



Vaccination Process for SAR CoV2: A Critical View

Bassols AC* and Bassols K*

Hospital Angeles del Carmen, Mexico

***Corresponding author:** Angel Carlos Bassols, Hospital Angeles del Carmen, Universidad Nacional Autonoma de Mexico, Guadalajara, Mexico, Email: acbassols@gmail.com; kbassols@gmail.com

Mini Review

Volume 4 Issue 1

Received Date: March 15, 2021

Published Date: April 01, 2021

DOI: [10.23880/oajmms-16000137](https://doi.org/10.23880/oajmms-16000137)

Mini Review

Our everyday routine has dramatically changed during the last 14 months because of the emergence of SARS-CoV-2. The World Health Organization declared the outbreak as a Public Health Emergency of International Concern, on January 30, 2020. More than two months later, on March 11, 2020 the Director-General of the WHO Dr. Tedros Adhanom Ghebreyesus declared a pandemic. The first case was reported in Wuhan City in Central China and then spread to more than 125 countries. As of March 4th, 2021 there were 119,603,761 confirmed cases of COVID-19; 2,649,722 confirmed deaths and 223 countries, areas or territories with cases worldwide, and 391.932.342 vaccine doses have been administered [1,2].

Human coronavirus were identified for the first time in the mid 60's. SARS-CoV-2 belongs to the family Coronaviridae (orden Nidovirales). The subfamily Coronavirinae is subdivided in four different genera and two of them are of medical importance. The coronaviruses that infect human populations lead to multiple diseases. Alpha coronavirus include human coronavirus (HCoV)-229E and HCoV-NL63; Beta coronavirus includes whereas HCoV-OC43, HCoV-HKU1, Severe Acute Respiratory Syndrome human coronavirus (SARS-CoV), Middle Eastern Respiratory Syndrome Coronavirus (MERS-CoV) and SARS-CoV-2 [3,4].

After WHO declared the outbreak the race to develop effective treatments and eventually a successful COVID-19 vaccine began. The virus got the attention of the most important pharmaceutical companies in the world as well as public and private research teams. The United States of America, United Kingdom, Russia, India, Japan, China, Italy, Spain, Belgium, Germany, Australia, Singapore, Israel and several other countries united their efforts to face an unprecedented crisis. The Lancet made an official announcement saying WHO had learned from the influenza A (H1N1) 2009 pandemic. They strongly suggest an equitable

access to vaccines, treatments and diagnosis promoting solidarity and health security worldwide. In a combined effort GAVI, the Coalition for Epidemic Preparedness Innovation and WHO, developed COVAX to manufacture, distribute and deliver vaccines, making them available for every country. The aim of the project is to have access to 2000 million vaccine doses for 2021-2022. However, this only represents the 20% of the vaccines needed for the members of the initiative and most of the low-income and middle-income countries are still having trouble accessing vaccines, getting enough supplies to treat for COVID-19 and vaccinating their populations [5,6].

Aside from the production and logistic problems relating to an efficient COVID-19 vaccine, there are several open questions relating SARS-CoV2. For instance, how long will the vaccine be protective especially because RNA viruses as SARS-CoV2 generally have a high mutation rate?. In addition, the high transmission rate, evidence of asymptomatic carriers and documented events of long-term sequelae in cases of mild disease. In an unprecedented time the scientific community has developed over 300 vaccine projects and more than 40 of them are in clinical trials. At the moment there are several different strategies: vaccines based on attenuated SARS-CoV-2 viruses, vaccines based on the inactivated SARS-CoV-2 viruses, vaccines based on SARS-CoV-2 proteins, Naked DNA-based vaccines, mRNA-based vaccines, Vaccines based on viral vectors, and a few other research technological platforms like orally administered Bifidobacterium probiotic to administer the Spike protein, heat-inactivated plasma from donors with COVID-19 and patient's dendritic cells modified to express SARS-CoV-2 antigens and proteins [7].

