What Ashland Parents Told Us About Religious Exemptions

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What Ashland parents told us about vaccines and religious exemptions

Introduction

The Community Vaccination Survey (CVS) was designed for exploring what Ashland parents perceive about the risks and benefits of immunizing school children, the sources of information that parents depend upon, and how these may lead parents to consider or sign a religious exemption to school immunization requirements for their children.

School Immunization Requirements

Specific legal definitions of religious exemptions and mandated immunizations vary at the present time among individual states. Oregon law requires children attending daycare, preschool and school in grades K to 12 to have immunizations against nine vaccine-preventable diseases. These diseases are diphtheria, tetanus, hepatitis B, polio, measles, mumps, rubella, and varicella. *Haemophilus influenzae* type B (Hib) is also required for children under age five who attend daycare or preschool.

Oregon law allows signed medical exemptions from physicians and religious exemptions from parents in place of school-required immunizations. The definition of religious belief for the purpose of exemptions is "any system of beliefs, practices or ethical values" (OAR 333-050-0010). Claiming a religious exemption requires a parental signature. In Oregon, physician-signed medical exemptions are rare compared to religious exemptions signed by parents.

For the 2001-2002 school year, 2.7% of the school children statewide claimed religious exemptions. During this period, school districts in Jackson County reported a cumulative exemption rate of 3%. The Ashland schools reported an exemption rate of 11%, with a 15% rate in public grade schools.

This increase in exemption rates between Ashland and the rest of Jackson County translates into a dramatically lower level of community protection against disease. A prior report, *School Exemptions and Disease Risk in Ashland* (Oregon Department of Human Services, Fall 2002), presented evidence regarding the increased chance of disease in Ashland caused by

exemptions. Studies in other parts of the U.S. have indicated that exemptors can not only act as a potential source of disease for others in their communities, but are also themselves at 22 to 35 times greater risk of catching measles, and 6 times more likely to catch pertussis. Preventing the spread of vaccine-preventable diseases in a community requires that between 80-95% of the population be immunized, depending on the disease to be prevented.

Designing the Community Vaccination Survey

Parental Perceptions of Risk and Benefit in Vaccination

The central questions behind the CVS are about parental attitudes to vaccination, parental sources of information, and what factors might be associated with seeking exemptions. This section describes the sociological and psychological assumptions used to design the CVS.

Parents generally receive positive reinforcement from a variety of sources for following what they perceive to be the right standards or norms for taking care of their children. In most American communities, getting young children vaccinated is part of the normative standards for parents. However some individuals and the social groups within a community may have different normative views about childhood vaccination, adopting anti-vaccine sentiment as a normative standard, in place of vaccination.

Parents balance their perceptions of risk from vaccination against their sense of individual or community benefit. Benefits may be individual, in a parent's sense that vaccination has made their child safer from disease. Or benefits may be on a larger level, such from a sense of helping the community, or from following a community norm. The level of actual risk to vaccinating a child is difficult for a parent to translate into everyday terms. On the one hand, parents are given medical research data on risk, such as vaccine product statements that the risk of serious side effects is one in several hundred thousand. This abstract, minimal risk can be hard for some parents to place in the context of making decisions. On the other hand, many parents are exposed to stories and personal accounts of children that have allegedly been hurt by a vaccine. This anecdotal, personally or socially based awareness of potential risk is more likely to enter the imagination of parents than is a statistic. Balancing these different types of information is difficult, likely causing a greater sense of concern or worry about vaccination. Also

many parents may want to rely on someone that they recognize as an authority to make this assessment of risk, and to balance the risk versus the benefit of vaccination. In most communities and for most parents, traditional healthcare providers fill this role.

An assumption going into the design of the CVS was that parents who believe that the perceived risk of vaccination is high, or who are exposed to personal and anecdotal accounts of vaccine risk, would be more worried about vaccinating their children. It was expected that these parents would more likely consider taking exemptions. This chance of worry and of considering exemptions was also expected to be reduced among parents who rely on providers acting as authorities for vaccine decisions.

Despite the increased concern and worry, it was expected that those who perceived a risk would mostly continue to comply with the school requirements, unless they no longer perceived a benefit to vaccination. Exemption seeking was expected to be associated with both having issues with the risk of vaccinating children, and with questions about the benefits, such as a belief that vaccines were not needed or did not work.

Also we considered that some parents may seek exemptions simply as a convenience. Vaccinating children requires money and/or time out of a parent's schedule. In contrast, an exemption can be claimed for a child with a single signature on the school immunization form. Some parents may be motivated to take an exemption because they believe that there is a community benefit to having children immunized, but also an individual risk to their own child. They prefer that the burdens of community disease protection be borne by other parents and children. These parent fit the economic definition of "free riders", as they want to receive a community benefit without paying their share of the cost or risk of disease prevention.

Sources of Information

The CVS was designed from the perspective that there is a link between parent's beliefs about vaccination and their seeking of exemptions. Along with determining what parents believe, the CVS explores what sources and types of information are influencing parents. The possible sources of information and influence can be put into three broad categories:

1) **Healthcare Providers**

The influence that healthcare providers have on a decision to seek an exemption is difficult to judge. One commonly heard idea is that alternative providers who may be more likely to promote "natural" immunity are likewise spreading anti-vaccine sentiment. Another possibility is that a larger group of providers of all types are not actively promoting vaccination in their practices because of a perceived new community anti-vaccine norm.

2) **Media**

A defining feature here is that the source of information is not being personally communicated, and has an appearance of objectivity. The last few years has seen an increase in media accounts of potential or alleged cases of harm to children from vaccines. One working idea is that this growth in anti-vaccine reporting is a major factor behind exemption seeking. Another potential factor is that the Internet has made it easier for people to circulate opinions, information and misinformation.

3) **Personal Accounts**

The third category covers the sort of information and influence that a parent receives from their social contacts, such as friends or family, school meetings, or community acquaintances. Generally the more personal the source of information, the more impact it is likely to have. From anecdotal accounts many parents in Ashland may be getting information about vaccines from other community members with strong opinions.

Possible Media Information & Misinformation

Within recent times the amount of media attention to stories of actual and alleged harm to children from vaccines has grown exponentially. These range from accounts of historical harm, such as Barbara Loe Fisher's "A Shot in the Dark", about problems with the whole-cell pertussis vaccine in the 1970's, to more recent concerns about thimerosal, and worries that vaccines or vaccine components may be a factor in the development of autoimmune disorders and autism. Also the Internet has served as a ready vehicle for communicating personal stories and opinions that may fall outside of established scientific literature or mainstream media.

