COULD PARENTS BE HELD LIABLE FOR NOT IMMUNIZING THEIR CHILDREN?

Rebecca Rodal & Kumanan Wilson[*]

Although most vaccines are highly effective, vaccination does not confer 100% immunity to all those immunized, and some individuals are unable to receive vaccinations. But the phenomenon of herd immunity, which arises when a large enough percentage of the population is vaccinated, more completely prevents the development of disease outbreaks by disrupting the possibility of person-to-person transmission of a pathogen. In the presence of an outbreak of a vaccine preventable disease, such as measles, a percentage of those who develop the illness may well have received the vaccine, since effectiveness of the vaccines in individuals varies. The implication of these basic scientific facts is that the decision by some parents to not vaccinate their children amplifies the possibility for an otherwise preventable outbreak to occur, and places even children who are vaccinated at risk. This issue has gained some currency at a time when vaccination concerns are rising.

In our analysis, using measles as an example, we examine the question of whether parents whose immunized children have contracted a disease due to breakdown in herd immunity may have recourse in tort against those parents who have refused to immunize their children. There are a few barriers to success which such parents may face. At the outset, identifying a specific individual as responsible would be virtually impossible. However, the potential to hold liable a group of parents who chose not to vaccinate their children does exist. In a disease like measles, with a low threshold for loss of herd immunity, it is possible to identify a small number of individuals, often in a geographical or social cluster, whose collective decision not to immunize has led to an outbreak. As a result, it can be said that each member of this group materially contributed to the emergence of an outbreak, which would not likely have occurred otherwise. However, while this may potentially be an answer to the causation problem, a main limitation to such an approach is the question of foreseeability, that parents may not know when making decisions on vaccination that they could be putting other children, including vaccinated children, at risk. The other major limitation is that under the status quo, exemptions to school-based immunization programs are authorized by statute and are presented as choices which relate only to individual, rather than to community health.

Under such a regime it is unlikely that a parent of an injured child could succeed in tort, when the supposedly negligent actions have been either explicitly or implicitly approved by the public health authorities. We hypothesize that an altered regime of disclosure and risk assumption in childhood immunization exemptions could have the effect of removing the statutory authority defence and of making parents aware of the possible negative consequences to other children. This would require clear transmission of information to parents that the decision to vaccinate a child is not only for the benefit of the individual child, but also the benefit of other children with whom the child may come into contact.

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INTRODUCTION

In 1989, Quebec City experienced an outbreak of measles. At first glance, the outbreak appeared unusual because the majority of cases occurred in vaccinated individuals. However, a closer examination of the data reveals that it was not a failure of the vaccine which led to the outbreak of measles in a highly vaccinated population. Rather, an epidemiological study following school children who developed measles and their siblings reinforces the strong protective effects of vaccination and the real risks associated with non-vaccination.[1] Fifty-eight of the 462 (13%) monitored siblings contracted the highly infectious disease. Of the monitored siblings, 17 were unvaccinated, and all of them (100%) contracted measles. In contrast, only 41 of the 445 (8%) vaccinated siblings also developed the disease—a small percentage always subsists given that vaccination is not 100 percent effective.[2]

These results not only reinforce the known protective effects of vaccination, but also illustrate that the dangers of refusing vaccination are not simply limited to those who abstain. The results point to the loss of herd immunity, which is established when a large proportion of immunized individuals within a population makes the chain of disease transmission difficult to maintain. The decision by some parents to *not* vaccinate their children permitted the spread of an epidemic that would have otherwise abated in the presence of higher rates of immunization.

Importantly, the results also illustrate the fact that even vaccinated children need protection against infectious diseases, since vaccines do not have perfect efficacy. Moreover, some children cannot be immunized at all, due to medical risks such as allergy to vaccine components. These children must rely on the protection given by herd immunity, which in turn depends on substantial compliance with recommended immunization schedules in the population to prevent the spread of communicable diseases.

These findings, and the central role herd immunity plays in the success of immunization programs, pose important ethical and legal questions concerning the obligations of parents to vaccinate their children not only for their children's benefit, but for the benefit of others. It seems unfair that a parent who follows the public health recommendations suffers due to the choices of other parents who have not followed these same recommendations. At the same time, the right of parents to make decisions on behalf of their children is integral to their role as guardians and supervisors. It is unclear, though, that the authority of parents as surrogate decision-makers for their children should trump the community's need to be protected from the spread of preventable disease.

Here, we examine the question of whether parents who took steps to reduce the risk of their child contracting a communicable disease and passing it on within the community may have recourse in tort against those parents who refused to take similar steps. What is an individual's potential liability for failing to immunize his or her child, when this failure leads to the infection of others? The Canadian legal system is meant to represent the societal norms reflective of values held to be important to Canadians. When attempting to balance collective security with individual choice regarding routine immunization, the answers are not obvious. These interests often conflict in the field of law and health, and the courts seek ways to achieve

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[1] G. De Serres *et al.*, "Measles Vaccine Efficacy During an Outbreak in a Highly Vaccinated Population: Incremental Increase in Protection with Age at Vaccination up to 18 Months" (1995) 115:2 Epidemiology & Infection 315.

[2] Public Health Agency of Canada, *Canadian Immunization Guide,* 7th ed. (Ottawa: Public Works and Government Services Canada, 2006), online: PHAC <http://www.phac-aspc.gc.ca/publicat/cig-gci/index-eng.php> [*Immunization Guide*].

a balance between protecting the health of others and preserving the autonomy of individual actors.[3]

Finding the correct balance in this scenario poses challenges to the status quo definition of the standard of care in the area of immunization, as well as to the traditional approach to causation, given the unique phenomenon of herd immunity. Because the government has explicitly allowed non-medical conscience-based exemptions from school immunization requirements, a statutory defence may, at present, create an insurmountable barrier to a plaintiff. However, there is an argument that this current model does not adequately encourage maintenance of herd immunity at a time when exemptions are on the rise, and can therefore place the greater population at risk.[4] We hypothesize that an altered regime of disclosure and risk assumption in childhood immunization exemptions could have the effect of removing the statutory authority defence. Whether or not a plaintiff will be barred by a statutory authority defence depends on the way in which exemptions from school immunizations are framed: as an equally acceptable option to immunization, or as a risky choice for which one ought to be liable should things go wrong.

To focus our argument we will specifically examine this issue as it pertains to vaccinated children who develop measles, the scenario which began this article. While some of our arguments are transferrable to other vaccines, ultimately each of these analyses will have to be conducted individually in order to take into consideration such factors as the reproductive number of the disease, the morbidity resulting from the disease, and the safety and effectiveness of the vaccine. To begin our analysis, we will first look at why this question is becoming increasingly relevant. Here, we discuss some of the scientific properties of vaccines and measles transmission. We will then examine whether parents who fail to vaccinate their children meet the legal tests for negligence liability. We conclude by suggesting scenarios under which liability might or might not exist.

Civil liability could prove to be a helpful factor in changing the tides of vaccine acceptance. It could provide some recourse to parents who have complied with public health recommendations but who are harmed by the choices of others, and could aid in changing social attitudes, which will help in avoiding large scale outbreaks of measles and other preventable diseases. Due to the availability of a statutory defence for conscientious objectors, as well as a lack of clarity in the current standard of care across the country, it appears unlikely that a parent or their affected child could currently succeed in a lawsuit. We would argue that government and public health authorities should move to clearly state that the immunization of school-aged children is a public health and safety requirement benefiting the greater community. Exemptions should remain a personal choice, but they should be reframed as one that does not negate liability if it results in a foreseeable and identifiable harm.

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[3] As an example, the Supreme Court of Canada in *Dobson (Litigation Guardian of) v. Dobson,* [1999] 2 S.C.R. 753, 174 D.L.R. (4th) [*Dobson*] examined the important balance between a pregnant woman's rights of individual autonomy and the fetus' right to be protected from prenatal harm caused by the mother's actions.

[4] See Saad B. Omer *et al.*, "Vaccine Refusal, Mandatory Immunization, and the Risks of Vaccine-Preventable Diseases" (2009) 360:19 New Eng. J. Med. 1981 [Omer *et al.*, "Vaccine Refusal"].

I
FRAMING THE QUESTION

Universal vaccination programs are central components of public health programs around the world, and have been heralded as one of the greatest public health achievements of the 20th century. In Canada, all provinces have instituted childhood vaccination programs for measles, mumps, and rubella ("the MMR vaccine"), haemophilus influenza B, diphtheria, pertussis, tetanus, and polio.[5] Furthermore, in the last fifty years, immunization has saved more lives in Canada than any other health intervention.[6] Yet, despite the long-standing, documented successes of these vaccinations in alleviating and even eradicating the spread of infectious diseases, there is increasing parental anxiety surrounding the decision to vaccinate children. The most apparent reason for this trend is concern about the risk of adverse effects from immunization, including the purported but unsubstantiated association between vaccination and autism, and fears about the negative health effects of vaccine preservatives such as thimerosol. These concerns, bolstered by media reports and Internet-based communication, are gaining momentum.[7] In addition, people may question the need to continue vaccination programs, as the success of these programs has reduced the incidence of vaccine-preventable diseases to the point where the general public no longer sees these diseases as a real threat. The perception that communicable diseases do not pose a substantial risk creates a context in which the potential for side effects associated with vaccines may appear more threatening than the diseases themselves.[8] However, these perceptions may actually lead to the resurgence of these diseases due to insufficient rates of immunization and a corresponding loss of herd immunity.

The anti-vaccination movement has recently come into the mainstream. In the United Kingdom, concerns about the association between the MMR vaccine and the development of autism spectrum disorders contributed to a decline in vaccination rates and a subsequent increase in measles outbreaks.[9] Since then, measles has once again been declared endemic in the U.K., fourteen years after local transmission of measles had initially been halted.[10] In the United States, prominent celebrities and political figures have argued in public that thimerosol preservatives in vaccines may be associated with the apparent increasing rates of autism spectrum disorders in the country.[11] Recently, a settlement in the U.S. no-fault compensation courts resulted in the U.S. Centers for Disease Control and Prevention ("CDC") compensating a child with a rare mitochondrial disorder who developed an autism spectrum disorder following vaccination.[12] While the CDC and vaccine proponents argued strongly that this was not an acknowledgement of the

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5 New vaccines supported by the National Immunization Strategy are continually introduced, including a pneumococcal vaccine, a vaccine for chicken pox and most recently, and perhaps most controversially, a vaccine for the human papilloma virus.

6 *Immunization Guide*, *supra* note 2 at 17.

