May Contain Unvaccinated Children: Imposing a Duty to Warn in the Context of Nonmedical Childhood Vaccine Exemptions

Katherine Shaw Makielski

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Abstract

Vaccines are one of the “ten great public health achievements” in the twentieth century according to the Centers for Disease Control and Prevention. Yet as a growing number of states allow exemptions from mandatory vaccination laws for religious, philosophical, and personal reasons, nonvaccination rates are on the rise. At the community level, increased exemptions lead to reduced herd immunity and increased vaccine-preventable outbreaks.

This Note addresses the community issues by applying a concept from tort, products liability, and food safety law: the duty to warn. Ultimately, this Note suggests imposing a duty to warn the public (and particularly vulnerable individuals who rely on herd immunity because they cannot be vaccinated for medical reasons) about vaccination levels in schools and day-care facilities. With such a warning, vulnerable individuals can avoid exposure to low-vaccination areas and reduce their risk of contracting injurious, preventable diseases. This duty to warn balances the interests of parents seeking exemptions and vulnerable individuals seeking to avoid harm.

The data required for such a warning—aggregate immunization rates—already exist because many states require schools and day-care facilities to report such data to public health officials. Moreover, publicly disseminating vaccination levels in the aggregate would avoid privacy issues. The warning should be required by statute, creating a standardized system that is easily understood and simplifies facility comparison. Covered entities would be required to publicly post their current vaccination levels as green, yellow, or red, thus building on the public’s familiarity with the stoplight paradigm: green is good, yellow means caution, and red signals stop or avoid. The statutory limits for each color would be based on herd immunity thresholds and the Healthy People 2020 goals. Effectiveness could be increased by adding emotional indicators: a smiling face with green and a frowning face with red. If successful, the warning could be expanded to other entities such as pediatrician offices.
May Contain Unvaccinated Children

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Introduction

“We got into Wellington!” Already eager to relocate your family
to beautiful San Diego, your excitement grows exponentially knowing
your children will attend such a prestigious private school. But then,
by chance, you learn that over half of the school’s kindergarteners are
unvaccinated. You feel overcome with relief realizing what a fortunate
discovery this is: Sam, one of your children, is unvaccinated due to
severe allergies and, as a result, relies on the protective herd
immunity created when others are vaccinated.1 Being exposed to other
unvaccinated children significantly increases Sam’s risk of contracting
a disease2 that could leave him paralyzed, brain damaged, deaf, or

1. See infra notes 56–59 and accompanying text. Herd immunity is reached
   when a threshold number of people are vaccinated such that disease
   transmission is dramatically reduced in a community. People who are
   unvaccinated benefit indirectly from this reduced disease transmission
   because it limits their exposure to vaccine-preventable diseases.

2. See, e.g., Saad B. Omer et al., Nonmedical Exemptions to School
   Immunization Requirements: Secular Trends and Association of State
   Policies with Pertussis Incidence, 296 JAMA 1757, 1762 (2006)
   (“Children with nonmedical exemptions are at increased risk of disease
   and they increase community risk of disease transmission. From 1985
   through 1992, exemptors in all states were 35 times more likely to
   contract measles than nonexempt children. In Colorado, exemptors were

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even dead.\textsuperscript{3} Using the map of San Diego school vaccination rates you fortuitously found,\textsuperscript{4} you select another school that better balances Sam’s needs for quality education and a safe—that is, vaccinated—learning environment.

But what if this database didn’t exist? The San Diego map represents a unique resource provided by a local nonprofit watchdog group; similar information is not readily available in other areas. Parents have some options: if they are savvy, they can find reports for their state, and sometimes region, through their local public health authority\textsuperscript{5} or the Centers for Disease Control and Prevention (CDC);\textsuperscript{6} or parents can call public and school officials to inquire about community and school-level vaccination data if they are available. But what about less savvy parents, or parents who don’t know about herd immunity? And what about other entities such as day-care facilities, where children can foreseeably be exposed to unvaccinated and even infected children? What if avoiding areas with high exemption rates was more like avoiding allergens in food products, where allergic individuals know and trust that warnings like “Contains peanuts” will be posted where food should be avoided?

This Note proposes a statutorily imposed duty to warn in the context of vaccine exemptions, allowing medically exempted children and their parents to avoid exposure to areas with high vaccine exemptions and thus reducing the risk of contracting an injury-

\footnotesize{22 times more likely to have had measles and 5.9 times more likely to have had pertussis than vaccinated children.”} (citations omitted).

3. \textit{See infra} note 92 and accompanying text.


5. \textit{E.g.}, Tex. Dep’t of State Health Servs., \textit{Vaccination Coverage Levels in Texas Schools}, \url{http://www.dshs.state.tx.us/immunize/coverage/schools.shtm} (reporting at state, heath service region, and county levels) (last updated Oct. 14, 2013); Va. Dep’t of Health, \textit{Annual Virginia Vaccination Survey} (last updated Apr. 15, 2013), \url{http://www.vdh.virginia.gov/epidemiology/immunization/datamanagement/vaimmsurvey.htm} (reporting at the state level).

inducing, vaccine-preventable disease. The warning would be imposed on schools and day-care facilities, and could be expanded to other entities, such as pediatrician offices, if successful. The warning would be statutorily imposed, creating a standardized system that would be easily understood by the public and allow for comparison across facilities. The warning would build on people’s familiarity with the stoplight paradigm: green is good, yellow indicates caution, and red signals stop or avoid. The statutory limits for each color could be based on herd immunity thresholds for common diseases and the *Healthy People 2020* goals.\(^7\)

Each entity would then be required to publicly post its vaccination coverage level using green, yellow, or red. Effectiveness could be increased further by combining colors with emotional indicators, such as a simple happy face graphic with green and a sad face with red.\(^8\) Consumers would then be able to avoid red and yellow areas and reduce their risk exposure.

Part I begins by discussing current vaccine policy, vaccination trends, negative externalities that result from religious- and philosophical-based vaccine exemptions, and previously recommended strategies for addressing those negative externalities. Part II then presents and analyzes the legal basis for a duty to warn in the vaccine exemption context, looking at general negligence law, products liability law and allergen warning requirements, the Food Allergen Labeling and Consumer Protection Act of 2004, and previous case law addressing duties to warn where contagious diseases are involved. Finally, as alluded to above, Part III details the proposed warning, including its scope, regulatory considerations, potential benefits, and potential limitations.

### I. Vaccine Policy Background

The CDC lists vaccination as one of the “ten great public health achievements” in the twentieth century.\(^9\) Because of vaccines, smallpox has been eradicated and morbidity for other infectious diseases—including diphtheria, polio, measles, mumps, rubella, and *haemophilus influenzae* type B (Hib)—has been reduced by 99–100% since 1900.\(^10\) State-based mandatory vaccination laws gave effect to the powerful tool found in vaccines and “played a substantial role in

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7. See infra text accompanying notes 121–22 for proposal details and infra note 30 and accompanying text for information on *Healthy People 2020*.
10. *Id.* at 245–46.
[generating the significant] disease reductions." But increased nonmedical exemptions to vaccination laws threaten herd immunity and create negative externalities for communities and individuals who are unable to be vaccinated.