Vaccines have the potential to rarely produce reactions that either appear serious or are truly serious. The national system for reporting vaccine adverse events accepts reports from all sources, including vaccinees. It does not differentiate between events known to be associated with vaccines and other events. In 2001, only 178 adverse reactions to vaccines were reported in Oregon, out of over 600,000 doses administered to people of all ages. Most of these adverse reactions were neither serious nor persistent, such as a sore arm or slight fatigue after an immunization.

However many media outlets consider stories about alleged vaccine adverse events news-worthy, so that new fears and old ones continue to appear despite rejection in the scientific literature. For example, stories continue about an alleged link between MMR vaccine and autism, despite major scientific research to date that has rejected any association (Madsen K, et al. N Engl J Med 2002; 347: 1477-1482).

Vaccine Harm and Coincidence

Some parents in the U.S. are sincerely convinced that vaccines have given their children autism, or caused other harm. However most, though not all, of such personal accounts are likely based on a coincidence in timing rather than biologic causes. People typically believe that events that occur at about the same time are connected, which is only one consideration for causation. Consider if someone sneezes on you in the evening, and you wake up the next morning with flu symptoms. The sneezer is likely to be blamed for passing it on. Whereas the truth is that it generally takes 2 to 3 days from exposure before flu symptoms appear. The person blamed is not the one who is likely to have actually passed it on. For vaccines and conditions such as autism, some amount of coincidence in timing is also likely to occur.

Other concerns from the media may focus on the characteristics of the medical industry and costs surrounding vaccines. According to the Urban Institute, the cost of vaccinating a child grew from $10 in 1971 to $384 in 2000 due to the increased number of diseases covered by immunizations and the inflation of the medical industry in general. The cost to public agencies in Oregon, for 2003, to fully immunize a child to age 4 is $463. The cost of vaccines to private clinics can be over $700. This cost increase has not helped in countering some parents' fears that vaccines are being recommended to support profits within the pharmaceutical industry.

Survey Methods and Responses

Who Answered the CVS

Parents who received the CVS were randomly selected from public school enrollment lists for Ashland grade and middle schools during the 2001/2002 school year. Parents with children who had religious exemptions on file at the schools during this time were oversampled for the survey. This oversample was to ensure that enough responses would be received from both exemptors and non-exemptors. Overall 648 eligible parents received a survey, of which 169 had a child with an exemption in 2001/2002. All selected parents received a pre-mailing notification in September 2002. The survey was administered in three waves. An initial mailing was performed in October 2002, with a follow-up mailing to non-responders in November and a limited phone survey for non-responders in December.

Overall 62% of parents responded to the survey. This response rate shows that Ashland parents are concerned about the issue of religious exemptions to school vaccination requirements. Both parents with and without religious exemptions responded equally to the survey, at 60% and 63% respectively.

All identifying information was deleted prior to analysis.

Survey Weighting

The results in this report are based on weighted counts of responses. The weights applied to the CVS data are for the oversampling of parents with exemptions, and to a lesser degree for unequal response rates from schools.

Survey Limitations

As a caveat, the results presented in this analysis are based on associations between exemptions and what parents report on the survey. In some cases, such as with parental recall of provider advice, the fact of having or not having an exemption may bias what the parent remembers now. Whether a parent has taken or not taken an exemption in the past may also have an impact on their current attitudes to immunizations. This potential interaction leads to other questions, some of which (as with providers), can be at least partially addressed with the survey data.

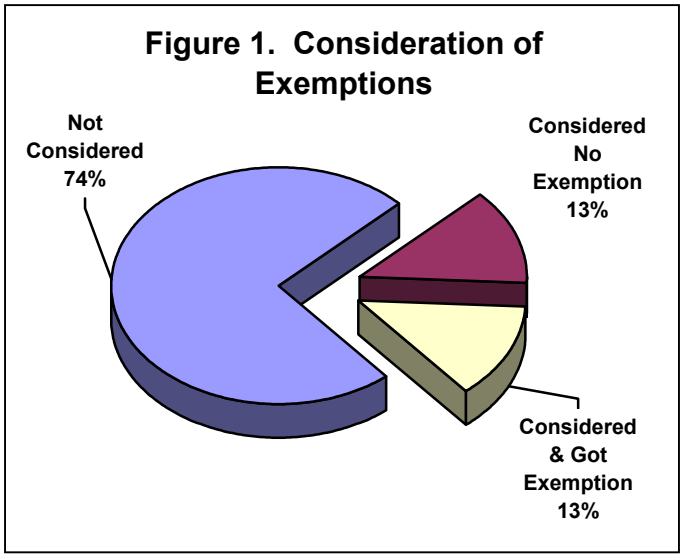
Presentation of Exemption Results

In our analysis, we looked at different beliefs and practices among those without exemptions, compared to those with exemptions. Exemption status was based on official school records for the 2001/2002 school year, because it is believed to be more objective and robust.

Another measurement that is used in presenting the results of the CVS is whether a parent considered getting an exemption but didn't. This is an intermediate level between exempting and not exempting.

Research Findings

Consideration of Exemptions, and Having Exemptions



One focus of interest in this study is on those parents who considered getting an exemption, and whether they proceed to take an exemption or not. The CVS asked parents who did not report having an exemption whether they had considered getting an exemption but did not. In addition, all parents with exemptions at some point considered whether to take an exemption or not. Overall 26% of the surveyed Ashland parents had considered taking a religious exemption at some point, and 13% of the surveyed parents had a religious exemption based on their children's school record. That is, of those parents who came to the point of considering an exemption, roughly half, (48%) decided to get one, while the other half (52%) decided to get school required vaccinations.

It is important to remember that the overall percentage of exemptors is low among our study population. However, in the following sections of this report, we present percent rates of those who considered getting or got exemptions for sub-groups of parents that we studied. We used the questions from the survey to find smaller sub-groups of parents that were

more likely to consider or to choose exemptions for their children. While the percent rates of those considering or getting exemptions are higher within these sub-groups, the rates only apply to the small proportion of parents represented within these sub-groups. The majority of the parent population studied did not consider or get exemptions. This caveat applies to all analyses in this report that show associations with considering or having exemptions.

It is also important to look at both exemptions and consideration of exemptions. Some factors, such as those that influence a parent's judgment of the risk of vaccination, are likely to have more impact on the numbers of parents that consider an exemption. Also other factors may affect the sense of benefit from vaccination, and possibly have a greater impact on moving parents from considering an exemption to actually getting one.

