Ann Ist Super Sanità 2017 | Vol. 53, No. 2: 157-162
DOI: 10.4415/ANN_17_02_13

Vaccine hesitancy: parental, professional and public responsibility

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Abstract
The opposition to vaccinations is a well-known phenomenon that dates back to the Victorian age when it was self-limited by the awareness of the importance to be protected against fearsome infectious diseases. In the XX century, the mass use of vaccination has – instead – consented to eradicate or drastically reduce the burden of diseases such as smallpox and polio. These positive effects of the vaccination campaigns have blurred out, if not erased, the memory of the tragic consequences of the past's widespread diseases, leading people to underestimate the severity of the harm that vaccinations prevent. In recent years, a complex mixture of contextual factors have promoted an amplification of that paradoxical situation, leading experts to study causes and consequences of the so called "vaccine hesitancy". Several studies have shown the impact for children and for the community of the refusal or hesitation towards vaccinations from different points of view, including epidemiological, clinical, social and economic evaluation. This article provides an analysis of vaccine hesitancy from an ethical perspective: parental, professional and public responsibilities are analysed and described according to the "responsibility of the fathers towards the children", as articulated by Hans Jonas in 1979.

Key words
- vaccine hesitancy
- responsibility
- ethics
- immunization
- vaccination

INTRODUCTION

In 1998, the *Lancet* published an article in which the authors sustained the presence of a correlation between the vaccination against measles-mumps-rubella (MMR vaccination) and some behavioral disorders, including autism. In a statement of February 2nd 2010, the *Lancet* subsequently retracted the article since it was found to be a fraud for which the first author was, in fact, expelled from the British General Medical Council [1]. The years between 1998-2012 were twelve years of uncertainty, during which the negative effects of this "false science" became the subject of many scientific publications trying to redress the error and several media campaigns with ambiguous purposes [2, 3] that, however, led many parents to the decision to not vaccinate their children.

The reasons behind this loss of trust in vaccinations are obviously varied and complex: amongst the main reasons is surely the high quality of life of the industrialized countries, which was achieved also through the control over infectious diseases. However, this phenomenon also determined the loss of the historical memory of what it was like to live with the fear of contracting an infectious disease, therefore, allowing the population to understand the value of the prevention of infectious diseases that was highlighted in the 20th century by the unquestionable successes of the mandatory vaccination, such as the eradication of smallpox and polio. At the same time, the spread of innovative technologies, especially the new social media, have opened the way for new methods of communication that often bypass the traditional doctor-patient relationship, with the risk of allowing the circulation among the population of health information that is not based on scientific evidence, at that at times can even be completely false or dangerous.

There has always been the presence of an opposition to vaccinations [4], but in recent years the above mentioned contextual factors have promoted its amplification, leading experts to study the currently well-known phenomenon of "vaccine hesitancy" which can be referred to as "a set of beliefs, attitudes, behaviours, or a combination of these, exhibited by lay people in regard to their own or their children's immunisations but also sometimes by healthcare professionals" [5].

The consequences of the refusal or hesitation towards vaccinations are well known and potentially harmful both for children and for the community. They imply an

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increase in the risk of diseases, which are normally preventable through vaccination, and consequentely, in the number of hospital admissions and deaths. Literature has shown, especially in unvaccinated children, the effects of the individual failure to vaccinate which can be observed in an increased risk of pertussis, varicella, and pneumococcal pneumonia respectively of 22 [6], 8.6 [7] and 6.5 [8] times compared to the children who were vaccinated. The negative effects of vaccination hesitancy can also be observed in the general population, which is burdened with an increased risk of measles and whooping cough [9] in the areas where there is a greater use of vaccination exemption (due to medical reasons or philosophical, personal or religious beliefs). And it is clearly the most vulnerable persons, especially those who cannot benefit of the preventive effects of vaccination for medical reasons (*e.g.*, severe allergic reaction to a vaccine component or severe immunodeficiency from hematologic and solid tumors, chemotherapy, congenital immunodeficiency, long-term immunosuppressive therapy, human immunodeficiency virus/HIV infection with a severe deficit) or because of their young age, to run the greatest risk [10]. In Italy, for example, three cases of meningitis caused by *Haemophilus influenzae* type b have been reported, affected newborns aged 2, 3 and 5 months, who were too young to be able to receive the complete vaccination series [11].