A. A Brief History of Mandatory Vaccination Laws, Their Constitutionality, and the Inclusion of Nonmedical Exemptions

Cities and states began passing mandatory vaccination laws in the early nineteenth century in response to several smallpox outbreaks. In 1809, Massachusetts passed the first vaccination law requiring its citizens to be vaccinated against smallpox. Less than twenty years later, in 1827, Boston passed the first school vaccination law requiring proof of smallpox vaccination for children entering the public school system. Other states followed suit, and by 1905, many Americans found themselves under a legal obligation to be vaccinated.

With this legal obligation, however, came strong and—to this day—unwavering resistance based on several grounds, including: doubted efficacy, safety concerns, religious or philosophical beliefs, and liberty interests that call for minimal government interference with individuals’ personal choices. Those opposed to mandatory vaccinations refused to comply with vaccine requirements and took action to repeal and challenge the existing laws.


13. Id.; Orenstein & Hinman, supra note 11, at S20.
14. Gostin, supra note 11, at 379; see also James G. Hodge Jr. & Lawrence O. Gostin, School Vaccination Requirements: Historical, Social, And Legal Perspectives, 90 KY. L.J., 831, 850 (2002) (noting the connection between compulsory education and public school policies and the subsequent development of compulsory vaccination laws).
15. Gostin, supra note 11, at 379, 653 n.39; see also Hodge Jr. & Gostin, supra note 14, at 851 (“The Commonwealth of Massachusetts incorporated its own school vaccination law in 1855, New York in 1862, Connecticut in 1872, and Pennsylvania in 1895. Other northeast states soon passed their own requirements. The trend toward compulsory child vaccination as a condition of school attendance eventually spread to states in the Midwest (e.g., Indiana (1881), Illinois and Wisconsin (1882), Iowa (1889)), South (e.g., Arkansas and Virginia (1882)), and West (e.g., California (1888)) . . . .”) (citations omitted).
16. See, e.g., Hodge Jr. & Gostin, supra note 14, at 844–49.
17. E.g., Gostin, supra note 11, at 379, 653 n.40; Hodge Jr. & Gostin, supra note 14, at 851.
When the issue came to the Supreme Court in 1905, the Court unequivocally held that states can require vaccination under the police power, which authorizes states to pass “reasonable regulations . . . [to] protect the public health and the public safety.”18 Seventeen years later, the Court affirmed that cities and states can exclude unvaccinated children from public schools “for the protection of the public health.”19

In an unfortunate turn for vaccine challengers, the Court in Jacobson stressed a state’s authority to pass vaccination laws even where individual liberties may be at stake, stating: “[T]he liberty secured by the Constitution of the United States . . . does not import an absolute right in each person to be, at all times and in all circumstances, wholly freed from restraint.”20 Moreover, various jurisdictions have consistently held that the Americans are not constitutionally entitled to nonmedical exemption from mandatory vaccination laws.21 Despite this lack of obligation, the majority of states permit individuals to obtain vaccine law exemptions based on religious or philosophical beliefs.22

While states passed the first vaccination laws in response to smallpox, measles drove the enactment of modern vaccination laws. As Walter A. Orenstein and Alan R. Hinman stated, “It was control of a real disease rather than reaching an immunization coverage target which spurred school law efforts.”23 Several facts supported the push for broader and more strictly enforced vaccination laws. First, measles primarily affected school-age children,24 and officials identified schools as “major sites of transmission.”25 Second, officials learned from the experiences of states with enforced school vaccination laws: in the 1970s, these states’ measles incidence rates were forty to fifty-one percent lower than those of their counterpart states with no school vaccination laws.26 In 1977, the nationwide Childhood

22. See infra note 35–36 and accompanying text.
23. Orenstein & Hinman, supra note 11, at S20.
24. Seventy-one to eighty-three percent of reported measles cases for the years 1973–77 occurred in children aged five to nineteen years. See id. at S20–21.
25. Id. at S20.
26. Malone & Hinman, supra note 21, at 344; Orenstein & Hinman, supra note 11, at S20–21.
Immunization Initiative helped encourage states to pass and strictly enforce school vaccination laws, and by 1980, vaccination rates for children entering school reached ninety-six and ninety-five percent for measles and polio, respectively.

B. Current Policies and Trends

The CDC’s Advisory Committee on Immunization Practices (ACIP) currently recommends vaccinating children against sixteen diseases: hepatitis A and B, rotavirus, diphtheria, tetanus, acellular pertussis, Hib, pneumococcus, poliovirus, influenza, measles, mumps, rubella, varicella, meningococcus, and human papillomavirus. Additionally, Healthy People 2020, a collection of national health objectives created by a coalition of federal agencies, sets a target kindergarten coverage level of ninety-five percent for five vaccines covering nine diseases: DTAP (immunizing against diphtheria, tetanus, and acellular pertussis), MMR (immunizing against measles, mumps, and rubella), polio, hepatitis B, and varicella. But the ultimate authority for determining vaccination requirements—including diseases covered, dosage levels, and age thresholds—falls with the states. All fifty states require some level of vaccination as a condition for attending both public and private schools; additionally, although definitions vary by state, all fifty states require vaccination for children attending child care facilities and programs. All states exempt from these requirements children who cannot receive the recommended vaccines for medical reasons.

27. Gostin, supra note 11, at 380; Malone & Hinman, supra note 21, at 344–45.
28. Orenstein & Hinman, supra note 11, at S23.
32. See, e.g., Gostin, supra note 11, at 380.
33. See Table 1 in the Appendix for a list of all relevant statutory and regulatory provisions by state.
34. States with Religious and Philosophical Exemptions from School Immunization Requirements, NAT’L CONFERENCE OF STATE
but two states—Mississippi and West Virginia—allow exemptions where vaccination contravenes religious beliefs. Finally, nineteen states permit exemptions for broader reasons, where parents oppose vaccination for philosophical or personal reasons.

Although standards and processes vary, states typically require schools and child care facilities to keep records of enrollees’ vaccination statuses and report annually to public health officials. These data are then aggregated by state health officials and reported to the CDC for surveillance. The CDC data are published in its Morbidity and Mortality Weekly Report, copies of which are publicly available through the CDC website. Additionally, some states require that schools and day-care facilities make the “number of non-immunized children” or “aggregated immunization rates” publicly available.

Troubling to many public health officials are the recent increases in exemptions, particularly at the local school and community levels. As the CDC explains, while “vaccination coverage and exemptions aggregated at national or state levels [may be at or close to target levels, they] can mask substantial vulnerability at the local level.”

Legislatures (Dec. 2012), http://www.ncsl.org/research/health/school-immunization-exemption-state-laws.aspx; see also Table 1 in the Appendix (listing relevant statutory and regulatory provisions by state).