7 Lucy Serpell & John Green, "Parental Decision-Making in Childhood Vaccination" (2006) 24:19 Vaccine 4041. Other motivating factors include concerns that vaccinations are painful, the belief that natural exposure is superior to immunization, access to resources, and a phenomenon of general distrust of the medical community or belief in conspiracy.

8 Robert T. Chen *et al.*, "Challenges and Controversies in Immunization Safety" (2001) 15:1 Infectious Disease Clinics of North America 21.

9 See David C. Burgess, Margaret A. Burgess & Julie Leask, "The MMR Vaccination and Autism Controversy in United Kingdom 1998-2005: Inevitable Community Outrage or a Failure of Risk communication?" (2006) 24:18 Vaccine 3921.

10 European Centre for Disease Prevention and Control (Stockholm), "Measles Once Again Endemic in the United Kingdom" (2008) 13:27 Eurosurveillance.

11 For more on this topic see Arthur Allen, *Vaccine: The Controversial Story of Medicine's Greatest Lifesaver* (New York: W.W. Norton & Company Inc., 2007) at chapter 10.

12 See Paul A. Offit, "Vaccines and Autism Revisited: The Hannah Poling Case" (2008) 358:20 New Eng. J. Med. 2089 at 2089.

risks associated with vaccines, but rather the structural inadequacies in current judicial adjudication practices, the optics of the settlement lend support to those who have been arguing in favour of the link between vaccines and autism.[13]

Throughout the ongoing controversies, epidemiological evidence has not supported the association between vaccines and autism. Reviews and statements by leading institutions, such as the U.S. Institute of Medicine and the World Health Organization, have rejected the possibility that a causal link exists.[14] Rather, the increased numbers of autism cases have been attributed to various other factors, including changes in diagnostic criteria and a heightened awareness of the condition amongst parents and doctors.[15] Nevertheless, parental anxieties persist and there is evidence that these anxieties are translating into declining vaccination rates.[16]

In those Canadian provinces with school immunization policies,[17] current legislation permits parents to exempt their school-aged children from being vaccinated. These exemptions can be based on medical reasons such as previously having had the disease, or contraindication, for example an allergy to a component of a vaccine. There is also an allowance for religious or philosophical objections, which requires a witnessed statement such as a "Statement of Conscious or Religious Belief" exemption form.[18] The difficulty for public health policy-makers lies in the inclusion of philosophical exemptions, which essentially permits the opting out of conscientious objectors. Legislation allowing philosophical exemptions has been shown to dramatically increase the number of parents claiming non-medical exemptions, which could in turn increase the probability of outbreaks of vaccine-preventable diseases, especially if those claiming exemptions are clustered geographically.[19] Geographic aggregation of persons refusing vaccination through non-medical exemptions has a clustering effect which has been found to correlate with local risk of outbreaks of vaccine-preventable diseases such as pertussis.[20] These clusters may be found amongst certain demographic and socioeconomic groups, and there may be wide local discrepancies even between neighbouring counties in a single region.[21] It is important then to understand what effect the choice of some individuals not to immunize their children may have on vaccinated and unvaccinated individuals as well as the community-at-large.

The debate surrounding immunization can be characterized as a conflict between the values of public welfare and individual liberty, engaging issues of law, medicine, ethics, and policy. Public health authorities and governments present immunization as a necessary public good, as success is reliant on near-universal compliance. The practice of routine immunization encourages healthy individuals to assume some level of individual risk to benefit their long-term per-

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[13] Of note, subsequently the U.S. court of Federal Claims rejected compensation for three test cases arguing that autistic spectrum disorder was associated with vaccination.

[14] See Michelle Meadows, "IOM Report: No Link Between Vaccines and Autism" (2004) 38:5 FDA Consumer 18 at 19; World Health Organization—Global Advisory Committee on Vaccine Safety, "MMR and Autism", online: WHO <http://www.who.int/vaccine_safety/topics/mmr/mmr_autism/en/index.html>.

[15] See Lorna Wing & David Potter, "The Epidemiology of Autistic Spectrum Disorders: Is the Prevalence Rising?" (2002) 8:3 Mental Retardation & Developmental Disabilities Research Reviews 151.

[16] See Serpell & Green *supra* note 7.

[17] At present, this includes Ontario and New Brunswick *infra* notes 64 and 65. Other provinces follow the recommended immunization schedule but do not have separate legislation mandating compliance.

[18] For a summary of the Ontario Scheme, see City of Ottawa, "Immunization Requirements for School Registration", online: City of Ottawa <http://www.ottawa.ca/residents/health/conditions/id_prevention/immunization/requirements_en.html>.

[19] Joseph W. Thompson *et al.*, "Impact of Addition of Philosophical Exemptions on Childhood Immunization Rates" (2007) 32:3 American Journal of Preventative Medicine 194.

[20] Saad B. Omer *et al.*, "Geographic Clustering of Nonmedical Exemptions to School Immunization Requirements and Associations with Geographic Clustering of Pertussis" (2008) 168:12 American Journal of Epidemiology 1389.

[21] Omer *et al.*, "Vaccine Refusal", *supra* note 4 at 1983.

sonal health as well as the overall health of the whole community. Nevertheless, the responsibility of the individual to contribute to public health has been downplayed compared to the notion of vaccination as a medical treatment subject to personal approval, leaving these ideas in tension. Decision-making about whether to pursue routine or particular immunization for oneself or one's child is an individual choice, requiring informed consent. But conversely, the public good and prevention of disease depends on a large majority of the population making the "right" choice. In fact, it is not simply a public good versus an individual good, but a public good versus a public harm. That is, each non-medically based choice to avoid vaccination contributes to the risk of public harm. If this movement reaches a tipping point where herd immunity is broken, it could inspire a backlash by parents of children who have been negatively affected by these decisions. Since recent developments have shown a concerning trend in this direction, a discussion of possible legal consequences is timely. First, though, it is useful to briefly discuss some of the scientific aspects of vaccination and measles infection.

A. The Science of Vaccination and Epidemiology of Measles

When an individual is infected by a pathogen, the body launches an immune response to control and destroy the foreign invader. The development of this response can take time. It requires the body's ability to recognize the specific components of the pathogen, called antigens. The body then manufactures specific antibodies which target these antigens. In addition, the body also creates a memory of the antigen to which it was exposed, so that on subsequent exposures it can respond immediately. A vaccine attempts to replicate this process by stimulating the body to create a memory of an antigen, facilitating rapid response to it on future exposure. The goal of vaccination is to present antigens to the human body in a safe and controlled manner. This can be done, for example, by exposing the body to a killed virus, or to a live virus that has had its pathogenic qualities removed (known as a live attenuated virus). The effectiveness of a vaccine will depend on its ability to induce a sufficient immune response in an individual; most vaccines are not 100% effective, and often have effectiveness rates ranging from 80% to 90%.[22] Despite the imperfect coverage, the introduction of vaccine programs has been accompanied by the virtual eradication of vaccine preventable diseases in many instances, most notably smallpox.[23] This is due to a combination of factors which include the important concept of herd immunity.

When a virus enters into a human population, its ability to spread is dependent on its basic reproduction number, R_0, which reflects the number of subsequent individuals infected for each initial infection. For a virus with an R_0 of 2, every infected individual will cause the further infection of two additional individuals. As long as the R_0 is greater than 1, the infection will continue to grow and spread. If the R_0 dips below 1, the size of the epidemic will decline. In most instances, viruses will create natural immunity in enough members of a population that the R_0 will eventually decrease to below 1, and the epidemic will dissipate. Public vaccination programs simulate the creation of natural immunity in large segments of the population, and can thereby reduce the R_0 to less than 1 at the point of entry of a virus into a specific human population. For example, for a virus with a natural R_0 of 2, if the vaccine creates effective immunity in half of the population, then for every two people who would have been infected, only one will be susceptible (Figure 1). Because of this, the epidemic would no longer be able to increase in size.

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[22] See *Immunization Guide*, *supra* note 2.

[23] See Sandra W. Roush, Trudy V. Murphy & the Vaccine-Preventable Disease Table Working Group, "Historical Comparisons of Morbidity and Mortality for Vaccine-Preventable Diseases in the United States" (2007) 298:18 Journal of the American Medical Association 2155, and the Centers for Disease Control and Prevention MMWR, "Progress Toward Interruption of Wild Poliovirus Transmission" (2007) 56:27 Morbidity and Mortality Weekly Report 682 at 682.

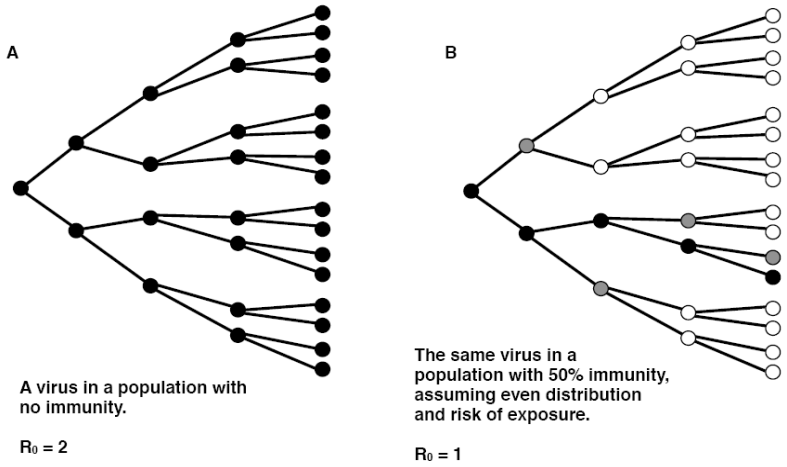

Figure 1: Our own figure representing an idealized example of how immunization impedes the spread of infectious disease. Black circles indicates an individual who has contracted the disease, grey a vaccinated individual who did not contract the disease from an infected individual, and white a disease-free individual. A) In a population with no immunity, with an R_0 of 2, an infectious disease spreads to two additional individuals for each infected individual. B) Assuming heterogeneous dispersal of the vaccine to 50% of the population, resulting in even distribution of immunity and even risk of exposure, the chain of transmission is restrained early on. Now for every two people infected, only one will be susceptible, an R_0 of 1.

