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 The Social Contract of Medicine: Vaccines

Infectious disease has crawled into the limelight at California’s Disneyland Resort. The measles outbreak that originated in the Happiest Place on Earth this December has stretched to new venues, reaching as far as [Michigan](http://abcnews.go.com/Health/measles-cases-climb-102-cdc/story?id=28669137) and pulling over 100 people into its grasp. Why did this happen? Measles is supposed to be a malady of the past—it was [declared eliminated](http://www.nejm.org/doi/full/10.1056/NEJMc1209037) from the United States fifteen years ago.  
 The anti-vaccination movement is largely to blame for measles’ recent return. In 1998, a scientific journal published a [study](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3136032/) by former doctor Andrew Wakefield, who claimed that the MMR vaccine (measles, mumps, and rubella vaccine) was connected to autism. This spawned a movement of parents who refused to vaccinate their children. [Investigators eventually found](http://www.nytimes.com/2011/01/13/opinion/13thu2.html?ref=topics) that the study contained false claims and Wakefield’s medical license was revoked, but the damage was already done. Previous Playboy playmate and MTV actress Jenny McCarthy helped spread these misconceptions of vaccines by insisting on their link to autism on live TV. As a result, two types of communities in the U.S. are not vaccinating their children: preexisting groups who don’t vaccinate for religious reasons, and a new group of “anti-vaxxers,” who don’t because [“vaccines are not safe,”](http://transcripts.cnn.com/TRANSCRIPTS/0904/03/lkl.01.html) as McCarthy claimed. In fact, it is this latter group that poses the greatest threat to herd immunity when paired with the availability of “philosophical” exemptions from routine vaccinations.

Changing the religious and philosophical exemption laws in all fifty states may prove difficult, but due to the recent outbreak of measles, doctors and politicians are speaking out in favor of stronger vaccination regulations. The Supreme Court also ruled in the [*Jacobson v. Massachusetts*](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449224/)case that vaccination can be mandated, since public health eclipses personal liberty in importance. Since the number of measles cases in 2014—644 cases—was the worst in [over fifteen years](http://www.cdc.gov/measles/cases-outbreaks.html), public health is in danger, and lawmakers must move to prevent this cycle from repeating. Because much of the discussion about disease seems like a Ping-Pong game of statistics and studies, we must also remember the impact of infectious disease on a direct, human level—how it harms families. In response to the recurrence of measles, Tim Jacks, an Arizona pediatrician, [expressed](http://www.motherjones.com/environment/2015/02/open-letter-parent-unvaccinated-child-measles-exposure) his worry for his two children: one is too young for vaccination, and the other is unable to be immunized because of her chemotherapy treatment. Both children were exposed to measles and had to get emergency vaccinations, but it is unknown whether they will remain healthy. Jacks writes, “Please realize that your child does not live in a bubble. When your child gets sick, other children are exposed…. I am upset and just a little bit scared.” The outbreak also ruined his toddler’s three-week break from chemotherapy. His daughter Maggie must spend the next 21 days—three weeks—in isolation, to avoid spreading the disease. To prevent sad stories like this, religious and philosophical exemptions must be restricted or eliminated nation-wide.

Maggie’s vulnerability is not only a result of her vaccination status, but a consequence of crumbling “herd immunity.” Herd immunity is a community-built shield against an infectious disease: if enough people in a population are immunized, then those without the luxury of immunity also remain safe. Why? Because infectious disease cannot get a foothold in a population and spread from person-to-person with only a needle-in-a-haystack chance of finding its next susceptible victim. Ultimately, vaccinated individuals protect the vulnerable. Vaccines are most effective if we all help to build the battlements. Immunization is the reason why polio—a disease that once boasted epidemic proportions—is now absent in the U.S. In 1952, there were [58,000 cases](http://poliotoday.org/?page_id=13) reported, over 3,000 deaths, and over 21,000 victims who kept their lives but not without paralysis. After the vaccine was developed in 1955, fewer than 2,500 cases sprung up in 1957. The prick of a needle is nothing compared to the burden of a lifelong handicap, and the small cost of herd immunity is nothing compared to the bite of rampant disease.