Although scientific journals systematically contradict the opinions of antivaccinists about the efficacy and safety of vaccines [12], the public campaigns are – often – too slow in reaching the population and correcting false information [13-15]. At the same time, mass media has begun to report the consequences of the decreasing concern towards certain infectious diseases, which by the population have erroneously been considered as defeated and are now starting to sow fear and death in many countries, including Italy.

Considering this troubling scenario, one wonders how to contrast the situation and reverse the trend in order to effectively combat the negative phenomenon known as "vaccine hesitancy". The issue needs to be approached from multiple points of views: epidemiological, clinical, social, ethical, and economic. As for the ethical point of view, we will make reference to the ethics of responsibility as articulated by Hans Jonas [16]. It is the "responsibility of the fathers towards the children", the most evident example of a responsibility and a duty that is not mutual and is recognized and practiced spontaneously. For Jonas, in fact, the origin of responsibility is not in the relationship between independent adults but rather in the relationship with those who are in conditions of greater fragility (the children) and who are in need of protection. In the case of vaccine hesitancy, there is not only the parents' responsibility, but also the responsibility of health workers, local and national governments, who have a decision making role on the vaccination of minors [17].

IS IT GOOD TO BE VACCINATED?

As with any medical procedure, the ethical evaluation of the use of vaccinations must keep in mind not only the sought benefits in terms of life expectancy and health gain but also the foreseeable risks of both performing and not performing vaccination for the preservation of the life and health of the child [18].

Scientific evidence, acquired through controlled clinical trials and post-marketing studies, has confirmed that the benefits of vaccinations are both direct and individual (being immunized against a disease) and indirect or social (the general state of immunization of the population through the mechanism of *herd immunity*) [19]. In fact, through the mechanism of herd immunity, a consequent dual effect is possible: by safeguarding those who undergo the vaccination, we also obtain a protection on the remaining part of the population.

The direct and indirect benefits of vaccination must then be confronted with the possible risks of vaccinations.

It is, in fact, exactly the fear of possible damages following the use of a vaccine that generates concern among a part of the public. On the other hand, it is true that the evaluation of the benefit/risk balance of a preventive intervention is generally considered complex. A preventive intervention acts, in fact, on a subject who appears to be healthy, promising protection from a possible disease (prevention as a "non-event") without being able to exclude the possibility of (even if remote) damage [20]. In this case, the comparison should not be done – however – between vaccination and non-vaccination, but between the possible risks due to the vaccine and the risks due to the disease that the vaccine is capable of preventing for both the individual and the community.

The items, which can help in the quantification of this risk, are two: scientific evidence and epidemiological evidence. Vaccines, especially the new generation, have a good safety and tolerability profile. These findings have led to a new analysis of the risks deriving from vaccinations as compared to the benefits that can be drawn from them. As mentioned above, epidemiological data shows that while the number of deaths that have been prevented through the use of vaccinations constantly increases, a large number of people still die or experiment the natural consequences of infection due to the absence of a vaccination immunity. In fact, historical facts also easily support what was stated above: diseases such as smallpox and polio have been, over time, eradicated thanks to the mass use of vaccination.

The advantages in terms of saving life, life expectancy and quality of life and the possible risks of vaccinations should be made known to parents so that they can make an informed decision. In front of a debate about the mandatoriness of vaccinations [21, 22], the final objective should be – today – an informed choice. This is true not only because medical practice is always more centered on the respect of patient autonomy but also because of the intrinsic added value of a motivated choice from an ethical perspective. For the purposes of a conscious decision it is firstly necessary to offer clear, comprehensive and accurate information regarding the benefits and risks of a preventive immunization in childhood.

