



Case study of a National Immunization Technical Advisory Group (NITAG), I.R. of Iran

Marandi A¹, Sadrizade B², Gouya MM³, Rezaei P⁴, Vazirian P⁵, Zahraei SM⁶, Yaghini F⁷

- 1- Professor of neonatology, Chairman of National Immunization Committee of Iran
- 2- Infectious Diseases Specialist, Member of National Immunization Committee of Iran
- 3- Infectious Diseases Specialist, Member of National Immunization Committee of Iran and D.G. of Center for Communicable Diseases Control, MOH&ME
- 4- Senior Public Health expert, Member of National Immunization Committee of Iran
- 5- Senior Public Health expert
- 6- Infectious Diseases Specialist, National EPI manager and secretary of National Immunization Committee of Iran
- 7- EPI expert, Center for Communicable Diseases Control, MOH&ME

Corresponding author: Dr Seyed Mohsen Zahraei

National EPI Manager

Center for Communicable Diseases Control

Ministry of Health and Medical Education, Tehran, I. r. of Iran

Tel: +98 2166704109

Fax: +98 2166700143

E-mail: zahraeicdc@yahoo.com

Introduction:

The I.R. of Iran is situated between 25-40 degree altitude and 44-64 degree East longitude. The country is one of the Eastern Mediterranean countries bounded on the North by the Turkmenistan, Caspian sea, Azerbaijan and Armenia, on the East by Afghanistan and Pakistan, on the South by the Persian Gulf and Oman sea and on the West by Iraq and Turkey. Topographically Iran is a semi-arid plateau, with high mountain ranges and much barer desert.

Iran central plateau is located between the Alborz and Zagros ranges. Due to altitude of the plateau the climate of this region is extreme, summers is hot with temperature reaching in places from 100 to 115 in Fahrenheit degree, winters are correspondingly severe with heavy snowfall, specially in the mountain areas. The desert and semi-desert areas of this region have served as an inhibitor to a high population density.



Demography indicators:

Area in square kilometers is 1648000. The country is divided into 30 provinces, 350 districts, 885 cities and approximately 68000 villages. The economic growth rate and investment levels have generally been stable in the recent past.

The total population which doubled in the course of three decades of the 20th century was estimated to be 70 million in 2006. Urban population was 67% out of total population. Crude birth rate per 1000 population in the same year was 18.1 and crude death rate per 1000 population was 5, so population growth rate was 1.4. The numbers of population below 15 years 29.6 above 65 was 4.6 and dependency rate 52 in 2005. Total fertility rate was 2 in 2005.

National Health Policy:

In the fourth five year national development plan (2004-2008), the I.R. of Iran has reiterated its commitment to the comprehensive health care as the right of all individuals. The policy has also outlined its ending support to the policy guidelines of Health for All with targeted adoption to the prevailing socioeconomic and cultural realities of the country. In this framework is committed to improve the quality of life of the citizen and has made the following precise choices:

- Improving the quality of and access to public health services.
- Advocating and contributing to the multisectoral efforts for creating sustainable health environment, Promoting mental health, healthy life styles, prevention and control of variety of behavior related conditions like HIV/AIDS, drug abuse and traffic accidents.
- Reducing malnutrition, elimination and eradication of communicable diseases and reduction of the burden and risk factors of non-communicable diseases, and mental and emotional diseases and conditions like substances abuse.
- Ensuring equity, social justice and fairness of financial contribution through covering the poor people by health insurance and social welfare services

Immunization Programme background:

Immunization against vaccine preventable diseases in Iran is the oldest public health interventions. This intervention was initiated by immunization against Smallpox since 1829 in Tabriz only 23 years after its discovery by Jenner in 1796, and thus Iran was a pioneer in inoculation against Smallpox.

Accordingly, we can claim that the culture of vaccination against vaccine preventable diseases because of the acceptance of the successful Smallpox vaccination became a belief in our nation, and played a major role in public acceptance in our country. It is interesting to know that in 1827 a book on smallpox inoculation was written by a man named M.A Khoie in Tabriz and was printed there in 1829 .

