IMPROVING VACCINE UPTAKE

appg

The All-Party Parliamentary Group on
Vaccinations for All

CONTENTS

MAY 2021

RESULTS UK acts as the secretariat of the group, and assisted in the compiling of this report.
For more information, please contact vfa.secretariat@appg-vfa.org.uk.

ABBREVIATIONS:

ACT-A	Access to COVID-19 Tools Accelerator
AMC	Advanced Market Commitment
AMR	Antimicrobial resistance
APP:	All-Party Parliamentary Group
CEPI	Coalition for Epidemic Preparedness Innovation
COVAX	led by Gavi, the WHO and CEPI, aimed at distributing COVID – 19 vaccines internationally
C-TAP	COVID – 19 technology access pool
cVDPV	Circulating vaccine derived polio virus
DCMS	Department for Culture, Media and Sport
DHSC	Department of Health and Social Care
DTP3	Diphtheria, tetanus and pertussis vaccine – third dose
FCDO	Foreign, Commonwealth and Development Office
Gavi	Gavi, the Vaccine Alliance
GNI	Gross national income
GSK	Glaxo Smith Kline
GPEI	Global Polio Eradication Initiative
LIC	Low-income country
MIC	Middle-income country
NHS	National Health Service
ODA	Official Development Assistance
PHE	Public Health England
SAGE	Strategic Advisory Group of Experts on Immunisation
SDG	Sustainable Development Goal
VPD	Vaccine preventable diseases
WHO	World Health Organisation
WIW	World Immunisation Week

Cover Photo:
Burnt Ash surgery and their nursing team


COVID-19
vaccination
centre

FOREWORD: DR PHILIPPA WHITFORD MP

The All-Party Parliamentary Group on 'Vaccinations for All' includes MPs and Peers who work on a cross-party basis, to promote parliamentary awareness of the importance of vaccines and their contribution to good health. Having published a previous report on improving the provision and access to vaccines in low and middle-income countries, the group turned its attention to the decline of vaccine confidence and uptake in many wealthy countries.

Vaccines have been an essential public health intervention since first developed by Jenner in 1796, and have been responsible for some of the most remarkable health successes of our time, including the eradication of smallpox in 1980 and the near eradication of polio. The Covid pandemic has put vaccination high on the agenda, with politicians, journalists, scientists and the public, debating vaccine safety and efficacy in greater detail than ever before and, in contrast to previous occasions, the vast majority of the coverage has been both informative and positive.

The discussion about the development of Covid vaccines appears to have led to greater confidence in them, rather than less, and incredibly high rates of uptake have been achieved in those offered the vaccine so far. Prior to the Covid pandemic, routine vaccination rates among all age groups had been steadily declining and falling below the high thresholds required to maintain community protection.

While it is important to tackle the erosive drip of online misinformation and anti-vaccine campaigns, most submissions have highlighted the significant impact on vaccine uptake of practical access issues. Lessons learned from the Covid vaccine roll-out should be used to improve routine programmes, particularly in communities or groups with low immunisation rates.

The pandemic has, however, exposed historical health and economic inequalities, both within the UK and between high and low income countries. Nowhere is this more evident than in access to Covid vaccines, with the vast majority of early production bought up by wealthy countries. While it is important to ensure that the COVAX facility is fully financed, it is also vital to ensure vaccine doses and production technology is shared more equitably, so that low and middle income countries can produce their own vaccines. Failure to do so, will simply prolong the pandemic and risk the emergence of further dangerous variants. The international community must also evaluate their response to Covid and consider what lessons must be learned to be better prepared for future pandemics.

It is essential that funding commitments to international programmes are maintained to ensure that global efforts to improve routine immunisation are not neglected. This is critical as extensive catch-up programmes will be required to repair the impact of the Covid pandemic on routine immunisation services. It was therefore, concerning to hear of the UK Government's decision to reduce overseas aid, and particularly the 95% cut to the funding of the Global Polio Eradication Initiative. This is particularly disappointing as the UK has been a long-standing donor and champion of vaccination for over three decades. It would be tragic if the international effort to eradicate polio was undermined and led to a resurgence of this horrific disease.

The speed of development and delivery of Covid vaccines have demonstrated what can be achieved with political will. There are many lessons to learn from the Covid vaccination programme regarding sharing information, tackling anti-vaccine narratives and, importantly making access as easy and convenient as possible. All of these can contribute to improving the uptake of routine immunisation in the future.

My thanks to all those who submitted written or oral evidence to this inquiry and to the members of the APPG who took part in evidence hearings, particularly Baroness Sheehan for her regular commitment.

In addition, I would like to thank RESULTS UK for their work on the inquiry and for providing the secretariat to the All-Party Group.

Dr Philippa Whitford
Chair of the APPG on Vaccinations for All

EXECUTIVE SUMMARY

Vaccines continue to save millions of lives every year across the world & have enormous potential to prevent illness throughout life. From eliminating life-threatening childhood diseases to reducing the threat of influenza, antibiotic resistant infections and cancer among adults, vaccines represent one of the most cost-effective public health measures.

Overall vaccine confidence remains high, internationally, but while uptake is improving in low-income countries it has been steadily declining in many wealthy nations.

Through international vaccine programmes, such as GAVI, the Global Fund and the Global Polio Eradication Initiative, access to childhood vaccination has improved dramatically in low income countries, though many routine immunisation services have been disrupted by the pandemic and catch-up programmes will be required.

As community protection from illness requires high vaccination rates, it is concerning to see the small but steady decline in vaccine uptake which led to the significant global resurgence of measles in 2019. Due to significant outbreaks, the UK lost its measles elimination status that same year, which triggered this inquiry.

The provision of clear and accurate information is critical to building confidence in the safety and efficacy of vaccines and, while public health campaigns are important, healthcare staff are the most trusted source of information for those with questions or concerns.

Online misinformation, and deliberate disinformation poses a significant threat to vaccine confidence but for many families, practical issues were still the dominant cause of missing immunisation appointments. While vaccines are freely available in the UK, issues such as the distance to, timing and flexibility of clinic appointments all impact on the ease of access, particularly for working parents with other children.

Good overall immunisation rates can mask poor uptake in certain areas or among specific ethnic communities or groups. It is therefore vital to ensure that information is provided in a broad range of languages as well as accessible formats, for those with a sensory or learning disability.

One should not assume that low vaccine uptake in ethnic communities is due to cultural or religious objections, as there is often a broad range of views and access issues often play as big a role as in the general population. The most important approach is to engage with leaders and members of any community and listen to their concerns. Multiple delivery approaches should be considered to make accessing them as easy as possible for everyone.

Politicians can be tempted to think mandatory vaccination will increase uptake but the majority of contributors suggested it runs the risk of alienating those who merely seek additional information or reassurance. In addition, as the lowest vaccine uptake is often among more marginalised groups, any system which penalises non-attenders would tend to increase inequality.

The high uptake of Covid vaccines has been as a result of increased awareness of the impact of the disease and innovative approaches to improve delivery. It is important such learning is retained and successful approaches are utilised to improve the uptake of routine immunisation.

INTRODUCTION: **THE POTENTIAL OF VACCINES**

Along with clean water and sanitation, immunisation is one of the most cost-effective ways to prevent illness and death among children across the world, with the World Health Organisation (WHO) estimating that immunisation currently saves approximately 4-5 million lives each year (46).

IMMUNISATION CURRENTLY SAVES APPROXIMATELY **4-5 MILLION LIVES** EACH YEAR

While improving health is a benefit in itself, reducing vaccine-preventable diseases has also been shown to improve educational and economic development in low-income countries.

Reduction in infectious diseases, disability and death

Immunisation has led to a dramatic reduction in many serious infectious diseases that were once commonplace. With no cases since 1977, Smallpox was formally declared to have been eradicated globally in 1980: the first disease to be eradicated through international cooperation and ambitious vaccination programmes. Through a similar global effort, the world is close to eradicating polio with it persisting only in the challenging border regions of Afghanistan and Pakistan.

The development of major international vaccine programmes such as the Global Polio Eradication Initiative (GPEI), the Global Fund and GAVI, the Vaccine Alliance, has led to a more systematic approach to capacity building and long term health system development. While the former fund vaccine delivery projects, Gavi supports immunisation programmes through purchasing vaccines in bulk and keeping prices low for the governments of low-income countries: a long term project which involves most of the major global vaccine producers.

This more systematic approach has significantly improved access and uptake of the broad range of WHO-recommended childhood vaccines in low and middle-income countries. The UK has been a long-standing donor and champion of universal vaccination for over 3 decades but the recent cuts to overseas aid raise concerns for the future.

Tackling the logistical challenges of vaccine access in low income or unstable countries, was addressed in the report 'The next Decade of Vaccines', published by the APPG in January 2019 and is not explored in detail in this inquiry (26).

Good health for all age groups

Despite a common perception that immunisation is mainly for infants and young children, vaccination can contribute to the prevention of illness throughout the life course.

Adolescents are vaccinated against additional strains of meningitis and Human Papilloma Virus (HPV) while older people, and those with underlying conditions are offered vaccination against pneumococcal pneumonia, shingles and influenza.

The Covid 19 vaccination programme is the first time there has been an attempt to vaccinate the entire adult population but the potential uses of vaccines in adults is growing.

Preventing cancer

As infection with Human Papilloma Virus is central to the development of the vast majority cervical cancers, the vaccine against HPV has the potential to virtually eliminate this disease, particularly if high uptake can be maintained.

A review, by the Cervical Screening service in Scotland, found an 89% reduction in Grade 3 Cervical Intraepithelial Neoplasia (CIN3) pre-cancerous lesions after the introduction of vaccination against HPV at 12-13 years of age (39). Similarly, prevention of Hepatitis B through vaccination, reduces the incidence of chronic hepatitis and thereby lowers the associated risk of developing liver cancer (Hepatocellular cancer).

While the HPV and Hepatitis B vaccines work indirectly, by eliminating key risk factors for cancer, research is also ongoing to develop more specific anti-cancer vaccines which might cause the immune system to attack and destroy cancer cells.

Tackling Anti-Microbial Resistance (AMR)

Vaccination can also contribute to the global fight against one of the biggest threats to modern medical practice - antimicrobial resistance (AMR).

The development of antibiotics was one of the greatest medical breakthroughs of the 20th Century but resistance to all antimicrobials is increasing and there have been no new classes of antibiotics developed in the last 30 years. In a post-antibiotic era, without antimicrobials, it would become increasingly difficult to control infection in medical care settings which, in turn, would limit the ability to safely carry out invasive procedures or complex surgery. Each new antibiotic appears to last a shorter time before resistance develops but this is not seen with vaccines, despite many decades of use.

Vaccines, like those against haemophilus or pneumococcal chest infections, can reduce the widespread use of antibiotics which can lead to resistance.

In addition, research is underway to develop vaccines against the key multi-drug resistant organisms, such as MRSA and Clostridium Difficile, which cause serious healthcare acquired infections and lead to significant morbidity and mortality.

THE FUTURE

Technological advances, such as mRNA and DNA vaccines, developed as part of the COVID response, could help to provide future vaccines for infectious diseases that remain a significant threat in low and middle-income countries, such as malaria, tuberculosis and HIV as well as improving the accuracy and effectiveness of influenza vaccines.

01 The Challenges facing immunisation

Internationally, confidence in vaccines remains high at over 90%, as shown by the Wellcome Trust Global Monitor report (24). However, while immunisation rates are improving among low and middle-income countries due to improved access, uptake has been declining in high-income countries such as the UK, US and Europe.

Vaccine scepticism is not unique to one particular geography but the rise in wealthy nations is of particular concern as it doesn't just undermine local vaccine uptake but could negatively influence attitudes in other parts of the world. If vaccination is not seen as important, domestic political support for vaccine-related aid funding could be reduced and immunisation projects they fund in low-income countries may be treated with suspicion by local people.