Characteristics of Parents Who Answered the CVS

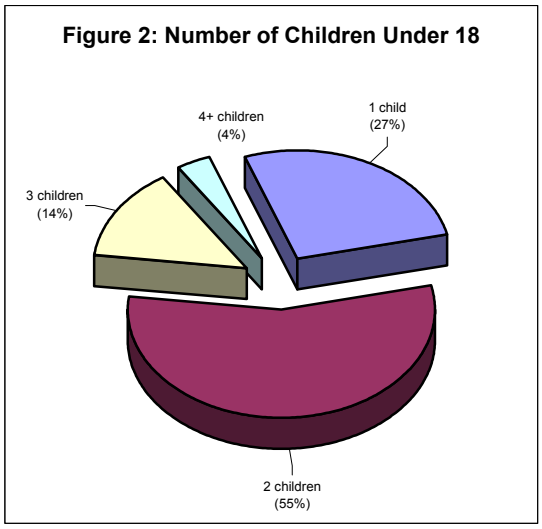
From discussions with area residents, healthcare providers, school officials and county health personnel, a number of different ideas were proposed about the characteristics of those who had religious exemptions and what was believed to distinguish exemptors from non-exemptors. Some of these initial anecdotal accounts included that parents with exemptions were younger,(or older), with higher, (or lower) income, with larger, (or smaller) families, and were either recent émigrés to Ashland or were long term residents. Clearly there was no commonly agreed on set of familial or background features that were expected in advance to distinguish exemptors from non-exemptors. Because some of the basic features of Ashland parents with and without exemptions were not well known, several questions on the CVS covered general family features. These include questions about household composition, age, finances, mobility and insurance.

Age of Responding Parent

The majority of parents reported that they were between the ages of 35 and 54. Few younger or older adults were found as parents of school children through the survey. Forty-four percent (44%) of parents were between 35 and 44, and 41% were between the ages of 45 and 54. Overall there was no relationship between the age of parent and whether their child had an exemption.

Number of Children in Household

All but one of those who responded to the survey reported that they had at least one school-aged child. Families with more than three children were comparatively rare among respondents, amounting to less than 4% of the total. The average number of children per household was 1.9, and the median household had two children. Twenty-seven percent (27%) of children were in single-child households. No important difference was found in the number of children in families with or without exemptions.



Age of Youngest Child in Household

Several questions were asked about the youngest child in the household. In part the youngest child was chosen because they were more likely than older siblings to have had recent immunizations. In 47% of families the youngest child was between the age of 5 and 10 and in 38% of families the youngest child was between 11 and 18. Only 15% of surveyed families reported having a youngest child of age 4 years or less.

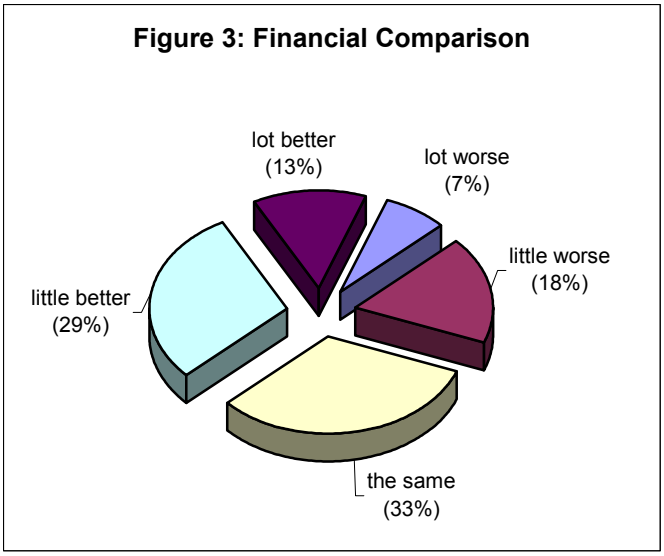
Family Mobility

The CVS asked families about the number of times they moved since their youngest child was born. It was suspected that immunizations may be impacted by mobility, or that mobile parents would be more likely to object to immunizations. Overall 24% of families reported having made no moves since their youngest child was born and 33% reported having moved only once. The average number of reported moves was 1.5 per family. No effect was observed between mobility and exemption seeking.

Financial Comparison of Families

Although many surveys ask about income, it is often a sensitive item that may discourage return of a survey or accurate reporting. A question about income also does not measure wealth, or measure the value of a lifestyle. Arguably, many residents of Ashland appear to have chosen lifestyle over higher income elsewhere. The CVS did not include a traditional survey question about income. Instead a more general measure was used of how respondents felt they were doing financially in comparison to other families

in the community. Seven percent (7%) of parents reported that they were doing a lot worse than others, compared to 13% who felt that they were doing a lot better. The majority, 62%, felt they were financially equal or a little better off than the community. Those who reported that they were doing the same as others were 1.6 times more likely to have an exemption, and those who reported that they were doing better than others were 1.7 times more likely to not have an exemption.



Health Insurance For Children

A lack of health insurance can be a major limit on either receiving accurate information about immunizations or on a parent's ability to pay for immunizations. In addition, features of some insurance plans such as high copays, deductibles and limited coverage, still pose significant barriers to parent's ability to seek immunizations for their children. Ninety-two percent (92%) of the surveyed families reported that their youngest child was covered by health insurance. However, only 80% reported having insurance that paid most of the cost of taking their child to their provider. Some of the problem with insurance not paying for children's visits may be due to the use of alternative and often uncovered providers, such as naturopaths. Yet even among children using pediatricians, only 82% of parents reported that their insurance paid all or most of the cost of visits. Children without health insurance or with inadequate health insurance were found to be 1.8 times more likely to have an exemption.

Discussion –Basic Characteristics

No strong differences were found in basic traits between families with exemptions and those without. A small difference was found in self-reported financial status. Those who reported that they were doing the same as others in the community were more likely to have an exemption, while those who reported that they were doing better than others in the community were more likely to not have an exemption.

What Ashland Parents Told Us About Their Attitudes and Sources of Information for Immunizations

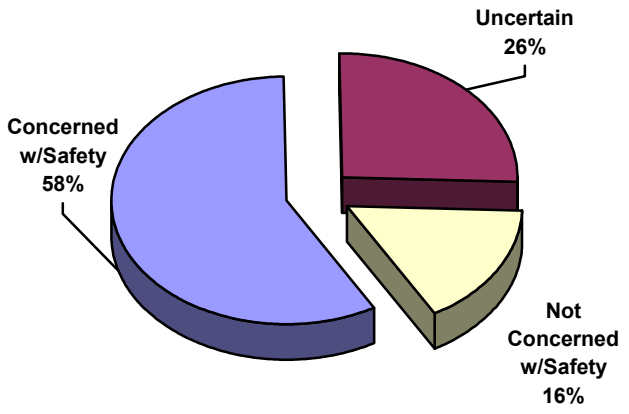
Two concerns of the CVS were to ask parents what they believed about immunizations, and to find out where they had gained their information. The CVS asked questions about parent's attitudes on issues of vaccine safety, delaying vaccines, getting all recommended vaccines, and vaccine efficacy.

