**THE HIDEOUTS OF THE VACCINATION PROCESS**

**ABSTRACT**

The purpose of the study is to evaluate the degree of information and the population opinion regarding the vaccination process. The paper aims to evaluate both the reasons of decreasing the vaccination degree and the sources of wrong information on this topic to better identify between mistakes and correct knowledge.

Vaccines are biological products prepared following specifical tehcniques to improve the body's immunity against particula, given conditions. The lives of millions of children from 188 countries who received different vaccines (diptero-tetanus-pertussis, measles, polio) were saved in the world along the time (WHO, 2017). In Romania, the antidifteric vaccination introduced in 1960 made disappear the disease in 1990. No case of diphtheria has been confirmed so far.

Unfortunately, in 2016, the vaccine coverage has fallen below 90% (CNSCBT, 2017) because of either parents' refusal and the failure in attending a family doctor.

Therefore, today, the society is facing a serious situation caused by: a) insufficient and erroneous information of parents expressing their opposition to vaccination and b) manipulation of organizations against vaccination.

***Keywords:*** *society, vaccination, general practitioner, public health programs*

**JEL:** I10, I 11, I18

**VACCINATION: MECHANISM OF ACTION**

The beneficial effect that vaccination has on the quality of life, population longevity and public savings has always been proven by specific statistics. Vaccines keep within bounds the diseases' severity, reduce complications and decrease contagiousness. Immunization programs are based on well-defined strategies, their purpose being associated to monitor, assess, eliminate and eradicate the diseases. The monitoring and check of a disease spread suppose its limitation until it is no longer a problem for the population. The phase of elimination of any dangers is a greater challenge than control, assuming the reduction to zero of cases of disease in a geographical area, although the pathogen still exists in the human or animal population.

Eradication of a disease is achieved when the pathogens disappear following vaccination; the only eradicated disease at this time is the smallpox.

Vaccines differ in composition, mechanism of action, infectious agents from which they are derived and the way they are administered. Thus, the viral vaccines are of three types: live attenuated virus vaccines (consisting of "*weakened*" strains of the infectious agent and lacking aggressiveness), inactivated virus vaccines (containing virions which after treatment with the inactivating chemical cannot multiplex) and sub-unit vaccines (containing viral proteins extracted from the infectious agent).Vaccines are designed to protect against the unintended consequences of infectious disease with adverse or even life-threatening consequences. This is achievable by vaccinating the population with live attenuated or inactivated forms of pathogens that cause the growth of antibodies, B and T lymphocytes that will protect the individual against dangerous diseases.

In 2019, during 24th until the 30rd of April, people celebrate the vaccination week. This is a great opportunity to perceive the process s from different perspectives:

1. According to the World Health Organization vaccination represents the process by which any individual can gain access to resistance to an infectious disease by administering a specific drug that enables the body to fortify the immune system and creating a natural shield against infections or various communicable diseases.
2. Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases, favoring the illness and even the death of people.
3. Immunization is one of the most profitable investments in health, with strategies recognized by international practice as useful and profitable, and with programs accessible to all population categories. As a process of health protection, vaccination is built on well-defined target groups, with which are constantly communicated through complex information channels and do not require major changes in lifestyle.
4. Vaccination is both the right of any human being to keeping the body in proper health and the state and individuals to preserve the good status of health in good condition as one of the most important and strategic resource of the nation.

**BENEFITS AND SIDE EFFECTS**

Vaccines are the best tool that can be used to support public and individual health; vaccination policy needs adequate publicity (Andre, 2005). Vaccines are valuable for their ability to control and contain disease by eliminating and then eradicating. This, however, does not remove the danger of the disease being reintroduced into an area where it has been eliminated. This is the case for: a) Bostwana - where successful polio removal in 1991 was endangered in 2004 by an import of Type 1 polio virus from Nigeria (WHO, 2004), and b) USA/Indiana where the reintroduction of measles happened in 2005 by a tourist in Romania (Parker et al, 2006).

Benefits of vaccination are also beneficial at society level, Ehreth predicting that vaccines annually prevent over 6 million deaths worldwide (Ehreth, 2003). In the US there is a 99% decrease in deaths from the 9 diseases for which vaccines have been recommended and a decline in mortality and sequelae. Complications that appear may have a more pronounced long-term effect than the disease itself. Over 40% of children surviving Haemophilus influenzae (Hib) meningitis may have permanent neurological defects (WHO, 2006).

Effective vaccines do not only protect vaccinated people, but may reduce illness among non-immunized individuals. A vaccination percentage of less than 70% against Hib in the Gambia was sufficient to eliminate the disease (Adegbola R., 2005). Also, rubella, which is not dangerous for children, may present a real risk for pregnant women who have not become immune to rubella before pregnancy. In this sense, the concept of flock hymns involves vaccination of children as an aid to protect the pregnant woman from getting infected during the first trimester of pregnancy, which would increase the risk of fetal development abnormalities (congenital rubella).

