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Article

Vaccine Hesitancy: Christian Reasons and Responses

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Vaccine hesitancy is thriving even amid a pandemic. This threatens global health. Understanding the reasons for vaccine hesitancy, especially in Christian and religious groups where it appears to be prevalent, is necessary. This article summarizes common reasons for vaccine hesitancy and proposes factual and logical responses. These responses may be most effective when combined with interventions that include empathy. Christians, who seek truth and love, may be well poised to enact such responses.

It is difficult to imagine a world without vaccines. What if Edward Jenner never developed a vaccine from cow pox to prevent smallpox infections? What if Louis Pasteur never developed a rabies vaccine? What if Albert Sabin and Jonas Salk never developed polio vaccines? Without these vaccines, the remnants of humanity would likely be waging a war against several pandemics at once.

Vaccination is considered one of the greatest life-saving medical achievements of all time.¹ While the majority of pharmaceuticals *treat* disease, vaccines *prevent* disease. Vaccines train the immune system to detect and destroy an infectious agent. This prevents infectious diseases in the individuals who receive vaccines and also prevents infectious diseases in the broader population by reducing disease transmission. If enough people are vaccinated, then the chance of an infected case passing the disease to someone who is unvaccinated and susceptible is quite low. This population level of protection is known as herd immunity. Therefore, high vaccination rates protect both the individuals who were vaccinated and the few who were not.

Vaccination rates in North America are below the target that achieves herd immunity. For some infectious diseases, 95% of the population must be vaccinated. Results of the 2017 Childhood National Immunization Coverage Survey showed that vaccination coverage in two-year-old Canadians was 73.4% to 90.7% depending on the vaccine. This same survey reported 2.35% of Canadian children were completely unvaccinated at age two.² Results of the similar 2017 National Immunization Survey in the United States show vaccination coverage for a similar age (19–35 months) to be between 59.7% and 94.0% depending on the vaccine, and 1.1% of children in this age group were completely unvaccinated.³

The success of vaccines is threatened by a growing sense of uncertainty, in secular groups and Christians alike. The World Health Organization (WHO) has described this as “vaccine hesitancy” which encompasses vaccine uncertainty, vaccine delays, and vaccine refusals.⁴ In contrast, the term “anti-vaxers” refers to just refusals.

Vaccine hesitancy refers to delay in acceptance or refusal of vaccination despite availability of vaccine services. Vaccine hesitancy is complex and context specific, varying across time, place and vaccines. It is influenced by factors such as complacency, convenience and confidence.⁵

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The WHO named vaccine hesitancy one of the top ten risks to global health in 2019.⁶ This list also includes health challenges such as pollution and antimicrobial resistance, and significant pathogens such as HIV and influenza. In January 2020, the WHO released a list of urgent health challenges for the next decade. This included expanding access to medicines, stopping infectious diseases, earning public trust, and more.⁷ Vaccination is a key component in these challenges.

Unfortunately, there are people of faith known for their vaccine hesitancy and for their religious exemptions from vaccines.⁸ Recent measles outbreaks in British Columbia, Quebec, and New York have all involved unvaccinated religious groups.⁹ In addition, some religious schools in Canada and the United States have vaccination rates well below average.¹⁰

All American states require regular vaccines for children attending public school. All states accept medical exemptions from vaccinations, as they should. The majority of states (45 to be exact) accept religious, philosophical, and/or personal belief exemptions.¹¹ In Canada, Ontario and New Brunswick are the only provinces that require regular vaccines for children attending public schools, and both accept religious and/or philosophical exemptions.¹² The New Brunswick government voted down Bill 11 in June 2020 which proposed to remove these exemptions.¹³ Vaccination is voluntary in all other Canadian provinces.

The topic of vaccine hesitancy is of acute concern given the current COVID-19 pandemic, and the risk of more pandemics in the future. Mass vaccinations may be the only way to control the spread of pathogens such as SARS-CoV-2,¹⁴ but herd immunity may be difficult to achieve due to vaccine hesitancy.¹⁵ Understanding the reasons for vaccine hesitancy, and addressing them successfully, is of immediate importance. The purpose of this article is to review the reasons for vaccine hesitancy, especially among Christians, and to propose factual and logical responses. Common reasons for vaccine hesitancy among Christians in North America include the idea that vaccines interfere with divine providence, vaccines defile the body—God’s temple, vaccines are not safe, vaccines have side effects and can cause autism, and that vaccine manufacturing involves aborted stem cells.¹⁶ These will be addressed in the following text.

Reason: Vaccines interfere with divine providence.

Response: Vaccines, like other medical advancements, are forms of divine providence.

