EXCELLENCE IN PEDIATRICS INSTITUTE

Improving Child Health Globally

MEETING REPORT

ALL-CAUSE MENINGOCOCCAL DISEASE: TIME TO EXPAND MENINGOCOCCAL VACCINATION POLICIES TO MATCH CURRENT TRENDS

Policy Focus Group Meeting on Meningococcal Vaccinations

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Initiative History, Purpose and Work Within the EU Coalition on Vaccination

Since 2015 the Excellence in Pediatrics Institute (EIP) has worked with European and global partners to help overcome the many remaining barriers to vaccination uptake. By connecting and working with colleagues across Adolescent Medicine, General Practice, Pharmacy and Nursing, and uniting behind the **EU Commission's Coalition on Vaccination**, EIP's goal is to promote a LifeCourse approach to vaccines.

Most notably, EIP believes that the following barriers remain: 1) **Policy discrepancies** - Heterogeneous national vaccination policies. Differences in approach, prioritisation and decision making processes. 2) **Overarching barriers** - Lack of policies to increase vaccines confidence, counteract misinformation, increase awareness and mobilise medical communities, and 3) **Failure to adopt a life course approach** - Prevention Policies not adapted to demographic changes and an increasingly ageing population. Disease prevention in all stages of life is not yet a priority.

As part of EIP's work within the **EU Coalition on Vaccination**, 8 Stakeholder Working Groups, as well as a joint EU Commission and WHO plenary briefing, took place at 11th EIP Annual Conference in Copenhagen in December 2019.

The following report summarises the invited expert's briefings, discussions, and proposed action plans that were debated during the proceedings of the **Policy Focus Group on All-Cause Meningococcal Disease - *Time to Expand Meningococcal Vaccination Policies to Match Current Trends.***

CAN WE ERADICATE MENINGOCOCCAL DISEASE?

Working Group Briefing

Professor Simon Kroll (*Professor of Paediatrics and Molecular Infectious Diseases, Imperial College and St Mary's Hospital, Member of the UK Health Protection Agency Meningococcus Forum, United Kingdom*) was invited to deliver the opening statement to the Working Group. The context and purpose being that the Group should establish if comprehensive eradication of Meningococcal Disease is an achievable goal.

Prof. Simon Kroll stressed that one should focus on eradicating the disease caused by Meningococcus and not the pathogen itself. As he mentioned, the first documented outbreak of Meningococcal disease took place at the end of 1885 in Geneva and later, larger incidents occurred in the Sahel of sub-Saharan Africa[1]. Nonetheless, his main question was why there are no documented outbreaks of such a deadly disease before 1885. Prof. Kroll speculated that this may be because of the pathogen's ability to be genetically modified over the years and thus, it came a moment in history where a strain of Meningococcus was finally turned into a highly invasive and dangerous pathogen.

Unlike smallpox, many Meningococcus strains are genetically variable and unstable, and there are many situations where one cannot tell if a person is infected. Going into further detail, Prof. Kroll analyzed the main characteristics of strains A, C, W and Y. Serogroup A holds limited genetic diversity, and although its outbreaks are mainly geographically contained, it had affected large populations and therefore there was an interest in its elimination due to the huge human cost and the huge challenge to health systems. Thus, the vaccine MenAfriVac was created resulting in over 99% reduced incidents of a fully vaccinated population and carriage elimination for a year or more. Regarding serogroup C, when the vaccine against it was introduced in the UK, its infection rates dropped significantly but nonetheless, its high ability of mutagenicity made it difficult to be vaccine-controlled.

Prof. Kroll raised another problem regarding vaccination against serogroup C is its high cost and the low incident rates around the world, and thus not making it an international priority. Similar to serogroup C, serogroup W shares the same problems; the disease rates are low, its carriage very common, it may become vaccine-resistant and the vaccine cost is high.

On the other hand, by introducing a vaccine against serogroup Y and in particular strain 22, we may risk an increased threat, as it has low invasive potential, is widely carried and it offers natural protective immunity to those that carry it.

