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# Vaccination of Children in Romania between Civic Obligation and Personal Choice

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## Abstract

The discovery of vaccines and their introduction in medical practice led concomitantly to the eradication of certain diseases that devastated humanity throughout history and to the control of other diseases whose epidemic potential currently persists. In this article, the authors pursue the odyssey of this historic discovery and highlight the Romanian contribution through the two reference names: Victor Babeş – the discoverer of the antibiosis process, and Ion Cantacuzino – the discoverer of the cholera vaccine, as well as the position of leader in vaccinology held until recently by our country by means of Ion Cantacuzino Institute. The current actualities of Romanian vaccinology are analyzed as regards to the progress and drawbacks generated by the disappearance of the autochthonous production of vaccines, as well as the increase in the population's distrust regarding the value of vaccination, from the perspective of civic and professional ethics and from the perspective of the involvement of the medical system.

*Keywords:* vaccination, child, ethics, controversies, dilemmas, immunization.

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## Introduction

One of the greatest accomplishments of medical sciences was the discovery and implementation of vaccination against the main infectious-contagious diseases, often spread in pandemic proportions, which shook humanity throughout history through the epidemics that decimated entire populations (Centers for Disease Control and Prevention, 1999). The biological aggression has always been the most powerful in the relation of men to their life environment, therefore, in the fight against infectious agents there were three main moments that marked the odyssey of the combat against infectious and contagious diseases produced by them.

The first great accomplishment was the implementation of active immunizations by the agents of vaccination, once the smallpox (black pox) vaccine was discovered and applied in 1786 by the English physician Edward Jenner (1749-1823) and applied starting 1831 (Riedel, 2005; Lakhani, 1992). This method was continued and developed for the main epidemic diseases until today, when after almost two hundred years from the beginning of the vaccination practice as a prophylactic method, there are vaccines for 26 diseases with massive spread (Baxby, 1999).

The second great accomplishment was the discovery in 1867 of asepsis and antisepsis by British surgeon Joseph Lister (1827-1912), and this method proved to be salutary in the management of different surgical diseases, in terms of prevention and combat against contamination and inter-contamination during procedures, medical and surgical interventions on sick people, antiseptic measures in locations, public institutions, public interest networks (water supply, sewage) etc., because they considerably reduced contamination and disease spread (Sherwin, 1988; Pitt & Aubin, 2012). His work was published in 2 papers in the *Lancet* (in March and in July, 1867) (Ackerknecht, 1982). As a result, postoperative mortality decreased from the 45% generally reported to 15%. "*If I could, I would even singe my hands*", Lister rightfully said in his time, and this dictum remained as valid today (Lister, 1870).

The third moment, as important as the first two, was the introduction of antibiotics in the therapy of infectious-contagious diseases, and this era begins with the discovery of penicillin in 1928 by Alexander Fleming (1881-1955), which was turned to advantage as late as 1945 (Maurois, 1965; Tan & Tatsumura, 2015), and this practice continues today through a true arsenal of antibiotic classes available to medical practice. These three moments with historic impact in eradicating or epidemiologically controlling these contagions led to the fading of one of the Malthusian methods (besides hunger and wars) involved in the demographic control of population (Lupu & Lupu, 2014).

By far, though, vaccination has proved to be the most powerful weapon that science made available to humanity with the purpose of preventing and even eradicating the main diseases of massive spread (Plotkin & Plotkin, 2004). The essential condition in accomplishing and maintaining this desideratum is the achievement of a reasonable immunity in population, which can only be obtained by vaccinating the entire receptive population, according to a well-established schedule (Chiotan, 1998).

### **Romanian actualities in the vaccinology field**

Romania was one of the countries that introduced and actually contributed to the development of vaccinology as a science and practice from the second half of the 19<sup>th</sup> century, through reference names in the pantheon of autochthonous and international medical sciences (Pistol, 2011; Lambert, Strebel, Orenstein, Icenogle & Poland, 2015). It is worth reminding here, that the first bacteriology textbook was elaborated by Victor Babe<sup>o</sup> (1854-1926) in collaboration with Victor Andre Cornil, and published in 1885 (Petri Dish). The bacteriology schools in Bucharest and Cluj, founded and led by Victor Babe<sup>o</sup>, contributed decisively to the progress of bacteriology as a science. We mention that, among other things, Victor Babe<sup>o</sup> is the discoverer of over 50 bacteria and viruses and a species of parasites that bear his name (babesiidae) producing the disease known as babesiosis (Iftimovici, 2010).

