

# Can the World Be Vaccinated in Time?

by David Shavin

March 6—There are around 5.65 billion people in the world who are 16 years old or older, and so are eligible for the types of COVID-19 vaccines that are being developed. According to calculations by Bloomberg News, there are currently 130 vaccine contracts worldwide, between nations and manufacturers, for a total of 9.6 billion vaccine doses. That would cover almost 5 billion people if properly distributed. (Almost all are two-dose vaccines.)

However, Bloomberg's calculation needs to be adjusted. For example, China is listed for only about 440 million doses for their population, and, as of March 2, they now plan to produce in 2021 at least another 1.4 billion doses (and possibly another 1.6 billion above that). So, there are optimistic reasons for thinking that there are at least about 11 billion doses planned for production, almost all in 2021. What would count against this estimate would be any contracts that fell through due to a vaccine failing medical trials, or serious delays in development of a particular vaccine. But, hedging against that, production estimates themselves have been rising over the last couple of months as new factories open and production line techniques are mastered.

Serious vaccine campaigns would need to get 70-80% of the eligible populations to roll up their sleeves, in order to achieve a "herd immunity" level, sufficient to put the coronavirus back on its heels. That translates to around 4-4.5 billion vaccinations, or around 8-9 billion doses. So, the production process is in the right ballpark if 9 billion of the 11 billion or so planned doses are produced this year.

## Problem: Unequal Distribution

Vaccine doses have not been contracted equitably around the world. Western Europe, New Zealand, Canada and Australia have contracts for vaccines that cover anywhere from 230 to 340% of their respective populations. This is even larger over-coverage than it seems: These countries' population figures include the youth from birth to 15 years of age who are not receiving



Russian Defense Ministry

*Military personnel and civilian specialists of Russia's Northern Fleet are getting their second component of Russia's COVID-19 vaccine, January 15, 2021.*

these vaccines. Countries generally have around 20-25% of their population under 16 years of age, so covering 75-80% of the population is full vaccine coverage. Canada and the UK top the list above, at 335% and 340% of their populations. The EU countries are all figured at 231% of their populations. Of course, the EU has been late in securing contracts, making those countries presently seriously behind in the rollout of vaccines.

Then there is a group of countries that planned out their contracts in some suitable proportion to their population, with levels of coverage ranging from 110% to 138% of their population. It includes Mexico, the United States, Malaysia, Uzbekistan, South Korea, Japan and Israel. However, the United States broke from that plan in January when the Biden administration decided to contract an extra 200 million doses from Pfizer and Moderna, pushing America to the level of 197%. This had nothing to do with any unclarity as to whether the existing contracts would actually deliver on time—they are doing so.

At the time this strange decision was made, the U.S.'s Operation Warp Speed program had already secured enough doses—all deliverable before the end of June—to cover 300 million people—90% of the total population; 115% of the eligible population; and about 150% of all Americans likely to accept a shot.



CGTN

*First shipment of Chinese-produced COVID-19 vaccine leaves Beijing, for Hungary, February 16, 2021.*

A third group of countries, in the 70-85% coverage range, can be considered to be on the edge. This includes Argentina, 70%; Colombia, 73%; Brazil, 76%; and India, 85%. If all their contracts come through, they could certainly reach a level of 70-80% of their population being vaccinated. India's figure is a bit deceptive, as they will be *producing* around 2.25 billion doses of the world's COVID-19 vaccines this year—around double what they need. So, they know they can cover their population, and the 85% figure reflects that they've only contracted for the portion that they need, exporting all the rest.

China is listed by Bloomberg's contract count as only covering 16% of their population, or 220 million people. But their testing, tracking and isolating program, for the most part, has kept the coronavirus out of the country, greatly reducing internal need for vaccination. The fifty million doses distributed so far have been highly targeted—some for health care workers, but primarily for those employed at the points of entry into the country. That includes employees at international airports or rail terminals and those handling products, especially frozen food products, that arrive at their port facilities.