Nonetheless, Prof. Kroll pinpointed that the main problem regards serogroup B, as the vaccines created against it are in many times powerless due to its different clonal complexes. Furthermore, there is no vaccine available that targets its capsular protein because its polysaccharide may serve as a self-antigen and cause other major autoimmunity problems in the human organism.

Prof. Kroll continued that the main problem about serogroup B that remains is the fact that vaccination does not impact on carriage and therefore, community immunity is not well enough established.

In conclusion, Prof. Kroll pointed out that the control or elimination of particular strains is a realistic goal both globally and locally, depending on the serogroup and the political will to afford the necessary cost.

FACTORS INFLUENCING DECISION MAKING IN EUROPE

Working Group Briefing

Next the Working Group was tasked with exploring the various factors that influence and impact on the decision making processes across Europe, in terms of which vaccinations are

[1] Maiden, M.C. and M. Frosch, *Can we, should we, eradicate the meningococcus?* Vaccine, 2012. **30 Suppl 2**: p. B52-6.

funded and included in national vaccinations schedules, and which are not. To assist with this task, Professor Philippe De Wals, MD, PhD (*Department of Social and Preventive Medicine at Laval University, Quebec, Canada*) was invited to analyze the main factors that are crucially influencing the Decision-making process on Meningococcal vaccines in European Countries.

Prof. De Wals noted that In 1974, when starting his scientific career, there was a MenB outbreak in Belgium and unfortunately 45 years later, the problem is not solved. As in this case and many other countries across Europe, the adoption of a new vaccine into a publicly-funded program is often based on a complex decision-making process that involves different social, political and economic factors. In *Agendas, Alternatives, and Public Policies* (1984), John Kingdon proposed the 'multiple streams' theoretical framework for analyzing how and why governmental policies are adopted, and this framework could be applied to immunization programs (it has also been used to describe the adaptation of ObamaCare, MediCare programs)[2].

Prof. De Wals explained that the three Streams influencing the decision-making process - ***Problem*** (disease burden and epidemiology), ***Solution*** (the vaccine) and the ***Political*** (agenda, values and interest of the stakeholders) stream – convert and at a certain point, and when the proposal is on the political agenda, a decision is made; although this window of opportunity is highly unpredictable.

Subsequently, examples on the justification of immunization programs using either meningococcal conjugate or protein-based vaccines were described. For the conjugate vaccines, the main pattern in Europe consisted of an outbreak or a short-term rise in incidence, a mass campaign and then a routine program (UK, Ireland, Netherlands, Belgium, Italy, France), followed by an easy decision due to the cost (not expensive, limited number of doses), safety (not that reactogenic) and effectiveness (direct and herd community protection) of meningococcal C and ACWY conjugate vaccines.

Although there was a lot of economic analyses published, they played little role in decision-making, that mostly was driven by the will to prevent or control outbreaks that were intolerable for the public health authorities.

The large variation of schedules around Europe (e.g. Belgium recommends a single dose for MenC, France two doses with mandatory catch-up, while Italy two doses for MenACWY with no mandatory catch-up program etc.), even if it cannot be explained by Epidemiology, it is justified by the operational feasibility and the priority considerations of each country. In the case of protein-based vaccines, only in 3 countries in Europe (UK, Ireland, Italy) and lately in South Australia there are jurisdictions that recommend the vaccine for high risk groups or in special circumstances. The justification was based on the low serogroup B disease incidence, the uncertainty on the duration of vaccine protection, the lack of effect on carriage, the considerable reactogenicity, the need of multiple doses, the budget impact and various cost-effectiveness considerations. The decision-making process was a very complex one, ended up as a political decision in the European Countries (UK, Ireland, Italy) after putting much effort on tailoring the cost-effectiveness evaluations (dropping doses, reaching on cost-effective agreements with companies, correcting under-notifications/diagnosis of incidents etc.) so as to reach the desired outcome, while in South Australia the decision was driven mostly by epidemiology.