Vaccine 'Hesitancy'

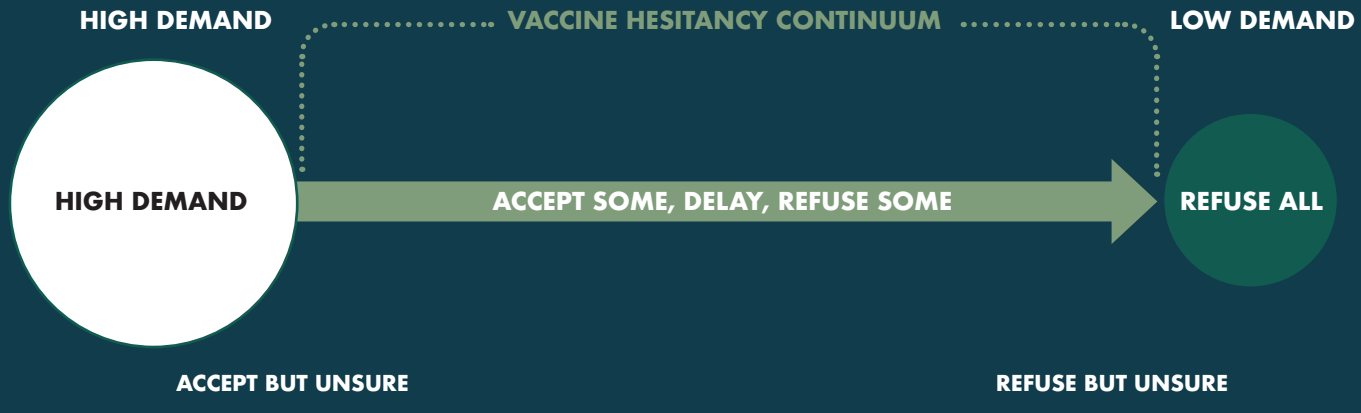
In 2017, the World Health Organisation (WHO) described vaccine 'hesitancy' as one of the top ten threats to global health with hesitancy defined as "a delay in acceptance or refusal of vaccination despite the availability of vaccination services" (42,44).

Unfortunately, using this definition as a blanket term, for everyone who does not immediately get vaccinated, groups people who merely have some questions or concerns with those who refuse vaccination and even those who actively campaign against immunisation in general - so called 'anti-vaxxers'.

Hesitancy represents a continuum of views and a significant proportion of those who are hesitant are likely to eventually accept immunization if they are given the appropriate information. However, using the term 'hesitancy 'in a negative or critical manner creates the impression that seeking information is wrong. Indeed, at the start of discussions with a health professional, many parents feel the need to declare they are not 'anti-vaccine'! (Figure 1)

Asking for information about any medical treatment is normal, especially as immunisation is the first major decision parents make regarding their new baby, and parents must feel empowered to ask any question.

FIGURE 1. WHO HESITANCY INFOGRAPHIC



Achieving and maintaining community protection

For vaccines to prevent infectious diseases at a population level, it is important to achieve high uptake to maintain what is called 'herd immunity'. This means there are very few unvaccinated people, to whom a virus or bacteria could spread, which thus prevents significant outbreaks or epidemics becoming established. Therefore, even those who cannot be vaccinated gain a significant degree of protection.

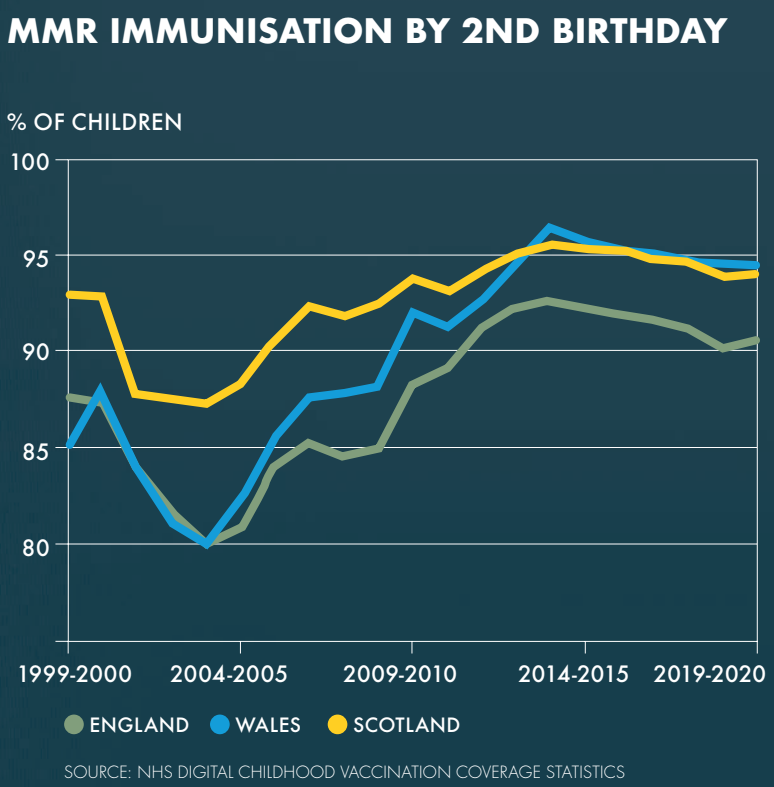
Due to its high transmissibility, measles is one of the first infectious diseases to reappear if vaccination rates drop below the herd immunity threshold, and outbreaks provide an early warning sign of declining levels of overall routine immunisation. Each person carrying the measles virus can typically infect 12-18 others, so the R0 number is 12-18. The WHO therefore recommend that a very high level of vaccination (95%) is required to achieve herd immunity and eliminate community spread.

Between 2000 and 2018, the WHO estimate that immunisation against measles saved over 23.2m lives, making it one of the most cost-effective preventative health interventions (45).

The impact of the campaign against MMR

Despite causing many thousands of deaths worldwide every year, measles tends to be considered a minor illness in wealthy countries. This complacency, combined with a loss of confidence in the vaccine, caused vaccination rates to plummet just over 20 years ago after Andrew Wakefield published his claims that the MMR vaccine caused autism. Sensationalist media coverage of his paper, based on a study of just 12 children, engendered such fear in parents that measles immunisation in England and Wales fell as low as 80% by 2003/04.

FIGURE 2. MMR UPTAKE FALL AND RECOVERY



SOURCE: NHS DIGITAL CHILDHOOD VACCINATION COVERAGE STATISTICS

His spurious claims have been discredited and refuted by extensive research, including a population study in Denmark (38), and the original paper has been retracted. While uptake recovered by 2013/14, it left many young adults in the UK and Europe unvaccinated against measles and, after significant outbreaks in recent years, catch-up MMR programmes have been established for those who missed out as children. (Figure 2)

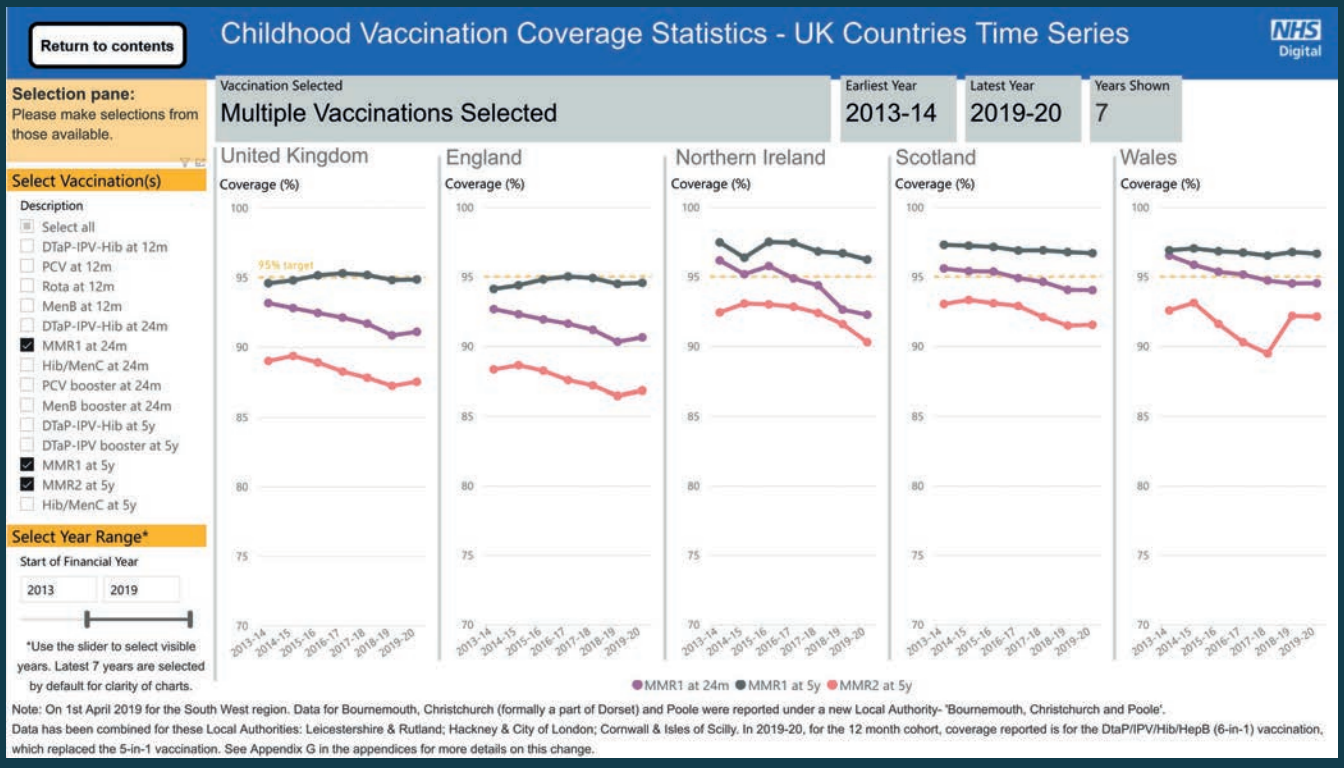
Drifting decline in immunisation

This incident has however continued to cast a long shadow over immunisation in general and such claims are recycled on a regular basis. Despite a significant recovery in the uptake of MMR by 2013/14, uptake of the first dose of a measles-containing vaccine, typically measles-mumps-rubella (MMR), has been steadily declining in many countries in recent years and is below the 95% threshold in the UK, Europe and the US. Uptake of the MMR booster dose is significantly lower.

By 2019, after six years of declining vaccination rates, there were 80,000 cases of measles and 72 deaths across Europe, with approximately 207,000 deaths worldwide. Due to significant outbreaks the UK lost its elimination status for measles in 2019. This highlights the ease with which vaccine preventable diseases can reestablish themselves if high immunisation levels are not maintained.

