Vaccine concerns weighed against natural immunity

The COVID-19 vaccine train forges ahead with reckless speed and destinations unknown

John Zwaagstra, PhD

20 September 2021

Published at: https://ocla.ca/

Abstract

We briefly summarize a past public health disaster and draw a parallel to the COVID-19 vaccine roll-out. On a scale vastly larger than the thalidomide travesty, countless millions are blindly submitting to COVID-19 vaccinations without being informed about safety concerns or understanding how the vaccines actually work. We submit that the multiple adverse events experienced in the vaccinated are attributed predominantly to SARS-CoV-2 spike protein and vector toxicity and misappropriate distribution in the body. Beyond these concerns, it is apparent that the vaccines have not succeeded in preventing viral infection and transmission, given the reported surge of the Delta variant within populations virtually 100% vaccinated. In contrast to this failure, we outline basic features of natural immunity and cite recent studies showing that the human body mounts robust antibody and cell-mediated immune responses against the SARS-CoV-2 virus and associated variants. Accumulating evidence continues to corroborate that the arsenal of the human immune system significantly out-performs anything the vaccines can offer.

Introduction

Three fundamental questions should be answered regarding any medicine or vaccine prior to public use:

1) Is it safe?
2) Does it work?
3) Is it needed?

Before we answer these questions regarding the COVID-19 vaccines it is worthwhile reviewing the thalidomide story. Thalidomide was hailed as an effective drug to alleviate nausea and morning sickness in pregnant women. Unfortunately, proper safety studies were never done and thalidomide was an unmitigated disaster. With implicit trust, a young mother took this medicine thinking surely a drug recommended by my doctor and dispensed by my pharmacist must be beneficial, right? Tragically, a few months later, she gave birth to a horribly deformed baby.

Thalidomide was put on the market in 1956 in Germany. It entered the Canadian market with official authorization in 1961 and was distributed by the American pharmaceutical company, Richardson-

Merrell. Complacent Canadian laws allowed Richardson-Merrell to distribute thalidomide to physicians as 'clinical investigators' (The Canadian Tragedy | Thalidomide; **Kim and Scialli, 2011**). A Canadian doctor, Dr. Frances Kelsey, who worked as a pharmacist for the US Food and Drug Administration (FDA), requested that Richardson-Merrell demonstrate that the drug was safe for pregnant women, evidence that was never provided. No study had ever been done by independent researchers. Canadian authorities did not question the information supplied by Richardson-Merrell.

In December 1961 thalidomide was taken off the German and British markets after severe birth defects began to appear. Though the Canadian government was informed of these concerns, it wasn't until late March 1962 that thalidomide was withdrawn. In the interim period hundreds of newborns were born and had to live their lives with thalidomide-induced malformations. Class action lawsuits were launched, yet no case ever reached a trial verdict and families were forced to settle out-of-court and submit to gag orders preventing the discussion of settlements. The government has never formally acknowledged its share of the responsibility for this tragedy.

The thalidomide tragedy could have been averted if the warnings of Frances Kelsey, the "whistle blower", had been heeded. Complicit physicians down-played safety concerns and governmental bureaucracy blocked immediate action.

The lesson of the thalidomide story is obvious in the context of the COVID- 19, as insufficiently tested vaccines continue to be promoted and indiscriminately given to the entire population, including pregnant women and young children, without stringent safety trials. It should also be noted that class-action lawsuits are not an option for anyone adversely affected by these vaccines as drug companies were granted regulatory and contractual no-liability status even before the roll-outs began.

History may be repeating itself as Pfizer has rushed its vaccine towards FDA approval without enlisting an advisory committee for independent evaluation or reporting safety data to the public. As a liability shield, Pfizer has retained emergency use authorization for groups more susceptible to vaccine hazards, such as youth less than 16 years old and pregnant women (**Iacobucci, 2021**; Did FDA really approve the Pfizer COVID vaccine? Wait. What? « Jon Rappoport's Blog (nomorefakenews.com)). Hence the vaccine roll-out is proceeding at full steam, irrespective of any harm that may ensue in the months ahead.

Now, let's return to the questions posed above.

Is it safe?