There are two types of SARS-CoV2 vaccines approved for emergency use. The first one is mRNA technology and lipid nanoparticle delivery systems like Pfizer and Moderna which

achieved 90-95% efficacy in protecting against COVID-19. The second type is adenovirus vector systems like formulations from AstraZeneca, Johnson and Johnson and the Gamaleya Research Institute of Epidemiological and Microbiology which achieved a protection between 70-91%. Both Vaccines types require two doses spaced by three or four weeks. The second dose has a higher probability of mild to moderate side effects [8]. On December 31st, 2020 WHO listed Pfizer COVID-19 vaccine (BNT162b2) for emergency use being the first vaccine to be used worldwide. The U.S. Food and Drug Administration and the European Medicines Agency approved COVID-19 vaccine Moderna and Janssen COVID-19 Vaccine in February 2021. In addition, other vaccines have been used after being approved by their national agencies. Some examples are Cansino, Sinopharm and Sinovac. There has been a close scrutiny over COVID-19 vaccines safety for early detection of any side effects or unforeseen allergic reactions [9-16].

WHO has promoted health as a universal human right. This means guaranteeing vaccination for SARS-CoV2 for every single person in the world. However, around 1% of the human populations have severe allergic reactions that could prevent them from getting a vaccine. The CDC has issued a protocol stating when the vaccine should be avoided, it is really important for health care staff to be aware of this high risk population [17].

A remarkable consideration is the possibility of experiencing a severe allergic reaction (anaphylaxis) to any component of the vaccine. Another complication is developing severe allergic reactions after a dose of any COVID-19 vaccine (the most common allergen is polyethylene glycol) or any milder reactions like fever, muscle pain, fatigue or headache. At the moment, there is limited data of SARS-CoV2 vaccines for people who are pregnant, breastfeeding or children. However, studies of animals vaccinated before or during pregnancy with Moderna, Pfizer-BioNTech, or Johnson & Johnson's Janssen COVID-19 vaccine reported no safety concerns [18,19].

Dror AA, et al. [20] published a study about the hesitancy to get a vaccine among healthcare workers. The research showed how people in the frontline were more willing to get the vaccine than medical workers not caring for SARS-CoV-2 positive cases. This highlights the importance of educational campaigns to avoid misinformation leading reluctance to vaccinate and promote high inoculation rates [20].

On March 15, 2021 health authorities of nine European Countries (the Netherlands, Ireland, Denmark, Norway, France, Germany, Bulgaria, Austria, Latvia and Iceland) suspended, delayed or limited rollout of AstraZeneca

vaccine. The Italian Medicines Agency (AIFA) banned a batch of the same vaccine. The main concern is an increased rate of thromboembolic events. However, there are 30 cases reported in the European Economic Area after nearly 5 million people were vaccinated (less than the number that might be expected to happen naturally). The European Medicines Agency reported on March 11, 2021 that the vaccine's benefits continue to outweigh its risks [21-24].

Research has shown that up to a third of the world population around the world avoid vaccines on different basis the most frequent are fear, faith-based restrictions or a negative perception towards vaccines. WHO has issued a guide to help communities adapt and preserve spiritual health while observing proper social distancing during the pandemic.

Practical considerations and recommendations for religious leaders and faith-based communities in the context of COVID-19. 2020. Interim guidance. WHO/2019-nCoV/Religious_Leaders/2020.1.

It is particularly important to ensure protection for vulnerable population groups for COVID-19. Cancer patients are of special interest due to the negative life quality effects during the pandemic. Reduced capacity of hospital facilities lockdowns and even fear of visiting a hospital lead to suboptimal cancer care. People with active malignancies, lung cancer, and hematological malignancies, on chemotherapy treatment, immunotherapy or a mixed treatment are more susceptible to a fatal outcome of COVID-19 [25].

COVID-19 pandemic has made evident the disproportionate effect this health crisis is having worldwide. Vulnerable populations from low-income and middle-income countries are among the highest mortalities in the world. This situation reflects on the viewpoints and expectations of the inhabitants of each country. In an interview with a grave digger from Mexico City, he declared: "In my opinion, the best vaccine in the world is the one that is available for me". That contrasts with the more rigorous comment of the senior reporter for Nature, Heidi Ledford comparing vaccines efficiency. She said "any effort to classify vaccines must take into account not only their effectiveness, costs, the logistics to achieve their implementation, their durability (protection in months) and their ability to continue being useful even with strains emerging virals" [26].

