Childhood Immunization: Laws That Work

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Abstract

In the United States, many vaccine-preventable disease rates are at an all-time low. Low disease rates have been achieved through high rates of immunization coverage. Vaccination requirements for school and child care attendance have been recommended by the independent Task Force on Community Preventive Services based on systematic review of immunization interventions. These requirements have been determined to be effective in reducing vaccine-preventable disease and improving immunization coverage rates in all at-risk populations. At the same time, complacency, increasing vaccine costs, vaccine shortages, and the potential risks associated with vaccinations pose challenges to immunization requirements. Some states offer not only medical and religious exemptions to immunization requirements, but also philosophical exemptions for parents who choose not to immunize their children. Policy makers must balance the need to provide individual choice with the need to protect children's health.

Vaccines are among the 20th Century's most successful and cost-effective public health tools for preventing disease and death. Not long ago, diseases such as polio, measles, pertussis, diphtheria, and Haemophilus influenzae type b (known as Hib) were commonplace. Today, cases of most vaccine-preventable diseases are at or near all-time lows, and childhood immunization rates have never been higher. In less than a decade, the use of Hib conjugate vaccines nearly eliminated Hib invasive disease among children. During the course of the century, we have eradicated smallpox worldwide and, as of 1991, have eliminated wild polio virus from the Western Hemisphere.

School laws requiring immunizations are effective in ensuring that high numbers of children are immunized. School laws are particularly effective for several reasons: (1) school laws are generally accepted among communities, (2) immunization of children becomes a priority, (3) physicians support school laws, and (4) school laws harness extra resources for immunization.

History, Impact, Current Status, and Enforcement of Compulsory Vaccination

History

Compulsory vaccination as a means of controlling disease has a long history in the United States, nearly as long as the use of vaccination. In 1809, Massachusetts passed a law requiring the population to be vaccinated against smallpox. In 1827, the school committee of the city of Boston ordered teachers to require all children entering the public schools to give evidence of vaccination, and in 1855, Massachusetts became the first state to enact a compulsory school vaccination law. During the latter half of the 19th Century, many more states passed similar laws. Enactment of school immunization requirements in general accompanied enactment of compulsory school attendance requirements, as it was recognized that bringing large numbers of children together in schools would facilitate the spread of smallpox. By the beginning of the 20th Century, nearly half of the
states had requirements for children to be vaccinated before entering school.

Statutory immunization requirements have been challenged but repeatedly upheld. In 1905, the U.S. Supreme Court affirmed the right of states to pass and enforce compulsory immunization statutes for the population at large, and in 1922, the U.S. Supreme Court upheld the constitutionality of school immunization requirements.

**IMPACT**

In the late 1960s, efforts were undertaken to eradicate measles from the United States and it was recognized that transmission in schools was a significant problem. In the early 1970s, it was demonstrated that states that had school immunization laws for measles vaccine had measles incidence rates 40-51% lower than states without such laws. In 1976 and 1977, measles outbreaks in Alaska and Los Angeles led health officials to strictly enforce the existing requirements. Advance notice was given that the laws were to be enforced, and major efforts were made to ensure that vaccination could be easily obtained. In Alaska, on the announced day of enforcement, 7,418 of 89,109 (8.3%) students failed to provide proof of vaccination and were excluded from school. One month later, fewer than 51 students were still excluded. No further cases of measles occurred. In Los Angeles, approximately 50,000 of 1.4 million students (<4%) were excluded; most were back in school within a few days, and the number of measles cases dropped precipitously. These experiences demonstrated that mandatory immunization could be enforced and that it was effective.2

In 1977, a Childhood Immunization Initiative was launched to try to reverse gradually declining immunization rates and the continuing epidemics of measles. Since many vaccine-preventable diseases were primarily being transmitted in schools, a major effort was made to review the immunization status of school children and to immunize those in need. Over a two-year period, more than 28 million records were reviewed and millions of doses of vaccine administered. As a result, measles incidence declined and immunization levels in school children rose dramatically. Major emphasis was placed on enactment and enforcement of school immunization requirements, with the result that 30 states formally changed their laws or regulations in the direction of increasing comprehensiveness and more rigorous enforcement. By the 1980–81 school year, all 50 states had laws covering first entrants to school.