Currently, it is difficult to quantify the degree and scope of vaccine-related adverse events. Yet, contrary to what we have been led to believe, it is clear that COVID-19 vaccines aren't benign. The Vaccine Adverse Event Report System (VAERS) provides a list of deaths and adverse incidents associated with recently injected individuals, including myocarditis, Bell's palsy, heart attacks and miscarriages. As of July 30, 2021 there were a total of 545,337 adverse reports, including 46,036 hospitalizations (COVID Vaccine Data (openvaers.com)).

One must conclude that, although people highly susceptible to respiratory diseases (i.e. the elderly and those with co-morbidities) may questionably benefit from the vaccines, young, healthy individuals and those who have recovered from COVID-19 should be exempted based on vaccine risk versus benefit.

From the onset there has been general concern based on preclinical data indicating problems with coronavirus vaccines (**Tseng *et al.*, 2021**). In the Tseng study mice were treated with candidate vaccines for SARS-CoV, a virus similar to SARS-CoV-2, which is reported to have caused the SARS outbreak in 2002. The different vaccines tested consisted of: inactivated whole-virus, purified spike protein or recombinant DNA encoding the spike protein (the latter is similar to the Adenoviral DNA vector used in the AstraZeneca vaccine). Each of these vaccines induced high titers of antibodies that neutralized the virus, suggesting good efficacy. However, when the vaccinated mice were subsequently exposed to live virus, this caused severe inflammation and destruction of lung tissue.

This pathological effect is attributed to antibody dependent enhancement (ADE). After mice become infected, vaccine-induced antibodies against the spike protein react with the virus and then bridge with additional immune components, causing the observed adverse response. It remains to be seen whether similar ADE events will occur in the millions of people who are now vaccinated and subsequently encounter SARS-CoV-2 in the long term. Given the strong evidence for vaccine-elicited enhancement of disease, disclosure of specific risk of worsened COVID-19 disease due to vaccination should be explicitly stated in every informed consent form. Currently this is not the case and the majority of the public remains unaware of this legitimate risk (**Cardozo and Veazey, 2020**).

Given the go-ahead of government approved "operation warp-speed" the stringent safety studies normally performed in animals and humans prior to FDA approval have been bypassed. But results from recent appraisals have raised several warning flags. Some major concerns are as follows:

1. **Systemic spread of nano-particles in the body.** The nano-particles used in the Pfizer and Moderna vaccines are comprised of an outer capsule, consisting of polyethylene glycol (PEG) and lipids, that surrounds the inner mRNA encoding the spike protein. A recent biodistribution study of the Pfizer vaccine in animals determined that the particles did not only localize in the muscle at the injection site, but distributed throughout the body and in some cases localized in the ovaries, liver and bone marrow (Dr Bridle 's 202 Page Report —Pause Vaccines | peckford42 (wordpress.com), Vaccine researcher admits 'big mistake,' says spike protein is dangerous 'toxin' - LifeSite (lifesitenews.com)). Nano-particle accumulation damages organs, which is of particular concern in the reproductive system and in pregnant women (**Wang et al., Int J Nanomedicine 2018**). PEG accumulation can cause mild to severe hypersensitive immune reactions which can be life threatening or lethal (**Kozma *et al*. 2019**).
2. **Inappropriate spike expression in several tissues and toxicity.** The ACE-2 receptor protein that binds the spike protein is not only found in the lung (the lung is the main target of SARS-CoV-2 infection and pathology). ACE-2 is also found in blood vessel walls, heart, brain and male and female reproductive organs, making these tissues a target for binding to the spike protein. In experiments, where purified spike protein was directly infused into tissues, it caused damage to blood vessel function and acute lung injury (**Lei *et al.* 2021, Solopov *et al.* 2021**). Of major concern are the findings that the spike protein causes blood clots by promoting platelet aggregation and activation (**Greinacher *et al*. 2021; Maayan *et al*. 2021**). Furthermore, the incidence of Guillain-Barre Syndrome and paralysis seen in some patients treated with the AstraZeneca vaccine, was attributed to the spike protein crossing into the brain and subsequent inflammation (**Martin *et al.,* 2021; Maramattom *et al.,* 2021**).
3. **A growing number of adverse events.** The overall number of serious adverse events versus other traditional vaccines is alarmingly high yet ignored and under-reported. As of July 30, 2021

there have been a total of 12,366 COVID-19 vaccine-related deaths (COVID Vaccine Data (openvaers.com)), far more than all the vaccine-attributed deaths in the last 30 years. Sadly, the COVID-19 vaccines are being promoted in children and teens and proving to be harmful, with a growing number of myocarditis events. The long-term effects on health and fertility in these children are unknown.