35. Nat’l Conference of State Legislatures, supra note 34.

36. Id.

37. Gostin, supra note 11, at 380; see also Table 1 in the Appendix (listing state statutes and regulations that call for vaccination coverage and often include reporting requirements); 2011–12 CDC Kindergarten Report, supra note 6, at 647 (describing the data collection process for the report).

38. 2011–12 CDC Kindergarten Report, supra note 6, at 647.


41. Vt. Stat. Ann. tit. 18, § 1121(c) (2012) (“To the extent permitted under the federal Health Insurance Portability and Accountability Act, Pub. L. 104-191, all schools and child care facilities shall make publicly available the aggregated immunization rates of the student body for each required vaccine using a standardized form that shall be created by the department of health.”).

42. See, e.g., 2011–12 CDC Kindergarten Report, supra note 6, at 647 (“Although statewide levels of vaccination coverage are at or very near target levels, locally low vaccination coverage for extremely transmissible diseases such as measles remains a threat to health.”).

43. Id. at 651 (discussing MMR coverage).
Researchers have identified several factors that significantly increase exemption rates, including: (1) offering personal belief or philosophical exemptions instead of only medical and religious exemptions\(^44\) and (2) permitting exemptions through an “easier” process, such as, for example, parents signing a template form versus meeting with a physician or submitting a notarized form.\(^45\) Overall, however, exemptions are on the rise in all states, including those that offer only medical and religious exemptions and those with relatively difficult exemption processes.\(^46\)

C. Effect of Exemptions on Individuals and Communities

Not vaccinating a child impacts both the unvaccinated child and the larger community. At the individual level, an unvaccinated child has been shown to be 22\(^47\)–35\(^48\) times more likely to contract measles compared to vaccinated children, and 5.9 times more likely to contract pertussis.\(^49\) Contracting measles then puts a child at risk for “ear infection, pneumonia, seizures, brain damage, and death,”\(^50\) while contracting pertussis can lead to complications such as “pneumonia, seizures, and brain damage.”\(^51\) These complications give rise to long

\(^44\) Omer et al., supra note 2, at 1759 (“States that offered personal belief exemptions had higher rates of exemptions than states that only offered religious exemptions for each year from 2001 through 2004 (P<.01).”); Saad B. Omer et. al., Letter to the Editor, Vaccination Policies and Rates of Exemption From Immunization, 2005–2011, 367 NEW ENG. J. MED. 1170, 1170–71 (2012).

\(^45\) See Omer et al., supra note 2, at 1760; see also Stephanie Stadlin et al., Medical Exemptions to School Immunization Requirements in the United States—Association of State Policies with Medical Exemption Rates (2004–2011), 206 J. INFECTIOUS DISEASE 989, 991 (2012) (“Compared to states with difficult medical exemption criteria, medical exemption rates were significantly higher in states with easy or medium criteria . . . .”).

\(^46\) Omer et al., supra note 44, at 1170–71.

\(^47\) Daniel R. Feikin et al., Individual and Community Risks of Measles and Pertussis Associated With Personal Exemptions to Immunization, 284 JAMA 3145, 3147 (2000).


\(^49\) Feikin et al., supra note 47, at 3147 (noting that the calculated pertussis risk was “likely an underestimate”).

\(^50\) Ctrs. for Disease Control & Prevention, Vaccine Information Statement: Measles, Mumps, Rubella, & Varicella 1 (May 21, 2010) [hereinafter MMRV VIS].

\(^51\) Ctrs. for Disease Control & Prevention, Vaccine Information Statement: Multiple Vaccines 2 (Nov. 16, 2012), [hereinafter Multiple VIS].
hospital stays and likely many sleepless nights for parents and families, not to mention steep financial consequences.

At the community level, vaccine exemptions put communities at an increased risk for vaccine-preventable outbreaks that can be costly on multiple levels. One group of researchers found that for a school population, every one percent increase in exemptions corresponded with a twelve percent increased risk of a pertussis outbreak. An outbreak can be costly to a community not only in terms of health risks, but also from a financial perspective. A 2008 San Diego measles outbreak cost a total of $176,980, which included an average of $775 paid by the families of seventy-three quarantined children and $124,517 in other containment costs paid by the county.

From an individual health perspective, increased outbreaks expose vulnerable individuals in a community—those who rely on the creation of herd immunity—to preventable diseases that can lead to dangerous complications. “Herd immunity” occurs when a threshold proportion is vaccinated against a disease such that the disease can no longer be transmitted in the community. The threshold levels vary by disease and range from eighty percent for polio to more than ninety percent for measles. Those who rely on the indirect protection of herd immunity cannot receive direct protection through vaccination, such as children who are too young to be vaccinated and children who cannot be vaccinated for medical reasons. Because these children “are often more susceptible to the complications of infectious diseases than the general population of children,” their reliance on herd immunity becomes that much more crucial.

52. See, e.g., Rachel M. Cunningham et al., Vaccine-Preventable Disease: The Forgotten Story 9, 25 (2d. ed. 2010) (describing hospital stays of three weeks and one month for two children diagnosed with Hib).

53. Id. at 17 (describing how one family’s medical bills reached close to $10,000 after their three-year-old son contracted rotavirus and required hospitalization for four days).

54. Feikin et al., supra note 47, at 3148.


56. Malone & Hinman, supra note 21, at 340; see also Ctrs. for Disease Control & Prevention, Parent’s Guide to Childhood Immunizations 37 (2d ed. 2010), [hereinafter CDC Parent’s Guide] (explaining that when a significant number of people are vaccinated, a disease will have “nowhere to go” and will thus “die out”).

57. Malone & Hinman, supra note 21, at 340.

58. Id.

Additionally, up to ten percent of vaccinated children do not develop immunity and are thus dependent on the indirect benefits of herd immunity.\(^{60}\) Unfortunately, these vulnerable children have contracted vaccine-preventable diseases during outbreaks that began in exempted children.\(^{61}\)

**D. Negative Externalities and Strategies to Address Them**

The consequences of nonmedical vaccine exemptions felt by communities and vulnerable third persons can be described as negative externalities.\(^{62}\) Several theories have been implemented and proposed to reduce the number of nonmedical exemptions or, alternatively, help parents realize the full costs of their decision to forgo vaccination. One approach taken by some states, including Washington, California, and Vermont, involves making the exemption process more difficult in an effort to reduce the number of requested exemptions.\(^{63}\) New York City, on the other hand, reportedly assessed fines as high as $2,000 a day against schools that allow unvaccinated children to attend classes, thus encouraging institutions to promote vaccination.\(^{64}\) Other theories proposed by legal scholars include taxing

\(^{60}\) See CDC Parent’s Guide, supra note 56, at 32; see also Malone & Hinman, supra note 21, at 340 (discussing herd immunity’s indirect protection of people “who receive[] vaccine[s] but are not protected (i.e., vaccine failures”)); Cunningham, supra note 52, at 9 (describing a girl who, although vaccinated, did not develop immunity due to a rare immune deficiency disorder).