Attitudes to Vaccination

Vaccine safety
The CVS included a broadly worded question about vaccine safety. Parents were asked whether they agreed or disagreed that "People should be more concerned with vaccine safety". The purpose of this question was to capture any level of concern with vaccine safety, not just those with the greatest doubt. By asking the respondent for their opinion relating to other people, and not just themselves, this question captures a contrast between vaccines as a community or social norm and the perception of risk.

"I think of vaccinations as insurance, if others do not wish to vaccinate their children, that is their right. Knowing that increasing numbers of parents choose not to vaccinate, (even though it is a small percentage) reinforces my desire to make sure my child is vaccinated because it increase the likelihood of exposure to diseases. I do not think of vaccines as making my child healthier or unhealthier – just that they are protection and prevention against disease they might or might not encounter and it is worth it to prevent." – Ashland Parent

Figure 4. Safety Concerns



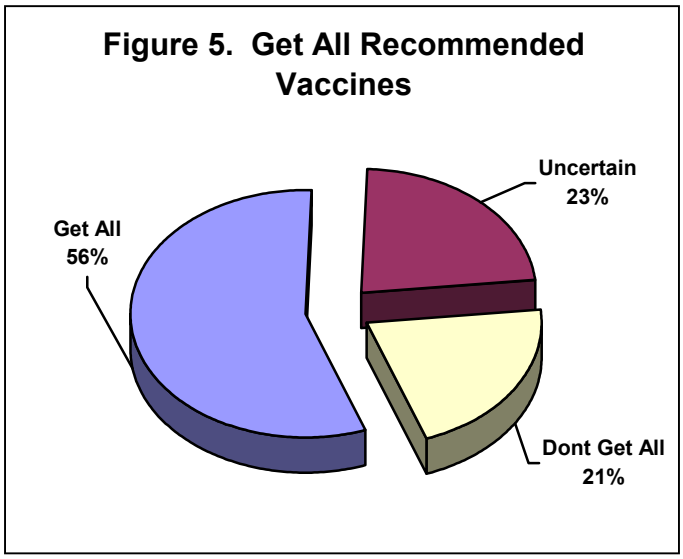
Overall 58% of parents agreed that people should be more concerned with vaccine safety. In addition, 35% of those who agreed had also considered getting an exemption. This 35% is divided between the 17% who considered an exemption but didn't get one, and the 18% who considered and got an exemption. About half (51%) of those with safety concerns

and who had considered an exemption went ahead and got an exemption. This is not significantly different from the overall rate (48%) of proceeding from considering an exemption to getting one. Those who agreed that people should be more concerned with vaccine safety were 2.7 times more likely to report that they had considered getting an exemption, as compared to those who were uncertain or who believed vaccines were safe.

The conclusion from the above data is that vaccine safety concerns are associated with a greater risk of considering exemptions, but not with a greater risk of proceeding from considering an exemption to getting one.

Getting all recommended vaccinations

Many parents have expressed concern with the number of vaccinations that children receive. Parents were asked on the CVS whether "it is important for kids to get all recommended vaccinations". Fifty-six percent (56%) of parents answered that it is important for kids to get all recommended vaccinations. Of those who agreed with the importance of getting all recommended vaccinations, only 11% considered getting an exemption, which is divided between the 8% who considered but didn't, and the 3% who considered and got an exemption. In contrast, of the 21% of parents who disagreed with getting all recommended vaccines, 55% had considered an exemption, and 42% got. This means that most of those who disagreed and considered taking an exemption also got an exemption.

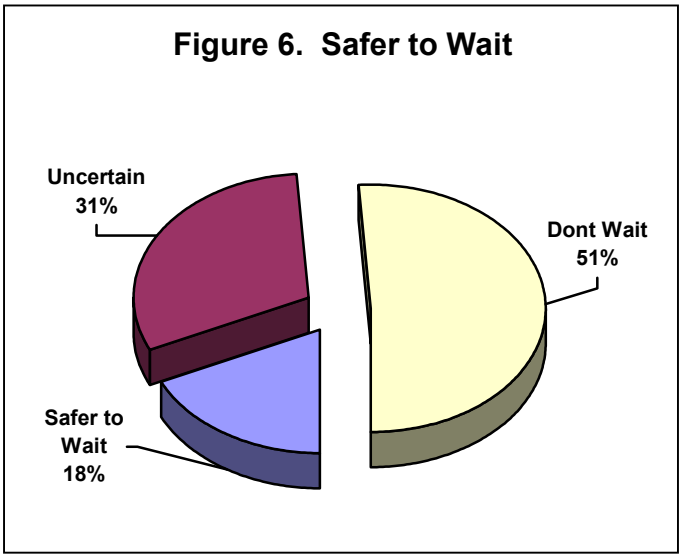


In addition only 3% of those who agreed that children should get all recommended vaccinations also had religious exemptions. This is one possible measure of "free-riders"; people who believe in immunization but who don't want the risk or cost of immunizing their own children. This implies that "free-riders" are not a major component of the parents with exemptions.

Delaying vaccination

As the majority of childhood vaccinations are due between 2 months and 24 months of age, some parents worry that they are given too early. The timing of vaccines is based on two considerations: 1) severity of disease to younger infants; and 2) passive immunity passed from mother to infant. Vaccines, such as for Pertussis or Hib, are given at an early age because young children are the most vulnerable to these diseases. Measles on the other hand is delayed until 12 months because of the waning immunity. The recommended well-child visit schedule is based on the immunization schedule in order to keep children on track with immunizations.

> *"I would trust vaccination recommendations more if they didn't push immunizing 2-month-olds." – Ashland Parent*



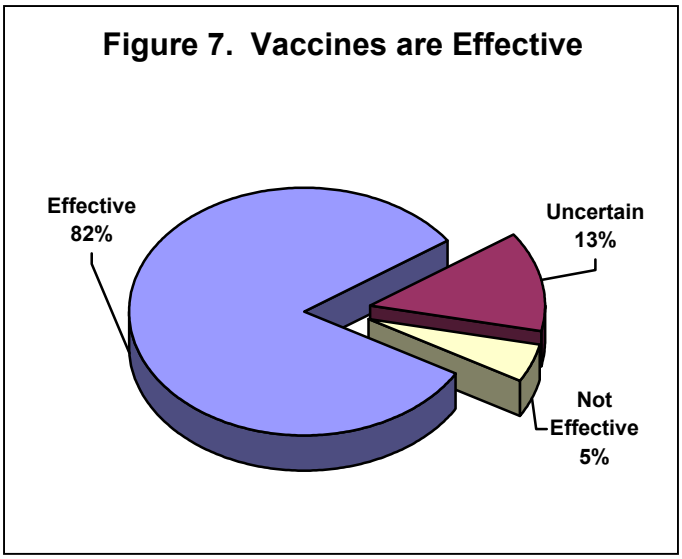
On the CVS parents were asked if it is "safer to wait as long as possible before getting vaccinations". Only 18% of parents agreed that it is safer to wait. Forty-four percent (44%) of those who agreed with waiting had considered exemptions, and 30% had gotten exemptions. In contrast, only 13% of those who disagreed with waiting had considered an exemption, and 5% got one.