Does it work?

As a preamble, it is important to note that all the studies of vaccine efficacy published in peer-reviewed journals have been funded and often outright written by the pharmaceutical industry, that few are actual blinded studies (the person injecting knew whether the product was vaccine or placebo), that "symptomatic COVID" was tenuously defined based on a threshold of mild generic symptoms, and that the reported short-term absolute risk reduction is always marginal.

An August 2021 update given by the director of public health in Israel, Dr. Sharon Alroy-Preis, reveals that 50% of the current tested and presumed COVID-19-infected cases in hospital have already been vaccinated (https://www.cbsnews.com/news/transcript-dr-sharon-alroy-preis-on-face-the-nation-august-1-2021/). Dr. Alroy-Preis notes that there seems to be a waning protective response in those that received the early stage double-vaccinations . This has led Israel to push for a follow-up booster. Our present report indicates that the vaccine did not provide the expected level of protection and has prompted health officials to advocate for additional vaccine boosters as they attempt to solve this problem. One can envision them recommending a continuous cascade of booster shots as novel variants arise.

A retrospective observational study in Israel compared individuals, from the January-February 2021 period, who previously tested negative for SARS-CoV-2 virus and received two doses of the Pfizer-BioNTech vaccine with infected and recovered individuals who had not been vaccinated (**Gazit *et al.*, 2021**). The vaccinated individuals were shown to have a 13-fold increased risk for breakthrough infection with the presumed Delta variant compared to the infected, recovered and unvaccinated individuals. Overall the study demonstrated that natural immunity (present in the unvaccinated people who became infected) confers stronger protection against infection, symptomatic disease and hospitalization, compared to vaccine-induced immunity, which was to be expected from what is known about immune response to an actual pathogen.

The nation of Iceland is another salient test case for the efficacy of the vaccines. The vast majority of Iceland has been vaccinated (~95%) but this has failed to bring about herd immunity (COVID-19 in Iceland: Vaccination Has Not Led to Herd Immunity, Says Chief Epidemiologist (icelandreview.com)). Iceland is currently reporting an 'outbreak' of the Delta variant in its population. This is driving a renewed push for lockdown measures and further hysteria. It is evident that seeking 'zero COVID-19' (or 'zero' any respiratory viral disease) is not attainable and vaccines are not the solution. Prof. Andrew Pollard, who led the Oxford COVID-19 vaccine team, is quoted as saying "We don't have anything that will stop transmission, so I think we are in a situation where herd immunity is not a possibility and I suspect the virus will throw up a new variant that is even better at infecting vaccinated individuals." (Herd Immunity Not A Possibility With Delta Variant, Warns UK Vaccine Expert Professor Andrew Pollard (ndtv.com))

Further evidence of vaccine ineffectiveness is noted in a recent presumed Delta variant outbreak in Massachusetts, US (**Deyer, 2021**). Testing among residents during a local outbreak in July 2021 found that 75% of those infected were fully vaccinated. Epidemiologists are having to admit that vaccination does not prevent viral spread. Based on this reality and building on fear, population/infection modellers are now proposing that maintaining non-pharmaceutical measures, such as masking and social distancing, will be required in the vaccine roll-outs in order to avoid further emergence of variants (**Rella *et al*. 2021**).

It is erroneous to believe that unvaccinated people are variant factories and to incriminate them for refusing the vaccine. The presumed Delta variant cases have overtaken other variants in Iceland, despite the fact that only 5% of the population 16 years and older remains unvaccinated. Given this outbreak in the vaccinated, a reasonable alternate hypothesis is that vaccinated people may be a breeding ground for the emergence of SARS-CoV-2 variants. The vaccinated may in fact be potential factories for the evolution of novel variants, due to selection pressure in individuals harboring antibodies against the spike protein strain used for immunization. Vaccines that do not prevent viral transmission have been termed "leaky vaccines" (**Read *et al.*, 2015**). Leaky vaccines can facilitate the evolution of viral strains that put the vaccinated and unvaccinated hosts at greater risk of disease. This would be of particular concern for those too frail or sick to be vaccinated, which are also those at most risk of death from any respiratory disease.