In 1977 and 1978, the incidence rate of measles in six states strictly enforcing school immunization requirements was 50% to 90% lower than the rates in the rest of the country. A 1981 study found that the ten states with the lowest measles incidence rates were significantly more likely to have laws covering the entire school population and to be strictly enforcing the laws than were the thirteen states with the highest measles incidence rates. The incidence of mumps in New Jersey children covered by a school law was lower than in children not so covered. Day-care center requirements for *Haemophilus influenzae* type b (Hib) vaccination in New York resulted in declines in Hib incidence among child care attendees that were greater than in the state as a whole. Finally, a study of 796 colleges found that those with state-mandated measles immunization entry requirements were 70% less likely to have a measles outbreak than colleges in states without such requirements.

More recent data concerning the impact of school immunization requirements on immunization coverage come from California, which enacted a requirement that, as of the 1999–2000 school year, all 7th grade students had to provide evidence of immunization against hepatitis B. A survey of 5th-6th graders in San Diego in April–June 1998 showed that only 15.8% had received 3 doses of hepatitis B vaccine. By October 1999, 68.5% of 7th graders had been immunized. Statewide data indicated that in October 1999, 70.6% of 7th graders had received hepatitis B vaccine, but by February–April of 2000, coverage in 7th graders was 89.9%.2

Since the 1981–82 school year, 95% or more of children entering school have documented
immunization against DTP, poliomyelitis, measles, mumps, and rubella. School immunization requirements have not only been highly successful in reducing the incidence of disease but also in improving immunization levels in school children. Unfortunately, levels in preschool children have not been so high, as manifested by the resurgence of measles that occurred from 1989–1991, primarily affecting unimmunized preschool-aged children. Immunization rates in preschool-aged children have been raised to their currently high levels as a result of major efforts (and major infusions of resources) directed at this population during the past ten years.

The Task Force for Community Preventive Services is an independent body carrying out evidence-based reviews of the literature to assess the strength of evidence that preventive interventions directed to populations are effective. One of the seventeen interventions reviewed for vaccine-preventable diseases was mandatory immunization requirements. The Task Force found that sufficient evidence existed to demonstrate the effectiveness of these requirements in increasing immunization coverage and reducing disease incidence, and thus the Task Force recommended their use.  

**CURRENT STATUS**

As of the 2001–2002 school year, all 50 states, the District of Columbia, and Puerto Rico have school entry requirements. In all states, the requirements cover all grades from kindergarten through 12th grade (three states require only new entrants to show proof of immunization). In all states, the requirements cover day care centers, and in 48 states, the requirements cover Head Start programs. Thirty-two states have some requirements for college entrance. Some of the laws specify the exact vaccines required (and the numbers of doses of each), whereas others authorize the state health officer (or public health board) to designate which vaccines (and doses) will be required, often after a public rule-making process.

In all 50 states, the requirements cover diphtheria, tetanus, polio, measles, and rubella vaccines; 47 states require vaccination for mumps, 44 for pertussis, and 41 for hepatitis B. Forty-nine states require a second dose of measles vaccine, 21 require varicella vaccine, and 6 require hepatitis A vaccine. All 50 states require Hib vaccine for day care attendance and all but Idaho and West Virginia require Hib vaccine for Head Start.

**ENFORCEMENT AND EXEMPTION**

The general experience of allowing children to enter school without complete immunization and then following up to try to monitor and ensure that they have been immunized has proven to be a much greater burden on the school system than requiring children to be immunized before they enter school (“No shots, No School”).