As Christians, we believe that God reigns with truth and love. How does God interact with us and the universe? What is God’s will during a pandemic? It depends on whom you ask. Some Christians consider divine providence to only include miraculous healings. Perhaps they rely on miracles because of verses such as Psalm 103:2–3 which says that the Lord “heals all diseases”. Other Christians see divine providence in modern technologies and medicines, perhaps because scripture speaks positively about medicine. Proverbs mentions that a “cheerful heart is a good medicine” (17:22) and there are several examples of the use of medicines in Isaiah 38:21, Ezekiel 47:12, and more. If Jesus could heal with water or mud, why not vaccines?

The argument that vaccines act against God’s will is not new; it dates back to the 1700s when some opposed the use of variolation which inoculated people with smallpox in an effort to induce protective immunological memory. During the 1721 smallpox outbreak in Boston, clergymen such as Cotton Mather and his supporters argued that God gave humans their reason and knowledge. They reasoned that if variolation was against God’s will, then were not all other medical procedures also against God’s will?¹⁷ These words are still insightful three hundred years later.

If vaccines interfere with divine providence, then they do so just as much as seatbelts.¹⁸ Both vaccines and seatbelts are preventative measures that protect people from harm. Both come with slight risks of injury that are greatly outweighed by the risks associated with refusal. Both are uncomfortable and have been met with criticism. However, people cannot file a religious exemption to avoid wearing seatbelts. They can, however, to avoid vaccination.

Vaccines and other medications can be considered gifts from God and products of our God-given wisdom. Christian doctors and scientists say that their passion, abilities, and work products come from God. Dr. Francis Collins is an excellent example of a scientist who is a Christian and views his scientific work as the director of the National Institutes of Health

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(NIH) as “a form of worship.”¹⁹ Dr. Kizzmekia Corbett, the scientific lead of the NIH’s Vaccine Research Center’s Coronavirus team, is another example. In a recent *Washington Post* article, Corbett says that her religion tells her why she “should want to help people, make the world a better place.”²⁰ Science has shown her a way. Her work on a COVID-19 vaccine could save countless lives. Clearly, we are being blessed through individuals such as Collins and Corbett.

Reason: Vaccines defile the body, God’s temple.

Response: Vaccines contain ingredients that are also found in our food and bodies naturally.

Vaccines contain a variety of ingredients including adjuvants, stabilizers, preservatives, and inactivated or attenuated pathogens or parts thereof. Two chemicals that have caused some public concern are formaldehyde and thimerosal.

Formaldehyde is a ubiquitous chemical found in nature and in some man-made products such as resins, cosmetics, and vaccines. It inactivates viruses used in the manufacturing of some vaccines. These vaccines have ≤ 0.1 mg of formaldehyde, which is significantly less than the 1.1 mg found in the circulation of the average 2-month-old infant due to their natural metabolism.²¹ Formaldehyde is a normal component of blood and is involved in amino acid and nucleotide synthesis, which builds proteins and DNA, respectively.²² Formaldehyde is also a natural chemical found in other animals and plants. In fact, many meats, mushrooms, vegetables, and fruits (especially pears, oranges, and papayas) consumed by humans naturally contain more formaldehyde than a vaccine.²³

Formaldehyde is problematic when inhaled at significant quantities from fuel combustion, industrial emissions, and industrial products such as resins. The International Agency for Research on Cancer (IARC) assesses cancer-causing agents called carcinogens and has concluded that formaldehyde causes cancers of the nose and throat when inhaled in sufficient quantities.²⁴

Thimerosal is a mercury-containing compound which acts as an antimicrobial agent in some vaccines. This chemical ensures that vaccines stay free of contaminants. The vaccines with the most thimerosal (0.01% or 50 μ g) still have less elemental

mercury than a 3-ounce can of tuna. Furthermore, thimerosal contains ethylmercury which is cleared from the body faster than methylmercury found in fish. While studies have shown that high concentrations of mercury are neurotoxic, repeated studies have shown that the small quantity of ethylmercury in vaccines does not cause neuropsychological deficits. From an abundance of caution, thimerosal was removed from childhood vaccines after the Food and Drug Administration Modernization Act was signed in 1997. Now, it is used only in multi-dose vials of vaccines given to adults.²⁵

In summary, if vaccine ingredients such as formaldehyde and mercury defile the body (God’s temple), then so too must foods like fruits and fish which contain these chemicals naturally. However, we cannot avoid ubiquitous formaldehyde-containing and mercury-containing foods, just as we should not avoid vaccines.

Reason: Vaccines are not safe.

Response: Vaccines are well tested and safe.