Those who agreed that it is safer to wait were 3.4 times more likely to consider an exemption, and 6.4 times more likely to have one.

Vaccine efficacy

Along with vaccine safety, parent's belief that vaccines are effective at preventing disease is a key factor in choosing to get an exemption.
Only a minority of parents questioned whether vaccination is effective at preventing disease. Among parents who did not believe that vaccines are effective, 44% had considered getting an exemption, and all of those who considered an exemption went on to get one. For parents who were uncertain whether vaccines are effective, 51% had considered taking an exemption,

and 35% had one. This means that 77% of those who were uncertain and who had considered getting an exemption, got one. For those who believed that vaccines are effective, 21% considered taking an exemption, and 7% had one.



Among parents, those who were uncertain or disagreed that vaccines were effective at preventing disease were 2.3 times more likely to consider getting an exemption. Overall those that doubted efficacy were 5.5 times more likely to have an exemption.

Safety and efficacy discussion

As mentioned in the design section, satisfaction or dissatisfaction with vaccinating children is influenced by a balance of perceived risk against a sense of individual or community benefit. Among the attitudinal measures, one measure of perceived risk is parental concern over vaccine safety. As noted, parents that reported doubts about vaccine safety also had thought more about taking exemptions.

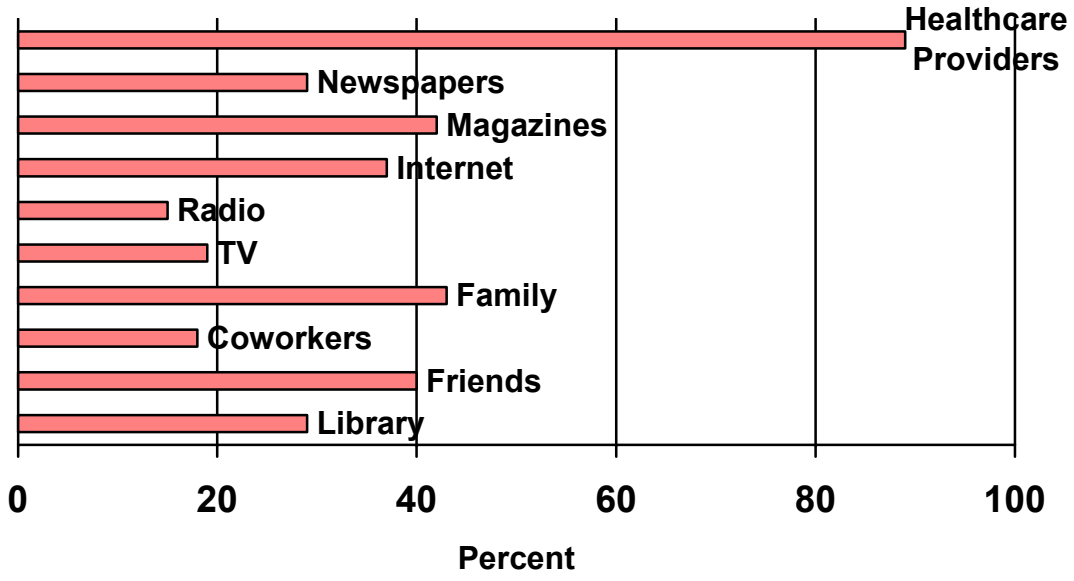
Among parents who answered both the questions about safety and efficacy, 91% of those who believed vaccines are safe also believed that vaccines are effective. Among these parents that believed both, only 5% considered getting an exemption, and 1% had an exemption.

The parental attitude about vaccine effectiveness is one measure of the perceived benefits of vaccination. A parent who doubts vaccine effectiveness will see less benefit in vaccination than will a parent who believes that vaccines are effective. Within the survey data, as shown above, 100% of parents who did not believe that vaccines are effective, and who also had considered getting an exemption, got an exemption. This supports the idea that parents are likely to consider getting an exemption based on perceived risk, but that proceeding from considering one to taking one depends highly on a perceived lack of benefit from vaccination.

Sources of Information

The CVS asked parents to identify (from a list) their sources of trusted healthcare information. The following discussion breaks these sources down into the categories of healthcare providers, media-sources, and social-community sources.

Figure 8: Sources of Information, (N=394)



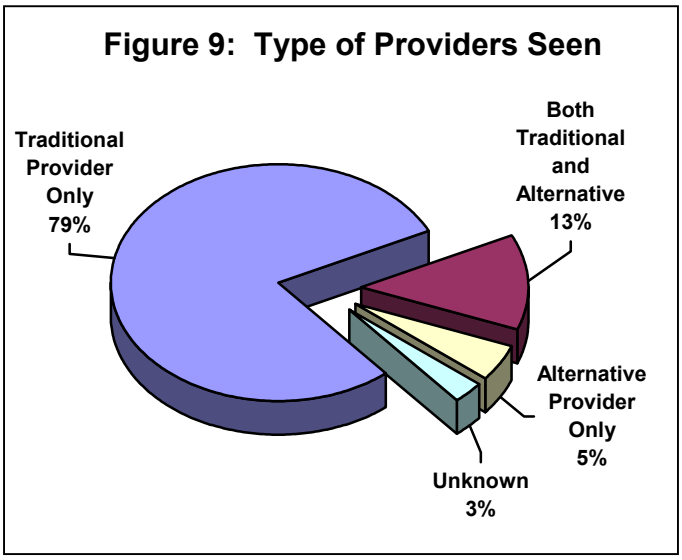
Healthcare Providers

Overall 89% of parents reported that their healthcare providers were trusted sources of information; 25% of those listing their providers had considered an exemption, and 12% had an exemption. More importantly, of the 11% who did not list their healthcare provider as a trusted source, 36% had considered an exemption, and 19% had one. Those parents who reported that their provider was a trusted source were 1.4 times less likely to have considered taking an exemption, and were slightly if not significantly less likely to proceed from considering to actually taking an exemption.

The CVS included several questions about the providers that parents took their children to, and the types of immunization advice that parents received from their providers.

Types of Providers

In total, 97% of parents reported having at least one healthcare provider for their child and many parents reported using more than one type of provider for their child's healthcare. Most parents, 79%, reported that they only took their child to a traditional provider such as a family practitioner or pediatrician, compared to 5% who sought care only from alternative practitioners such as naturopaths, chiropractors or homeopaths. Thirteen percent reported taking their child both to a traditional provider and to an alternative provider.



The CVS asked parents, with multiple providers, who had the most important role in vaccinating their child. The majority of parents, 77%, reported that a family practitioner or pediatrician had the most important role. However among parents reporting that a family practitioner or pediatrician had the most important role, 22% reported that they had considered taking an exemption, and 5% took an exemption.