PARENTAL RESPONSIBILITY

It is the parents who decide whether or not to vaccinate a child if the child is incapable of giving assent. Ac-

cording to Savage, the mandatoriness of a vaccination is by now considered an unnecessary invasion of freedom of choice [23]. The elimination of the mandatoriness of a vaccination does not imply, however, the refusal to be vaccinated. In a mature society that is inspired by values of solidarity, parents should be able to choose not only freely but also responsibly [17]. As already mentioned, it is the responsibility "of the fathers to the children" that is founded not so much on the reciprocity of an adult relationship but rather on the "duty" of the active person towards anyone who is in a more fragile condition (the "children") or in need of protection. The ethics of responsibility should strengthen the rationale behind the acceptance to be vaccinated, serving as a support in the passage from the presence of a compulsory vaccination to free choice. Given the high medical-scientific and social value of vaccinations, they would be so to speak "morally dutiful" (moral duty) in the protection of the community's and the individual's most valuable assets: life and health.

Vaccine hesitancy by parents is in most cases a consequence of biased and alarmist information regarding vaccinations, spread by the media and sometimes also by health professionals [24]. Parents, fearing to become, through their own decisions, the cause of harm to their healthy child, delay or refuse to adhere to the vaccination proposal. Sometimes, parents refuse the pediatric vaccination, because they know that the mechanism of herd immunity can defend their children against the infections, without considering the eventual risk for other kids who are not able to be vaccinated. This attitude is described in terms of Free-Rider problem [25].

In the comprehension of this phenomenon, it is also necessary to add the effect of the loss of historical memory. The positive effects of the vaccination campaigns of the past have blurred out, if not erased, the memory of the tragic consequences of the past's widespread diseases, leading people to underestimate the severity of the harm that vaccinations prevent.

PROFESSIONAL RESPONSIBILITY

When speaking of the "responsibility of the fathers to the children", one does not refer only to parents but also to those people engaged in the world of health. In fact, the latter is an even greater responsibility: a health professional "professes" to the person that goes to them their knowledge and skills with a promise to aid. The responsibility of those who have and can determine knowledge is greater than that of anyone receiving knowledge, at least for the "power" that knowledge gives.

The pediatrician, in particular, has the responsibility (the professional responsibility model of pediatric ethics) [24] to put the parents in the best position to choose wisely for the child. When giving advice on vaccinations, it is necessary to explain the nature and purpose of vaccines, to present the scientific evidence on their efficacy and safety and, in absence of specific contraindications, to strongly recommend parents to vaccinate their child for the benefit of the child but also for the community. Hence, according to the available scientific evidence, it seems incredible that even only one physician could not recommend vaccination "under any circumstance" [26]. It could not be justified by any realistic physician concerns regarding their specific patients, but it sounds as a clear declaration against their code of conduct. This implies that giving advice against the evidence based medicine, especially against the national recommendations for vaccinations should be considered under the same way as any other health circumstances and physicians' conduct should be evaluated by their college of physicians according to the professional code.

The responsibility of the pediatrician and parents, in fact, go beyond the responsibility towards that specific child: through the mechanism of *herd immunity* it is possible to prevent risks for children, especially for those who for age or health conditions are and cannot be vaccinated.

The involvement of the parents as decision makers should not bring the pediatrician to forget that the patient is the child, to whom the pediatrician must ensure the greatest care. Hesitation or vaccine refusal by parents should not to deter the pediatrician from seeking the best solution for the child. The first reason is that parents who considered not following vaccine recommendations, but ultimately did, cited the physician's recommendation as the reason for vaccinating [27]. Anyway, there may be situations in which a pediatrician might try to impose on the parents the decision to vaccinate their child. This could be especially the case if the vaccination were necessary to safeguard the life and health of the child, for example in case of an epidemic or, for even more obvious reasons, if vaccination had an immediate therapeutic effect, as in the case of the vaccination against rabies. On the other hand, it is true that it is assumed that parents are able to understand the needs and interests of their own child, therefore enabling them to decide for the child. However, this right is not unlimited- especially if it does not respect the well-being or threatens the life of the child [28].