\(^{61}\) Malone & Hinman, supra note 21, at 355–56 (discussing a 2005 measles outbreak that “extended beyond the community of vaccination objectors to impact exposed hospitalized children who were too young to be vaccinated”); see also Feikin et al., supra note 47, at 3148 (presenting the results of a Colorado study where at least eleven percent of vaccinated children contracted measles through exposure to an exempted child); Salmon et al., supra note 48, at 51 (discussing previous outbreaks where infection initiated in exempt individuals and subsequently spread to vaccinated people).

\(^{62}\) Cf. Black’s Law Dictionary 664 (9th ed. 2009) (defining a “negative externality” as “[a]n externality that is detrimental to another, such as water pollution created by a nearby factory”).


parents who forgo vaccination for nonmedical reasons,\textsuperscript{65} holding parents liable in tort for damages incurred,\textsuperscript{66} and allowing for a nuisance claim against parents whose children are not vaccinated for nonmedical reasons.\textsuperscript{67}

While these interventions attempt to reduce exemptions or compensate injured third parties for the damages incurred, this Note proposes a different approach—imposing a duty to warn so the negative externalities can be avoided or at least mitigated.

II. LEGAL BASIS FOR THE PROPOSED DUTY TO WARN

The law recognizes in several substantive areas the fact that adequate warning of nonobvious risks can allow individuals to avoid injury in the first place or, at a minimum, make an informed choice. Unlike the strategies discussed in Part I.C., a duty to warn permits free will so long as risks are disclosed and simultaneously protects vulnerable individuals by facilitating informed decisions and reduced exposure to potential harm. In the childhood vaccine context, imposing a duty to warn—based on those imposed by general negligence law, products liability law, and the Food Allergen Labeling and Consumer Protection Act of 2004—provides a mechanism for balancing the interests of vulnerable individuals relying on herd immunity and individuals who wish to forgo vaccination for religious or philosophical reasons. Although some precedent exists with regard to infectious disease cases, the duty to warn imposed by past courts can be readily distinguished from the proposed duty to warn.

A. Negligent Failure to Warn

The duty to warn imposed by common law theories of negligence can inform a potential duty to warn in the vaccine exemption context. In negligence cases, lack of reasonable care can be established where an individual fails to warn of a dangerous risk that (1) arose out of the defendant’s actions, (2) was actually or constructively known by the defendant, (3) would not be readily realized by potential victims,

\begin{itemize}
\item 65. Parkins, supra note 55, at 437; see also Karin Schumacher, Note, Informed Consent: Should It Be Extended to Vaccinations?, 22 T. JEFFERSON L. REV. 89, 118 (1999) (comparing a vaccine-refusal tax to the excise tax already in effect for cigarettes).
\end{itemize}
and (4) could be reduced with adequate notice. Thus, an individual can act negligently through direct conduct and by failing to warn of certain hazards. In fact, some conduct and resulting risks may be reasonable on their own, but become unreasonable when combined with a failure to warn. This basic concept applies with particular force to the context of vaccine exemptions. Obtaining an exemption and the resulting threat to herd immunity may not be unreasonable in isolation, but the failure to warn vulnerable individuals relying on that herd immunity—by parents, schools or others—can render the unknown risk exposure unreasonable.

Several other negligence concepts offer support for a duty to warn for vaccine exemptions. In negligence cases, no warning is required where the hazard is considered “generally appreciated,” meaning that it is or should be recognized by persons whose intelligence and experience are within the normal range. In the case of vaccine exemptions, the risk of unvaccinated children in a school or other facility would not be considered generally appreciated for two reasons. First, individual immunization status is protected as private health information and education records. Second, government and

68. Restatement (Third) of Torts: Liability for Physical & Emotional Harm § 18(a) (2010).
69. See id. § 7(a).
70. Id. § 18 cmt. h.
71. See infra Part III for further discussion of who should bear the burden of warning vulnerable individuals.
72. Restatement (Third) of Torts: Liability for Physical & Emotional Harm § 18 cmt. f.
73. See infra Part III for further discussion of which facilities should be required to warn vulnerable individuals.
public health officials typically report aggregate exemption data at the state and national levels rather than at the local and school levels. Admittedly, a concerned parent could call school or public health officials to learn the aggregate exemptions for a school or area; however, this ability to obtain information differs significantly from a proactive duty to warn and fails to alert well-meaning parents who fail to inquire for various reasons. Therefore, because the risk of unvaccinated children is not “generally appreciated,” a duty to warn would be appropriate by the standards used in negligence cases.

Moreover, by requiring a warning as part of reasonable conduct, negligence law gives potential victims three important opportunities: to change course and avoid the risk altogether; to press forward after weighing the benefits and risks posed; or to reduce the severity of any inevitable damages. Similarly, a vulnerable individual who relies on herd immunity stands in an excellent position to mitigate should she receive adequate warning: she could change course—for example, by attending an alternative school—to avoid an unreasonably high risk; she could weigh the risks and benefits to make an informed decision—for example, attending a prestigious school that has a higher number of unvaccinated students; or she could minimize the risk incurred by wearing a mask or taking other preventive measures. Because the potential victim, here a vulnerable individual relying on herd immunity, can, upon adequate warning, act to avoid or reduce the harm suffered, a duty to warn would be an appropriate mechanism for reducing the negative externalities of nonmedical vaccine exemptions.

(2008). As such, individual students’ records generally cannot be disclosed to third parties unless parents provide written consent. Id. at 4. Some exceptions to the consent requirement include sharing records with teachers and other school officials who have “legitimate educational interests.” Id. (quoting 34 CFR § 99.31(a)(1) (2007)).


77. RESTATEMENT (THIRD) OF TORTS: LIABILITY FOR PHYSICAL & EMOTIONAL HARM § 18 cmt. b (2010) (“A pilot, for example, can alter the route to avoid a protruding structure . . . .”).

78. Id. (“[H]aving been informed of the risks of surgery, a patient may decline to undergo surgery . . . .”).

79. Id. (“For example, by the time one skier is able to warn another, a collision between the two of them may be inevitable; nevertheless, the warning may be effective in reducing the force of the collision and hence in reducing the severity of the resulting injuries.”).
B. Product Defect Liability and Allergen Warnings

Products liability law also utilizes a duty to warn to reduce negative externalities. The law considers a product “defective” when (1) the product poses foreseeable risks, (2) those risks could be avoided or mitigated through reasonable instruction or warning, and (3) the instructions or warnings are inadequate for the circumstances. In the context of products liability, the law seeks to “create incentives for manufacturers to achieve optimal levels of safety in designing and marketing products.” Realizing that “[s]ociety does not benefit from products that are excessively safe—for example, automobiles designed with maximum speeds of twenty miles per hour—any more than it benefits from products that are too risky,” the law seeks to promote “optimal” product safety levels. In the context of vaccine exemptions, a duty to warn would encourage schools, day-care facilities, and other entities to reach the optimal safety level by monitoring vaccine exemptions and, if necessary, to take steps to encourage increased vaccination. Such steps could, for example, include educating parents not only about the risks and benefits vaccines pose to the individual being vaccinated, but also the risks and benefits to the public and those who rely on herd immunity for protection. Thus, a duty to warn in the context of vaccine exemptions finds further support in general products liability law.

