

BSI Response to the Labour Party National Policy Forum Consultation

2. How can Labour ensure the NHS and social care deliver a first class service for all?

Increasing the uptake of childhood vaccinations, in particular MMR.

In 2020/21, nine out of the thirteen routine child vaccinations saw their uptake decrease, including the MMR vaccine that protects against measles, mumps and rubella. England still continues to miss key targets on uptake for vaccinations for children and no vaccination reaches the World Health Organization's (WHO) and the Government's coverage target of 95% uptake at the correct time point. Across England, only 36 out of 148 local authority areas met the 95% target for the 6-in-1 vaccination (diphtheria/tetanus/polio/pertussis/Hib/Hep B vaccination) at 12 months old, and only 19 out of 148 local authority areas met the 95% target for the first dose of the MMR vaccine at 24 months. Recently, poliovirus was detected in sewage samples from London, and this reminds us of the need to meet vaccine targets to keep diseases once eliminated from our society from returning. Lessons need to be learned from the COVID-19 deployment and applied to the regular childhood immunisation schedule; vaccine uptake rates are in part driven by inherent health inequities in our society and it is crucial that these do not become embedded further. We were pleased to see the inclusion of a vaccine strategy in Labour's 2019 manifesto and hope that a future Labour government will stand by this pledge.

Measures recommended should include:

- More accessible services and more active outreach by health professionals into individual communities that are undervaccinated.
- The wider and more accessible provision of vaccination services, e.g., school visits by community nurses, mobile vaccination services, using nurseries or community centres to signpost parents to information.
- Better training of health professionals on what vaccines are, what vaccines do, how they work, what is in them, and communication skills themselves, so that they are more ably equipped to answer parents' questions.
- Increasing public awareness of the benefits that vaccination confers and the danger that the return of vaccine preventable diseases poses through high profile communications campaigns.
- Provision of the right public health funding for vaccination services to function effectively, including provision for reaching undervaccinated groups, and improving access to evidence based information.
- Restoration of local immunisation co-ordinator roles that provide both a focal point for achieving vaccine targets and an individual who can provide institutional memory.

Second and third generation COVID-19 vaccines and their development.

Next generation COVID-19 vaccines are needed to make vaccinations easier to administer, more effective, and longer lasting.

In terms of countering the continuing threat from COVID-19, the answer may lie in predictive immunology. This has worked well for influenza, but while parallels can be drawn, this is not a suitable model to follow for SARS-CoV-2. Influenza utilises a reactive model for vaccine production that draws on a well-defined geographical distribution and clear seasonality, enabling a stable approximate six-month window in which to make predictions between influenza seasons. This model is too slow for SARS-CoV-2. To address the challenge posed by SARS-CoV-2 we need to implement a new model of proactive immunology.

To move from a reactive to a proactive stance, it is critical to understand the factors that drive variant emergence and to use this knowledge to evaluate likely future variants before they arise. The importance, urgency and complexity of this work was made apparent by the emergence of Omicron, which changed substantially from the original SARS-CoV-2 virus detected in Wuhan from which the pandemic originated – the Omicron variant will likely provide a new substrate for further evolutionary change. Understanding how mutations were accumulated will help to understand and predict subsequent evolution. A key part of this will be rigorous programmes of surveillance and focused clinical studies; a high disease burden will increase risk of the emergence of new variants. Sample collection has also been a limiting factor of the surveillance programmes during the COVID-19 pandemic and should be overhauled in preparation for future threats.

Having this infrastructure in place will ensure that we are better prepared for future non-COVID-19 pandemics. The UK is a world leader in immunology and maintaining and building this infrastructure will help to attract private investment into our economy and to cement our status as an innovation nation.

The development of next generation vaccines will bring a number of real benefits:

- Second generation models will see the adaption of current vaccines to new and emerging viral variants.
- Third generation vaccines, which could be produced in the next three to five years, will focus on managing COVID-19 long term with the aim to provide broader protection against multiple variants of SARS-CoV-2, and possibly even multiple coronaviruses.
- Advantages of next generation vaccines could include: (1) greater thermostability, so they are easier to store without expensive cold chain refrigeration (especially useful in LMICs with warm climates); (2) broader and longer term protection against a greater number of new and yet to emerge variants for a greater length of time; (3) easier to manufacture with the quantity of active ingredients reduced to the minimum to alleviate the pressure on raw materials for vaccines that are currently in short supply; (4) eventually act as a universal vaccine that is

effective against all variants.

- Development of next generation vaccines will require continued funding from the Government but will also rely on the funding of other research, e.g., long term immune monitoring to determine how long effective immunity lasts in the vaccinated population (knowing the longevity of immunity could eventually reduce the need for boosters and free up vaccine supply for more of the world, which in turn could reduce conditions under which new variants emerge in unvaccinated populations).
- The ability to reduce transmission of the virus should be a key objective of next generation vaccines.
- Methods of delivery could be altered, e.g., a nasal spray, which could have the capacity to enhance protection in mucosal linings in the nose and throat which is the area the virus first infects, so could reduce the level of virus in these tissues and consequently decrease chances of transmission. These would not necessarily require a healthcare worker to administer, so could be more effective in deployment in countries where health workers are in short supply. Work on intranasal vaccines is happening at the moment, with AstraZeneca trialling a nasal version of its vaccines in humans. CEPI has provided funding to MigVax to support development of an orally administered protein subunit vaccine tablet that they hope could use a chimeric protein to trigger three types of immune response: mucosal immunity, antibodies, and T cells. This year, other companies are preparing to trial microneedle patches which aim to deliver the vaccine via thousands of tiny spikes; these could be self-administered and stored at room temperature.