The criterion for the parent's choice must be the *best interest of the child* and the social responsibility toward other children. In the evaluation of the best interest of the child, all the elements involved must be taken into account [29]. Despite being a bearer of interests, the child does not have a decisional capacity. It is, then, the pediatrician's task to isolate the child's rights and interests from those of the other parties involved. Amongst the interests at stake, in fact, there are not only the life and health of the child but also: for the parents, the exercise of autonomy in decisions affecting the child; for the doctor, reducing the number of unvaccinated children in their own clinical practice; for the community, minimizing the burden of preventable diseases through vaccination [30].

Furthermore, a pediatrician may not refuse to continue to take care of a child, who is not vaccinated because of the parents' decision, for fear that the child might represent a risk to other children attending the clinic and who have not been vaccinated because of age or specific medical contraindications. [31]. Given that the pediatrician's surgery is not the only environment in which the non-vaccinated child is in contact with other children, responding to a refusal (towards vaccination)

with another refusal (to care for the child) is not ethically acceptable [32]. The person who pays the consequences of this double refusal is the child, who is made more vulnerable not only because of their age but also by the subtraction of treatment. The refusal of the pediatrician to provide care to a non-vaccinated child is a form of professional negligence and lack of responsibility. The pediatrician is the "guardian" of the protection of the life and health of the child and must not give up this role in front of a refusal by the parents, especially if this refusal will damage the child and indirectly also other children. The pediatrician must, therefore, continue to take care of the young patient, using every licit strategy that can make the parents change over time their idea regarding vaccinations [33].

PUBLIC RESPONSIBILITY

The responsibility "of the fathers to the children" takes into consideration even those who play a role in the management of public health, for they must ensure all the basic conditions that are necessary for health and for social life, and assure equal access to prevention and primary care [34].

The heterogeneity in vaccine coverage in different countries and in different regions of a country is the consequence not only of the difference in adhesion by part of the population, but also of the diversity of the offer by part of the local governments. In times of economic crisis, the rationalization of healthcare expenditure directed towards the containment of pathologies, often neglecting investments in preventive strategies (unless they determine short term effects). However, considering that the population's health is a factor that contributes to the social and economic growth of a country, preventive immunization programs of the population in infancy and early childhood should be among the major long-term investments in healthcare.

And if, on the one hand, it is necessary to raise awareness among decision makers on the need to act according to justice, ensuring that each person receives what is needed to achieve their best health condition and eliminating situations of unequal treatment, on the other hand it is necessary to make the population more sure as regards to their choices and less "suspicious" towards preventive strategies. This requires knowledge by part of the population of scientifically accurate information about the risks/benefits of preventive immunization [35] and maximum transparency by part of the pharmaceutical companies that produce the vaccines and those who are responsible for the vaccination campaigns.

When preparing information campaigns, one must keep in mind the characteristics of the current scenario in the dissemination of information: the velocity of communication, the conviction that more than one truth exists, and the population's presumption of being able to individually understand and process any type of information. All these elements put us in front of the great challenge of finding new methods of communication that are effective and, above all, credible. It is sufficient to think, for example, of some websites, whose varying degrees of reliability become particularly low when they are used as a source of health information [36]. An analysis of 153 YouTube videos that matched the search terms "vaccination" and "immunization" has shown that about 50% of the videos were not explicitly in favour of vaccination, while the information contained in the videos that were against vaccinations often contradicted the information contained in official documents [37]. As for the web sites in Italian, a recent research indicated that approximately 67% of the analysed pages expressed positions that were against vaccination [38]. If we consider that the web pages that are against vaccination generally occupy the top positions in the search results of various search engines and, therefore, are the easiest to come across and visit, it is easy to understand that even in Italy it is common to be exposed to web sites which are a source of misinformation.

