IMMUNOPROPHYLAXIS OF INFECTIOUS DISEASES
Immunoprophylaxis is an antiepidemic measure (of public health) taken in order to prevent the spreading of infectious diseases via immunization of the susceptible groups of the population.
Main targets

- Reducing the incidence (VHB, pertussis, mumps, rubella)
- Liquidation of the morbidity (eliminating the disease from certain territories - diphtheria, polio, measles)
- Eradication of the disease (smallpox)
Eradication of smallpox

- 1966 - was adopted the Global program of eradication by the WHO (1966-1976)
- 1967 – smallpox was registered in 44 countries including in 31 countries with endemic character (Brasil, the majority of countries from Africa and 5 Asian countries: Afganistan, India, Indonesia, Nepal, Pakistan).
- Registered cases ≈15 mil. among 1,2 billion population.
- 1970 – elimination of smallpox in the 20 countries from Central and Western Africa.
- 1971 – Brasil
- 1972 – Indonesia
- 1975 – Asian countries
- 1976 – Ethiopia
- 1977, October 26 – Somalia
- 1980, May 8 – WHO announced officially about the global eradication of smallpox.
Cost-efficiency of the immunoprophylaxis

- the estimative cost of the Global smallpox eradication program - 300 million US dollars
- efficiency of over 1 billion $ saving annually (stopping the immunization, quarantine measures etc.)
- global eradication of polio starting with 2015 will make savings of ≈ 3 milliard US dollars
- 1 $ spent for the production of MMR vaccine saves 21 $
- 1$ spent for the production of DTP vaccine saves 29 $
Conclusion: public health measures used for the prevention and control of infectious diseases via immunization are very cost-efficient.
The role of immunoprophylaxis

- Immunoprophylaxis of over 30 infectious diseases: smallpox, diphtheria, tetanus, pertussis, polio, measles, mumps, chikenpox, Haemophilus influenzae type b infection, VHA, VHB, TB, meningococcic infection, pneumococcic infection, influenza, typhoid fever, cholera, rabies, tick encephalitis, anthrax, yellow fever, rotaviral infection, tularemia etc.

- Infectious diseases in the prevention of which immunoprophylaxis holds the main role are called vaccine preventable diseases.

- Immunoprophylaxis as an individual protection: rabies, yellow fever etc.
Types of immunity

Hereditary
(For certain biological types)

Acquired

Natural
(from mother to child, post-infectious)

Artificial

Active

Passive

Depending on the participation of immunocompetent cells, the immunity can be -
The indications of immunoprophylaxis

- Schedule (routine) immunization (obligatory, mass)

- Epidemiological (spreading danger - flu, sickening danger - rabies, yellow fever).
Classification of vaccines

- Live attenuated
- Inactivated (killed)
Live attenuated vaccines

Viral
OPV, MMR

Bacterial:
BCG, STI
Inactivated vaccines

Corpuscular

Fractionated
Inactivated corpuscular vaccines

Viral: IPV, Antirabic, VHA

Bacterial: Pertusis, typhoid fever, cholera
Fractionated inactivated vaccines

Proteic

Out of the subunits of pathogenic agent: VHB, aP

Toxoids: diphtheria, tetanus, botulism

Polysaccharide

Pure: meningoccic infection, pneumococcic infection, Hib

Conjugated:
VACCINES

Live attenuated
  - Viral
  - Bacterial

Inactivated
  - Corpuscular
    - Viral
    - Bacterial
  - Fractioned
    - Proteic
    - Polysaccharide
      - Subunits
      - Toxoids
      - Pure
      - Conjugated
Principles and methods of obtaining vaccines

- **Live vaccines** - E. Jenner, L. Pasteur (avirulent and immunogenic stems of pathogenic agents)

- **Inactivated vaccines** - chemical substances (alcohol, acetone, formaldehyde) (Pathogenic microorganisms and their inactivated and immunogenic products)

- Obtaining of necessary amounts of microorganisms - cultivating in mediums - biotechnological methods
National Program of immunization (NPI) for the years 2011-2015