Vaccines undergo development and scrutiny that is similar to other pharmaceutical products. A product is first tested in lab cells and animals. If these results are positive, the product is then tested at low doses in phase 1 clinical trials to assess safety in healthy people. These trials often include dose-escalation which compares increasing doses of the product to see which are the safest. If these study results are positive, then the product is deemed safe and it is moved along to more advanced clinical trials. Phase 2 and 3 trials assess not only safety, but also efficacy of the product in a representative human population.²⁶ If the product is a possible anti-cancer drug, then it is tested in cancer patients. If the product is a possible anti-bacterial agent, then it is tested in people with that bacterial infection. If the product is a possible vaccine, then it is tested in people who may be exposed to that infectious disease. Once tests are complete, the trial data is submitted to independent government agencies such as Health Canada and the US Food and Drug Administration. These groups review all data on the product, along with the pharmaceutical premise, process, and people.²⁷ If all these meet standards, then the product may be approved for use in humans.

Vaccine development has been on full display in the COVID-19 pandemic. Vaccine developers have openly shared data throughout the pandemic, even

impressively detailed and coveted clinical trial protocols.²⁸ The phase 3 trial results of the Pfizer and BioNTech-funded vaccine were the first to be published on December 2, 2020, and additional data came later on December 17, 2020.²⁹ These studies were checked and published in the *New England Journal of Medicine* (NEJM), a prestigious peer-reviewed journal. The vaccine contains short-lived messenger RNA which can show the immune system a portion of SARS-CoV-2. This RNA resembles some of the RNA within the virus itself. A vaccine group funded by Moderna developed a similar product and published phase 1 results in *NEJM* on December 17, 2020.³⁰ More have followed.

Vaccines that protect individuals from SARS-CoV-2 infection have been developed at record speeds. Importantly, this fast pace does not imply that corners were cut. Rather, it is an indication of progress, collaboration, and shared priority. As time goes on, scientific and medical advancements accumulate faster than ever before. Academics and experts from around the world have come together in unprecedented ways. They have shifted their research focus to the pressing problem at hand. Those that studied other respiratory viruses are now studying SARS-CoV-2. Those that studied other infectious respiratory diseases are now studying COVID-19. Those that studied physical and mental health are now studying these in the context of the pandemic. Researchers have declared war on a common enemy.³¹

Just as researchers have made this pandemic a priority, so too have funding organizations and governmental agencies. Resources to fight this pandemic abound. Clinical trials are being completed so fast because they have had no problem securing funding, hiring trained personnel, and recruiting interested participants. The well-known epidemiologist and blogger Gideon Meyerowitz-Katz (known as Gideon M-K) explains this well.

So it's actually not correct to say we have rushed these vaccine trials. What's really happened, by and large, is that we've removed the usual hurdles such trials face. Funding has been no object, recruitment has been quicker than ever before, and even minor things like finding trained staff has been much easier this year than in previous ones.³²

Furthermore, the fact that the COVID-19 pandemic is still raging through 2020 and into 2021 means that clinical trial participants had many possible exposures and data have accumulated quickly. After just

112 days, the mRNA vaccine funded by Pfizer and BioNTech had achieved 95% efficacy in a phase 3 clinical trial. Trial participants were divided into two groups: 18,325 individuals received the placebo while 18,198 individuals received the vaccine doses. Results show that 162 participants in the placebo group and only 8 participants in the vaccine group contracted COVID-19.³³

The abundance and transparency of open access data should address worries of vaccine safety from Christians and non-Christians alike. Anyone with internet access can read all the clinical trial protocols and published trial results free of charge.

Reason: Vaccines have serious side effects and can cause diseases, such as autism.

Response: Vaccines do have rare side effects, but autism is not one of them.

The idea that some vaccines cause autism originated in the 1990s from the work of Dr. Andrew Wakefield and colleagues. He investigated 12 select children who received the combination measles mumps rubella (MMR) vaccine and who then developed autistic behaviors as reported by the parents, and intestinal inflammation as determined by medical doctors.³⁴ After significant investigation, the paper was retracted for reasons of data fraud and unethical conduct.³⁵ This small correlative study initiated a wave of vaccine misinformation that still persists today.³⁶ Numerous studies have investigated hundreds of thousands of people from around the world and found no correlation between MMR vaccination and autism.³⁷

While vaccines do not cause autism, they do have rare side effects. These adverse events are monitored by the Vaccine Adverse Event Reporting System (VAERS) in the U.S., and by Canadian Adverse Event Following Immunization Surveillance System (CAEFISS) in Canada. In the most recent reporting year of 2017, there were 2,960 adverse events reported in Canada. Considering that 23 million vaccine doses were administered, both privately and publicly, this is a rate of 12.6 adverse events per 100,000 vaccine doses. The most common adverse reactions are vaccination site reaction (n=1,339), non-anaphylactic allergic reactions (n=355), and rash alone (n=346). Of all the adverse events, 8.5% (n=253) were serious. The most frequent serious adverse events are neurologic (n=78), most of which were seizures (n=58) which can be induced by fever.