Measles, a vaccine-preventable illness, causes death and severe disease in children worldwide.[24] It is particularly harmful in impoverished areas, where there is overcrowding and poor nutrition. However, even in developed countries with healthy populations, the virus can have serious effects. The measles virus is one of the most highly contagious viruses that exist today. Estimates of its natural R_0 have been placed between 15 and 25, a remarkably high number.[25] The clinical presentation of measles is the development of signs of an upper respiratory tract infection, followed by more severe symptoms; eventually the individual will develop high fevers and a characteristic rash.[26] The infectious period, however, develops prior to the pathognomonic signs of measles. This pattern of disease progression may leave individuals unaware of the need to avoid contact with others. In most instances, the individual will have spread the infection before even becoming aware that he is suffering from the condition. In general, measles is a self-limited condition characterized by the individual suffering high fevers, rash and malaise for a limited duration. In some instances the infection can also cause otitis media (an infection of the middle ear). But in rare cases, serious complications can arise. Approximately 1 out of 1000 people suffering from measles is at risk of developing encephalitis, an inflammation of the brain which can cause severe neurological problems and death. A similar proportion of people are at risk of developing a severe form of pneumonia, which accounts for most measles-associated deaths. Thus, the effects of large scale vaccine program failure could result in grave consequences to certain individuals. The measles vaccine is a live attenuated virus vaccine, with an efficacy of approximately 90%, and the epidemiological data makes clear that the introduction of universal vaccine programs for measles has dramatically reduced the prevalence of the condition.[27] It is important to remember, though, that the measles vaccine efficacy exists to a large

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[24] Robert T. Perry & Neal A. Halsey, "The Clinical Significance of Measles: A Review" (2004) 189:S1 Journal of Infectious Diseases S4 at S4.

[25] Jacco Wallinga, Janneke C.M. Heijne & Mirjam Kretzschmar, "A Measles Epidemic Threshold in a Highly Vaccinated Population" (2005) 2:22 PLoS Medicine 1152.

[26] See Perry & Halsey, *supra* note 24.

[27] See *Immunization Guide*, *supra* note 2 at 230.

extent because of the effects of herd immunity. If herd immunity is compromised due to a large unvaccinated fraction of the population, the disease may be resurrected.

II
EXAMINING POTENTIAL PARENTAL LIABILITY IN NEGLIGENCE FOR FAILURE TO IMMUNIZE

The question of whether parents could be held liable in negligence for failing to immunize their children is a complex one raising novel issues of law. Parents are proxy-decision makers for their children. In health matters it is routine to accept parental decisions as acceptable choices for their children. This is generally the acknowledged societal role of a parent and in most cases does not have a large effect on the wider community. There are limits, however, to what is acceptable when the decision may actually harm the child: there may be a legitimate interest of the state in protecting the child where parental conduct falls below an acceptable standard. This was discussed in the case of *B. (R) v. Children's Aid Society of Metropolitan Toronto*, where the Supreme Court of Canada found that Jehovah's Witness parents could not deny a blood transfusion to their child if it was needed to keep the child alive.[28] However, this case was about a medical situation of some urgency. There would be a weaker case for violating a parent's decision where the harm was much further into the future and the risk more diffuse. The added complexity of the vaccination question also lies in requiring a person to assume a personal risk for the collective good, rather than simply a personal good. Thus the societal interest in maintaining public health could potentially justify overriding parental objections in some cases, but this may be perceived as a more coercive and heavy-handed approach. For this reason, we instead examine the possible consequences in private law, more specifically in tort law.

One of the basic principles of tort law is *restitutio in integrum*, returning a person who has been injured through the fault of another to the position they would have occupied had the harm not occurred. The outcome of a case should make the plaintiff whole and attribute fault to the defendant, while allocating the loss between them in a just manner. In proving a negligence action, the burden is on the plaintiff to establish five elements, ordered here by seriousness of the challenge that they present to establishing liability for failure to immunize: (A) that the injury was not too causally distant from the tortious act, (B) that the injury was caused by the negligent action, (C) that the defendant breached an accepted standard of care, (D) that a duty of care was owed to the plaintiff in particular, and (E) that the damages are recoverable. While the reasonable person is expected to be aware of common knowledge, such as the knowledge that vaccination reduces the spread of infectious diseases, the contentious issue is whether refusal of immunization could be considered negligent. The outcome of the legal argument may rest on the quality and content of information disseminated to the public about the risks of vaccinating and the risks of not vaccinating, which determines foreseeability of harm. It also depends on the balance between individual choice and public harm, and how far this boundary can be stretched.

A. Remoteness

The first question we will examine is whether the decision that led to the adverse event is sufficiently connected with the outcome to be considered compensable. Recovery is confined to those injuries that were reasonably foreseeable as a result of negligence.[29] Thus, if a defendant were to be held negligent in the case of exposing others to a substantial risk of infectious disease, the injury would need to be fairly direct.[30] The distinction revolves around the likely knowledge

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[28] [1995] 1 S.C.R. 315, 122 D.L.R. (4th) 1 [*Children's Aid Society*].

[29] *Overseas Tankship (U.K.) Ltd. v. Morts Dock and Engineering Co. Ltd. (The Wagon Mound No. 1)*, [1961] 1 All E.R. 404, A.C. 388.

[30] Bizarre results that are beyond the realm of what would be expected are not recoverable (*Mustapha v. Culligan*, 2008 S.C.C. 27, [2008] 2 S.C.R. 114). For example, a vaccine-allergic unimmunized child in an after-school program with the infected child might be able to recover. But if the child's supervisor panics at the situa-

the non-immunizing parent would have had about the consequences of his actions. If the resulting harm is reasonably foreseeable the defendant would be liable to the extent of that damage. Therefore, if a child suffers a rare but known complication of an infectious disease, one could not argue that the child was abnormally susceptible.[31]

The question of remoteness in this instance revolves around whether the decision by a parent not to immunize his child can be considered sufficiently related to the development of a vaccine preventable condition, either by a child who is immunized or one who could not be immunized. The chain of events leading to this result would likely follow a particular pattern: a parent chooses not to immunize his child, who then becomes infected with measles; while infectious, but still clinically asymptomatic or unaware that they have measles, the child attends school; the child comes into contact with potentially susceptible children and transmits the infection to them. An argument could be made that the decision to not vaccinate, which then is followed by the transmission of an illness, is sufficiently foreseeable. This is based on our understanding of the effects of immunization, since not vaccinating greatly increases the risk of the child contracting the disease, and therefore of passing it on to others.

There are many possible intervening factors which might confuse the analysis and make the end result too remote, for example, other unvaccinated children as potential sources of the infection, an absence of adequate hygiene practices, or neglecting to take proper care to mitigate the spread of disease in the face of a measles outbreak. These factors can make it difficult to draw the line between what was foreseeable, and what was not. While the number of children who are unvaccinated or practice good hygiene may be variable, it is plausible that the science of herd immunity presents a predictable and foreseeable result, even in the presence of other mitigating or exacerbating factors. It is in fact the presence of a critical mass of unvaccinated children that leads to an outbreak, and thus it is best considered an integral part of the analysis rather than an intervening factor. Simply put, measles outbreaks do not occur when there is 100% vaccination coverage. The extent of foreseeability requires a more detailed examination of causation, and the epidemiology of vaccine-preventable diseases.

B. Causation

To establish liability, plaintiffs must demonstrate a causal link between the negligent act and the subsequent injury, which presents some difficulties in this situation. It is not enough to merely expose one to an unreasonable risk. That risk must be realized and must result in harm. In the case of failing to immunize a child, the question would be whether the failure to immunize is the direct cause of another child contracting the communicable disease. It would be difficult to prove on the standard "but for" test of causation for one defendant, since non-immunization of just one child in a community is not likely to lead to an outbreak and widespread infection. In the regular case, it is not simply one individual responsible, but a number of children, the number contributing being the percentage that breaks down the barrier provided by herd immunity. Given that these numbers can be estimated, and that the percent vaccine coverage required to protect against highly infectious diseases such as measles can be as high as 94%,[32] it is possible that in some cases there may be quite a small number of parents who contributed to the outbreak by negligently exposing other children to their infected non-immunized child. In finding

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tion and suffers mental distress, it would not be recoverable.

[31] The "thin skull" rule: *Smith v. Leech Brain*, [1962] 2 Q.B. 405, [1961] 3 All E.R. 1159 at 1161.

[32] Centers for Disease Control and Prevention, "History and Epidemiology of Global Smallpox Eradication. Accessible", online: CDC <http://emergency.cdc.gov/agent/smallpox/training/overview/ppt/eradicationhistory.ppt> at slide 17.

tort liability, unless evidence to the contrary is adduced by a defendant, an inference of causation may be drawn despite the absence of positive proof of medical causation.[33]

Epidemiological data reveals that outbreaks do not occur where people are substantially immunized. The curves constructed from this data show that prevalence of communicable diseases decreases when vaccinations are available and widely used. When vaccine coverage drops, vaccine-preventable diseases return (Figure 2).

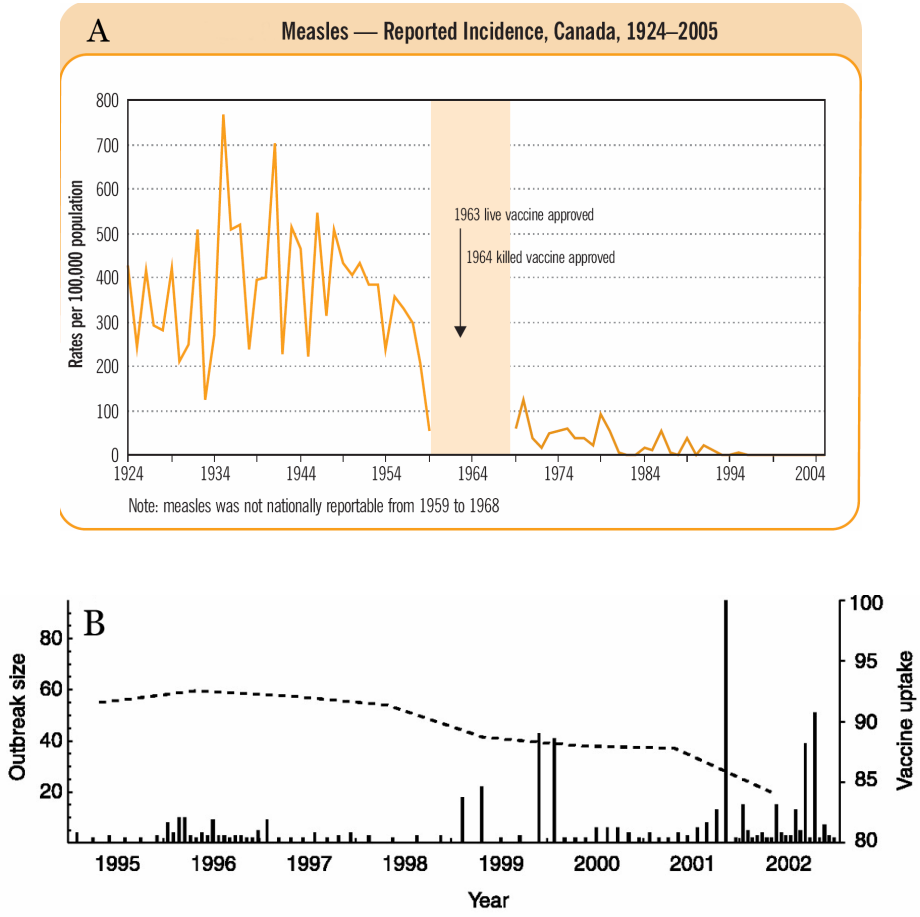

Figure 2: Measles vaccine and reported incidence of measles cases. A) Live measles vaccine was introduced in 1963, and killed measles vaccine in 1964. This innovation helped to reduce cases of measles to almost zero, and prevented new outbreaks of the disease.[34] B) The dotted line indicates dropping MMR vaccine uptake in England and Wales.[35] Note the dramatic increase in outbreak frequency and size once the coverage has dropped below a critical point in the population.