Initially, smallpox vaccines were imported for inoculation purposes. Gradually, however, the Pasteur Institute of Iran began to produce smallpox vaccine locally which permitted a broader based inoculation campaign.

In June 1941, a law passed by the parliament which stressed the importance of vaccination against smallpox. According to the 16th article of this law, infants had to be vaccinated against smallpox during the first two months after birth and booster shots were to be administered at the ages of 7,



13 and 21. Parents were held legally responsible for ensuring that their children were properly vaccinated. Educational authorities were required to obtain vaccination certificate for all students prior to their registration at school and all employers in both government and private sectors were required to obtain similar certificates for their new employees. Non-adherence to this regulation on the part of school authorities, employees and parents was punishable by Law.

However, in spite of its excellent intent, the parliamentary smallpox vaccination act of 1941 had little impact to reducing smallpox incidence. This was due to a lack of trained manpower, inadequate road and transportation system, limited access to electricity for refrigerating vaccines and lack of well-organized surveillance system and immunization programme.

In 1952 the national public Health co-operative organization was established with the assistance of Ministry of health, as a national approach towards health development and became a pioneer in promoting preventive medicine. Smallpox eradication was one of the achievements of this organization. In the connection the campaigns were planned, health manpower recruited and trained, and surveillance system was introduced to find out the high risk areas and populations. In 1966 eradication of smallpox in Iran was adopted by WHO, and after a coordinated activities smallpox became eradicated in all over the world. These efforts were crucial for eradication of smallpox in 1977.

EPI Target Diseases in Iran

i. Poliomyelitis Eradication

Further to the smallpox eradication in 1977, the World Health Assembly committed WHO in 1988 to eradicate Poliomyelitis by the year 2000, in a manner to strengthen routine immunization the I.R. of Iran was joined the campaign with full implementation of WHO recommended strategies. As the first step the initiative was approved by the national immunization committee then the national poliomyelitis eradication plan was prepared and adopted by the parliament so as to caused high level political commitment for its implementation. Furthermore the president of the I.R. of Iran issued a decree to all governmental and non-governmental organizations to cooperate with MOH&ME towards polio eradication. Also the supreme Leader issued an order to all armed forces and voluntary youth organization (Basidje) to cooperate with MOH&ME until complete eradication of wild indigenous polio virus. These activities resulted in high level political commitment, strong intersectoral collaboration and full community participation.

Polio eradication strategies were implemented under the active supervisions of the national immunization committee, and with full involvement of the chancellors of Universities of Medical Sciences at the provincial level.

High quality of routine and supplementary immunization, vaccine potency, maintenance of cold chain, and immunization coverage above 95% were among the major factors contributory to polio eradication in Iran. As a result of these facilitating factors the programme reached the following :

- 1- Increasing the routine OPV coverage in children less than one year with four doses OPV to more than 95% SINCE 1995.
- 2- Launching the first NID in 1994 covering 9 million under 5 years' children within a single day



and repeating it annually in two rounds until 1998.

- 3- Interrupting circulation of indigenous wild polio virus since 1997. The last case of imported virus from Afghanistan was in the year of 2000.
- 4- Conducting Sub national Immunization Days in two rounds a year since 1998 which is still continued.
- 5- Achieving laboratory containment of wild polio virus in 2002.

The Regional Certification Committee (RCC) has certified the I.R. of Iran as polio free in 2001 and the national certification committee has continued to submit abridged annual update reports to the RCC since 2002.

Neonatal Tetanus:

In a cluster survey in 1985 that was carried out to calculate the mortality rate of neonatal tetanus, the rate was 4.8 per 100 live births. On this basis annually 10,000 deaths out of 45000 of newborns death were related to neonatal tetanus. In the same year the TT coverage of child bearing age women with two doses of TT in rural areas was 5% and in urban areas was 3%. With the expansion of PHC services in Iran including the expanded program on Immunization and strengthening of surveillance system coupled with compulsory vaccination of women before marriage in 1988 the coverage of TT immunization in women increased considerably. The national programme for elimination of neonatal tetanus was initiated in 1988 considering with the initiation of the national plan for measles control and poliomyelitis eradication. Based on a cluster survey in 1995 done by CDC the coverage of TT in child bearing age women increased to 94% in rural areas and to 73 % in urban areas.