In conclusion, Prof. De Wals, pinpointed that decisions on publicly funded immunization programs that target rare and severe conditions such as meningococcal disease, are mostly influenced by socio-political and organizational factors rather than by pure technical considerations, like the disease burden or the vaccine characteristics. In addition, very often the results of the economic evaluations are used to justify decisions that are mainly based on other considerations. Finally, Prof. De Wals was clear that central funding is required, to achieve harmonization of schedules, something that is the case in the US or Australia but not in Canada or across Europe.

REMAINING BARRIERS TO UPTAKE ACROSS EUROPE

Working Group Briefing

Having established the feasibility of eradicating Meningococcal Disease and analysing the decision making processes (in terms of approval, funding and implementation by decision makers), the Group's attention turned to other barriers to uptake. To help the Working Group have a concise summary, and inform the debate, Dr. Irene Rivero-Calle (*Consultant in Pediatrics and Pediatric Infectious Diseases, University Clinical Hospital of Santiago de Compostela, Spain*) was invited to present a summary of the remaining barriers for the elimination of Meningococcal disease.

[2] De Wals, P., M.E. Espinoza-Moya, and D. Beland, *Kingdon's Multiple Streams Framework and the Analysis of Decision-Making Processes Regarding Publicly-Funded Immunization Programs.* Expert Rev Vaccines, 2019. **18**(6): p. 575-585.

Dr. Rivero-Calle started by proposing that **one of the main barriers is the lack of access**. A lack of access which is due to various factors, such as: **1) the pathogen diversity** among geographical regions, **2) significant use outside of routine immunization, 3) the 29 different marketed products** targeting various combinations of the six serogroups (A,B,C,W,X,Y), **4) the discontinued production of polysaccharide vaccines**, and finally, **5) increased incidence rates of serogroups C and W.**

Most importantly, Dr. Rivero-Calle pointed out that the lack of access is not only observed globally, or by country, but also in different regions of the same country and this is because of the presence of different patient groups (infants, adolescents and immunocompromised individuals) that require special care.

According to Dr. Rivero-Calle, **another significant barrier is the financial one**. Different vaccines have different costs, with MenACWY costing about $8/dose, whereas MenB vaccines may rise up to $80/dose.

Elaborating further, Dr. Rivero-Calle mentioned that another barrier that should be taken into consideration is **herd protection and the impact on carriage**. Conjugate vaccines are preferred over polysaccharide vaccines, due to their advantageous effects on direct and indirect protection, but nonetheless, **the new MenB protein vaccines does not cover all strains and may not induce herd protection**[3] [4].

Technical and programmatic barriers are also another matter to be discussed by the Working Group, and these include the type of the vaccine to be used, the type of Meningococcus serotype to target, the appropriate age to vaccinate and the different immunocompromised patient groups that may exist[5] [6] [7]. For instance, if the desired outcome is the carriage coverage, then the adolescent group should be targeted, as the carriage rates of this group may rise up to 20-30%.

Dr. Rivero-Calle mentioned, **another significant barrier is the lack of data**, although there are new studies coming out in recent years that may help overcome this problem[8]. These include the USA Campaign, the UK Immunization Calendar, the Canada Campaign and the Spain National Pediatric Association recommendation, that report the coverage rate, the effectiveness and the impact of vaccination, depending on the chosen vaccine and vaccination age group.

Dr. Rivero-Calle went on to comment, **competition with vaccines for other diseases, or even among the different vaccines for Meningococcus**, is another problem that prevents disease elimination. In addition, epidemiology can be a significant factor to be taken into consideration because, low incident rates, different serotypes or low publicity may alter the health system policies both nationally and internationally.

The **psychological and social factors are also of significant importance**. As Dr. Rivero-Calle pointed out that in order for one to be vaccinated, they need to believe that they are susceptible to the disease, the disease is severe, the vaccination would provide benefits and barriers would not be encountered[9]. In a recent study among first-year undergraduate students in the UK, it was shown that although the meningitis disease severity was taken into high consideration, susceptibility to it was not. In the same article, it was clearly underlined the importance of the health care specialists in persuading the population into non-mandatory vaccination[10].