It is also possible that COVID-19 vaccines were unsuccessful in a certain percentage of individuals (due to suboptimal dosing, defective vaccine lots or lower than anticipated efficacy), giving a false sense of protection in the vaccinated and leaving them susceptible to infection and outgrowth of viral variants.

Thus, mass vaccination — with its induced false sense of safety and its potential to generate variants — would be the opposite of protecting the most vulnerable. From the above information it is abundantly clear that the hoped-for herd immunity provided by vaccines is a pipe-dream. Our attention must now turn to the importance of natural immunity, a bodily-function much overlooked.

Natural Immunity

The mainstream media and health officials have consistently dismissed natural immunity. Vaccines have been thrust upon us as the only means to solve the presumed COVID-19 crisis. However, peer-reviewed scientific reports clearly challenge the official narrative. For example, a study of 254 COVID-19-infected patients followed for up to 8 months showed long-lived antibody and T cell responses and memory T cells to SARS-CoV-2 proteins (including the spike protein), as well as immunity to SARS-CoV-1 and other coronaviruses (**Cohen *et al.*, 2021**). The results indicate that broad and effective immunity persists long-term for recovered COVID-19 patients.

Natural immunity has distinct advantages over vaccines for the following reasons:

a) Repertoire of immune targets: Infection by whole virus causes exposure and immunity to a wide range of viral proteins and their sub-regions (known as epitopes), not just spike protein.

b) Delivery location: Intramuscular delivery of current vaccines does not reproduce or approximate the location of virus entry. Coronaviruses enter predominantly by aerosol particles deep into the respiratory tract. Exposure to the virus promotes localized production of immune memory B cells and T cells in the

lungs, thus combatting viral propagation where the body needs it most and preventing re-infection (**Sette and Crotty, 2021**).

Empirical evidence of natural immunity efficacy: A recent comparative study of several age groups in Israel showed 96.4% protection for COVID-19 recovered patients, which was modestly higher than Pfizer-BioNTech vaccinated individuals (94.4%), indicating vaccination provided no advantage and highlighting how unnecessary it is to vaccinate previously infected individuals (**Goldberg *et al.*, 2021**).

Another comparative study performed in New York, USA observed that COVID-19 recovered patients showed faster and more effective immune responses versus vaccinated individuals (**Ivanova *et al.*, 2021**). Furthermore, Harvard epidemiologist Dr. Martin Kulldorff commented in a recent interview (Harvard Epidemiologist Martin Kulldorff on Vaccine Passports, the Delta Variant, and the COVID 'Public Health Fiasco' (theepochtimes.com)) that we are seeing a decoupling of mortality and test-result COVID-19 cases with the new surges of the Delta variant. This is an indicator that natural immunity is doing its job protecting the population.

To summarize the above, it is clear that people with natural immunity are well protected. Vaccination provides no added benefit and may in fact be detrimental.

As a final caution, it must be emphasized that the effects that experimental COVID-19 vaccines have on natural immunity and human biology are yet to be determined. Vaccines tamper with a sophisticated and interrelated balance of components within the immune system. There is always a risk of anaphylactic shock, auto-immune reactions, insufficient quality control, improper dosing, indiscriminate mixing and matching of vaccines from different sources and variable time windows between doses. We have decades of experience with standard vaccines that are comprised of inactivated virus or viral antigens, but the gene delivery design approach of the current mRNA and DNA vaccine technologies is uncharted territory in humans. For example, it is assumed that the gene template encoding the spike protein will not integrate into the cellular chromosome and that expression of the spike will be temporary. But this has not been ruled out. Human cells possess the molecular machinery to reverse-copy the vaccine's RNA template encoding the spike into DNA and integrating this into the genome (**Zhang *et al.*, 2021**). How will repeated injections and high levels and potentially continuous expression of the spike protein affect the human body? What happens if the spike is expressed within the bone marrow and interferes with natural immune functions? We need answers to these questions.

Is it needed?

