



"COLD CHAIN" - EFFICIENCY AND SAFETY OF VACCINATION

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Article history:	Abstract:
Received: March 11 th 2022 Accepted: April 20 th 2022 Published: May 30 th 2022	Vaccination is one of the greatest achievements of public health in the history of humanity. Vaccines used in national immunization programs are considered rational, safe and effective when used correctly. Immunization can prevent up to three million deaths worldwide from such controlled infectious diseases as measles, pneumonia, diarrhea, diphtheria and Covid-19, among others. This is one of the most cost-effective types of investments in healthcare. The Republic of Uzbekistan, together with UNICEF, WHO, GAVI, is working in an organized manner to improve the system of uninterrupted provision of vaccines, in compliance with the requirements of the cold chain.
Keywords: Vaccine, Immunization, Cold Chain, Evidence-Based Medicine, COVID-19, Controlled Infections, Disease Prevention.	

Vaccination is one of the greatest public health achievements in human history. Vaccines promote health, unlike many other medical interventions, they help healthy people stay healthy by removing a major obstacle to human development. [1,3]. Vaccines have a broad scope: they protect individuals, communities and entire populations. Vaccines have a rapid impact: the impact of most vaccines on communities and populations is almost instantaneous. For example, between 2000 and 2008, vaccination reduced the high death rate from measles by 78% (from 750,000 deaths to 164,000 deaths per year). [4,5] Vaccines save people's lives, save government spending on health care. Recently, a panel of prominent economists ranked expanded child immunization coverage fourth on a list of 30 cost-effective ways to increase global prosperity [14].

In recent years, Uzbekistan has made great strides in the fight against manageable infectious diseases. In accordance with the state program, large-scale anti-epidemic and preventive work against infectious diseases has been launched in Uzbekistan. As a result, such a disease as poliomyelitis has been eradicated in the republic since 1996. On June 22, 2002, a WHO certificate was received on this. According to the republic's statistics department, in accordance with the National Immunization Schedule, 99% of children received vaccines against 12 manageable infectious diseases recommended by WHO. Every child in our republic has the opportunity to be vaccinated at the place of residence free of charge [14].

In our country, vaccination is carried out according to the National Immunization Schedule, which is constantly being improved, approaches to indications and contraindications, as well as to immunoprophylaxis

in special cases, are being clarified. Vaccination is carried out taking into account the requirements of the WHO Expanded Program on Immunization, the National Immunization Program of the Republic of Uzbekistan, based on the results of many years of monitoring the strength of herd immunity, infectious morbidity, as well as the epidemiological efficacy and safety of the vaccines used.

In the Republic of Uzbekistan, children are vaccinated against the following infectious diseases: tuberculosis, viral hepatitis B, whooping cough, diphtheria, tetanus, poliomyelitis, measles, mumps, rubella, pneumococcal infection, rotavirus infection, human papillomavirus, as well as against Hib infection for the purpose of prevention purulent-septic diseases caused by Haemophilus influenzae type b (Haemophilus influenzae) [7]. In order to increase the effectiveness of vaccination, increase the adherence of the population to vaccination, prevent outbreaks of infectious diseases, prevent a large percentage of vaccine losses due to bottling and violation of the properties of vaccines, and prevent shortages of vaccines, vaccination safety, which includes cold chain management, plays an important role. The cold chain includes:

- rules for storage of vaccines in vaccination stations (refrigerators);
- the importance of maintaining the temperature regime during transportation, storage of vaccines;
- ways of arranging vaccines and diluents in refrigerators, cooler bags, etc.

The cold chain is an integrated system that combines equipment, people, storage policies, procedures and information [16].



The concept of the cold chain is a continuously functioning system that ensures the optimal temperature regime for the storage and transportation of vaccines and other immunobiological preparations at all stages of their journey from the manufacturer to the vaccinated locally [6].