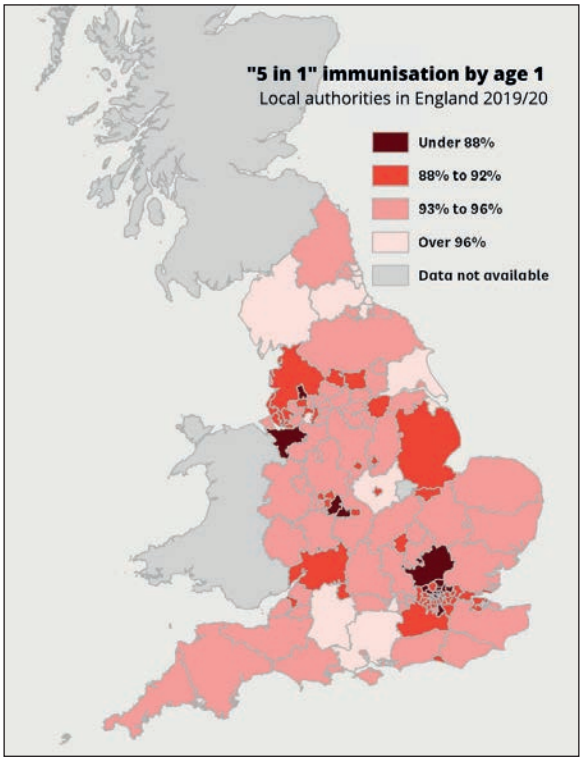
Governments across the UK recognise immunisation as a public health priority, with approximately 92% of children receiving the first dose of most vaccines. However, in 2018, the UK was ranked 28th out of 36 OECD countries and the small annual declines, seen in the uptake of most vaccines, could fall below herd immunity thresholds and run the risk of disease outbreaks. There has, however, been a slight but welcome improvement in 2019/20 in all four UK nations. (Figure 3)

FIGURE 3. MMR UPTAKE 4 UK NATIONS



England has lower overall vaccine uptake than the other UK nations, with uptake below the 95% threshold. However, the geographic variation shown by Public Health England's data maps, demonstrate that this is largely driven by low uptake in specific areas, particularly large cities, which tend to have ethnically diverse communities and more transitory populations. It is therefore critical that local Public Health teams have access to their local vaccine uptake data, as it is likely that targeted local initiatives are required rather than changes to the national system. Vaccine uptake rates have remained several percentage points higher in the three devolved nations but the same pattern of downward drift has also been visible. (Figure 4)

FIGURE 4. PHE MAP 5IN1 VACCINE



Facing the Challenge - the 3 Cs

The World Health Organisation describe the key to achieving high vaccine uptake, among any age group, as coming down to the '3 Cs' (42):

01

TACKLING COMPLACENCY ABOUT THE RISK OF DISEASE

02

BUILDING CONFIDENCE IN THE SAFETY AND EFFECTIVENESS OF VACCINES

03

PROVIDING VACCINATION AS CONVENIENTLY AS POSSIBLE

All three are closely linked. In particular, tackling Complacency about the disease and building Confidence in vaccines are critical, as people are only likely to bother taking a vaccine for an illness they consider dangerous, and only if they trust its safety and effectiveness.

It is then important to make vaccination as convenient as possible to ensure access does not become a barrier, particularly for those who live rurally, some ethnic communities or marginalised groups such as those who are homeless. Covid highlights that it is in ALL our interests for everyone to have easy access to vaccines to stop the spread of

02 Tackling complacency about infectious diseases

The first step in the decision to take up any medical treatment is whether a person feels it is necessary in the first place.

Out of sight, out of mind

Complacency about the seriousness of infectious diseases is already recognised as contributing to the falling uptake of childhood vaccinations as younger parents have never seen diseases such as polio or diphtheria and, despite measles causing the death and disability of many thousands of children globally every year, most people in the UK consider it a minor illness.

Complacency is not a significant issue in low and middle-income countries as the devastating impact of infectious diseases is visible in every community and parents go to great efforts to get their children vaccinated.

In contrast, in high income countries such as the UK, US and Western Europe, immunisation has become a victim of its own success with the reduction in life-threatening or disabling childhood illnesses, due to vaccines, leading to complacency about the need for their ongoing use. Once a disease is no longer perceived as a risk, concern about possible vaccine side effects, or the hassle of obtaining vaccines, can be enough to create a sufficient barrier to immunisation.

BEFORE THE POLIO VACCINE WAS INTRODUCED IN 1956, FREQUENT EPIDEMICS CAUSED UP **TO 7,000 CASES OF PARALYTIC POLIO IN THE UK WITH UP TO 750 DEATHS,**

Most parents are not complacent about the threat of meningitis as they are aware of the danger it poses and thus there is good uptake of the infant vaccines which can prevent this life-threatening condition. There appears however to be less recognition of the importance of ensuring good uptake of meningitis vaccines in teenagers to reduce the risk associated with group settings such as attending college or university. This is likely to be due to the fact that teenagers are more involved in the decision themselves and maybe less aware of the danger.

Before the polio vaccine was introduced in 1956, frequent epidemics caused up to 7,000 cases of paralytic polio in the UK with up to 750 deaths, and the vaccine was therefore welcomed by parents. However, with no naturally occurring cases of polio in the UK since 1984, most younger parents will not have seen anyone wearing the distinctive callipers associated with the flaccid paralysis caused by polio and may not consider it a significant threat.

Early warning system: Measles

Similarly, despite measles being a major global cause of blindness in children, and killing over 207,000 people in 2019, it has come to be seen as a minor ailment in the UK. By 2013, uptake of the MMR vaccine had recovered from the impact of the erroneous autism claims of the early 2000s, but drifted down over the following 6 years when, after several outbreaks, the UK lost its measles elimination status in 2019.

Due to its highly infectious nature, measles has been described as the 'canary in the coal mine' as it is likely to be one of the first infectious diseases to reappear if vaccination uptake drops. The occurrence of 80,000 cases and 72 deaths in Europe, in 2019, was therefore a wake-up call that falling vaccination levels could see a significant return of vaccine preventable diseases with their associated morbidity and mortality.

Naturally, the Covid pandemic has impacted on routine vaccination as, despite attempts to maintain childhood vaccine provision, many parents did not wish to attend medical facilities. While significant catch-up programmes will be required, it will be interesting to see whether the prominent discussion about vaccines, and their role in tackling the pandemic, leads to higher uptake of routine immunisation.

Impact of Covid on Influenza immunisation

This certainly appears to have been the case with the 2020/21 Influenza campaign. Prior to Covid, the annual influenza campaign was one of the largest adult vaccination programmes in the UK. However, despite thousands of deaths every winter, and efforts to improve convenient access through pharmacies, the annual 'flu' jab campaigns often had poor uptake.

Campaigns have been plagued by the complacency of people confusing Influenza with the minor viral illnesses, often described as 'flu', which are experienced each winter and perhaps the term 'flu' jab should be replaced by Influenza vaccination to avoid such conflation. The difficulty of predicting the most likely influenza strain to circulate each year, undermines confidence its efficacy and some people even blame post-vaccine side effects on the vaccine having given them 'flu'.

IN THE MIDST OF THE COVID PANDEMIC, UPTAKE OF THE INFLUENZA VACCINE **INCREASED FROM 70% TO OVER 80% AMONG THOSE OVER 65 YEARS**

However, in the midst of the Covid pandemic, uptake of the influenza vaccine increased from 70% to over 80% among those over 65 years; finally reaching the WHO recommended level of 75%, and to just over 50% among younger patients with underlying conditions.

This is likely to have been influenced by the public campaign which called on people to get vaccinated so as to prevent additional pressure being put on the NHS. The high acceptance of the influenza vaccine in autumn 2020 shows what can be achieved by investing in greater publicity and organisation, while the record-breaking uptake of the Covid vaccine in the same cohort, suggests there is potential to achieve further improvement in the future.

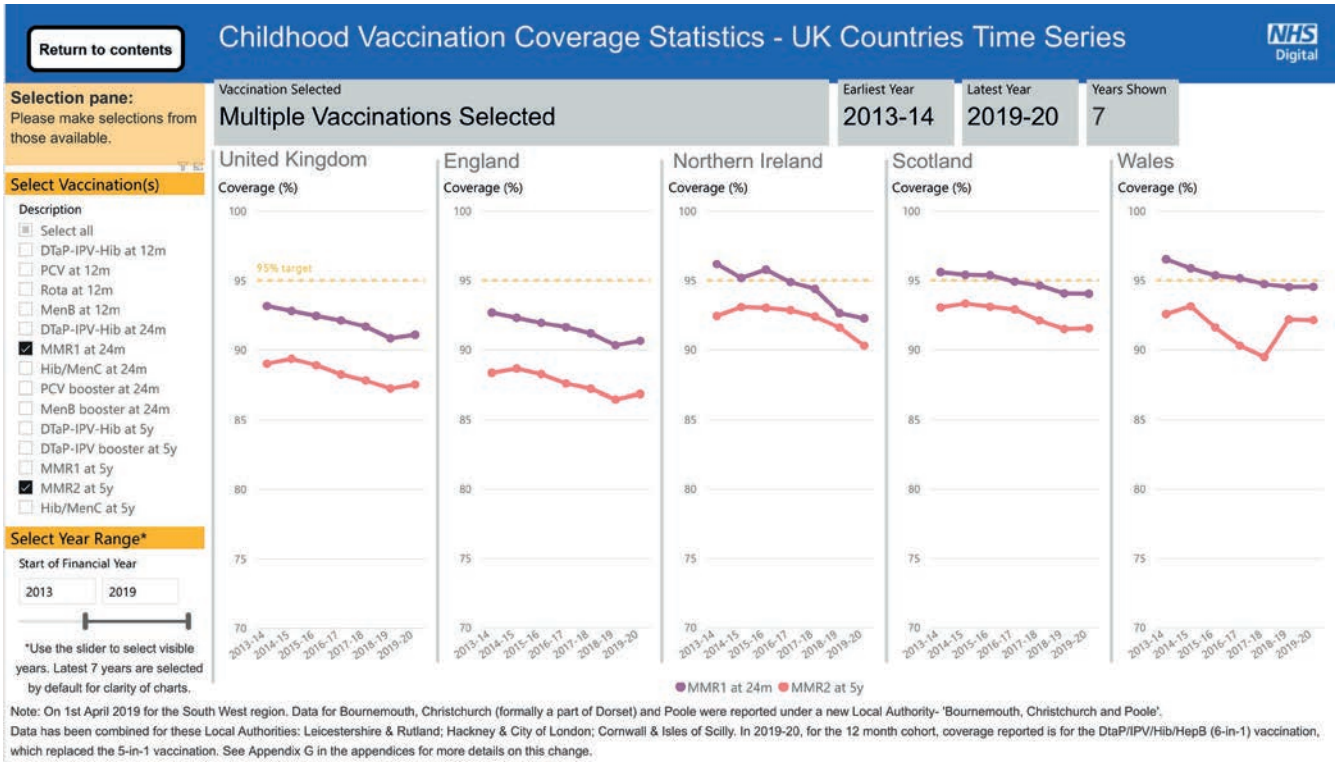
Completing the vaccine schedule

Failure to attend for booster doses is a common issue with childhood vaccination, with lower uptake for each subsequent dose. This may be due to access issues, as there is less contact with health services for children between the age of 12 months and starting school, or that life gets in the way as parents return to work or have further children.

IT IS IMPORTANT TO EXPLAIN THE ROLE OF BOOSTER DOSES IN **PROVIDING LONG TERM IMMUNITY**

This highlights the importance of advising parents about the entire immunisation schedule and having well functioning recall and reminder systems. There may also be a degree of complacency, with some parents considering that one dose will give sufficient protection, so it is important to explain the role of booster doses in providing long term immunity. (Figure 5)

FIGURE 5. MMR BOOSTER UPTAKE



Note: On 1st April 2019 for the South West region. Data for Bournemouth, Christchurch (formally a part of Dorset) and Poole were reported under a new Local Authority- 'Bournemouth, Christchurch and Poole'.
Data has been combined for these Local Authorities: Leicestershire & Rutland; Hackney & City of London; Cornwall & Isles of Scilly. In 2019-20, for the 12 month cohort, coverage reported is for the DtaP/IPV/Hib/HepB (6-in-1) vaccination, which replaced the 5-in-1 vaccination. See Appendix G in the appendices for more details on this change.

The Covid pandemic

After the pandemic curtailing our work, social and leisure activities for over a year, complacency regarding Covid has not been a major problem for the UK's vaccination programme.