Due to Increased access to clean delivery in rural areas as well as availability of skilled birth attendant, the incidence of neonatal tetanus decreased to less than one case per 100 live births in 1995. It was further decreased to one per 1000 in 2000.

National Immunization Committee:

The first immunization committee in Iran before the start of Expanded Program on immunization constituted of the following members:

- 1- Technical Deputy of MOH
- 2- Director General for communicable diseases
- 3- The Head of Immunization Department



4- The Head of Razi Institute

5- The Head of Pasteur Institute

The committee was revised since 1984 composed of medical professors including pediatricians, infections diseases specialist, virologist, community medicine specialist, epidemiologist and public health experts. These members are nominated by the D.G of CDC and approved by the deputy for health. The committee has between 17-18 members.

The committee was established after the approval of the EPI by the cabinet of the ministers so as to help MOH in policy making regarding immunizations. Further to the Alma-Ata Declaration on Primary Health Care (PHC) in 1978, the I.R of Iran committed itself to implement PHC throughout the country. So all of the PHC principles were included in the national health plan. EPI was accepted as one of the main component of PHC and chancellors of Universities of Medical Sciences were made responsible for its implementation.

Terms of Reference and process of meeting:

Since its establishment the committee carried out following activities:

- Revision and updating of the immunization schedule.
- Introducing new vaccines into the immunization programme.
- Approving the supplementary immunization programs.
- Monitoring of the current programs in line with global elimination/eradication targets.
- Responding to the questions received from medical universities which needed decision making at the national level.

The committee has published "National Guideline and Schedule of Immunization" and revised it for seven times, the latest edition of which was published in 2009. This guideline is for medical society, health care workers and medical students. Minutes of meeting of the committee are not for public distribution but are disseminated for senior authorities in the Ministry of Health & Medical education.

Members:

New members are introduced by one of the authorities and further to the assessment and approval by the committee the accepted member is appointed by the Deputy for Health. The appointment period is for three years and there is no limitation for its extension.

There are three ex officio members representing Pasteur Institute of Iran, Razi vaccine and serum research and production Institute and Center for communicable Diseases Control. They can participate in discussions actively and may vote like other members to reach consensus.



Non-government members do not receive any payment for serving on the immunization advisory committee but membership in the committee is considered as a kind of credit and prestige for the person.

Secretariat:

National EPI manager prepare the preparatory work for the committee meetings. The secretariat is the Center for communicable diseases Control, Ministry of Health and Medical Education. The secretariat provides logistic support of the committee while being assisted by two experts from the EPI department.

The secretariat is the responsible body to convey the recommendations of the committee to the MOH&ME and medical universities and also transfers any questions from the universities to the committee. In addition to this it provides all scientific documents and materials necessary for the periodic meeting of the committee upon its request.

Meetings:

Meetings of the committee are held at Center for Communicable Disease Control. In these meetings only members are allowed to participate. The minutes are available and disseminated to the committee members. These are quarterly meetings but extra meetings might be conducted on the request of CDC. During 2008 five meetings were held.

Scope of the committee:

Within the committee's scope of work vaccine and immunization are the only topics that are under consideration. For example introduction of MMR vaccine in 2004, the revision of vaccine schedule in 2008, a recommendation on vaccination of family members of positive cases of Hepatitis B and also health care workers. Meningitis vaccination for all soldiers and pilgrims, checking and completing the vaccination schedule of all students prior to enrollment, vaccination against tetanus in all industry workers, mass immunization against measles in 9 month to 14 years old children in 35 districts which had under 85% coverage in 1996, mass immunization against MR in December 2003 in 5 -25 year old population in all over the country and recommendation on panta or tetravalent formulation of Hib vaccine in combination of DPT and Hep.B vaccines .