Approved by the Decision of the Government of the Republic of Moldova nr. 1192 from 23.12.2010

Republica Moldova

GUVERNUL

HOTĂRÎRE Nr. 1192
din 23.12.2010

cu privire la aprobarea Programului Național de Imunizări pentru anii 2011-2015


www.ms.gov.md
Main objectives: reducing, elimination or eradication of transmissible diseases preventable via immunization
Main targets:

- Assuring access to the population from the republic;
- Assuring the quality (efficiency and safety) of the vaccines used within the framework of the Program by implementing the control procedures of the quality and maintenance of the “Cold chain” at all levels of storage, transportation and use;
- Assuring the vaccine coverage of over 95% at the national scale, in the target age groups of the population;
- Improving the epidemiological surveillance of the preventable diseases via vaccination.
NPI is elaborated in accordance with the Law of the Republic of Moldova nr. 1513-XII on June 16 1993 “Concerning the sanitary-epidemiological-sanitary assurance of the population” and the Law of Health Care nr. 411-XIII on March 28 1995 and in accordance with the Extended Global Immunization Program. The Program was approved by WHO, supported by the UNICEF and the General Assembly of UN
The Cold Chain - the system of persons and equipment

Personnel

Personnel training

Attesting and licensing the institutions and personnel of the immunization service

Equipment

For the production of low temperatures-refrigerations, freezers,

For keeping the low temperatures - containers

For the monitoring of the temperature-thermographs, thermometers, indicators

For the transportation of vaccines
# Indicator for the cold chain

## Vaccine Cold Chain Monitor

<table>
<thead>
<tr>
<th>Date in</th>
<th>Index</th>
<th>Location</th>
<th>Date out</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Vaccine**

- Polio
- Measles & Yellow Fever
- DPT & BCG
- TT & DT & Hepatitis B

### MonitorMark Indicator

<table>
<thead>
<tr>
<th>3M</th>
<th>INDEX/INDICE</th>
<th>10°C</th>
<th>34°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>If A all blue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>If B all blue</td>
<td>Use within 3 months</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>If C all blue</td>
<td>Use within 3 months</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>If A &amp; B &amp; C &amp; D all blue</td>
<td>Use within 3 months</td>
<td></td>
</tr>
</tbody>
</table>

**TEST VACCINE BEFORE USE**

- These vaccines may be used

**SUPPLIER**

**FOURNISSEUR**

- Name: 
- Nom: 
- Date of dispatch: 
- Date d’expédition: 
- Vaccine: 
- Vaccin:
Freeze indicator

Freeze-tag®
alarm condition:
below 0°C for 60 min

[ ] = OK display
[ ] = ALARM

EXP/LOT 2008-05/A
Freeze control (0°C)
Indicator on the bottle
Immunization schedule

Document including methods and instructions, which establishes the target groups for the immunization, consecutivity, indications and the scheme of the vaccines use for a certain period of time.

Preventable diseases included in NPI (epidemiological situation. Morbidity objective. Operativ tasks)

- Viral hepatitis B
- Tuberculosis
- Pertussis
- Diphtheria
- Tetanus
- Rotaviral infection

- Polio
- Measles
- Rubella
- Mumps
- Hib
- Infection with pneumococci
## Immunization schedule for 2011-2015 years