The low COVID-19 morbidities have been consistently ignored in public policies that legislate the pandemic response and in the on-going push for vaccines. The CDC lists COVID-19 fatality percentages (infection fatality ratio, IFR, # of deaths/# infected) for ages 0-69 years ranging between 0.003 and 0.5%. A careful meta-analysis, that takes into account seroprevalence (serum testing positive for SARS-CoV-2 antibodies), population density and location, indicates that median IFRs may be lower than the reported CDC values (**Ioannidis, 2021,** https://www.researchgate.net/publication/343889424_Review_of_calculated_SARS-CoV-2_infection_fatality_rates_Good_CDC_science_versus_dubious_CDC_science_the_actual_risk_that_does_not_justify_the_cure_-_By_Prof_Joseph_Audie). Additionally, governments and the media have

systematically refused to put COVID-19 in the proper context of what is known about influenza virulence. For example, the highly-cited longitudinal field study of **Loeb et al. (2000)** found an influenza-outbreak case fatality ratio (CFR) of 8% in 5 care homes in Toronto over 3 years, a number large enough to sound the alarm of a looming health crisis that outweighs COVID-19. For other cities, Loeb et al. noted "Rates of pneumonia as high as 42% and case-fatality rates exceeding 70% have been reported in outbreaks due to influenza virus."

Likewise, in Canada and in many jurisdictions around the world, all-cause mortality figures (total number of deaths due to all causes including accidents and diseases) by year show no evidence of a COVID-19 pandemic in 2020, and further reveal evidence of deaths caused by government-imposed pandemic measures rather than COVID-19 disease (2021-08-06 Analysis of all-cause mortality by week in Canada 2010-2021 by province age and sex There was no COVID-19 pandemic and there is strong evidence of response-caused deaths in the most elderly and in young males - Denis Rancourt).

Governmental coercion and mandates for global and nation-wide vaccination against a disease with such minimal risk to the majority of the population, and no evidence of virulence greater than that of influenza, is reprehensible. Despite low morbidity the mainstream voices continue with fear-mongering and speak of "new surges" and "raging fires" as new variants arise. Thus the vaccine train continues to accelerate, driven by fear, ignorance and reckless abandon.

It is now established that effective medical treatments are available for COVID-19 patients. Some prominent examples are ivermectin and hydroxychloroquine, combined with vitamin regimens (**Kory *et al.*, 2021, Bryant *et al.*, 2021**). Multiple randomized treatment and prophylaxis trials with ivermectin have demonstrated statistically significant reductions in mortality, recovery times and improved viral clearance. The availability of effective medications, for a disease not more virulent than the flu, further renders the initial "emergency use" justification for the experimental vaccines unwarranted and reckless.

Conclusion

We are currently seeing a global coercion to vaccinate people against a virus that is no more serious than the common flu, with experimental COVID-19 vaccines that cause levels of harm and death beyond anything before seen for previous vaccines. An expanding group of individuals are experiencing life-altering adverse reactions and their personal stories testify that these vaccines are not safe. These voices must be heeded. In the wake of entirely predictable emerging variants in populations almost fully vaccinated, it is clear the vaccination program has failed and the virus is (the viruses are) here to stay. Furthermore, again as expected, a growing body of scientific research has shown that recovered COVID-19 patients have robust, natural immunity. Even with mild illness, people retain a broad and durable immunity, including protection against the variants. It's time to dismantle the fear campaign, resume critical investigation of all the facts and start assuring our neighbours that normal living is well within reach. It's time for science-based policy and governance, not more reprehensible vaccine salesmanship.

Biography

John Zwaagstra obtained his PhD at the University of Alberta (Edmonton, AB) in medical sciences and virology. He further conducted research in Los Angeles, CA and Pennsylvania in the fields of virology and molecular biology. Now working in Montreal, QC, he is a senior research scientist in biotechnology and has spent 30 years devoted to the study and development of receptor-based and antibody-based biologics as cancer therapeutics. He is a project and expertise lead in collaborations with Canadian biotech companies.