Despite previous surveys suggesting a significant proportion of the population might refuse a Covid vaccine, over 95% of those over 50 years have been vaccinated. It appears therefore, that the extensive media coverage of Covid has helped provide the public with valuable information on both the impact of the disease and the safety and efficacy of the new vaccines. This suggests publicity campaigns could help increase awareness of the need for vaccination for other infectious conditions but, naturally, without the societal and economic impact of Covid, it is unlikely they would receive such blanket media coverage.

DESPITE PREVIOUS SURVEYS SUGGESTING A SIGNIFICANT PROPORTION OF THE POPULATION MIGHT REFUSE A COVID VACCINE, **OVER 95% OF THOSE OVER 50 YEARS HAVE BEEN VACCINATED**

While the uptake of Covid vaccines has been very high in older adults, complacency could be more of an issue among younger age groups who may be dismissive about the threat of Long Covid to themselves or the danger they might pose to a vulnerable loved one. There has been no evidence so far of people failing to take their second dose of the Covid vaccine although there is anecdotal reporting of less cautious behaviour among some recipients after only one dose.

A global response to pandemics

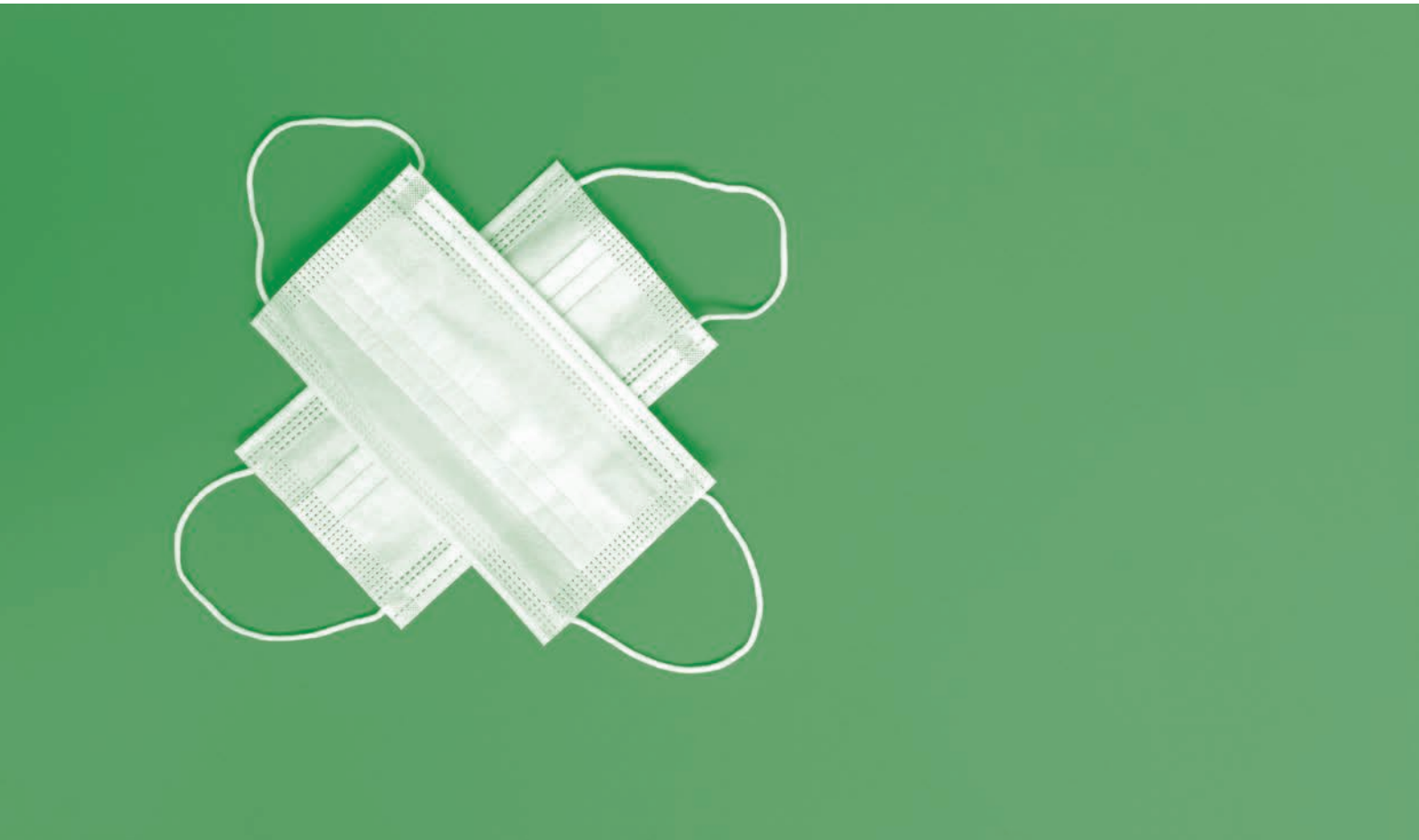
One area of complacency regarding Covid is at the governmental and international level. Despite all the rhetoric in spring 2020 about the need for a global response, the international community has failed to see that the fastest way to bring the pandemic under control was to actually make that a reality.

While many countries, including the UK, donated funding to COVAX, the WHO programme to provide Covid vaccines to 92 low-income countries, there has been less generous approach to sharing vaccine doses or the knowledge and technology which would allow more countries to produce their own vaccines. Nations with successful vaccine programmes are failing to recognise not just the humanitarian need in other countries but the threat to their own populations if a failure to control Covid, globally, leads to the evolution of more infectious or vaccine resistant variants.

NATIONS WITH SUCCESSFUL VACCINE PROGRAMMES ARE FAILING TO RECOGNISE NOT JUST THE HUMANITARIAN NEED IN OTHER COUNTRIES BUT THE **THREAT TO THEIR OWN POPULATIONS IF A FAILURE TO CONTROL COVID**

The phrase ‘no one is safe until everyone is safe’ has been widely quoted but the vast majority of Covid vaccines have been delivered in just a small number of the wealthy countries while others have no access at all.

It is vital that the international community learn from this pandemic, both to cooperate more fairly, to bring it to an end, and to develop stronger international structures to ensure greater preparedness for future pandemics.



03 Maintaining confidence in vaccines

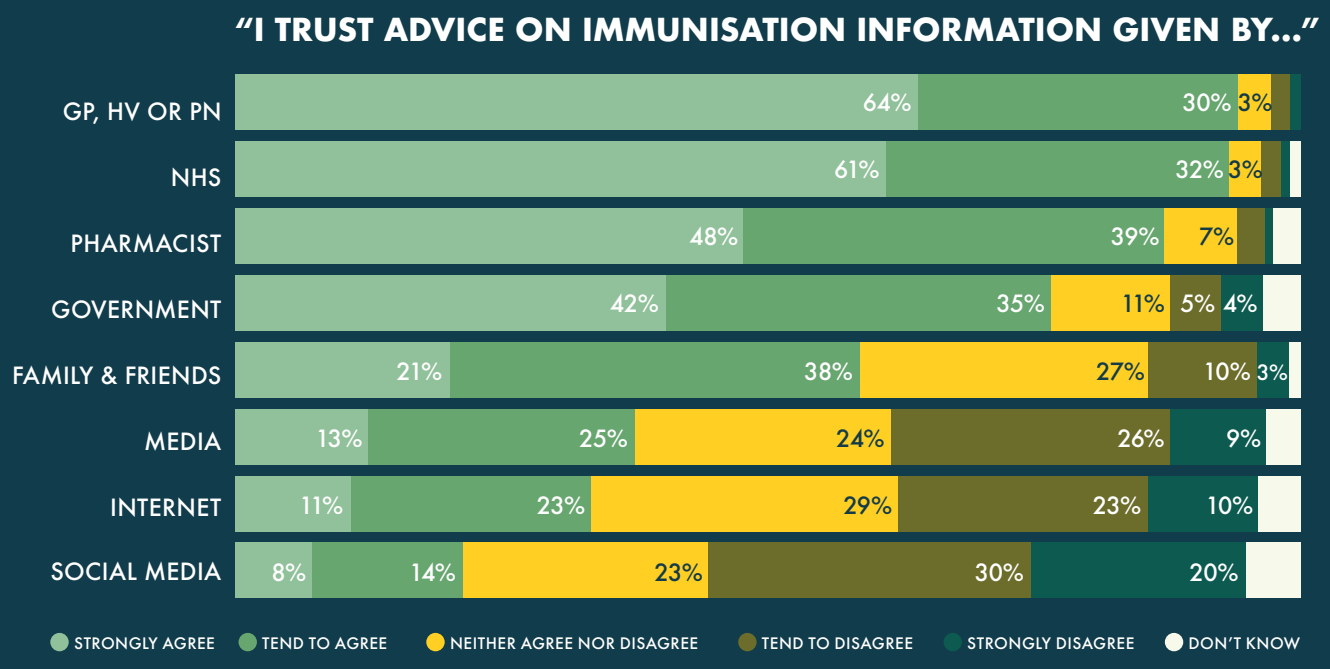
Parents and patients are only likely to take a vaccine they consider both safe and effective. Trust is at the heart of building and maintaining confidence in vaccines and is crucial to the success of any information campaign. A high level of trust is required in the quality and source of the information as well as the institution which will be delivering the vaccinations.

Information from trusted sources

Confidence in vaccines has traditionally been comparatively high in the UK with recent surveys demonstrating that 91% of parents in England take their children for some or all of their vaccinations, only 2% refuse and only 0.5% refuse or delay immunisation on the basis of safety concerns (15).

This generally high uptake is in part due to the high esteem in which healthcare professionals and the National Health Services are held. Multiple submissions to this inquiry listed NHS health professionals as the most trusted source of information and advice regarding immunisation with the 2019 Public Health England survey showing that 94% of people would agree or strongly agree (27). (Figure 6)

FIGURE 6. PHE SURVEY HIGH TRUST IN HEALTH CARE STAFF



The free provision of routine vaccines through the NHS, not only removes a cost barrier, present in other countries, but the fact there is no commercial transaction between the patient and their nurse or GP, also removes any suspicion there might be a profit motive or conflict of interests.

Building or maintaining confidence in vaccines depends on ongoing public health campaigns, to raise awareness of the importance of vaccines among the general population, as well as the provision of clear and accurate information to patients or parents in multiple languages and formats which can be easily read and understood.

HAVING QUESTIONS ABOUT THE RISKS AND BENEFITS OF ANY MEDICAL TREATMENT IS **A PERFECTLY NORMAL REACTION**

Having questions about the risks and benefits of any medical treatment is a perfectly normal reaction, whether about new Covid vaccines which have been developed in record time or because vaccination is the first serious medical decision most parents will make for their child.

The term 'Hesitancy' is currently used as the blanket term for all those who delay or refuse or campaign against vaccines rather than just those who want additional information before finally proceeding. The tone of criticism associated with the term could create barriers and inhibit parents and patients from coming forward to speak to a health professional about their concerns. This perception may drive some people to seek information online, where they are more likely to be exposed to inaccurate misinformation or deliberate disinformation.

It is vital to ensure that those with reservations feel comfortable to come forward, as many will eventually proceed with vaccination if their questions are satisfactorily answered. All interactions with GPs and other health professionals provide the opportunity to promote immunisation in general as well as to answer questions, dispel myths and explain the benefits of particular vaccines.

Authorities should therefore ensure accurate information is easily available to all patients and parents and that health professionals are accessible for those who still have concerns. Being able to get answers from a trusted source is the best approach to anti-vaccine claims. Naturally, the corollary is that healthcare staff must have access to accurate information and training to help them provide the answers in clear language and the time to spend with parents. It is important to ensure that people understand that NO question is unreasonable and ANY concern can be raised.

