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Vaccination Exemption

David Selvage, MHS, PA-C
Epidemiology and Response Division
New Mexico Department of Health

The global implementation of vaccination to prevent infectious diseases is considered one of the 10 greatest public health achievements of the 20th century.[1] In the United States, the acceptance of national recommendations for vaccination of children has resulted in a 92% decrease in cases and a 99% decrease in death from diphtheria, mumps, pertussis, and tetanus. Death and illness due to hepatitis A, acute hepatitis B, *Haemophilus influenzae* type b, and varicella have declined by 80% or more.[2] Vaccination has eliminated endemic transmission of polio, measles and rubella in the United States.[2] Smallpox, a highly contagious viral disease that once killed 25-50% of its victims and infected over 300,000 people worldwide as recently as 1950, was eradicated as of 1977, primarily because of an effective vaccine.[3]

Despite the overwhelming evidence that vaccination prevents disease and death, vaccine refusal is increasing in the United States. Recent data indicate rates of vaccine exemption at school entry exceed 5% in 8 states, with pockets of vaccine exemption in excess of 20% in some locales.[4] Parents requesting vaccine exemption tend to cluster in certain communities and even within specific schools within those communities. One large study found that parents of vaccine exemptors tend to be more educated, have higher income, be more likely to self-identify as White and be more likely to question the advice of physicians.[5] Parental concerns about vaccine safety and the perception that vaccines are unnecessary are among the most common reasons cited for refusing vaccination.[6,7]

Vaccine Exemption in New Mexico

Currently, exemption from vaccine requirements for child care or school entry is allowed by law in New Mexico. The New Mexico Administrative Code (NMAC) 7.5.3 specifies that parents may request a vaccination exemption based on religious beliefs. The portion of the NMAC 7.5.3 that refers to religious exemption includes two salient provisions. The first provision refers to people who are members of a recognized "denomination whose religious teaching requires reliance upon prayer or spiritual means alone for healing." As members of a religious denomination, these individuals presumably have access to an "officer of the church" who can write a letter indicating that the church recognizes spiritual means or prayer as the singular method of healing.

The second provision applies to people who share the same religious beliefs as members of a recognized religious denomination but who themselves are NOT members of a given denomination. The statutory language grants this group of people an equal opportunity to file an exemption. To accommodate this group, the legislature designated that a vaccine exemption form be created. The form, known as the Certificate of Exemption, must be completed by parents, notarized and submitted to NMDOH for approval. A new form must be submitted to the program every 9 months for each child. As long as parents comply with the process and attest to possessing religious beliefs that do not permit vaccination, the exemption is approved. Currently no vaccine education or counseling regarding the risks and benefits of vaccination is provided to parents requesting vaccine exemption.

Despite statutory language and programatic intent, parents have likely used the Certificate of Exemption for "personal belief" or "philosophical" exemptions. The form does not require any direct statements from parents stating that they are requesting an exemption based on religious grounds. Over time, parents have used the form to file exemptions that may have nothing to do with religious beliefs. The statutory language in the second provision of the NMAC

("*religious beliefs, held either individually or jointly with other individuals"*) has been interpreted as a "personal belief" exemption, and thus the operative practice has become that all personal belief or philosophical exemptors can use the Certificate of Exemption as their documented request.

Trends and rates in New Mexico

Vaccine exemption trends in New Mexico reflect the increase in exemptions nationally, though specifically why parents in New Mexico are requesting vaccine exemption more frequently is not known. The total number of vaccine exemptions granted by NMDOH increased from 1,148 in 1999 to 3,372 in 2011, a total increase of 194% (Figure).

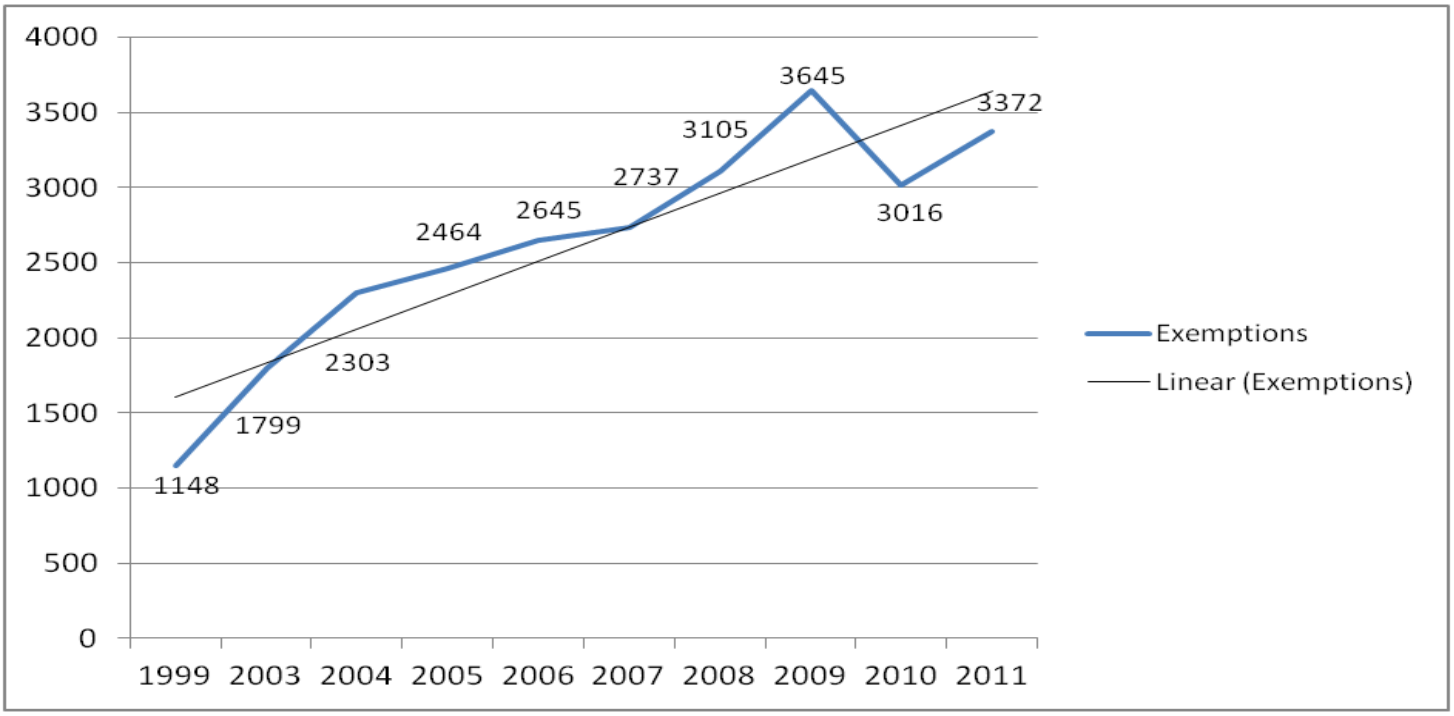
Even though the total number of vaccine exemptions has remained relatively low, the rate of exemptions since 1999 has nearly tripled in New Mexico. The Table shows the rate of vaccine exemptions per 1,000 children aged 0-19 for 1999 and the period of 2003 through 2011. Vaccine exemption data for 2000 to 2002 are not available.

