

COVID-19 crisis - Exit strategy: Part 1- Exploring pathways of Vaccination

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Vaccination group all over the globe made a strong coordinated effort to put an end to the current COVID-19 crisis. Since vaccination started first in the UK on 8th December, we have sufficient data to analyse some results. Critical and open analyses, balanced discussion in the current crucial state is desperately needed. Questioning, debating and criticism are always the basis of good science and the main pillars to its advancement. With that objective in mind, it is an effort to explore areas relating to the effectiveness of COVID-19 vaccine. Policymakers will be greatly benefitted out of such analyses.

Some analyses on effects of Lockdown vs. Vaccination vs. Seasonality

In winter, many countries showed a sudden surge. After the imposition of lockdown, surges are likely to be reduced. Moreover, different countries started vaccination at different time of the winter; some started early winter e.g. UK (8th December, [1]) whereas, some started late e.g. South Africa (17th February, [2]). It is beneficial to study effects of Vaccination vs. Lockdown vs. Seasonality in various countries.

For UK and Israel, the 2nd peak was much stronger than the first one (Fig.1). For both countries, the second peak occurred after vaccination started. South Africa did not start vaccination till 17th February, but the 2nd wave peaked same time with the UK and Israel (around mid-January). Not only that but also the 2nd wave was **falling much faster than UK and Israel** (Fig. 1).

The UK had much higher vaccination than any other EU countries. Also, the UK showed the highest daily Deaths than any other EU countries [3, see 7-day average till 28th February]. UK had a strict lockdown and as expected Death is decreasing in late winter (Fig. 2).

A success story on vaccination in Israel attracted global attention [4]. However, a study [5] authored by Dr Hervé Seligmann, a scientist from the Faculty of Medicine, Aix-Marseille University, France who is of Israeli-Luxembourg nationality rejected the success story that claimed Israel could be a role model. That study raised issues towards unsubstantiated claims and biased analyses and suggested a mismatch between data published by authorities to that with the observed reality. It explored how after vaccination started, the overall outcome of the health situation in Israel deteriorated in various respects.

