living' document and will be kept up to date and reviewed on an annual basis.

SHORT TERM research questions (timing approx. 2025 /2026)

Rank	Priority %	Disease/pathogen	Research question
1	85.6	INVASIVE PNEUMOCOCCAL DISEASE	What is the impact of pneumococcal vaccination on prevention of severe disease in current vaccination programs in EU/EEA (to take into consideration new vaccines (i.e., 15-valent vs 20-valent conjugate vaccines), serotypes (cross-protection), mixed schedules, target populations and strain replacement.
2	82.4	INFLUENZA	What is the effectiveness against symptomatic and severe disease of newer vaccines (e.g., adapted, adjuvanted, combined, new platforms) compared to traditional influenza vaccines in the elderly?
3	80.8	INFLUENZA	What is the impact of influenza vaccination on severity of disease (based on a severe acute respiratory infection (SARI) based surveillance system/studies)?
4	79.2	COVID-19	Gather further evidence on the safety and effectiveness of adapted COVID-19 vaccines, with special interest in immunocompromised, elderly, pregnancy, and younger paediatric population
5	76.8	COVID-19	What is the effectiveness of vaccines against post COVID-19 condition (long COVID) (stratified by age; symptoms/organ system, hospitalised or non-hospitalised patients; sex; different genetic variants of the virus; impact of vaccine boosters)?
6	71.2	COVID-19	What is the long-term impact of COVID-19 vaccination on prevention of infection?
7	70.4	NEISSERIA MENINGITIDIS	What is the effectiveness of new meningococcal vaccines (e.g., tetravalent) by age group (including indirect impact of vaccination) vs. older vaccines?
8	68	INFLUENZA	Gather further evidence on the safety of co-administration of influenza vaccines with COVID-19 vaccines
9	67.2	INFLUENZA	Gather further evidence on the safety and effectiveness of Influenza vaccines per brand)
10	66.4	COVID-19	Gather further evidence on the safety and effectiveness of COVID-19 vaccines after concomitant administration with other vaccines
11	66.4	DIPHtheria	Diphtheria burden of disease (Need to collect data on diphtheria due to changing epidemiology (new cases, migrant populations))
12	60.8	COVID-19	Gather further evidence on the safety and effectiveness of COVID-19 vaccines in infants born to people vaccinated during pregnancy
13	56.8	COVID-19	Gather further evidence on the safety and effectiveness of COVID-19 vaccines in at-risk children below 5 years old
14	56.8	COVID-19	Seroprevalence studies of SARS-CoV-2 especially in young children.

MEDIUM TERM research questions (timing approx. 2025 /2026)

Rank	Priority %	Disease/pathogen	Study question
1	93.6	RSV	Gather further evidence from the post-authorisation setting on the vaccine safety and effectiveness in individuals targeted by the RSV vaccination programmes such as elderly, paediatric, immunocompromised individuals and pregnant persons. Impact of revaccination.
2	87.2	INVASIVE PNEUMOCOCCAL DISEASE	Which vaccination strategy, including mixed regimens, provides optimal protection against disease (e.g., PCV-13 or PPV-23, or PCV-20, PCV-13 followed by PPV-23) with special interest in different populations including immunocompromised and elderly?
3	84.8	COVID-19	What is the duration of immunity after repeated COVID-19 vaccine doses in all populations of interest?
4	80	HPV	What is the HPV vaccine effectiveness in preventing severe disease (cancer) in individuals by reduced dose schedules (one and two dose schedules)?
5	80	MPOX	Gather further evidence on the safety and effectiveness of Mpox vaccine according to different vaccination schedule (including doses 1 vs 2, timing, fractional ID doses, booster doses, prior smallpox vaccination, intradermal route administration).
6	79.2	MPOX	Gather further evidence on the safety and effectiveness of Mpox vaccination against severe disease in population vaccinated during 2022 PHEIC with special interest in immunocompromised individuals.
7	77.3	MPOX	What is the Mpox vaccine effectiveness against transmission?
8	73.6	INVASIVE PNEUMOCOCCAL DISEASE	What is the burden of invasive pneumococcal disease including assessment of circulating serotypes?
9	70.4	COVID-19	What is the effect of immunologic imprinting on COVID-19 updated vaccines effectiveness?
10	65.6	COVID-19	Gather further evidence on the safety and effectiveness of COVID-19 vaccines per brand.
11	63.2	TRAVELLERS VACCINES	Effectiveness and safety of vaccines in travellers (e.g., dengue vaccine, chikungunya)?