Similar results have been seen with other vaccine-preventable illnesses (Figure 3). In Japan, pertussis vaccine coverage dropped from 90% to less than 40%, after two infants died following DPT immunization.[36] The marked drop in vaccine coverage contributed to the increase in num-

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33 *Snell v. Farrell*, [1990] 2 S.C.R. 311, 72 D.L.R (4th) 289 at 330; *Sindell v. Abbott Laboratories*, 26 Cal. 3d 588 (1980).

34 From *Immunization Guide*, *supra* note 2 at 229. One may note that the levels of measles declined prior to introduction of the vaccine; improved hygiene and medical knowledge aided in the reduction of infectious diseases, but the vaccine ensures that resurgence of the disease is prevented.

35 From V.A.A. Jansen *et al.*, "Measles Outbreaks in a Population With Declining Vaccine Uptake" (2003) 301:5634 Science 804. This 2003 paper predicted a possible re-establishment of endemic measles in the U.K., which has now actually occurred.

36 *Immunization Guide*, *supra* note 2 at 31.

ber of pertussis cases each year in Japan, which rose from between 200 and 400 cases, to 13,000 cases between 1976 and 1979. Over 100 of these cases were fatal. Similarly, in Ireland, allegations of a link between immunization and autism led to a drop to 76% measles vaccine coverage. Several children died from measles complications when the number of measles cases increased from 148 in 1999, to 1200 in the year 2000, following the decreased vaccine coverage.

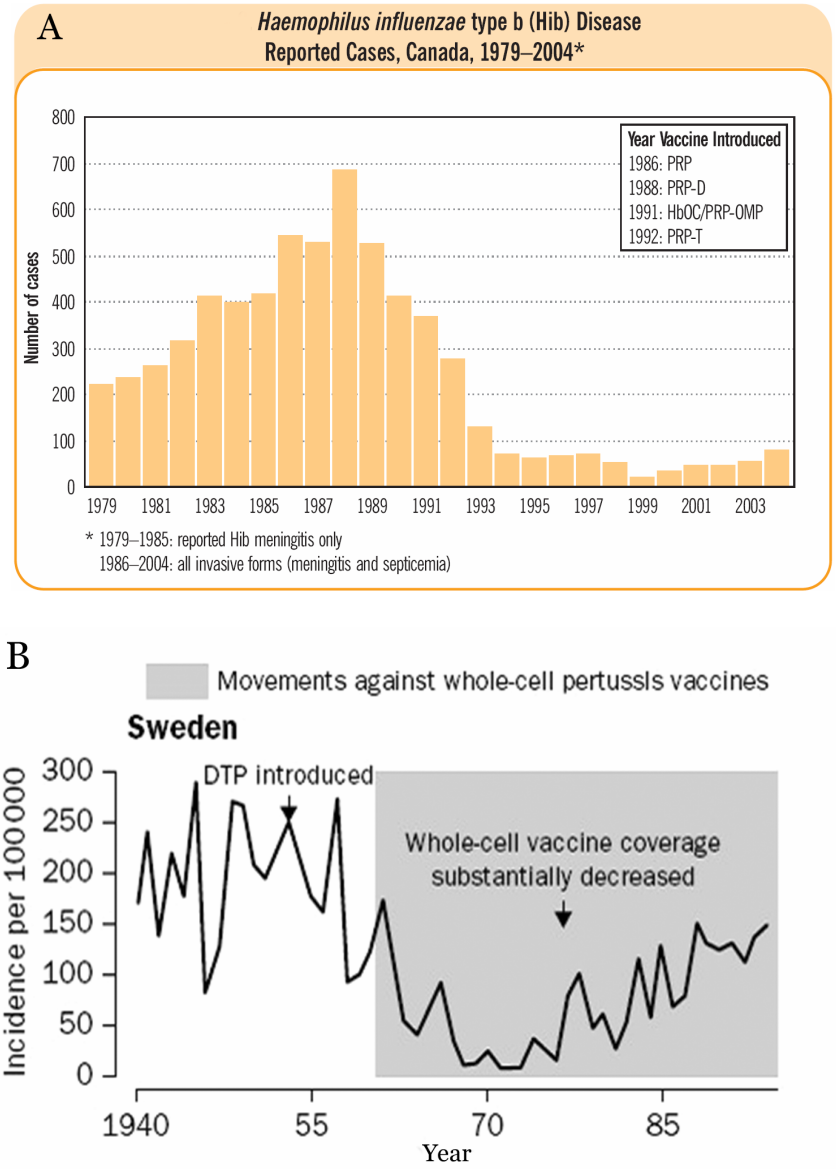

Figure 3: Effects of vaccination on incidence rates of other vaccine-preventable diseases. A) *Haemophilus influenzae type b* cases have been dramatically and sustainably reduced after introduction of the Hib vaccine.[37] B) Movements against whole-cell pertussis (whooping cough) vaccines in Sweden have led to a substantial decrease in vaccine coverage, which in turn have led to climbing incidence rates of the disease.[38]

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[37] From *Immunization Guide*, *supra* note 2 at 173. *Hib* was, prior to the introduction of the vaccine, the most common cause of bacterial meningitis and was a leading cause of other serious invasive infections in young children.

[38] Adapted from E.J. Gangarosa *et al.*, "Impact of Anti-Vaccine Movements on Pertussis Control: The Un-

These diseases have almost been eradicated thanks to routine immunization and high levels of societal compliance with these practices. While it is possible that a single individual might re-introduce a disease, recurrence is highly improbable unless there are pockets of unimmunized individuals; this geographical clustering is likely when groups of parents have chosen to forego vaccinations. If there is a small community of parents who did not immunize their children, then collectively they are most likely the cause of the outbreak and the resulting damage. "But for" the actions of all of these individuals together, the outbreak would not have occurred; yet fault for the outbreak cannot be pinned on any particular individual using the logic of the "but for" test. Thus there may be problems with applying the "but for" test due to the nature of herd immunity, as exceptions to the test are of an extremely limited nature.[39]

However, this problem can be surmounted using the "material contribution" test, the application of which was recently clarified by the Supreme Court of Canada in *Resurfice Corp v. Hanke*.[40] In *Resurfice*, the Court found that the "material contribution" test may be used in place of the "but for" test when two criteria are met:

> First, it must be impossible for the plaintiff to prove that the defendant's negligence caused the plaintiff's injury using the "but for" test. The impossibility must be due to factors that are outside of the plaintiff's control; for example, current limits of scientific knowledge. Second, it must be clear that the defendant breached a duty of care owed to the plaintiff, thereby exposing the plaintiff to an unreasonable risk of injury, and the plaintiff must have suffered that form of injury. In other words, the plaintiff's injury must fall within the ambit of the risk created by the defendant's breach.[41]

Crucially, the Court held that the material contribution test could be applied to cases in which uncertainty arises over which of several defendants was responsible for a given injury. In such cases, as long as *one* of the defendants was surely the cause of the plaintiff's injuries, and as long as *all* of them were negligent, then the "material contribution test" could be used to impose liability, given the impossibility of proof under the "but for" framework.[42] In cases which fall within this category, *restitutio in integrum* should favour the plaintiff who has been injured, but cannot prove conclusively which negligent defendant actually caused the injury. In Britain, this approach has already been used to hold a group of defendants liable for provoking cancer in an employee, even though scientific proof of which defendant caused the injury was impossible.[43] If adopted in Canada, this approach would empower the victim, who has done nothing wrong, to succeed over a defendant who has wrongly exposed him to harm by materially increasing the risk of illness.

Since herd immunity relies on a very high percentage of immunization within a community, the material contribution test may allow for recovery against the discrete group of defendants who have chosen not to vaccinate their children. Measles has a clear epidemic threshold level, where a precise quantitative relationship exists between the infection attack rate during a major outbreak, and the number of susceptible individuals in excess of this threshold.[44] When this level is reached, even in highly vaccinated populations, nearly two additional infections are associated with each susceptible individual above the threshold point (Figure 4). Because of this scenario, a

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told Story" (1998) 351:9099 The Lancet 356.

39 See e.g. *Cook v. Lewis*, [1951] S.C.R. 830.

40 2007 SCC 7, [2007] 1 S.C.R. 333, 278 D.L.R. (4th) 643 [*Resurfice*].

41 *Ibid.* at para. 25.

42 *Ibid.* at para. 27.

43 This succeeded in the "toxic tort" House of Lords case of *Fairchild v. Glenhaven Funeral Services* [2002] U.K.H.L. 22, [2002] 3 All E.R. 305, (Fairchild was exposed to asbestos by multiple employers, and developed mesothelioma, yet it could not be scientifically proven which one had caused the disease; rather than deny compensation to Fairchild, it was determined that all of his employers were liable on the basis of materially contributing to his risk of asbestos-related injuries).

44 Wallinga, Heijne & Kretzschmar, *supra* note 25 at 1152.

few individuals could be deemed to have contributed substantially to the risk of outbreak through their actions.