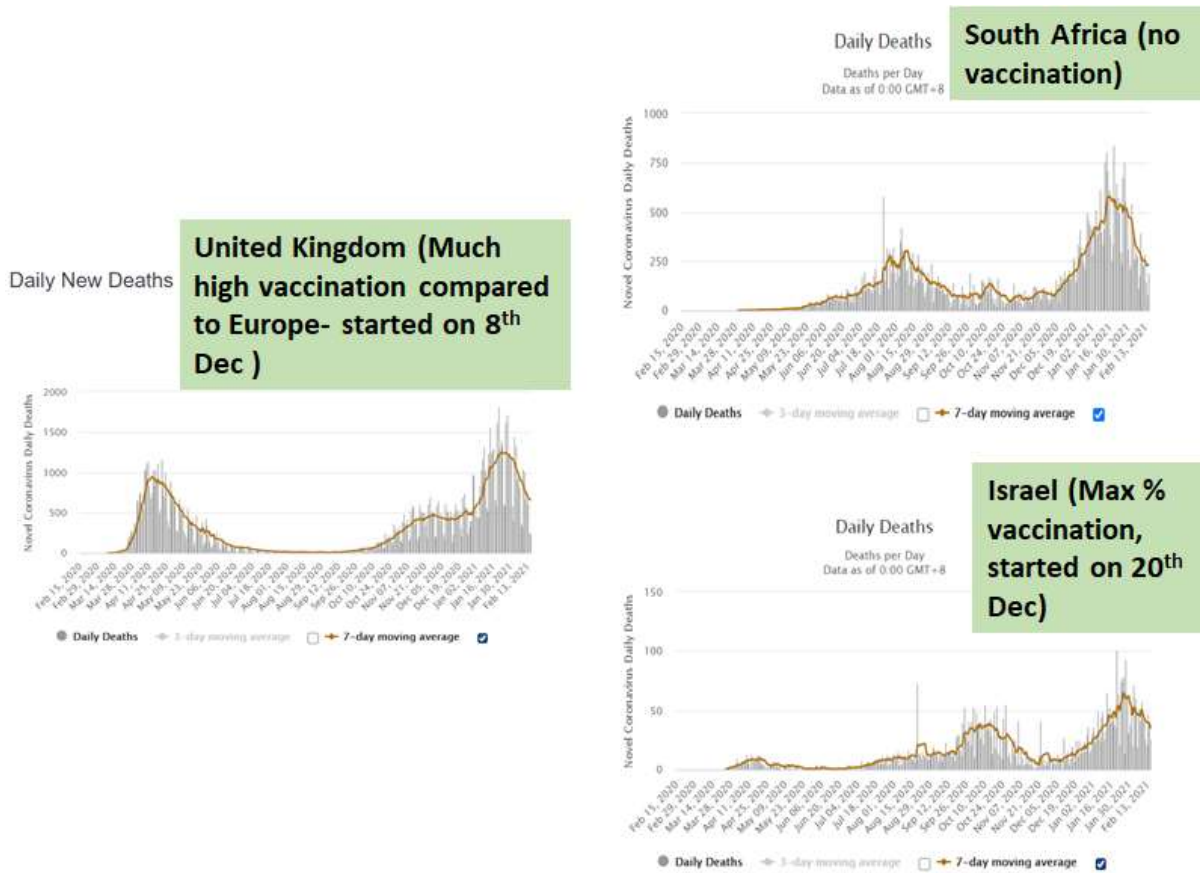
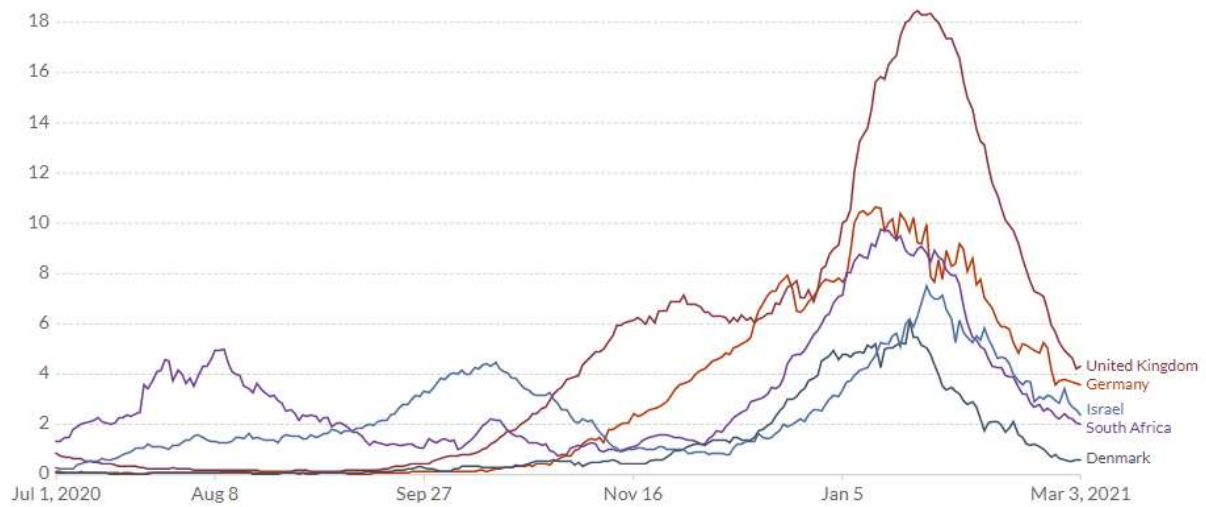


Fig. 1: Daily new Deaths for UK, Israel and South Africa before South Africa started the vaccination programme (on 17/02). Seven-day moving average is marked by thick line. (<https://www.worldometers.info/coronavirus/country/>, accessed on 17/02/2021)

a)



b)