<table>
<thead>
<tr>
<th>Virsta efectuării vaccinării</th>
<th>Hepati-tei virale B</th>
<th>Tuberculozei</th>
<th>Poliomyelitei</th>
<th>Infecției cu rotavirus</th>
<th>Infecției Hib</th>
<th>Infecției cu pneumococi</th>
<th>PC</th>
<th>Difteriei, tetanosului, tusei convulsive</th>
<th>Difteriei, tetanosului</th>
<th>Rujeolei, orzicoului, rubeolei</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 ore</td>
<td>HepB-0*</td>
<td>BCG</td>
<td>VPO</td>
<td>RV</td>
<td>Hib</td>
<td>PC-1***</td>
<td></td>
<td>DTP-1</td>
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<tr>
<td>2-5 zile</td>
<td></td>
<td>BCG 1</td>
<td></td>
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</tr>
<tr>
<td>2 luni</td>
<td>HepB-1</td>
<td>VPO-1</td>
<td>RV-1**</td>
<td>Hib-1</td>
<td>PC-1***</td>
<td></td>
<td></td>
<td>DTP-1</td>
<td></td>
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</tr>
<tr>
<td>4 luni</td>
<td>HepB-2</td>
<td>VPO-2</td>
<td>RV-2**</td>
<td>Hib-2</td>
<td>PC-1***</td>
<td></td>
<td></td>
<td>DTP-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 luni</td>
<td>HepB-3</td>
<td>VPO-3</td>
<td>RV-3**</td>
<td>Hib-3</td>
<td>PC-1***</td>
<td></td>
<td></td>
<td>DTP-3</td>
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<tr>
<td>12 luni</td>
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<td>ROR-1</td>
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<tr>
<td>22-24 luni</td>
<td></td>
<td>VPO-4</td>
<td></td>
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<td></td>
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<td></td>
<td>DTP-4</td>
<td></td>
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</tr>
<tr>
<td>6-7 ani</td>
<td>BCG 2</td>
<td>VPO-5</td>
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<td></td>
<td></td>
<td>DT</td>
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</tr>
<tr>
<td>15 – 16 ani</td>
<td></td>
<td>VPO-6*</td>
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<td>Td</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adulții: La 20, 25, 30, 35, 40, 50 și 60 ani</td>
<td></td>
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<td>Td</td>
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</tbody>
</table>
General characteristic of the vaccines used for the immunoprophylaxis of infectious diseases included in the schedule

Viral hepatitis B – inactivated vaccine, proteic fractioned (HBsAg)
- plasmatic, biotechnologic

Tuberculosis – live attenuated vaccine, BCG

Diphtheria
Tetanus – associated vaccine DTP, DTPa, DT, Td

Pertusis
Polio – live attenuated vaccine (OPV)
Corpuscular inactivated vaccine (IPV)

Measles
Rubella – live attenuated vaccine (MMR)

Mumps
Haemophilus influenza type b (Hib) – inactivated vaccine, fractioned polysaccharide
Measures taken by the Ministry of Health and Social Protection, medical departments and institutions for the implementation of the National Program of Immunization

- Control of the vaccines quality
- Surveillance of the postvaccinal reactions
- Assurance of the safety of vaccination
- Monitoring the “Cold Chain”
- Personnel training
- Attesting and licensing the institutions and the personnel of the immunization service
- Social mobilization
- Selective control of the immunity level via serological methods
- Scientific studies
- International cooperation
External donor assistance
UNICEF, WHO, WB etc

MH

Acquisitions

National Scientific-Practical Center for Preventive Medicine

District and municipal Centers of Preventive Medicine

Primary health care sector

Maternities

Departmental medical institutions
Efficiency and the quality assessment of immunoprophylaxis

- Vaccination coverage index
- Epidemiological method
- Immunological method
Side effects and postvaccinal complications

**Local**
- pains
- oedema
- hyperemia
- infiltration
- adenopathy
- nodules
- abscess
- ulcerations
- necroses

**Systemic**
- fever
- headaches
- indisposition
- myalgia
- lack of appetite
- arthralgia
- sleepiness
- thrombocytopenia
- paralysis

**Allergic**
- generalized urticaria
- face and laryngeal edema
- shortness of breath
- encephalopathy
- collapse
- shock
Measure of reducing the frequency of side effects and postvaccinal complications

- selection of the persons for the vaccination
- observance of the immunization rules
- precocious registration and medical assistance
- evidence, epidemiological investigation and case analysis
- population information
Means used for the formation of passive immunity

- Immune serums
  - Homologous
  - Heterologous

- Immunoglobulines
  - Homologous
  - Heterologous
Obtaining methods:

- Homologous medicines - out of donors’ blood
- Heterologous medicines - out of hyperimmunized animals’ blood
Use indications:

- Epidemiological (urgent) - for the rapid immunization (immune protection)
- Individual protection of the persons with the high risk of sickening (rabies, tetanus, measles, VHA etc.)