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Report of an expert panel discussion on: *The Future of Vaccines: The Next Decade*

Executive Summary

Background

A meeting to discuss the future of vaccines was sponsored by Dr Philippa Whitford MP, chair of the All Party Group on Vaccination for All, organised by the Association of the British Pharmaceutical Industry Vaccine Group and chaired by Sarah Champion MP. Speakers and attendees included parliamentarians, officials, immunisation and public health experts and representatives from healthcare professional organisations, patient groups and industry. The meeting was held in the Palace of Westminster on 28 February 2018.

Topics discussed

Attendees discussed a range of topics including, **the impact of the UK immunisation programme on public health, the UK's international reputation for leadership in this field, factors affecting the success of immunisation programmes and meeting future demands.** Key points made were:

- Immunisation is an enormously productive investment, not just for health but also education and the economy.
- Immunisation programmes differ from other medical interventions because of the benefits they can provide in preventing disease among people not directly vaccinated (herd immunity).
- Increasing and maintaining high vaccination coverage is impossible without strong political support.
- The UK punches well over its weight in this field and is looked at with huge respect globally.
- There are many factors affecting the uptake of vaccination by the public, including ease of access, complacency about the risk of diseases that are no longer commonplace, safety concerns and culturally sensitive delivery of the service.
- There is no direct evidence in the UK that recent trends in vaccine uptake are due to reduced public confidence in immunisation, however there is no room for complacency.
- Whilst the current system works well to support uptake of vaccination in population based programmes, there continues to be issues with the levels of uptake in vaccination for specific clinical risk groups.

The discussion moved on to consider the **priorities for vaccine research and development and how technological advances will hold significant potential for vaccine development and delivery** in the future. Key points made were:

- There are significant health needs both in the UK and globally that vaccines research is trying to address. The most urgent need for the UK population is for vaccines that can help the fight against antimicrobial resistance and ease NHS winter pressures.
- There are a number of technologies in development that could be helpful for vaccines research and delivery.

Finally, the meeting considered a number of **factors that policy makers should consider when looking to the future success of the UK immunisation programme.** These included:

- The growing importance of designing vaccination programmes which protect people throughout their life.
- The mutual benefits of early dialogue between Government and industry about future vaccines, population need, likely demand and supply.
- The importance of properly valuing vaccination and the potential impact on immunisation programmes of changes to how decisions on cost-effectiveness are made.
- The risk of significant impact on the regulatory approval of vaccines and the free flow of vaccines into and out of the UK after Brexit.
- The importance of continuing to build public confidence and trust in the immunisation programme.
- The benefits of a Strategic Policy Position by Government on vaccines that looks to the future and sets out the policy, regulatory and economic framework, which ensures the future success of the national immunisation programme and the continued international leadership of the UK in this area.

Future of Vaccines Meeting Wednesday 28 February 2018

Note of the discussion

Background

The Future of Vaccines Meeting was hosted in the Palace of Westminster by Dr Philippa Whitford MP, Chair of the 'Vaccination for All' All Party Parliamentary Group (APPG) and organised by the ABPI Vaccine Group. The meeting was chaired by Sarah Champion MP, Vice-Chair of the APPG. The speakers were: Professor David Salisbury, Associate Fellow at the Centre for Global Health Security at Chatham House and former Director of Immunisation at the Department of Health; Robb Butler, Programme Manager for Vaccine Preventable Diseases and Immunisation for the European Regional Office of the World Health Organisation (WHO) and Dr Thomas Breuer, global Chief Medical Officer for vaccines at GlaxoSmithKline. Other attendees included parliamentarians, officials, immunisation and public health experts and representatives from healthcare professional organisations and patient groups. The meeting was held under Chatham House rules.

