Importance of Vaccination

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Acknowledgement:
Collective of authors would like to express acknowledgement to all who contributed in any way to edition of this publication.

This publication was financially and technically supported by the Biennial Collaborative Agreement between the Ministry of Health of the Slovak Republic and Regional Office for Europe of the World Health Organization 2016-2017.
**Foreword of the Chief Public Health Officer of the Slovak Republic**

The main task of the public health is to point out the risks for the human health and try to prevent them. The difference between prevention and treatment is in the fact that the effects of prevention are often „invisible” for the public, while after the commencement of treatment we can see its real results on patient’s health status after a short time. However, the public health has not got „invisible results”. They are hidden in statistics on occurrence of diseases which are the signal during decision making about prevention measures strategies.

Vaccination is also called a „miracle of medicine“. We can not be surprised about it. If we had lived in times of epidemics of smallpox, poliomyelitis and other serious diseases which caused deaths and crippling of people and someone would suddenly offer us the way how to protect ourselves against it, we would certainly have used this possibility without any hesitation.

Vaccination belongs to the controversial topics for a long time. In Slovakia, there are vivid discussions amongst public about its positive and negative aspects. There are people who perceive vaccination as helpful but there are also people who refuse it. From the side of the public health we can be happy about the fact that parents are interested in this type of prevention and that they try to find out as much information as they can. At this point, I would like to point out to already mentioned statistics on the occurrence of infectious diseases which are often missing during discussions on the vaccination. We can still hear discussions on the vaccination itself but not about the fact what it brought to the human health. The statistics show us that serious infectious diseases are not threatening human population in such big extent that it used to be before the introduction of vaccination. However, we should not have an opinion that serious infectious diseases are irrelevant for us because they do not occur in a place we live. Just because of the fact that we do not know them, their sudden outbreak would have more serious consequences for us than we can imagine. There is nothing better for dangerous viruses and bacteria than unaware and unprepared human organism.

The anti-vaccine crowd objects that infectious diseases do not occur from such reasons as better standard of living, housing, boarding, health care, etc. Yes, these factors also influence spread of microorganisms. However, decrease of infectious diseases started after introduction of the vaccination, so in times when the conditions for life and health care were not at the level as in recent years. Furthermore they argue that people cannot decide themselves on the vaccination of their own children. From the side of the public health we should recognize the situations in which our own decision is not endangering health of the others.

Decision to stay physically passive mainly harms our own health and we risk e.g. the formation of diabetes. However, the decision not to have our child vaccinated increases the risk of the spread of infectious diseases and so we increase the risk of endangering the health not only of our child but also of all the others we meet or communicate with.

In this publication we would like to offer you at least the basic information on the vaccination, its importance, reasons for its introduction, its development and impact on the occurrence of infectious diseases. We believe that our experience with vaccination in the Slovak Republic will be beneficial for you and that it will contribute to your perception of vaccination as a way of prevention, which main task is to protect human health.

Bratislava, May 2016

Prof. Ivan Rovný, MD, PhD, MPH
Foreword by the Regional Office for Europe of the World Health Organization

Resurgence of some vaccine-preventable diseases in the European Region over the past five years has served as a wake-up call, demanding urgent action. Deaths of infants, children and adults in the Region over the past year, due to vaccine-preventable diseases, should be considered as unacceptable in a region of the world with the sufficient financial and human resources to have prevented these cases.

Member States in the Region restated their commitment to extending the benefits of immunization equitably by adopting the European Vaccine Action Plan 2015–2020 (EVAP) in 2014, thus setting a new course that addresses the current context in the European Region. Implementation of the Plan empowers immunization programmes through new and ambitious strategies to ensure financial sustainability and reliable supply of vaccines. Indeed, the success of our collective vision for a Region free of vaccine preventable diseases depends on the sustained commitment of us all to provide sufficient human and financial resources to fully implement the new Plan.

After just one year of implementation, it is clear that we are well on our way. Technical support for the introduction of new vaccines is helping to tackle diseases that threaten life at all ages, from pneumonia in infancy to cancer in adulthood. Immunization system strengthening efforts have contributed greatly to increased government budgets for immunization and self-sufficiency in procuring vaccines in the Region’s middle-income countries. Three years into the verification process for measles and rubella elimination, the Region can boast that 32 countries have interrupted endemic transmission of measles (21 of which have eliminated the disease) and 32 countries have interrupted rubella (20 of which have eliminated the disease). Furthermore, preparations for the global oral polio vaccine (OPV) switch and poliovirus containment, as critical steps towards eliminating polio globally, are on track. These efforts have been both exemplary and absolutely vital.

Slovakia’s commitment to eliminate vaccine-preventable diseases is evident and strong. Organized vaccination was introduced in the country in the 1950s; since 1986, the National Immunization Programme has been aligned with standard WHO recommendations and guidelines. The aim of the programme is to eliminate and/or eradicate vaccine-preventable communicable diseases by immunization through the life-course. Slovakia has already declared elimination of measles and rubella and has successfully maintained the polio-free status the entire Region has enjoyed since 2002. Slovakia also serves as a very good example for countries burdened with tuberculosis, on how to manage this difficult disease. Despite the National Immunization Programme being threatened by a mounting anti-vaccine sentiment, the Programme has been successful in preserving the high vaccination rates necessary to protect its population. This is also thanks to the close collaboration and support by WHO and partners.

In 2016 WHO will take stock of progress made towards the goals and objectives of the European Vaccine Action Plan (2015-2020). Whilst much progress will undoubtedly be evident and a renewal in the efforts and engagement of immunization stakeholders is certainly being felt within the Region today, to reach our goals by 2020, at least as much effort will be needed from all of us to maintain this momentum.

Rob Butler, Division of Communicable Diseases, Health Security and Environment, Vaccine preventable diseases and immunization

Darina Sedláková, Head of the WHO Country Office in Slovakia
On 17 September 2014, the Member States of the WHO European Region unanimously adopted the European Vaccine Action Plan 2015-2020 (EVAP). They made an unprecedented pledge to ensure long-term domestic funding of and political commitment to immunization.

The key aspects of the EVAP are summarized below.

**EVAP OBJECTIVE 1**
All countries commit to immunization as a priority.

**EVAP OBJECTIVE 2**
Individuals understand the value of immunization services and vaccines and demand vaccination.

**EVAP OBJECTIVE 3**
The benefits of vaccination are equitably extended to all people through tailored, innovative strategies.

**EVAP OBJECTIVE 4**
Strong immunization systems are an integral part of a well-functioning health system.

**EVAP OBJECTIVE 5**
Immunization programmes have sustainable access to predictable funding and high-quality supply.

**EVAP OBJECTIVE 6**
Achieve financial sustainability.

**VISION**
A European Region free of vaccine-preventable diseases, where all countries provide equitable access to high-quality, safe, affordable vaccines and immunization services throughout the life course.

