

# CMI, Vaccines and Vaccination

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## Introduction

As a biblical, scientific organization, we often get asked by inquirers about our position on a range of related issues. One such issue is vaccinations. We realize that for some this is a highly charged issue that can engender strong emotions. Unfortunately, there is much confusion and even emotion, even in Christian circles, as a result of misinformation that is proliferated on the Internet. Often, with Christians, much of the thinking is driven by well-meaning, but misapplied biblical statements and, in some cases, even conspiratorial (anti-government or anti-establishment) constructs—an area outside of CMI's purview.

CMI takes a generally pro-vaccination position, as the best trade-off in this fallen world, because the benefits overall greatly outweigh the harms. This is consistent with a Christian ministry, because disease and suffering are the results of the Curse at the Fall, and Jesus himself alleviated the effects of the Curse.

It is a scientific and historical fact that vaccines have saved millions of lives. Thus, as a part of our duty of care for our staff and supporters, we should support medical treatments with a proven record of high safety and effectiveness.

And at my suggestion, the CMI-US office, following the biblical principle of proper care for workers (Colossians 4:1, Ephesians 6:9), pays for influenza ('flu') shots for all employees and their dependent family members, if they choose to obtain them. The CMI-AU office has followed suit.

We think we have a duty-of-care to protect our families and also not to bring the 'flu back to the office to the rest of the staff, etc. Actually, even apart from the principle of care, it has a sound economic basis: just one or two employees off work for a week would cost the ministry (and thus its supporters) many times more than the cost of flu shots for all. Indeed, our speakers when on ministry are at greater risk than otherwise through shaking dozens of hands of well-wishers at ministry events.

Note that the influenza virus kills tens of thousands of people in the US alone every year, and statistics show that most of these victims are unvaccinated. It is not just a bad cold, even this bad cold is misnamed 'the flu'.

## Theological and philosophical preamble

Because of Adam's sin, God cursed the entire creation. This is why humans and animals are now afflicted with death and disease. This curse is still in effect, as shown by the obvious fact that Christians still die. While we also believe that God can heal the sick, this curse that has affected the whole of creation won't be completely undone until the final resurrection bodies, as per the closing chapters of Revelation with their Edenic allusions.

It is also clear that God doesn't always heal the sick supernaturally. Millions of devout people have died of infectious diseases throughout history. So, using modern medicine is no more a lack of faith than putting a seatbelt on you and your children, and hoping God will heal them *after* an accident. Indeed, the Bible also teaches, especially by the example of Christ, that ameliorating the effects of the Curse is a blessing—He healed many diseases and disabilities and we would endorse praying for healing at all times.. Any medical advance, backed by rigorous scientific testing, that can prevent or cure infectious diseases though, is thus following the example of Christ.

As explained later, God's sovereignty means that even natural (which God made anyway) or man-made medicines (within the boundaries of the Genesis 1:28 Dominion Mandate) are also His means of healing. As CMI has often explained, what we call 'natural laws' are really our descriptions of God's normal, regular, repeatable way of upholding His creation; miracles are God's extraordinary

non-repeatable way of upholding His creation, or an *addition* to the ordinary ‘natural law’ way He normally acts.<sup>1</sup>

CMI is also not anti-establishment, anti-government or anti-majority for its own sake, but pro-Bible. We would oppose the establishment or the majority view of scientists only when it conflicts with the Bible (as we do with evolution theory), and reject conspiratorial theorizing.<sup>2</sup> To do otherwise would, for one thing, involve needlessly trying to fight a battle on multiple fronts. Thus, for example, CMI does not oppose the majority view of physicists in favour of relativity and quantum mechanics, since neither of these views conflicts with Scripture. Most creationist physicists support these well-established theories, too.<sup>3</sup> The same goes with vaccination, supported by the vast majority of medical doctors and scientists—including creationists in those fields.

## **What is vaccination?**

God has given us an immune system. This would have had a pre-Fall role in differentiating self and non-self, but in this fallen world, it also fights against invading microbes. However, because we are fallen creatures, this system doesn’t work perfectly, as shown by the millions of deaths from infectious diseases throughout history (the 1918 Spanish flu epidemic is thought to have killed up to 100 million people or 3% of the world’s population at the time—including great numbers of Christians).

This immune system has long known to be ‘trainable’ (a great example of intelligent design)—in many cases, survivors of a disease become immune to further attacks of this disease. For example, although smallpox had a mortality rate of about a third, survivors never got it again. From this, many researched ways of acquiring this immunity without the dreadful ‘side-effect’ of the full-blown disease. First, this was via crude inoculations of powdered smallpox scabs, with much weakened but still live smallpox germs. This had a much lower mortality rate than full-blown smallpox, but still the famous American theologian and preacher Jonathan Edwards (1703–1758), a supporter of inoculation, died from this.

Smallpox prevention was much improved when doctors observed that maids who suffered from the mild disease cowpox were likewise immune to smallpox. So, Edward Jenner (1749–1823) in 1798 used material from cowpox blisters to inoculate patients successfully against smallpox.

With the development of the germ theory of disease, and the rejection of spontaneous generation, by creationist Louis Pasteur (1822–1895), the methods could be further improved by using *dead* microbes, which cause no disease at all. He demonstrated this by showing that rabies vaccine would prevent the development of this almost always fatal disease—he gave it to Joseph Meister, a 9-year-old boy bitten severely by a rabid dog (1876–1940). No amount of nutritional measures or hygiene had ever prevented the development of rabies in people who had been mauled by rabid dogs.

