Public opinion on childhood immunisations in Iceland

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3 A B S T R A C T
4 Introduction: In recent years, vaccine preventable diseases such as measles and pertussis have been re-emerging in Western countries, maybe because of decreasing participation in childhood vaccination programs in some countries. There is clear evidence for vaccine efficacy and the risk of adverse effects is low. This needs to be communicated to the general public. The aim of the study was to evaluate the public opinion on childhood vaccinations in Iceland.

5 Materials and methods: An internet based study was used to evaluate the opinion on childhood immunisations in Iceland. The cohort was divided in three groups: (a) general public (b) employees of the University Hospital Iceland and (c) employees (teachers and staff) of the University of Iceland. The cohorts could be stratified according to age, gender, education, household income, parenthood and residency.

6 Results: Responses were received from 5584 individuals (53% response rate). When asked about childhood vaccinations in the first and second year of life, approximately 95% of participants were “positive” or “very positive”, approximately 1% were “negative” or “very negative”. When participants were asked whether they would have their child immunized according to the Icelandic childhood vaccination schedule, 96% were “positive” or “very positive”, 1.2% were “negative” or “very negative”. Similarly, 92% trust Icelandic Health authorities to decide on childhood vaccination schedule, 2.3% did not. In total, 9.3% “rather” or “strongly” agreed to the statement “I fear that vaccinations can cause severe adverse effects”, 17.5% were undecided and 66.9% “disagreed” or “strongly disagreed”. Individuals with higher education were more likely to disagree with this statement (OR = 1.45, CI95 = 1.29–1.64, p < 0.001) as did males (OR = 1.22, CI95 = 1.087–1.379, p = 0.001).

7 Conclusion: This study shows a very positive attitude towards vaccinations raising expectations for an ongoing success in preventing preventable communicable diseases in childhood in Iceland.

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1. Introduction

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these diseases, people worry more about the possible side effects [10–14]. This has resulted in less participation in childhood vaccination in some countries [15].

The childhood immunisation program in Iceland consists of vaccinations against diphtheria, pertussis, tetanus, poliomyelitis, Haemophilus influenzae type b and pneumococcus at 3, 5 and 12 months, meningococcus C at 6 and 8 months and measles, mumps and rubella at 18 months of age. A booster with diphtheria, tetanus and pertussis is given at age four and again at fourteen years of age combined with poliomyelitis. A booster of measles, mumps and rubella is given at age twelve as well as human papilloma virus vaccine.

To maintain high vaccine coverage, prevent diseases and achieve adequate herd effect, it is important to provide parents with evidence based information on the success of immunisations as well as possible side effects [16–18]. It is our opinion that extensive vaccine uptake and subsequent effective results in reducing vaccine preventable diseases must be founded on good cooperation and mutual agreement between parents and health care professionals, built on sound, evidence based facts. In order to achieve this, knowledge on the general opinion on immunisation is mandatory.

Therefore, a study was conducted on a large cohort in Iceland, evaluating the public opinion on childhood immunisations.

2. Materials and methods

An internet based survey was conducted in Iceland during the winter 2013–2014 to evaluate the public opinion on childhood immunisations. The cohort was divided in three groups: (a) general public (b) employees of the University Hospital Iceland and (c) employees (teachers and staff) of the University of Iceland.

The general public cohort was collected and approached by The Social Science Research Institute of The University of Iceland and was based on a well-defined cohort of almost 5000 individuals in Iceland. The participants were older than 18 years of age, randomly selected from the National Register of Iceland, who had accepted to participate in surveys conducted by The Social Science Research Institute on a regular basis. The composition of this cohort was monitored for gender, age distribution, residency (urban vs. rural), education and household income. Given the very high internet usage in Iceland and the probabilistic nature of the recruitment, the online panel was representative of the population in Iceland and its validity has been repeatedly tested and evaluated [19].

The survey (LimeSurvey®) sent out to employees of the University Hospital and University of Iceland was addressed to all individuals employed at these institutions at the time of the study.

The internet based survey was sent to all these individuals with e-mails and followed up twice for those who had not responded. Questions on immunisation were graded into five categories (very negative, negative, undecided (neither positive nor negative), positive and very positive as well as don’t know (unsure) or no answer).

The questionnaire consisted of 11 questions on childhood immunisations and trust in the Icelandic health authorities and a few questions to gather background and demographic information. The questions presented in this study are shown in Table 1. Individuals at the University Hospital were also asked about their occupation at the hospital and the department or service where they were employed. Participants at the University of Iceland were asked about their school or faculty within the university and when employed at the School of Health Sciences they were further asked about the faculty (faculty of medicine, nursing etc.).

All answers were anonymous and in our calculation all groups comprising less than 20 individuals weren’t evaluated or analysed further.