**Goal 1**
Sustain polio-free status.

**Goal 2**
Eliminate measles and rubella.

**Goal 3**
Control hepatitis B infection.

**Goal 4**
Meet regional vaccination coverage targets.

**Goal 5**
Make evidence-based decisions.

**Goal 6**
Achieve financial sustainability.

**Game Changers**

The EVAP outlines a path to achieve these goals and objectives in the form of innovative strategies and proposed actions by Member States. These include:

- **Strengthening immunization information systems:**
  - Ensuring strong and reliable monitoring and surveillance and improving the quality of immunization data and using this to improve programme performance, including capacity to respond to vaccine safety-related events.

- **Tailoring immunization programmes:**
  - Using improved immunization data and research methods that monitor public perceptions, knowledge and attitudes to develop tailored and innovative strategies ensuring equitable extension of immunization and stimulating the demand for immunization among all population groups.

- **Establishing and strengthening the role of technical advisory groups:**
  - Ensuring evidence-based decision-making on immunization, including new vaccines, through independent national advisory bodies (NITAGs).

**Targets**

A set of targets agreed to by Member States in the EVAP will be used to evaluate and monitor their progress. These include:

- Financial self-sufficiency for procuring routine vaccines (domestic resources) (2020: all countries, except two low-income countries as of 2012)
- A national immunization technical advisory group (NITAG) or equivalent body (2020: 90% of countries)
- An expert review committee in place (2020: all countries)
- A fully functional national regulatory authority (or access to regional quality assurance mechanisms) (2020: all countries)
- No stock-outs for any routine vaccine at national level (2020: 95% of countries)
**Why we need vaccination**

Human population has always been endangered by infectious diseases and their epidemics. The idea of preventative protection of people against infectious diseases comes probably from ancient China. In the past, the biggest factors which negatively influenced the number of inhabitants were mainly wars and infectious diseases. Wars brought the death, invalidity, disruption of social, economical and hygienic structures with subsequent spread of infectious diseases with the participation of famine, bad water, infestation of rodents, dirt, lice, etc. As far back as ancient civilizations in China, India, Arabia, Greece and Rome, there was an effort to solve protection against infectious diseases by interventions which are similar to that of contemporary active immunization.

The Middle Ages created ideal conditions for waves of epidemics which caused deaths to millions of Europeans. Until the end of the 18th century, besides wars and natural disasters, the most frequent cause of deaths and also cause of shortening of life were epidemics of infectious diseases. For example, between the 14th to the 18th centuries the plague epidemics, disease known as „black death”, lowered the number of inhabitants in Europe by one third. Even in the 19th century people died of the cholera epidemics. In the last century, tuberculosis was still cause of deaths between two world wars.

Infectious diseases are sometimes referred to term „communicable diseases”. This means that they have the ability of transmission – either from man to man or from animal to man. One of the most significant prevention measures against infectious diseases is the vaccination, which is in expert literature termed as the immunization or the vaccination. Vaccination has a long history, though into routine practice it was introduced in the 20th century. In development of the vaccines from the first vaccine till presence we can see different periods. The most important ones are the period of empirical development and the period of rational development of the vaccines. The first and the longest was the period of empirical development when the vaccination against true smallpox began. This was the period of the vaccines development based on experience, period of random observation without thorough study. Till 1970s vaccines development was positively influenced by research of etiological agents of diseases and by production of vaccines with attenuated agents. This empirical development changed into rational research and development, priority was put on search and recognition of antigen structures of infectious agents by molecular biology, production of subunit and recombinant vaccines and employment of new adjuvant techniques.
At the beginning of 1970s vaccines against 20 infectious diseases were available to the public. In many countries these were used mainly as prevention mean for highly risk groups (travellers, soldiers) or for occasional vaccination (campaigns). As late as in mid-1970s vaccination started to be systematic, mainly thanks to EPI programme (Extended Programme on Immunization), which was enforced by WHO. At first there were applied the vaccines against six infectious diseases. In the mid-1980s it was proved that vaccination can prevent millions of diseases and deaths. Thanks to vaccination, serious infectious diseases were eradicated or significantly eliminated. At the beginning of 1990s effort of international organizations UNICEF, WHO and other brought success in vaccination, when vaccination coverage on the global level was around 80%.

The vaccination is an important preventive measure not only for individual but also for the whole society. The vaccination influence on health of population has immense global significance for decrease of morbidity and mortality. The vaccination not only protects from infectious diseases, but also helps to prolong life of healthy individuals, who can lead longer productive life. As far back as in the last century it was proved that higher number of vaccinated people leads not only to the protection of those vaccinated but also of unvaccinated persons thanks to so called collective immunity. This immunity is reached by decrease of circulation of etiological agent in immunized area thanks to the vaccination. The more people are vaccinated and thus protected against infectious diseases, the lesser is the possibility of spreading of microorganisms in the environment and causing serious infectious diseases.

**Vaccination in the world**

The World Health Organization (WHO) was founded on 7 April 1948 as a specialized agency of the United Nations Organization (UN). According to the Constitution, the main task of WHO is to help the governments in the promotion, protection and development of health of their inhabitants with the participation of general public. The 7th April – day of founding of WHO – is commemorated globally each year as the World Health Day. The World Health Organization helps countries through projects and programmes in different areas of human health.

One of the biggest milestones in the area of vaccination was Smallpox Eradication Programme. This was serious infectious disease which killed as many as quarter of infected. Surviving persons had often permanent consequences in a way of blindness and significant scarring of skin. In the 20th century smallpox killed millions of people. It is estimated that the number of smallpox victims was higher than the number of victims from both world wars. In 1948 WHO established working group focused on study of this disease and on possibility to develop the vaccines. This period required big financial resources and cooperation of experts from all over the world. This was the first opportunity to show the quality of cooperation between countries all over the world not only at governmental level but also at the expert level. In 1965 at the 18th WHO session, the Smallpox Eradication Programme was adopted and WHO appealed for all member states to contribute, according to their possibilities, to fulfillment of this goal. National governments, national authorities of public health, health workers, including laboratory workers showed unbelievable will to fulfill the goal of programme. Cases of the disease started to gradually decrease in individual regions. Global eradication programme was successfully completed in 1979, variola was declared as eradicated in all over the world and since 1980 mandatory vaccination was ended. Eradication of smallpox is a concrete example of effective international cooperation in the fight against serious diseases causing epidemics. It was reached thanks to employment of scientific knowledge and through mobilization of governmental and nongovernmental organizations under the lead of WHO.

After successful vaccination against smallpox, the development of vaccines against other infectious diseases came into consideration. In 1974 WHO launched Expanded Programme on Immunization (EPI). Its objective was to ensure that children all over the world have access to vaccination and thus being protected against life threatening infectious diseases. In the world, diseases causing mutilation and significantly lowering quality of life were still occurring.
The development of new vaccines requires long-term research of etiological agents and big financial resources. At the level of individual states, EPI was incorporated into national immunization programmes. First, vaccination against six diseases started — tuberculosis, diphtheria, tetanus, pertussis, measles and poliomyelitis. Number of diseases and deaths was significantly reduced thanks to vaccination. At the beginning of 1990s, the list of diseases for elimination was supplemented, new goals in the area of morbidity decrease and operational goals for immunization and surveillance of infectious diseases were set.