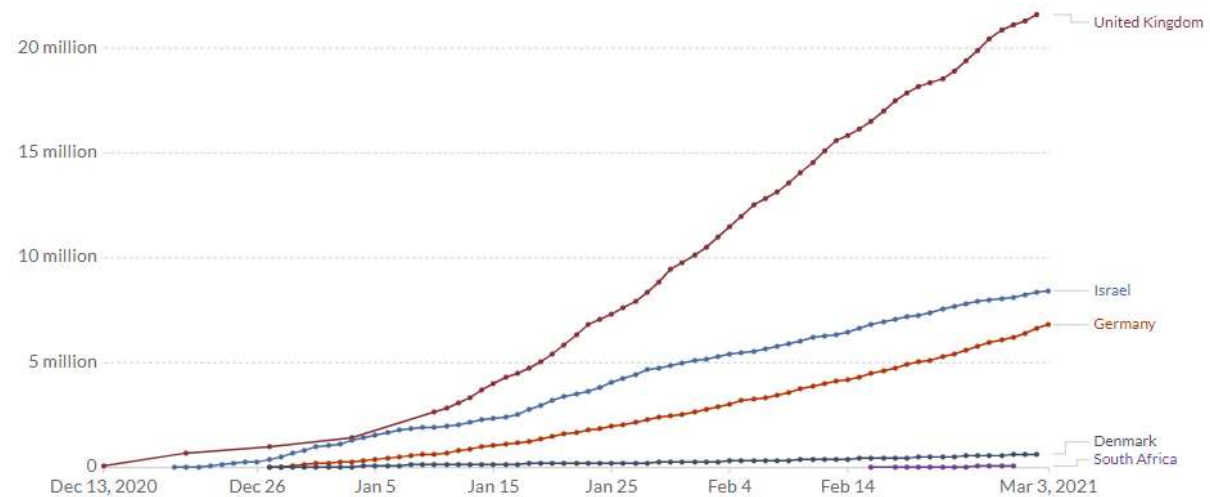


Fig.2. Deaths of Covid-19 and Vaccination data of few selective countries, where Deaths peaked in winter. a) Daily new confirmed Deaths per million in rolling 7-day average, b) cumulative COVID vaccination dose. Israel and UK had highest vaccination though daily Deaths are still higher at the beginning of March. South Africa practically did have nominal vaccination, but the daily Death though peaked higher than Israel but falling at a much faster pace and now even lower than Israel. [Source: <https://ourworldindata.org/coronavirus-data-explorer>].

UAE had much high vaccination and it started on 14th Dec [6]. Some days after the start of vaccination, there is a very steep rise in Cases and thereafter a steep rise in Deaths (Fig.3). Death is still on the rise till 3rd March 2021 and the current wave is much stronger than previous waves.