Dr. Rivero-Calle then went on to suggest that **miscommunication is another important barrier and that engaging with social media platforms and providing effective, transparent, and objective information (evidence based) are required in order to fight false and misleading information.**

In conclusion, Dr. Rivero-Calle pointed out that meningitis must be prioritized as a global-health issue, more accurate, available and easily accessible data on global burden of meningitis are required, new, effective, affordable vaccines developed and manufactured are needed, policies and funding to support introduction and optimization of vaccine schedules are also in need and finally, vaccine awareness and uptake must be increased and encouraged, respectively.

[3] Rivero-Calle, I., et al., *Meningococcal Group B Vaccine For The Prevention Of Invasive Meningococcal Disease Caused By Neisseria meningitidis Serogroup B.* Infect Drug Resist, 2019. **12**: p. 3169-3188.

[4] McNamara, L.A., et al., *Meningococcal Carriage Following a Vaccination Campaign With MenB-4C and MenB-FHbp in Response to a University Serogroup B Meningococcal Disease Outbreak-Oregon, 2015-2016.* J Infect Dis, 2017. **216**(9): p. 1130-1140.

[5] Rivero-Calle, I., et al., *The Burden of Pediatric Invasive Meningococcal Disease in Spain (2008-2013).* Pediatr Infect Dis J, 2016. **35**(4): p. 407-13.

[6] Christensen, H., et al., *Meningococcal carriage by age: a systematic review and meta-analysis.* Lancet Infect Dis, 2010. **10**(12): p. 853-61.

[7] Pelton, S.I. and G.P. Gilmet, *Expanding prevention of invasive meningococcal disease.* Expert Rev Vaccines, 2009. **8**(6): p. 717-27.

[8] Rivero-Calle, I., et al., *Meningococcal Group B Vaccine For The Prevention Of Invasive Meningococcal Disease Caused By Neisseria meningitidis Serogroup B.* Infect Drug Resist, 2019. **12**: p. 3169-3188.

[9] Rosenstock, I.M., *Historical Origins of the Health Belief Model.* Health Education Monographs, 1974. **2**(4): p. 328-335.

[10] Rosenstock, I.M., V.J. Strecher, and M.H. Becker, *Social learning theory and the Health Belief Model.* Health Educ Q, 1988. **15**(2): p. 175-83.

WHO MENINGITIS 2030 ROADMAP - CoMO

Working Group Briefing

The Working Group were then briefed on the wider context of the current WHO Meningitis 2030 Roadmap and where the the Working Group could link in and support the current plans. Dr. Elena Moya (*Co-ordinator for Europe and Africa - CoMO - Confederation of Meningitis Organisations, Spain*) presented a summary of the key points of the 2030 roadmap regarding meningitis to the Group. Dr. Moya, informed the Group that the WHO roadmap to defeat meningitis, had three main goals: **1) to eliminate bacterial meningitis epidemics, 2) reduce cases and deaths from vaccine-preventable bacterial meningitis and, 3) to reduce disability and improve quality of life after meningitis due to any cause.** Dr. Moya went on to mention that during the consultations, the main outcomes were that there is a need for prevention to be a higher priority topic, followed by improved surveillance.

In conclusion, Dr. Elene Moya highlighted that in order to reach a world free of meningitis, the importance of the patient voice should not be understated, as this will assist the health care experts and the political will to protect against meningitis.

ORGANIZATIONS STATEMENTS

Following on from the invited expert briefings, the Working Group invited a number of organisations and associations to comment on what, in their view, were the remaining barriers, what they are already working on to overcome these, and how they can work with EIP and the EU Coalition on Vaccinations to improve vaccination coverage rates.

Coalition for Life-Course Immunisation (CLCI)

Based on the previous presentations, Dr Daphne Holt underlined that vaccines against meningitis should be available to all who need them in every age and stage of life. At the same time, she questioned the scientific community on whether there is an actual benefit or prospect in vaccinating other age groups beyond adolescent or patient groups with chronic medical conditions and more susceptible to infection. CLCI advocates a LifeCourse approach and believes that immunisation across the LifeCourse can reduce cases of meningitis, as well as other infectious diseases, and further LifeCourse based campaigns to healthcare professionals and policymakers are needed to change the current targeted vaccine strategies and approach across Europe.