The Global Poliomyelitis Eradication Programme adopted in 1988 belongs to the period of universal children vaccination era. Poliomyelitis, or infantile paralysis is the viral infectious disease caused by poliovirus. There are 3 types of wild polioviruses. They hardly survive outside the human body and if they do not find an unprotected, i.e. unvaccinated man, they will die soon. Wild poliovirus type 2 was eradicated in 1999. Number of cases caused by wild poliovirus type 3 is currently at very low level. The disease causes mainly paralysis of legs, but the most infected children, during the epidemics of poliomyelitis, ended on artificial lung ventilation because of lowered ability of lungs. Cure for this disease does not exist. There is only vaccination as prevention. It is estimated that 5% to 10% of paralysed people, mostly children, die of consequences from disease. Number of cases dropped from 350,000 in 1988 to 359 cases in 2014. Number of endemic areas dropped from over 120 to two (Afghanistan and Pakistan).

Another WHO initiative is the Global Measles and Rubella Strategic Plan for the years 2012 – 2020. Measles are highly infectious disease with 100% contagiousness. A man in contact with sick person will certainly get infected. During this disease, high fever or spots are frequent. Vaccination is the most effective way to prevent it. It consists of two doses. To maintain the low occurrence of measles it is needed to have vaccination coverage at the level of more than 95% in both doses enabling the disease not to be spread further. Rubella is dangerous mainly for pregnant women and their unborn child. Woman infected with rubella virus during pregnancy is the carrier of virus and can infect also her foetus. There is a high risk that the child will be born with disability of any kind. Pregnancy can end with abortion or by birth of dead foetus.

Vaccination coverage against rubella

Vaccination coverage of children against poliomyelitis and measles in Europe, 2012

With the help of vaccination we can significantly decrease the morbidity of infectious diseases and prevent deaths or worsened quality of life. WHO encourages countries through promotion of elimination programmes. Thanks to development and progress in the area of vaccination, it can be considered as one of the safest and the most effective way in the prevention of deaths and improving quality of life. Countries all over the world gradually introduce and extend immunization programmes which are today available to more than 80% of children in the world.
In the area of vaccination, the progress in research and development is inevitable. WHO initiated the Global Vaccination Action Plan for the years 2011 – 2020, which is in connection with Global Immunization Vision and Strategy. It is clear that during the last 10 years there was substantial success in development and implementation of new vaccines. However, around 24 million children in the world are still not vaccinated. The ambition is to continue in vaccines development and to ensure the best possible access to them by people all over the world. The main goals of WHO are to ensure the vaccination for as much people as possible against as much diseases as possible, to implement new types of vaccines and to improve research and development in the area of vaccination.

### Financial coverage of vaccination by national governments, 2007


### Cooperation in the area of vaccination

In the area of vaccination strategy, each country decides what kind of vaccination it implements into its national immunization programme. However, all countries follow the WHO recommendations. Implementation of a new kind of vaccination in individual countries depends mainly on epidemiological situation and on quality of monitoring system of infectious diseases. Highly-developed countries do not have a problem of access to quality vaccines, because they are the ones who create suitable conditions for research and development in the area of vaccination and surveillance of infectious diseases is in most countries electronic. Nevertheless, there are countries which do not have sufficiently developed surveillance system, thus information on occurrence of diseases is considerably distorted. Not always the rule that the low occurrence of infectious diseases does not require the introduction of the vaccination is valid. There are often hidden cases which would be covered by vaccination.

Surveillance of infectious diseases is carried out in most of the countries already for decades. In every highly-developed country there is a national institution which task is to implement good surveillance system and vaccination strategies. These institutions are mostly the part of national authorities of the public health with the experts from the field of infectious diseases and vaccination. These can also be agencies having support of national governments. Best-known agencies which enrich the knowledge and support the development in the area of infectious diseases and vaccination are Centers for Disease Control and Prevention in the USA (CDC) and European Centre for Disease Prevention and Control (ECDC). Irreplaceable role have also research institutions and universities promoting research in the area of vaccination. The cooperation between WHO, CDC, ECDC and other expert institutions and universities is inevitable for the progress in the area of research and development of the vaccines.

### Vaccination in Europe

Infectious diseases do not respect state borders and they can dangerously spread when needful measures are not performed. A lot of cases of spread of infectious disease into other country are known. These cases happen mainly in the period of increased migration of people. In the past, people were leaving home countries mainly because of economic reasons. In the last years there is a boom of travelling thanks to development in air transport, which enables faster transport and knowing other cultures. Spreading of a disease is not only the question of the past, but it becomes actual also in presence. Many people are looking for a place of better life because of economic, climatic or social reasons. It is good to know how epidemiological situation in the area of infectious diseases develops in other countries and what level of vaccination coverage they have.

The European countries are in the area of vaccination independent and they may differ as for the vaccination strategies. However, all countries in principle follow the WHO recommendations. As for geography, Europe is a small region, but we can find here many different approaches in the area of vaccination strategy. In some European countries vaccination is carried out besides outpatient departments of paediatricians and general practitioners for adults or specialized health departments also at other places such as vaccination centres, pharmacies or shopping centres. There can be differences also in the area of financing of vaccination and vaccines. As the infectious diseases can spread from one country to another and the vaccination is preventive tool against this spread, in the last years there are stronger voices calling for more intensified communication between countries in
the area of vaccination strategy. It is good to know what kind of vaccination is needed during
the visit of other country.

European Union (EU) stepped into the topic of infectious diseases in 1980s. The first
surveillance network financed from the EU was founded in 1984. This was EuroHIV network,
which success led to creation of another networks for european surveillance over spread of
different infectious diseases and in the end of 1980s it led to development of more consistent
strategy of surveillance system and related legislation. These steps in strengthening and
extending of monitoring of infectious diseases were the real public health success of the EU
policy at the end of the 20th century. Nevertheless, it became obvious that for the European
surveillance, stronger base is needed. Solely financing of networks as a series of projects
for selected diseases or group of diseases was not enough. The whole topic of control of
infectious diseases in Europe needed systematic way and effective coordination by central
expert institution, which ensures continuous collection, processing and analysis of data on
occurrence of diseases and adequate employment of gained results, cooperating closely
with member states, providing them with expertise, support in building of preparedness
and in introduction of measures against origination and spread of infections. That is why the
European Commission with the big support of European Parliament and ministers of health
of member states initiated in 2003 the process of creation of the new independent European
Centre for Disease Prevention and Control - ECDC. This process started at the beginning of
2003 after SARS epidemic and it was completed in a short time within one year.