LONG TERM research questions (timing approx. 2027 onwards)

Rank	Priority %	Disease/pathogen	Study question
1	88	RSV	Gather evidence on the long-term vaccine safety and effectiveness of RSV vaccines in all vaccinated populations.
2	86.4	NEISSERIA MENINGITIDIS	What is the effectiveness of meningococcal vaccination (by serotype) against carriage / transmission / invasive disease, and the length of protection?
3	83.2	NEISSERIA MENINGITIDIS	Gather evidence on the effectiveness of newer serogroup B meningococcal vaccines.
4	82.4	NEISSERIA MENINGITIDIS	What is the impact of meningococcal quadrivalent conjugate vaccines and protein-based vaccines on nasopharyngeal carriage and their ability to induce herd protection?
5	82.4	NEISSERIA MENINGITIDIS	Gather further evidence on the effectiveness of the pentavalent meningococcal vaccine (MenABCWY).
6	81.6	NEISSERIA MENINGITIDIS	What is the duration of protection and waning of effectiveness after meningococcal conjugate and protein-based vaccines to determine the optimal timing of the booster dose?
7	79.2	MEASLES	What is the long-term effectiveness of measles vaccination?
8	78.4	MEASLES	What is the waning in the immune response elicited by measles vaccination over time?
9	77.6	CYTOMEGALOVIRUS	What is the post-authorization safety and effectiveness in individuals targeted by the CMV vaccination programmes with special interest in immunocompromised individuals, new-borns and pregnancy?
10	75.2	INFLUENZA	What is the impact of repeated influenza vaccination in children (effectiveness)?
11	74.4	INFLUENZA	What is the indirect protection of influenza vaccination conferred to the elderly by vaccinating younger populations?
12	73.6	MEASLES	What is the vaccine effectiveness of booster vaccination (without previous infection) as used during outbreak situations?
13	72.8	COVID-19	What is the burden and impact of the disease over time? What is the global burden of COVID-19 and how to evaluate this as it would affect vaccine acceptance – effectiveness?
14	70.4	INFLUENZA	What is the burden and impact of influenza?
15	68	MPOX	What is the long-term Mpox vaccine safety and effectiveness in population vaccinated during 2022 PHEIC?
16	68	HEPATITIS B VIRUS	What is the impact of hepatitis B vaccination on the prevention of liver cancer?

17	68	BORDETELLA PERTUSSIS	What is pertussis vaccine effectiveness against hospitalisation for laboratory confirmed pertussis in infants aged less than one year, by age group (0-3 months, 4-12 months), number of doses, (vaccine product)?
18	67.2	NEISSERIA MENINGITIDIS	What is the impact and vaccine effectiveness of meningococcal B vaccine against gonorrhoea?
19	65.6	MEASLES	Is genotype replacement linked to reduced vaccine effectiveness?
20	59.2	BORDETELLA PERTUSSIS	What is pertussis vaccine effectiveness against disease, severe disease, and hospitalisation in adolescents?

Questions of interest

These are questions which have not been prioritised for investigation yet, but which represent potential future research agenda topics for prioritisation in the coming years.

Disease/pathogen	Conceptual question
Herpes Zoster	What is the duration of protection of different HZV (Herpes zoster virus) vaccines in adults in different age and risk groups.
Borrelia burgdorferi/Lyme Disease (when vaccine becomes available)	What is the post-authorisation safety and effectiveness of Lyme disease vaccine/s?
Human papillomavirus	The reduced HPV schedule (human papillomavirus vaccines) has not been approved for immunisation for the immunocompromised population, however it could be of interest to understand the (long term) vaccine effectiveness in preventing severe disease in a population that is immunocompetent at the time of vaccination and subsequently became immunosuppressed years after.
Diphtheria	What is the long-term protection from diphtheria vaccination?
Mpox	What is the vaccine effectiveness and safety in pregnant individuals?