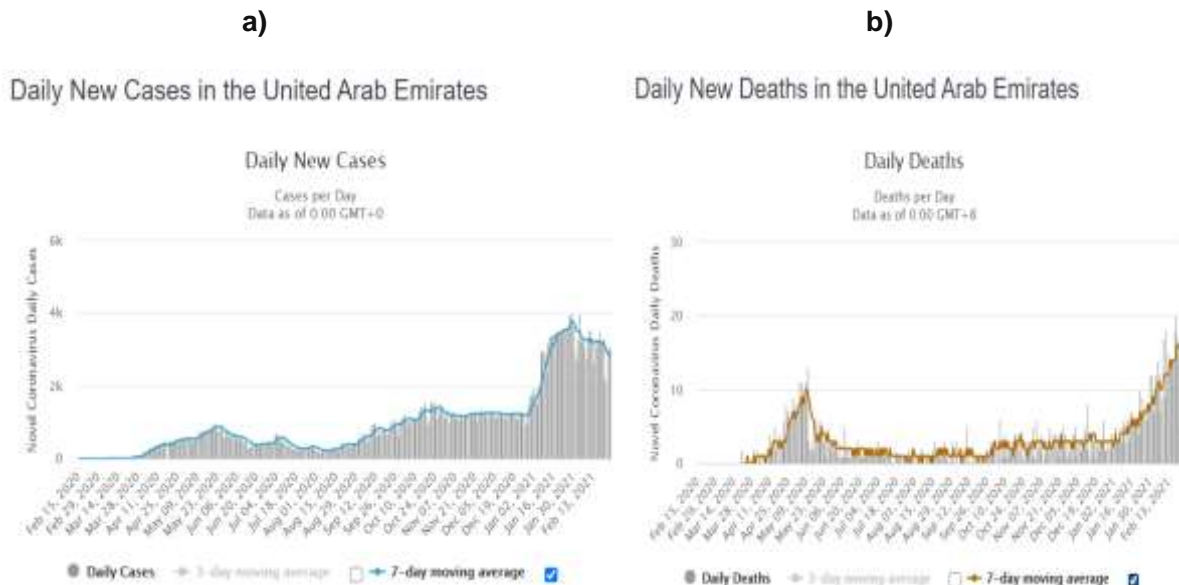


Fig.3. Daily new Cases (a) and Deaths (b) for the United Arab Emirates (UAE). Seven-day moving average are marked by coloured thick line. Vaccination programme started on 14th December [6]. (Source: <https://www.worldometers.info/coronavirus/country/ united-arab-emirates/>)

A highly populated country India was having a steady decrease for five months. India did not have any lockdown. Though neighbouring countries Pakistan and Bangladesh experienced the 2nd wave this winter but India did not. India passed major festive seasons where social distancing was very difficult to be maintained, still cases and deaths continued to decline. Vaccination started on 16th January and from around 16th February, India started showing a rise in cases [2]. For Brazil, vaccination started at mid-January and a steady rise in cases is observed since mid-February [2]. Even for the UK and Israel, where massive vaccination took place, the total deaths in the last three months after vaccination now reached the overall death of the past 10 months before vaccination [2]. Globally, the cases started increasing after five weeks of a steady decline [3, data accessed on 18/03/2021] and coincidentally, the period of rise matches when major vaccination programme was initiated worldwide. The rise in global cases is happening even when most of the highly vulnerable (in winter) countries of the EU and north America started showing a decline in Cases and Deaths during late winter, most likely due to seasonal effect and lockdown.

Thus, it could be of interest to check which country showed a decrease after the vaccination started, eliminating the effect of lockdown and seasonality.

Importance of healthy Peer-review and service to Humanity

Constructive criticism, healthy peer-review are always the pillars of good science, which became more important when lives of billions of people are involved. In relation to the openness of the peer-review system, peer review report and clinical trial experiment procedure should be publicly disclosed. People need to see the report, how the trials were conducted, whether the data and interpretations were biased or not etc. An ongoing rigorous open review process is very necessary and queries need to be answered and resolved publicly.

Experts, scientists raised various sensible questions on several platforms e.g., questions on mRNA technique, the trial process for understanding medium and long-term effects etc. among others. Those are very important steps and need to have complied when millions of people are vaccinated on a regular basis. Even for short term adverse effect, recent data raised questions [7] e.g., in the United States, a total of 1136 individuals have died till 26th February after receiving mRNA vaccines for COVID-19. A total of 587 (51.7 percent) died within a week; among who died, 94 (8.3 percent) died on the same day, 150 (13.2 percent) died the day after, 105 died 2 days after, and 68 within 3 days [7,8]. Authorities say Deaths are unrelated to the vaccine [8].