Summary of topics discussed

The value of vaccination

It was accepted that immunisation is one of the most cost-effective health interventions, not just in terms of its public health benefits but also in ensuring long-term economic prosperity. One speaker quoted the statistic that there is a return of £16 for every £1 invested in immunisation. It was also noted that immunisation programmes differ from other medical interventions and their economic and health benefits are advanced because of 'herd' or community immunity, whereby the unvaccinated can be indirectly protected if vaccination programmes are well designed and a sufficient percentage of the population is directly vaccinated:

- Vaccinating children against influenza, for example, protects their families and wider communities[1].
- When the Meningococcal C vaccine was introduced, incidences of the disease reduced significantly across all age groups, not just those who had been vaccinated[2].

UK leadership

It was widely acknowledged that the UK is a world leader in immunisation. In particular, the UK has long recognised vaccination as a public health priority, resulting in high coverage rates that are respected internationally.

Meningococcal C was referenced as a particular example of UK leadership. The UK was the first country to introduce this vaccine and it was done through a public private partnership that accelerated the availability of a new vaccine in response to a significant and widely recognised health need.

The Joint Committee on Vaccination and Immunisation (JCVI)[3], which advises the Secretary of State for Health, was acknowledged to be one of the best National Immunisation Technical Advisory Groups (NITAG) in Europe, providing a model for the independent evaluation of vaccines that is now being replicated by other countries.

About the ABPI Vaccines Group

The ABPI Vaccine Group is committed to advocating on behalf of the industry on all aspects of vaccination and the benefits it brings to the health of our nation.

The group, comprising of member companies: AstraZeneca, GlaxoSmithKline, MSD, Pfizer, Sanofi and Takeda, aims to work in partnership with the public health community throughout the four nations of the UK to encourage the continued and further success of the national immunisation programmes.

[1] Pebody RG et al. Euro Surveill. 2015;20(39):pii=30029.
[2] Ramsay ME, Andrews NJ, Trotter CL, et al. BMJ 2003;326(7385):365-6
[3] https://www.gov.uk/government/groups/joint-committee-on-vaccination-and-immunisation

European Vaccine Action Plan

The European Vaccine Action Plan 2015-2020[4] has set out some ambitious goals for the 53 member states of the World Health Organisation Europe Region, including the UK. These include:

- The sustainment of the polio free status maintained since 2002
- Elimination of measles
- Control of hepatitis B
- The ring-fencing of domestic financing of immunisation programmes
- The universal use of evidence based decision making to ensure appropriate access to vaccines

Maintaining high coverage rates and programme resilience

Whilst the current system works well to support uptake of vaccination in population based programmes, however, it was agreed that there continues to be issues with the levels of vaccine coverage in some specific clinical risk groups and harder to reach groups. The speakers discussed the reasons why there are varying vaccination coverage rates across disease areas, age cohorts and geographical areas and why disease outbreaks can sometimes occur despite active vaccination programmes. They concluded the reasons are multifactorial and include:

- Practical ease of access to immunisation, for example patients with existing health conditions who are eligible for the influenza vaccine but are predominantly treated in secondary care have sub-optimal levels of vaccination uptake.
- Populations which are marginalised in society or for whom vaccines may not be delivered in a socially or culturally sensitive way.
- Some complacency within the community and among healthcare workers and policymakers, particularly around diseases that are now rarely seen in modern Britain or which are considered to be less serious (often resulting from the success of many years of immunisation).
- Safety concerns. Where concerns about a vaccine do arise, it was noted that the UK is extremely proactive at conducting research to better understand and address the concern and communicate this to the public.
- 'Newness' of the programme. Vaccination is given for the prevention rather than treatment of disease and is typically given to healthy people, so there is a natural degree of caution among the public especially when a new vaccine is introduced. Typically, vaccines against diseases where there is a high level of public fear, such as Meningococcal C and B, are more rapidly accepted.