The committee also recommended conducting a survey on burden of Haemophilus influenzae type b at national level in 2004-5 and conducting a survey on nasopharyngeal carriage of Streptococcus pneumonia in children at national level in 2009. These surveys have been done for evidence based decision making by the committee.

Setting of the Committee's Agenda

Center for Communicable Diseases Control/MOH&ME has a key role in setting agenda and has the authority to revise it according to the needs and advice of WHO.

Development of recommendations and the basis for decision making:

Scientific textbooks (e.g. Red Book Of Pediatrics or Vaccines), Official results of local research



projects, WHO position statement and interest sites www.cdc.gov.org and www.who.int are used as sources of technical data and expertise by the committee for Development of recommendations and the basis for decision making. In addition the following outcomes are important in decision making: Mortality pattern of disease in the country, Epidemic potential, International commitment Eradication or Elimination, Equity, Disability adjusted life years (DALYs) or quality adjusted life years (QALYs) lost and Hospitalization.

Making recommendations

Recommendations of the committee are almost accepted by consensus but rarely open voting used in case of need, if experts do not agree the majority's decision is considered. When recommendation become finalized, the Center for Communicable Diseases Control is responsible for dissemination of them to the decision makers. Recommendations are published as a guideline/booklet and are distributed for public health personnel and the medical society.

The committee considers economic issues about vaccine cost, overall program cost, cost effectiveness, cost benefit, cost utility, affordability and financial sustainability. Where ever the committee needs some economic evaluation for its decision making asks the CDC to conduct an economic survey if such information is needed. The committee also uses the international or regional data but decision making is based on local determinants. In the case of economic evaluation undertaken by pharmaceutical industry if a study proposal is approved by the Ministry of Health, the committee uses its results.

Role of the committee in the ultimate decision making process:

The EPI manager and the Director General of CDC are members of the committee and the recommendations are addressed to them and the MOH&ME is informed by the DG of CDC for implementation. As EPI has already been approved by the government and government is committed to implement it so its implementation is a kind of obligation.

Case study:

There is a consensus among medical historians that Iranian scientist Mohammad ebn – Zakaria al – Razi was the first one to provide differential diagnosis between small-pox and measles in the ninth century AD. According to 1961 statistics prior to availability of measles vaccine some 150000 to 500000 cases of measles occurred in Iran annually and the mortality rate was 10 to 15 %. Most cases occurred in the age group involved 1-7 years and most deaths were those of 1-2 years old children.

In Iran the measles immunization program officially started in 1967 with imported vaccines and was strengthened by production of this vaccine in Razi Institute. By 1971, about 37% of at risk population had been immunized. Further to the initiation of the Expanded Programme on Immunization (EPI) in 1984, the disease followed a downward trend as a result of which in 1991 there were only 2652 reported cases. Given the level of coverage of measles immunization and the epidemiological status of measles, in 1996 an immunization campaign was launched for at risk children in the age group 9-14 years. There were 35 districts where coverage was less than 90%. Achieving immunization coverage of up to 99% meant that 6.6 million individuals were vaccinated. As a result of efforts by healthcare professionals and increased immunization,



primary measles vaccination coverage reached 100% by 2002.

Measles vaccination coverage (MCV 1) in the I.R. of Iran
(1996-2002)

Year	1996	1997	1998	1999	2000	2001	2002
Coverage (%)	100	96	100	99	100	96	100

Measles surveillance improved remarkably, indicating that highest number of measles cases was observed in the age group 10-19 years old. Taking the vaccine efficacy (95%) and the fact that vaccine coverage was less than 100%, accumulation of susceptible population led to local epidemics. Aiming at national elimination of measles, the National Immunization Committee decided on a MR mass campaign for 5-25 age groups to cover all urban and rural areas all over the country, this decision was made in the meeting dated 19 January 2002, and this decision was suggested to the MOH&ME.