Vaccines are an important weapon in the fight against cancer, knowing that infection agents cause certain types of cancer. Chronic hepatitis B infection leads to liver cancer and HPV infection leads to cervical cancer. Vaccination against these parogens should prevent associated cancers, as already observed in hepatocellular cancer in Taiwan, China (Chang, 2003). It is also expected to decrease the incidence of cervical cancer using the vaccine against HPV (human papilloma virus). An important asset for society and for the state is money saving. Worldwide, Ehreth estimated in 2003 that vaccination led to a direct saving of tens of billions of US dollars (Ehret, 2003). The gain is even greater as the more antigens are combined in the same vaccine.

Combined vaccines bring multiple benefits: increased compliance, coverage, and injection safety.

Immunization programs are a better and more efficient investment than other public trenches such as wearing a seatbelt, chlorinating drinking water, or smoking cessation advice (Chabot I, 2004). By reducing the need for antibiotics, vaccines appear to play an important role in preventing the development of antibiotic resistance. Vaccines of the type of influenza and anti-hepatitis A are also a real support for those who travel a lot.

Vaccines contribute to increased life expectancy, women's empowerment, economic growth, or protection against bioterrorism. Robust immunization programs are a cornerstone for public health, reducing inequality, elminating illness, suffering and increasing the capital of a country.

Like any other medicine, the vaccine may also have certain risks and side effects: local, systemic, allergic. The most common side effects that occur within hours of injection are usually local, slightly severe and self-limiting - edema, pain and redness at the site of the injection. In rare cases, local reactions can be very serious or severe. Systemic side effects are more extensive events including fever, malaise, myalgia (muscle pain), headache, lack of appetite, and more. The third type of adverse reaction to the vaccine is severe (anaphylactic) allergic reaction, even caused by a component or vaccine antigen. However, the incidence of this event is less than 1 in a million vaccinated people. Such events are treated as a medical emergency. Over time, vaccines have been accused of increasing the risk of or even causing multiple serious illnesses such as autism, multiple sclerosis, type 1 diabetes, Guillain-Barré syndrome, or autoimmune diseases. These myths were, in turn, dismantled, through specialized studies showing that there is, in fact, no real statistical association between these pathologies and vaccination. In conclusion, we can say that the benefits of vaccination far outweigh the adverse reactions that some individuals may face.

**ABOUT THE OBLIGATION OF VACCINATION IN ROMANIA**

In Romania there is a planning of vaccination according to the age of the child, established by legal norms, as follows: Hepatitis B vaccine - in the first 24 hours, Calmette Guerrin Vaccine (BCG) - for the first 2-7 days, Atherosclerotic polymorphitis-Haemophilus B-hepatitis B diphtheria-pertussis pertussis vaccine - 2 months, 4 months, 11 months, Conjugated pneumococcal vaccine - 2 months, 4 months, 6 months, Measles-Rubella-Mumps Vaccine - at 12 months, 5-7 years old, Atherosclerotic diphtheria-tetanus-pertussis-poliomyelitis vaccine - at 6 years, Polio vaccine - 8 years old, Diftero-tetanic vaccine for adults / diphtheria-tetanus-pertussis acellular vaccine - 14 years of age.

To assess the population's awareness of vaccination and its role in disease prevention, we assessed the population's attitudes about vaccination and the reasons why some parents refuse vaccination. The study, descriptive and transversal, was conducted in the period 15 October 2015 to 25 March 2016, based on a questionnaire applied to a group of 139 subjects, 80 female and 59 male, aged between 21 and 63, through voluntary participation. The application of the questionnaire was aimed at a relatively diverse population from the point of view of the background environment, the level of training, income, age and number of children.

The questionnaire questioned 21 questions: a part with preformed answers and a part with answers to the free choice, completing it under 5 minutes, this being completed on 2 sheets offered to the respondent. In this study we used variables of the quantitative (age) and qualitative type (environment of origin, gender, social status, level of training). The inclusion criteria in the study were over 18 years of age. Missed questionnaire questionnaires were not removed.

Data was collected by autocompletion, keeping the respondent's anonymity and confidentiality. Data was collected after completing the questionnaire, then centralized and analyzed with Microsoft Office Excel, and then processed with Microsoft Office Word. They used graphical representations of the results obtained, radial structure diagrams, column diagrams, bar graphs and graphs**.**

**STUDY RESULTS**

Out of a total of 139 subjects, most respondents were those in the 25-29 age group with a total of 29 participants and those between 30-34 years of age, attended by 28 people. The age group of 60-65 years was the lowest represented, with only 2 respondents. The reason why most of the subjects are between the ages of 25-34 can be explained by the fact that during this period most of them become parents and the interest in vaccination increases with the appearance of children. Most respondents who participated in the study come from urban areas (71.28%); they have shown a high degree of interest in the subject of vaccination.