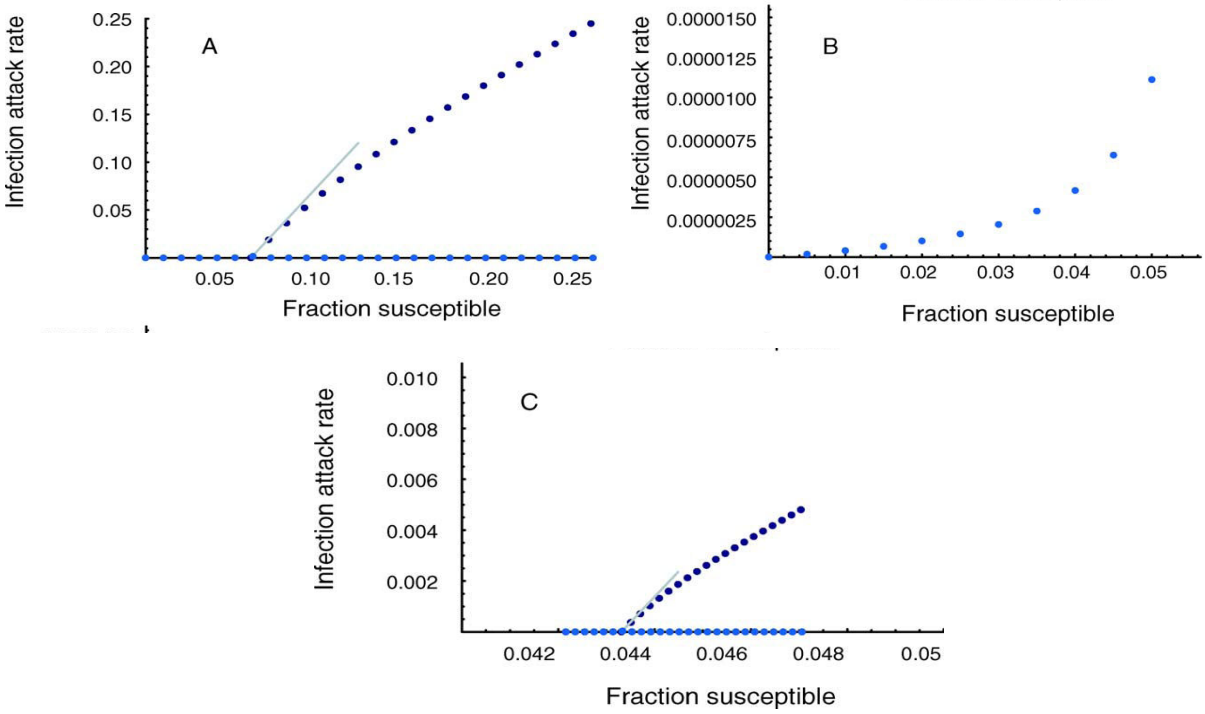

Figure 4: Adapted from Wallinga, Heijne & Kretzschmar, *supra* note 25. Expected infection attack rates during measles outbreaks in A) an idealized homogeneously mixing population, B) in a population protected by solid herd immunity and C) in a heterogeneous population, consisting of a small community embedded in a larger population. There is a clear threshold level for the fraction of susceptible individuals, near 0.043, above which major outbreaks are much more likely to occur.[45]

These individuals would be collectively responsible for the outbreak and as such could be sued as joint defendants. In most cases it would be very difficult to demonstrate that a measles infection arose from a single person. It is possible, however, to find connections between school outbreaks and the number of philosophical and religious exemptors in the community. It is also possible to identify exempt individuals as the source of a transmission. For example, in one study, at least 11% of vaccinated children who acquired measles in outbreaks in Colorado were infected through contact with an exempt child identified as the source.[46] Increased exemption rates show a correlation with an increased number of school-based outbreaks; for schools with outbreaks, the mean exemption rate was 4.3%, compared with a 1.5% mean exemption rate for schools which did not experience outbreaks. While the risk of contracting measles was found to be elevated in personal exemptors, the more important finding is that their presence in large numbers also creates the potential for increased outbreaks in the community overall, a risk that parents may not be aware of when deciding not to vaccinate. On these facts, it appears that each individual decision not to vaccinate a child materially contributes to the emergence of a measles outbreak in a school, which would not likely have occurred otherwise. If these medically unsupported decisions had not been made, the vaccinated child would not have developed measles.

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45 *Ibid.* at 1155.

46 Daniel R. Feikin *et al.*, "Individual and Community Risks of Measles and Pertussis Associated with Personal Exemptions to Immunization" (2000) 284:4 Journal of the American Medical Association 3145 at 3148.

Applying this causation analysis to the question of remoteness, it can also be concluded that there is a proximate and foreseeable link between the decision of a small group of individuals not to vaccinate their children, and the development of measles in those vaccinated children or in a nearby vaccinated child.

C. Standard of Care

Establishing whether a single parent or group of parents breached a recognized standard of care is likely to be a particularly challenging obstacle. Categorizations of wrongdoing are based on an objective standard; the reasonable person avoids creating a foreseeable risk of injury to others.[47] Thus, reasonable persons who believe their actions to be in the best interests of their children should also avoid causing harm or creating substantial risks of harm to other children through their actions. Since the reasonable person is independent of the idiosyncrasies of the particular defendant in question, their personal views on the "right" course of action in the situation are irrelevant. What standard of care is owed to the community? In the case of immunization, the answer to this question depends on the reasonably foreseeable consequences of failure to immunize. It seems foreseeable that the failure to immunize a child could result in that child developing an otherwise avoidable disease. What is less clear is whether parents could foresee that the decision not to immunize their child would potentially place other children, immunized or not, at risk.[48]

Creating a risk is only considered negligent if it is a substantial risk, that is, one that is likely to result in harm, or one that could result in especially serious harm.[49] Even where the probability of injury is small, a loss will be recoverable where the extent of harm is so great, were it to materialize, that the reasonable person would act to prevent it.[50] Another factor involved in determining whether a risk is reasonable is how advantageous the act is, in comparison with the negative effects associated with taking the risk.[51]

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47 Philip H. Osborne, *The Law of Torts*, 3d ed. (Toronto: Irwin Law, 2007) at 30.

48 Exposing others to a risk of disease as a result of negligent practices has been shown to be actionable. For example, the Canadian Red Cross Society has been held liable for negligently screening blood donors with HIV, leading blood recipients to become infected. See *Walker Estate v. York Finch General Hospital*, 2001 SCC 23, [2001] 1 S.C.R 647, 198 D.L.R. (4th) 193.

49 *Bolton v. Stone,* [1951] A.C. 850, U.K.H.L. 2. For example, children who have never been immunized due to allergy to vaccine components could be particularly susceptible to vaccine-preventable diseases, and greater care might be expected with these individuals.

50 *Overseas Tankship (U.K.) Ltd. v. Miller Steamship Co. Pty (The Wagon Mound No. 2)*, [1966] 2 All E.R. 709, 3 W.L.R. 498 (P.C.). If the burden of eliminating the risk of serious harm is minimal, and not taken, the action or non-action will be more likely to be deemed unreasonable. There could be considerable debate as to whether the burden of mandatory vaccination is minimal, as it inherently requires assumption of some personal risk of physical adverse reaction, which can potentially be quite serious in very rare cases.

51 Angus Dawson, "Herd Protection as a Public Good: Vaccination and our Obligations to Others" in Angus Dawson & Marcel Verweij, eds., *Ethics, Prevention, and Public Health* (Oxford: Oxford University Press, 2007) 160. There is an ethical argument that creating herd immunity through vaccination is an important public good of such significance that there is a moral obligation on individuals to participate in vaccination programs. However, Dawson argues that once herd protection is established in a population, the moral obligation to participate is no longer present and there may be valid reasons to opt out. This argument would seem to hold as long as herd immunity remains constant and certain; by receiving vaccination at this point a person would be taking on a risk in a situation in which no additional benefit would be brought about to others. However, this argument would only work if a very small number of people took this position. The problem is that if a large enough number of people subscribe to this view and choose not to vaccinate, herd immunity will be lost and the rationale will be undermined. We would counter, then, that the moral obligation remains to continue vaccination programs for the public good because of the importance of maintaining herd immunity. This position is bolstered by findings that herd immunity is lost in populations with clusters of unimmunized individuals, leading to an increase in the number of outbreaks. For more on this point see Omer *et al.*, "Vaccine Refusal", *supra* note 4.

The scientific literature indicates that immunization is a socially and personally beneficial activity, and many of the perceived dangers associated with vaccination have not been substantiated.[52] Thus it can be argued that claiming a non-medical exemption to routine vaccination is not a beneficial activity, neither for the child nor for society. It can in fact be considered a harmful activity, as non-vaccinated children increase the risks of disease exposure and transmission. The positive aspects of vaccination and the negative aspects of non-vaccination militate in favor of imposing a stricter standard of care.

The imposition of a new standard of care poses several questions. The first is whether parents could be held liable for discrete actions, aside from the initial decision not to vaccinate, which increase the risk of outbreak in the community. As an extreme example, a parent of a non-immunized child could conceivably be perceived to have broken a standard of care if the child, after being in a region with a known outbreak of the communicable disease for which the refused vaccine was intended, is then brought into the company of other community children, despite first displaying symptoms of the disease.[53] If, in such a situation, another child in close proximity contracted the disease, and developed a serious case of encephalitis resulting in permanent damage, there would be a fairly good case that the non-immunizing parents breached a standard of care, and were causally responsible for the injury. A reasonable person would have recognized the substantial risk involved, particularly because the child was unimmunized. Relevant governing bodies strongly recommend immunization when traveling to certain areas of the world, and travel advisories are released to the public.[54] Global travel has increased the possibility of importing diseases into Canada, including those which are no longer found endemically in this country.[55] In cases of endemic communicable diseases, such an argument may also apply in cases where the travel is not abroad, but simply to a local area of high disease prevalence.

One could posit that the reasonable person would act to reduce risk by conforming to standard routine immunization practices and updating immunization with required vaccinations for travel. Failure to take care in these circumstances may arguably endanger the Canadian population in general, and could be considered not just a matter of health policy, but also of health security. Although such recommendations are not binding law, they could be used in court as strong evidence of the level of care expected of Canadians who travel abroad. Assuming that measurable damages occurred and a causal link can be established, a novel claim in negligence could possibly succeed against parents who chose not to immunize their children prior to travel-

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[52] See Christopher B. Wilson & Edgar K. Marcuse, "Vaccine Safety—Vaccine Benefits: Science and the Public's Perception" (2001) 1:2 Nature Reviews Immunology 160.