European Pharmaceutical Students' Association (EPSA)

Dr. Tilen Kozole presented the actions of European Pharmaceutical Students' Association, which aim in advocating for vaccinations to Public Health by organizing campaigns in Europe and globally. He pointed out that the educational part is lacking not only in pharmaceutical studies but also in other Healthcare territories.

Dr. Kozole commented that the lack of scientific data is an important point to address towards eliminating meningitis and that everyone should advocate for accessibility and affordability of vaccines. He also commented that pharmacists play an important role in recommendation for vaccination, and that this is arguably underutilised as a channel to increase uptake through family contact/consultations and education. Highlighting a need for further campaigns and activities in this area. He finally concluded that disease elimination is an actual possibility and a goal that we should all drive for.

National Institute for Public Health and the Environment (RIVM)

Dr. Lieke Sanders commented that in the Netherlands there was an outbreak of MenW in 2006 affecting mostly infants under 2 years old, adolescents and elderly people and resulting in high mortality. Nonetheless, there are no scientific data regarding effectiveness of vaccination in the elderly group and this is a subject that needs further examination. Another key remark that was mentioned during the discussion was that healthcare professionals should focus on the herd effect, in order to protect either immunocompromised individuals or elderly people.

Finally, Dr. Sanders commented that even though there is an increase of meningitis incidents in the group of elderly people, everyone focuses on the infants and the adolescents and this is something that needs to be changed.

COUNTRY UPDATES

Next the Working Group invited a number of Country representatives and vaccine experts to brief the Working Group on the latest developments within their country. Looking at the latest coverage rates, surveillance and disease data, and highlighting any recent or upcoming changes to vaccination policies and schedules. The purpose of this part of the

meeting was to gain a greater understanding of how country priorities and interpretation of vaccines needs can differ greatly in each case and only by understanding the individual country context can we devise an effective roadmap and plan to assist in each case.

Serbia

Prof. Radovan Bogdanovic (*Professor of Pediatrics & Pediatric Nephrologist, Paediatric Association of Serbia*) described the current rules on the Meningococcal Vaccination in Serbia and provided some recent statistical data. Currently, rules apply to MenA, C, Y and W while formerly it was only about MenA and MenC.

There are two general groups that are categorized as Mandatory and Recommended vaccination. More specifically, mandatory group consists of patients at special risks (asplenia, C5-C9 deficiency, bone marrow transplantation etc.), laboratory staff routinely exposed to *Neisseria meningitidis* (meningococcus) isolates and passengers (transit or sojourn) to endemic regions, while the Recommended group consists generally of individuals of specific ages (infants, children, adolescents, young adults).

The percentages of the reported cases of meningococcal disease in Serbia in the time period of 2013-2017, are similar to other countries such as France or Netherlands (ranging at 0.05 to 0.17 per 100.000 population vs 0.07 or 0.29 on 2016 respectively). Surprisingly, even though the number of vaccinated people in Serbia, in the last two years (2017, 2018) is considerably lower than what was expected by adopting the new vaccination rules (196 with non vaccinated for traveling to endemic regions in 2017 and 255 with 109 vaccinated for traveling to endemic regions in 2018)[11],

In conclusion, Prof. Bogdanovic speculated that this is due to the very recent changes to law and rules and there is a time period till the new rules are in full effect, adding that the numbers of vaccinated people in Serbia should greatly rise in the near future.

Bulgaria

Dr. Mira Kojouharova (*Consultant Epidemiologist, National Centre of Infectious and Parasitic Diseases, Bulgaria)* updated the Working Group on the epidemiology in Bulgaria for meningococcal disease and the current vaccination rules.

Dr. Kojouharovathat elaborated that *meningitidis* is not a major concern disease in Bulgaria, as in the last 18 years (2001-2019), only 428 cases have been reported, an average of 0.3 per 100.000 population (raging annually from 0.7 to 0.07 per 100.000) and for the last year, the reported cases were only five.