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Death, the most serious adverse event, was reported in 4 individuals. Two of these deaths were in children <2 years of age, and the remaining two deaths were in adults >18 years of age. All four individuals had comorbidities (heart surgery, serious injury, cardiovascular disease, and diabetes) which were deemed the causes of death, not the vaccination.³⁸

To put these correlative deaths in perspective, consider the deaths directly caused by vaccine-preventable diseases during the same time period. Between the years 2013 and 2017, Canada averaged less than 1 death per year from *Haemophilus influenzae* (Hib) infection, less than 1 death per year from chickenpox caused by varicella-zoster virus infection, 1 death per year from pertussis (whooping cough) caused by *Bordetella pertussis* infection, over 3 deaths per year from invasive pneumococcal disease caused by *Streptococcus pneumoniae* infection, and 11 deaths per year from invasive meningococcal disease caused by *Neisseria meningitidis* infection.³⁹ This totals an average of 16 deaths caused by vaccine-preventable diseases per year in Canada. That is dramatically fewer deaths than if vaccination had not been widespread, but still four times more than the number of deaths temporally correlated with vaccine use.

Reason: Vaccine manufacturing involves aborted stem cells.

Response: Yes, the production of some vaccines uses cells derived from fetuses aborted over 55 years ago. In the absence of good alternatives, we can use vaccines in good conscience.

Lung cells of two aborted fetuses were grown in labs and named WI-38 and MRC-5 by Dr. Leonard Hayflick in 1964 and Dr. J. P. Jacobs in 1966, respectively.⁴⁰ The source abortions were elective, and not done for the purpose of vaccination production. The fetal cells were deemed optimal for viral production due to their enhanced replicative potential, which is a benefit given the fact that viruses do not self-replicate. Viruses produced from these cells, but not the cells themselves, were collected and used for vaccine production. Vaccines for rubella (including the rubella portion of the combined measles, mumps, rubella vaccine), chickenpox, hepatitis A, and one rabies vaccine are made with the help of these 55+-year-old fetal cell lines.⁴¹

The Vatican has researched vaccines made using aborted fetal cells and issued a clear statement in response. While it condemns abortions, it has come to the conclusion that in the absence of alternatives, one should abstain from these particular vaccinations only if the disease poses no risks to children or the population as a whole. The Vatican specifically states that there is reason to accept the rubella (also called German measles) vaccine due to the risks associated with the lack of vaccination.⁴² If pregnant women contract German measles, it often infects their fetus too and could cause intellectual disability, blindness, deafness, or death as demonstrated by the severe epidemic of German measles in the United States in 1964.⁴³

As regards the diseases against which there are no alternative vaccines which are available and ethically acceptable, it is right to abstain from using these vaccines if it can be done without causing children, and indirectly the population as a whole, to undergo significant risks to their health. However, if the latter are exposed to considerable dangers to their health, vaccines with moral problems pertaining to them may also be used on a temporary basis. The moral reason is that the duty to avoid passive material cooperation is not obligatory if there is grave inconvenience. Moreover, we find, in such a case, a proportional reason, in order to accept the use of these vaccines in the presence of the danger of favoring the spread of the pathological agent, due to the lack of vaccination of children. This is particularly true in the case of vaccination against German measles.⁴⁴

In response to this same topic, Gene Rudd, MD, writes for the Christian Medical and Dental Associations that vaccines are good.

While never condoning evil acts so that good may result, the Judeo-Christian tradition teaches of a loving God Who seeks to make good out of evil. A Christian does not reject the resurrection (good) because of its linkage to crucifixion (evil). Though linked, participation in the good does not endorse the evil. Neither does one need to reject the benefits of vaccination (good) solely because of its past linkage with abortion (evil).⁴⁵

Certainly, vaccines do good. The use of vaccines can demonstrate our commitment to Jesus's second greatest commandment: to love our neighbors as ourselves. Vaccines protect the individual and prevent them from transmitting the infection to their vulnerable neighbors that may be young, pregnant, or immunosuppressed. Despite these vaccine benefits, the use of cells from two abortions over 55 years

ago in the manufacturing of some vaccines seems to be the most significant reason for vaccine hesitancy among Christian groups today.⁴⁶ Abortion is a much more contentious issue in the church than in secular society. Ninety per cent of atheist Americans said that abortions should be legal while only 56% of Anglicans, 48% of Catholics, and 30% of Southern Baptists would say the same.⁴⁷ Even if, after careful prayer and risk assessment, Christians feel that taking a rubella vaccine makes them complicit in abortion, then at least they can accept other vaccines (like the annual flu vaccine) with a clear conscience.