[53] This situation may seem far-fetched at first glance. However, these scenarios are in reality becoming more common as a result of the increase in parental resistance to immunization, especially within close-knit social groups. In 2005 in Indiana, a 17-year-old unvaccinated girl brought measles back to the U.S. on return from a trip to Romania, leading to the largest documented measles outbreak in the U.S. in a decade. Transmission was magnified as the girl was sent to attend a church gathering of 500 persons the day after she returned home, despite the fact that she was exhibiting prodromal symptoms. Many individuals at the gathering were unvaccinated, including young children. This incident led to hospitalizations and some complications, but luckily, no serious adverse effects or deaths. However, there is no guarantee that such events in the future will be as benign. It is important to note that 94% of the patients with confirmed measles were unvaccinated. There is a reasonable argument that the parents of this teenager breached a standard of care by exposing the public, and especially a largely unimmunized sector, to their unimmunized daughter, who had recently traveled abroad and was showing symptoms of illness. This example reveals that the issue is highly relevant today. See A.A. Parker *et al.*, "Implications of a 2005 Measles Outbreak in Indiana for Sustained Elimination of Measles in the United States" (2006) 355:5 New Eng. J. Med. 447.

[54] Such as *Immunization Guide*, *supra* note 2.

[55] Health Canada, "It's Your Health: Travel Health", online: Health Canada <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/life-vie/travel-voyage-eng.php> (to protect oneself from the health risks of travel, one is advised to ensure that routine vaccinations are completed and up-to-date, and if necessary to immunize against other diseases, depending on the location).

ing to a high-risk area. If the disease contracted by immunized or medically-exempted children has been virtually eradicated in this country, then a convincing chain of transmission can likely be traced to those who have recently traveled to an area where the disease is present.[56] Thus, it is possible that in some situations, actions taken that expose others to an unreasonable risk of contracting a contagious illness may be considered a breach of the expected standard of care. Of course, this depends on the weight given to the force of health recommendations, and the expectations of Canadians in following these recommendations.

Public health considerations lead to a second and more difficult question: can the choice not to immunize a child in itself be considered an unacceptable level of risk to impose on others? This engages considerations that arise much earlier, namely whether a citizen must vaccinate his child as an infant or small child to conform to a Canadian standard of care. At present, the answer to this question is not clear for parents who are looking for reparations for harm caused to their children by vaccine-preventable illnesses from those who have caused an outbreak. The standard of care represents what the reasonably prudent person would do. It is a convincing argument that the reasonable and careful parent would immunize against common communicable diseases, despite the small risk of adverse reaction. It is customary practice in Canada to vaccinate, and the overwhelming majority of the country follows the guidelines strongly emphasized by national and international public health bodies; although standard practice is not binding, it can be used as evidence of the standard of care.[57] The courts have historically shown deference to the medical profession and health practices, determining the reasonable standard of conduct in accordance with accepted customary practice.[58] Vaccination is a long-established customary practice in Canada, despite being optional.

The immunization program is, however, according to current rules, a personal choice made by parents and is not mandated by the government, though regulations are implemented to encourage a high level of compliance.[59] As there is no "tort of selfishness" in our country, parents of children harmed by a disease outbreak would be unlikely to succeed. The best argument to improve their chances of success is that the standard of care should be made more rigorous, such that Canadian citizens would be required to implement prudent prophylactic measures to protect against communicable diseases.[60]

The issue within the standard of care analysis that requires attention from public health officials is whether or not parents are aware of the consequences of their choice not to immunize. The risks must be adequately communicated to parents in order to establish that they could be breaching a standard of care. For many diseases, such as measles, there is no doubt about the efficacy and importance of vaccines. Data shows that many devastating diseases of the past have declined drastically in prevalence since the introduction of routine immunization programs.[61] These programs have as their goal the national and worldwide eradication of diseases, and not simply personal health protection. However, information sources and promotional literature for parents, such as those provided by the Ontario Ministry of Health and the Canadian Pediatric

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[56] The SARS outbreak in Toronto is illustrative of this phenomenon: Priya Sampathkumar *et al.*, "SARS: Epidemiology, Clinic Presentation, Management, and Infection Control Measures" (2003) 78:7 Mayo Clinic Proceedings 882.

[57] See Osborne, *supra* note 47 (established practice is useful evidence for a court to consider, as it represents a "concrete, defined course of conduct that reflects the accumulated wisdom of those involved in the activity" at 36).

[58] *ter Neuzen v. Korn*, [1995] 3 S.C.R. 674, 127 D.L.R. (4th) 577 at 693.

[59] See Public Health Agency of Canada, "Vaccine Safety", online: PHAC <http://www.phac-aspc.gc.ca/im/vs-sv/index-eng.php>.

[60] Of course this standard would include, to honour *Charter* rights, exemptions for medical reactions to vaccination and for bona fide religious beliefs that prohibit vaccination: *Canadian Charter of Rights and Freedoms,* Part I of the *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982* (U.K.), 1982, c. 11.

[61] See *Immunization Guide*, *supra* note 2.

Society, stress the benefit for *your* child's health, rather than for the benefit of community health.[62] Thus, it may be difficult to establish, even if immunizations were mandatory, that a parent "ought reasonably to have had in his contemplation" the well-being of others when the public literature indicates that it is a personal choice for the health of your child, rather than a standard procedure for the health of all children.[63] Under the *Immunization of School Pupils Act* schools in Ontario require immunization, or an official exemption, before pupils may enroll.[64] Parents must vaccinate their children and there is a $1000 fine for non-compliance. This is not done for the benefit of each child; schools do not generally inquire into the well-being of each pupil. Rather, it is for the societal protection associated with vaccines: the well-being of all of the children. This requirement is a strong indicator that the reasons for vaccination are not personal but rather communal, and can serve as evidence of the reasonable standard which is expected of Canadians.

In New Brunswick, under the *Education Act*,[65] a student must also provide proof of required immunizations, subject to similar exemptions. While Manitoba had an analogous provision, it was repealed in 1999.[66] Other provinces do not have specific acts dealing with the issue, although schools may request an immunization record and there may be repercussions for those not meeting the provincial vaccination lists.

Immunization practices for the general public are strongly recommended in Canada, the U.S., and in virtually every country around the world.[67] There are essentially no dissenting views at the appropriate levels of regulation and public health leadership.[68] The result is that children in those provinces and states implementing these policies must be vaccinated or officially exempted in order to legally attend school. Although home-schooled children are not legally required to be vaccinated, there have been calls for changes to this policy, as it leaves those children and others in the community in danger of contracting preventable diseases.[69] The same problem applies to provinces with voluntary vaccination schedules for school children.

While the majority of the population adheres to voluntary immunization according to the prescribed schedule, this may not be enough to determine what parents "should" have done. The

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62 Canadian Pediatric Society, "Immunization: Vaccination and Your Child" in *Caring for Kids*, online: CPS <http://www.caringforkids.cps.ca/immunization/vaccinationchild.htm>; Ontario Ministry of Health and Long-Term Care, "Immunization: Your Best Protection", online: MOHLTC <http://www.health.gov.on.ca/english/public/pub/immun/immunization.html>.

63 The "neighbour" principle as formulated by Lord Atkin in *Donoghue v. Stevenson*, [1932] A.C. 562, S.C. (H.L.) 31 at 580. It can be argued that a reasonable parent would only have considered the health of her own child, rather than the health of other children.

64 R.S.O. 1990, c. I. 1., s. 3 [*Immunization Act*].

65 S.N.B. 1997, c. E-1.12, s.10.

66 The act which was repealed in 1999 was the *Public Schools Act*, Re-Enacted Statutes of Manitoba 1987, c. P250 at s. 261(1).

67 See the World Health Organization, "Global Immunization Vision and Strategy", online: WHO <http://www.who.int/immunization/givs/en/index.html>.

68 While there is an acknowledgement that vaccination does pose some risks, there is consensus amongst most public health officials that for recommended childhood vaccines serious risks are exceedingly rare and the benefits of immunization outweigh the risks posed to the child. Perhaps the most high profile of these vaccination controversies has been the link between thimerosal and the development of autistic spectrum disorders. While initially health officials called for a removal of thimerosal from childhood vaccines on precautionary grounds, subsequent epidemiological studies failed to show an association. The U.S. Court of Federal Claims has adjudicated over three test cases purporting a link between vaccines and autistic spectrum disorder and rejected all three. Of note, the necessary evidentiary level for justifying compensation within these courts is less than the level in a civil court: United States Federal Court of Claims, "The Autism Proceedings", online: USCFC <http://www.uscfc.uscourts.gov/sites/default/files/Hazlehurst_ Affirmance.pdf>.

69 See Danya Khalili & Arthur Caplan, "Off the Grid: Vaccinations Among Homeschooled Children" (2007) 35:3 J.L. Med. & Ethics 471.

fact that immunization requirements are not standardized throughout the country, combined with the lack of information about the broader societal risks of the choice, presents a major barrier to establishing a higher standard of care. Parents may not know, or claim not to know, the risks posed to other children by choosing not to vaccinate their own children. In some cases, they know of the risks but declare that they are unwilling to "sacrifice" their child for the greater good.

Although it is not necessarily negligent to try to save oneself at the risk of another, this determination may depend on the quality and nature of the information one is acting on. In this type of situation, the parent is assuming a risk and could conceivably be held responsible if that risk materializes. However, the exemption affidavit form for conscience or religious beliefs mentions only that the signatory understand that a pupil may be excluded from school if there is an outbreak of disease.[70] It does not mention the particular risks posed to other children of actually causing an outbreak of disease due to lack of immunization. Allowing conscientious objections to vaccination compromises the important goal of eradicating infectious diseases. This problem should be dealt with more thoroughly by public health authorities; at a minimum, individual parents should be made aware of the communal consequences of declining vaccinations.

D. Duty of Care

Establishing the duty of care is generally considered the primary instrument of control over the extent of negligence liability.[71] There is no such thing as "negligence in the air"; that is, negligence is not a tort unless it results in the commission of a wrong which causes the violation of a protected right.[72] A plaintiff seeking to recover in tort must show that damage occurred, but also that a duty was owed to him by the negligent defendant not to cause him harm. Thus the relationship in question must be identified before one can assess the potential for liability. Certain relationships have been identified by the common law as leading to a duty of care, while others have not been specifically examined in previous cases. Where an unrecognized duty of care is proposed, the three stage Anns/Cooper test is used to assess whether the law of negligence may be extended to a new situation or be used to create a new cause of action.[73]

The relationship between non-immunizing parents and the children to which their non-immunized children are exposed will likely be considered a novel one for the courts, not falling within or closely analogous to a recognized category of relationships where a duty of care has been found. If faced with this problem, the Anns/Cooper test would likely be implemented.[74] The outcome of this test would be central to establishing whether a plaintiff has the right to make a claim, as it defines the scope of liability. In the first part of the investigation, a prima facie duty of care would be found if the harm suffered was reasonably foreseeable, and there was sufficient proximity between the parties.[75] If such a prima facie duty were found to exist, the court would then ask if any residual policy considerations might limit or negative that duty.[76]

The first stage of the test is foreseeability, which is necessary but not sufficient to establish a prima facie duty of care. Here, we contemplate three separate scenarios. (1) If the disease is clinically manifest during the infectious period, responsibilities would be no different for an immunized child versus an unimmunized child. In this situation, it is entirely foreseeable that

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70 This is the case in Ontario, with similar forms in New Brunswick and the U.S.