Coordinated activity of the European Union in the area of monitoring, early warning
and subsequent response to public health threats is the added value in protection and
improving of human health. During the past decade, development in the European Union in
many areas showed that not only infectious diseases endanger public health. There are
many other sources of endangering the health which are related mainly to other biological,
chemical, radiation or environmental events which includes risks connected with climate
change. They can endanger the health of the European Union citizens, cause malfunction of
critical sectors of society and economy and endanger the ability of individual member states
to adequately react to them. The European Parliament and Council based on the European
Union proposal agreed with the adoption of Decision No. 1082/2013/EU on serious
cross-border threats to health (Decision 1082/2013/EU). It applies to measures in the area of
public health with regard to serious cross-border threats to health such as threats to health of
biological origin (communicable diseases, antimicrobial resistance and infections connected
with health care), biotoxins or other harmful biological factors not related to communicable
diseases, threats of chemical origin, threats of environmental origin, threats of unknown
origin and events which can cause extraordinary situation in the area of public health with
international impact. Decision, besides other things, establishes the „Early Warning and
Response System“ (EWRS) at the European level, establishes the „Health Security Committe“
(HSC) and constitutes possibility of common public procurement of health measures through
agreement on common public procurement at the European level „Joint Procurement
Agreement“ (JPA).

EWRS – the Early Warning and Response System at the European level allows the
European Commission and member states permanent communication for the purpose of
warning, risks assessment on human health and determination of measures which may be
needful for the protection of public health. Member states or European Commission issue
a warning in EWRS, if origination or development of serious cross-border threat to health
is unusual or unexpected for given place or time, causes or may cause significant morbidity
or mortality of people, increases quickly or may increase quickly as for the extent, exceeds
or may exceed capacity of national reaction, influences or may influence more than one
member state, requires or may require coordinated reaction at the level of Union. When
member states inform the World Health Organization about events which can represent an
extraordinary situations of international extent in the area of public health, they should at the
same time issue a warning in EWRS. ECDC is an operator of this system. Inasmuch as during
the origination of an event caused by biological, chemical, environmental and other factors also
other sectors outside health sector are involved in ensuring the needful measures, effective
international communication is very important. Government of the Slovak Republic therefore
approved the implementation of Decision 1082/2013/EU by its resolution No. 16/2015 from
7 January 2015 and through this it approved to ensure the intersectoral communication in
case of public health threat. Individual sectors – Ministry of Interior of the Slovak Republic,
Ministry of Foreign and European Affairs of the Slovak Republic, Ministry of Defense of
the Slovak Republic, Ministry of Transport, Construction and Regional Development of the
Slovak Republic, Ministry of Agriculture and Rural Development of the Slovak Republic,
Ministry of Economy of the Slovak Republic, Ministry of Environment of the Slovak Republic
and Ministry of Finance of the Slovak Republic have determined competent point for
communication with the contact place for EWRS in the Slovak Republic, which is the Public
Health Authority of the Slovak Republic. In the case that the contact point for EWRS receives
request or information which concerns cross-border threat to health, it sends this request or
information to competent points for communication of responsible sectors. Competent
points of responsible sectors, during origination of an event which could endanger health of
inhabitants of the Slovak Republic and by its extent could endanger health of inhabitants of
other member states send information about this event and on adopted measures to contact
point for EWRS. Contact point for EWRS evaluates seriousness of this event and in the case of
a need sends through EWRS information to member states, European Commission and ECDC,
which after evaluation elaborates risk assessment of EU citizens health threat.
Health Security Committee (HSC), of the European Commission was formally founded in accordance with Decision of European Parliament and Council No. 1082/2013 on serious cross-border threats to health. All member states are represented in this committee. The task of the committee is to promote sharing of information on serious threats of public health, mainly in situations when there is a risk of spread of this threat from one member state to another. It also coordinates preparedness for these situations and reaction on the European level. The committee closely cooperates with ECDC, mainly as for risk evaluation of certain threat for public health at the European level. Its task is therefore to assess the extent of seriousness of a threat to public health, find out the level of preparedness of individual member states and to coordinate response on the European level. In the area of vaccination the committee solves, for example, the lack of vaccines reported by some European countries and tries to find a solution in cooperation with international institutions.

Joint Procurement Agreement (JPA) on health countermeasures at the European level enables faster and price preferable mechanism of procurement of not only vaccines but also of other health appliances or medicines. By signing the general agreement, member states will get involved into the process of joint public procurement. In this way they will secure a possibility of participation in procurement of health products and medicines in case of their general shortage. The Slovak Republic welcomed this possibility. The Government of the Slovak Republic approved a recommendation on joining of the Slovak Republic the Agreement on common public procurement of health countermeasures. The agreement was signed by the State Secretary of the Ministry of Health of the Slovak Republic during the meeting of EU health ministers on 20 June 2015. Big contribution is the possibility of joint procurement of pandemic vaccine, which is essential during influenza pandemics. Pandemic vaccines against influenza are not manufactured in the Slovak Republic and so it is dependant on their purchase from abroad. Participation in joint public procurement at the European level can ensure pandemic vaccine for inhabitants of the Slovak Republic.

European Centre for Disease Prevention and Control (ECDC) was officially established in 2004 when its founding statutes were issued. Particular networks for notification of infectious diseases by member states were founded. The European surveillance system of infectious diseases was gradually established, which is today at high level and provides overall picture on epidemiological situation at the European level thanks to one European epidemiological system TESSy. ECDC launched so called „Surveillance Atlas of Infectious Diseases“, where can be found, according to selected criteria, the occurrence of infectious diseases in individual EU member states. So far, Atlas provides overview of some selected diseases. It is assumed that further diseases will be gradually added. Atlas is available to public at ECDC web site.


Through the collection of the statistical data on the occurrence of infectious diseases, setting up the vaccination strategies can be evaluated. The Vaccine Preventable Diseases Programme (VPD Programme) was established in 2006. In 2009 VENICE project (Vaccine European New Integrated Collaboration Effort) was established, which is focused on exchange of information on the strategy of vaccination implementation, processes for the introduction of new types of vaccination into national immunization programmes or on the vaccination coverage against selected infectious diseases in EU member states. In framework of VPD Programme, so called „Vaccine Schedule“ was created which is available on web sites of ECDC. According to simple criteria, everyone can find what kind of vaccination is implemented in selected European country.
Occurrence of measles in EU countries according to age and vaccination status - October 2014 – September 2015


Vaccination in the Slovak Republic

National Immunization Programme (NIP)

Vaccination in the Slovak Republic was introduced in 1950s, when new types of vaccination were introduced into the immunization programme (Table 1). Since 1986, vaccination in the Slovak Republic is governed by unified immunization programme. The aim of the National Immunization Programme is elimination up-to eradication of communicable diseases by consistent providing of effective immunization of children and adults.