References

Allen CM, Ramsamy S, Tarr AW, Tighe PJ, Irving WL, Tanasescu R, Evans JR. Guillain-Barré Syndrome Variant Occurring after SARS-CoV-2 Vaccination. Ann Neurol. 2021 Aug;90(2):315-318. doi: 10.1002/ana.26144. Epub 2021 Jul 2. PMID: 34114269.
Guillain-Barré Syndrome Variant Occurring after SARS-CoV-2 Vaccination - PubMed (nih.gov)

Bryant A, Lawrie TA, Dowswell T, Fordham EJ, Mitchell S, Hill SR, Tham TC. Ivermectin for Prevention and Treatment of COVID-19 Infection: A Systematic Review, Meta-analysis, and Trial Sequential Analysis to Inform Clinical Guidelines. Am J Ther. 2021 Jun 21;28(4):e434-e460. doi: 10.1097/MJT.0000000000001402. PMID: 34145166; PMCID: PMC8248252.
Ivermectin for Prevention and Treatment of COVID-19 Infection: A Systematic Review, Meta-analysis, and Trial Sequential Analysis to Inform Clinical Guidelines - PubMed (nih.gov)

Cardozo T, **Veazey R**. Informed consent disclosure to vaccine trial subjects of risk of COVID-19 vaccines worsening clinical disease. Int J Clin Pract. 2021 Mar;75(3):e13795. doi: 10.1111/ijcp.13795. Epub 2020 Dec 4. PMID: 33113270; PMCID: PMC7645850.
Informed consent disclosure to vaccine trial subjects of risk of COVID-19 vaccines worsening clinical disease - PubMed (nih.gov)

Cohen KW, Linderman SL, Moodie Z, Czartoski J, Lai L, Mantus G, Norwood C, Nyhoff LE, Edara VV, Floyd K, De Rosa SC, Ahmed H, Whaley R, Patel SN, Prigmore B, Lemos MP, Davis CW, Furth S, O'Keefe JB, Gharpure MP, Gunisetty S, Stephens K, Antia R, Zarnitsyna VI, Stephens DS, Edupuganti S, Rouphael N, Anderson EJ, Mehta AK, Wrammert J, Suthar MS, Ahmed R, McElrath MJ. Longitudinal analysis shows durable and broad immune memory after SARS-CoV-2 infection with persisting antibody responses and memory B and T cells. Cell Rep Med. 2021 Jul 20;2(7):100354. doi: 10.1016/j.xcrm.2021.100354. Epub 2021 Jul 3. PMID: 34250512; PMCID: PMC8253687.
Longitudinal analysis shows durable and broad immune memory after SARS-CoV-2 infection with persisting antibody responses and memory B and T cells - PubMed (nih.gov)

Dyer O. Covid-19: Delta infections threaten herd immunity vaccine strategy BMJ 2021; 374 :n1933 doi:10.1136/bmj.n1933
Covid-19: Delta infections threaten herd immunity vaccine strategy | The BMJ

Gazit S, Shlezinger R, Perez G, Lotan R, Peretz A, Ben-Tov A, Cohen D, Muhsen K, Chodick G, Patalon T. Comparing SARS-CoV-2 natural immunity to vaccine-induced immunity: reinfections versus breakthrough infections. medRxiv, Aug 25, 2021.doi: https://doi.org/10.1101/2021.08.24.21262415
Comparing SARS-CoV-2 natural immunity to vaccine-induced immunity: reinfections versus breakthrough infections | medRxiv

Goldberg Y, Mandel M, Woodbridge Y, Fluss R, Novikov I, Yaari R, Ziv A, Freedman L, Huppert A. Protection of previous SARS-CoV-2 infection is similar to that of BNT162b2 vaccine protection: A three-month nationwide experience from Israel.
medRxiv 2021.04.20.21255670; doi: https://doi.org/10.1101/2021.04.20.21255670
Protection of previous SARS-CoV-2 infection is similar to that of BNT162b2 vaccine protection: A three-month nationwide experience from Israel | medRxiv

Greinacher A, Thiele T, Warkentin T-E, Weisser K, Kyrle P-A, Eichinger S. Thrombotic Thrombocytopenia after ChAdOx1 nCov-19 Vaccination. N Engl J Med 2021; 384:2092-2101.
DOI: 10.1056/NEJMoa2104840
Thrombotic Thrombocytopenia after ChAdOx1 nCov-19 Vaccination | NEJM

Iacobucci G. Covid-19: FDA set to grant full approval to Pfizer vaccine without public discussion of data BMJ 2021; 374 :n2086 doi:10.1136/bmj.n2086.
Covid-19: FDA set to grant full approval to Pfizer vaccine without public discussion of data | The BMJ