Although the incidents are rare, she recognized that there is a problem in the death to case ratio, that is higher in Bulgaria in comparison with the average ratio in European Union (during the last 18 years the death/case ration was 19.4%) and even if last year there were not deaths, in 2015 20 deaths were reported by meningococcal disease with a death/case ratio of 33.33%.

Analyzing the age groups affected mostly, 70% of the cases have to do with young children ageing from 0-14 years old, as for the other age groups meningococcus doesn't pose a serious threat, **in contrast with *Streptococcus pneumoniae* that is the main issue in Bulgaria**. As for the different serogroups, 60% of the cases have to do with MenB and 36% with MenC, while there are almost no cases concerning MenA, Y and W.

There is not a vaccination schedule currently in effect and while MenACWY and MenB vaccines are available on the market, the expenses are not covered as meningococcal vaccination is not mandatory in Bulgaria to any groups and mostly recommended to medical risk groups.

Finally, Dr. Kojouharova proposed that at least for the groups with high medical risk, the vaccination should be mandatory, explaining that it could be a feasible plan to cover the vaccination expenses for this group, as it is not currently for the whole population.

Denmark

Prof. Kare Molbak (*Executive vice president, Statens Serum Institut. Professor, Faculty of Health and Medical Sciences, University of Copenhagen, Director, State Epidemiologist, Department of Infectious Disease Epidemiology, Statens Serum Institut*) analyzed the current status of Meningococcal Vaccination in Denmark, explaining the reasons for not following a general vaccination schedule.

Prof. Molbak went on the state that the reported cases that were counted as 300 per year (5/100.000 population) at the end of 1980's, dramatically decreased to 40/year (a ratio of 0.7

[11] Presa, J., et al., *Epidemiologic Trends, Global Shifts in Meningococcal Vaccination Guidelines, and Data Supporting the Use of MenACWY-TT Vaccine: A Review*. Infect Dis Ther, 2019. **8**(3): p. 307-333.

per 100.000 population). In 2011, an increase in MenC cases, raised the concern of authorities is the direction of introducing serogroup C vaccination into the national immunization program. The economic-technical assessment that was conducted, revealed that with a vaccination schedule where 2 doses are supplied (15 months and 12 years of age), they would be able to prevent 2.1 cases of invasive meningococcal disease and 0.1 deaths per year, with an annual cost of 6.4mil euros. Adding a catch-up program to the schedule, for the age group of 13 to 18 years old, would dramatically increase the benefits of the immunization program, preventing 9 cases and 0.4-0.5 deaths annually, but the cost would exponentially rise to 30 million Euros.

So, the political decision was against the introduction of meningococcal vaccine into the national vaccination program. Currently, meningococcal vaccination is used mainly to prevent outbreaks, to populations at high risk and in the military.

In general, groups with a high medical risk have yet to pay for the vaccination, but it's not always the case as for example some hospitals may provide the vaccination for free.

Concluding, Prof. Molbak pointed out that, at the moment in anycase, MenC in Denmark seems not to be such a serious threat (last year only 6 cases and this year only 2 of MenC). However, this cannot be said for MenW and MenY that has shown an increase lately.

Netherlands

Prof. Lieke Sanders (*Professor in Pediatric Immunology & Infectious Diseases at Utrecht University Medical Centre and Chief Scientific Officer at the Institute of Public health and the Environment*) presented two major issues that Netherlands has come against concerning meningococcal disease, both of which were related to the recent MenW outbreak.

The first one was that they had to change their approach to a catch-up program for the adolescent and then switch to a vaccine schedule for children, while organizing to implement a routine MenACWY vaccination program for the 14 months and 14 years of age in the following year. However, they had to wait for almost a year to have the vaccines ready.

The other issue of concern was related to the elderly (80+ years group) and that no policy decision was made during this time period. **An interesting point to note was that no economic analysis was made for the aforementioned vaccine schedule and the decisions were driven mostly by the outbreak incident and the public opinion** (as many patients complained publicly about having no vaccines, in conjunction with the situation in the UK, there was huge pressure to the policy makers to reach a swift decision).

