MORNING BRIEFING
January 27, 2021

The Road to Victory

(1) Victory over the virus may not require full herd immunity. (2) Widespread immunity of just the herd's most essential and vulnerable equates to 230 million doses of vaccine, half as much as required for full herd immunity. (3) Looking at vaccine supply/distribution/administration logistics, we estimate the virus could go from plague to pest by summer 2021. (4) We think investors are right to assume that Biden's strategic goals to fight the virus can be met. (5) But much still could go wrong to derail the optimism. (6) Virus mutations might represent the biggest threat.

Epidemiology I: 460 Million or 230 Million Doses for Victory? According to many epidemiologists, it would take Covid-19 immunity of at least 70% of the US population of 328 million to achieve "herd immunity." That's the Holy Grail where immunity—via past infection or vaccination—would be high enough for community spread to drop enough that victory over the health crisis could be declared. That 70% projection implies a need for about 460 million doses of vaccine, assuming double doses are required for 230 million people.

But is such herd immunity necessary for a return to normalcy? Likely not. The virus causes severe illness mostly in those over 65 years old; approximately 80% of total US Covid-19 deaths have been in the over-65 population. Less than 1% of America's population lives in long-term care facilities, but this small fraction of the country accounts for 36% of US Covid-19 deaths.

So widespread senior immunization should be the best way to reduce the pandemic's lethal consequences. Case counts may become an irrelevant metric as the serious cases of infection and number of deaths diminish with widespread vaccination. Consider the following:

(1) *108 million doses for over 65*. Since there are about 54 million individuals over 65 in the US, we would need about 108 million doses to vaccinate all of them.

(2) *122 million doses for healthcare workers & at-risk individuals.* Appropriately, the Centers for Disease Control and Prevention (CDC) has recommended a tiered-priority approach for states to follow in distributing limited vaccination doses, with seniors at the top. In addition, healthcare

workers and individuals with underlying conditions (more susceptible to severe conditions) are prioritized, among a few other essential worker groups.

To keep it simple, consider that the US has about 20 million health care and social assistance workers, including those in administrative functions. They plus the 41 million adults under 65 at serious risk owing to underlying conditions equals 61 million. Full vaccination (i.e., two doses per person) of this population equates to 122 million doses.

(3) *230 doses is all victory should require*. Full vaccination (i.e., two doses per person) of the 115 million people mentioned above (54 million seniors and 61 million healthcare workers combined with those under 65 years old but at risk) equates to 230 million doses—exactly half of the 460 million doses that general-population herd immunity would require.

Epidemiology II: Victory by Summer Is Possible. Last Wednesday morning, my wife took her mother to be vaccinated against Covid-19 at New York's Jacob Javits Convention Center. They texted me a photo from inside the 1.8-million-square-foot conference center. A mere *three people* sat awaiting their first-dose jab in the arm! What looked like hundreds of rows of seats remained empty.

My wife reported that the center—run by New York State Department of Health officials with the New York National Guard—seemed set up to administer the vaccine extremely efficiently. It took less than 10 minutes for my mother-in-law to be vaccinated and out the door. The Guard News reports that the site can accommodate thousands of people per day—in 20-30 minutes per session—when enough doses are available.

So where are all the shots? The simple answer is that supplies are limited, and distribution is complicated. But we anticipate that by summer, enough of the at-risk population will be vaccinated to relegate this virus to pest from plague. Consider the following:

(1) *Orders & production*. The federal government under its Operation Warp Speed (OWS) plan promised to deliver 300 million doses of safe and effective vaccines "with the initial doses available by January 2021." Pfizer-BioNTech and Moderna's mRNA vaccines received Emergency Use Authorizations (EUAs) from the Food & Drug Administration (FDA) on December 11 and December 18, respectively.

Last year, OWS ordered 200 million doses of the Pfizer-BioNTech vaccine in two 100 million increments for delivery by July 31, 2021 (see here and here). The government has the option to acquire up to 400 million more doses. To date, the US has ordered a total of 200 million doses of Moderna's vaccine, deliverable by Q2, with an option to purchase up to 300 million more. If Pfizer-BioNTech and Moderna meet these production goals, victory could be achieved not long after Q2.

(2) *Allocations & administrations*. But that's a big "if" given that initial production goals haven't been met by the manufacturers. So how many vaccines should we expect to be administered by when?

OWS spokesperson Michael Pratt sent NPR the following statement on behalf of the outgoing Trump administration: "Both companies continue to scale up production, and current forecasts indicate we are on track to allocate 200 million doses by the end of March across the vaccine portfolio. Operation Warp Speed continues to assess all available avenues to assist manufacturers to optimize and maximize their production processes as requested/required." Importantly, Pratt used the word "allocate" rather than "administer," suggesting that some doses would be reserved as second doses. (See more on allocations to states below.)