Table 1: Introduction of systematic vaccination in the Slovak Republic

<table>
<thead>
<tr>
<th>Disease</th>
<th>Year of introduction of systematic vaccination</th>
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<tbody>
<tr>
<td>Tuberculosis</td>
<td>1951</td>
</tr>
<tr>
<td>Pertussis</td>
<td>1956</td>
</tr>
<tr>
<td>Poliomyelitis</td>
<td>1957</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>1958</td>
</tr>
<tr>
<td>Tetanus</td>
<td>1958</td>
</tr>
<tr>
<td>Measles</td>
<td>1969</td>
</tr>
<tr>
<td>Rubella</td>
<td>1984</td>
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<tr>
<td>Mumps</td>
<td>1987</td>
</tr>
<tr>
<td>Viral hepatitis type B</td>
<td>1998</td>
</tr>
<tr>
<td>Haemophilus influenza type b (Hib)</td>
<td>2000</td>
</tr>
<tr>
<td>Pneumococcal diseases</td>
<td>2009</td>
</tr>
</tbody>
</table>


In the framework of the European Union, vaccination strategy of individual countries can slightly differ and we can find differences also from the aspect of legislation. Vaccination in EU countries is either mandatory or voluntary. Regardless of whether the vaccination is mandatory or voluntary, it can be fully or partially covered by public sources. Coverage of individual types of vaccination is regulated by each country. Mandatory vaccination is fully covered by public sources. When national authority makes such decision, some types of voluntary vaccination for public can also be fully or partially covered.

Sharing the information between countries on the effectiveness of vaccination and its positive impact on the occurrence of infectious diseases is important. There are groups of people refusing the vaccination because of different reason. Not only for these groups we should spread publicly the examples when the vaccination was successful in the fight against infectious diseases.

The epidemics of infectious diseases are occurring mainly in communities where there are concentrated more unvaccinated persons. Unvaccinated people visiting the other country pose also the risk of spread of infectious disease into the home population in the case they get ill during their stay. From the aspect of the occurrence of infectious diseases, Europe belongs to the world regions with their lowest incidence. However, there are e.g. epidemics of measles on annual basis here, which is highly contagious disease. This occurrence is mostly in unsufficiently vaccinated communities with no collective immunity which enables to spread the virus very fast.
Besides immunization, the programme includes also vaccination coverage control, monitoring of adverse events following immunization, the evaluation of immunity status of the population, monitoring of the occurrence of vaccine preventable diseases and monitoring of the circulation of infectious agents in the population or in environment.

NIP is fulfilled in accordance with the World Health Organization recommendations and in accordance with the practice of EU member states. Strategy of the World Health Organization in the area of vaccination is focused on its extension with other target groups of the population, on introduction of new vaccines into the common practice, introduction of new vaccination programmes which will lower occurrence of infectious diseases that might be influenced by vaccination and which will increase safety, effectiveness and compliance (acceptability) of target population group will increase.

Goals

The National Immunization Programme is ensured in accordance with the World Health Organization programme goals „Health for all in the 21st century”.

Fulfillment of the WHO goals in the Slovak Republic

By consistent fulfillment of the National Immunization Programme, the majority of priority goals in the Slovak Republic were accomplished. Slovakia was one of the first countries in the world, which accomplished elimination of poliomyelitis. In 2002, eradication of poliomyelitis was confirmed in the WHO European Region, including the Slovak Republic. By systematic universal vaccination performance, the Slovak Republic succeeded in the elimination of serious infectious diseases such as diphtheria, tetanus in children and youth and in the reduction of the other diseases of immunization programme.

Since 1998, there was no occurrence of measles, with the exception of three persons with measles in asylum facilities of the Slovak Republic and three cases of imported measles. In other vaccine preventable diseases, morbidity is at low or zero values. There is significant morbidity decrease on viral hepatitis type B since introduction of regular mandatory vaccination of infants against viral hepatitis type B in 1998. Pertussis is the only disease in which the increased incidence can be seen recently.

The organization of vaccination

Vaccination is planned, organized, coordinated and controlled by the Public Health Authority of the Slovak Republic (PHA SR) in cooperation with the regional public health authorities in the Slovak Republic according to valid legislation.

The National Immunization Programme includes a number of types of vaccination, which are supported by the legislation, concretely the Ordinance of the Ministry of Health of the Slovak Republic No. 585/2008 on details on prevention and control of communicable diseases. In the Slovak Republic, we have introduced mandatory and also recommended types of vaccination for different population groups (Table 2). Mandatory types of vaccination are fully covered by health insurance companies.

Table 2: Types of vaccination in the Slovak Republic

<table>
<thead>
<tr>
<th>Type of vaccination</th>
<th>Vaccination against</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular mandatory vaccination of children</td>
<td>poliomyelitis, diphtheria, tetanus, pertussis, viral hepatitis type B, haemophilus influenza type b (Hib), pneumococcal diseases, measles, mumps, rubella</td>
</tr>
<tr>
<td>Regular mandatory vaccination of adults</td>
<td>diphtheria, tetanus</td>
</tr>
<tr>
<td>Mandatory vaccination for persons in high risk of contagion</td>
<td>tuberculosis, viral hepatitis type B, tetanus, rabies, influenza, pneumococcal diseases, viral hepatitis type A, meningococcal infections</td>
</tr>
<tr>
<td>Recommended vaccination for persons in increased risk of contagion</td>
<td>influenza, pneumococcal diseases, viral hepatitis type B, viral hepatitis type A, meningococcal infections, haemophilus influenza type b (Hib), human papillomaviruses (HPV)</td>
</tr>
<tr>
<td>Mandatory vaccination for persons in professional risk of contagion</td>
<td>tuberculosis, viral hepatitis type B, rabies, influenza, tickborne encephalitis, viral hepatitis type A</td>
</tr>
<tr>
<td>Recommended vaccination for persons in professional risk of contagion</td>
<td>rabies, tickborne encephalitis, viral hepatitis type A, influenza, viral hepatitis type B</td>
</tr>
</tbody>
</table>
The Control of Vaccination

In accordance with valid legislation, annual regular administrative control of regular mandatory vaccination is performed, when the vaccination coverage of children vaccinated in connection with their age is monitored. Vaccination coverage is monitored at the level of districts, counties, regions and at the national level.

All cohorts of children that should have been vaccinated due to their age are controlled firstly followed by the evaluation of the vaccination of newborns of HBsAg positive mothers, vaccination coverage of patients against VHB at haemodialysis departments, vaccination coverage of contacts of persons infected with virus of hepatitis type B, vaccination coverage against influenza and pneumococcal diseases in persons residing in social care facilities.

The control includes also the accuracy of procedure during vaccination and the completeness of records on vaccination in health documentation, the storage of vaccines, the contraindications of vaccination and adverse events after vaccination. Sufficient collective immunity against vaccine-preventable diseases is reached with at least 95% vaccination coverage at the national level. The vaccination coverage of children population in the Slovak Republic exceeds this level for a long time. However, in the last years, there is an increased number of parents which, from different reasons, refuse to vaccinate their children. This is reflected in the level of the vaccination coverage, which is slightly lower in comparison with previous years. Sufficient collective immunity on the national level is maintained, but it is needed to reach 95% vaccination coverage also at the level of counties and 90% vaccination coverage at the level of districts.