Table 1

<table>
<thead>
<tr>
<th>Questions evaluating the public opinion towards childhood immunisations in Iceland. Answers to the questions How positive or negative are you towards the following? were graded into the five categories; very negative, negative, undecided (neither positive nor negative), positive and very positive as well as don’t know (unsure) or no answer. For the questions Do you agree or disagree with the following? The answers were similarly graded into the categories strongly agree, agree, undecided, disagree or strongly disagree as well as don’t know (unsure) or no answer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>How positive or negative are you towards the following?</td>
</tr>
<tr>
<td>-Childhood immunisations in the first year of life according to the Icelandic schedule (diphtheria, pertussis, poliomyelitis and the bacteria Haemophilus influenzae type b, pneumococcus and meningococcus C)</td>
</tr>
<tr>
<td>-Childhood immunisations in the second year of life according to the Icelandic schedule (measles, mumps and rubella)</td>
</tr>
<tr>
<td>Do you agree or disagree with the following?</td>
</tr>
<tr>
<td>-I would have my child vaccinated according to the Icelandic schedule</td>
</tr>
<tr>
<td>-I trust Icelandic health authorities to decide on the vaccination schedule</td>
</tr>
<tr>
<td>-I fear that vaccinations can cause severe adverse effects</td>
</tr>
<tr>
<td>-I believe that naturally acquired infections provide better protection against infections than vaccinations</td>
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</table>

Statistical calculations were done in SPSS (Version 20) using binary multivariable logistic regression to evaluate which variables were associated with the participants’ opinion. This method was also used to compare the opinion of different professions within the University Hospital i.e. doctors, nurses and midwives. Similarly, this method was used to compare different schools within the university. As little difference was established between these groups, the answers were pooled together for statistical calculations in addition to analysing the separate groups.

The study was approved by The National Bioethics Committee (VSNb2014010002/03.11), the authorities of The University Hospital and The University of Iceland and a notification was sent to the Data Protection Authorities in Iceland.

3. Results

The survey was sent out to a total of 10,544 individuals, responses were received from 5584 (53%). The demographics of the participating individuals are described in Table 2

Approximately 95% of participants were “positive” or “very positive” towards childhood vaccinations in the first or second years of life whereas approximately 1% were “negative” or “very negative” (Fig. 1). Males responded more often “very positive” to this question (OR = 1.48, CI95 = 1.23–1.77, p < 0.001) as did individuals married or living together (OR = 1.44, CI95 = 1.18–1.76, p < 0.001). Being a parent had no significant association with attitudes towards childhood vaccinations in our study.

Compared to the general public, University Hospital employees were more likely to be “very positive” (OR = 3.60, CI95 = 2.78–4.67, p < 0.001) as were University of Iceland employees (OR = 2.05, CI95 = 1.45–2.98, p < 0.001).

Individuals in the general public cohort with household income above the average were also more likely to answer “very positive” (OR = 1.54, CI95 = 1.12–2.13, p = 0.008).

In the three cohorts, 62 individuals of the 5584 responders (1.1%) were “negative” or “very negative” towards vaccinations in the first two years of life. These individuals were more likely to distrust health authorities, feared vaccinations and did not believe that vaccinations prevented infections. This small group was otherwise not distinguishable from the whole cohort in terms of background variables.

When participants were asked whether they would have their child immunized according to the Icelandic childhood vaccination schedule, 95.3% were “positive” or “very positive”, 1.2% were “negative” or “very negative” and 3.4% were neither positive nor negative, unsure or did not answer (Fig. 2). Similarly, 92% trust Icelandic
Health authorities to decide on childhood vaccination schedule, 2.3% did not. Others were undecided or did not answer this question.

Replies to the statement “I fear that vaccinations can cause severe adverse effects” revealed for the combined cohort a total of 9.3% “rather” or “strongly” agreed, 17.5% were undecided and 66.9% “disagree” or “strongly disagree”. The three cohorts were similar but individuals from the University or The University Hospital more often answered “disagree” or “strongly disagree” (Fig. 3). Individuals with higher education were more likely to disagree with this statement (OR = 1.45, CI95 = 1.29–1.64, p < 0.001) as did males (OR = 1.22, CI95 = 1.087–1.379, p = 0.001).

Seventeen percent of respondents thought that naturally acquired infections provided better protection than immunisations.

Within The University Hospital cohort, attitude towards childhood vaccinations was in general very positive and there was little fear of adverse effects, doctors being in all questions more assertive (“very positive” or “strongly disagree”) than nurses or midwives. Similarly, within the cohort of The University of Iceland, the employees at the School of Health Sciences were more assertive in their opinion (“very positive” or “strongly disagree”) than other employees. In general the attitude was “positive” or “very positive” to all questions except fear of adverse effects when two third of respondents “disagreed” or “strongly disagreed” to fear of vaccinations.

4. Discussion

This study shows a very positive attitude towards childhood immunisation in Iceland which is encouraging. In Iceland, as in other countries [20], childhood immunisation has been extremely successful in controlling vaccine preventable diseases. Our results therefore raise expectations for an ongoing success in preventing preventable communicable diseases in childhood.

An overwhelming majority of responders have confidence in Icelandic health authorities when asked about immunisation schedules. This trust can be regarded as a prerequisite for accepting health related information from health professionals as they are the strongest and most reliable source for parents [15,16,21].