Ioannidis JPA. Infection fatality rate of COVID-19 inferred from seroprevalence data. Bull World Health Organ. 2021 Jan 1;99(1):19-33F. doi: 10.2471/BLT.20.265892. Epub 2020 Oct 14. PMID: 33716331; PMCID: PMC7947934.
Infection fatality rate of COVID-19 inferred from seroprevalence data - PubMed (nih.gov)

Ivanova EN, Devlin JC, Buus TB, Koide A, Cornelius A, Samanovic MI, Herrera A, Zhang C, Desvignes L, Odum N, Ulrich R, Mulligan MJ, Koide S, Ruggles KV, Herati RS, Koralov SB. Discrete immune response signature to SARS-CoV-2 mRNA vaccination versus infection. medRxiv [Preprint]. 2021 Apr 21:2021.04.20.21255677. doi: 10.1101/2021.04.20.21255677. PMID: 33907755; PMCID: PMC8077568.
Discrete immune response signature to SARS-CoV-2 mRNA vaccination versus infection - PubMed (nih.gov)

Kim J-H, **Scialli A-R**. Thalidomide: The Tragedy of Birth Defects and the Effective Treatment of Disease, Toxicological Sciences, Volume 122, Issue 1, July 2011, Pages 1–6, https://doi.org/10.1093/toxsci/kfr088
Thalidomide: The Tragedy of Birth Defects and the Effective Treatment of Disease | Toxicological Sciences | Oxford Academic (oup.com)

Kory P, Meduri GU, Varon J, Iglesias J, Marik PE. Review of the Emerging Evidence Demonstrating the Efficacy of Ivermectin in the Prophylaxis and Treatment of COVID-19. Am J Ther. 2021 Apr 22;28(3):e299-e318. doi: 10.1097/MJT.0000000000001377. PMID: 34375047; PMCID: PMC8088823.
Review of the Emerging Evidence Demonstrating the Efficacy of Ivermectin in the Prophylaxis and Treatment of COVID-19 (nih.gov)

Kozma G-T, Mészáros T, Vashegyi I, Fülöp T, Örfi E, Dézsi L, Rosivall L, Bavli Y, Urbanics R, Mollnes T-E, Barenholz Y, and Szebeni J. Pseudo-anaphylaxis to Polyethylene Glycol (PEG)-Coated Liposomes: Roles of Anti-PEG IgM and Complement Activation in a Porcine Model of Human Infusion Reactions
ACS Nano **2019** *13* (8), 9315-9324. DOI: 10.1021/acsnano.9b03942
Pseudo-anaphylaxis to Polyethylene Glycol (PEG)-Coated Liposomes: Roles of Anti-PEG IgM and Complement Activation in a Porcine Model of Human Infusion Reactions | ACS Nano

Lei Y, Zhang J, Schiavon CR, He M, Chen L, Shen H, Zhang Y, Yin Q, Cho Y, Andrade L, Shadel GS, Hepokoski M, Lei T, Wang H, Zhang J, Yuan JX, Malhotra A, Manor U, Wang S, Yuan ZY, Shyy JY. SARS-CoV-2 Spike Protein Impairs Endothelial Function via Downregulation of ACE2. bioRxiv [Preprint]. 2020 Dec 4:2020.12.04.409144. doi: 10.1101/2020.12.04.409144. Update in: Circ Res. 2021 Mar 31;: PMID: 33300001; PMCID: PMC7724674.
SARS-CoV-2 Spike Protein Impairs Endothelial Function via Downregulation of ACE2 - PubMed (nih.gov)

Loeb M, McGeer A, McArthur M, Peeling RW, Petric M, Simor AE. Surveillance for outbreaks of respiratory tract infections in nursing homes. CMAJ. 2000 Apr 18;162(8):1133-7. PMID: 10789627; PMCID: PMC1232363.
Surveillance for outbreaks of respiratory tract infections in nursing homes - PubMed (nih.gov)

Maayan H, Kirgner I, Gutwein O, Herzog-Tzarfati K, Rahimi-Levene N, Koren-Michowitz M, Blickstein D. Acquired thrombotic thrombocytopenic purpura: A rare disease associated with BNT162b2 vaccine. J Thromb Haemost. 2021 Jun 8:10.1111/jth.15420. doi: 10.1111/jth.15420. Epub ahead of print. PMID: 34105247; PMCID: PMC8237075.
Acquired thrombotic thrombocytopenic purpura: A rare disease associated with BNT162b2 vaccine - PubMed (nih.gov)