Based on the committees' recommendation, the Ministry of Health and Medical Education committed itself to the elimination of measles by the year 2010. To this end following activities were carried out:

1- Creation of Interdepartmental coordination, including representatives of:

- Top state authorities
- Ministries and state Institutions, Ministry of education science, Research & Technology. Ministry of culture and Islamic guidance
- Islamic Republic of Iran Broadcasting (IRIB)
- Red Crescent Society
- All private universities , Armed forces , medical university
- Specialist Associations of Organization
- Professional Medical Organization
- Chancellors of Medical universities
- Deputy direction for Health affairs at medical universities
- Workshops and briefing sessions were held with presence of national immunization committee.

2- Workshops and briefing sessions with presence of national immunization committee.

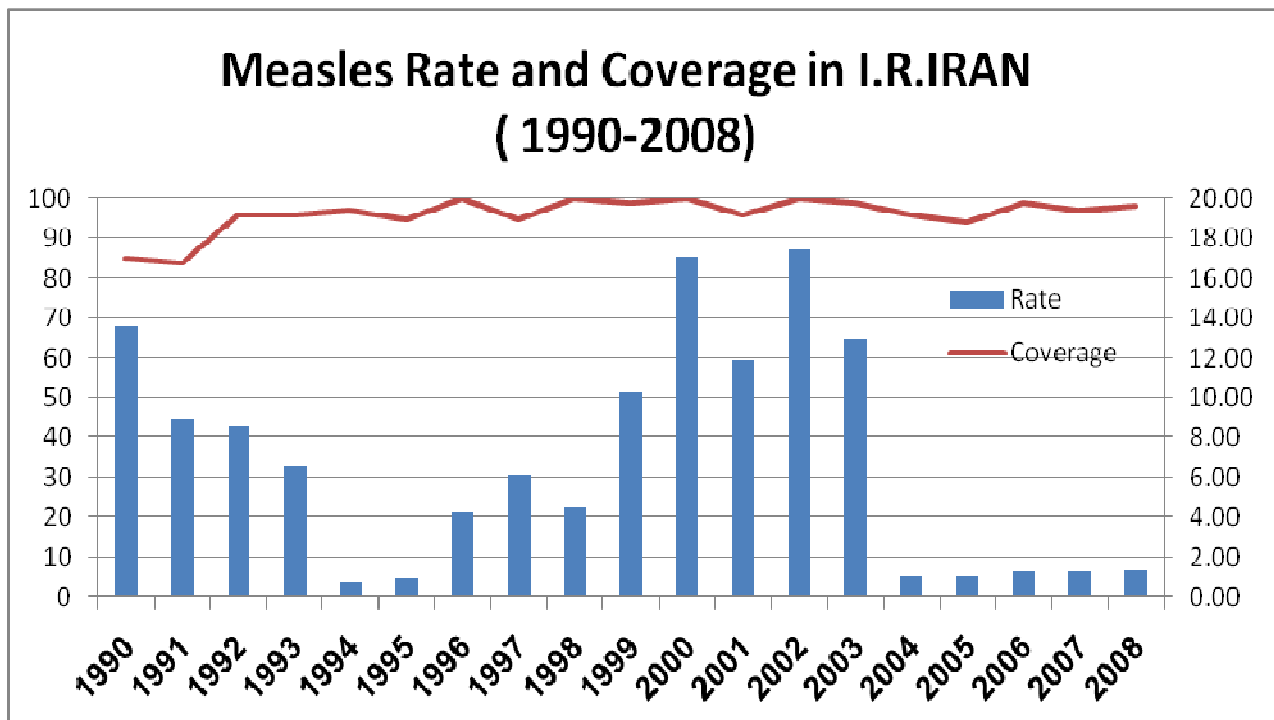
3- Ensuring technical support by the committee in the following areas:



- ✓ Determining of 5-25 age bracket as the target age groups, deciding on the vaccine strain for measles and rubella.
- ✓ Choosing MR vaccine instead of Measles vaccine.
- ✓ Changing the vaccine in the routine measles immunization to MMR and the timing of routine vaccination from 9 &15 to month 12 and between 4&6 years of age.
- ✓ Advising use of Auto Disable syringes for more safety and less adverse events, data collection of adverse events, use of safety boxes and hygienic disposal the syringes.