Further analysis of products liability law reveals a particularly on-point comparison: allergy warnings. As a general rule, entities must give warning where a product contains a “harm-causing ingredient . . . to which a substantial number of persons are allergic.” Substantiality, while not clearly defined, typically involves two considerations: rarity and severity. For the first consideration, the allergy cannot be unique to the plaintiff and must be sufficiently common. In the context of vaccine exemptions, it is manifest from public health reports that numerous children are naturally susceptible or “allergic” to areas of high exemptions and threatened herd immunity.

81. Id. § 2 cmt. a.
82. Id.
83. See infra Part III for further discussion of which entities should be subject to the warning requirement.
84. See infra Part III.B for further discussion on herd immunity education.
86. Id.
87. Id.
immunity.\textsuperscript{88} That is, children who receive medical exemptions are naturally susceptible or “allergic,”\textsuperscript{89} while children who receive nonmedical (i.e., religious or philosophical) exemptions, while also susceptible because of their unvaccinated status, actually represent the voluntarily added threat to herd immunity—the “allergen” to be avoided if possible—through their parents’ decisions to forgo vaccination.

The second factor for substantiality—severity—also applies with great force in the vaccine context. In product liability cases, courts consider the severity of harm when deciding whether a warning should be required.\textsuperscript{90} Furthermore, a severe, albeit less frequent, allergy can justify requiring a warning.\textsuperscript{91} Vaccine-preventable diseases such as polio, pertussis, Hib, and pneumococcal disease can lead to paralysis; pneumonia; seizures; brain damage; meningitis (infection in the brain and spinal cord); infection in the blood, joints, bones, ears, and outer heart covering; deafness; and, in the worst cases, death.\textsuperscript{92} Certainly these harms would be considered severe enough to warrant warning even where a small percentage of the population is susceptible.\textsuperscript{93}

Two other allergy warning concepts can be applied to a vaccine coverage warning. First, similar to the “generally appreciated” standard used in general negligence cases,\textsuperscript{94} products liability law requires manufacturers to give warning only where the allergen’s

\textsuperscript{88} Just over 11,000 children enrolled in kindergarten for the 2011–12 school year reported receiving medical exemptions. \textit{2011–12 CDC Kindergarten Report, supra} note 6, at 650–51.

\textsuperscript{89} All states allow medical exemptions where vaccination is medically contraindicated (that is, a doctor certifies the child will likely suffer adverse effects from a vaccine). Examples include children with compromised immune systems—such as those being treated for cancer—and children with confirmed allergies to vaccine ingredients. \textit{Gostin, supra} note 11, at 380.

\textsuperscript{90} \textit{See Restatement (Third) of Torts: Products Liability} § 2 cmt. k (1998).

\textsuperscript{91} \textit{Id.} (“The more severe the harm, the more justified is a conclusion that the number of persons at risk need not be large to be considered ‘substantial’ so as to require a warning. Essentially, this reflects the same risk-utility balancing undertaken in warnings cases generally. But courts explicitly impose the requirement of substantiality in cases involving adverse allergic reactions.”).

\textsuperscript{92} \textit{Multiple VIS, supra} note 51, at 2.

\textsuperscript{93} The 11,000 medically exempted children, \textit{see supra} note 88, represented between 0.0% and 1.3% of the total kindergarten enrollees in the various fifty states. \textit{2011–12 CDC Kindergarten Report, supra} note 6, at 650–51.

\textsuperscript{94} \textit{See supra} Part II.A.
“danger or . . . presence . . . is not generally known to consumers.”95 While the harm presented by unvaccinated children may be “generally known,”96 the actual presence of unvaccinated children is likely unknown for the reasons discussed in Part II.A. On the basis that unvaccinated children constitute an “unknown-ingredient” case,97 a warning would be appropriate to alert parents of vulnerable “allergic” children. Also notable with product warnings, manufacturers are not always required to warn consumers with specificity of potential harms that could result from a hazardous ingredient; warnings as to the general risks can be sufficient in some circumstances.98 This nuance can inform the scope of the proposed warning for vaccine exemptions.99

C. Mandated Warnings: The Food Allergen Labeling and Consumer Protection Act of 2004

In addition to the common law duty to warn, in 2004, Congress passed the Food Allergen Labeling and Consumer Protection Act of 2004100 (“2004 Act”) and gave the Food and Drug Administration authority to regulate labeling and warnings for “major food allergens,” including “milk, egg, fish (e.g., bass, flounder, or cod), Crustacean

95. Restatement (Third) of Torts: Products Liability § 2 cmt. k (1998); see also Mills v. Giant of Md., LLC, 508 F.3d 11, 14–15 (D.C. Cir. 2007) (characterizing the types of cases where warnings may be required as “unknown-harm” and “unknown-ingredient” cases).


97. See supra Part II.A for discussion of the proposed vaccine exemption warning, including the scope of disclosure.

98. See infra Part III for further discussion of the proposed vaccine exemption warning, including the scope of disclosure.

shellfish (e.g., crab, lobster, or shrimp), tree nuts (e.g., almonds, pecans, or walnuts), wheat, peanuts, and soybeans.”

This law gave rise to the commonly used warning “Contains [major food allergen].”

As rationale for the law, Congress found, among other things, that (1) “approximately 2 percent of adults and about 5 percent of infants and young children in the United States suffer from food allergies,” (2) “each year, roughly 30,000 individuals require emergency room treatment and 150 individuals die because of allergic reactions to food,” (3) “at present, there is no cure for food allergies,” and (4) “a food allergic consumer must avoid the food to which the consumer is allergic.”

Similar rationale exists in support of a vaccine exemption warning: (1) depending on the state, up to 1.3% of enrolled kindergarteners are unable to receive vaccines for medical reasons and are thus reliant on herd immunity for protection from diseases such as polio, pertussis, Hib, and pneumococcal disease that can cause harms that include paralysis and death; (2) infants and other young children rely on herd immunity for protection until they reach the appropriate age for vaccination; and (3) vulnerable children and adults can reduce their risk of contracting a vaccine-preventable disease by reducing their exposure to unvaccinated children, who are susceptible to infection.