His name is related to the introduction of the rabies vaccination in our country and of serotherapy in the treatment of diphtheria, achieved together with his disciple Mihail Manicatide, the founder of the pediatrics school in Romania (Nastase, 1972). Victor Babes also discovered the antibiosis process that would be the basis of antibiotherapy (Chiotan, 1998).

Another great name of Romanian medicine is Ion Cantacuzino, who discovered and put into practice the cholera vaccination in the second Balkan war, which is a disease that decimated Napoleon Bonaparte's troops in his campaign in Russia and influenced decisively the denouement of the first Balkan war. He laid the foundations of the autochthonous production of vaccines in the institute bearing his name, which today is unfortunately taken over by malefic structures and persons. On this basis, vaccinations were introduced rapidly in our country, and what is more, Romania became the largest producer of vaccines from the South-East of Europe through Ion Cantacuzino Institute, which lasted until the end of the 20<sup>th</sup> century (Mesrobeanu, 1965).

Vaccination in Romania is organised on three important lines (Ivan & Azoicai, 1995):

- *Compulsory vaccination* – for a number of nine diseases, performed until this year within the national vaccination program for children, as follows: (1) BCG vaccination in new-born, between the second and the seventh day from birth, (2) Hepatitis B vaccination administered immediately after birth (after two hours), then at the ages of two months, six months and nine years; (3) Diphtheria-tetanus-pertussis vaccination (DTP); at the ages of two months, four months, six months, 1 year and three years (4) Polio vaccination; at the ages of 2, 4, 6 months, 1 year and 9 years; (5) MMR (measles, mumps, rubella) triple vaccination at the ages of 15 months and five years. These vaccinations are compulsory; they are administered by family physicians at small ages and in school vaccination campaigns for the school population. The degree of coverage of the vaccinations reached 95 – 98% of the population, the difference being related to incompatibilities, temporary or permanent contraindications, refusal of vaccination (very rare in the past) and other reasons. In appreciating the efficacy of the vaccination, we must not omit the fact that vaccination itself has variable immunization percentages, as follows: the BCG vaccination provides immunization against tuberculosis to up to 80% of the vaccinated individuals, the DTP vaccination up to 96-97%, the polio vaccination 95-100%, MMR – 95%, and the hepatitis B vaccination to 65-92% of the vaccinated individuals. Corroborating these data with the situations in which immunization is not achieved for other reasons, we can say that the actual coverage of the population by means of vaccination used to be of 95%. This year, a new calendar of compulsory vaccinations has been elaborated, and according to it by the 18 months of age, each child should receive at least three doses of hepatitis B vaccine, three doses of the DTP, IPV and Hib vaccines, the first dose of MMR by 1 year and the second dose by the age of 5 years (Ministerul Sanatatii, 2015).

- *Vaccination of selective compulsoriness*; it is a method of immunization of a given population, with the purpose of solving certain epidemiologic situations emerged in an area or community, involving a major risk of sickening. This category includes a few special situations: (1) Particular epidemiologic conditions (floods, earthquakes, other acts of God), in which the typhus, dysentery, hepatitis A vaccines used in areas and communities with high epidemiologic risk are compulsory; (2) In emergencies: tetanus, rabies, anti-venom vaccination in case of animal bites, rubella vaccination in rubella epidemics; (3) Regional interest vaccinations: cholera, malaria, plague vaccines etc. in areas where there is an epidemiologic potential for these diseases; (4) Vaccinations of interest for professional groups, such as: anthrax, rabies vaccination for those working in animal husbandry and influenza or hepatitis B vaccination for those working abroad; (5) Population groups with high epidemiologic risk, such as: elderly, suffering from chronic diseases or consumptive diseases, where certain types of vaccine are

necessary, such as the influenza vaccines. Both vaccine categories are free of charge and covered from the budget of the health ministry, being at the same time compulsory.

- *Optional vaccinations* generally performed based on a medical recommendation, but paid for by the patient, including: influenza, hepatitis A, pneumococcal, meningococcal, chickenpox vaccines etc. (World Health Organization, 2012).

### **The accomplishments and actualities of the past 10 years in the field of Romanian vaccinology**

We may say that the Romanian accomplishments generally keep up with the world accomplishments and meet the WHO recommendations in the field. We would like to point out the fact that the national coverage of compulsory vaccinations shifted massively to polyvalent vaccines in the shape of tetra-, penta- or hexa-vaccine, which include the classic triad diphtheria-tetanus-pertussis, polio vaccination with antigenic fractions, antigenic fractions for hepatitis B and Haemophilus influenza type B (Tavakol, 2014).