Some people have medical conditions that increase the risk of adverse effects and should not receive vaccines. Recognizing this fact, all state immunization laws provide for exemptions for persons with contraindicating conditions. In addition, the religious beliefs of some people are in opposition to vaccination, and others are opposed to immunization on other (philosophic) grounds. Further, some persons are not opposed to all vaccines but oppose the concept of mandatory vaccination or mandates for specific vaccines. In the latter case, some may feel they (or their children) are not at risk for a particular disease or that, if contracted, the disease is not that severe. If the disease in question is uncommon (as is the case in the United States today for most vaccine-preventable diseases), these individuals might not be willing to undertake any level of risk of adverse effect.

Forty-eight states currently allow religious exemptions, and sixteen permit philosophical exemptions. Additionally, Arizona and Missouri allow philosophical exemptions in some settings. The criteria used for allowing these exemptions vary greatly. Some states require membership in a recognized religion, whereas others merely require an affirmation of religious (or philosophical) opposition. All 50 states have provisions for excluding noncompliant students from K–12; 47
states have exclusion clauses for day-care settings, and 32 have exclusion clauses for colleges. A 1998 study found that, in 32 of the 48 states with religious or philosophic exemptions, no request for an exemption had ever been denied.

Nationwide, in the 1997–1998 school year, fewer than one percent of entering students had any kind of exemption from immunization laws, but seven states had more than 1%, with exemptions the highest for Michigan, with 2.3%. There are local areas in many states where religious or philosophical exemptions are claimed by a significant proportion of students. For example, in California in 1995, 84% of schools had fewer than 1% of students with exemptions, but 4% of schools had 5% or more students with exemptions. There is some indication that some parents claimed exemptions because it was easier to do so than to go to the effort of finding an immunization record. It should not be easier to get an exemption than it is to get immunized.

Rota et al. studied the processes required to obtain religious and philosophical exemptions to school immunization laws and found that there was an inverse correlation between the complexity of the exemption process and the proportion of exemptions filed. None of 19 states with the highest level of complexity in gaining exemptions had 1% or more students exempted, compared with 5 of the 15 states with the simplest procedure. In these latter states, it often required less effort to claim a nonmedical exemption than it did to fulfill the immunization requirement.

Daniel Salmon, conducting a study of religious and philosophical exemptions to immunization laws, found that in the period 1985–1992, persons with such exemptions had 35 times higher risk of contracting measles than did vaccinated persons. In addition, persons living in communities with increased numbers of exempted persons were at increased risk of contracting measles.

In Colorado, Feiken et al found that children with personal exemptions to immunization were 22.2 times more likely to acquire measles and 5.9 times more likely to acquire pertussis than vaccinated children. In general, the greater the number of exempted persons, the higher was the incidence rate of both measles and pertussis in unvaccinated children.

Staff at the Centers for Disease Control and Prevention identified 13 outbreaks of measles in the period 1985–1994 in religious groups opposing immunization. These outbreaks resulted in more than 1,200 cases and 9 deaths (CDC, written communication from Robert Snyder, BA, April 1997). Outbreaks of polio (in the 1970s), pertussis, and rubella have been documented among Amish groups.

Generally, school laws have been shown to be very effective. A meta-analysis demonstrated reduced disease incidence associated with immunization requirements in six of nine studies. Furthermore, three studies demonstrated improved coverage rates after requirements were implemented. The evidence of effectiveness applies to most children and young adults.

Most vaccines provide both individual and community protection. Most of the diseases against which we vaccinate are transmitted from person to person. If a large enough proportion of individuals in a community is immunized, this proportion serves as a protective barrier against transmission of the disease in the community, thus indirectly protecting those who are not immunized for whatever reason as well as those few who received vaccine but are not protected (vaccine failures). The proportion of the population that must be immune to provide this herd immunity varies according to the infectiousness of the agent. For poliomyelitis, it is considered to be on the order of 80%, whereas for measles it is in excess of 90%. When a community has a high level of vaccination, an individual might decide not to be vaccinated in order to avoid the small risk of adverse events while benefiting from the vaccination of others. Of course, if a sufficient number of individuals make this decision, the protection levels in the community decline, the herd immunity effect is lost, and the risk of transmission rises. Since approximately 11,000 infants are born every day in the United States, immunization coverage is not static; there is an ongoing need to
ensure that children continue to be protected. Additionally, a continuing threat of importation of disease from other countries exists.\textsuperscript{10}