Thus, the main principle of vaccination is to train the immune system with dead or highly weakened germs, to give the immune system ‘target practice’. As a result, if it encounters the live pathogen, it is ready for it. Because the germ has little chance to multiply to dangerous levels, a vaccinated person usually doesn’t develop an illness at all or gets it much less severely. So, vaccination has saved millions of lives, and prevented severe injuries in millions more. One of our own senior staff was a practising medical doctor for many years and has seen firsthand the baneful effects and damage caused by people contracting such preventable diseases, including brain damage, in unvaccinated children.

## **Vaccines are very effective**

There is no doubt that we have far lower rates of many nasty diseases today. Smallpox has been completely eradicated, iron lung wards of hospitals that kept polio victims alive have largely disappeared, and rabies and tetanus are completely preventable. Also, debilitating diseases of childhood like measles, mumps, rubella, and whooping cough are no longer unpleasant rites of passage for most children. It’s notable that most anti-vaxers and even lots of doctors today are not old enough to remember when these diseases were widespread. Because they are not common, many often see no need to be vaccinated.

Many anti-vaxers claim that these diseases were eradicated not by vaccination but by improvements in hygiene and nutrition. No one doubts their important roles. However, if they were the main causes of infectious disease reduction, then we would have seen these diseases disappear almost simultaneously. But the contrary is true: the diseases disappeared at different times, which correlated strongly with the introduction of specific vaccines for these diseases in both the USA<sup>4,5</sup> and Australia<sup>6</sup>—many in modern times where there was negligible further improvement in hygiene and nutrition.

This is further supported by modern outbreaks of infectious diseases in the western world which correlate with areas of widespread vaccination refusal. This has often been linked with wealthier communities where there would obviously be no drop in sanitation or nutrition, in the USA and Japan.<sup>7</sup>

Furthermore, the hygiene explanation fails particularly badly in the case of polio. There were still outbreaks in the hygienic 1950s, because sanitation actually made the disease *more* prevalent, because it reduced contact with the disease germ in the environment that sometimes conferred natural immunity—so the dirty environment was acting like a crude vaccine! So, polio mainly hit the prosperous and clean places.<sup>8</sup>

Anti-vaxers might point out ‘correlation does not causation’ (although they don’t apply this to claims such “I got flu after the flu shot”, as below), but this correlation is combined with a known mechanism for vaccines to work, and controls of the other plausible variables.

*Bottom line: if vaccination is not effective, then our immune system is not trainable!*

## Vaccines are very safe

It is true that vaccination, even with dead germs, is not 100% safe. But then, nothing is 100% safe! That includes activities we regularly choose to undertake, judging their benefits to be worth the risks, such as driving a car. In a fallen world, there are *no* perfect solutions, only trade-offs. So, it is folly to compare vaccination safety with a perfect standard that doesn’t exist; rather, it should be compared with the safety of *non*-vaccination (a.k.a. ‘relative risk assessment’). The latter (non-vaccination) is manifestly unsafe. Even on the face of it, the logic seems obvious:

If you think your child’s immune system is strong enough to fight off vaccine-preventable diseases, then it’s strong enough to fight off the tiny amounts of dead or weakened pathogens present in any of the vaccines.<sup>9</sup>

## Non-vaccination is very unsafe

The blatant **un** safety of non-vaccination should be obvious with well-known killers like smallpox and tetanus, but even ‘childhood illnesses’ are badly underestimated. For example:

- **Influenza.** Too many people refer to a bad cold as ‘the flu’, but actual influenza is much worse. Thousands die in the USA every year from influenza complications:
  - Centers for Disease Control (CDC) estimate an average of 23,607 deaths per year from 1976 to 2007.<sup>10</sup>
  - The figures are more certain about the number of children who die from flu, because it has been a nationally notifiable condition since 2004: from the 2003–4 to the 2013–14 seasons, the average is about 113 pediatric flu deaths per season.<sup>11</sup>
  - The CDC estimated that 90% of the children who died from influenza last season were not vaccinated. Further, about 40% of the deaths were in previously healthy children.

Pregnant women who receive the influenza vaccination are much less likely to deliver premature, underweight,<sup>12</sup> or stillborn<sup>13</sup> babies. This means that influenza is dangerous to unborn babies, so vaccination is a very pro-life policy.<sup>14</sup>

- **Chickenpox.** At best, it’s still a nasty disease with itchy blisters that often leave scars, plus a high fever and headache, resulting in a week missed from school. Further:

