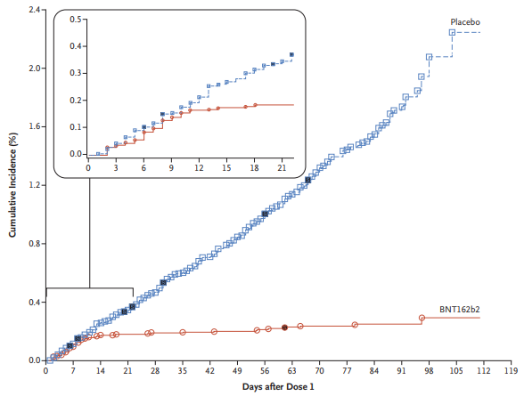
**mRNA Covid-19 Vaccines**

**Vaccine Efficacy**

Context: mRNA vaccines rely on novel technology not extensively used prior to the Covid-19 pandemic.

Current: Two trials that randomized 43,5481 and 30,4202 patients to vaccine or placebo found ~95% efficacy for Covid-19 prevention across multiple subgroups in both trials.

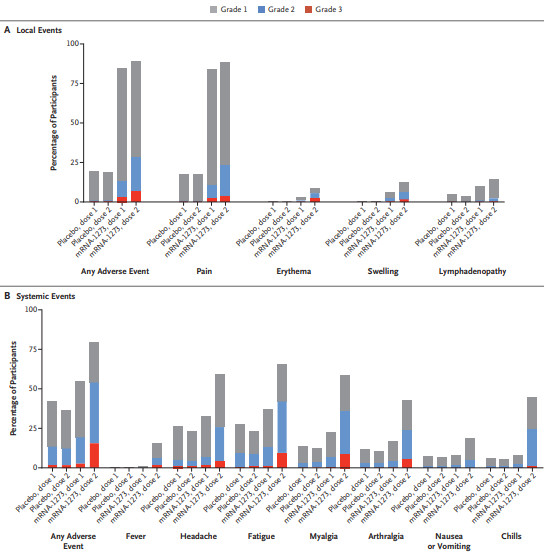
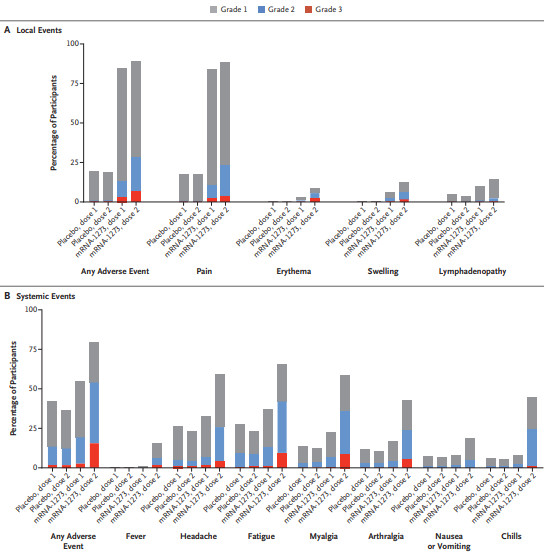
Cutting Edge: Physician leadership partnering with community leaders will be critical for educating patients and communities about the importance of vaccination. Many resources are available to help facilitate these conversations.3

**Vaccine Safety**

Context: Public concerns about potential adverse events related to Covid-19 vaccination are prevalent.

Current: These Efficacy trials above also examined vaccine safety.1,2 Most reactions were mild (grade 1/2).

Cutting Edge: Symptoms that last >48 hrs after vaccination, begin >7 days after, or include or loss of taste and smell should trigger evaluation for actual disease. Isolating while symptomatic is probably prudent.



**Herd Immunity**

Context: Natural immunity following Covid-19 infection is variable with unknown durability. Tools are available to help providers encourage patients and community members to pursue vaccination.3

Current: With vaccine efficacy of ~90%, herd immunity requires vaccinating 60% of the population if the R0 is 2.0 (meaning each new case infects 2 other people). This is >195 million people in the US. If the R0 is 3, 80% of the population needs to be vaccinated to achieve herd immunity.4

Cutting Edge: Continued physical isolation and masking can effectively reduce the R0, thus lowering the threshold to achieve herd immunity in addition to the direct protection that masks provide.

**Mutant Covid Strains**

Context: Mutant strains of Covid are emerging. Vaccine efficacy against these strains is unproven.

Current: Mutants first identified in the United Kingdom and South Africa have been detected in the US.

Cutting Edge: Because the mRNA vaccines use the entire spike protein to generate an immune response, they may still protect against mutant strains.4 Preliminary evidence suggests good protection against the UK strain but reduced protection against the South African strain.

1. Fernando P Polack, et al. Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. N Engl J Med 2020; 383:2603-2615.
2. Lindsey R Baden, et al. Efficacy and Safety of the mRNA-1273 Sars-CoV-2 Vaccine. N Engl J Med. Published on-line December 2020.
3. CDC Covid-19 Vaccination Communication Toolkit. Available online at: <https://www.cdc.gov/vaccines/covid-19/health-systems-communication-toolkit.html#faqs>
4. Frederick Southwick. Educational content create for Coursera, available online at: <https://www.youtube.com/watch?v=P3wBVs-s7jI&feature=youtu.be> and <https://www.youtube.com/watch?v=P3wBVs-s7jI&feature=youtu.be>