Working Group on Immunization

In 2006, the Working Group on Immunization was appointed by the Minister of Health of the Slovak Republic (WGI) as the advisory group of the Public Health Authority of the Slovak Republic for the topic of immunization. It consists of experts from the fields of epidemiology, paediatrics, immunology, microbiology and representatives of the State Institute for Drug Control and the Ministry of Health of the Slovak Republic.

• WGI submits proposals for antigen composition of vaccines for regular mandatory vaccination of children and adults, recommends extraordinary vaccination and application procedures during use of vaccines, proposes short-term and long-term strategy of NIP in the Slovak Republic, recommends introduction of new vaccines, new types of vaccination in the Slovak Republic (Table 3).
• WGI submits proposals for harmonization of NIP in the Slovak Republic with the recommendations of WHO, EC and with the practice of EU member states.
• WGI evaluates expert standpoints on proposals of expert guidances of the Chief Public

Table 3: Overview of the most important changes in strategy of vaccination in the Slovak Republic since 1998

<table>
<thead>
<tr>
<th>Vaccination against</th>
<th>Change</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>VHB</td>
<td>Mandatory vaccination of infants</td>
<td>1998</td>
</tr>
<tr>
<td>Hib</td>
<td>Mandatory vaccination of infants</td>
<td>2000</td>
</tr>
<tr>
<td>Diphtheria</td>
<td>Revaccination of 13-years old children</td>
<td>2004</td>
</tr>
<tr>
<td>VHB</td>
<td>Mandatory vaccination of teenagers</td>
<td>2004</td>
</tr>
<tr>
<td>Poliomyelitis</td>
<td>Mandatory vaccination of infants with inactivated vaccine</td>
<td>2005</td>
</tr>
<tr>
<td>Diphtheria, tetanus, pertussis, poliomyelitis, VHB and Hib</td>
<td>Mandatory vaccination of infants with hexa vaccine</td>
<td>2007</td>
</tr>
<tr>
<td>Pneumococcal diseases</td>
<td>Mandatory vaccination of infants</td>
<td>2009</td>
</tr>
<tr>
<td>Diphtheria and tetanus</td>
<td>Mandatory revaccination of adults</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Cancellation of revaccination of children in the age of 11</td>
<td>2010</td>
</tr>
<tr>
<td>Diphtheria, tetanus, poliomyelitis and pertussis</td>
<td>Revaccination in the age of 13</td>
<td></td>
</tr>
<tr>
<td>Viral hepatitis type B</td>
<td>Recommended vaccination for 2-years old children living in bad hygienic conditions</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Cancellation of vaccination of newborns</td>
<td>2011</td>
</tr>
</tbody>
</table>

The strategy of vaccination in the Slovak Republic enables equal access to vaccination for all citizens of the Slovak Republic. Thanks to this strategy there is no occurrence of serious diseases such as child poliomyelitis, diphtheria and many others for a long time. Even diseases causing epidemics among unprotected persons (e.g. measles) occur rarely in the Slovak Republic (imported cases) thanks to the high vaccination coverage, which we maintain by good organized vaccination strategy.

Vaccination influence on the occurrence of infectious diseases in Slovakia

Diphtheria is a disease caused by bacteria Corynebacterium diphtheriae. Systematic vaccination was introduced in 1958. It affects tonsils, larynx and pharynx. It is characteristic with frequent heart and neurological complications. The most serious form of diphtheria is
infliction of larynx, which can end up with suffocation within some hours. The vaccination against diphtheria is very effective way of prevention. In those states where the vaccination does not cover sufficient proportion of children population, the incidence can increase significantly. Similar effects on the increase of incidence may have migration of the population as well as bad immune status of the adult population.

**Pertussis** is highly infectious disease caused by bacteria *Bordetella pertussis*. Systematic vaccination was introduced in 1956. It affects air passages and causes serious attacks of cough, which can interfere with normal breathing, it can cause infections of ears, inflammation of bronchi, pneumonia, brain damage or even death. Before introduction of vaccination, pertussis was the most frequent child disease. After introduction of vaccination there was a significant decrease of its occurrence. However, in the last years there has been a slight increase of number of cases. There is an increase of number of cases not only in teenagers but also in adults as a consequence of natural loss of immunity after last revaccination (immunity after vaccination decreases with higher age). The adults are reservoir of infections for newborns and infants, for whom the clinical course is the most serious and can be even fatal. The vaccination is extremely important, because it prevents origination of serious forms of pertussis and deaths in most vulnerable age groups of the population which are newborns and infants.

**Tetanus** is an acute infectious disease of the nervous system caused by toxin produced by bacteria *Clostridium tetani*. Systematic vaccination was introduced in 1958. Tetanus can be serious complication of different injuries, burns, contaminated with soil or dust. Infection of respiratory tract is the cause of high mortality. The vaccination against tetanus is performed in accordance with the WHO recommendations and it is unambiguously the most effective way of prevention. In the Slovak Republic, mandatory vaccination was introduced in 1958. The risk of infection with the bacteria exists in small, negligible injuries, in cut wounds, during play in sand, clay, during fall from bicycle etc. That is why very big emphasis is put on prevention.

**Poliomyelitis** is acute viral disease caused by poliovirus. Systematic vaccination was introduced in 1957. It affects the nervous system and causes flaccid paralysis of legs, leading to permanent paralysis. In the Slovak Republic, poliomyelitis has not occurred since 1960. In 2002, European region was declared by the World Health Organization as an area without child poliomyelitis and a big effort was made to maintain this status.
Viral hepatitis type B is viral disease of liver. Systematic vaccination was introduced in 1998. It has a tendency to pass into chronic stage with the possibility of liver cirrhosis or hepatocellular carcinoma. Its seriousness is in the fact that its course is often unknown and it lasts a long time. Probability of origination of chronic consequences is dependent on the age of patient, it is high in newborns and in infants. The disease is spread through infected blood of blood derivates, body fluids in close contact in family, during sexual intercourse, but also vertically – from mother to child during pregnancy and during the delivery of newborn. The virus survives in environment for a long time. The most effective preventive measure against the origination of viral inflammation of liver type B is vaccination.

Source: PHA SR, 2016

Haemophilus influenzae diseases are serious infections caused by invasive strain of bacteria. The most pathogenic for humans is Haemophilus influenzae type b. Systematic vaccination was introduced in 2000. The bacteria cause mostly meningitis, inflammation of epiglottic cartilage, bronchitis, pneumonia and blood-poisoning. Severe forms of infection lead to chronic consequences in 30%, mainly damage of hearing and damage of brain. The most endangered group are children up to the age of 1 year and persons with disorders of the immune system. Acute inflammation of epiglottic cartilage is a serious disease which can cause, without medical intervention, sudden suffocation of a child. The mortality is between 2 to 5%. In spite of treatment, in 15 to 30% of cases there is permanent neurological damage. Haemophilus influenzae diseases in children in the Slovak Republic occur very rarely after the introduction of regular vaccination of infants.