Most of the participants in this questionnaire have higher education (46.04%), followed by those with high school education (34.53%), professional studies (14.38%) and the lowest ones are those with studies gimanasial (5.05%). From this graph it can be seen that those with higher levels of training were more interested in the subject of vaccination.

Of a total of 95 subjects with children, 94 of them vaccinated children and one respondent did not. This seems to be a good and encouraging situation as most parents have understood the importance of vaccination and chose this path of prevention.

Of the 44 interviewed children, 39 responded that they agreed to vaccinate and 5 said they disagreed with this method of disease prevention. It is noted that, relative to the total number of children without children, there are many who refuse vaccination.

**Figure 1. The attitude of people without children in relation to vaccination**

Of those surveyed, 99 people knew that all vaccines on the list are mandatory in Romania. The vaccine against tuberculosis (BCG) was the second most important response chosen by 34 people, the reason being probably determined by the increased incidence and coverage of this disease. The least of the respondents knew that the hepatitis B vaccine is part of the mandatory vaccines in our country, probably because it was last entered into the free immunization list, only in 1995. However, there are no statistically significant differences between respondents with higher education than respondents without higher education (p> 0.05). The most frequent source of information is the family doctor (51.80%). Specialty literature occupies the second position followed by the Internet, television, friends and the last place is occupied by other sources of information: magazines. This graph shows a good situation of the level of information among the interviewed population, over 80% having a correct and informed source of information.

**Figure 2. Structure of the main sources of information about the benefits of vaccination**

After analyzing participants' responses to the existence of legal sanctions for parents who refuse to vaccinate their children it is noticed that 61.15% think that there should be no sanctions or constraints and the rest 38.85% think that there should be. Of the 54 respondents who believe that there should be sanctions, most (18 people) believe that a feasible constraint is to exclude children from communities by refusing authorities to enroll in educational institutions. A percentage of 11.51% of all respondents appreciate that there should be legal constraints, but without exemplifying methods of coercion. Of those who consider that there should be sanctions, 7.19% believe that there should be higher healthcare contributions. Other proposed methods of sanctions / constraints were: fines or the idea that insurance does not cover preventive diseases by vaccinating or even canceling guardianship. The graph reveals the tendency of respondents to refuse the constraints. Of the respondents, most (89) said that vaccination is best done by the family doctor. 39 of those questioned did not have any opinion about the doctor who should vaccinate children-family doctor or school doctor. Among those interviewed, 14, the family doctor should not be responsible for vaccination without giving any explanation.

**REASONS SUSTAINING THE GENERAL PRACTITIONERS INVOLVMENT IN THE VACCINATION PROCESS**

Of the 86 people who consider that vaccination must be under the responsibility of the family doctor (MF), 32 respondents did not provide any explanation for their choice. However, 28 individuals consider that the family doctor knows better the history of the child and the entire family, so the vaccination should be done at his office. Another relevant reason, supported by 13 of the respondents, is the fact that the GP offers informed advice, shows the possible side effects and especially the benefits of vaccination, thus increasing parental compliance. 8 people raised the issue of the different age of children in the same class, or the fact that they may be deliberately absent to avoid vaccination, and thus highlighted the importance of observing the vaccination program that can only be done by the family doctor. Another reason was that the family doctor is also attending parents who can supervise the vaccination, support and help the child.

When asked about alternatives to vaccination to prevent childhood illness, 77 questioned people said they did not know other alternatives. Increased importance was given to proper hygiene. 16 people considered it important to inform the population through campaigns, through medical education courses made in primary classes or through governmental notification programs. A balanced and fixed program of sleep and nutrition with fruit and vegetables was considered by 13 interviewees to be an effective prevention option.

# Conclusions

# As a result of the data analysis, it appears that the female population was more interested in the subject of vaccination, as it responded to more questionnaires, although male subjects had equal access to completing the questionnaire. Fortunately, most of the respondents with children have a positive attitude towards vaccination. Except for one respondent, all the parents surveyed vaccinated their children. Although most respondents claimed that they knew the benefits of vaccination, less than half knew all the complications of preventable diseases by simply vaccinating. The fact that the hepatitis B vaccine was last added to the list of mandatory vaccines in Romania was translated by a number low respondents who knew this.

# There is a good percentage of respondents' documentation from safe and informed sources about the details, information and benefits of child vaccination.

# As for the main reason why some beggars refuse to vaccinate - "*the influence of other parents*" - it strikes that it has no scientific basis or eloquent explanation. This reason is found in a larger number among females compared to male gender. We tested the hypothesis that females are more inflexible than other males, but the difference between the two groups is not statistically significant (p> 0.05).