Online Information and disinformation

The provision of clear, accurate and understandable information is a key element of improving uptake in vaccines. Public perception is that social media is the main driver of any fall in vaccine uptake but opponents of immunisation have existed since the earliest days of inoculation against smallpox and there were many outspoken critics of Jenner when he developed the first vaccine against smallpox in 1796.

How the public sources and interacts with information has of course changed dramatically and social media certainly gives a greater reach to those who wish to spread misinformation than word of mouth. The constant drip of anti-vaccine narratives is of concern and the challenge remains to ensure that accurate information, rather than dangerous disinformation, is promoted - whether about specific vaccines or vaccination in general.

As with the provision by health professionals, trust in the source of the information is critical to it being accepted and some of the promotion of 'anti-vax' materials, by outside actors, is clearly aimed at undermining public confidence in political systems. Strengthening trust in vaccines therefore requires coordination between many different public bodies, including government, NHS, schools, media and international development.

OFCOM data shows that, while 86% of the public still obtain their information from mainstream media, over a third access information via social media and online platforms (5). In addition, the boundary between traditional broad-

casting companies and online channels is becoming blurred, yet the latter face much less regulation.

While only 22% of people report trusting social media as a source of vaccine information, Campbell et al (27) found that 31% of those using online chat groups reported reading worrying claims, compared to just 8% of all parents. The ubiquitous nature of social and online media, and the rise of 'fake news', therefore poses a threat to all public information but particularly in relation to the Covid pandemic and vaccination.

The Department for Culture, Media and Sport (DCMS) are, therefore, developing policies to 'block' or 'obstruct' the easy spread of harmful content, through measures that will be included in the UK Government's Online Safety Bill. However, managing misinformation poses a challenging balance between freedom of speech and reducing online harm (5).

At the start of the Covid pandemic, the UK Government established the Counter Disinformation Unit (CDU) which is based within the DCMS but works across all Whitehall departments and with all the major online platforms.

Continuously monitoring online media, the CDU has identified approximately 70 pieces of disinformation per week and worked with social media platforms to take down harmful content. In addition, closed groups like WhatsApp, have reduced the ability to forward highly shared materials to multiple recipients.

Misinformation ranges from people simply discussing their own concerns or sharing inaccurate content through to those running deliberate campaigns to spread dangerous disinformation about the pandemic or vaccines. Some of these latter have political motives, of undermining trust in state and public institutions, or seek to make advertising profit through generating interactions with their websites by using dramatic narratives and 'click bait' (4).

The DCMS is working closely with online platforms to prevent such monetisation and profiteering and to tighten their Terms and Conditions to allow harmful material to be taken down. While digital information from NHS bodies score highly as trusted sources, they are not always sufficiently engaging and have to compete online with sensationalist claims by anti-vaccine groups.

The main focus should be on promoting vaccination as a positive contribution rather than giving too much publicity and attention to anti-vaccine campaigners. It is generally unhelpful to engage in debate with people who rely on pseudoscience or scaremongering to spread anti-vaccine messages as this can simply amplify their reach on social media. However, in order to tackle the spread of online vaccine scepticism, it is important to confront the reality that it is happening and try to understand why some people decline one of the most successful public health initiatives.

Disinformation in the International context

While vaccine scepticism is often considered a problem of wealthy countries, the internet is a global phenomenon and misinformation, and deliberate disinformation, can percolate into almost every community.

As well as the direct impact, communities are likely to become suspicious of vaccination programmes if the donor country is seen not to be promoting such vaccination for their own children. This would simply feed conspiracy theories of experimentation or other manipulation and it is therefore important to be cognisant of the impact of anti-vaccine narratives on countries where death and disability from vaccine-preventable diseases is still very high.

Alongside UNICEF, Gavi, the Vaccine Alliance, is working to build real-time information systems that use newly developed survey tools to gather data on the behavioural and social drivers of vaccine uptake. Such information will contribute to improving programme development but will also act as a risk management tool and draw attention to any significant change in attitudes or spread of disinformation. (Case study 1)

Gavi has recognised the importance of using tailored approaches within different communities and is scaling up the use of culturally sensitive 'people-centred' programmes. Such a community focus is likely to be very important

in ensuring the uptake of Covid vaccines, as they become available, and in promoting the essential catch-up programmes for routine immunisations which have been missed due to the pandemic. Regaining lost ground in immunising against vaccine preventable diseases, such as polio and diphtheria, will be critical if we are to avoid a rise in childhood mortality and disability (8).

During the strategic planning period 2016-2020, Gavi intensified its work on 'demand generation' by defining this as a Strategic Focus Area and assigning significant additional funding to the approach. They formed a new team to lead on demand generation, communities and gender and worked with partners to develop the Demand Hub which aims to build trust and ensure proactive community engagement in immunisation and broader primary health care services (8, 21).

The GAVI project encompasses 5 main work streams:-

Gavi is projecting an increased level of investment in the area of demand generation over the next five years (Gavi 5.0: 2021-2025) but this may be impacted by changes in the overseas aid spending of donor countries due to the economic impact of the pandemic.

CASE STUDY 1

UNICEF VACCINATION DEMAND OBSERVATORY

UNICEF has announced a multi-stakeholder global initiative to identify, track, and respond to vaccine hesitancy, scepticism and misinformation.

This global network of 'infodemiologists' will support national immunisation programmes by providing technical and behavioural expertise, along with digital tools and interventions to help countries manage disinformation and build demand for vaccination.

The project will work with local partners on social listening to recognise and manage misinformation and identify vaccine hesitancy, particularly with regards the introduction of new vaccines; beginning with a focus on the COVID-19 vaccine.

The programme includes establishment of a social-listening, cloud-based platform which uses Artificial Intelligence (AI) and algorithms to filter and make sense of information by monitoring traditional media and social media as well as non-digital sources.

It can be tailored to national and regional needs and includes a learning academy to train local people to use the platform and understand conversations, issues and rumours which can provide insights for their national team.

The academy will also deploy misinformation training for the public and journalists and create continuous learning programmes.

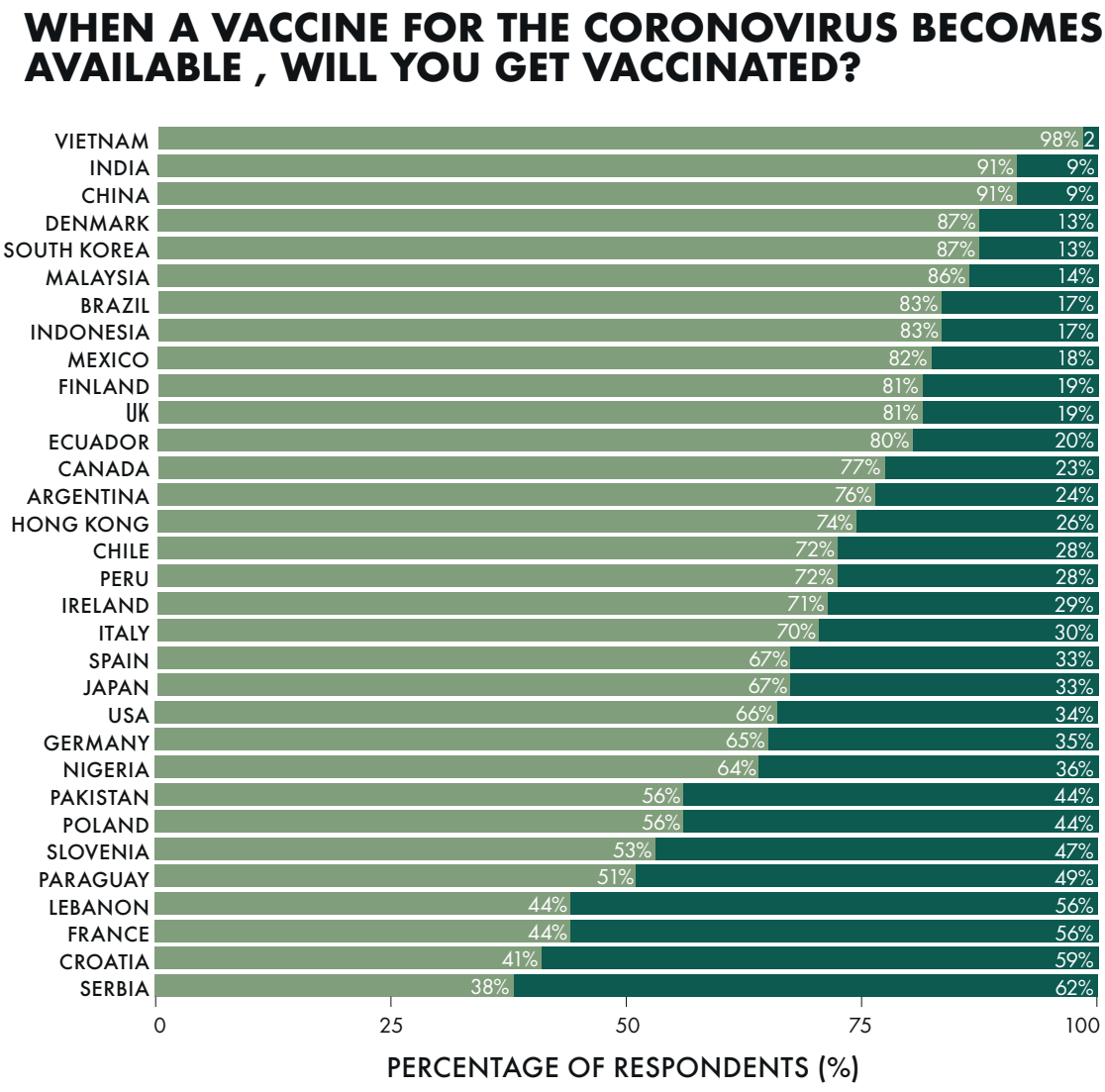
An Interventions Content Lab will design proactive content and immunisation narratives, rapidly assess content for efficacy & safety and support their deployment. There will be a particular focus on the social & behavioural determinants of COVAX demand.

Multi-stakeholder collaboration at a national and global level, through the Vaccination Demand Hub, should ensure coordination of the response to disinformation across multiple countries and regions.