Our study reveals that less than 10% of participants fear severe adverse reactions of childhood immunisations. Other studies have

Fig. 1. Attitude towards childhood vaccinations in the first and second years of life from all three cohorts; general public, employees of The University Hospital and employees of The University of Iceland (total 5584 individuals). Answers to the two questions compiled.

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indicated a substantially higher rate but this skepticism may vary between countries and vaccines. A recently published study from Seattle USA, described 58% of parents having concerns about severe adverse effects of childhood vaccinations in general and one third was hesitant regarding their child’s vaccinations [22]. It has also been described in studies from USA that less than 25% of parents claim that they have no concerns for the general immunisations [17,22]. On the other hand, almost 80% of parents in another study from USA believed that immunisations are important and safe for their children [16]. In our study, higher education was associated with less fear of severe adverse effects. This indicates that more knowledge and better information may result in less concern.

Health care professionals play an important role in this education [16–18] and strangely, one of the most important reasons for parents postponing or abandoning immunisation is information from health care professionals according to a recent study [23].

Less than 10% of participants in our study had concerns or fear of vaccine adverse effects while at the same time more than 95% of participants had a positive attitude towards childhood vaccinations and intend to have their children vaccinated. Males and individuals with higher education were more likely to disagree with the statement of fearing immunisation. It is natural for parents to have concerns for all interventions for their young child. However, these results indicate that despite this concern, these parents have sufficient information to participate in the vaccination schedule. We believe that although parents may fear adverse effects, they make the decision to accept vaccination for the benefit of their child.

In our study, a gender difference was noted with males being more positive towards vaccinations and expressed less fear of adverse effects. This has been described in a study from USA as well [24]. However, with the general positive attitude in our study, this difference has probably little practical effect. Similarly, higher...
education in our study was associated with more positive attitude towards immunisations and less concern for adverse effects. We also found a more positive attitude and less fear of adverse effects among hospital doctors and employees of The School of Health Sciences, indicating an association with education and information. In other studies, contradictory results have been found with regards to education [18,25–28]. The fear of severe adverse effects of immunisations is an important predictor for rejecting immunizations.

In our study, less than 10% agreed or strongly agreed, to fear of severe adverse effects of immunisations but only about 1% of individuals strongly disagreed or disagreed to childhood immunisation. These small numbers limit the possibilities for extended analysis of this group. Nevertheless, it is important to recognize this group, understand its concerns and anxiety and address these. Moreover, we must be ready to provide them with scientific evidence based knowledge when needed. Other studies have shown that individuals who reject immunisations for their children claim that they are ineffective and unnecessary, they distrust health professionals and authorities, doubt research on vaccination efficacy and rely more on various types of media and alternative medicine for information [29–31]. In some countries, this skepticism can be high and can influence participation. In a study in five European countries, almost 30% of parents admitted to doubts about having their children vaccinated [21]. Several studies have revealed parents concerns for adverse effects, this probably being the most common reason for rejecting immunisations [21,24,30,32]. In our study, no background variables, including being a parent, distinguished this group from others. However, those opposed to vaccinations were much more likely to distrust health authorities, did not believe that vaccinations prevent infections and were more fearful of adverse reactions. Nevertheless, only a small fraction in our study claimed that they would not have their children vaccinated according to the current Icelandic schedule. Similarly, more than 90% agreed to the question that immunisations protect against infections although a small group thought that natural infections provided a better protection. This is understandable as it can be confusing that the efficacy of vaccinations against various infectious diseases can be different. We realise that several other factors, including dynamics in the household, copying behaviors, trust in the collective wisdom of peers, social opinion and several health related issues can influence parents opinion on vaccinations. These factors can work both towards positive opinion as well as skepticism towards vaccinations.

The strength of our study lies in the number of participants in a well-established cohort in Iceland. This cohort has been well described and is stratified according to age, gender and residency with background information on education and income, and is thought to be representative of the Icelandic population [19]. In addition, employees of The University Hospital and The University of Iceland were added to that cohort. The response rate was quite high in all cohorts and in the general public the participation was similar to earlier studies carried out by The Social Science Research Institute of The University of Iceland. In a survey like this, a response bias is always possible. However, with the high response rate this effect is less likely to hamper the results. The gender ratio in the general population cohort was almost equal. In the University Hospital cohort, more females reflect the nursing staff and midwives.

This study confirms a very positive attitude of the Icelandic public towards childhood immunisations. This is especially strong in individuals with higher education, parents, and health care professionals. This study also illustrates that although there is a high proportion of people with positive attitudes, there is still a small proportion of people with concerns about adverse events. It is worth finding out what these concerns are and address them.

These results are encouraging and raise strong hopes for continuing success of the childhood immunization program in Iceland.

Conflict of interest statement

ÃH and KGG have done studies on pneumococcal vaccinations partly supported by pharmaceutical industry but not related to the subject of this study. Otherwise, the authors have no conflicts to report.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.vaccine.2015.10.125.

References


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