The growing degree of public hesitancy towards vaccination in other European countries such as Italy and France was discussed. The meeting concurred that this trend is not apparent here. The UK has sophisticated data analysis systems, which enables it to accurately monitor vaccine coverage rates and measure shifting public attitudes towards vaccination. Extensive surveys have shown that the public has a very high level of trust in the healthcare system and healthcare workers, and that this contributes to high levels of confidence in the national immunisation programme. The role of nurses in leading delivery of the programme was cited as a key factor in its success.

Despite this, it was agreed that the UK cannot assume the national immunisation programme will not be challenged by some of the issues faced elsewhere, for example the anti-vaccine lobbying which has resulted in marked reductions in uptake of the HPV vaccine in Denmark and Ireland. The importance of continuing to build public confidence in the immunisation programme was agreed. Including vaccination as a topic in the health curriculum taught in school today to the parents of tomorrow was suggested as an example of how this could be done.

[4] http://www.euro.who.int/en/health-topics/disease-prevention/vaccines-and-immunization/publications/2014/european-vaccine-action-plan-20152020-2014

Vaccine research and development

The speakers looked to the future to outline some of the technological and medical possibilities of vaccines over the next decade.

Antimicrobial resistance (AMR)

The important role that vaccination can play in the global fight against antibiotic resistance was discussed. It was agreed that AMR is one of the most pressing public health threats of our time. As bacteria become resistant to antibiotics, even minor infections will have the potential to become serious and fatal. By helping to prevent infections in the first place, vaccines can reduce the need for antimicrobials. Improving uptake of vaccination among populations where uptake is low will therefore contribute to the fight against AMR. There is also the potential for new vaccines to be developed that can be used against multi-drug resistant organisms.

Vaccine pipeline

Speakers discussed the opportunities provided by the vaccine pipeline. It was acknowledged that vaccination has saved more lives and prevented more serious diseases than any advance in recent medical history but it was recognised that there are still significant health needs both in the UK and globally that vaccines research is trying to address. It was noted that there are currently over 270 vaccines in research and development for many different conditions including malaria, ebola and norovirus as well as avoidable conditions that impact the UK such as MRSA and *Clostridium difficile*. Vaccines research is not just focused on infectious disease – there is also the potential for vaccines to be developed for non-communicable diseases like cancer and COPD (Chronic Obstructive Pulmonary Disorder).

The speakers were agreed in their wish list of where the urgent need is in terms of vaccines development and the fact that two key issues link the vaccines that are most needed – AMR and the challenge on the NHS of winter pressures. The disease areas cited to be of most urgent need include:

- RSV (Respiratory Syncitial Virus)
- *Staphylococcus aureus*
- *Clostridium difficile*
- Universal influenza vaccine
- Group B streptococcus
- Gonorrhoea
- Norovirus