Furthermore, because the presence of unvaccinated children in schools, day cares, and local geographic areas is not readily apparent—similar to the inadequate food warnings prior to the 2004 Act—a statutorily imposed warning system could be an appropriate method of imposing a duty to warn for vaccine exemptions. Finally,
Congress noted in its findings that inconsistencies in food labeling prevented consumers from accurately discerning which foods actually contained the major food allergens they meant to avoid.\footnote{108} By giving the FDA authority to regulate food allergen warnings, Congress thus attempted to standardize warnings and increase their utility to consumers. This strategy can be particularly instructive in the context of a vaccine exemption warning because herd immunity threshold levels, the basis of the information to be conveyed in the warning, can be complex and is not necessarily well understood by the public. Thus, a standardized and easily understood warning—similar to those prescribed by the 2004 Act—represents a potential highly effective method of conveying vaccine exemption information to consumers.

**D. Application in Infectious Disease Cases**

Courts’ rulings with regard to contagious diseases and a duty to warn can be both distinguished from and informative to the proposed vaccine exemption warning. To begin, courts hold that doctors and hospitals are not required to warn the public when a patient is known to be infected with a communicable disease.\footnote{109} These cases can be distinguished, however, because the patients were already infected and public policy suggested a duty to warn would be both unreasonable\footnote{110} and impractical.\footnote{111} These holdings should not diminish the validity of a statutorily imposed warning for two reasons. First, even without active infection, unvaccinated children pose a threat to herd immunity and, in particular, to the medically exempted children who rely on that herd immunity.\footnote{112} Second, the proposed duty to warn and regulation would limit the duty so as to make it both reasonable and practical.\footnote{113}

Many jurisdictions already find it proper to impose a duty to warn where a special relationship exists or where a disease is

\begin{footnotes}
\item[108] § 202(4), 118 Stat. at 906.
\item[109] Gammill v. United States, 727 F.2d 950, 954 (10th Cir. 1984) (rejecting plaintiffs’ argument that doctor “owed the public the duty of ordinary care to protect them from the diseases of his patients”); Derrick v. Ontario Cnty. Hosp., 120 Cal. Rptr. 566, 571 (Ct. App. 1975) (“It would impose an intolerable burden upon Hospital to notify all members of the public that one of its patients being released from the hospital is suffering from a contagious, communicable disease.”).
\item[110] Gammill, 727 F.2d at 954 (agreeing with the district court and finding that a duty to warn the public “would constitute an ‘unreasonable burden’ upon physicians”).
\item[111] Derrick, 120 Cal. Rptr. at 571 (“We can think of no way in which Hospital could discharge such a duty.”).
\item[112] See supra Part I.C.
\item[113] See infra Part III.
\end{footnotes}
particularly devastating. Thus, while courts decline to impose a duty to warn the public of an infected individual, they do hold that a doctor114 or employer115 should give warning to an infected patient’s family members and others who are known to be in close contact with the patient. Additionally, where a patient is infected with the human immunodeficiency virus (HIV), which gives rise to the currently incurable acquired immune deficiency syndrome (AIDS), a doctor is required to warn the patient of her disease status and how to reduce risk of transmission to others.116 Furthermore, the patient herself may be liable if she fails to notify a person who may be exposed to a sexually transmitted disease, including HIV/AIDS, through intimate relations or other risky behavior.117

114. See, e.g., Gammill, 727 F.2d at 954 (“A physician may be found liable for failing to warn a patient’s family, treating attendants, or other persons likely to be exposed to the patient, of the nature of the disease and the danger of exposure.” (citation omitted)); see also Bradshaw v. Daniel, 854 S.W.2d 865, 871 (Tenn. 1993) (recognizing the duty imposed by Gammill and citing eight states’ similar rulings and three treatises in support of the duty).

115. Bolieu v. Sisters of Providence in Wash., 953 P.2d 1233, 1241 (Alaska 1998) (finding in a staph infection case that a “health care facility owes a duty of care to the spouses of its nursing assistants to take reasonable measures to minimize the spread of infection, including informing its nursing assistants of the risks of exposure”); see also Redditt v. BellSouth Telecomms., No. 3:09cv21/MD, 2009 WL 1659367, at *3 (N.D. Fla. June 11, 2009) (declining to find as a matter of law that employer did not owe a duty to employee’s spouse after methicillin-resistant Staphylococcus Aureus (MRSA) outbreak at company).

116. See, e.g., Reisner v. Regents of the Univ. of Cal., 37 Cal. Rptr.2d 518, 523 (Ct. App. 1995) (“[W]e believe that a doctor who knows he is dealing with the 20th Century version of Typhoid Mary ought to have a very strong incentive to tell his patient what she ought to do and not do and how she ought to comport herself in order to prevent the spread of her disease.” (footnote omitted)); see also Estate of Amos v. Vanderbilt Univ., 62 S.W.3d 133, 138 (Tenn. 2001) (“The duty contemplated here is not one to warn [plaintiff] himself of [plaintiff’s spouse’s] exposure to HIV but to warn [plaintiff’s spouse] so that she might take adequate precautions to prevent transmission of the disease to [plaintiff] and their child.”).

117. See generally Restatement (Third) of Torts: Liability for Physical & Emotional Harm § 18 cmt. a (2010) (“[T]he defendant who is about to come into intimate contact with the plaintiff can be negligent for failing to warn the plaintiff that the defendant suffers from a communicable disease.”) (citing B.N. v. K.K., 538 A.2d 1175 (Md. 1988) (genital herpes); R.A.P. v. B.J.P., 428 N.W.2d 103 (Minn. Ct. App. 1988) (genital herpes); Mussivand v. David, 544 N.E.2d 265 (Ohio 1989) (venereal disease); Lockhart v. Loosen, 943 P.2d 1074 (Okla. 1997) (genital herpes)); see also Gostin, supra note 11, at 305–06 (citing McPherson v. McPherson, 712 A.2d 1043 (Me. 1998) (human papilloma virus); Aetna Cas. & Sur. Co. v. Sheft, 989 F.2d 1105 (9th Cir. 1993) (HIV); Eric L. Schulman, Note, Sleeping with the Enemy:
These holdings apply to the vaccine exemption context in several ways. First, the proposed duty to warn will impose the duty on entities such as schools, day-care facilities, and pediatrician offices that bear a closer “relationship” with medically exempted children: these entities are where children are most likely to be exposed to unvaccinated children (1) for extended periods of time or (2) who have contracted a vaccine-preventable disease and are seeking treatment. Second, although—unlike the cited viral infections—some of the vaccine-preventable diseases are treatable, many have serious implications such as paralysis, deafness, and death. Thus, case law where courts recognized a duty to warn, albeit in limited situations, provides further support for imposing a duty to warn in the context of vaccine exemptions.

III. Proposed Duty to Warn and Regulation

This Note proposes a statutory warning system as a means of reducing harm to individuals who cannot be vaccinated due to medical reasons or young age. By implementing a uniform warning system that is easily understood, states can empower their citizens to make informed decisions regarding their children’s care. Specifically, a warning system would allow people to minimize vulnerable children’s exposure to areas with high vaccine exemption rates. Reduced exposure translates into reduced incidence of infectious, vaccine-preventable diseases that can lead to dangerous complications and even death. Otherwise stated, reduced exposure through a warning system can lead to reduced harm.