The Role of Provider Advice

The CVS included two questions about the type of advice that parents recalled receiving from their providers. The first was whether parents recalled a discussion of the pros and cons of vaccination. It was expected that a greater level of these would, for most parents, increase their perception of risk, and possibly lower their perception of individual benefit. Thus it was expected that remembering a discussion of the pros and cons would be related to considering and getting exemptions.

> *"With my first child, health care professionals seemed to discuss the importance of vaccines much more – and remind – here it seems up to parents to request immunizations." – Ashland Parent*

The second question was about what parents recalled their provider telling them regarding vaccination, such as to get all vaccines, to get some but not others, or not to get vaccines. This question was intended to consider the normative role that providers have for most parents regarding their children's health. The expectation was that for parents considering an exemption, having a provider tell them to get all would reinforce the normative aspect of vaccination, and increase their perceived benefit from vaccination. Thus the provider advice type was expected to influence the rate at which parents considering exemptions proceeded to get exemptions.

Discussions of Pros and Cons

Overall 23% of parents reported that their providers discussed the pros and cons of vaccination a lot, 53% reported some discussion of the pros and cons, and 24% said that their providers did not discuss the pros and cons. Among parents who reported that their providers discussed a lot the pros and cons of vaccination, 30% considered getting an exemption, and 19% got one. Among those whose providers gave some discussion of the pros and cons, 30% considered getting an exemption, and 14% got one. Among parents whose providers did not discuss the pros and cons, 15% considered getting an exemption, and only 4% got one. Those parents who remember their providers discussing the pros and cons were 1.9 times more likely to have considered an exemption, and 4.1 times more likely to have one.

Parents using only pediatricians and family practitioners show a similar pattern. For these parents, those whose providers discussed the pros and cons a lot were 1.6 times more likely to consider an exemption than those who did not have a discussion, and were 3 times more likely to have one.

Type of Provider Advice

Overall 57% of parents said that their provider told them to get all vaccinations, 13% said that their provider told them to get some and not others, and only 2% said that their providers told not to get vaccinations. 27% reported that their provider did not tell them what to do.

Among parents who reported that their providers told them to get all vaccinations, 21% considered getting an exemption, and 4% got one. Among those whose providers told them to get some but not others, 34% considered getting an exemption, and 24% got one. Among parents whose providers did not tell them what to do, 32% considered getting an exemption, and 19% got one. From this data the important factor appears to be whether the parent

was told by a provider to get all vaccinations for their child. Those parents with providers who told them to get all vaccinations were 1.5 times less likely to have considered getting an exemption, and 5 times less likely to have an exemption.

Provider Conclusion

The great majority of Ashland parents, 89%, reported that their provider was a trusted source of healthcare information. The majority of parents in Ashland also use and depend on traditional medical providers. Providers have a significant level of influence on parents, both on their perception of risk and of benefit to vaccination. If providers reinforce parent's perceptions of risk or lack of benefit through discussions of pros and cons, it appears that parents are more likely to consider and take exemptions. On the other hand, when providers tell parents to give their children all vaccinations, then parents are much less likely to consider or take exemptions.

Anecdotally, some community members consider a small handful of alternative providers to be responsible for exemption seeking by Ashland parents. Others believe that either many providers have experienced some drift of practice from allopathic norms, or that some other factors, possibly including features of provider behavior for immunizations, have diminished their influence with parents.

A simple test of the idea that alternative providers are causing anti-vaccine sentiment is to consider that 45% of those with exemptions reported that their children went only to traditional providers, 36% reported that their children used both alternative and traditional providers, and 18% reported relying exclusively on alternative providers. Thus exemptions are spread across provider types.

However exemptions and vaccine concerns are more concentrated among parents reporting the use of alternative providers. Among parents reporting that they used an alternative provider for their child, 50% reported considering taking an exemption, and 38% had an exemption. Among parents who used only family practitioners or pediatricians, 21% reported that they had considered an exemption, and only 6% proceeded to get one. Parents using alternative providers were 2.4 times more likely to have considered an exemption, and 5.5 times more likely to have an exemption.

Thus while children with exemptions are spread across practice types, the use of alternative providers is associated with greater rates of considering and taking exemptions. However the findings here about provider discussions and advice may suggest that the type of provider is secondary to the type of advice and information that parents receive from their providers.

Media

Parents were asked whether they got trusted information from Newspapers, Magazines, the Internet, Radio, or Television. Most parents reported multiple sources of information.

All media sources, except for Newspapers, were associated with small increases in the chance of considering exemptions (see appendix table 2). For example, 37% of parents reported the Internet as a trusted source of information, and those who reported trusting the Internet were 1.4 times more likely to have considered an exemption. Only 15% reported getting trusted information from the Radio, as compared to 19% for Television. With parents reporting multiple sources of trusted information, it was difficult to say which sources had the most influence on considering exemptions.

In comparing media sources and having exemptions, Magazines was the only trusted source of information associated with an increased chance of having an exemption. The CVS found that 42% of Ashland parents reported that Magazines were a source of trusted healthcare information. Those parents who got information from Magazines were 1.7 times more likely to have an exemption than those who didn't report Magazine use. While we did not ask about specific publications in this survey, we do know that recently a number of magazines, such as *Mothering,* have featured articles from a point of view critical of vaccination.

Media Discussion

One finding from this data is that parents with media sources of information have higher rates of considering exemptions compared to those who relied on healthcare providers and/or social networks. However, with the exception of magazines, this use of media sources is not statistically associated with higher rates of exemptions. Exposure to media likely provides a boost to the perception of risk from vaccination. Most media sources don't increase the chance of progressing from considering an

exemption to getting one. In fact, the local media as represented by newspapers, television and radio all appeared to lower the chance of progressing from considering exemptions to getting one.

Social & Community Sources

The items in this category for sources of information include Family, Coworkers, Friends, and the Library, and fall into two camps – those sources that support vaccination and those which support exemptions. Forty-three percent (43%) of parents reported trusting their family for healthcare information, and 18% reported trusting coworkers. Both of these sources of information are associated with a reduction in the chance of having considered an exemption. Neither of these however has a statistically significant association with exemption rate.

Conversely parents who reported their friends, (40%), and the library, (28%), as trusted sources were at elevated risk for both considering and having exemptions. Those reporting that their friends were a source were 1.5 times more likely to have considered an exemption, and 1.5 times more likely to have an exemption. Those reporting the library as a source were 1.7 times more likely to have considered an exemption and 2.1 times more likely to have an exemption.

Social & Community Source Discussion
Getting healthcare information from Family and Coworkers is, in general, not associated with exemptions. However Friends and the Library as sources of trusted information are associated with a greater chance of considering exemptions and of having one.