Learning from the COVID-19 response

With the social and economic impact over the last year, there was relatively little complacency about Covid but surveys carried out last year, prior to the development of vaccines, suggested uptake might be low with 22% of people saying they would be reluctant to take such a vaccine and only 49% saying they would definitely get vaccinated (32). The reasons given by those taking part in the original surveys were based on concerns about vaccine safety and the speed of vaccine development, rather than any complacency regarding the dangers of COVID. (Figure 7)

FIGURE 7. INTERNATIONAL COVID VACCINE

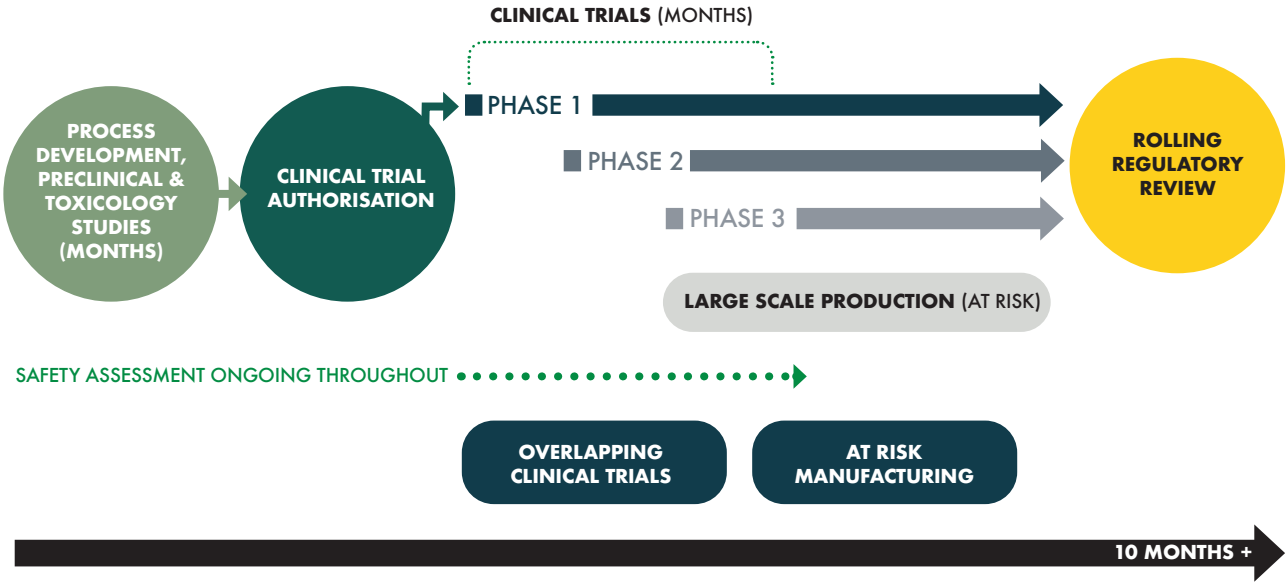


Data were jointly collected by the polling company ORB International and the Vaccine Confidence Project (London School of Hygiene & Tropical Medicine) between Oct 21 and Dec 16, 2020. Samples were random and nationally representative of the adult population in 30 of the 32 countries. Each respondent was asked, in the local language: "When a vaccine for the coronavirus becomes available, will you get vaccinated?" The possible responses were "definitely will", "unsure but probably will", "unsure but probably will not", or "definitely will not". In this figure, the category "will not get vaccinated" included respondents who said they "definitely will not" or "probably will not" get vaccinated, and the category "will get vaccinated" included respondents who said they "definitely will" or "probably will" get vaccinated. Appendix 3 describes the survey methodology.

In contrast, the fact that more than 95% of those over 50 years have been vaccinated demonstrates how the intensive media coverage, of both the seriousness of the disease and the vaccination programme, has led to the highest vaccine uptake of any adult vaccine programme.

In particular, concerns about vaccine development being rushed or safety measures cut, have clearly been allayed by explanations of how the trial elements were run in parallel rather than sequentially and that all normal safety analyses were carried out. (Figure 8) (Case study 2)

FIGURE 8. ACCELERATED COVID VACCINE



CASE STUDY 2

THE ROLE OF THE PHARMACEUTICAL INDUSTRY IN PROVIDING PUBLIC INFORMATION

The pharmaceutical industry has a role to play in providing the public, health professionals and the media with information regarding how vaccines work as well as how they are researched and manufactured.

Such explanations were crucial in allaying public concerns about the accelerated development of COVID vaccines. Clear information was provided regarding how the trial elements were run in parallel, rather than sequentially, and bureaucratic delays were avoided by regulators reviewing safety and efficacy data on a continuous basis.

Information is provided through direct public outreach such as the #valuingvaccines social media campaign by the Association of the British Pharmaceutical Industry or school materials such as Superbugs: Join the Fight, which includes the role of vaccines in fighting antimicrobial resistance, or 'Viruses & Pandemics' covering Covid.

Broadcasters have helped demonstrate how bureaucratic delays were avoided by regulators reviewing safety and efficacy data on a continuous basis. In addition, with the use of advance purchasing contracts, Governments supported pharmaceutical companies to take a commercial risk by manufacturing at scale before being granted a license. Hopefully there are lessons to be learned regarding how future vaccines could be developed and deployed for some of the other killer diseases, such as malaria and tuberculosis, that still remain without effective vaccination options.

Risk-Benefit discussions and side effects

Thankfully, most side effects from vaccines are minor and transitory and the 2019 PHE survey demonstrated that only 0.5% of delays or refusals are due to safety concerns (15). While many claims about vaccines have no evidence base, parents may have genuine concerns about potential side effects they have heard about and should not be dismissed as uninformed or marginal voices.

For open dialogue to succeed, it is vital not to be dismissive or secretive about rare but serious side effects, such as the cases of Cerebral Venous Sinus Thrombosis (CVST) associated with the Astra-Zeneca and Johnson vaccines, both of which use the same viral vector technology.

While experiencing such a serious side effect is devastating, the identification of the issue has demonstrated that the safety monitoring systems, of bodies such as the European Medicines Agency (EMA) and Medicines and Healthcare Products Regulatory Authority (MHRA), are able to detect and investigate even such rare occurrences.

Being open about this rare side effect has allowed the risk to be put in context, by explaining that the number of cases relating to the vaccine is a fraction of the risk of CVST associated with Covid-19 itself. It has also allowed for modification of the vaccination programme by now offering alternative vaccines to younger cohorts. (Case study 3)

CASE STUDY 3

PHILIPPINES' MIS-HANDLING COMPLICATIONS

The fragility of vaccine confidence can be demonstrated by an example from the Philippines where confidence in vaccine safety dropped from 82% to 21% between 2015 - 2018, after the disastrous introduction of a new vaccine to protect children against Dengue fever and what was perceived as government failure to recognise and react quickly to detrimental impacts.

Dengue fever is unusual in that the first infection is rarely serious but previous exposure appears to prime the immune system for antibody-dependent enhancement, making subsequent infections much more serious. In a small number of children, without previous exposure to dengue fever, the vaccine appeared to prime the body in a similar way, leading to severe complications if they became infected.

The legacy of this incident has persisted for several years, with the Philippine Ministry of Health struggling to rebuild public trust in vaccines. This loss of confidence is judged by many to have been a crucial factor in the country's measles outbreak in 2019.

A similar issue emerged after the introduction, in 2008, of the vaccine against the strains of Human Papilloma Virus (HPV) which cause the vast majority of cervical cancers. There were multiple reports of two syndromes in teenage girls who had received the vaccine: Chronic Regional Pain Syndrome (CRPS), which affects a single limb, and Postural Orthostatic Tachycardia Syndrome (POTS) which causes headaches, fainting, nausea and fatigue.

In light of the reports, and parental concern, the European Medicines Agency (EMA) carried out a Europe-wide pharmacovigilance review. This review showed that these syndromes are actually very common, with each occurring in about 150 teenage girls per million of the general population and there was no increase among those who had been vaccinated (31). A separate study in 2013, by Donegan et al (30), had already demonstrated that there was no association between HPV vaccination and Chronic Fatigue Syndrome (CFS).

Investigating these reports has allowed parents, and teenage girls themselves, to be reassured regarding the safety of the HPV vaccination which is particularly important as, prior to the vaccine, cervical cancer was responsible for over 20,000 deaths in Europe each year.

Unfortunately, the Japanese Government suspended the HPV vaccine in 2013 after similar reports, despite their internal review showing no causal effect. Uptake fell from 70% to less than 1% and Japan has seen a 9.6% increase in cervical cancer deaths, as cervical screening attendance of young women is also low, at just over 22%. While some Japanese politicians are trying to reverse this approach, it is predicted that there could be an additional 700-800 cervical cancer deaths for every year the crisis continues (43).

In contrast, a population study of data from Scotland's Cervical Screening Service, has already shown the virtual elimination of HPV infections among young women who have been vaccinated and an 89% reduction in high grade Cervical Intraepithelial Neoplasia (CIN3) a condition which is the forerunner of invasive cervical cancer (39).

Any attempt to hide, diminish or dismiss concerns about side effects is self defeating. They should be reported and investigated and, once the evidence is available, the results should be shared openly to explain the risks or mitigations that are required, or reassure patients or parents and reestablish confidence in the vaccine.

Increasing uptake in ethnic Communities

While trust in Health Services is generally high across the UK, the negative experiences of some ethnic or religious minorities with public authorities or even health services themselves, can undermine overall trust. Local leaders, civic society organisations, and religious groups are essential in identifying the concerns or barriers faced by particular communities and, if given appropriate support, can help modify services to meet their community's needs and utilise their local engagement to build confidence and improve vaccine uptake.

LOCAL LEADERS, CIVIC SOCIETY ORGANISATIONS, AND RELIGIOUS GROUPS **ARE ESSENTIAL IN IDENTIFYING THE CONCERNS OR BARRIERS FACED BY PARTICULAR COMMUNITIES**

The UK has a very diverse multicultural population and significant variation in immunisation rates is seen within several ethnic communities. During the pandemic, one of the consistent themes has been that health services must work more closely with 'BAME' communities to improve uptake of the Covid vaccine. However, this term is too broad and ill defined as different communities and ethnic groups have quite individual attitudes and requirements. The Bengali community in East London and the Afro-Caribbean community in South London are likely to have different needs and experiences from each other, and from those of Pakistani origin in Bradford. It is, therefore, important to engage with each specific community and actively listen to their experiences, concerns and ideas with an open mind.

This is the principle behind the Tailoring Immunisation Programme (TIP) designed by WHO Europe which utilises

CASE STUDY 4

WHO: TAILORING IMMUNISATION PROGRAMMES (TIP)

The Orthodox Charedi Jewish Community in the borough of Hackney, has experienced regular vaccine–preventable disease outbreaks, with 117 cases of measles per 100,000, compared to 29 cases per 100,000 in the rest of the borough. This was attributed to low immunisation rates, with 78% of infants receiving their first dose of MMR by 24 months, compared with 83% in London and 90.3% in England.

After engagement with community leaders, evidence was gathered widely within the community, using various tools such as questionnaires and structured interviews, particularly with mothers, to identify community-specific issues related to vaccine provision and uptake.

The findings did reveal a misconception that high vaccine uptake in the wider UK population, rather than within their own community, provided sufficient disease protection but it challenged the traditional assumption that cultural or religious beliefs were causing significant anti-vaccine sentiment. It demonstrated that the community had a similar range of views to the wider population and actually had 'significant enthusiasm' to improve uptake. Instead, they were hampered by practical problems particularly related to the large size of many families.

The community was then closely involved in developing measures to improve uptake, including ensuring that all communications, including proactive reminders, were culturally sensitive, specific and consistent. The timings of immunisation clinics were modified to accommodate their religious commitments and, if attending a clinic, children were provided with all recommended vaccinations.

evidence from behavioural economics and psychology to engage and diagnose the drivers of low vaccine uptake in any community (36). (Case study 4)

TIP does not promote any particular intervention or strategy but aims to engage and listen to community leaders and members, analyse the various barriers or enablers of vaccination and then support service redesign to increase uptake.

The case study provides a powerful example of the WHO 'Tailored Immunisation Programme' which was designed as a flexible and transferable approach to improving engagement with communities with specific cultural and religious needs. It demonstrates that presumptions that low vaccine uptake is due to cultural issues is often too simplistic and views on immunisation in such communities, are often as varied as across the rest of society.

The most important approach is to listen to community members themselves and take action to improve the provision of information or the delivery of the vaccines themselves. It may be that information needs to be provided in a broader range of languages or dialects or in a format that is considered culturally appropriate or it may simply be that local vaccine clinics are not easily accessible due to timing or location. Acting on the learning from such a project is essential, as failure would simply undermine trust and be likely to cause the community to disengage.

In Australia, the introduction of Aboriginal Immunisation Officers in New South Wales improved uptake among Aboriginal children helped close the gap in immunisation between them and their non-indigenous peers. However, in one district the contacting of parents for a 'pre-call' telephone discussion prior to their first appointment, accelerated the uptake rates and closure of the Immunisation gap (28).

While Australia has introduced sanctions, in that benefit payments are withheld for non-vaccination, many of those involved in vaccination programmes believe that greater effort through such outreach programmes would achieve a similar outcome without further marginalising some communities.