Call for Empathy

The responses discussed in this article focus on scientific facts and philosophical arguments. It seems logical to use this information to combat vaccine misinformation that abounds in easily accessible web courses and social media.⁴⁸ However, information alone may not address vaccine hesitancy sufficiently. Indeed, the health experts Drs. Sara and Jack Gorman, authors of the book *Denying to the Grave*, state that “the problem is not simply lack of information” and argue that “irrational behavior occurs even when we know and understand all the facts.”⁴⁹ Facts and arguments must be combined with empathy, the ability to understand and share feelings, to really respect the vaccine-hesitant individual. The following quote that is often attributed to Theodore Roosevelt explains this idea well: “People don’t care how much you know, until they know how much you care.”

The most effective efforts employ multiple strategies, including those that display empathy and build trust.⁵⁰ Among the many strategies, motivational interviewing approaches are common, effective, and supported by professional health experts such as Drs. Sara and Jack Gorman mentioned previously.⁵¹ One such motivational interviewing strategy named the PromoVac strategy has reduced vaccine hesitancy and improved vaccination rates in Quebec. In 2018, this educational interview session was implemented in all maternity wards in the province.⁵² This strategy involves health care professionals using motivational interviewing based on three main actions: (1) cultivating a partnership with empathy; (2) fostering engagement; and (3) understanding and then adapting to the needs of the patient or caregiver.

Achieving the first step in the PromoVac strategy may be the most difficult for Christians who dis-

agree about vaccines. In response to difficult topics such as this that involve science and faith, psychologist Erin Smith has reviewed influences on human reasonings and provided a list of suggestions for navigating difficult conversations. Her suggestions include affirming self-worth, agreeing about core values, and highlighting diversity within Christian belief. These three suggestions emphasize personal importance, reduce the feeling of threat, and maintain social connections by expanding the group identity. Smith states that these strategies on their own “will not change minds, but the evidence suggests that they will promote the psychological safety for minds to be open to hear and engage with otherwise threatening ideas and data.”⁵³ Humans are social and stubborn animals. Without the first step of forming a relationship (partnership, friendship, or other), fruitful discussion may not proceed.

Scripture encourages discussion, truth seeking, and empathy. In Romans 12:15, we are told to “weep with those that weep,” and in Colossians 3:12, we are told to clothe ourselves “with compassion, kindness, humility, meekness, and patience.” Therefore, Christians are familiar with these values and are well equipped to use them to address vaccine hesitancy. Perhaps, someday, Christ-followers will be known for our vaccine confidence and our ability to address vaccine hesitancy, instead of our religious exemptions and vaccine refusal.

Conclusion

The current COVID-19 pandemic has highlighted the significant problem of vaccine hesitancy, and there is no doubt that this discussion will continue through 2021 and beyond as COVID-19 vaccines are distributed and as future pandemics are encountered. Vaccine hesitancy is a threat to global health, and it could potentially reverse years of medical advancements. This can be partially addressed by understanding the reasons for vaccine hesitancy, especially in a Christian context, and discussing responses that involve scientific evidence and philosophical arguments. These facts and logic, combined with empathy, may constitute the most successful approach to combat vaccine hesitancy. Further research will continue to evaluate and improve these approaches. ⇔

Notes

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Dr. Francis S. Collins, MD, PhD is a physician-geneticist noted for his groundbreaking discoveries of disease genes, as well as his leadership of the international Human Genome Project. Since 2009 he has served as the Director of the National Institutes of Health, the largest supporter of biomedical research in the world, spanning the spectrum from basic to clinical research.

He is an elected member of the Institute of Medicine and the National Academy of Sciences, and was awarded the Presidential Medal of Freedom in November 2007, followed by the National Medal of Science in 2009. He is the 2020 Templeton Prize Laureate.

Dr. Collins is the author of the *New York Times* best seller, *The Language of God: A Scientist Presents Evidence for Belief* (2006), in which he describes his own conversion from atheism to Christianity, and presents the case for an intellectually satisfying harmony between the worldviews of science and faith. He is also the founder of the BioLogos Foundation (www.biologos.org) and a Fellow of the American Scientific Affiliation (www.asa3.org).