President Joe Biden has created a strategic outline to administer 100 million shots in his first 100 days in office—a seemingly less aggressive target than Pratt's but not far off considering that "administer" means actual shots in arms. Biden's target could put the US nearly halfway to victory (by our rough 230 million administered metric) by April 30.

That may be achievable, as the US averaged 914,000 doses administered per day over the last week through January 21, according to CDC data reviewed by CNN. So victory could be at hand by this summer if shots given stay on pace.

(3) *Late-breaking news.* Late yesterday afternoon, the Biden administration announced that the US government is purchasing an additional 200 million doses of the Covid-19 vaccine. The new purchase of 100 million doses from Pfizer and 100 million from Moderna will be made available over the summer and are in addition to the 400 million combined doses the companies had already committed to providing to the US. The move could provide enough doses for nearly every American to get fully inoculated by the end of the summer.

Epidemiology III: State of the States. As of yesterday morning, just 44.4 million doses of both vaccines combined have been "distributed" since vaccinations began on December 14, according to the CDC. And only 23.5 million doses have been administered thus far. The CDC says that doses distributed "are cumulative counts of COVID-19 vaccine doses reported to [OWS] as delivered since December 14, 2020," while total doses administered are cumulative reported counts since that date of doses that have made it into arms.

Why the discrepancy between distributions and administrations? "A large difference between the number of doses distributed and the number of people initiating vaccination is expected due to several factors including the time it takes for doses delivered to be administered, the time it takes for administered doses to be reported to CDC, and management of available vaccine stocks by jurisdictions and federal pharmacy partners," explains the CDC.

The last point seems to us to be most significant. If the difference is mostly due to reserves for second doses as we assume, that's probably a good thing because the at-risk populations in the early phases could be assured full vaccination. If the difference is a result of operational delays in administering vaccines, that could signal a problem. Either way, we anticipate that more supply eventually will become available and that administration operations will be improved along the way. Consider the following:

(1) *No federal stockpile*. The OWS vaccine distribution process chart suggests that there is not a federal holding site for vaccine doses, although there are kitting and distribution centers between production and endpoints. The notion that the Trump administration was holding back a stockpile is false, as Oregon Governor Kate Brown exposed January 15 on Twitter. It seems logical that the federal government intended for states to hold onto reserves of second doses, as recommended by the manufacturers and authorized by the FDA.

So Biden's vaccination plan seems to incorrectly suggest that there is a federal stockpile that can be depleted: "In order to expand the supply available to states, the Administration will end the policy of holding back significant levels of doses, instead holding back a small reserve and monitoring supply to ensure that everyone receives the full regimen as recommended by the FDA." In any event, it does not seem that a federal stockpile would be needed for states to responsibly manage doses.

(2) *Weekly allocations*. According to the US Department of Health & Human Services (HHS) vaccine distribution webpage, the federal government makes weekly allocations to states.

States order accordingly, and shipments begin about a week after orders are placed, with second doses sent two or three weeks later. It is unclear to us whether states may actually use the supply of second doses for the initial round if the supply lags eligibility and demand. (We don't think they should, as that risks altering second-dose intervals, which experts warn against.)

(3) *New York case*. Going back to our Javits Center anecdote, my wife was told by the vaccine center workers that their supply was running low. Media headlines reported that New York's first doses would run out by the end of last week, leaving none until the following week's allotment arrived. In other words, New York can administer doses faster than doses can be delivered under the federal government's allocations.

Updating New Yorkers on January 24, Governor Andrew Cuomo said that lack of supply is the primary obstacle to vaccinating more New Yorkers. The state has the operational capacity to do over 100,000 doses a day, he said, and the 250,000 more doses coming this week is not enough to expeditiously vaccinate the 7 million currently eligible New Yorkers in accordance with the CDC's updated eligibility guidelines.

(4) *Operational challenges.* New York may be ahead of the game, however. The rates at which many states have administered doses relative to the number of doses delivered to them have significantly lagged, and the discrepancy may not be a result of second-dose reserve management.

The expectation that prevailed before FDA vaccine approval that we'd be home free once there had been emergency authorization of effective vaccines has proven naïve. No tsunami of doses has been delivered to well-oiled and -staffed vaccination centers, ready to serve eligible crowds with shirtsleeves rolled up. It takes time to build efficient distribution channels at scale for any operation. Operational issues include the fact that distribution is no small feat (see Pfizer's guidelines for vaccine storage here and Moderna's here).