Media Versus Social Information

Parents are exposed to many sources of information that may change their perceptions of the potential risks and benefits to vaccination. Media and social contacts, as reported in the last section, both have the potential to influence parents.

The perception of risk and benefit to vaccines is most dramatically changed for parents who are exposed either to accounts of allegedly vaccine-hurt children, or who are exposed to children hurt by disease.

The CVS included a set of questions about from where parents had learned of vaccine-hurt children. These questions fit together to provide a measure of how close or distant the source of information was from the parent. This measure has four levels:

> **No Awareness**– the parent had no knowledge of children allegedly hurt by vaccines.
>
> **Media Only Source**– the parent answered only that they had heard or read about vaccine-hurt children.
>
> **Mixed Source** –the parent had heard or read of vaccine-hurt children, as well as knowing of hurt children. This reflects exposure to accounts of vaccine-hurt children from more personal or social sources.
>
> **Social Source** -the parent had heard or read of vaccine-hurt children, knew of hurt children, and personally knew someone with a hurt child. This personal level, of knowing someone with an allegedly vaccine-hurt child, is based in a parent's social network or community.

These provide a measurement of how personal or distant the accounts of vaccine-hurt children are to the parent. This is also one measure of the parent's perception of risk to vaccination. The closer the knowledge of perceived harm, the greater the perceived risk will be. This item also provides a bridge between the earlier findings about media and social influences on exemptions.

Overall 20% of parents reported no knowledge of vaccine-hurt children. The Media Only category had 41% of parents, the Mixed category had 16% of parents, and the Social category had 23% of parents.

A finding here is that the chance of considering an exemption is associated with a closer social distance to accounts of alleged vaccine-hurt children. For those with no knowledge of vaccine-hurt children, only 11% considered taking an exemption. For those in the Media category, 19% considered taking an exemption; 34% of parents in the Mixed category considered

taking an exemption; and 45% of those in the Social category considered an exemption.

Similarly, the chance of having an exemption is associated with closer social distance to accounts of vaccine-hurt children. For those with no knowledge of vaccine-hurt children, only 4% had an exemption. For those in the Media category, 7% had an exemption; 13% of parents in the Mixed category had an exemption; and 30% of those in the Social category had an exemption.

Almost all categories had similar rates of proceeding from considering exemptions to having one. Remember that an earlier statistic was that overall, about half (48%) of parents who considered an exemption proceeded to having one. Here, for all categories except for Social, 36% to 38% of those who considered an exemption got one. So while parents' chances of having considering an exemption increased with closer social distance to accounts of more personal knowledge of alleged vaccine hurt children, the chances of progressing from consideration to exemption did not.

The exception to this is for parents in the Social category. Those parents who reported that they knew someone with a vaccine hurt child had a substantially higher rate of progressing from considering an exemption to getting one, 66%. From this it is possible that parents who believe that they have personal knowledge of a vaccine hurt child may not see a benefit to vaccination.

"Doctors telling me they are safe are not as convincing as children who react to vaccinations." – Ashland Parent

A limitation on these findings is in the nature of parent's knowledge of vaccine-hurt children. These are subjective items, measuring what parents believe rather than a medically determined reality. The accounts of vaccine-hurt children to which parents have been exposed may be from real reactions to vaccines, from coincidences in timing, or even possibly from urban myths. The urban mythic form is that the event happened a step and a half away in a social network from the teller of the myth, such as "this really happened to a kid belonging to a friend of my sister." The CVS did not include items to determine which of these categories the perceived close knowledge of vaccine-hurt children fall into.

There are two conclusions from the above. The first is that accounts of vaccine hurt children from the media are widespread, and are a common

source of increasing the perceived risk of vaccinating children. Across all categories, 80% of parents reported that they had heard or read of vaccine-hurt children. However, personally or socially having connections to allegedly vaccine hurt children appears to have a far stronger impact on exemption seeking.

Perception of Risk and Perceived Vaccine Safety
The above question for the knowledge of allegedly vaccine-hurt children is a measure of the perceived risk of vaccination. A prior expectation is that this measure is highly associated with the attitudinal measure of concern over vaccine safety. For those parents with no knowledge of vaccine-hurt children, only 35% were concerned with vaccine safety. For those in the Media Only category, 45% were concerned with vaccine safety. For those in the Mixed category, 66% were concerned. For those in the Social category, 89% of parents had a concern with vaccine safety.

Perception of Risk and Perceived Vaccine Efficacy
The question from the above was whether a close, personal or social connection to allegedly vaccine-hurt children would also influence the perception of vaccine benefit as well as risk. The parent's attitude to vaccine efficacy was used as a measure of perceived vaccine benefit. If a close connection decreases the perceived benefit, then this should be evident in looking at attitudes of vaccine efficacy.

Among parents with no knowledge of vaccine-hurt children, or those in the Media Only category, there is only a slight effect on the belief in vaccine efficacy: 91% of parents with no knowledge, and 92% of those in the Media Only category agreed that vaccines are effective at preventing disease. For parents in the Mixed category, 80% agreed that vaccines are effective. Only 65% of parents in the Social category agreed that vaccines are effective. Thus increasingly personal or social connections to accounts of vaccine harm appear to influence not only the perception of risk, but also the perception of benefit from vaccination.

> "No parent wants to give their child a shot but I have witnessed several children of friends with whooping cough after taking the "P" out of DPT. Was a reminder that disease still lingers. – Ashland Parent

Conclusion

This study sought to identify factors that influenced Ashland parents to consider or seek exemptions to school immunization requirements. Within the limitations of survey research, the Community Vaccination Survey determined associations between exemptions and relevant factors.

Overall the CVS reinforced that the majority of parents in Ashland believe that vaccines are effective and their children should receive all recommended vaccines. Among the study population the overall percentage of parents with exemptions was 13%. However for some sub-groups of parents we found much higher percent rates of parents who considered getting or got exemptions. Sub-groups were based on parent answers to some of our survey questions. It is important to remember that, while the percent rates of those considering or getting exemptions are high within some sub-groups, these higher rates do not imply that the majority of parents are at risk of taking exemptions or necessarily disagree with immunizing school children. While some parents have concerns that are associated with considering or getting exemptions, data from this study show that the majority of the parents population studied did not consider or get exemptions.

The decision to *seek* an exemption is based, for most parents, on a balance between perceived risk and perceived benefit from vaccination. Going into the study it was believed that the perception of risk would be closely related to a parent's willingness to consider taking an exemption. These findings support this position. The factors that appear most significantly associated with *considering* exemptions and with the perception of risk from vaccination include concerns with vaccine safety, concerns with the timing of vaccinations, provider discussions, relying on information from friends and the local library, having read or heard from the media about allegedly vaccine-hurt children, and the use of alternative healthcare providers.