The proposed scope and statutory considerations, outlined in this Part, represent one of many possible frameworks for a warning system. While putting forth a comprehensive discussion of potential benefits and limitations, this Note, at its core, aims to propose and discuss a framework that could be modified based on local community needs.

A. Scope and Statutory Considerations

Although the statute could be state- or federal-based in theory, state authority seems most likely given the current role states play in regulating public health, vaccines, and education under the police


118. Bacterial infections such as pertussis, tetanus, and Hib are treatable with antibiotics. Viral infections such as polio, measles, mumps, and rubella, however, cannot be treated directly; only symptoms can be addressed while the patient’s immune system fights the infection.

119. Multiple VIS, supra note 51, at 2.
power. The federal government could supplement states’ efforts, however, by encouraging adoption of a standardized system through conditional funding for schools, vaccines, or health care.\textsuperscript{120} Implementing a national standard would help inform interstate consumers (that is, individuals moving from one state to another), but more research is needed to determine if state variances make a national standard impractical. The remainder of this analysis assumes a state-based statute and warning system enforced by the agency tasked with enforcing current vaccination requirements.

The warning system would consist of a standard format for publicly posting where an entity falls on the vaccine coverage spectrum. The recommended covered entities include schools and child care facilities because they are currently regulated by states with regard to required vaccines, record keeping, and reporting. If this program proves successful, expansion to pediatrician offices could be feasible given the quasi-enrollment status of patients and already-collected vaccination records. Further expansion to other entities such as gyms, little league teams, or library programs could follow; however, barriers to expansion include (1) needing a defined population of “enrolled” children for calculation of coverage levels and (2) public resistance to exposing personal health information and the risk of entities, not accustomed to dealing with health records, improperly disclosing such information. When considering expansion beyond schools and day cares, state should balance the barriers and administrative costs with the benefits (that is, total harm that could be avoided).

The three levels of vaccine coverage correspond with a familiar classification system: green means good or safe, yellow indicates caution, and red points to danger. The actual threshold vaccination levels for green, yellow, and red could be based on various benchmarks, including the \textit{Healthy People 2020} goal of maintaining ninety-five percent vaccination for DTAP (immunizing against diphtheria, tetanus, and acellular pertussis), MMR (immunizing against measles, mumps, and rubella), polio, hepatitis B, and varicella.\textsuperscript{121} Using \textit{Healthy People 2020} as a guide, green could be defined as ninety-five percent and above; yellow between ninety and ninety-five percent; and red below ninety percent. States could also consider the estimated herd immunity thresholds for individual diseases\textsuperscript{122} or create green, yellow, and red levels that include different


\textsuperscript{121} See supra note 31 and accompanying text.

\textsuperscript{122} See supra note 57 and accompanying text.
coverage levels for different diseases. Depending on the current and target vaccination levels at local and state levels, a state could consider the above-mentioned values—based on Healthy People 2020—either overly conservative or overly liberal. Thus, flexibility is necessary to ensure states and localities can implement systems that serve to warn individuals in a meaningful way.

Combining the color classifications with emotion graphics—for example, a happy face with green and a sad face with red—could further enhance the system’s effect on consumer and school behavior. In a study123 described by Richard Thaler and Cass Sunstein,124 nearly three hundred California households were given information about their energy use and the average energy use for their neighborhood. In response to this feedback, the above-average users reduced their energy usage, but the below-average users actually increased their usage—demonstrating the “boomerang effect.”125 Half of the households, however, received a nonverbal sign indicating that their energy use was “socially approved” as below average or “socially disapproved” as above average. The approval or disapproval was communicated through the emotion graphics of a smiling face or a frowning face, respectively. Interestingly, the emotional icons resulted in a larger reduction for above-average users and diminished the boomerang effect.126

Leveraging this insight, states could use emotional graphics to communicate social approval of high vaccination rates (smiling face with green) and social disapproval of low vaccination rates (concerned face with yellow, frowning face with red), thus encouraging schools to take steps to maintain or increase their coverage rates accordingly. Consumers, likewise, could be encouraged to choose the socially acceptable green schools even if their children were not unvaccinated and at known high risk levels. This consumer effect is especially desirable because up to ten percent of children do not develop immunity from vaccination, although this vulnerability will not be known until a child contracts a disease for which he or she received vaccination.127

To ensure long-term effectiveness, the statute should require the enforcing agency to develop evaluation metrics and processes. For example, officials could review outbreaks of vaccine-preventable

125. Id.
126. Id.
127. See supra note 60 and accompanying text.
diseases and, in particular, the number of children infected by category: too young to be vaccinated, medical exemption, nonmedical exemption, and vaccinated but low or no immunity (that is, vaccine failures). Another easily quantifiable metric could be community and state vaccination levels. Coverage levels could be compared before and after the warning to assess the program’s effectiveness at one, five, and ten years. Further interventions could then be pursued if goals for any of the metrics (outbreaks, incidence rates in medically exempt and vaccine failure individuals, or coverage levels) are not met.

B. Potential Benefits

There are many benefits and opportunities presented by the proposed warning system. To begin, the system could go hand-in-hand with education on vaccinations and herd immunity. In one instance, a state could combine its system launch with a public education campaign to ensure people understand the system and what it communicates. Additionally, particularly in states that allow easy transfers between school districts, market forces could encourage schools to implement education programs so their vaccination levels rise to the socially acceptable “green” zone.

These education opportunities can take many forms and serve many purposes. With regard to form, information on the community benefits of vaccination could be included in the informed consent process, as Wendy Parmet suggests, or distributed by schools and day-care facilities. Federal law requires healthcare providers to give patients, or their parent or legal guardian, a copy of all applicable Vaccine Information Sheets before administering any vaccinations. These sheets are created and maintained by the CDC, however, they focus on the individual risks of vaccination and only marginally mention a community benefit: “[w]hen vaccination rates go down, disease rates go up.” In contrast, the CDC’s Parent’s Guide to Childhood Immunizations clearly explains the protective role of herd


132. MULTIPLE VIS, supra note 51, at 1; see also CRTS. FOR DISEASE CONTROL & PREVENTION, VACCINE INFORMATION STATEMENT: MEASLES, MUMPS & RUBELLA 1 (Apr. 20, 2012) (“But if we stopped vaccinating [the diseases] would return.”).
immunity for vulnerable children and vaccine failures and compares an individual’s decision to voluntarily forgo vaccination and rely on herd immunity to carpooling but never contributing for gas. Perhaps states, schools, and day-care facilities can utilize this CDC resource and other materials to increase parents’ awareness levels.