The OWS distribution flow chart linked above provides little transparency into the final-destination framework, seemingly passing the buck for endpoint administration onto a patchwork of state and local administrators overseeing patchwork public and private healthcare providers. Endpoint operations are fraught with problems, including buggy local appointment systems, frustrated non-tech-savvy seniors attempting to secure appointments, and no-shows (people often make multiple appointments with different providers to secure a

spot) necessitating the discarding of precious vials since vaccines taken out of the deep freeze must be administered within a specified timeframe.

But most importantly, it seems that insufficient allocations to states have complicated administrators' ability to get shots into arms. New York, for example, has postponed opening additional planned mass Covid-19 vaccination sites due to limited supply.

Epidemiology IV: What Could Go Right—and Wrong? What does this all mean for financial markets? The S&P 500 has risen 6.8%, as of Monday's close, since the November 18 announcement that the Pfizer-BioNTech vaccine had greater than 95% efficacy. Of course, a great deal of the jump reflects the support coming from the Federal Reserve and fiscal stimulus. From the promise of the vaccines alone, patience and optimism are warranted, in our view. We are placing our bets on what could go right, but there is still a lot that could go wrong. Consider the following:

(1) *What could go right?* Investors rightly seem to be assuming that the shots will come soon enough. Lots of the operational problems thus far could be resolved. Production and distribution chains could learn from early failures to ramp up. Biden's targets could be met. Several additional vaccines in the testing pipeline could be authorized to help achieve that.

Johnson & Johnson's vaccine, for example, could be days away from authorization. It leverages a more well-used adenovirus technology than the mRNAs, requires just one dose, and is more portable than the mRNAs. If the one-shot vaccine is deemed safe and effective, it could provide 100 million doses by April.

Funding needs for state vaccination administration—a perceived problem under the previous administration—could be federally fulfilled. More well-equipped vaccination sites modeled after the Javits Center could be set up nationwide. More people could gain confidence in the vaccines as time passes and the vaccines are continually deemed safe and effective. Mutations that appear could be squashed in short order by booster shots like the one Moderna is already working on for the South African variant.

(2) *What could go wrong?* But further delays in manufacturing and production of the authorized vaccines could occur in the US as well as abroad. Short supplies of the materials and skilled labor needed to produce the vaccines could lead to further production backlogs. Timely required second doses of the vaccines could be put into jeopardy if states start doling out

second doses as first doses. Any indication of safety issues for the mRNAs could halt EUAs or hinder public confidence in the shots. Other promising vaccine candidates could be deemed unsafe or ineffective.

Perhaps the worst-case scenario is that mutations to the virus, as we discussed in our January 11 *Morning Briefing*, could threaten the efficacy of the authorized inoculations. Last week, chief White House medical advisor Dr. Anthony Fauci suggested that the current vaccines may be less effective against some new virus strains. A separate but related problem is inequitable global distribution of vaccines. If lower-income countries are unable to distribute vaccines, then the virus could be given opportunity to further mutate as it circulates in those areas, only to hit other regions if not contained.

And according to the CDC, it remains unknown exactly how long the vaccines may be effective against infection. If not very long, then we may need many more doses of the vaccines than anticipated in short order before victory can be declared.

CALENDARS

US: Wed: Durable Goods Orders Total & Ex Transportation 0.9%/0.5%, MBA Mortgage Applications, EIA Natural Gas Storage, Fed Interest Rate Decision 0.25%. **Thurs:** GDP 4.0%, GDP Price Deflator 2.4%, Headline & Core PCEDs 2.3%/1.5%, Leading Indicators 0.3%, Initial & Continuous Jobless Claims 875k/5.054m, New Home Sales 865k (+1.9%), Advance Goods Trade Balance, Wholesale Inventories, Kansas City Fed Manufacturing Index, EIA Natural Gas Storage. (DailyFX estimates)

Global: Wed: Germany Gfk Consumer Confidence -7.9, France Consumer Confidence 94, Japan Retail Sales -0.4%, Japan Leading & Coincident Indicators 96.6/89.1, World Economic Forum Annual Meeting, Lane. **Thurs:** Eurozone Economic Sentiment 89.5, Eurozone Consumer & Industrial Confidence -15.5/-7.2, Italy Business & Consumer Confidence 96.5/100.5, Germany CPI 0.4%m/m/0.7%y/y, Spain Unemployment Rate 16.6%, Japan Unemployment Rate 3.0%, Japan Industrial Production -1.5%m/m/-0.6%y/y, BOJ Summary of Opinions, World Economic Forum Annual Meeting, Enria, Schnabel. (DailyFX estimates)

