

Sources

[How effective is a mask in preventing COVID-19 infection? - PMC \(nih.gov\)](#)

[Effectiveness of COVID-19 Vaccines in Preventing Hospitalization Among Adults Aged \$\geq 65\$ Years — COVID-NET, 13 States, February–April 2021 | MMWR \(cdc.gov\)](#)

Implementing both a widespread Pfizer vaccination mandate with masking regulations would be a very important and influential step into the right direction here. According to the CDC, the Pfizer vaccination prevented COVID-19 hospitalizations by 96% among those 65 and older. Since this is the most at-risk population, we can assume the effectiveness towards the rest of the population is at least this high. If the hospitalizations got reduced by 96%, it would be a fair assumption to believe that the death rate got reduced by at least this amount. As for the masking mandate, according to the National Library of Medicine, in a 2009 study, masks were proven to be at least 80% effective against influenza-like diseases. Since COVID-19 is an influenza-like disease, we can safely assume there will be an 80% reduction in the COVID-19 infection rate if we were to implement a masking mandate.

What we do with these values is simple. We incorporate them into a new fit, which is our 'Y_fit_new'. With our 'Y_fit_new', we realistically adjust the function's case and death rates based on these masking and vaccination effects. We can say on day 0 of the outbreak everyone can start wearing masks, so we can augment our infection rate to be 20% of what it originally was. However, when it comes to creating a vaccine, that will realistically take a lot longer. A reasonable guess for when a vaccine would be in full effect with widespread administration is around one year, and for our data we made the hard assumption that everyone would be vaccinated, making it a required to reduce the death rate by the highest amount possible. Our death rate once the vaccine was administered was reduced by 96%, as explained before. So, our case rate was only affected by the mask mandate, but our death rate was affected by both. So, in Figure 3, we plotted the actual cases against the previously and newly modeled cases, and then did the same in Figure 4 for the deaths. We got incredibly good results, showing how effective these policies would realistically be.