Regardless, on March 2, China decided it would not be socially responsible to avoid working for herd immunity. If a neighbor, such as India or some Southeast Asia countries, made the effort to achieve herd immunity and China didn't, they themselves, at some point, would become a potential threat to their neighbors. So, to join the countries planning to achieve herd immunity, a centralized decision was made to vaccinate 890 million more Chinese this year, requiring almost 1.8 billion more doses, and achieving a minimal herd immunity

level. China simultaneously committed to ramp up production to 3.5 billion doses in 2021, so they have no supply concerns and are able to export to others.

Russia is listed for 55% of their population, or 80 million people, but they pretty much control their own destiny. The early deployment of their Sputnik V vaccine has shown very high levels of efficacy. The big issue in Russia will be how high the acceptance level—the percentage of people who volunteer to roll up their sleeves for the vaccine—can reach. Russia has limited production capacity, but enough presently to cover 70% of their eligible population.

Current polls indicate that authorities will be fortunate to get that many to take the vaccine.

### **Much of the World Faces a Big Delay**

Most of the rest of the world is in clearly identifiable trouble, certainly until the over-contracted countries decide to allocate some of their future deliveries to them. Almost all of Africa is presently listed at the 5% level, but a different story emerges from examining the activity of the African Union. Africa has 1.3 billion people, but a very high portion, 41%, are youth under 15 years of age; so they need to deal with around 750 million eligibles who would require around 1.5 billion doses at two apiece. Of the 1.5 billion doses, a 70-80% vaccination rate would require 1.05 to 1.2 billion doses. COVAX, the World Health Organization-associated program, has promised 600 million doses in 2021.

Importantly, the African Union has, separately, arranged for 570 million doses of vaccine—300 million of Sputnik V and a combined 270 million from AstraZeneca, Pfizer and Johnson & Johnson. This would equip Africa with a total of 1.17 billion doses, an amount putting them in the proper range for herd immunity. The problem is that Africa has been pushed near the back of the line. The reality is that a significant proportion of the COVAX vaccines won't be available until the oversubscribed countries turn them loose.

The orientation of COVAX is to deliver to over ninety countries around the world a total of two billion doses in 2021—but only about 500 million doses by June. Africa's portion of 600 million would be about 150 million doses by June, and 450 million doses by the end of the



USANG/John Linzmeier

*U.S. National Guardsmen at Joint Base Pearl Harbor-Hickam, Hawaii loading U.S.-produced COVID-19 vaccination kits onto a C-17 Globemaster III transport aircraft, January 5, 2021.*

year. COVAX's priority, in 2021, is trying to get a selected 20% of the populations in these countries covered (e.g., health care workers and the most-at-risk in the population). The African Union stepped in to address the gap.

### Rate of Distribution Is Key

The SARS-CoV-2 virus is not a respecter of production capacities or boundaries. The key is that the vaccination rate must outpace the rate of creation of new variant strains. And the distribution of vaccines cannot proceed at the present, greatly uneven levels without raising the risk of new variant strains that can undermine *previous* vaccinations.

These are not rules to be negotiated. Viruses constantly undergo mutations. A recent study in India showed around 20,000 different mutations and over 7,000 variant strains, nationwide. About 60 or so "strains of interest" were identified as possibly involved in the recent rise in new COVID-19 cases in the state of Maharashtra. Most mutations don't substantially strengthen or weaken the virus in its assault on humanity. However, some combinations of mutations can result in a new strain of the virus, which can reduce the



CC/IMF/James Oatway

*A nurse dons her personal protective equipment at a COVID-19 field hospital in Nasrec, Johannesburg, South Africa, July 24, 2020.*

efficacy of the present vaccines, or even require an alteration in vaccines—similar to what happens annually with the flu vaccine.

There is a real danger in initiating a vaccine assault on the virus but proceeding in a "set-piece" fashion. What is required is an all-out war, everywhere and rapidly. Cleaning out one area at a time risks rewarding certain viral strains that are more prone to circumventing the vaccine, resulting in a much stronger enemy. And rolling out the vaccine too slowly gives the virus pool that much more time and opportunity to mutate, also raising the risk of something much more unmanageable coming on the scene.

So, the present model of well-meaning countries, first taking care of business at home, and then feeling safe enough to help their neighbors, actually raises the risk to

the country that thought it had secured itself against the virus. A strategic deployment of vaccines aimed at identifiable transmission avenues of the virus in all countries at once, makes the most sense.