Mandatory Vaccination

Mandatory vaccination is often considered by politicians as a quick-fix option to improve vaccine uptake and varying versions of formal mandating or compulsion have been introduced in Australia, Italy, Germany, France and some US states. Such approaches are based on compelling compliance with vaccination programmes, rather than convincing people of the merits of immunisation.

It is important to remember that those who are vaccine 'hesitant 'are the main focus of any campaign to increase immunisation and the likely long-term impact of such strategies should be considered in that light. As deprived or marginalised populations could be most affected by any punitive aspect, there is a real danger of driving up financial, social, educational and health inequalities by restricting the activities of those who are unvaccinated.

The submission by Professor Noel T. Brewer (23) demonstrated that compulsory approaches do tend to increase uptake but, along with the majority of submissions, he raised concerns that introducing a note of compulsion could increase increasing distrust and resistance particularly among those at greatest risk of refusing immunisation. He also highlighted that the administrative costs of mandatory systems diminished the funding available for other out-reach projects and even immunisation itself.

Examples which amount to 'practical' or informal mandatory vaccination would be limiting societal engagement, through the domestic use of Covid 'vaccine passports', or the exclusion of unvaccinated children from childcare or school. In some US states, where unvaccinated children are excluded from school or kindergarten, parents may sim-ply opt for home-schooling which then decreases the opportunity for engagement with the parents.

In Australia, when vaccination was made compulsory, to access benefit payments, data collection was not continued of those who had previously registered as objectors. This has created the situation that some families or communities may become even more estranged from the authorities and there could be a delay in identifying a growing problem.

While a mandatory approach may well produce an increase in overall uptake, some within the 'hesitant' group may well be driven to become confirmed vaccine 'refusers' and ethnic or religious communities could become more iso-lated and therefore in danger from localised but significant disease outbreaks.

Global trust in vaccines

The Wellcome Trust Monitor 2018 (24) reported that globally, trust in vaccines was high, with 92% of parents reporting that their children had been vaccinated and, in low and middle income countries, progress is being made in offering more of the WHO-recommended childhood vaccines.

GLOBALLY, TRUST IN VACCINES WAS HIGH, WITH **92% OF PARENTS REPORTING THAT THEIR CHILDREN HAD BEEN VACCINATED**

However, confidence in their safety and efficacy is reported to be 81% and varies dramatically, from almost 100% in Rwanda and Bangladesh to just 2/3 of the French population. The declining vaccine uptake in Western European countries like France, also risks undermining the overseas projects they fund as the promotion of interventions in low and middle-income countries, which are not seen to be taken up in the donor country, could engender suspicion and distrust.

While uptake remains over 90% in many countries, the reported lower level of confidence in safety suggests there is potential for uptake rates to drift further. It is therefore vital to ensure that patients are given information on immunisation and those with questions or concerns are enabled to seek further discussion.

It is important to work with European and global partners to share good practice, learning and information on how best to respond to parental anxieties, tackle scepticism and increase vaccine uptake. The central role of Health Care Workers in promoting vaccine confidence, emphasises the need to strengthen basic health care systems in low and middle income countries, both to improve vaccine provision and maintain outbreak surveillance.

The failure of the international community to cooperate sufficiently on a shared response to the Covid crisis, is prolonging the pandemic due to inequitable access to vaccines doses or the sharing of vaccine technology. It is critical to change this attitude, if the current pandemic is to be brought under control. Thereafter, international health structures must be strengthened to enable much better preparation and response to future pandemics.

04 Improving convenient access to immunisation

It can be easy to think that declining vaccine uptake is purely due to online anti-vaccine campaigning and that, with free vaccines and NHS services to deliver them, there are no access issues in the UK.

However, many of the submissions to this inquiry have highlighted practical barriers and Public Health England (PHE) surveys have reported that more parents identify difficulty of access, rather than safety concerns, as their main reason for vaccine refusal.

This was highlighted by the project exploring the causes of poor immunisation rates among the Charedi Jewish community in Hackney (36, 40). Contrary to the assumption that religious or cultural objections were the main issue, the majority of feedback from the community highlighted that practical difficulties, relating to getting appointments, clinic times and provision for large families, were the main drivers of low vaccine uptake. This project demonstrates the need to listen to communities, rather than make assumptions or impose external 'solutions'. The reasons for low vaccine uptake tend to be multi-factorial but, as in this case, practical issues often play as much of a role as culture or religion. (Case study 4)

Overall, the main practical barriers to uptake of vaccines can be: cost, distance to vaccination facilities, availability of transport, clinic timing and flexibility of appointments, communication methods and the need for appointment reminders. The Royal Society of Public Health (29) identified that the key barriers to uptake of childhood vaccination in the UK are the timing of appointments (49%), the availability of appointments (46%) and childcare duties (29%).

Financial Barriers

An obvious barrier in many parts of the world is the cost of vaccines in health systems where patients must pay. Dr Kate O'Brien of the WHO, highlights that in the US, vaccine uptake among those without health insurance or Medicaid is only 75%, well below the desired level. Even if costs are reimbursed, poorer patients or parents may struggle with up-front payments and the administration of such systems is often slow, burdensome and expensive; using up funds which would be better spent supporting free vaccine provision.

FREE PROVISION OF ROUTINE VACCINATIONS IN THE UK REMOVES THIS BARRIER

The free provision of routine vaccinations in the UK removes this barrier and the fact there is no financial transaction between health professionals and their patients improves vaccine confidence, as there is no perceived conflict of interest when they promote vaccination. Patients may, however, still face other costs, particularly associated with transport, missing a work shift or the need to provide childcare for other children.

Internationally, COVID vaccination programmes have demonstrated that, when vaccines are provided without charge, this has contributed to high uptake and fast roll out. The benefit in overall population health and prevention of disease-related health or disability costs, mean that vaccines are one of the most cost effective public health measures and all governments should aspire to provide them without charge.

Ease of access to vaccination

After cost, physical distance, clinic timings and quality of public transport can increase the challenge of attending for vaccination appointments. This would appear at first glance to be less of a problem in the UK, than in many remote parts of the world, as vaccination is provided through a wide network of community health facilities. However, even here, it may be difficult to get to GP practices, particularly if living rurally or relying on poor public transport connections.

In addition, it is worthwhile following up those who have not attended their initial appointment and considering active outreach to them as well as more marginalised groups. In particular, after the initial set of vaccinations, there is less contact with health services and the lower attendance for all booster doses emphasises the need for reliable call and recall systems.

Similarly, providing any required vaccinations for pregnant women at ante-natal clinics, rather than through separate appointments at their GP surgery, could increase uptake as well as providing the midwife with an opportunity to open the discussion about infant vaccinations.

Flexible delivery of vaccines

The health benefits of vaccination are so significant, there should be more flexibility and outreach to communities or individuals who have not taken up the invitation to be immunised. Home vaccination, by community and practice nurses, has been used to support the influenza and Covid programmes for frail elderly patients who are housebound, but more consideration should be given to offering a similar service to parents who are struggling to bring their baby for routine vaccination appointments. New parents, and particularly single parents, may struggle to get to their family doctor's practice by public transport, particularly if they have several pre-school children in tow or have already returned to work.

PROJECTS WHICH HAVE ENGAGED OR DIRECTLY DELIVERED VACCINES TO TARGET GROUPS **HAVE BEEN SHOWN TO INCREASE UPTAKE**

Projects which have engaged or directly delivered vaccines to target groups have been shown to increase uptake, as was demonstrated by the direct delivery of Covid vaccines to residents and staff of Care Homes in Scotland.

Due to the integrated structure of NHS Scotland, they were able to obtain permission from the MHRA to start delivering the Pfizer vaccine directly into Care Homes from mid-December 2020. Scotland's national policy, of vaccinating Care Home staff on the same visit as residents, provided convenient delivery but also encouraged the solidarity of being vaccinated along with colleagues as well as the vulnerable residents for which they were responsible. Along with providing expert webinars to counter a targeted disinformation campaign, this is likely to have contributed to vaccine uptake of over 99% among Care Home staff in Scotland.

Greater flexibility in the timing of vaccination clinics could make attendance easier for patients or parents who are working. Covid vaccination clinics, whether in GP surgeries or mass vaccination centres, have operated extended hours, making it much easier for workers to attend their appointment. Similarly, appointment hotlines sought to provide alternative appointment timings when required.

Logistics and communication

Providing clear information about vaccines is essential but it is also necessary to get practical communication right, such as highlighting appointment times, explaining how to change an appointment and sending reminders or recall appointments. Modern communication technology, such as emails or SMS texts, can help improve attendance at

CASE STUDY 5

AMREF HEALTH AFRICA SMARTPHONE APP - MVACCINATION

Working with a broad range of partners, and the Tanzanian authorities, Amref Health Africa developed and piloted a smartphone app, mVacciNation. The app creates an individual health record for every child and captures contact details, age, vaccine visit type and the actual vaccine received. All data is synchronised with the cloud and can demonstrate real-time variations in demand and uptake of immunisation.

The system sends SMS text reminders about upcoming appointments and allows health staff to identify children who have not attended and contact their caregivers to arrange a further appointment. Over the duration of the mVacciNation project from May 2016 to June 2019, vaccination coverage in the two trial regions, increased from 93% to 98% and immunisation data accuracy improved from 78% to 93%.

In addition, monitoring stock levels and maintaining ideal refrigeration temperatures, reduced vaccine stock-outs (the complete unavailability of a vaccine) from 78% to 28%. Preventing stock-outs is of particular importance in a rural setting, as some families are likely to have traveled a considerable distance to get their child vaccinated and, if no vaccine was available, they may simply not return.

vaccine appointments by sending simple reminders or providing easy access to rearrange appointments.

Amref Health Africa has developed a mobile phone app, mVacciNation, which improves the practical aspects of vaccine distribution and patient access and has contributed to increased vaccine uptake in the Geita and Shinyanga regions of Tanzania, where it has been introduced (1). (Case study 5)

As well as creating an electronic health record for every child, the app has allowed healthcare staff to send SMS text reminders to families and follow up with those who don't attend. It has also improved the management of cold-chain refrigeration and stock levels to reduce the risk of a family attending only to find no vaccine is available. In view of the distances that may have been traveled to reach a clinic, failure to deliver the vaccine as arranged could reduce future attendances.

While mobile phone technology is widely available in many low and middle-income countries, GAVI have identified that approximately 433 million women have no mobile phone connection with 165 million fewer women having a mobile phone compared to men (8). Greater access to such communication technology would allow the proliferation of more projects like Amref's and increase the potential for better communication and follow up as well as accurate data collection.

SMS text messages are already used by GP practices and NHS systems in the UK but this project highlights their further potential, particularly in rural settings or when working with busy families.

Outreach services

Communication with parents and vaccine recipients is crucial in providing accurate information regarding the principles of the immunisation programme as well as the particular benefits of any specific vaccine. It is therefore vital to provide information in accessible formats for those with sensory impairment or learning difficulties and, with the UK having a significant immigrant population, that information is provided in a broad range of languages.

One of the largest challenges to ensuring consistent uptake of vaccines is the difficulty in communicating by post with transitory populations, such as those in temporary housing, migrant workers, children in foster care or the travel-

ler community. In addition, are those who may not register with a GP and therefore fall out with the normal NHS systems, such as refugees, asylum seekers and rough sleepers. This issue has been aggravated during the COVID pandemic, particularly in large cities, as lockdown has reduced routine interaction with social services, health workers, charities and volunteers. (Case study 6)

The example provided by the Royal College of Nursing displays how nurse–led interaction has been essential in ensuring that migrant populations are provided with the vaccines they need (17).