- A person who has had chickenpox can get a painful and scarring rash called shingles years later, because the virus lies dormant in nerve cell bodies for years, but for some reason is re-activated and travels down the nerves to infect the skin near the nerve endings. In some people, it can lead to lifelong chronic pain.<sup>15</sup> It's even worse when it affects nerves of the ear or eye.
- Before the vaccine, about 11,000 people were hospitalized for chickenpox each year in the United States.
- Before the vaccine, about 100 people died each year as a result of chickenpox in the United States.<sup>16</sup> They were usually healthy before contracting the disease.<sup>17</sup>
- **Whooping cough or pertussis.** This is not just a bad cough, but can have severe complications of pneumonia, brain damage, and the coughing fits are often so severe as to cause cracked ribs and turn children blue from oxygen deprivation. It was known as the 100-day cough.<sup>7</sup> It used to kill 8,000 babies per year.<sup>8</sup>
- **Measles.** At best, it's a nasty, itchy pox accompanied by high fever, cough, runny nose, and inflamed red eyes. Worse:
  - Ear infections occur in about one out of every 10 children with measles and can result in permanent hearing loss.
  - As many as one out of every 20 children with measles gets pneumonia, the most common cause of death from measles in young children.
  - About one child out of every 1,000 who get measles will develop encephalitis (swelling of the brain) that can lead to convulsions and can leave the child deaf or mentally retarded. 1 in 10,000 children will get Subacute Sclerosing Pan-Encephalitis (SSPE), a progressive brain-eroding condition that inevitably leads to a slow, distressing death.
  - For every 1,000 children who get measles, one or two will die from it.<sup>18</sup>

Overall, if vaccination were so unsafe, then it's hard to explain why sharp increases in vaccination correlate so strongly with increases in general health as well as sharp drops in child mortality.<sup>19</sup>

For another example of such trade-offs, 350 people die annually in the USA taking baths,<sup>20</sup> but this would not justify refusing to wash, because that would increase the risk of acquiring diseases. Similarly, most wouldn't refuse to wear seatbelts just because in rare freak situations, being thrown out of a vehicle could enhance the chance of survival.<sup>21</sup> This is because they realize that overall, the chances of being killed or injured by *not* being restrained are far greater.

The impossible demand for 100% safety is similar to the claim that vaccination violates the faux-Hippocratic maxim *Primum non nocere* ("First do no harm").<sup>22</sup> But it should be clear that *withholding* such a life-saving measure is inflicting considerable *harm by omission*.

*Bottom line: anti-vaxers often make the two contradictory claims about our immune system: apparently our immune system is so strong that it can fight off legions of rapidly multiplying live germs, but it is simultaneously so fragile that a few fragments of dead germs will overwhelm it.*<sup>23</sup>

Of course, if someone has been harmed by vaccination, however rare (see Vaccine Injuries, below), great compassion is in order; one can scarcely expect a parent to be consoled by the statistical fact that the child's chance of being harmed by the disease was greater. (From the parent's perspective, the child, if unvaccinated, may have survived the illness with no lasting harm.) This is part of what makes it such an emotive issue.

For example, say that a parent chose to vaccinate for a particular illness where the chance of serious complications from the vaccine was 1 in 100,000, and the chance of serious complications from being unvaccinated was 1 in 10,000. And the child suffered complications from the vaccine. Without the benefit of foresight, as only God has, one can still say that at the time the decision was made, the parent's decision to vaccinate was the wisest and most responsible one in discharging their duties as a parent—even though in hindsight the picture looks different.

## Objections

### Vaccines contain deadly poisons

This is a meaningless claim, because the first rule of toxicology is: ‘the dose *makes* the toxin’. For example, there are chemicals in perfectly safe food and even in our bodies, as well as vaccines, that would be toxic in a thousand times the amounts. Conversely, even ‘good’ things like oxygen and water can act as poisons in large amounts.<sup>24</sup>

Many poisons have benefits in small amounts, e.g. the potent digitalis toxin in foxglove plants in tiny amounts can benefit heart arrhythmias and congestive cardiac failure. The ‘deadliest toxins’ known, the botulinum toxins, have an LD<sub>50</sub> (median lethal dose),<sup>25</sup> of around a nanogram per kilogram (ng/kg) of body weight.<sup>26</sup> Yet it is used to control squinting and wrinkles in minuscule doses (commonly given as ‘botox’ injections). The class of anti-hypertension medicine called ACE inhibitors were developed after analysing a component of a pit viper venom.

Another important issue is that poison molecules cannot reproduce; disease germs are so dangerous precisely because they can make many more of themselves.

### Mercury

For many decades, many vaccines have included a strong preservative, a compound of mercury with an ethyl and thiosalicylate<sup>27</sup> group called *thiomersal* (from ethylmercury **thio**salicylate) or *merthiolate* or *thimerosal*.<sup>28</sup>

Back in 1931, it was shown that thiomersal is 40–50 times more effective against *Staphylococcus aureus* (golden staph) than phenol (carbolic acid), the classic antiseptic used by the pioneer Joseph Lister (1827–1912). Indeed, a concentration of only 1 part in 10,000 (0.01%) would stop bacterial growth in vaccines,<sup>29</sup> but not destroy the vaccine itself as phenol does.<sup>30</sup> Since this concentration was used as a vaccine preservative, this amounts to 50 µg (µg = microgram = one millionth of a gram) of thiomersal in a 0.5 mL dose, or 25 µg of mercury.<sup>31</sup> To put this into perspective, a typical serving of tuna would have an average of 30 µg of mercury.<sup>32</sup> Vaccinations are a single dose—people frequently eat tuna.

However, quite large amounts didn’t harm test animals: “up to 20 mg per kg body weight in rabbits and still higher in rats—without apparent injury.”<sup>33,34</sup> For humans, it seems to require 3 to a few hundred mg/kg of thiomersal to produce acute mercury toxicity. So if we take the most cautious figure of 3 mg/kg, a 50-kg person would need to receive over a thousand thiomersal-containing vaccinations to receive a toxic dose. So not surprisingly, one review revealed no evidence of harm caused by doses of thimerosal in vaccines, except for local hypersensitivity reactions,<sup>35</sup> although it was used for many decades.