4- Promoting advocacy and IEC campaigns with active involvement of the members of the committee.

5- Organizing consultative committees with groups of medical specialists and pediatrics for scaling up of the campaign.



The campaign was started on time inaugurated by the president Khatami at 9.AM Dec.6.2003 attended by a number of Iranian and International officials .The campaign was launched at the same time in all over the country with the commencement ceremonies at provincial and district level being attendant by high rank authorities . The total number of personnel involved amounted to 113308 persons, who were organized into 45832 active and 40077 passive immunization teams. To ensure efficient and meticulous performance every team was



designated to do 80 vaccination shots a day. The operation was under monitoring of 11470 supervisors, with one senior officer supervising the work of every five supervisors. There were also two in-house observers per districts, two observers per university and 20 senior operational Observers at the ministry of health.

Communication activities:

The tools that were used for sharing and disseminating data and information related to committee activities to medical profession and the public included: letters from Committee / Government Department to public health affairs and the physicians, newsletter, publications, guidelines, website. The committee members communicate to each other through meeting and workshops.

Conclusion:

In conclusion, the national immunization committee having a long history in Iran has played a significant role in policy formulation and priority setting for prevention and control of vaccine preventable diseases. It has helped the concerned authorities on evidence based decision making for choice of vaccines and immunization development throughout the country. Moreover, as many members of the committee come from the Universities of Medical Sciences, not only they have been able to institutionalize the immunization programme in the medical schools, they have also succeeded in disseminating public health messages to the medical students. The lesson learned from the involvement of medical faculties in the national immunization committee have been used to involve the teachers of medical schools in other national consultative bodies related to public health including the communicable and non-communicable diseases control advisory committees in ARI, CDD, IMCI, HIV/AIDS, Malaria, TB, etc. The impact of their technical consultation has been reflected in control, elimination and eradication of a number of major endemic infectious diseases in the country.



Members, affiliations and expertise:

- **Chairman :**

Dr Seyed Alireza Marandi, Professor of Neonatology, Shahid Beheshti University of Medical Sciences

- **Secretary :**

Dr Seyed Mohsen Zahraei, Infectious Diseases Specialist, National EPI Manager, Center for Communicable Diseases Control, Ministry of Health and Medical Education

- **Members :**

- Dr Abdolvahhab Alborzi, Pediatric Infectious Diseases Specialist, Shiraz University of Medical Sciences

- Dr Abdollah Karimi, Pediatric Infectious Diseases Specialist, Shahid Beheshti University of Medical Sciences

- Dr Talat Mokhtari Azad, Virologist, Tehran University of Medical Sciences

- Dr Abbasali Keshkar, Epidemiologist, Golestan University of Medical Sciences

- Dr Abbas Shafiee, Virologist, Razi Institute for Vaccine and Serum Production

- Dr Abbas Momen Zadeh, Pediatric Infectious Diseases Specialist, Shahid Beheshti University of Medical Sciences

- Dr Bijan Sadrizadeh, Infectious Diseases Specialist

- Dr Abdolreza Esteghamati, Pediatrician, Iran University of Medical Sciences

- Dr Mansoor Bahrami, Pediatric Infectious Diseases Specialist, Shahid Beheshti University of Medical Sciences

- Dr Gholamreza Khatami, Pediatrician, Tehran University of Medical Sciences

- Dr Mohammad Ali Nilfrooshan, Pediatrician, Shahid Beheshti University of Medical Sciences

- Dr Seyed Hosein Mirfakhraei, Pediatric Infectious Diseases Specialist, Shahid Beheshti University of Medical Sciences

- Dr Safieh Amini, Virologist, Pasteur Institute of Iran

- Dr Parviz Rezaei, Senior expert of public health

- **Ex officio members :**

- Dr Mohammad Mehdi Gouya, Infectious Diseases Specialist, Director General of Center for Communicable Diseases Control, Ministry of Health and Medical Education

- Dr Seyed Mohammad Hosein Modarresi, Parasitologist, Dean of Pasteur Institute of Iran

