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SHORT PRIMER ON THE NEW VACCINES

Today, we had both encouraging and discouraging news. Large parts of Oneida County, including Utica, were declared a “yellow” zone, indicating that more of us are sick, hospitalized, and dying. But on the same day, a critical care nurse, Sandra Lindsay, got the first Covid vaccine in New York State, paving the way back to a healthy world. So here we are, on the cusp of a dark winter, and yet with clear hope at the end of the tunnel. It seems like an appropriate time for this Newsletter, the point of which is going to be to encourage everyone, except those who are precluded for health reasons, to get vaccinated as soon as they are able to do so.

Vaccines to prevent infectious diseases are the greatest medical innovation of all time. The CDC estimates that U.S. childhood vaccinations given in the past two decades will prevent Americans from 322 million illnesses, 21 million hospitalizations, 732,000 deaths, \$295 billions of direct costs, and \$1.3 trillion in social costs. For example, before the advent of the measles vaccine in 1963, the virus infected 500,000 Americans annually, causing 480,000 hospitalizations. Today, we see only 60 measles cases a year, primarily from foreign travelers. Smallpox, polio, diphtheria, pertussis, measles, mumps, and many other vaccines have also had an enormous impact on public health.

Nonetheless, despite this incredible scientific progress, recent national polling has suggested that many individuals do not trust the rapid development of current Covid vaccines. Many people are hesitant to participate because they either doubt the efficacy or the safety of these vaccines.

In the past, vaccines have taken years to develop. However, many factors contributed to the rapid development of these new vaccines. These factors include a massive collaboration between the federal government and private companies that included agreements to finance research and to pre-purchase large quantities of the vaccines once they were developed.

The rapid vaccine development we are going to benefit from occurred because there was sufficient financial backing to try molecular techniques in new ways that

bypassed the tedious trial-and-error approach used historically by scientists. These new molecular approaches taken with Covid are truly groundbreaking. Both the Pfizer and the Moderna vaccines use the body's own cells to manufacture an incomplete version of the virus. These incomplete viruses are identified by our immune system as foreign invaders. Our bodies then create the necessary antibodies and any Covid viral infections will cause a rapid immune response that binds and destroys the virus. In other words, these vaccines enable one's own body to mimic a native infection to elicit an immune response, but without the ability to cause disease or spread.

Both of the new vaccines went through the normal clinical trials. On July 27th the companies launched a final Phase 3 trial with 30,000 volunteers in the United States and other countries. Phase III trials test for both the safety and efficacy of the trial vaccine. These Phase III tests are randomized and double blind and involve the experimental vaccine being tested against a placebo. One Phase III goal is to assess vaccine safety in a large group of people. Vaccine efficacy is tested as well. These factors might include 1) Does the candidate vaccine prevent disease? 2) Does it prevent infection with the pathogen? 3) Does it lead to production of antibodies or other types of immune responses related to the pathogen? Phase III trials simply cannot be rushed. They involve tens of thousands of people and months to both administer and study the results. The Phase III trials yielded what we all hoped for: vaccines that were both safe and effective.

The FDA met, in an open session, a few days ago and granted emergency authorization of the Pfizer vaccine. The FDA's criteria for this emergency authorization were high. The Moderna vaccine will go through a similar authorization process. We will probably hear soon that it is being distributed.

Here are the very important things to keep in mind: 1) vaccines are why we no longer die of measles, or are disabled by polio, etc. 2) Covid, just like measles and polio, is an infectious disease: we are all in this together. Getting vaccinated is not something we should do only to protect our own health (though it is), but also to protect the health of all the people we come into contact with. Once we are vaccinated and cannot get Covid, we also cannot give it to others. Moreover, some people have medical reasons why they cannot be vaccinated. We can protect them by making sure that as many people who can be vaccinated are vaccinated, and as soon as is possible.

These vaccines are going to allow us to be together again. Once we achieve herd immunity through vaccines, I want to hang out with my siblings, have dinner parties, and bring the public back to Common Council. Who are you looking forward to being with again?

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