One challenge in determining a vaccine exemption rate is determining a reasonable denominator. In this instance, the denominator for calculating the exemption rate for each year corresponds to the total population of children 0-19 in the state of New Mexico. A denominator that only includes children in school or child care would provide a more accurate rate calculation; however, enrollment totals for private schools and child care in New Mexico are not readily accessible.

Vaccine exemptions are not evenly distributed across New Mexico. Presumably, parents sharing similar religious or personal beliefs prohibiting or opposing vaccination cluster together socially and may be more likely to enroll their children in schools with those who share their beliefs. Two assessments of 44 select schools (public and private) conducted in 2000 and again in 2011 found schools in New Mexico with exemption rates ranging from 0 to >50%. For the schools included in this assessment, the aggregate rate of vaccine exemptions increased 27% from 15/1,000 in 2000 to 19/1,000 in 2011. In both years, the vaccine exemption rates for the 44 schools exceeded the mean state rates, reflecting the fact that some of the schools included in the assessment had unusually high vaccine exemption rates.

It is not known what rate of vaccine exemption contributes to initiating or sustaining outbreaks of vaccine preventable diseases; to a great extent this depends on the communicability of the specific organism. However, data suggest that vaccine exemptors

Figure. Number of vaccine exemptions, 1999 and 2003-2011, New Mexico



and individuals residing in areas with higher vaccine exemption rates for measles and pertussis are at increased risk of contracting these diseases. Feikin, et al, found that exemptors are 22.2 and 5.9 times more likely to acquire measles and pertussis respectively.[8] A study by Omer, et al, found that people residing in areas with clusters of vaccine exemptors were more likely to be in pertussis clusters. The authors concluded that "geographic pockets of vaccine exemptors pose a risk to the whole community."[9]

A study conducted in New Mexico in 2010 produced similar conclusions.[10] In this study, confirmed and probable pertussis cases aged < 18 years during 2006 through 2009 and schools reporting vaccine exemptions were geocoded by census tract. A multivariate logistic regression model was constructed to predict whether a tract would be in a pertussis case cluster. After controlling for income level, immigration status, population density, race and ethnicity, the results indicated that children living in an exemption cluster were about 15 times more likely to be in a cluster of pertussis cases (OR: 14.67, 95% CI: 5.06, 42.48). A causal relationship between living in an area with a high rate of vaccine exemptions and risk of contracting pertussis cannot be determined based on these results. However, the inference from this and other studies is increased rates of vaccine exemption in communities contribute to decreased herd immunity and increased risk of disease transmission.

Recommendations

Annually, vaccines save millions of lives around the world. But vaccines work only if governmental and non-governmental agencies maintain concerted efforts to promote vaccine availability, safety and use. Toward that end, NMDOH recommends that all children and adults receive vaccines on time and at the recommended intervals. For further information about recommended vaccinations for children and adults, go to the NMDOH Immunization Program website @ http://www.immunizenm.org/ .

In addition, the following are recommended:

1. Regulations around vaccine exemption should be reviewed and potentially revised in order to limit vaccine exemptions to the minimum allowed by state law.

2. Parents submitting requests for vaccine exemption should receive counseling and education about the risks associated with not vaccinating their children.

3. A survey of parents requesting vaccine exemption should be completed to more fully understand the demographics and motivations of this group in New Mexico.

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C. Mack Sewell, Dr.P.H., M.S.
State Epidemiologist

Michael G. Landen, M.D., M.P.H.
Deputy State Epidemiologist & Editor

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Table. Vaccine exemption rates, 1999 and 2003-2011, New Mexico

Year	Exemptions	Population 0-19*	Rate/1,000
1999	1148	567,386	2.0
2003	1799	570,833	3.2
2004	2303	572,126	4.0
2005	2464	573,411	4.3
2006	2645	574,682	4.6
2007	2737	575,988	4.8
2008	3105	577,271	5.4
2009	3645	578,557	6.3
2010	3016	580,210	5.2
2011*	3372	580,210	5.8

*Population data from the New Mexico Indicator-Based Information System (NM-IBIS)

**Population totals for 2011 are provisional