In contrast, the sense of benefit from vaccination has more of an impact on progressing from considering to *taking* exemptions. Factors that appear to be associated with a sense of benefit, (or lack of), include whether the parent knows someone with an allegedly vaccine hurt child, whether providers told the parent to get all the recommended vaccines, and whether the parent believes that vaccines are effective at preventing disease.

Another finding from this study is that the vast majority of parents in Ashland who seek religious exemptions have anti-vaccine sentiments, as opposed to taking exemptions out of convenience.

Provider advice appears in the data to have a significant role in the parent's sense of risk and benefit, to the extent that providers are relied upon as experts or authorities by parents in determining risk and benefit. The type of advice, or lack of a pro-vaccination message, from a provider appears strongly related to exemption seeking by parents.

At the current time, outbreaks of Pertussis in southern Oregon and elsewhere are a reminder that vaccine preventable diseases still exist and can still threaten our communities. For the purposes of public health in the Ashland community, any drift away from the acceptance of vaccination as a community norm, whether by the public or by local healthcare providers, may open the door to further disease outbreaks.

Appendix:

Table 1: Percent of Respondents with Selected Beliefs and Characteristics, CVS Survey, Ashland, Oregon, 2002.

Beliefs and Characteristics[1]	Percent
Vaccine Safety Concerns: (N=388)	
Concerned about safety of vaccines	57.9%
Uncertain	26.1%
Not concerned about safety of vaccines	15.9%
Recommended Vaccines: (N=389)	
Should not get all recommended	20.7%
Uncertain	23.1%
Should get all recommended	56.2%
Waiting for Vaccinations: (N=385)	
Safer to wait	18.2%
Uncertain	31.4%
Safer not to wait	50.4%
Vaccines Efficacy: (N=388)	
Vaccine are not effective	4.9%
Uncertain	12.5%
Vaccines are effective	82.6%
Provider with Most Important Immunization Role (N=404)	
Chiropractor	0.9%
County Health Dept	5.4%
Pediatrician/Family Practitioner	75.5%
Homeopath	4.0%
Naturopath	4.1%
Nurse Practitioner	4.9%
Other	5.2%
Discuss Pros and Cons (N=385)	
Provider did not discuss	24.2%
Provider discussed some	53.2%
Provider discussed alot	22.6%
Type of Advice (N =380)	
Provider recommended not getting any	1.2%
Provider recommended getting some	11.3%
Provider recommended getting all	60.3%
Provider didn't make recommendation	27.2%

Beliefs and Characteristics[1]	Percent
Sources of Information[2]: (N=394)	
Healthcare Providers	88.9%
Newspapers	29.1%
Magazines	42.3%
Internet	36.6%
Radio	14.7%
Television	19.0%
Family	42.7%
Coworkers	18.2%
Friends	40.3%
Library	28.5%
Sources of Awareness of Accounts of Vaccine Hurt Children (N = 357)	
No knowledge of vaccine hurt children	19.8%
Media Only (read or heard about)	41.4%
Mixed (know of, & read/heard about)	16.2%
Social/Personal (know someone with, & know of, & read/heard about)	22.6%

1 Based on parental responses to questions about their perceptions or beliefs on this topic.

2 Sources are not mutually exclusive. Parents may have responded with one or more sources.

Table 2. Prevalence Rates for *Considering an Exemption* and *Getting an Exemption* for select items, CVS Survey, Ashland, Oregon, 2002.

Beliefs and Characteristics[1]		Considered Exemption[2] Rate[3]	Got Exemption Rate[3]
Concern about safety of vaccines	yes	35.5%	18.0%
	unc	16.5%	6.0%
	no	7.0%	1.4%
Should not get all recommended vaccines	yes	55.3%	42.5%
	unc	37.7%	10.1%
	no	10.9%	2.6%
Safer to wait until child is older	yes	44.0%	30.1%
	unc	37.2%	14.3%
	no	12.9%	4.7%
Vaccines are not effective	yes	43.5%	43.5%
	unc	50.7%	35.2%
	no	20.8%	6.9%
Sources of Information:			
Healthcare Providers	yes	24.8%	11.7%
Newspapers	yes	31.4%	11.6%
Magazines	yes	34.3%	16.3%
Internet	yes	33.1%	15.2%
Radio	yes	40.1%	16.8%
Television	yes	33.7%	10.4%
Family	yes	26.1%	11.6%
Coworkers	yes	27.0%	11.1%
Friends	yes	33.5%	15.9%
Library	yes	36.9%	19.9%

1 Based on parental responses (yes, uncertain, or no) to questions about their perceptions or beliefs on this topic

2 Includes parents who got an exemption for their child and those that considered but did not get.

3 The denominator for the rates for *Considered Exemption* and *Got Exemption* is the total number of respondents.

Table 3. Relative Risks (RR) for *Considering an Exemption* and *Getting an Exemption* among those with select beliefs and characteristics, CVS Survey, Ashland, Oregon, 2002.

Beliefs and Characteristics[1]		Considered Exemption[2] Relative Risk[3] (95% CL)	Got Exemption Relative Risk[3] (95% CL)
Concern about safety of vaccines	yes	2.75 (2.21-3.42)	4.21 (2.69-6.58)
Should not get all recommended vaccines	yes	2.96 (2.48-3.53)	8.89 (6.55-12.04)
Safer to wait until child is older	yes	1.98 (1.63-2.41)	3.58 (2.59-4.95)
Vaccines are not effective	yes	1.76 (1.25-2.46)	4.10 (2.69-6.24)
Sources of Information:			
Healthcare Providers	yes	0.47 (0.34-0.63)	0.60 (0.38-0.94)
Newspapers	yes	1.13 (0.85-1.50)	0.90 (0.61-1.31)
Magazines	yes	1.61 (1.23-2.09)	1.67 (1.18-2.33)
Internet	yes	1.40 (1.07-1.83)	1.39 (0.98-1.95)
Radio	yes	1.50 (1.07-2.08)	1.42 (0.93-2.17)
Television	yes	1.39 (1.11-1.72)	0.80 (0.50-1.26)
Family	yes	0.66 (0.52-0.82)	0.88 (0.62-1.24)
Coworkers	yes	0.66 (0.49-0.89)	0.86 (0.54-1.36)
Friends	yes	1.51 (1.15-1.96)	1.55 (1.10-2.16)
Library	yes	1.73 (1.32-2.26)	2.08 (1.49-2.90)

1 Based on parental responses (yes, no, or uncertain) to questions about their perceptions or beliefs on this topic.
2 Includes parents who got an exemption for their child and those that considered but did not get.
3 Relative Risk for considering an exemption or getting an exemption compared to those parents who with responses in all 'uncertain' or 'no' answer categories. 95% confidence limits (CL) are included in parentheses.