Technological advances in vaccine development and delivery

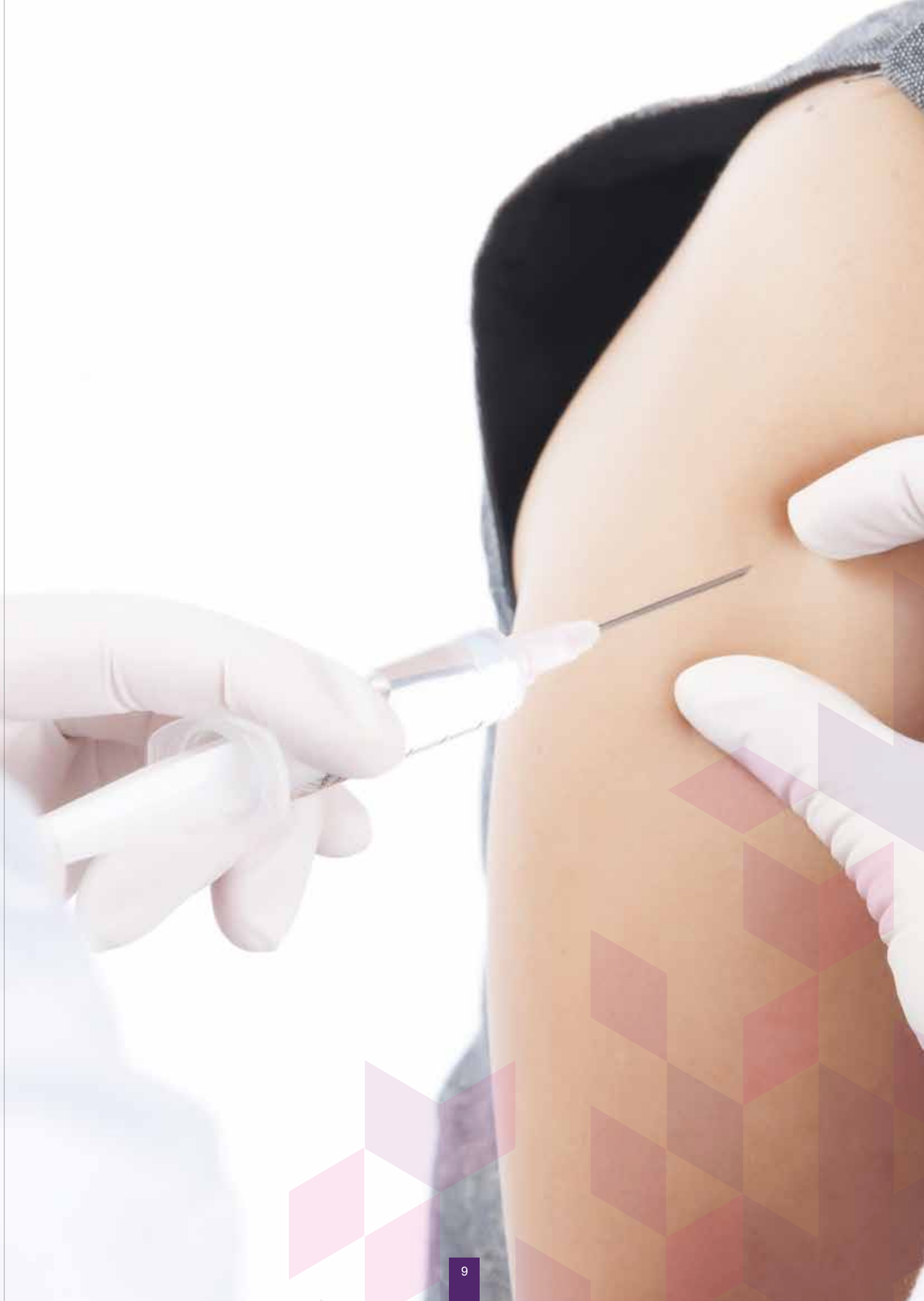
In the short-term, research is focused on adding additional antigens to existing vaccines to protect against more strains of a disease (e.g. influenza, HPV) or more diseases in one vaccination (childhood 6 in 1 vaccine), thus improving the simplicity and efficiency of delivery and making vaccine programmes easier for the NHS to implement.

Current research is also focusing on the role of vaccination in pregnancy, which was highlighted as an opportunity to better protect young babies with the potential for more vaccines to be given in the last trimester. The UK has led the way with the maternal vaccination programme against pertussis (whooping cough), which has had a marked impact on cases and deaths among babies under 3 months old[5]. It was noted that a programme of education would be needed, however, to help pregnant women to understand the value of vaccines and to overcome their nervousness about any perceived adverse effect on their baby.

In the longer-term, the research community is focused on harnessing the potential of new technologies that are aimed at designing more effective vaccines, a better immune response or vaccines that can be easier or quicker to manufacture, such as:

- Adjuvant technology – this boosts the immune system's response to a vaccine, improving its efficacy and giving the potential for vaccines to be developed that are longer lasting and more effective in older populations
- Bioconjugation technology – developments in the process of joining a protein to an antigen could increase vaccines effectiveness
- Viral vector technology – this is a different delivery mechanism for an antigen, aimed at generating an improved immune response
- Self-amplifying messenger RNA (SAmRNA) – harnessing the human immune system to produce proteins, aligned to the principles of gene therapy and could prove useful in tackling epidemics.