Vaccination is not merely an individual choice because the effects of this choice are felt quite tangibly, in the form of outbreaks, by entire populations. For medical reasons, cancer patients, people with allergies or autoimmune disorders, pregnant women, and small infants are unable to be immunized. These groups suffer the most from outbreaks. Although side effects of vaccines do exist, they [are rare](http://www.vaccinesafety.edu/cc-mmr.htm) and unlikely to cause damage, so the benefit of herd immunity gained from widespread vaccination outweighs the chances of improbable complications.

Therefore, it is crucial that we tighten vaccination regulations. But where to begin? Where everybody begins: school. Here in the U.S., we have a strong set of immunizations required for children entering public school, but these requirements have softened in recent years as states have begun to allow vaccination exemption not only for religious reasons, but also for philosophical reasons. This “philosophical” rationale is often based on the autism-link scare or on the all-natural, “crunchy mama” fear of [“toxins”](http://www.nytimes.com/2015/01/31/us/vaccine-critics-turn-defensive-over-measles.html?_r=0) in the vaccines. Furthermore, we must address the range of difficulty in obtaining religious exemptions from state-to-state. The road to high vaccination rates and corresponding low outbreak rates will be made smoother by removing the philosophical reasons (also called personal belief or conscientious belief) exemption, and by making applications for religious exemptions on student immunization forms more difficult in every state.

Still, we must assume that religious exemptions are here to stay for a while: [48 states](http://www.ncsl.org/research/health/school-immunization-exemption-state-laws.aspx) allow them. But not all religious exemptions are equal: some are broad, vague, and function almost as a personal belief exemption with their relaxed demands. In some cases, a parent or guardian’s unique scribble along a dotted line will do the trick. For example, Colorado only requires a [parent’s signature](http://www.nvic.org/Vaccine-Laws/state-vaccine-requirements/colorado.aspx) and the religious exemption is granted. On the other end of the spectrum, Colorado’s neighbor, Nebraska, [requires](http://www.nvic.org/Vaccine-Laws/state-vaccine-requirements/nebraska.aspx) “an affidavit signed by a legally authorized representative stating that the immunization conflicts with the tenets and practices of a recognized religious denomination of which the student is a member.” A few states go further—Washington’s [exemption form](http://www.nvic.org/Vaccine-Laws/state-vaccine-requirements/washington.aspx) asks for evidence that a parent has spoken to a healthcare provider about the possible consequences of not immunizing their child. Yet all of these still fall under the label of “religious exemption,” and the variation here must be reduced. If Nebraska and Washington's high standards for religious exemptions become the standard for all states, then immunization rates [will rise](http://pediatrics.aappublications.org/content/132/1/37) without any conflicts between laws and religious beliefs.  Ideally, laws should be amended to require a combination of proof of dialogue between parents and healthcare providers and proof of religious affiliation with an official religion that objects to vaccination and related medical procedures.

  Another mountain to climb is the looming peak of exemptions based on personal beliefs. States that allow personal belief exemptions experience [2.54 times the number of opt-outs](http://www.nejm.org/doi/full/10.1056/NEJMc1209037) compared to states with only the religious exemption. The loudest proponent of the personal belief exemption is the anti-vaccine crowd, which—almost counter-intuitively—is mainly composed of well-off, well-educated parents. Aside from concerns that vaccines threaten children’s health, some "anti-vaxxers" point out that immunization is unnecessary, because [“the incidence of these diseases are far lower than they were in the past.”](http://www.blogher.com/myths-about-anti-vaxxers-need-be-debunked-now?from=pop) But this decline in disease was the result of effective vaccine use; so vaccines have become victims of their own success. Although the vast majority of the population is immunized, those who refuse immunization tear holes in our herd immunity while reaping its benefits. This endangers public health: a [study](http://www.ncbi.nlm.nih.gov/pubmed/17032989) from 1986 to 2004 found that states with relaxed personal belief exemptions were connected with lower vaccination rates and higher pertussis outbreaks. Common sense should kick in at this point—let’s eliminate the personal belief exemption on a national level.

Higher vaccination rates mean greater safety and well-being for infants and other individuals who can’t be immunized, because with herd immunity, the chances of those people coming into contact with diseases like measles become comfortably low. Removing the personal belief exemption from school vaccination requirements and tightening the religious exemption nationwide are both feasible and practical solutions. If we enact both of these changes, then all of us as a society can help protect each other. Since vulnerable individuals like Maggie are a part of our community, we have a moral obligation to vaccinate ourselves and our children, not only to prevent our own suffering, but the suffering of others.