- Dr Abdolhosein Dalimi ASL, Immunologist, Dean of Razi Institute for Vaccine and Serum Production

Immunization profile - Iran (Islamic Republic of)

Development status	Developing		GNI per capita (US\$) ¹		2'930		GDP per capita (US\$) ¹	
Infant (under 12 months) mortality rate	2§		31		Child (under 5 years) mortality rate		2§	
Population data in thousands ²								
	2007	2006	2005	2004	2003	2000	1990	
Population	71'208	70'270	69'421	68'669	68'001	66'125	56'674	
Births	1'441	1'407	1'370	1'330	1'290	1'213	1'980	
Living infants	1'396	1'361	1'323	1'283	1'243	1'164	1'859	
less than 5 years	6'472	6'270	6'092	5'932	5'799	5'954	9'467	
less than 15 years	19'150	19'510	19'961	20'493	21'100	23'226	25'326	
Age 15-49 years	20'794	20'326	19'850	19'374	18'895	17'330	12'431	

Number of reported cases								<i>(full incidence series at 1990)</i>
Cholera	32	26	15	6	24	18	373	
Japanese encephalitis	-	-	-	-	-	-	-	
Diphtheria	133	220	7	3	11'644	11'874	5'341	
Measles	-	-	-	-	-	10'417	-	
Scarlet fever	267	89	125	98	81	94	1'230	
Typhoid	0	0	1	0	0	3	15	
Typhus	20	-	-	-	-	1'154	-	
Whooping cough (CRS)	-	-	-	-	-	-	-	
Neonatal tetanus	3	7	1	-	2	13	26	
Tetanus (total)	11	11	8	11	9	27	30	
Yellow fever	-	-	-	-	-	0	-	

Percentage of target population vaccinated, by antigen									<i>(full official coverage series at 1990)</i>
	<i>Last coverage survey</i> ³		<i>Official country estimates</i> ⁴						
	Year	Result							
DTP3	1989	92 EPI	99	99	99	99*	99*	99	95
	1989	EPI	99	98	97	99*	99*	99*	-
	1989	88 EPI	99	98	95	98	99	99*	91
	-	-	99	99	96	99*	99	99	-
	-	-	97	98	94	95	98	99*	-
	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-
	1996	96 MICS	97	99	94	96	99	99*	85
	-	-	97	98	92	99*	96	99*	-
	-	-	-	-	-	-	-	-	-
Polio	1989	88 EPI	98	99	95	98	99	99*	90
	1996	90 MICS	25	26	25	31	76	46	63
	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	

Percentage of target population vaccinated, by antigen									<i>(full WHO-UNICEF series at 1990)</i>
	<i>WHO-UNICEF estimates</i> ⁵								
DTP3			99	99	99	99	99	99	95
			99	98	97	99	99	99	97
			99	98	95	98	99	99	91
			97	98	94	95	98	99	-
			-	-	-	-	-	-	-
			97	99	94	96	99	99	85
			83	83	83	82	82	82	71
			98	99	95	98	99	99	90
			-	-	-	-	-	-	-
			-	-	-	-	-	-	-

Number of districts in the country	348	Proportion of districts reporting DTP3 coverage	<ul style="list-style-type: none"> Greater or equal to 90% From 80 to 89% From 50 to 79% Lesser than 50%
Number of coverage reports received at national level vs number of reports expected			

Immunization schedule		
Vaccine	Schedule	Schedule
Td	birth; 2, 4, 6, 12, 18 months; 6 years;	(repeated every 10 years – military and pro women)
Polio	birth; 2, 4, 6 months; (also specified high risk group)	
Polio	(specified high risk group)	
Polio	(military)	
Polio	12 months; 6 years;	
Polio	birth; 2, 4, 6, 18 months; 6 years;	

1) Source: "The 2008 World Bank Development Indicators Online", GDP per capita is PPP adjusted.

2) Source: "World Population Prospects: The 2006 Revision", New York, United Nations, 2007.

§ deaths per 1'000 live births