71 Osborne, *supra* note 47 at 67.

72 *Palsgraf v. Long Island Railroad Co.,* 248 N.Y. 339, 162 N.E. 99 (1928) at 345.

73 *Cooper v. Hobart*, [2001] 3 S.C.R. 537, 206 D.L.R. (4th) 193 [*Cooper*]. The Anns test, from *Anns v. Merton London Borough Council,* [1977] 2 All E.R. 492, [1978] A.C. 728 was adopted by the SCC in *City of Kamloops v. Nielsen,* [1984] 2 S.C.R. 2, 10 D.L.R. (4th) 641.

74 *Cooper*, *ibid*.

75 *Ibid*. at para. 31.

76 *Ibid*. at para. 37.

an infected child could transmit a communicable disease to an uninfected child. (2) It is less foreseeable that an unimmunized child could develop a vaccine preventable condition and then transmit this condition, while infectious but *not clinically symptomatic*, to a child who could not be immunized. (3) It is perhaps even less foreseeable that an unimmunized child could develop a vaccine-preventable condition and then transmit this condition to a child who is immunized; however, the scientific basis for this mode of transmission is understood. Whether the second and third cases would be considered foreseeable would depend on the likely knowledge of the parent.

Parents can be expected to know that infectious diseases are transmissible. And even though they may disagree, they are informed by their health care providers, or through the exemption form that they sign, that not immunizing their children places them at greater risk for developing vaccine preventable diseases. What the parent is less likely to be aware of is that some children cannot be immunized and that even if immunized, one may still develop a vaccine-preventable disease. Still, large measles outbreaks are far more likely in populations which decline vaccines. Non-immunizing parents would be aware of the increase in infectivity resulting from such a decline in uptake if the authorities have made them aware of this fact during the opting-out process. This would have to be done in a manner that is comprehensible to parents, for example informing parents that the decision they are making may place other children at risk of developing potentially serious illnesses. If this type of information transfer were implemented, it could shift, in the minds of parents, the scenario of an outbreak into the realm of foreseeability.

The second stage of the Anns/Cooper test is proximity, that is, whether there is a relationship of sufficient closeness and directness which, upon examination of policy factors pertaining to the relationship, makes it fair and just to impose a duty of care in the context.[77] Proximity can be implied by physical, social, and causal closeness. The court must be satisfied that the plaintiff is a foreseeable victim, or a member of a class of foreseeable victims. This would likely be met by children who are in schools or day care facilities with the defendant's child.[78] A close and direct relationship would surely arise in a situation of prolonged and direct physical contact between a non-immunized child and another child, particularly in the setting of an educational institution. A policy factor which would tend to limit the duty at this stage is the wide range of persons to whom the infectious child would be exposed; the plaintiff must be able to show that he belonged to a particular identifiable group owed a duty of care by the defendant. There is a strong argument then that, at least at this stage of the test, a duty should be imposed on parents who choose to send their unimmunized children to after school programs, play dates, or arguably day school, depending on the statutory authority barrier, which will be discussed below. Because infection in such close quarters would be both foreseeable and proximate, it seems likely that a prima facie duty of care would be imposed.

The third stage of the test involves residual policy factors relating to the impact of imposing a duty on society, legal obligations, or the legal system in general.[79] The implications of finding a duty in this case could be far-reaching, in that it would require a child to undertake a personal physical risk to avoid causing a larger risk to others. Balancing policy concerns with individual rights would be an integral aspect of the policy analysis. A judge may not be willing to impose such a duty on parents, given their role as guardians and decision-makers in their children's

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77 *Ibid.* at para. 37.

78 Patricia Peppin, "Vaccines and Emerging Challenges for Public Health Law" in Tracey M. Bailey, Timothy Caulfield & Nola M. Ries, eds., *Public Health Law and Policy in Canada* (Markham: LexisNexis Butterworths, 2005) 133 at 147.

79 Osborne, *supra* note 47 at 68.

lives. However, the judge would also take into account the difficulties posed to a parent who is harmed by those decisions, which may be made without full information.

In the case of *Dobson*, it was determined that although a prima facie duty of care exists between a mother and her injured unborn child, it cannot be imposed for reasons of public policy.[80] This case holds some relevance to the situation under consideration as it shows that the courts have indicated a need for restraint where a change in the law would affect sensitive and far-reaching issues of public policy. In many ways though, this situation is different. The policy decision in *Dobson* seems to have been guided mainly by the nature of pregnancy and the closeness of that relationship. This is not easily transferable to the case where a person's "lifestyle" choices harm a child not only outside of the womb, but also from another family altogether. The risk of harm posed is serious and potentially violates the rights of children to be protected from ill health. Still, the situation is in a similar vein to *Dobson*, in that holding parents negligent for failing to immunize their children may be considered too far a reach into the private and personal actions of citizens. When immunization is at issue, the autonomy rights of parents to make decisions about their children's medical care come up against the rights of other children to be protected from preventable dangers. These types of issues are often characterized as beyond the jurisdiction of the court and better left for Parliament. Immunization practices raise their own complex constellation of public policy issues, and these must be weighed along with the importance of individual autonomy in medical consent and parental choice.

An important caveat to the tort analysis is that the duty of care usually relates to malfeasance, or acting wrongly, rather than to nonfeasance, or failure to act.[81] Harm can in fact result from failure to perform an action, although negligence law does not normally oblige a person to confer a benefit on others. However, there is a growing list of exceptions that give rise to affirmative, positive duties in certain special relationships.[82] The Supreme Court of Canada in *Childs v. Desormeaux* envisions the imposition of positive duties of care upon three classes of defendants: those who create risks and invite others to participate in them; those who exercise "paternalistic relationships of supervision and control"; and those who "offer a service to the general public that includes attendant responsibilities to act with special care to reduce risk".[83] The failure to immunize best approximates the first "creation of risk" class. In some cases, there is a duty to rescue others from situations of danger.[84] Thus, one possible future direction for this area is the imposition of a duty to act, to receive immunizations or mitigate exposure, thus "rescuing" others from infectious disease. This duty, as stated in *Childs*, would arise from "the defendant's causal relationship to the origin of the risk of injury faced by the plaintiff," and here the causal chain runs from the defendant's failure to vaccinate to the plaintiff's subsequent infection.[85] The courts are, however, reluctant to impose an obligation of rescue. In the court's analysis, it would be relevant to examine the degree of risk posed to the defendant in taking this action, including the risk of adverse effects from the vaccine, and the degree of uncertainty attached to the scientific knowledge, before concluding that such a duty to rescue exists.[86]

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[80] This is due to the unique nature of the maternal-fetal relationship and the impossibility of allowing negligence claims based on injury during pregnancy without trespassing on the privacy and autonomy rights of women (see *Dobson*, *supra* note 3).

[81] Osborne, *supra* note 47 at 73.

[82] *Childs v. Desormeaux*, 2006 SCC 18, [2006] 1 S.C.R. 643 [*Childs*].

[83] *Ibid.* at paras. 35-37.

[84] *Horsley v. MacLaren,* [1972] S.C.R. 441, 22 D.L.R. (3d) 545 (this case concerns the tort consequences to a ship owner for failing to rescue a passenger who had fallen overboard).

[85] *Childs*, *supra* note at 82 at 35.

[86] Bailey, Caulfield & Ries, *supra* note 78 at 147.

E. Damages

To establish negligence liability, harm caused must be actual and compensable by damages.[87] Physical damage is the prototypical type of recoverable harm. If a child contracts a disease against which he is immunized, the harm caused is likely to be minimal, as the immunization will either fully protect the child or attenuate the severity of symptoms. Effective management of disease symptoms is generally possible; thus, only in rare cases will an immunized child have a legal claim. However, the law emerges from exceptional cases, and it is possible that a claim could arise from an immunized child who contracts a vaccine-preventable illness from a negligent exposure, and incurs permanent or sustained harm. Such results are a distinct possibility with the measles virus, which can progress into serious and even fatal complications, including encephalitis and pneumonia.[88] The situation may be more probable, and more severe, in cases where the child infected is one who cannot be immunized as a result of contraindication due to medical conditions or allergy. This category of child relies on herd immunity for protection from dangerous childhood diseases, and could suffer significant damages which would be compensable.

III
DEFENCES FOR FAILURE TO IMMUNIZE

A significant and possibly insurmountable barrier to plaintiff recovery in court, when dealing with exposure within schools, is the defence of statutory authority. Ontario's *Immunization Act* requires immunization according to a prescribed schedule to attend school, but explicitly allows exceptions to those who file a statement of medical exemption, or a statement of conscience or religious belief.[89] Such exemptions are being used increasingly frequently in the U.S. and Canada.[90] The Canadian provinces which require immunization for school entrance provide an option for non-immunization. Other provinces do acknowledge the importance of immunization programs, providing funding for immunization clinics and promotional literature, but do not make it mandatory for children to be immunized in order to enter school.[91] Thus, either a parent is given explicit authority not to immunize, or implicit authority not to immunize based on the absence of strict requirements. The defence of statutory authority states that defendants cannot be held liable in negligence for their actions if there is legal authorization for the action or non-action in question, unless that action or non-action was *executed* negligently.[92] Thus, as long as parents who refuse to vaccinate based on personal beliefs follow the policy, they cannot be penalized simply for taking the exemption, as the government has already said that this was an acceptable choice.

However, the law is only permissive. If the exemption is taken but the parent still acts negligently, for example sending an unvaccinated child who has recently been in an area of outbreak to school despite clear warning signs of contagion, the possibility for an action in negligence could still remain. In such a case, the choice not to immunize itself would not be negligent, but rather negligence would derive from the exposure of that child in a situation where there was a likelihood of infecting others, including those who are particularly susceptible. The statutory au-

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87 John G. Fleming, *The Law of Torts*, 9th ed. (Sydney: LBC Information Services, 1998) at 216.

88 See Jacqueline Gindler *et al.*, "Acute Measles Mortality in the United States, 1987-2002" (2004) 189:S1 Journal of Infectious Diseases at S69.

89 *Immunization Act*, *supra* note 64, s. 17(2).