However, from the 1960s to the 1990s, mercury-containing effluent poured into the sea was shown to have highly toxic effects. And it accumulated in the food chain, so it became concentrated in fish. Several thousand people in the fishing community of Minamata Bay, Japan, had serious mercury poisoning with often fatal results. In particular, bacteria converted the inorganic mercury into *methylmercury* CH<sub>3</sub>Hg<sup>+</sup>.<sup>30</sup>

However, there is an important difference between this and thiomersal—the latter is metabolized into *ethylmercury* CH<sub>3</sub>CH<sub>2</sub>Hg<sup>+</sup>. Even though there is only a CH<sub>2</sub> group difference, this makes *all* the difference—compare ethanol or ethyl alcohol (CH<sub>3</sub>CH<sub>2</sub>OH) that makes you “merry” (Ecclesiastes 10:19) with methanol/methyl alcohol (CH<sub>3</sub>OH) that makes you blind or dead. Ethyl mercury does *not* accumulate. Rather, it is removed quite quickly from the blood and excreted via feces. Indeed, even giving thiomersal-containing vaccines to infants did not raise their blood mercury level above safe levels, and the half-life of mercury in the blood was about a week.<sup>36</sup>

Unfortunately, in a typical panic-reaction by bureaucracies,<sup>37,38</sup> on 9 July 1999, the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics (AAP) asked the vaccine makers to remove thiomersal from their vaccines. The absurd double-speak of the AAP press release just confused matters:

Parents should not worry about the safety of vaccines. The current levels of thimerosal will not hurt children, but reducing those levels will make safe vaccines even safer. While our current immunization strategies are safe, we have an opportunity to increase the margin of safety.

Of course, if the amounts are safe already, then how could the safety be improved by removing it? And it sent the mixed message to parents: “if they are removing thiomersal, it must really have been harmful after all—and they must have been hiding this in the past.”

This caused immediate harm: after about 10% of hospitals suspended their hepatitis B vaccines that contained thiomersal, a 3-month-old baby born to a mother infected with the disease died of this. And the ban enabled concerned parents and associated ambulance-chasers to blame thiomersal for their children’s autism (see below).<sup>39</sup> It has also increased the costs of vaccination, because they must be in single-dose vials without a preservative.

However, now, this issue is a red herring, because so few vaccines still contain thiomersal. In the USA, only some influenza, tetanus, and meningococcal vaccines have as much as 25 µg of mercury; the vast majority have *none*.<sup>40</sup>

### **Formaldehyde**

Formaldehyde or methanal (HCHO) is the simplest aldehyde (RCHO), and has the ability to cross-link proteins. This makes it toxic to microbes, so it is used as a preservative. For vaccines, it is important to have dead microbes, so formaldehyde is used to inactivate viruses. It also denatures the deadly toxin proteins of the tetanus and diphtheria bacteria, so they can no longer do their damage, but can still provoke the desired immune response.<sup>41</sup>

So how much formaldehyde is in vaccines? Some vaccines have about 100 µg per dose, as per this table.<sup>42</sup> Note that the table lists different versions of the same vaccine, whereas a patient would receive only one of these. This means that the typical vaccination schedule for infants would result in about 120 µg.<sup>43</sup> So let’s put that into proper perspective.

Actually, our bodies produce formaldehyde in small amounts. Metabolism of some amino acids produces formaldehyde as a by-product. And it is even essential as a metabolic intermediate in manufacturing purines (essential components of DNA and RNA) and some amino acids. So the naturally occurring concentration of formaldehyde in our blood is 2–3 µg/g<sup>44</sup> or about 2–3 mg/L. So even a 2-month-old infant with half a litre of blood would have 1–1.5 mg in the whole bloodstream. It means that the total recommended vaccination schedule would add about a tenth to the infant’s natural level, which is below the natural variability.

We can’t escape formaldehyde from outside, because it is contained in many foods, especially pears, which have about 60 µg/g (mg/kg), and cod, apples, and pork have about 20 µg/g.<sup>45</sup> Thus a 200-g pear would have 12,000 µg, 100 times as much as the total infant vaccination schedule.

### **Aluminium**

Aluminium is an adjuvant, that is, it enhances the immune response, so that less of the deactivated infectious agent is needed. Aluminium is in any case abundant in nature, e.g. clay minerals are aluminosilicate sheets (called *phyllosilicates*). Once again, the amount in vaccines is incredibly tiny by comparison.

### **Egg protein**

Albumin, the protein from eggs, is used as a vaccine stabilizer. This is what’s responsible for many of the reported allergic reactions to vaccines. This is a non-issue for those who can eat eggs or egg products.

### **“I got influenza from the flu shot”**

No, you didn’t. Dead viruses simply can’t cause infection. The impression is a good example of the fallacy, unfortunately widely used by anti-vaxers, of *post hoc ergo propter hoc* (“after this therefore because of this”). That is, some people became ill after a flu shot, so think that the flu shot caused the disease. In reality, it takes about two weeks for the body’s immune system to respond fully, and these unfortunates caught the live flu virus (if in fact the illness was influenza) before the immune

system was fully protective. Also, no system is totally effective, and sometimes the vaccine doesn't contain the right match for the live virus in the current 'flu season'.<sup>46</sup> Finally, again, too many people call a bad cold 'the flu', and an influenza shot won't protect against non-influenza illnesses.