Regarding epidemiological data from the Netherlands, Prof. Sanders underlined that meningococcal serogroup B cases are at all time low currently, as well as the other serogroups that are low at the basic level.

Finally, Prof. Sanders concluded that reaching the optimal decision on choosing a vaccination program is of high importance, as it is then nearly impossible to change it when it's already in effect.

Finland

Dr Hanna Nohynek (*Chief Physician, Infectious Disease Control and Vaccinations Unit Department of Health Security, National Institute for Health and Welfare THL Helsinki, Finland*), co-chair of the Working Group, briefly described the meningococcal epidemiology and vaccination rules in Finland.

In the 1970's, there was a major outbreak of meningococcal disease that drew attention to the authorities and initiated meningococcal vaccine research mainly by randomized control trials. Since then, there has been a steady reduction in reported cases (4 per 100.000 population for ages under 5, came down to 0.3/100.000), without any vaccination program on effect, except in the army that a ACWY conjugate vaccine is scheduled as joining the army is compulsory in Finland.

The Dominant strain of meningococcus was B until 2013, then there is an equal division among strains C, B, W and Y. Health-technology assessments concerning meningococcal vaccination were not conducted during the years, mostly because of high cost.

In conclusion, Dr Hanna Nohynek underlined that still in Finland meningococcal vaccination is not compulsory, although there is recommendation to some groups of high risk - for example travelers.

Czech Republic

Prof. Roman Prymula (*Professor of Preventive Medicine at School of Medicine, Charles University, Prague*) analyzed some epidemiology data for meningococcal disease in the Czech Republic, as well as the current vaccination rules.

Reported cases of Meningococcal Disease are low in general and have seen a steady drop over the last years (last 10 years the ratio is 0.6 per 100.000 population), in 2017 there were 6

cases reported and that halved this year, when only three cases were reported (one of each serogroup MenB, C and Y). The most affected age cohort was that of young children under 1 year of age, while the most uncommon to be affected age group was adults and elderly people (only 5/65+ cases).

Subsequently, Prof. Prymula explained that Czech Republic recently took the decision to change the national immunization strategy and include all dosages of meningococcal vaccination into insurance policy. Up to this point only the first dose was covered by insurance while the rest were paid by the citizens directly. Prof. Prymula went on to suggest that medical risk groups are already fully covered by insurance for the vaccination expenses. In the end, he underlined that at 1st of July 2020, a new meningococcal vaccination program will be in effect in Czech Republic, that offers MenB vaccination opportunity to young children (one dose at 1 year of age and one dose at 2 years of age), as well as one vaccination for MenC in the starting months of life.

Belgium

Prof. Marc Van Ranst (*Professor, Department chair of the Department of Microbiology, Immunology and Transplantation, Head of the Laboratory of Clinical and Epidemiological Virology, Rega Institute for Medical Research*) offered some epidemiology data and the current meningococcal vaccination rules for Belgium.

Prof. Marc Van Ranst explained that there has been a steady drop of meningococcal disease cases, MenC in particular, went down to 3-4 cases per year as Belgium is running a vaccination program from 2002 against MenC with a 95% coverage rate. The opposite is observed for serogroups Y and W that have a steady increase from 1% of incidents in 1993, to 15% in 2011 and nearly 42% currently, that caused the High Health Council to take the decision in August of 2019 and change the vaccination program from MenC to MenACWY for young children 15 month of age and additionally add a catch-up program for people between 15-19 years old.

A brief economical analysis was completed before the change took place. As for MenB, it's only recommended to individuals and is not on the schedule in Belgium. However, as Prof. Van Rast pointed out, there is already concern that if MenB gets also on schedule, it will probably badly affect other vaccination programs currently running in Belgium (high number of doses, high reactogenicity for MenB Vaccine).

INTERVENTIONS AND COMMENTS

Following the Country Updates the floor was opened to the Working Group members to comment on the discussion so far and contribute to the shaping of the roadmap and action plan for 2020-2021.