[5] Incidence of laboratory-confirmed pertussis, by total case-patients and age group in England & Wales, 1998–2013 PHE data. https://www.gov.uk/government/publications/pertussis-enhanced-surveillance-laboratory-confirmed-cases-in-england-in-2013/laboratory-confirmed-cases-of-pertussis-reported-to-the-enhanced-pertussis-surveillance-programme-in-england-annual-report-for-2013 Accessed March 2018



Future policy considerations

It was recognised that vaccines research, development and manufacture need to operate within a supportive political environment, which values innovation and enables long-term access to appropriate vaccination. The speakers and participants outlined some of the policy considerations for the future success of the immunisation programme in the UK.

Lifecourse vaccination approach

It was acknowledged that a lifecourse approach to vaccination is needed. In the last century, vaccines were predominantly for children, whereas vaccination now supports good health at all stages of life. With children born today potentially living to 100, it was argued that it will become increasingly important to design vaccination programmes which protect people throughout their life. This will include immunising children to protect adults through herd immunity and greater research into how to improve the efficacy of vaccines given to older adults.

Early dialogue between industry and Government on future health needs

It was also acknowledged that the manufacturing process for vaccines is long and complex, therefore it is essential that industry and Government have early dialogue about future vaccines, population need and likely demand and supply.

Determining the cost-effectiveness of immunisation programmes

The consultation on the Cost-Effectiveness Methodology for Immunisation Programmes and Procurement, which looks into whether the method for determining the cost-effectiveness of immunisation programmes should change, was published the day before the meeting. There were a number of references made to the consultation by the speakers and the participants, including:

- The need to ensure that any potential changes to the cost-effectiveness methodology for vaccines do not jeopardise the success of the current immunisation programme in the UK.
- That the healthcare system should not treat vaccines differently from other medical interventions, thereby potentially devaluing immunisation programmes.
- Economic analyses of new vaccines in particular often underestimate the benefits as the impact of herd immunity is hard to predict. It was agreed developing ways to more accurately predict herd immunity is important for accurate assessment of the cost-effectiveness.
- The Government should consider how tackling AMR can be incorporated into decision-making processes about the introduction of immunisation programmes.

Brexit

Questions were raised about the potential impact of Brexit on the UK's leadership role in immunisation. There were a number of views expressed:

- The UK will continue to be a world leader when it comes to immunisation programmes due to the quality of the programme, the level of trust in UK healthcare practitioners, the quality of the measurement systems and the internationally renowned research community.
- The UK will remain a member state of the WHO regardless of its EU status.
- What will happen to the regulatory regime for vaccines and medicines is unclear. It was noted that industry sees great advantages for the UK in being part of one regulatory agency with Europe and the UK has benefitted from this to date.
- Vaccines are subject to an extremely high degree of quality control and each batch of vaccines must be approved before being distributed. Currently any EU member state can approve a vaccine for use across the EU. Questions therefore arise about the impact on the free flow of vaccine products post-Brexit.
- The current situation is causing a lot of uncertainty for vaccine manufacturers

Strategic Policy Position for Vaccines

The participants acknowledged that there is no room for complacency about the success of the UK immunisation programme. The issues highlighted above, such as falling vaccine confidence in other countries, an increase in anti-vax sentiment and noise, financial constraints potentially requiring vaccines to be more cost-effective than currently and Brexit were all cited as factors that could potentially jeopardise the programme in the future if they are not properly managed.

It was therefore suggested that Government should consider the development of a Vaccination Strategy in the UK that looks to the future and sets out the policy, regulatory and economic framework which ensures the future success of the national immunisation programme and the continued international leadership of the UK in this area.

[6] https://www.gov.uk/government/consultations/cost-effectiveness-methodology-for-vaccination-programmes

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