### **“Vaccines cause autism”**

This is a very common claim, infamously promulgated by former Playboy model Jenny McCarthy, who claimed that her son became autistic after being vaccinated. It also gained some credibility with a study published in *Lancet* by British doctor Andrew Wakefield. Later, he was “held guilty of ethical violations (they had conducted invasive investigations on the children without obtaining the necessary ethical clearances) and scientific misrepresentation (they reported that their sampling was consecutive when, in fact, it was selective).”<sup>47</sup> *Lancet* retracted the study in February 2010.

In contrast to Wa, study after study has shown no link between vaccination and autism. The U.S. National Academy of Science's (NAS) Institute of Medicine published a study in 2004 which summarized:

Thus, based on this body of evidence, the committee concludes that the evidence favors rejection of a causal relationship between thimerosal-containing vaccines and autism.<sup>48</sup>

And in 2014, a huge meta-study was published, involving over a million children, concluding:

Five cohort studies involving 1,256,407 children, and five case-control studies involving 9,920 children were included in this analysis. The cohort data revealed no relationship between vaccination and autism ..., nor was there a relationship between autism and MMR ..., or thimerosal ..., ... Findings of this meta-analysis suggest that vaccinations are not associated with the development of autism or autism spectrum disorder. Furthermore, the components of the vaccines (thimerosal or mercury) or multiple vaccines (MMR) are not associated with the development of autism or autism spectrum disorder.<sup>49</sup>

Even autism advocacy organizations reject a link between vaccination and autism:

### **Are Vaccines to Blame?**

Over the last two decades, extensive research has asked whether there is any link between childhood vaccinations and autism. The results of this research are clear: Vaccines do not cause autism. We urge that all children be fully vaccinated.<sup>50</sup>

But like the whack-a-mole game, this charge keeps raising its head after being refuted repeatedly. In particular, the originator of the claim, Andrew Wakefield, has been thoroughly discredited for fraudulent research<sup>51</sup> and was stripped of his medical licence in 2010 for showing “callous disregard” for children's welfare.

Also, and very importantly, if the autism really were due to thiomersal in vaccines, then removal of that from most vaccines should have caused reduction in autism rates. But they are rising instead.

### **The real reason for the perceived increase in autism**

When it comes to some diseases, the increase in numbers can actually be attributed to the increase in average lifespan. That is, people now live longer, so have more chance to contract these diseases, instead of dying young of the infectious diseases now limited by vaccination. For example, since the average lifespan used to be in the 40s, there were fewer cases of cancer than an increased population who now have the average lifespan in the later 70s. We are living longer, but are also having more time to develop those diseases.

Therefore, in one sense there is a correlation between increase in vaccination and increase in some diseases: but not in the way anti-vaxers claim—rather, it's because vaccines are allowing us to live long and healthy enough, so we don't die before catching them!

In the case of autism in particular, the reason for the perceived increase is much more straightforward. There was a medical reclassification of many diseases under the 'umbrella' diagnosis of Autism Spectrum Disorder, or ASD. This means there is now one diagnosis, with degrees, instead of many different diagnoses. For example, my youngest brother, for example, is no longer diagnosed 'Aspergers', but instead 'highly functioning ASD'. He is still the same person, but reclassified, as

many others have been, making the number with ‘Autism’ look much larger without actually adding new people. To clarify, if there were 10 cases of A, 5 cases of B, and 15 cases of C, reorganizing them into 30 cases of ABC, one label, does not mean there was any increase in actual number.

Additionally, medicine is getting better at diagnosis, so people who used to be dismissed as ‘off’, ‘eccentric’, or sometimes even ‘insane’, are receiving proper diagnosis in recent times, increasing the numbers statistically, but not for any increase in affected people. For example, ‘weird Uncle Harry’ might not be seen as ‘weird’ if diagnosed in recent times, but instead properly diagnosed as ASD.

One can’t help but comment on the gross inconsistency in common anti-vax claims. On the one hand, they reject the strong, repeated correlation between introduction of a vaccine for a disease and decrease in incidence of that disease (and between rise of anti-vax practices and rise of those diseases). But on the other, they accept a correlation between vaccines and autism that’s so weak as to be non-existent.

### **“More vaccinated kids become sick than unvaccinated kids”**

This claim is a clear demonstration of the misunderstanding/misuse of statistics. The important thing is the percentages of sicknesses in the vaccinated and unvaccinated kids, not the absolute numbers, simply because (fortunately) many more kids are vaccinated. One anti-vaxer claimed, “We have mumps outbreaks in the UK where 92% of the affected were fully vaccinated ...”<sup>52</sup> Now I have learned not to trust unsourced claims from anti-vaxers (and this is so for even most sourced claims because of their propensity to misrepresent the sources), but even if we take this claim as factual, this is insufficient.

To illustrate: suppose that in an outbreak, there were 100 cases of mumps, and 92 of them were vaccinated and 8 were not, to match the claimed figures. But what was not said was, say, this was from a sample of 10,000, of whom 98% were vaccinated, i.e. 9800 people were vaccinated and 200 were not. So in reality, the *properly weighted* percentages were  $92/9800 = 0.94\%$  incidence of mumps in the vaccinated people, and  $8/200 = 4\%$  in non-vaccinated people. Therefore, these statistics, *when properly understood*, show that there is *over four times the likelihood of getting mumps* when non-vaccinated.