It is pointed out that COVID-19 vaccine trials and 'studies seem designed to answer the easiest question in the least amount of time, not the most clinically relevant questions' [9]. Studies also discussed that current trials aren't designed to tell whether covid-19 vaccines can save lives [10]. In the end, it should not be the media who will control and lead science. It should not be the money and power that can influence ethics and the scientific process. Fabricated analyses and biased results should not be on the headline in everyday news whereas many important research/analyses will be suppressed. Those areas need to be addressed and brought to the knowledge of respective authorities in various steps of decision making. With fixed world resources, the proposition of vaccinating billions and billions of people in every six months times raises a simple question, whether such an effort is worth it and essential. The direct and indirect cost of that strategy needs attention so as the effectiveness of such a strategy.

Healthy open peer-review from qualified scientists and experts from various disciplines are likely to dismantle many unsorted puzzles and now urgently required. It is such an important step and enough scrutiny in every step is indeed expected.

As there are huge vested interests involved for vaccine and allied businesses, ethics and integrity should not be compromised in that novel goal of saving humanity. One proposition in that direction could be producing and distributing vaccine on a **not-for-profit basis**. It could be very welcoming coordinated initiatives from all vaccine groups and will be highly appreciated and valued.

How can a sensible person sit idle without exploring the truth and refrain from offering services to humanity where so many lives and livelihoods are involved?

Similarities between Influenza and COVID-19

There are still not any vaccines for many diseases, e.g. AIDS etc. Hence a balanced media coverage, focus on varied medical research or remedy on COVID-19 other than the vaccine is equally important.

Every winter, tens of thousands of people die in the UK, Europe and northern America from Influenza (Flu), a virus borne respiratory disease. Centers for Disease Control and Prevention (CDC) estimated 61,000 deaths in the United States during 2017–2018 from influenza, which was higher than any season since 2009 [11]. At the beginning of every winter, people mainly from old and vulnerable groups are vaccinated against Flu virus; but still, it is not yet been possible to eradicate Flu. On the contrary, it became more powerful and destructive in later years. The main reason is that the virus is mutating over time and space. Hence question arises could it be similar for COVID-19? There are many similarities between these two virus-borne respiratory diseases COVID-19 and Flu.

Few resemblances noted from the web [12]: 'Flu season occurs in the fall and winter. In the U.S., that means October-March, and in the southern hemisphere, June-September. Although the reason for this seasonality is not entirely understood, influenza virus has been shown to survive longer at low temperatures and low humidity. Other suggested explanations include weakened host immunity due to decreased sunlight and vitamin D and increased exposure to the virus due to indoor cohabitation in the winter.'

Other relevant facts and observations:

- Both the viruses are mutating over time and space. Many new strains of COVID-19 are emerging over time [13]. Since the first vaccine came up only in December 2020, many new variants are already detected in the next three months which are ineffective to the vaccine [14].
- There are many dissimilarities between COVID-19 with other vaccines (polio, smallpox etc.) too; e.g., unlike other vaccines, if people are vaccinated for COVID-19, they still can get the disease and can transmit it.
- Like Flu, during summer the situation improved in Europe and North America. Last summer, in Europe, deaths from COVID-19 were practically nil without any vaccine.

People vaccinated in March 2021 for COVID-19, will require to be vaccinated again after six months i.e., before the next winter. This is because, the immunity to the disease is expected to reduce after six months [15]. Whether the same vaccine will work or not that time will be another issue. Following our past experience with the Flu vaccine, it can be speculated easily.

There could be a relevance to this discussion to **Flu vaccine ineffectiveness in excess of 50,100 deaths in the UK and EU in 2017-18** [16]. Deaths were highest in more than 40 years though many vaccines were evolved and modified during that last 40 years. 'The Office for National Statistics said **flu and the ineffectiveness of the flu vaccine were key reasons for the rise of excess winter deaths in 2017-18**' [16]. Even for 2016, the rise in deaths in England and Wales for the previous 12 years, was attributed to the failure to provide an effective Flu vaccine, government's public health agency had admitted [17]. Those records indicated how poorly Flu vaccines performed in recent periods compared to the past.