Dr Roy Philip pointed out that the two public health recommendations are that one should not wait for the final symptoms, such as a rush, to appear in order to seek medical assistance and that if an infant is unwell, one should act immediately.

The two main developments in the health care system in Ireland were the introduction of MenCWY in college students and in the age group of 13 year old children. Finally, the introduction of pharmacies in the vaccination strategy was a successful move, as it changed positively the vaccination rates.

Dr Gertraud Daye spoke about improving European surveillance on Meningococcus and the main barrier in order to achieve this is the lack of common goals and objectives that would define the criteria, the characteristics and the timing of an incident that needs to be reported. Another significant problem is that not every country offers the same resources in surveilling the meningitis incidents, and thus common standards, such as the diagnostic technique, are difficult to meet.

Dr Catherine Weil-Olivier pointed out that reaching the adolescent group may seem difficult, due to the nature of their age but the positive fact is that adolescents are socially active and are constantly informed through modern technology. In addition, one should also focus on the parents because if the parent is well informed, then the adolescent would also be more reachable.

CONCLUSIONS

Meningitis continues to be a serious threat to public health and is a disease that can often result in life-changing side effects. Also, it's clear that the different serogroups require very different vaccination strategies. However, there is still great debate on which type of vaccine each country should choose to use and what is the appropriate age to focus on.

Apart from infants, the Working Group concluded that great care should also be given to adolescents, elderly people and immunocompromised individuals. In fact, pursuing a LifeCourse approach would be preferable and highlights a ongoing need for the current political will to change and take more drastic measures in eliminating meningitis globally.

In particular the Focus Group has raised the following areas that need to be explored in more detail with necessary actions taken to expand Meningococcal Vaccination Policies to match current trends, they include:

- **An Improved European surveillance on Meningococcus is needed**, and the main barrier in order to achieve this, is the lack of common goals and objectives that would define the criteria, the characteristics and the timing of an incident that needs to be reported.

- **Reaching the adolescent group is a necessity** - it may often seem difficult, due to the nature of their age but the positive fact is that adolescents are socially active and are constantly informed through modern technology. In addition, we should also focus on the parents because if well informed, then the adolescent could be more reachable.

- **There is no scientific data regarding effectiveness of vaccination in the elderly group** and this is a subject that needs further examination. Even though there is an increase of meningitis incidents in the elderly, everyone focuses on the infants and the adolescents and this is something that needs to change.

- **Pharmacists can play an important role in recommendations for vaccinations**, and this is arguably underutilised as a channel to increase uptake through family contact/consultations and education. Highlighting a need for further campaigns and activities in this area.

SUGGESTED ACTION PLAN FOR 2020/2021

Target 1
Improve European Surveillance

Need: Improved European surveillance/modelling and stronger local surveillance networks is needed. How can we help countries that are falling behind?

Proposed Action - Dedicated Focus Group on Improving European Surveillance & Modelling

Target 2
Increase Adolescent Rates & Understanding the Effectiveness of Vaccinations in the Elderly

Need - Adolescents are a difficult target group to reach. How could we increase adolescent coverage rates, including the adolescent booster dose? How can we succeed in improving herd protection for teenagers, as well as the wider population? How effective is direct targeting of the elderly with Meningitis Vaccinations?

Proposed Actions: 1) *A campaign to improve Adolescent Coverage, Booster Uptake and Herd Protection.* **2)** *A Pilot Project looking at collecting scientific data regarding effectiveness of vaccination in the elderly.*

Target 3
Improving HCPs Knowledge and Utilising Allied HCPs as Advocates

Need - Meningococcal vaccinations are often viewed with less scepticism by the public due to the severe nature of the disease they protect against. How can we better utilise this power of positive public opinion? How can we improve the healthcare professional's knowledge of the latest surveillance data? How can we better work with Pharmacists and allied HCPs?

Action - An educational campaign designed to use positive public opinion, improve HCP's knowledge and patient communication. Working with Pharmacists to promote meningitis vaccinations at every opportunity.