Source: PHA SR, 2016

Pneumococcal diseases are serious public health problem in children caused by bacteria Streptococcus pneumoniae. Systematic vaccination was introduced in 2009. Bacteria is the common cause of pneumonia, meningitis and infections of blood. It is a serious disease with high mortality, which is in 0 years old children at the level of 22.5%. It is estimated that in the world approximately 850 000 children up to the age 5 years die annually on consequences of this disease. Besides serious impact on health of the population, there is an increasing problem of resistance of pneumococci on antibiotics. The positive impact of universal vaccination of infants is the decrease of occurrence of invasive and also noninvasive pneumococcal diseases in children, the decrease of number of complications and permanent consequences, the decrease of a need of hospitalization and the decrease of expenses on antibiotic treatment. Among the common diseases with less serious clinical symptoms belong otitis media, sinusitis and bronchitis. According to studies carried out in the Slovak Republic, there is the significant decrease of hospitalizations of children up to the age 2 years with heavy otitis media by 42.8% after introduction of mandatory vaccination. Besides mentioned contributions of mandatory vaccination of infants there is also secondary effect, i.e. the decrease of pneumococcal
Mumps is a viral infectious disease. Systematic vaccination was introduced in 1987. It affects salivary glands and also often gonads and the central nervous system. The aim of the vaccination is mainly the prevention of complications connected with natural infection. The most frequent complication in adolescent boys and men is inflammation of testes and perididymis. Sterility is very frequent after inflammation of testes.

Rubella is a viral infectious disease. Systematic vaccination was introduced in 1984. It poses a big threat for pregnant women and their unborn children. Before introduction of universal vaccination (till 1985), in the Slovak Republic there were epidemics of rubella in 3 to 5-year cycles. In the case that a woman is infected with rubella in the first trimester of pregnancy, there is a probability up to 80% that a child will be born with disability of sight, hearing, with brain damage, with congenital heart defect or with mental disability (congenital rubella syndrome). Pregnancy can end up with miscarriage of foetus or birth of a dead foetus. The principle importance of vaccination is in prevention of congenital rubella syndrome.
Effective communication with the public

One of the main efforts of all institutions participating in the area of vaccination is effective communication with the public. The aim is to persuade the parents that vaccination is the best and at the same time the simplest and fastest way of protection of their children against serious infectious diseases. In the era of good access and sharing of information and increased migration of people, this task is very difficult for one independent country. Sharing of information between countries on the successes in the area of vaccination undoubtedly helps in building the public’s trust in the vaccination.

In the regional public health authorities of the Slovak Republic there are established the Advisory Centres of Health Protection and Promotion which provide the public with advisory services focused on different areas, such as smoking, HIV/AIDS, vaccination, etc. Advisory services on the vaccination are focused on communication with the public on the topic of the vaccination. The parents having doubts or questions can come and take advice on the vaccination. The Public Health Authority of the Slovak Republic also offers the public vaccination calendar and vaccination strategy available on its web site. Within the post partum packet, mothers in hospitals are given interactive tool of the vaccination calendar showing the dates when their newborn should be vaccinated in a simple and clear way. This interactive vaccination calendar is reliable source of basic information on individual types of vaccination in the Slovak Republic. Besides that, vaccination calendars are also distributed to paediatric outpatient departments.
Roma people are the biggest minority group in all countries of Europe, including Slovakia. From the aspect of public health, communication is very important because these people are mostly living in the environment with insufficient hygienic conditions and they are prone to different infectious diseases. In the Slovak Republic, the health promotion assistants play an important role in the terrain work. In the years 2007-2011 the health sector realized the Programme of Health Promotion of Disadvantaged Communities at the national level. The coordinator of the programme was the Public Health Authority and cooperating subjects were selected regional public health authorities with the highest number of the Roma settlements. The health promotion assistants acted in the programme as mediators, which ensured in the area of health education the communication between inhabitants of Roma settlements and physicians, nurses, midwives or public health workers and spread health promotion and awareness. During the programme, the number of vaccinated inhabitants of the Roma settlements increased from 6 855 in 2007 to 10 743 persons in 2014 thanks to the health promotion assistants. Accordingly, the number of persons which underwent preventive medical examination with the health promotion assistants support, increased from 4 399 in 2007 to 4 884 in 2010. The programme was also a contribution in detecting and solving some health problems of the target group. Communication between inhabitants of respective communities and physicians of first contact or physicians specialists improved which led to the improved health care service in the communities (the increased number of visits in outpatient departments). The communication between the Roma mothers and paediatricians became more effective, which reflected in the increased number of visits in children advisory service, increased vaccination uptake and preventive examinations. During the aggravated epidemiological situation, the contribution of the health promotion assistants was also a big help – the occurrence of parasite diseases, the visits in concerned areas and families, the education of family members and also of the Roma population about floods. Within the programme, the usefulness of the health promotion assistants work in the Roma settlements was proved.
Would we be better off without vaccination?

In many countries there are groups of people, which principally refuse the vaccination. They have different reasons for that. They have an opinion that it is not a vaccination what decreases morbidity on infectious diseases but other factors such as boarding, environment and life style. There are also extreme groups refusing the vaccination claiming that the vaccination seriously damages health of their children. Besides these groups there is an increased number of parents which do not have an opinion on the vaccination and they are easily negatively influenced by a lot of information from internet or media. These parents – if they have a possibility – start to consider, whether they will or will not vaccinate their child. Some parents do not principally refuse the vaccination, but they do not agree with the dates of the vaccination and they ask for the vaccination in later age of their child as it is officially recommended. Would be such children really more protected against infectious diseases?

It is indisputable, that higher quality of living standard and particularly the thorough following of the rules of personal hygiene and hygiene in household contribute to the fact that microorganisms spread in such environment slower. Cleaner water, air and environment we live in certainly influence the spread of bacteria and viruses, but these are the factors which we can not always ensure. The microorganisms which cause infectious diseases live with us since long time and they always will be in our surrounding. They are living organisms, which are part of ecosystem. On the other hand, the vaccination is a preventive way, which is available in most of the countries to all children and all have an equal chance to protect themselves against serious infectious diseases. The vaccination will induce the production of antibodies against the microorganism, which invaded human organism, regardless of the fact whether we were or were not able to influence quality of environment we live in. Moreover, infectious diseases are the threat mostly to small children. Though a child at birth has developed immune system, but the system is naive and it is still not activated against some infections. That is why, the microorganisms causing infectious diseases are that dangerous for small children and the course of a disease is serious. A child is gaining antibodies from mother through placenta or through mothers’ milk. However, gained antibodies through placenta decrease very quickly after the birth. Children are gaining antibodies through mothers’ milk only against the diseases which mother gained through vaccination or through overcoming the infection. Thus, the aim of vaccination is to outrun the risk of origination of a disease.

When the vaccination coverage is under 95% this leads to the creation of the conditions for the spread of diseases in unvaccinated population and in the vaccination coverage below 90% the epidemics start to occur. A place where there is a group of unvaccinated and thus unprotected people, we call as „the vaccination gap“.