Live attenuated strains, such as in the polio vaccine, are no longer used, consequently oral administration is no longer a choice. A legal framework has been created regarding the vaccination acceptance or unacceptance by participants, which is a phenomenon that, for the past few years, has become a public debate subject generated mainly, by the fact that the market of vaccines is diversified enough and there is even commercial pressure that predisposes to an exaggeration in the prescription and use of vaccines, which led to the unwanted consequence of a public perception, that is not quite favorable and even to the refusal of vaccination, even for compulsory vaccines (Lupu, 2012).

The great accomplishments of vaccinology seem to be eclipsed by the actualities of the past few years, when in certain areas, even in the Romanian capital, there has been a decrease in the vaccination percentage by 20% (Bucharest), and the population immunization percentage has decreased under 75%, which means that the critical mass necessary for epidemic outbursts has been exceeded (Ministerul Sanatatii, 2015). The main causes for this situation gravitate – in our opinion – around defective communication associated to a strong anti-vaccine offensive in the media exercised by unprofessional structures, starting from certain prejudices that are not confirmed in reality. The emergence of these situations was also favored by the fact, that there were discontinuities and dysfunctionalities in the provision of imported vaccines that were not precisely appropriate for our area, because our national source of vaccines was willingly and tendentiously impaired, in complicity with the authorities in the field.

Besides the mentioned dysfunctionalities, the liquidation of our national production of vaccines led to their purchase from abroad, for prices 10 times higher. Apart from the economic impact, which is not at all negligible, this situation will unfortunately end a tradition of research and production built across one century at Ion Cantacuzino Institute.

### **Ethical aspects regarding the vaccination of children**

For the past few decades, as vaccinology got consecrated as a science, a strong trend developed against the vaccination of children supported by different structures, some of which, unfortunately, even supported by professionals in the field (Dubé et al., 2013; Burton-Jeangros, Golay & Sudre, 2005; Benin, Wisler-Scher, Colson, Shapiro & Holmboe, 2006; Brown et al., 2011). To this situation a few elements contributed, the first is the lack of communication between physician and patient due, today, to a large extent to the bureaucratic approach of this relationship by the authorities that – we have to say – fail to encourage in any way this type of relationship. This becomes visible through the fact that, in the physician's activity, the necessary time is not allocated to certain discussions on medical topics, which would represent that sanitary education confirmed and validated by time. What is more, unfounded and even contradictory information polluting the media and especially the virtual space get to question the physician's authority in outlining the correct attitudes of the patient and population, as regards the usefulness of vaccines (Smith, Yarwood & Salisbury, 2007; Mason & Donnelly, 2000). There are studies indicated that parents' choice was often based on following what is recommended, rather than based on specific knowledge about vaccine or vaccine-preventable disease (Streefland, Chowdhury & Ramos, 1999; Tickner, Leman & Woodcock, 2006; Benin et al., 2006).

We would also add here, an unconvincing positioning especially online by experts, whose presence in the public space is rather poor. This is where we could answer scientifically the ethical question: *Why should we get vaccinated?* This is all the more, so as the 200-year old practice highlighted the benefits that vaccination brought to humanity (Lakhani, 1992). We dare to mention: (1) Due to vaccination, extremely serious infectious-contagious diseases such as: smallpox, plague, poliomyelitis, diphtheria, cholera etc. were eradicated (whose mortality in epidemic outbursts exceeded 50% of the affected population) and also, by means of vaccination, diseases such as rabies, tetanus, rubella etc. are kept under control; (2) Beyond the extremely high mortality rate generated by these diseases, vaccination spares the individual, the family and community from the risks and discomfort produced by the diseases, that can encumber the life of communities by means of the emergency measures imposed by an epidemic outburst (isolation, treatments, quarantines, restrictions, interdictions and drastic anti-epidemic

measures) with serious perturbations of the daily existence of the individual and of the community; (3) Vaccination responds in an extremely convincing way to two major desiderata. The first is medical and corresponds to the Hippocratic dictum “*prevention is better than cure*”, because the ongoing disease, apart from the discomfort it generates, implies vital risks and permanent sequelae, the most convincing example here being poliomyelitis. The second desideratum is economic, it is subsumed to the first, and according to it “*it is much cheaper to prevent than to treat*”, because an epidemic, besides the necessary reorientation of resources, can, economically and socially, disorganize a community; (4) Nowadays, there are sufficient specialized studies and other studies that unequivocally attest the unquestionable value of vaccination for the individual and public health. It is enough to remind that many of the great scourges of human kind are now history (the plague, smallpox, cholera etc.) precisely due to massive vaccination.