STRATEGY INDICATORS

S&P 500 Q4 Earnings Season Monitor (*link*): With nearly 17% of S&P 500 companies finished reporting revenues and earnings for Q4-2020, revenues are beating the consensus

forecast by a well-above-trend 2.7%, and earnings have crushed estimates by 19.1%. The large surprises result from a lack of financial guidance from the companies that analysts follow during an economic rebound. At the same point during the Q3 season, revenues were 3.1% above forecast and earnings beat by 17.1%. For the 84 companies that have reported through mid-day Wednesday, aggregate y/y revenue and earnings growth and the percentage of companies reporting a positive revenue and earnings surprise have improved from their Q3 measures. The small sample of Q4 reporters so far has a y/y revenue decline of 0.1% and an earnings drop of 2.9%. Those results mark a big recovery from Q3-2020, which was the worst quarter since Q1-2009 during the financial crisis. A whopping 87% of the Q4 reporters so far has reported a positive earnings surprise, and 79% has beaten revenues forecasts. More companies have reported positive y/y earnings growth in Q3 (60%) than positive y/y revenue growth (52%). These figures will change markedly as more Q4-2020 results are reported in the coming weeks, and we expect the y/y revenue and earnings growth results to turn negative.

US ECONOMIC INDICATORS

Consumer Confidence (*link*): “Consumers’ appraisal of present-day conditions weakened further in January, with Covid-19 still the major suppressor,” observed Lynn Franco, senior director of economic indicators at The Conference Board. “Consumers’ expectations for the economy and jobs, however, advanced further, suggesting that consumers foresee conditions improving in the not-too-distant future.” The Consumer Confidence Index (CCI) improved to 89.3 after sinking the prior two months from October’s seven-month high of 101.4 to 87.1 in December. However, it remains far from February's pre-pandemic levels of 132.6. The expectations component climbed for the second month from a four-year low of 84.3 in November to 92.5 in January, though was 15.6 points below its pre-Covid reading. The percentage of consumers expecting business conditions to improve (to 33.7% from 29.5%) rose 4.2ppts, while those expecting business conditions to worsen (18.1 from 22.0) fell 3.9ppts. “In addition, the percent of consumers who said they intend to purchase a home in the next six months improved, suggesting that the pace of home sales should remain robust in early 2021,” according to Franco. Consumers’ outlook regarding the job market also improved, with the percentage expecting more jobs (to 31.3% from 28.0%) 3.3ppts higher than December and the percentage expecting fewer jobs (21.4 from 22.2) slightly lower; 47.3% expect employment conditions to remain the same. In the meantime, the present situation component has plunged 21.8 points (from 106.2 in October to 84.4 this month), with December alone tumbling 18.7 points; it’s 84.9 points below pre-pandemic readings. Consumers’ assessment of

current conditions deteriorated again in January: The percentage of consumers claiming business conditions are good was basically unchanged from last month (to 15.8% from 15.4%), while those claiming business conditions are bad rose 3.1ppts (42.8 from 39.7)—with the latter at a five-month high. Consumers' assessment of the labor market was only slightly less favorable than last month, with those saying jobs are plentiful (to 20.6% from 21.0%) down 0.4ppt and those saying jobs are hard to get up 0.9ppt (23.8 from 22.9)—though the former was at a seven-month low and the latter at an eight-month high.

Regional M-PMIs (*link*): Four Fed districts have now reported on manufacturing activity for January (Philadelphia, New York, Dallas, and Richmond) and show the manufacturing sector expanded at a faster pace, thanks to a sharp acceleration in the Philadelphia region. The composite index climbed to 12.8 this month after slipping from 21.3 in October to 10.9 by year-end, as the Philadelphia (to 26.5 from 9.1) region posted its best performance in a year. Manufacturing activity in both the Richmond (to (14.0 from 19.0) and Dallas (7.0 to 10.5) regions eased a bit this month, with both down from recent highs of 21.2 and 29.0, respectively in October; activity in the New York (3.5 from 4.9) area continued to show limited growth. The new orders measure improved only slightly, from 12.2 to 13.7—as billings in the Philly (to 30.0 from 1.9) region expanded at the fastest pace since February, while Richmond's (12.0 from 24.0) grew at half December's rate. Meanwhile, orders in the New York (6.6 from 3.4) and Dallas (6.3 from 19.6) regions grew at roughly the same pace this month, though the former showed an acceleration while the latter showed a deceleration. In the meantime, factories added to payrolls at the best pace since August 2018, with the employment measure climbing from 15.2 to 18.3 this month, with both the Philadelphia (to 22.5 from 5.6) and Richmond (23.0 from 20.0) regions showing an acceleration in employment; hirings in both the Dallas (16.6 from 20.9) and New York (11.2 from 14.2) regions slowed from December's pace, though remained robust.

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