Maramattom BV, Krishnan P, Paul R, Padmanabhan S, Cherukudal Vishnu Nampoothiri S, Syed AA, Mangat HS. Guillain-Barré Syndrome following ChAdOx1-S/nCoV-19 Vaccine. Ann Neurol. 2021 Aug;90(2):312-314. doi: 10.1002/ana.26143. Epub 2021 Jun 22. PMID: 34114256.
Guillain-Barré Syndrome following ChAdOx1-S/nCoV-19 Vaccine - PubMed (nih.gov)

Read AF, Baigent SJ, Powers C, Kgosana LB, Blackwell L, Smith LP, Kennedy DA, Walkden-Brown SW, Nair VK. Imperfect Vaccination Can Enhance the Transmission of Highly Virulent Pathogens. PLoS Biol. 2015 Jul 27;13(7):e1002198. doi: 10.1371/journal.pbio.1002198. PMID: 26214839; PMCID: PMC4516275.
Imperfect Vaccination Can Enhance the Transmission of Highly Virulent Pathogens - PubMed (nih.gov)

Rella SA, Kulikova YA, Dermitzakis ET, Kondrashov FA. Rates of SARS-CoV-2 transmission and vaccination impact the fate of vaccine-resistant strains. Sci Rep. 2021 Jul 30;11(1):15729. doi: 10.1038/s41598-021-95025-3. PMID: 34330988; PMCID: PMC8324827.
Rates of SARS-CoV-2 transmission and vaccination impact the fate of vaccine-resistant strains - PubMed (nih.gov)

Sette A, Crotty S. Adaptive immunity to SARS-CoV-2 and COVID-19, Cell, Volume 184, Issue 4, 2021, Pages 861-880, ISSN 0092-8674, https://doi.org/10.1016/j.cell.2021.01.007.
(https://www.sciencedirect.com/science/article/pii/S0092867421000076)
Adaptive immunity to SARS-CoV-2 and COVID-19 - ScienceDirect

Solopov P, Biancatelli R-C, Sharlow E, Lazo J, Catravas J. Single intratracheal exposure to SARS-CoV-2 S1 spike protein induces acute lung injury in K18-hACE2 transgenic mice. FASEB J. First published: 14 May 2021.
https://doi.org/10.1096/fasebj.2021.35.S1.04183
Single intratracheal exposure to SARS-CoV-2 S1 spike protein induces acute lung injury in K18-hACE2 transgenic mice - Solopov - 2021 - The FASEB Journal - Wiley Online Library

Tseng CT, Sbrana E, Iwata-Yoshikawa N, Newman PC, Garron T, Atmar RL, Peters CJ, Couch RB. Immunization with SARS coronavirus vaccines leads to pulmonary immunopathology on challenge with the SARS virus. PLoS One. 2012;7(4):e35421. doi: 10.1371/journal.pone.0035421. Epub 2012 Apr 20. Erratum in: PLoS One. 2012;7(8). doi:10.1371/annotation/2965cfae-b77d-4014-8b7b-236e01a35492. PMID: 22536382; PMCID: PMC3335060.
Immunization with SARS coronavirus vaccines leads to pulmonary immunopathology on challenge with the SARS virus - PubMed (nih.gov)

Wang R, Song B, Wu J, Zhang Y, Chen A, Shao L. Potential adverse effects of nanoparticles on the reproductive system. Int J Nanomedicine. 2018 Dec 11;13:8487-8506. doi: 10.2147/IJN.S170723. PMID: 30587973; PMCID: PMC6294055.
Potential adverse effects of nanoparticles on the reproductive system - PubMed (nih.gov)

Zhang L, Richards A, Barrasa M-I, Hughes S-H, Young R-A, Jaenisch R. Reverse-transcribed SARS-CoV-2 RNA can integrate into the genome of cultured human cells and can be expressed in patient-derived tissues. Proceedings of the National Academy of Sciences May
2021, 118 (21) e2105968118; DOI: 10.1073/pnas.2105968118.
Reverse-transcribed SARS-CoV-2 RNA can integrate into the genome of cultured human cells and can be expressed in patient-derived tissues | PNAS