The insufficient knowledge of these epochal accomplishments due to vaccinations created the corridor necessary for the manifestation of a true offensive against vaccinations, fed on the one side, by the distrust of a considerable part of the population towards vaccination, and on the other side, by a commercial overstrain on vaccinations other than those epidemiologically important, due to the current technical possibilities (Kane, 1998).

### **The causes for the distrust regarding vaccines and possible remedies**

This situation is based on a few aspects, of which the first is precisely the lack of knowledge regarding the actualities presented above; therefore, we need to publish them in any way available. Then, there is the deep-rooted idea that the best immunization is provided by the disease, therefore the human body should be allowed to face the disease. It is true that, from the biological point of view, the confrontation with the disease provides the most durable immunization, but provided people survive the disease. What happens to the ones that do not survive it? (Mortality by diphtheria, for instance, was 50%) or are left with permanent sequelae for the rest of their lives? (the paralyses caused by poliomyelitis, subacute sclerosing panencephalitis following measles etc.), let alone the risks of the extremely fast spread of the diseases to the population, which are medically and epidemiologically dramatic aspects that can only be prevented through vaccination.

It is not less true that the industry of vaccines overbids immunization in population, even for common conditions, which is biologically and medically justified only in part and only for certain population categories (see optional vaccinations). Their extension to the entire population could be assimilated to the category of unnecessary interventions, that can lead to additional risks through the fact that the most sensitive system of the body structure – the immunity



system – is overstrained and its response is often unpredictable (Lupu & Lupu, 2014). These complaints are also accompanied by the unjustified fear of the contamination of vaccines with other germs or inorganic and organic components harmful for the body, or the fear that the rush of releasing them on the market makes the testing period uncertain and doubtful (Tavakol, 2014). We would also like to mention that it is not rarely, that the fierce and disloyal competition between companies feeds and supports this suspicion and distrust.

The maintenance of such a climate is favored by the intense circulation in the media – especially online media – of certain empiric and unfounded information from many people untrained in the field, who exaggerate with regard to certain particular cases, many of which are isolated and unchecked. The speculations on the contamination must be regarded suspiciously, because today the technique of vaccine manufacture is safer than ever (Tavakol, 2014). The wide propagation through the media of inappropriate charges must be seen rather as diversions in the commercial war. We should remember here, that the manufacture of vaccines uses strains that circulate in our area and not exotic strains with a small impact in our area but a high risk.

Refusal of vaccines has also been linked with religious convictions. Orthodox Protestants in The Netherlands and the Amish in the United States are religious communities well-known for rejecting to vaccination based on religious motives (Streefland, 2001; Ruijs, et al., 2012).

Another cause for the refusal to get vaccinated is a defective perception of informed consent, seen rather as a possibility to refuse, than an expression of autonomy by virtue of the fundamental human rights. Therefore, this leads to the unconscious assumption of risks that regard equally the individual and the community.

In approaching this last aspect, we must consider that, in a given epidemiologic context, in which the risk of sickening and equally of contamination of healthy persons is imminent, the refusal of vaccination raises fundamental ethical issues that overcome the strictly personal interest and must be seen as a collective right that must be respected as being of general interest. Before the major risks implied by an epidemic outburst, general interest prevails, because both the freedom and security of a person ends where they meet the freedom and security of another person. In addition, the refusal of vaccination, beyond its condemnable character (drastically sanctioned in some states), entails a series of inconveniences that encumber the child's and individual's social integrity, such as: integration in school communities, filling-in a position, access to certain professions and the right to travel worldwide.

## Conclusion

Furthering the idea that vaccination is the only individual and collective defense against a personal and collective disaster generated by any of the infectious diseases with epidemic potential must become a permanent concern of the medical system and the civil society. The correct understanding of the role of vaccination in the community life, of the fact that it is the only manner that ensures personal and collective security against epidemic diseases and equally corresponds to the ethical principles of cohabitation in society must prevail before any considerations. Here, the physician, and equally the medical system must take full responsibility in accomplishing this ethical desideratum implied by the profession.

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