However, real-world stats show that the chance is far higher than that. E.g. with measles, “[vaccine] exemptors were 35 times more likely to contract measles than were vaccinated persons (95% confidence interval ...)”<sup>53</sup>

### **“Babies get too many vaccines at once”**

No, they don’t. This is another argument that seriously underestimates how good a working immune system is. In reality, even a thousand vaccines at once would use up only about 1% of the immune system. This is because a child’s immune system must fight several thousand ‘new’ antigens every day from the environment, including from perfectly safe food, and even more with every cut or graze.

Indeed, this starts when a baby is born, transferring from the sterile environment in the womb to being exposed to trillions of bacteria in the outside world. The colon especially starts to be populated by all the ‘good’ bacteria (‘probiotics’) that we need for good health (this bacterial population is called the *microbiome*, and the number of bacterial cells in a healthy body can outnumber the human cells). The immune system must adapt and make sure that the bacteria can’t invade the bloodstream, i.e. septicaemia, which could cause fatal sepsis. There are thousands of bacterial species involved, each with its own set of antigens. And even after that, every cut and graze exposes the immune system to still more antigens.

This should put the vaccination schedule into perspective. All the vaccines together comprise only about 150 antigens. This is a fraction of a percent of the antigen load a healthy child faces every day. And even aside from this, although now we protect children against more diseases than decades ago, the number of antigens in the schedule has decreased about 20-fold.<sup>54</sup>



## **“Look at all the dangerous things listed in the package insert!”**

Much of this type of argument is addressed in the above section about poisons. Also, we note that these inserts are written by the same ‘Big Pharma’ that is often vilified (see below), and usually approved by government departments such as the FDA in the USA. They are legal documents, not medical ones, and apply to all prescription medicines as well.

One thing that anti-vaxers pick up on are the reported side effects that the inserts are required to list, even without any proof of causation. And often, there are articles on junk websites with mendacious clickbait titles. One that has been doing the rounds is a heading, usually in the obligatory all-capitals:

FDA announced that vaccines are causing autism:

The FDA has published conclusive proof on their website that the dtap vaccine can cause autism.

Then usually something about the FDA ‘admitting’ a causal link.

But the highlighted paragraph which they hope people will not read carefully is:

Adverse events *reported* during post-approval use of Tripedia vaccine include idiopathic thrombocytopenic purpura, SIDS, anaphylactic reaction, cellulitis, autism, convulsion/grand mal convulsion, encephalopathy, hypotonia, neuropathy, somnolence and apnea. Events were included in this list because of the seriousness or frequency of reporting. Because these events are *reported voluntarily* from a population of uncertain size, it is *not always possible to reliably estimate their frequencies or to establish a causal relationship* to components of Tripedia vaccine.

I have italicized some key words above, which should make it clear that these are *voluntarily reported* claims. There is no endorsement of whether the reports are accurate. Indeed, they make it clear that *there is no proof that the vaccine actually caused these problems*.

## **Vaccine injuries**

Vaccine injury stories are not what they seem. E.g the USA government maintains the VAERS – the Vaccine Adverse Event Reporting System, and Australia has TGA Database of Adverse Event Notifications. Anti-vaxers point to these as evidence for widespread problems. But in reality, these are collections of unverified reports, even saying so up-front:

In accessing the database we encourage consumers to understand that a report of an adverse event does not necessarily indicate there is a causal link between a medicine and an adverse outcome.

Some of these reports that made it into the database were demonstrably false claims that vaccines cause Shaken Baby Syndrome, and even absurd ones such as one claiming that vaccines turned into the Incredible Hulk. In fact, under 3% of the cases in the VAERS database were definitely caused by vaccines—and most of this small fraction were minor injuries like low-grade fever or soreness at the injection site.<sup>55</sup> “When you do the real numbers, the risk of serious vaccine injury is orders of magnitude less than 1%.”<sup>56</sup>

## **Vaccine injury lawyer supports vaccination!**

In fact, the commonest vaccine injuries have nothing to do with the components of the vaccine, but are shoulder injuries from an improperly used needle. One specialist vaccine injury lawyer, Leah Durant, suffered such an injury. But far from being an anti-vaxer, she is a strong supporter:

Vaccines keep us healthy. They eradicate disease. If I had children, I would get them vaccinated.<sup>57</sup>

And when parents ask for her help to try to evade a vaccination requirement for a school, she refuses. Instead, she says:

I talk to them about my personal view about vaccinations and the fact that I feel vaccines are safe.

## Theological/moral objections

### “God made a perfect immune system and doesn’t need our help”

Yes, He did, but we are now in a fallen world. The present curse-affected immune system demonstrably doesn’t protect us from every disease, as shown by the millions who have died from such diseases over history. The same applies to those who think ‘natural is good’, a form of the naturalistic fallacy, since nature is cursed (plagues are also ‘natural’). In a fallen world, there have also been many mutations of bacteria and viruses, which now cause diseases that were not there in an originally created very good world.

We should also note that if people were consistent with such claims, then they wouldn’t take care of any broken skin, because why does God need our help to wash and dress wounds given that the immune system He designed can manage without our help? Nor should we apply plasters or stitches to bleeding wounds, because God created Adam with a perfect blood-clotting system that doesn’t need our clever help. (But see Jesus’ reaction when Satan made a similar suggestion to Him—Matthew 4:6-7.)