One of the important points in this case is the storage of vaccines, which includes maintaining the temperature regime in the refrigerator and during the vaccination session. The temperature should be between +2°C and +8°C (except for some vaccines against COVID-19). The temperature must be measured twice a day - in the morning and in the evening. Thermometer readings must be recorded twice a day in a special temperature monitoring log, which must be attached to the refrigerator door.

Temperature indicators are entered into the temperature registration table twice a day - in the morning and at the end of the working day. It is also necessary to mark in the graph, which clearly shows when the temperature goes beyond the permissible corridor (from +2°C to + 8°C).

The next component of the cold chain is cold elements (cold elements). Ice packs are flat, non-leaking plastic containers filled with tap water. They are used for cooling from the inside of thermal containers or cooler bags [11].

Ice packs can freeze "freeze-sensitive vaccines". To avoid this, you need to properly put them in a thermal bag. It takes at least 24 hours to freeze the ice pack. Ice packs should be stored at room temperature (within 30 minutes) before use.

Outside of the refrigerator on the day of the vaccination session, the vaccine should be stored in a refrigerator bag - this is a product with heat-insulating properties and a tight-fitting lid. The required temperature inside is provided by frozen refrigerating elements.

With regard to ice packs, it is important to know that they must be available in sufficient quantities in every vaccination facility.

It must be remembered that:

- each thermal bag must be equipped with two sets of cold elements; one set is frozen and the other is used;
- daily new sets of frozen cold elements are placed in the thermo bag;
- in a thermal bag with a volume of 1.6 liters. there must be at least 4 cold elements.

There are 3 stages of using ice packs:

Stage 1 - freezing cold elements. Remember that it takes 24 hours to freeze an ice pack!

Stage 2 - preparation for laying in a cooler bag. Ice packs should be stored at room temperature (within 30 minutes) before use. Before putting it in a cooler

bag, you need to make sure that the ice pack is brought to the required condition by shaking it until a feeling of water overflow ("water overflow noise") appears. This will prevent freeze-sensitive vaccines from freezing.

Stage 3 - laying in a cooler bag. Lay the ice packs along the four sides of the thermal container or cooler bag, as well as on the bottom of the container, if necessary [13].

Responsibilities of the staff of the facility where the cold chain equipment is located: control and monitoring of temperature, correct positioning of packages of vaccines, diluents and cold packs, general maintenance (including cleaning and defrosting), record keeping and reporting of compliance with the temperature regime. All these actions increase the commitment of the population, as this ensures the safety of vaccination, which is an important requirement of the population in relation to vaccination. Vaccination is a victory over preventable infections, this also applies to COVID-19 infections.

Scientists do not see any other option in the fight against manageable infectious diseases, except for mass immunization - naturally or with the help of vaccines. Without vaccination, a person is like easy prey, because the virus will spread widely and will find almost everyone this fall and winter, this applies to the COVID-19 virus. Due to the rapid global spread of infection and high mortality, vaccination is critical. As of December 19, 2021, Pfizer\BioNTech, Moderna, AstraZeneca, Johnson& Johnson, Sinofarm, Sinovac vaccines have been approved for use by strict regulatory bodies recognized by the WHO. The dynamics of the development of the disease, its course and the final result shows 2021 and at the beginning of 2022 in the republic it proceeds more benignly, without large losses from the disease, although the number of cases set anti-records every day. All this is proof of the scope of vaccination in the republic. Thus, vaccination for disease prevention is not only in pediatric practice, it is also relevant for adults, especially for vulnerable groups who are more at risk of developing thrombosis with COVID-19 disease [17]. The success of vaccination depends on the commitment of the population to vaccination, this is directly related to the safety of vaccination. The safety and effectiveness of vaccination is cold chain management! It is more vulnerable at the stage when the vaccine is delivered to the medical facility before administration to the consumer. The control and monitoring of the cold chain is the responsibility of the family doctor, since his interest is very high. The degree of safety, efficiency and public confidence are



directly proportional. Vaccinations save lives, you should always remember this!

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