# Higher educated people responded more correctly to general questions about vaccines than those without higher education. This result can also contribute to the fact that they are informed in a higher percentage than those without higher education, from well-known sources: specialist literature and family doctor. Most of the respondents want child vaccination to be done at the family doctor's office. There is no statistically significant difference between those with higher education and those without (p> 0.05), both of which give priority to the family doctor as regards the vaccination of children. Vaccination is considered safer when done to a family doctor because he / she better knows the patient's, family history and can provide real information and details about the possible adverse effects of vaccination. Nearly half of respondents consider it appropriate to sanction parents who do not vaccinate their children, sanctions consisting either in banning children from enrolling in educational institutions or fines. Unfortunately, an increasing number of respondents do not know how to distinguish the myth of truth and have erroneous information about vaccination, such as it may cause autism or that it is pointless to vaccinate your child if the rest of the community is already vaccinated. Analyzing the data, it is noted that those without higher education offered the majority of the wrong answers compared to those with higher education, the difference being statistically relevant (p <0.05). Respondents are aware of multiple alternatives to vaccination against child illness: proper hygiene, information campaigns, or proper nutrition.

# Beyond the programs for the promotion of pro-vaccination vaccination, through proximity medical facilities and family doctors, an essential role is played by the full capacity to adequately support the benefits of vaginal side-benefits, alongside the efforts made by the Health Coalition to advocate respect for the rights and the freedoms of the person with regard to access to and application of various procedures, treatments or medical interventions of any nature, ensuring respect for the supreme principles of the prevalence of individual interest towards society, integrity and physical security of the person and informed consent.

**REFFERENCES**:

* Abbas D., Lichtman A. and Pober J., (1994), *Cellular and Molecular Immunology*. 2 ed. Philadelphia:WB, Saunders Co.
* Adegbola R.A., Secka O., Lahai G., Lloyd-Evans N., Njie A., Usen S., Oluwalana C., Obaro S., Weber M., Corrah T., Mulholland K., McAdam K., Greenwood B., and Milligan P.J., (2005), Elimination of Haemophilus influenza type b (Hib) disease from the Gambia after introduction of a Hib conjugate vaccine: a prospective study, *Lancet,* 366, pp: 144-50.
* Andre F.E., (2005), What can be done to make vaccines more trendy?, Expert Rev Vaccines Vol.4, pp: 23-5.
* Centers for Disease Control and Prevention, (2017), *Epidemiology and Prevention of Vaccine-Preventable Diseases*, Hamborsky J, Kroger A and Wolfe S.- ed., 13th eds., Supplement, Washington D.C., Public Health Foundation.
* Centrul Național de Supraveghere și Control al Bolilor Transmisibile (2017), *Analiza evoluției bolilor transmisibile aflate în supraveghere. Raport pentru anul 2016*, http://www.cnscbt.ro/index.php/rapoarte-anuale/779-analiza-evolutiei-bolilor-transmisibile-aflate-in-supraveghere-raport-pentru-anul-2016/file.Chabot I., Goetghebeur M.M. and Gregoire J.-P., (2004), The societal value of universal childhood vaccination, *Vaccine*, vol.22, pp: 1992-2005.
* Chang, M.H.,(2003), Decreasing incidence of hepatocellular carcinoma among children following universal hepatitis B immunization, *Liver Int*; Vol.23, pp: 309-24.
* Ehreth J., (2003), The global value of vaccination, *Vaccine;* Vol.21, pp: 596-600.
* Parker A.A., Staggs W., Dayan G.H., Ortega-Sánchez I.R., Rota P.A., Lowe L., Boardman P., Teclaw R., Graves C., LeBaron C.W., (2006), Implications of a 2005 measles outbreak in Indiana for sustained elimination of measles in the United States, *N Engl J Med*., Vol.355(11), pp: 1184, PMID:16885548, DOI:10.1056/NEJMoa060775.
* Pearce J., (2005), Poliomyelitis (Heine-Medin disease), J Neurol Neurosurg Psychiatry, Vol. 76(1), pp: 128.
* WHO, (2004), *Polio reported in Botswana*, Geneva, http://www.who.int/mediacentre/notes/2004/np11/en.WHO, (2006), Position paper on Haemophilus influenza type b conjugate vaccines, *Weekly Epidemiol Rec*; Vol.81, pp: 445-52.
* WHO (2015), *Tuberculosis* Fact sheet N°104, http://www.who.int/tb/publications/factsheets/en/.HO, (2017), *World Immunization Week*, 24-30 April, <http://www.who.int/campaigns/immunization-week/2017/en/>.
* World Health Organization, (2014), *World Cancer Report 2014*. pp. Chapter 1.