Local Public Health and Immunisation teams

As good overall immunisation rates can mask poor uptake in certain areas, or among specific communities, is important that local public health and immunisation teams have access to their detailed local vaccination data to spot where further outreach programmes are required.

The British Society of Immunology highlighted the loss of integrated immunisation networks and institutional memory due to the reorganisation of the NHS in England after the 2012 Health and Social Care Act (3). With yet another major reorganisation on the horizon, it is important that the importance of vaccination is considered and immunisation teams are strengthened, rather than further fragmented.

In Scotland, while GPs are still closely involved in provision, the ultimate responsibility for vaccination is moving from GP practices to geographical Health Boards. While the system has been incredibly successful in delivering both the 20/21 influenza programme and the COVID vaccine, it will be some time before it is clear if such a move maintains Scotland's very high vaccination uptake rates.

Learning from Covid

Imaginative approaches have been used to accelerate the roll out of Covid vaccines. Mobile vaccination units such as converted buses and ambulances, have been used to distribute Covid vaccines to rural communities as well as to rough sleepers and other transitory groups.

Every effort has been made to make it as easy as possible for people to take up the offer of Covid vaccination when it is their turn and such flexible and creative solutions have delivered record-breaking uptake rates when compared with other adult vaccination programmes.

It is important that after the COVID pandemic, creative vaccine delivery solutions that have been used locally, regionally and nationally are reviewed and consideration given to which approaches should be maintained or developed further. It is also vital to establish national systems of sharing best practice and learning, so that immunisation teams can improve the uptake of both childhood and adult immunisation, particularly in more difficult settings.

CASE STUDY 6

VACCINATION SUPPORT SERVICE FOR REFUGEES AND ASYLUM SEEKERS

In Coventry, where a specialist primary care service provides care for asylum seekers and refugees, the nursing team works closely with a specialist health visitor and interpreters to promote the benefits of immunisation and allow any questions or concerns to be addressed. Comprehensive nurse assessments are carried out for all new patients, allowing both children and adults to be offered 'catch up' vaccinations, including MMR for adults and Hepatitis B vaccination for those from high-risk countries.

The team explain the full childhood vaccine programme to ensure that parents know to expect a series of vaccination appointments up to 12 months and liaise with the local surgeries to arrange the initial appointments. Any missed appointments are logged and followed up by the nursing team who also make contact with the families when the infant is 12 months old to ensure vaccines courses are completed.

CONCLUSIONS & RECOMMENDATIONS

Information

Clear and accurate educational materials on 'how vaccines work' should be made available to media outlets, online fact-checking sites and schools. Pharmaceutical companies, health providers and health systems must provide clear and accessible material to raise general awareness and understanding of the vital contribution immunisation makes to good health.

The difference in regulation between mainstream and online media channels should be addressed as well as reviewing the responsibility of social media platforms. The Online Safety Bill should be utilised to ensure timely removal of harmful disinformation in the future.

As the internet is global, any learning on the management of online disinformation should be shared with international partners. It is important to prevent online anti-vaccine campaigns undermining confidence in low and middle-income countries with a high prevalence of vaccine-preventable diseases.

Communication

Care should be taken when using the phrase 'Vaccine Hesitancy' as a blanket term for all those who do not accept vaccination immediately. Patients and parents seeking additional information should feel empowered to discuss any concerns. The perception of criticism could create a barrier to such engagement with health professionals.

All projects to increase vaccine uptake should be considered in light of their impact on the 'hesitant', who are the target of such immunisation campaigns. Approaches should be used which would reassure rather than ostracise them, as it is to be hoped many who are 'hesitant' will eventually proceed with vaccination.

Health care workers should be provided with appropriate information and training on immunisation. As the most trusted source of information on vaccines, health care staff should be armed with the information necessary to rebut common myths, as well as sufficient time for such discussions.

Openness is required to address parental or patient concerns about side effects. This allows the risk of rare side effects to be put into context and explain any necessary mitigations or to provide reassurance by countering misinformation.

Practical Access Barriers

Attention should be given to the location, timing, accessibility and flexibility of vaccination clinics. Access barriers were one of the most common drivers of low uptake.

In addition to those who are housebound, consideration should be given to offering home vaccination to parents who are struggling to bring their children to a vaccination clinic. Similarly outreach services are required for marginalised groups such as homeless families, travellers, rough sleepers and refugees.

Governments should seek to learn lessons from the Covid vaccination programme to increase vaccine uptake. Innovative approaches, which contributed to the high uptake of Covid vaccination, should be considered for their application to routine immunisation programmes.

Community Outreach

Assumptions about the cause of low vaccine uptake in some communities should be avoided, as the problem may be due to practical issues rather than cultural beliefs or anti-vaccine views. Outreach projects, such as the WHO's 'Tailoring Immunisation Programmes', should be used to engage with ethnic communities and other groups in order to hear what issues or concerns are driving low vaccine uptake.

Mandatory vaccination is not recommended as it can increase distrust and drive those who are 'hesitant' to become vaccine refusers. While making vaccination mandatory may improve overall vaccine uptake, sanctions for non-vaccination could increase inequality and cause families to disengage with health or education services

International Cooperation

The Governments of wealthy countries, including the UK, should support the sharing of intellectual property and technology, at a global level, to ensure increased production and equitable access to Covid vaccines in low and middle-income countries. The Covid pandemic has demonstrated the fragility of international cooperation, with the inequity of access to vaccines likely to prolong the pandemic and increase both its death toll and societal impacts.

The UK Government should recommit to spending 0.7% of GNI on Official Development Assistance to support routine immunisation, including post pandemic catch-up programmes. Hard won health gains are at risk due to the impact of the pandemic but this is compounded by significant cuts to international development funding. The UK should resume its long tradition of funding global vaccination programmes to avoid a resurgence in vaccine-preventable diseases such as polio, with their associated disability and death, in low and middle-income countries**.**

SUBMISSIONS

1 AMREF Health Africa
2 Association of the British Pharmaceutical Industry
3 British Society of Immunology
4 Centre for Countering Digital Hate, *Imran Ahmed*
5 Department for Culture, Media and Sport
6 Department for Health and Social Care
7 Edinburgh University, *Annika Beate Wilder-Smith*
8 GAVI, the Vaccine Alliance, *Susan MacKay, Sebastian Meaney, Molly Ewing*
9 Glaxo Smith Kline, *Thomas Breuer, Gill Ayling*
10 Jo's Cervical Cancer Trust
11 London School of Hygiene and Tropical Medicine, *Beate Kampmann*
12 London School of Hygiene and Tropical Medicine, *Heidi J Larson*
13 Meningitis Research Foundation
14 Pfizer, *Darius Hughes*
15 Public Health England, *Mary Ramsay*
16 Public Health England, TIP
17 Royal College of Nursing
18 Royal College of Paediatrics and Child Health
19 Sanofi Pasteur
20 Sussex University, *Ben Kasstan*
21 Unicef
22 University College London
23 University of North Carolina, *Noel T Brewer*
24 Wellcome Trust, A*nna Mouser*
25 World Health Organisation, *Kate O'Brien*

REFERENCES

26 The next decade of Vaccines, APPG on Vaccinations for All, January 2019
https://www.results.org.uk/sites/default/files/files/NextDecadeOfVaccines_Single_NoBleed.pdf

27 Changing attitudes to childhood immunisation in English parents, Campbell, H et al, J Vaccine 2017;35:2979-2985
https://pubmed.ncbi.nlm.nih.gov/28442229/

28 Closing the gap in Australian Aboriginal infant immunisation rates — The development and review of a pre-call strategy. Cashman, PM et al, BMC Public Health 2016;16:514
https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-3086-x

29 Moving the needle. Promoting vaccination uptake across the life course. Cramer, S, Royal Society for Public Health, January 2019
https://www.rsph.org.uk/static/uploaded/3b82db00-a7ef-494c-85451e78ce18a779.pdf

30 Bivalent human papillomavirus vaccine and the risk of fatigue syndromes in girls in the UK, Donegan, K et al, J Vaccine 2013;31:4961-4967 *https://pubmed.ncbi.nlm.nih.gov/24001935/*

31 HPV vaccines: EMA confirms evidence does not support that they cause CRPS or POTS EMA 5/11/2015
https://www.ema.europa.eu/en/news/review-concludes-evidence-does-not-support-hpv-vaccines-cause-crps-pots

32 A fifth of people say they're unlikely to get vaccinated against Covid-19. Fancourt, D et al. UCL News 24/9/20

33 Wellcome Global Monitor 2018: How does the world feel about science and health. Farrar, J. Wellcome 2018
https://wellcome.org/reports/wellcome-global-monitor/2018

34 Childhood Immunisation Statistics. Harker, R. House of Commons Library, No 8556, 11 May 2021
https://commonslibrary.parliament.uk/research-briefings/cbp-8556/

35 Vaccine hesitancy around the globe: Analysis of three years of WHO/UNICEF Joint Reporting Form data - 2015-2017 Lane, S et al. J Vaccine 2018;36:3861-3867 *https://pubmed.ncbi.nlm.nih.gov/29605516/*

36 Tailoring immunisation programmes: Using behavioural insights to identify barriers and enablers to childhood immunisation in a Jewish community in London, UK. Letley, L et al. J Vaccine 2018;36:4687-4692 *https://researchonline.lshtm.ac.uk/id/eprint/4648952/*

37 Vaccine hesitancy: Definition, scope and determinants . MacDonald, NE. J Vaccine 2015;33:4161-4164 *https://pubmed.ncbi.nlm.nih.gov/25896383/*

38 A Population-Based Study of Measles, Mumps and Rubella Vaccination and Autism. Madsen, KM et al. N Engl J Med 2002;347:1477-1482 *https://www.nejm.org/doi/full/10.1056/nejmoa021134*

39 Prevalence of cervical disease at age 20 after immunisation with bivalent HPV vaccine at age 12-13 in Scotland: retrospective population study. Palmer, T et al. BMJ 2019;365:1161 *https://www.bmj.com/content/365/bmj.l1161*

40 Tailoring Immunisation Programmes. Charedi community, North LondonPHE April 2018 *https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/705096/Tailoring_Immunisatio_report_including_Protocols_and_research_appendix.pdf*

41 Childhood Vaccination Coverage Statistics - England - 2019-20. PHE NHS Digital 24/9/20 *https://app.powerbi.com/view?r=eyJrIjoiZTI3NWZhNzItMTIyZS00OWM2LTg0MzMtOGY5YTJjMGY0MjI1IiwidCI6IjUwZjYwNzFmLWJiZmUtNDAxYS04ODAzLTY3Mzc0OGU2MjllMiIsImMiOjh9*

42 Report of the SAGE working group on vaccine hesitancy. Strategic Advisory Group of Experts: Working Group on Vaccine Hesitancy. WHO 12/11/14 *https://www.thecompassforsbc.org/sbcc-tools/report-sage-working-group-vaccine-hesitancy*

43 Impact of HPV vaccine hesitancy on cervical cancer in Japan: a modelling study Simms, KT et al. Lancet Public Health 2020:5:e223-234 *https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(20)30010-4/fulltext*

44 10 Threats to Global Health 2019. WHO *https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019*

45 Measles. WHO 5/12/2019 *https://www.who.int/news-room/fact-sheets/detail/measles*

46 Immunisation coverage. WHO 15/7/2020 *https://www.who.int/news-room/fact-sheets/detail/immunization-coverage*

47 Resurgence of Measles in Europe: A Systematic Review on Parental Attitudes and Beliefs of Measles Vaccine Wilder-Smith, AB et al. J Epidemiol Glob Health 2020:10:46-58 *https://pubmed.ncbi.nlm.nih.gov/32175710/*

FIGURES

CASE STUDIES

IMPROVING VACCINE UPTAKE

The All-Party Parliamentary Group on
Vaccinations for All