New Variants and Fast Mutation

An inspiring initiative was taken to develop a COVID-19 virus mutation tracker, which is immensely beneficial to monitor the progression of mutated variants [13,18]. It gives an idea of how rapidly it can mutate over temporal and spatial scales. The fingerprints reveal the route of virus transmission so as timelines of different mutations (Fig. 4). For UK, till 03/03/21 the number of unique variants identified as 11,098, of which local variants 10,7038 and foreign variants 3,066 [13].

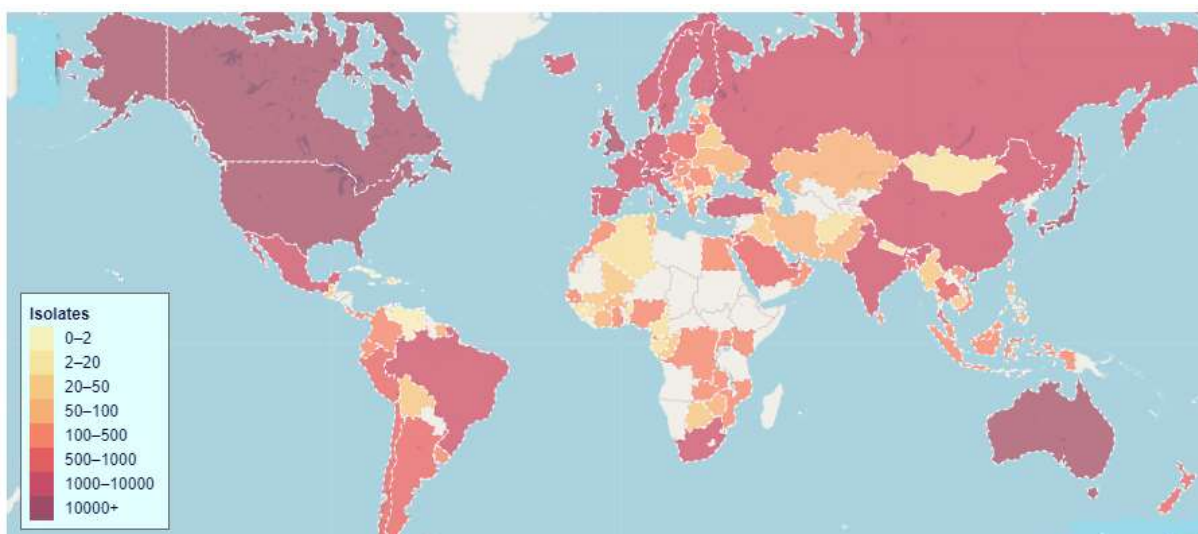


Fig. 4. COVID-19 virus genome isolates from patients are being regularly sequenced worldwide and continuously updated; for each sample, there is an accession number. The spatial distribution patterns are presented here. [<https://www.cbrc.kaust.edu.sa/covmt/>, Accessed on 03/03/2021].

Vaccines themselves can also drive viral mutations [19] and hence COVID-19 vaccines can add fuel to the evolution of mutation of Coronavirus. Professor Paul Bieniasz from Rockefeller University, USA, expressed his concern that the time between initial vaccination and the time of second shot to maximize the immune response might serve as a sort of breeding ground for the virus to acquire new mutations [19]. It may explain why there is a surge in cases globally after the vaccination started. Such analyses may raise major worries for developing countries like India and most countries of African continents where deaths per million were practically very less in comparison to developed countries. A highly populated country India was about to control the disease without any vaccine or lockdown, but since the middle of February (vaccination started on 16th January, [2]) was showing a surge in transmission, raising concerns.

Seasonality and COVID-19

Seasonal effects should be considered very important for the transmission of COVID-19. That area of seasonality is surprisingly overlooked by the scientific community, though the effect was very evident throughout [20, 21].

Then the question is why? Is it because of the experience with the Seasonal Flu Vaccine?

Competing Interest Statement:

This study did not receive any funding and there is no financial interest. This analysis was first submitted to Nature journal on 9th March 2021.

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