And, most importantly, it is necessary to recognize how difficult it is to put forth a mass communication which takes into consideration the peculiarities of all the cases, for example: parents who refuse only some specific vaccinations [39] or parents who consider themselves and their child invulnerable to disease [40]. On the other hand, while in clinical practice information is given through a personalized communication process, public health interventions do not respond to a request by the patient but focus on the population more than on the individual, who is, therefore, reached through methods that resemble mass communication. The difficulty to communicate the message on the importance of prevention through vaccination might be, therefore, a result not so much of the content of the message but more of the *ethos* (place), in which the communication takes place [41].

The information process should include also the vaccines that a country cannot offer free of charge since the resources are not sufficient to be able to ensure free access to all. This situation can determine the risk of discriminating against those parts of the population that cannot afford to buy the vaccine, relegating the children of low-income families to a condition of disadvantage. For this reason, before deciding to exclude the possibility to give free access to a vaccine simply because it might not be advantageous from an economic point of view it is necessary to think carefully if the required cost could be recovered through a different allocation of the country's healthcare resources.

The decision to introduce new vaccines should also be supported by rigorous scientific evidence on effectiveness and safety, including sufficient follow-up data. The use of an appropriate monitoring system allows the analysis not only of the spread of the infectious disease but also of the side effects of the immunization [42]. Knowledge of the dynamics that revolve around the vaccination system, public concern and the reasons that lead to the refusal of vaccination, is fondamental in order to be able to give answers and to restore trust in the healthcare system. Trust: it is the real antidote to the widespread phenomenon of distrust.

CONCLUSION

It is difficult to find a solution to such a complex problem, as can be evinced also from the large amount of literature on this subject.

Sanctions for those who do not vaccinate their children should be the last resort to use and only when all other approaches (education, health information, etc.) have been undertaken and have failed. With the use of sanctions (denial of care by the pediatrician; prohibition of access to school and other social activities, etc.), we encounter the risk not so much of limiting the autonomy of the parents, but rather to erode even further the relationship of trust that exists between the pediatrician and the parent, causing damage to the child [31].

In fact, one of the reasons behind the refusal of vaccinations seems to be a lack of trust in doctors, in the health system, and in public health organizations [43]. For this reason, Bester believes that the reconstruction of the relationship of trust between health professionals and the child's parents can improve the level of adherence to vaccinations [44]. If, as Bester goes on to explain, we do not restore this condition of trust, even educational interventions will be unsuccessful. To rebuild relations based on trust, to be capable of communicating properly, to listen to the concerns and difficulties of others- these actions may not represent the solution but certainly represent a great starting point towards the solution.

The worrying reduction in vaccine coverage in different countries highlights the inherent limits of mass communication. It is only through the dialogue with parents that the pediatrician can exchange opinions, discover what are the perceived risks, and help the parents to elaborate their fears. The pediatrician's goal should not be to convince the parents, but to remove all the obstacles that hinder the parent's free and responsible choice. It could be positive to involve not only the paediatricians, but also other professional figures. We can consider for example the role of nurses in presenting and discussing with the parents the information written in the consent form prior to the visit with the pediatrician, or that of community midwives in explaining to each woman during pregnancy the importance of the planned vaccination schedule. Understanding the moment in which one begins to develop attitudes and beliefs regarding vaccines, could be of great benefit: it could be useful to begin to speak about and address the doubts regarding vaccines *before* it becomes necessary to be vaccinated.

In general, this is an invitation to reflect on the necessity to identify new moments in which to intercept the request for vaccinations. Historically primary care is a setting of vaccinations for adults, while the school is a setting that is more studied and of great potential for teenagers. We must not neglect, however, other important occasions such as the work environment, in which the occupational physician can play a fundamental role in the promotion of a healthy environment, or the hospital, which (even during an admission) can provide the opportunity to identify a patient, for which a specific vaccination could be highly recommended.

Conflict of interest statement

There are no potential conflicts of interest or any financial or personal relationships with other people belonging to organizations that could bias the conduct or findings of this study.

Received on 2 August 2016.
Accepted on 13 December 2016.

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