Also, since God gave Adam perfect eyesight, then we shouldn’t wear glasses, since why does God need our help with His (now broken) design of the eyes with our ‘clever’ refractive aids?

Such a claim is also an affront to God’s sovereignty. God not only ordains the ends, but the means. If God chooses to bless someone with freedom from diseases, the means by which He bestows this blessing could certainly include vaccination. I’m reminded of this old tale:

A very religious man was once caught in rising floodwaters. He climbed onto the roof of his house and trusted God to rescue him. A neighbour came by in a canoe and said, “The waters will soon be above your house. Hop in and we’ll paddle to safety.”

“No thanks,” replied the religious man. “I’ve prayed to God and I’m sure he will save me.”

A short time later the police came by in a boat. “The waters will soon be above your house. Hop in and we’ll take you to safety.”

“No thanks,” replied the religious man. “I’ve prayed to God and I’m sure he will save me.”

A little time later a rescue services helicopter hovered overhead, let down a rope ladder and said. “The waters will soon be above your house. Climb the ladder and we’ll fly you to safety.”

“No thanks,” replied the religious man. “I’ve prayed to God and I’m sure he will save me.”

All this time the floodwaters continued to rise, until soon they reached above the roof and the religious man drowned. When he arrived at heaven he demanded an audience with God. Ushered into God’s throne room he said, “Lord, why am I here in heaven? I prayed for you to save me, I trusted you to save me from that flood.”

“Yes, you did my child,” replied the Lord. “And I sent you a canoe, a boat and a helicopter. But you never got in.”

Of course, God could have rescued him supernaturally, and it is biblical to seek healing first from Him. The point is that unless one believes that God is no longer the sovereign of even this fallen world, He is also worthy of praise for the development of such things as surgical advances, antibiotics and vaccines, and in particular, ones that take advantage of His designed immune system. If, as seems likely, an effective vaccine is developed for the Ebola that is currently wiping out many thousands (written in January 2015), such outbreaks amid fears of worldwide epidemics will be consigned to history books. We will then have a right to also see this as part of His divine blessing—just as when He supernaturally heals without any mediate cause.

### “Vaccination supporters are Big Pharma shills”

Of course, this is an ‘abusive *ad hominem*’ argument that’s far too common among anti-vaxers. A similar argument that is at least not a personal attack is to complain about the large profits of pharmaceutical companies.

I *prefer* vaccines to be made from profit-oriented companies, because they will earn profits only if buyers are confident that they will work. And probably even more importantly, they will suffer bad losses if they make something that hurts someone. Conversely, non-profit also means non-loss, and I can see little worse than decisions made by people who don't stand to lose if they hurt people. As Adam Smith, actually a moral philosopher before he turned to economics, said about 200 years ago, "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest." In this fallen world, selfishness is a ubiquitous human condition.

Also, the polio vaccine pioneer Jonas Salk famously refused to profit from his work, which probably could have made him \$7 billion if he had patented it. Another thing, the flu shot is under \$30, while there would be much more pharmaceutical profit if a person had to be hospitalized from influenza, or in days gone by, be maintained in an iron lung from polio.

Sometimes this argument is accompanied by claims that 'Pharma' must mean 'sorcery', because it comes from *pharmakeia*, which is translated that way in the New Testament. However, such claims display ignorance of the difference between Classical Greek and the *Koinē* Greek of the NT. Like most Greek-derived terms in English, the *Classical Greek* meaning was used. In particular, 'pharmacy' was derived via Old French *farmacie*, in turn derived from the Medieval Latin *pharmacia*, in turn from from the *Classical Greek* meaning of *pharmakeia* (φάρμακεία), meaning medicine. In turn, this was related to *pharmakon*(φάρμακον) i.e. a drug, whether a cure or a poison.

Finally, many of the anti-vax sites complaining about pharmaceutical profits have huge web stores for their own products. It's not clear from biblical, or even economic, principles why 'Big Pharma' is evil while the multibillion dollar 'Big Supplementia' (or 'Big Placebo') is good.

Every supermarket has rows of shelves full of natural supplements, and many of these supplements contain heavy metals such as iron, copper, and so on. But because these are apparently a natural cure, they are ok, but dangerous when minute doses are put into life-saving vaccines.

### **"Vaccines contain parts of aborted babies"**

As it stands, this claim is false. There are no baby parts in vaccines. There is a most tenuous connection between abortion and vaccines, as follows:

Bacteria are genuinely living organisms, so can be cultured on nutrients. Viruses are not living,<sup>58</sup> so require some living cells to be cultured on. Pasteur's pioneering vaccination against rabies, caused by lyssaviruses, was obtained from the nerves of rabbits that had died from the disease. Pasteur weakened the virus by drying the nerve tissue for 5–10 days. Now most rabies is cultured on embryonic eggs—but those of chickens, not humans.

Unfortunately, some vaccines have been cultured on cell lines that came *originally* from aborted babies: one (MRC-5) from an abortion that was performed in September 1966 and one (WI-38) that was performed in July 1962. There is no question that these original abortions were sinful. CMI takes a strongly pro-life position, that the human individual life begins at conception/fertilization, thus abortion is totally wrong, even for rape and incest (do children of rapists deserve the death penalty?).