If we want to address this pandemic efficiently we need to ensure equitable access to vaccines, therapeutics and diagnosis. Otherwise the high transmissibility rates, presence of asymptomatic carriers and emergence of new variants will continue to have a prolonged effect on the global population.

References

1. WHO Coronavirus (COVID-19) Dashboard. World Health Organization.
2. <https://www.who.int/dg/election/cv-tedros-es.pdf>
3. (2020) Health personnel: Mexico Central COVID-19. Gobierno De Mexico.
4. Ganesh B, Rajakumar T, Malathi M, Manikandan N, Nagaraj J et al. (2021) Epidemiology and pathobiology of SARS-CoV-2 (COVID-19) in comparison with SARS, MERS: An updated overview of current knowledge and future perspectives. *Clin Epidemiol Glob Health* 10: 100694.
5. (2020) First COVID-19 COVAX vaccine doses administered in Africa. World Health Organization.
6. (2021) Urgent needs of low-income and middle-income countries for COVID-19 vaccines and therapeutics Lancet Commission on COVID-19 Vaccines and Therapeutics Task Force Members. *Lancet* 397(10274):562-564
7. Forni G, Mantovani A (2021) COVID-19 vaccines: where we stand and challenges ahead. *Cell Death Differ* 28: 626-639.
8. Teijaro JR, Farber DL (2021) COVID-19 vaccines: modes of immune activation and future challenges. *Nat Rev Immunol*.
9. (2021) Provisional recommendations for using the COVID-19 vaccine produced by Pfizer and BioNTech, BNT162b2, within the framework of the emergency use. World Health Organization list.
10. Summary of Product Characteristics. Annex I, pp: 1-34.
11. (2021) Vaccines authorised in the European Union (EU) to prevent COVID-19. European Medicines Agency.
12. Comirnaty (COVID-19 mRNA vaccine [nucleoside modified]). European Medicines Agency, pp: 1-4.
13. Wibawa T (2021) COVID-19 vaccine research and development: ethical issues. *Tropical Medicine and International Health* 26(1): 14-19.
14. Interim Clinical Considerations for Use of COVID-19 Vaccines Currently Authorized in the United States. Centers for Disease Control and Prevention.
15. Kesselheim A, Darrow J, Kulldorff M, Brown BL, Mitra-Majumdar M, et al. (2020) An Overview of Vaccine Development, Approval, and Regulation, With Implications For COVID-19. *Health Affairs* 40(1).
16. Held S (2021) Two COVID-19 vaccines approved in China in less than 24 hour. *BioWorld*.
17. When talking to your patients about COVID-19 vaccines make a strong, effective recommendation and allow time for them to ask questions. Hearing your answers may help them feel more confident about getting vaccinated.
18. <https://www.cdc.gov/coronavirus/2019ncov/vaccines/recommendations/pregnancy.html>
19. Der Veldt AAM V, Oosting SF, Dingemans AMC (2021) COVID-19 vaccination: the VOICE for patients with cancer. *Nat Med*.
20. Dror AA, Eisenbach N, Taiber S, Morozov NG, Mizrahi M (2021) Vaccine hesitancy: the next challenge in the fight against COVID-19. *Eur J Epidemiol* 35: 775-779.
21. COVID-19 Vaccine AstraZeneca: PRAC investigating cases of thromboembolic events-vaccine's benefits currently still outweigh risks-Update. European Medicines Agency.
22. Covid: What is the Oxford-AstraZeneca vaccine?. *BBC News*.
23. France and Germany Pause Use of AstraZeneca's COVID-19 Vaccine. *npr*.
24. (2021) Italy, along with France and Germany, suspends the use of the AstraZeneca vaccine temporarily and as a precaution. *ABC Society*.
25. (2021) Elias Camhaji. *El País newspaper*
26. Ledford H (2021) Why Covid vaccines are so difficult to compare. *Nature* 591: 16-17.

