COVID-19 vaccine safety - From bench to bedside

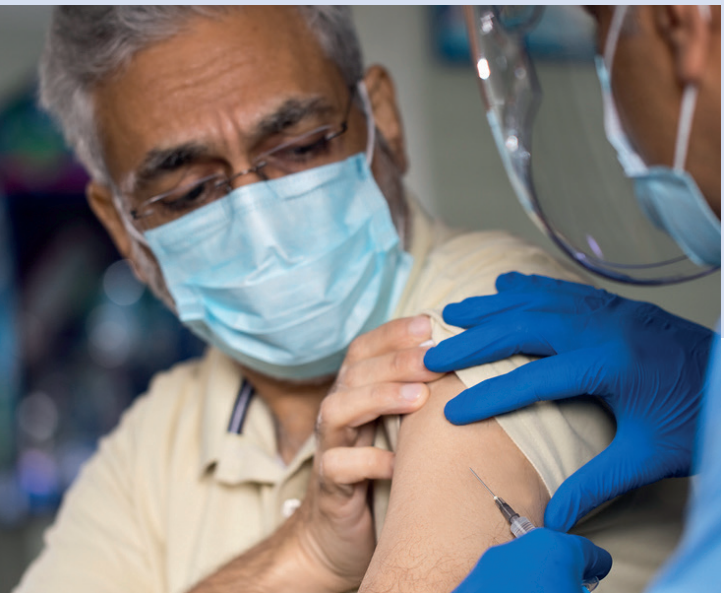
Executive Summary - May 2021

Introduction

The lightning-fast development of vaccines for the SARS-CoV-2 coronavirus has been an incredible achievement.

Within a year of the start of the pandemic a number of vaccines were developed, approved and administered to people around the world. This was possible because of decades of research on related viruses, unprecedented levels of funding that allowed companies to run multiple trials in parallel, and regulators speeding up their approval processes. However, the speed of the vaccine development process has caused some people to question their safety and has fuelled vaccine hesitancy. To combat this, healthcare professionals need to have trustworthy information to share with their patients and answer their questions.

A webinar, organised by BMJ and the Asian Development Bank explored COVID-19 vaccine safety in clinical trials, post-authorization safety methods, and risk communication. Over 1300 people registered for the webinar with 473 attendees live from 41 countries. Six key messages came out of the webinar:



> **"There is a fallacy that because one event is followed by another then it must be caused by it. We must be cautious not to presume causality because of a temporal relationship."**
>
> Dr Daniel Salmon, director of the Institute for Vaccine Safety at John Hopkins Bloomberg School of Public Health, USA

Six key messages from the webinar:

1. Cooperation and collaboration

The world was able to produce COVID-19 vaccines so quickly because researchers could build on technologies and platforms developed for SARS (Severe Acute Respiratory Syndrome) and MERS (Middle East Respiratory Syndrome) as well as earlier work on other human coronaviruses. There has also been an extraordinary level of cooperation and collaboration at a national and international level; between manufacturers and regulators, and between developers of vaccines

2. Adoption of cost risks

Governments, organisations, charities and private philanthropists gave large sums of money for the development of COVID-19 vaccines. And because they assumed the cost risk of product failure companies could gamble on starting large-scale testing and manufacturing of vaccine candidates that might not work out. The development of a new vaccine usually takes at least 15 years but for SARS-CoV-2 this process has been condensed to 10 months to 1.5 years. The extra funding allowed for parallel rather than batch processes. For example, phase 1 and phase II trials overlapped and manufacturers could scale up production before a vaccine received approval. In addition, regulators granted emergency use authorizations which permitted widespread use of vaccines while additional data was gathered. Importantly, all of the things that are normally done to ensure the safety of a vaccine were done for SARS-CoV-2 vaccines but they were done in a compressed timescale.

> **"All of the things that are normally done to ensure the safety of a vaccine were done for these SARS-CoV-2 vaccines but they were done in a compressed timescale,"**
>
> Dr Stephen Prior, microbiologist and president of Therax, Inc., USA

3. Don't presume causation because of a temporal relationship

A challenge for communication about vaccine safety is overcoming the fallacy that because one event is followed by another then it must be caused by it. In the US, for example, there are 2500 miscarriages and 3000 heart attacks every day and so it follows that some people will, by chance, experience these events in the weeks after vaccination. It is important to know the background rates of disease and to rapidly identify and follow up vaccine safety signals to determine if they are coincidental or causal.

4. The importance of active surveillance systems

Although double blind randomised trials are the gold standard for evaluating the safety and efficacy of a vaccine, they do have some limitations. Post authorisation safety monitoring can identify rare adverse events, look at subpopulations excluded from clinical trials and address emerging safety issues. Passive surveillance systems can detect signals of unanticipated events that may deserve further follow up. However there are potential biases with under-reporting, incomplete reporting or over-reporting. Active surveillance systems, such as the Vaccine Safety Datalink (VSD) in the United States, which links large healthcare databases from a number of managed care environments, can be effective at assessing a potential link between vaccines and adverse events.

5. Communicate the evidence clearly

Myths and scare stories about vaccine safety can spread rapidly via social media and word of mouth. Rare risks are often overestimated and common risks underestimated and the media tends to over-report negative information. Healthcare professionals have a key role in combating vaccine hesitancy by giving out clear factual information. Organisations such as UNICEF and the World Health Organization have excellent resources that can be used to communicate the evidence clearly.

6. Community engagement is vital

Healthcare professionals should allow people to express their anxieties and fears and then clear up any misconceptions. This can be done through meetings or by producing and distributing a list of Frequently Asked Questions which present factual information. People are more likely to be vaccinated if their healthcare professionals recommend it and set an example by having the vaccine themselves. Clear risk communication and community engagement can break the chains of transmission and mitigate the impact of the pandemic.

> **"Risk communication and community engagement can break the chains of transmission and mitigate the impact of the pandemic."**
>
> Dr Priscilla Rupali, infectious diseases physician, Christian Medical College, India

About the BMJ and ADB partnership

BMJ and the Asian Development Bank (ADB) launched the **COVID-19 (coronavirus): ADB Information Centre** to support frontline health professionals manage patients with COVID-19, its relevant differential diagnosis and common comorbidities in real-time, at the point of care.

The Information Centre provides free access to digital health tools such as clinical decision support from BMJ Best Practice, accredited e-learning courses from BMJ Learning as well as patient information leaflets and procedural videos. Evidence on COVID-19 is rapidly changing and frontline healthcare professionals can benefit from trusted, evidence-based and continually updated international guidelines.