Of the 11 billion or so doses to be dispensed of currently designed vaccines, only about 300 million have found arms so far, with about 97% yet to go. So, proper adjustments can be made in the rollout, if the will to do so be found.

The quickest rollouts so far, measured in terms of doses/population, are Israel, .94; the UAE, .58; the UK, .33; the US, .25; Serbia, .22; and Chile, .21. Most of Western Europe is in the range of .08 to .10. What does this measurement mean? Remember that 2.0 represents two injections for everyone. And if one estimates that 25% of the population are the ineligible youth, then 1.5 would represent covering all eligibles with two doses apiece; and 1.2, about 80% of the eligible, for "herd immunity."

Only 7 of Africa's 55 countries have vaccinated at all, and six of them are at miniscule levels of less than .01. (Morocco is the exception at .12.) Presently, Africa is scheduled to receive about 150 million doses, most likely in May and June. This

would translate into 75 million people, or about 10% of their eligibles, vaccinated by sometime in July. *This is an international problem.*

It is not as a favor to Africa that that situation be changed. To actually do a favor for Africa, infectious diseases ten times more deadly than COVID-19 would need be conquered. The continent suffers deaths from lower respiratory infections (pneumonia and tuberculosis), diarrheal diseases, and malaria over forty times greater than anything so far measured from COVID-19. Africa has somewhat over 100,000 official COVID-19 deaths, compared with 4-5 million deaths/year from the other three. (Further, Ebola and bubonic plague have reappeared in parts of Africa in the last month.) Clean water, refrigerators and insect eradication—all technologies long known to mankind—would represent a favor for Africa. But getting COVID-19 vaccines to Africa is a favor for the rest of the world, helping to pre-empt variant strains of the coronavirus.

### **An American Mission**

The United States has the largest rollout so far, with around 100 million vaccinations, now at a rate of around 2.5 million/day. In the last three weeks of March, it is expected that another 135 million doses will be made available—enabling, and requiring, a distribution of about six million/day! By the end of April, the country should reach a total of around 290 million doses of the Pfizer and Moderna vaccines and 40 million of the one-dose Johnson & Johnson vaccine. We will be fortunate to get 70-80%, or 182-208 million, of the 260 million adults in the country to roll up their sleeves—and those people should all have their first shots in April, with over half of them having received their second shot.

With around 100 million more doses coming in May, the only real question is, at what point does the country regain its heart and soul, by reaching out to other parts of the world with our vaccines to conquer this virus, and all its nasty variants?

The massive commitment of the United States, inaugurated in April, 2020, to launch the crash program “Operation Warp Speed” to develop a range of new vaccines against COVID-19, was a welcome dash of boldness and sanity, reviving memories of the 1960’s Gemini and Apollo programs. The results, in historic



*A COVID-19 testing center in Madagascar, March 31, 2020.*

World Bank/Henitsoa Rafalia

terms, have been incredible. Eight vaccines, representing four different types of vaccines, are being pushed forward. Three of them, Pfizer, Moderna and Johnson & Johnson, are already deployed, by far in record time. The first two have efficacies of around 95% and represent advances in the messenger RNA modality (mRNA vaccines). Among other things, such vaccines can cut the time in adjusting to new virus strains, from at least six months to as little as six weeks.

It would be a true shame if this mobilization of science and industry is not recognized for what it is, and for what it can do. Such a revitalized capacity must not be demobilized, as was done at the end of World War II. Then, the United States’ unprecedented military mobilization could have been carried over, postwar, into a massive economic mobilization for the world. Presently, China has adopted that “American” approach with their series of Belt and Road projects. The thinking that conquers poverty can conquer disease. The United States’ quickest pathway to becoming great again is to join with China in conquering poverty and disease.

There are problems in the world, such as viruses that mutate, sometimes in ways that threaten human life. There are rocks in space that largely pass by without doing harm, but could be disastrous. The challenge is to figure out what advance in human science and practice is sufficient to solve such problems. Not doing so leaves a culture, as Gottfried Leibniz put it, with a very mean notion of their Creator. If such challenges to the human race come upon us, let us discover, in the process of meeting the challenge, powers and capabilities that we didn’t know, or doubted, that we had.