The above is the tenuous connection between vaccines and abortion. However, no new embryos are being generated for the purpose of culturing vaccines—this would be immoral. Rather, these vaccines use the cell lines from a baby *already killed* decades ago, and that not for the purpose of creating vaccines. Any cultures from these original lines are likely to be now removed by tens of thousands of generations. That deed was unfortunately done, and *cannot be undone*. There is also no evidence of any 'moral hazard'<sup>59</sup>—that it would lead to more abortions.

A similar comparison would be organ donation. Would we refuse a life-saving organ that was from a victim of a drunk driver for example who listed "Organ Donor" on the driver's license, because he was killed in a sinful way? Accepting this organ is in no way condoning drunk driving.<sup>60</sup> Another example: it would be totally immoral to murder someone to harvest his organs, even if it would save another person's life. However, if someone you loved was murdered during an armed robbery, would it be immoral to consent to organ donation, so that even though a terrible sin had been com-

mitted, something good came from it, one silver lining on a very dark cloud? And would acceptance of such an organ mean condoning the murder? Similarly, should we refuse a life-saving treatment that is the one good thing that came from the abomination of murdering those two babies?<sup>61</sup>

The general principle here is that *the beneficiary of the organ must not have been complicit in the crime in the slightest* (called ‘formal cooperation in evil’). Actually the biblical ethical principles were deduced centuries ago. First, there is the *Principle of Double Effect*. That is, if a contemplated action has both good and bad effects, then it is permissible only if it is not wrong in itself and if it does not require that one *directly intend* the bad result. Second, there is “remote mediate material cooperation”, meaning that the moral object of the co-operator (in this case, the one being vaccinated) and that of the wrong-doer (the abortionist who aimed for a dead baby) are distinct. Under this principle, vaccination can be allowed if necessary to prevent severe illness and death (which it does), and if we also clearly condemn both the two abortions from which cell lines were derived and any future abortion to create more cell lines (which incidentally was not the purpose of the two abortions in question).<sup>62</sup>

--- (shortened by M.V.).

And governments require a multitude of tests before any vaccination is released to the public. Of course, conspiracy theorists might argue that the government is somehow complicit, but what for? So, that it can cost the very same government millions of dollars in dealing with increased pandemics like swine flu, for example—a disease that the very same government officials would be likely to catch if they did not take the same flu shots they were advocating.

### **“The government should not force people to be vaccinated”**

This argument confuses two separate questions:

1. Is something good (or bad)?
2. Should the government mandate (or prohibit) it?

I.e. one can argue that something is good, without saying that the government should make it compulsory, whether vaccines, seatbelts, bicycle helmets, etc. And one can argue that tobacco, alcohol, recreational drugs are harmful, without arguing that the government should punish people for taking them.

For this article, I am not making an argument for the role of the government. Rather, I am noting that there is a logical distinction between “vaccines are good” and “vaccines should be compulsory”—the first does not entail the second.

### **Summing up**

- Vaccination is one of the most important advances that God has allowed us to discover to alleviate the effects of the Curse.
- Vaccines train our immune system (which was designed by God to function in such a way) with dead or weakened germs, so it is ready to destroy invading live germs.
- Many diseases have been eliminated or drastically reduced by vaccines. There is no plausible alternative explanation for why particular diseases decreased so drastically at different times that correlate to when the particular vaccines became widespread. Further, the same diseases flare up in places with low vaccination rates. And such results are totally expected given what we know of how immunity works.
- Nothing is 100% safe. However, the safety of vaccination should not be compared with an impossible perfection, but with the (un)safety of non-vaccination.
- Vaccines are accused of containing dangerous poisons. But whether anything is poisonous depends on the amount. The ‘toxic substances’ in vaccines are many times lower than the toxic dose. Some of the ‘toxins’ exist naturally in the body in far greater amounts than the vaccines. Others occur in much higher amounts in well known foods.

- Vaccines cannot cause the disease, since they are made from dead germs. Some people get sick with the illness being vaccinated against just after vaccination, but before their immune system has been trained, so falsely think that the vaccination caused the illness. This is the *post hoc ergo propter hoc* fallacy. In other cases it is because it is a different illness (common cold rather than influenza, e.g.).
- There is no statistically significant evidence that vaccines cause autism, and much evidence to indicate that they do not.
- A claim that “We should trust God to heal us” fails for two reasons. First, such claimants would generally bandage wounds and wear seatbelts, rather than trust God to protect them from harm regardless. Second, given the doctrine of the Sovereignty of God, He is healing us through the wisdom He gave to the vaccine’s discoverers and prescribers.
- Vaccines do not have parts of aborted babies. True, some vaccines against viral diseases are cultured on cell lines from two babies aborted over 40 years ago, but no babies are being aborted today to make vaccines. Morally, it would be better to use an alternative, if it is available, but if not, it would be no different from using the organs of a person killed by sinful means—as long as the beneficiary played no part in the killing.

### Overall summary statement (representing the position of CMI ministries generally)

Vaccination of minors, in most jurisdictions, remains a parent’s choice. While there are real and immediate risks associated with vaccination, these are small overall, and the long-term risks of non-vaccination are much greater. Therefore, it is our opinion at this point in time that people should not forego vaccinations unless there is a sound medical reason for this following discussion with their own professional medical adviser. In fact, we urge people to consult their own doctors regarding any decision involving their own or their family’s health; none of this article should be construed as individual-specific medical advice.

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