Simulations offer another promising education format that could be effective with both children and adults. In 2012, student researchers at Worcester Polytechnic Institute demonstrated a viable interactive herd immunity simulation. For the simulation, participants were given T-shirts indicating their participation and one of three sticker or wristband colors: red for infected, blue for not vaccinated, and green for vaccinated. Day One represented no herd immunity: sixty-eight percent began unvaccinated (blue), twenty-two percent began vaccinated (green), and ten percent began infected with the flu (red). During the day, when an infected (red) individual encountered an unvaccinated (blue) individual, the previously healthy blue individual was tagged with a red sticker and given additional stickers to mark others he or she subsequently infected. At the end of Day One, without herd immunity, fifty-seven students—or over half the population of ninety-six—contracted the flu. For Day Two, eighty percent were vaccinated (green), ten percent were unvaccinated (blue), and ten percent were infected (red). By the end of the day, the number of infected individual nearly doubled from six to eleven students, but this remained a relatively small portion of the study population for Day Two. Importantly for states, schools, and day-care facilities, the exercise appeared to positively influence students’ views of vaccination.

With regard to the effect of educational efforts, it may be possible to, at a minimum, increase public understanding (and therefore, use

134. Id. at 44.
135. See generally, e.g., Cunningham, supra note 52 (sharing twenty individuals’ experiences with vaccine-preventable diseases).
138. Holmes et al., supra note 136, at 34.
139. Czapkowski et al., supra note 137.
140. Holmes et al., supra note 136, at 34.
141. Id. at 35.
of the warning system and generate recognition of the risks involved with being in close proximity with unvaccinated individuals. But while researchers observe parents may be willing to vaccinate for altruistic reasons, the relative significance herd immunity plays in parents’ decisions to vaccinate is not fully understood. One encouraging study in 2011 indicated that Rachel Cunningham’s book *Vaccine Preventable Disease: The Forgotten Story* proved useful in direct conversations with parents and, for ninety-five percent of survey respondents, positively influenced at least one parent’s decision to vaccinate. At the same time, however, some parents may be negatively affected by herd immunity messages. To be effective, then, messages should be balanced and educational in nature, rather than coercive.

Another benefit of the warning system is its inherent lack of coercion, particularly when compared to a mandate or other public health tool. Mandates in particular have a reputation for generating instant resistance based on liberty and government interference claims. And, unlike the recent laws passed in Washington, California, and Vermont, the proposed warning system doesn’t interfere with individual parents’ option to seek an exemption from vaccination laws. Instead, the warning system protects potential victims by giving adequate warning and allowing for risk avoidance while potentially also “nudging” entities to promote higher vaccination rates. Thus, the warning system may be more palatable without compromising effectiveness.


144. Quadri-Sheriff et al., supra note 142, at 525 (“[I]n 1 study a parent admitted feeling resentful toward governmental health care bodies that suggest children should be immunized to further herd immunity for the benefit of society.” (citation omitted)).

145. Wendy E. Parmet, *The Individual Mandate: Implications for Public Health Law*, 39 J.L. MED. & ETHICS 401, 410 (2011) (“Mandates may be relatively easy to enact and implement, but they often ignite a backlash that can undermine political and legal support for public health policy.”).

146. See supra note 63 and accompanying text.

147. See, *e.g.*, Thaler & Sunstein, supra note 124, at 3–5 (introducing “libertarian paternalism” and “choice architecture” as a viable and more palatable alternative to mandates).
Finally, the warning system poses relatively low implementation costs if administered by an existing agency. Staff time would likely be the most significant cost, needed for tasks such as rule promulgation, setting up reporting systems and formats, revising websites and other materials, and compliance monitoring. Additional costs could be incurred if educational campaigns are paired with the system’s launch. These already low implementation costs could be offset, however, if the federal government offered funding to induce state adoption of a national standard.\textsuperscript{148}

\section*{C. Potential Limitations}

There are several potential limitations to a warning system. First, unlike a mandate or restrictive exemption process, a warning does not directly address the risks (including high vaccination rates and compromised herd immunity) to which vulnerable children are exposed. Instead, the warning system, on its face, empowers individuals to make informed choices and avoid harm from existing risk, meanwhile aspiring to indirectly reduce risk levels. This limitation, while valid, lends itself to the conclusion that a warning will not be effective in isolation. Rather, current state laws requiring vaccination as a condition to attend school or day care—facilitating risk reduction—are essential components of a comprehensive vaccination strategy that includes a warning system to facilitate risk avoidance.

Second, the warning system is limited in its effect where individuals may be warned but unable to avoid the risk. For example, there could be only one school in a fifty mile radius, or the alternative school, while close, is a prohibitively expensive private school. But, as the Restatement authors recognized, society does not benefit from, nor does it encourage, elimination of all risks.\textsuperscript{149} That the warning system isn’t a comprehensive solution doesn’t negate its usefulness. A warning can still raise public awareness about vaccine coverage and herd immunity; encourage organizations to promote increased vaccination and become “green;” and, where exposure cannot be completely avoided, individuals and schools can work together to minimize a child’s risk.

\section*{Conclusion}

Childhood vaccines have long formed the basis for intense debate and resistance. Currently, exemptions, while low overall, are increasing in all states regardless if only religious exemptions are permitted or if exemptions are relatively difficult to obtain—two

\textsuperscript{148} See supra note 120 and accompanying text.

\textsuperscript{149} See supra note 82 and accompanying text.
factors associated with lower exemptions rates. Of particular concern are local communities with high exemption rates that can be masked by low state-wide exemption rates. Against this background, concern arises for vulnerable individuals that rely on herd immunity, or the indirect protection provided by having a threshold number of people vaccinated such that the disease cannot be transmitted in a particular community. Individuals relying on herd immunity include those who cannot be vaccinated for medical reasons or due to young age, as well as vaccinated individuals who did not develop immunity (vaccine failures). Notably, these vulnerable individuals are more likely to experience dangerous complications from a vaccine-preventable disease. To address the problem of third parties suffering because of some parents’ decision to voluntarily forgo vaccination, policy changes and proposals attempt to make exemptions less accessible, shift the negative externalities of the decision not to vaccinate, and compensate victims after they contract a disease and suffer harm.

This Note proposes another solution to address the negative externalities of vaccine exemption: a state-based, statutory warning system for schools and day-care facilities. The proposed system—with preset vaccination levels that correspond with green, yellow, and red as well as emotional graphics—would allow parents to choose schools and day-care facilities with an understanding of the vaccine coverage risk. Facilitating risk avoidance, this system would supplement other vaccine policies currently in place to increase vaccination rates.

_Katherine Shaw Makielski_†

† J.D. Candidate, 2014, Case Western Reserve University School of Law. I would like to thank Interim Dean Jessica Berg and Dean of Academic Affairs Jonathan Entin for their candid advice and helpful guidance. I also thank my husband, Peter Makielski, for his unending love and support.
## Appendix

Table 1. Relevant Statutory and Regulatory Provisions by State—School and Day-Care Vaccination Requirements and Exemptions

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150. *See supra* text accompanying notes 33–36 for discussion relating to these provisions.

151. Listed where needed to supplement the statutory provisions.
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