90 Thompson *et al.*, *supra* note 19.

91 See e.g. Alberta Health, *Alberta Immunization Strategy 2007-2017* (Edmonton: Communications, 2007).

92 Although this is normally considered in the context of actions of public authorities, it also applies where a person chooses to pursue a valid option presented by the legislation: *Priestman v. Colangelo,* [1959] S.C.R. 615, 19 D.L.R. (2d) 1.

thority defence would not apply in this situation, and so there may be a less complicated path to hold a parent liable.

The other scenario, in which the choice not to immunize is the only factor responsible for the outbreak, engages more significant statutory authority hurdles. Exemptions to school rules would not necessarily apply outside of school grounds. Much of the close contact between children that results in transmission of communicable diseases occurs after school hours. Furthermore, some children are home-schooled or live in areas without mandatory policies and therefore do not have any official immunization requirements. In these scenarios, there is no statute directing or exempting immunization, but there remains the standard practice of routine immunization, which could still serve as evidence of reasonable behaviour. A person may not be required to vaccinate, but this allowance does not absolve a person of all consequences of choosing not to immunize. This is a complicated area and will be difficult to resolve without changes to the statutory regime on immunization.

Another possible defence is voluntary assumption of risk or the doctrine of *volenti non fit injuria*. It is reasonable to say that parents are assuming some level of risk by sending children to a public school system which allows vaccination exemptions for non-medical reasons. This may not give parents a lot of options, but the choice remains—either through home-schooling or other alternatives. This is, however, a difficult defence to meet, as one must prove an express or implied agreement between the parties, and that the plaintiff has consented to accept both the physical and *legal* risk of injury from the defendant's negligence.[93] It is rare to find a plaintiff who willingly abandoned his right to sue in negligence. Still, life does entail some degree of risk, and contagion by an unimmunized child may be considered by the court to be simply a part of life in light of the fact that exemptions are permitted. This policy ambiguity can likely only be addressed by a change in immunization policy.

CONCLUSION

Litigation has become a popular means of social activism. In this atmosphere, a break in herd immunity may tempt parents of injured children to consider litigation as a way to address the increased risk posed by substantial numbers of parents declining routine immunizations. Still, from a legal perspective, there are certain barriers which may render recovery unattainable. The first is that a single individual could not normally be held causally responsible for the development of an outbreak. It would be impossible to identify which unvaccinated individual either transmitted the virus to a vaccinated child, or was responsible for the breakdown of herd immunity. However, a group of individuals could be found to be responsible for causing an outbreak. It is epidemiologically clear that in the presence of high vaccination rates of an effective vaccine, vaccine-preventable diseases disappear. For successful person-to-person transmission of the virus, and therefore for outbreaks to occur, a discrete portion of the population must be unvaccinated. If such a group is readily identifiable, recovery may become possible. The second major obstacle to determining liability is establishing whether parents have breached a standard of care. This issue will remain difficult to resolve as long as the government maintains its compromise policy of allowing immunization exemptions for conscientious reasons, particularly in the absence of full disclosure of the risks such exemptions create. While public health authorities and governments present vaccination as an individual choice, it is not clear whether those who refuse to vaccinate could be held liable because of the lack of clarity in articulation of the standard of care across and within provinces.

At present, then, litigation is likely not the best forum for this discussion, since the current model is not rigorous enough to categorize those who fail to immunize as negligent. Although

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93 *Dube v. Labar,* [1986] 1 S.C.R. 649, 27 D.L.R. (4th) 653.

the courts may open a gateway for discussion, the ultimate responsibility lies in the hands of Parliament and public health advocates. The possibility does exist though for governments to create an environment where the assertion that a parent or groups of parents who breached a standard of care could succeed. This would require clear transmission of information to parents that the decision to vaccinate a child is not only for the benefit of the individual child, but also the benefit of other children with whom the child may come into contact.

There remain valid arguments against the imposition of mandatory immunization. Parents would be forced to assume a risk to their child's health by adverse vaccine-related events, which occur in a low but unavoidable percentage of vaccine recipients. Determining which is favourable between competing risks is arguably a parent's determination and not one that should be left to the state. The main concern for parents is that epidemiological evidence can be ambiguous in this area, and needs further study. Nevertheless, it may be within the ambit of government action to ensure widespread protection by imposing mandatory vaccination, especially against diseases like the measles, which are particularly virulent and countered by long-established, high efficacy vaccines. Measles is presently a hot topic, with several recent measles outbreaks in North America attributed to heterogeneous vaccine uptake. While measles has been the focus of this article, the same arguments could apply to other diseases for which there are effective vaccines and in which outbreaks have recently occurred, for example pertussis and mumps. However, the analysis of these scenarios would depend on the scientific characteristics of the specific disease and vaccine and may not be entirely analogous to measles.

The standard of care issue could be clearer if exemption forms were standardized across the provinces, informing those parents claiming a philosophical exemption of the inherent risks of non-immunization. The addition of an unequivocal statement on exemption forms and a signature requirement that the parent is acknowledging the existence of risks to community health by not vaccinating, combined with standardizing school immunization policies across the country, will be an important step toward creating a climate in which private legal action will be more likely to succeed. This statement should highlight the importance of vaccination to the communal health of children, in addition to the health of any particular child, and should make clear the negative community effects of opting out. This would have the benefit of both informing the parents of the possible consequences of their choice, and serving as evidence that it was foreseeable that an outbreak would be increasingly likely to occur with each child unimmunized. Parents making a personal decision not to immunize should be aware that they are increasing the risk to the community. Holding conscientious objectors responsible for their decisions provides an alternative to absolute mandatory immunization, which tends to raise concerns about invasion of bodily integrity and other *Charter* issues.[94]

If philosophical exemptions were removed from school requirements, or if the form clearly explained to parents the risk of non-immunization, this could also deny parents the protection of a statutory authority defence ("choose inaction at your own risk"). In this way, people who so wish can avoid intrusive medical interventions, but will not be "let off the hook" for making a decision which could be harmful to public health. If people choose to claim a non-medical exemption to school immunization requirements, which is currently their prerogative, it can be argued that they are accepting a certain level of risk to others when making this decision. If this risk materializes, it could result in liability. Truthful and straightforward information like this, disseminated through public service announcements, government websites, and exemption forms, could provide a powerful tool for public health to combat the phenomenon of conscientious exemptions based on misinformation. Directly confronting anti-vaccination groups would

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[94] See R. Rodal, N.M. Ries & K. Wilson, "Influenza Vaccination for Health Care Workers: Towards a Workable and Effective Standard" (2009) 17 Health L.J. 297. See also Bailey, Caulfield & Ries, *supra* note 78 at 150.

prove very difficult for the authorities. The tides may turn in the immunization debate in a climate where parents of children who have suffered permanent damage from contracting a vaccine-preventable illness can succeed in court. As was the case with cigarette smoking, the "stigma effect" could substantially reduce the number of parents claiming conscientious objections to vaccination, simply through the power of social disapproval.[95] Further, the dissemination of more balanced knowledge about vaccination may help to convince parents that childhood immunization is the right choice. Parents who conform to the standard practice will be vindicated, and doubt will be cast on the anti-vaccine movement and the threat it poses to public health.

It is the nature of vaccination that as the number of parents making the choice not to immunize increases, the risk of vaccine-preventable disease outbreak increases concurrently. To reverse this trend, it may be necessary to prioritize public health over individual rights to choose medical treatment. The overriding interest in community health and safety could lead to challenges and changes in the non-medical exemptions to school immunization requirements.[96] Parents would likely launch a *Charter* challenge in response to any legislation which mandated compliance with the routine immunization program, though a full discussion of the difficult issues involved in legality of mandatory vaccination is not within the scope of this article.[97] Immunization as a legal, ethical, and policy issue presents unique challenges of balancing the rights of the individual versus the rights of the population as a whole. Respect for individual choice should be perceived as a core consideration in developing public health strategies, but this concern need not compromise the ability of government to protect the health of its citizens.[98]

What we have suggested in this paper is a mechanism by which policy makers could create a scenario where the majority can better protect their rights, while still protecting the rights of the minority. The process of informing parents of the consequences of their decision would not simply be for the end of establishing a legal right, but would also be part of a public health strategy. The reality that other children may be harmed as a result of one's choices could be a powerful factor in the decisions a parent makes about immunization. However, in conjunction with these changes it would be appropriate to ensure protection for those who have concerns about vaccination, for example introducing no-fault compensation programs for vaccine injured children and improving post-market surveillance of vaccine safety and efficacy.[99] Given the essential role

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95 See Jennifer Stuber, Sandro Galea & Bruce G. Link, "Smoking and the Emergence of a Stigmatized Social Status" (2008) 67:3 Social Science & Medicine 420.

96 See Linda E. LeFever, "Religious Exemptions from School Immunization: A Sincere Belief or a Legal Loophole?" (2006) 110 Penn St. L. Rev. 1047.

97 *Charter* issues are hotly debated in the public health context. In some situations, such as abortion, an individual forced to make choices unrelated to her priorities and aspirations violates the *Charter*: see *R. v. Morgentaler* [1988] 1 S.C.R. 30, 44 D.L.R. (4th) 385. But in other situations, for example when a parent refuses life-saving treatment for a child based on religious objections, the *Charter* right may be overridden: *Children's Aid Society*, *supra* note 28. The importance seems to be in balancing the positives and negatives of a choice that affects both oneself and the rights of others. What are deemed "lifestyle choices" do not necessarily receive the protection of the *Charter*, especially when they may cause harm: *R. v. Malmo-Levine*, [2003] 3 S.C.R. 571, 233 D.L.R. (4th) 415. In 1905, the U.S. Supreme Court held that requiring vaccination of the general population is within the reasonable exercise of a state's police power, and does not violate fundamental liberty rights: *Jacobson v. Massachusetts* 197 U.S. 11 (1905). The Court stressed that common welfare must sometimes trump an individual's unfettered freedom, which does not include the right to place the health of the community at risk. In a separate case, the Court stated that some state interventions are permissible restrictions on parental authority, including vaccination policies: *Prince v. Massachusetts* 321 U.S. 158 (1944).

98 J.D. Blum & N. Talib, "Balancing Individual Rights versus Collective Good in Public Health Enforcement" (2006) 25:2 Med. & L. 273.

99 See Nicole J. Kutlesa, "Creating a Sustainable Immunization System in Canada—the Case for a Vaccine-Related Injury Compensation Scheme" (2004) 12 Health L.J. 201; and K. Wilson *et al.*, "Addressing the Emergence of Pediatric Vaccination Concerns: Recommendations from a Canadian Policy Analysis" (2006) 97:2 Ca-

immunization plays in protecting the health of the public, and evidence that confidence in immunization is waning, a nuanced, multi-factorial approach will likely be necessary to address the emerging challenges.

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