School immunization laws reflect the delicate balance between the rights of the individual to determine his/her own fate and the rights of society to ensure that all members of society participate in community protection. A decision by a parent not to vaccinate his or her child is a decision to put at risk not only that child but the rest of the community as well, since there are many who would like to be protected but are not. These unprotected groups include children too young to be vaccinated, those with medical contraindications to vaccination, and the small proportion of those who have been vaccinated but were not protected. In some sense, persons who do not have their children immunized are getting a “free ride” without putting their children to the very low risk of an adverse event, because they are benefiting from the impact of the vaccination of others.

Challenges to mandatory immunization laws based on religion or philosophical belief have led various courts to hold that there is no constitutional right either to religious or philosophical exemptions.

**State Health Department Considerations**

Several important aspects of school immunization requirements must be taken into account by a state prior to enacting a school or day care entry requirement: the effectiveness of school mandates, the appropriateness of the requirement, and implementation and enforcement issues.

A decision about the appropriateness of an immunization requirement is generally based on national recommendations from groups like the Advisory Committee on Immunization Practices and the American Academy of Pediatrics. Input from the local medical community is also critical. The population at risk for a vaccine-preventable disease should be compared with the population that would be vaccinated under a school entry requirement as a means of determining the impact of a potential immunization requirement. Also, serious diseases transmitted by the airborne route in school-aged populations generally get the highest priorities for immunization requirements. The benefits of an immunization requirement must also be weighed against the side effects of a vaccine.

The legal processes to establish new requirements vary from state to state. However, the timing of the decision, the cost of the vaccine, and state purchase requirements are universally important to the implementation of new school requirements. States must be in a position to ensure that all students in the state have access to vaccine, without financial barriers. Furthermore, it is important that providers, parents, and schools be notified well in advance of any changes in school and daycare entry requirements.

Prior to implementation of school laws, consideration of how the law will be enforced is necessary in order to ensure that the law is effective.

It must be decided before a new law or regulation goes into effect whether only children enrolling in school for the first time are covered or whether all students, regardless of time of enrollment, must be vaccinated. Exclusions of unvaccinated students from school could be considerably greater if the law includes all states.

**Legislative Considerations for Childhood Immunizations: One State’s Experience**

At the legislative level, it must be recognized that the ability to compromise is essential. For example, this need to compromise, a key aspect relating to parents seeking exemptions from state school laws for their children, has arisen on a number of occasions in Idaho. In 1979, Idaho had legislation that did not allow philosophical exemptions from immunization. However, the Idaho legislature could also reject executive rules through a resolution. To address increasing concerns about immunization and the potential use of an associated resolution, the state passed revised legislation in 1991 containing a major exemption option. Specifically, this option involved legislative language that allowed
exemption from state immunization laws on "other grounds." Thus, essentially a blanket exemption was available to parents concerned with vaccination.

Compromise was also necessary in passing immunization registry legislation in Idaho. In 1999, legislation to establish a state registry passed, but it included the compromise that participation in the state's system was voluntary. The two major perspectives in these debates and in those compromises tended to be those of the state health agency and various scientists, on the one hand, and those of individuals opposed to vaccination or else questioning the safety of vaccines, on the other.

This experience in one state demonstrates that the public health community must recognize that there are political considerations associated with childhood immunization laws that cannot be ignored. This political dimension will continue to pose a challenge to those who seek to minimize the incidence of vaccine-preventable diseases.

**Conclusion**

The role of law in protecting the public's health is critical in the area of childhood immunizations. The effectiveness of childhood immunizations in preventing outbreaks of contagious diseases is well documented. Nevertheless, public health officials and supportive legislators continue to struggle to gain passage of comprehensive laws that mandate childhood vaccinations for all. Opponents' claims of civil liberties violations and the tendency of the few to avoid immunizations for their children for various reasons continue to pose an obstacle to complete elimination of many childhood diseases.

**REFERENCES**


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