In the Slovak Republic, we have also experiences with the vaccination gaps and subsequent local epidemics. An example is measles epidemic in the years 1997 and 1998. In 9 villages of Eastern Slovakia, with the majority of the Roma settlements, there were altogether 1 149 cases of measles. With high migration of the Roma population, the disease spreads also to the other areas. Totally, 11 districts of the Eastern Slovakia region were affected. Up to 40% of cases were the youngest children which could not be, because of their low age vaccinated which was a direct consequence of decrease collective imunity in a given area. Up to 32% of cases, these were children who should have been vaccinated but, because of the carelessness of their parents they were not. More than two thirds of sick children had to be hospitalized. One third of them had serious complicated course of measles. There were 2 cases of death in children of the age under 1 year.

Another example is mumps epidemic in the Slovak Republic, also mostly in the Roma population. This epidemic is an example of what would happen if ignoring the vaccination. The epidemic of mumps started at the end of 2013 in Eastern Slovakia in the Roma population with positive travel anamnesis. Number of cases was gradually increasing and in 2014 there were more than 1 100 cases. This epidemic is interesting in fact that it was caused by the mumps virus of different genotype than the one which contains the vaccine. In this epidemic there were not only cases in Roma people and adults but also in children living in better hygienic conditions which came into the contact with the sick at school or on the street. Almost 1 000 of the sick were duly vaccinated against measles, mumps and rubella. It is highly probable that when these children had been vaccinated against genotype of mumps virus causing infection it would not have occured. However, in this case the disease manifested with mild symptoms and it did not cause any death.
The sad example is Ebola epidemic in countries of Western Africa, which started in 2014 and significant decrease of morbidity was reached not until the end of 2015. In this epidemic nearly 30,000 people got sick and around 11,300 of sick persons died. Epidemic of Ebola reminded us of infectious diseases epidemics of the past when millions of people died. As if we had forgotten their serious complications. They can affect any system of human organism, cause its disruption and wrong functioning. Crippling, scarring of face and body, inability to breathe, dehydration, encephalitis, inflammation of nerves or joints, serious damage of liver or kidneys, deafness, blindness and other – these are examples of complications which certainly everyone would like to prevent.

**Vaccination of migrants and refugees**

Recently, there is an increased number of migrants and refugees in the European countries. People are coming mainly from the countries affected by wars and poverty which creates favourable conditions for surviving and reproduction of viruses and bacteria and their fast spread among population. On one hand, incoming migrants and refugees can be carriers of infectious diseases and on the other hand they can be in risk of infection, because they are not adequately protected against them. In regard to distance of their journey, they become more vulnerable and easier victims of infections, mainly those which are frequent in Europe. They do not have to spread only among the group of migrants and refugees but also among home population and they can cause diseases in people which are not protected against them. Therefore, the vaccination is not only important for migrants and refugees but also for inhabitants of the host countries.

The information on the health status and the vaccination coverage of people coming from the other cultural and societal environment is needed for the host country, when wanting to protect the health of its own inhabitants. The migration policy of the Slovak Republic, including the health care is governed by the Ministry of Interior of the Slovak Republic (MI SR). Applicants for asylum (legal migrants) have restricted free movement in the first month since admission, during which they remain in quarantine while the health examinations are performed. In accordance with valid legal norms, the citizens of the third countries undergo medical examination which includes serological examination of antibodies against selected infectious diseases (viral hepatitis type B and C, HIV, syphilis), parasitological examination of stool, RTG of chest and examination of gross drop on malaria in persons arriving from endemic areas. The facultative specialized examination is performed in the suspicion of pulmonary disease including tuberculosis. Children of applicants for asylum, children of asylum seekers, children in asylum facilities and children in foster homes for unaccompanied minors which are not accompanied by a legal representative in the Slovak Republic and which do not have any record on valid vaccination are being vaccinated against poliomyelitis and measles. PHA SR cooperates with MI SR mainly in the area of prevention of infectious diseases. As a reaction to increased number of people coming to Europe, PHA SR elaborated for MI SR a procedure for vaccination of children of asylum seekers from 2 to 15 years in accordance with valid legislative regulations. Depending of the age of children we recommend vaccination against tuberculosis, diphtheria, tetanus, pertussis, poliomyelitis, measles, mumps, rubella, viral hepatitis type A and type B, haemophilus influenza diseases, pneumococcal diseases and influenza.

**Vaccination coverage in selected countries with high level of migrants, 2014**

![Graph showing vaccination coverage in selected countries with high level of migrants, 2014](source: www.who.int, 2016)
Conclusion

The vaccination is one of the biggest discoveries in the history of medicine. It is the most effective intervention, which influences the occurrence of infectious diseases and hinders their recurrence. Actual favourable epidemiological situation induces the assumption that further vaccination is useless. As long as the microorganisms are circulating in outer environment and as long as there is the possibility to import the neglected infectious diseases from the countries with high morbidity, we can not to stop to vaccinate. The vaccination is still optimal protection against infectious diseases, which can be prevented by this specific measure.

When performing the vaccination it is needed to ensure maximum safety and effectiveness of the vaccines. This aspect is the most important condition for the effective communication and building of trust of the public towards the vaccination. Even little suspicion of the failure of the vaccines supports negative opinions on the vaccination.

Ensuring of the quality and safe vaccines, quality monitoring of infectious diseases as well as the vaccination promotion in the public is the task for all of us – for national governments, international and national institutions acting in the field of public health and also for the health workers, including the public health workers and the others who can promote, by any mean, research and development of the vaccines.

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17. Act of NC SR No. 355/2007 on protection, promotion and development of public health
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20. Decision of the European Parliament and of the Council No.1082/2013/EU on serious cross-border threats to health, which repeals Decision No. 2119/98/EC

The vaccination belongs to the most effective preventive measures not only for individual but also for the whole society, thanks to which we can prevent selected communicable diseases. The vaccination influence on health of population has immense global significance for decrease of morbidity and mortality. Most of the people perceive vaccination as helpful, but there are also people who refuse it. From the side of the public health we should recognize the situations in which our own decision is not endangering health of the others. Decision to stay physically passive mainly harms our own health and we risk e.g. the formation of diabetes. Decision not to have our child vaccinated increases the risk of the spread of infectious diseases and so we increase the risk of endangering the health not only of our child but also of all the others we meet or communicate with.

Communicable diseases do not respect state borders and they can dangerously spread. That is why it is needed to pay extraordinary attention to cooperation in the area of coordination of procedures, mutual informedness and common rapid reaction to these threats, which is carried out at the European level through European Centre for Disease Prevention and Control and WHO Regional Office for Europe.

In this publication we would like to offer you the basic information on vaccination, its importance, reasons for its introduction, its development and impact on occurrence of infectious diseases. We believe that our experience with vaccination in the Slovak Republic will be beneficial for you and that it will contribute to your perception of vaccination as a way of prevention, which main task is to protect human health.

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