The National Immunization Plan: China

Liu Yezhou[1], Rebecca Ling[2], Yu Xinwei[1]

1. School of Public Health and Family Medicine, Capital Medical University
2. John Radcliffe Hospital, University of Oxford, Oxford, UK

REVIEW

Please cite this paper as: Yezhou, L. Ling, R. Xinwei, Y. The National Immunisation Plan: China. AMJ 2010, 3, 7, 375-379. Doi 10.4066/AMJ.2010.310

Corresponding Author:
Liu Yezhou
juliet0428@163.com

China's immunization programme has a long history and is widely regarded as one of the country's most successful public health endeavours. Variolation for smallpox in China in the 1100s was the earliest recorded immunization in history. Smallpox elimination was one of the first acts of the newly created government of the People's Republic of China (PRC) and preceded the start of the Intensified Global Smallpox Eradication Program. Early in the new country's establishment, the government implemented a policy of putting the emphasis on prevention. In the 1960s, the government supported mass immunization campaigns with huge impact. In 1978, the Expanded Programme on Immunization (EPI) was established, and by 1988, 1990 and 1995, China achieved its Universal Childhood Immunization (UCI) goals of >85% coverage by province, county and village respectively. In 2000, the state was declared polio-free.[1] Vaccine preventable diseases targeted by the EPI are at low levels of incidence overall. The addition of hepatitis B vaccine to the EPI in 2003 has substantially reduced rates of new infection with this highly endemic disease.

In 2007, the central government announced it would expand the National Immunization Plan (NIP). Based on the present NIP vaccines programme, hepatitis A (HepA) vaccine, epidemic cerebrospinal meningitis (DCSM) vaccine, Japanese encephalitis (JE) vaccine and measles, mumps and rubella (MMR) vaccine have been added, and given to children free of charge in order to prevent Hepatitis A, DCSM, Japanese encephalitis, measles, rubella and mumps. Furthermore, certain people are immunized with Hemorrhagic fever vaccine free of charge in prevalent regions, and Anthrax vaccine and Leptospira vaccine would be reserved for emergency as diseases outbreak. By expanding the NIP, NIP vaccines increase from 6 to 14, and contagious diseases, which can be prevented, increased from 7 to 15 .[2] In this latest stage of the NIP, China is trying to fully implement the expanded national immunization plan, to keep the poliomyelitis eradication in status quo, to eliminate measles and control Hepatitis B, and further decrease rates of target diseases. Three stages of China's National Immunization Plan:

Stage 1 - (1950-1977)

In the 1950s, mass immunization of vaccinia (smallpox vaccine) around the country.
In the 1960s, immunizations of bacille Calmette-Guérin (BCG), oral polio vaccine (OPV), diphtheria-tetanus-pertussis vaccine (DPT) and measles vaccine were gradually launched. Smallpox was basically eradicated.
In the 1970s, on-the-spot immunization was popularized every spring and winter.

Stage 2 -(1978-1999)

In 1978, expanded programme on immunization was established.
In 1986, April 4 was set as National Children's Vaccination Day.
In 1988, the UCI goals of >85% coverage by province was achieved. The polio eradication initiative was launched.
In 1990, the UCI goals of >85% coverage by county was achieved.
In 1995, the UCI goals of >85% coverage by village was achieved. Implementation work plan of elimination of neonatal tetanus was started.
In 1997, accelerated measles control programs in the country began to be implemented.
In 1998, certification for poliomyelitis eradication started. Japanese encephalitis B vaccine, DCSM

vaccine, HepB vaccine, rubella vaccine and mumps vaccine were introduced into immunization plan management.

Stage 3 - (2000-present)

In 2000, certification of poliomyelitis eradication was passed.
In 2002, Universal Childhood Immunization (UCI) goals of >85% coverage by country was set up. HBV vaccine was added into NIP.
In 2005, regulations of vaccine distribution and vaccination were implemented. The Ministry of Health set Immunization work norms.
In 2007, NIP was expanded. The goal of elimination of measles in 2012 was launched.

See Table 1. China's Expanded NIP Vaccines and Target Diseases.[3]

What we are doing:

China's immunization system

The Law of the PRC on the Prevention and Treatment of Infectious Diseases stipulates definitely "The state shall practise a planned prophylactic vaccination system ", " The state shall practise a system by which certificates are issued to children who have received prophylactic vaccination." "Immunizations of NIP are free of charge ".[4]

Vaccines in China are divided into two classes. The first class of vaccines are provided for citizens by the government free of charge, and citizens should get immunized according to the government's regulations. These vaccines include NIP vaccines; vaccines added by provinces, autonomous regions and centrally administered municipalities when they implement the national immunization plan programme and vaccines of emergency immunization and group immunizations that the people's governments or the health administrative departments at or above the county level conduct. The second-class vaccines are the other vaccines provided at one's own expense and on a voluntary basis

What we have achieved:

Providing children with essential immunizations in the first few years of life is crucial to any country's fight against infectious disease. It has been more than 30 years since the Chinese government introduced EPI into the state. Many infectious diseases have been controlled well. In this presentation, the author just takes two examples to illustrate it [5].

See Figure 1 Pol3 and MCV coverage, 1983-2005
See Figure 2 Poliomyelitis annual reported incidence, 1980-2005
See Figure 3 Measles annual reported incidence, 1980-2005

The three graphs show third dose of polio vaccine (Pol3) and measles-containing vaccine (MCV) coverage (Figure 1), poliomyelitis (Figure 2) and measles (Figure 3) annual reported incidence from the 1980s to 2005. Polio and MCV immunization coverage both increase in the 1980s due to the establishment of the Expanded Programme on Immunization. Polio and measles immunization coverage both peaked in 1990 as a result of the push to achieve Universal Childhood Immunization through routine immunization services and campaigns focusing on unvaccinated children. Reported polio and measles immunization coverage remained high and steady through the 1990s which reflects only those doses given through routine immunization services, and not the massive numbers of supplemental doses provided through campaigns. The drop of polio immunization coverage observed from 2000 to 2001 was mainly the result of a change in the methodology used to produce official national estimates.

In 1988, the polio eradication initiative was launched and in 2000, the certification of poliomyelitis eradication was passed. But there were some sporadic cases reported in 2004 and vaccine-associated paralytic poliomyelitis (VAPP) cases also occurred recently.

Reported measles incidence is affected by variations in case definitions, reporting artefacts, surveillance performance, and measles outbreaks. Generally, reported cases substantially underestimate the true measles burden. The goal of measles elimination by 2010 will be achieved with considerable difficulty.

What we are going to do:

There are still some problems in implementing the expanded national immunization plan programme.
The huge domestic migration from rural to urban areas contributes to economic development. But these rural labourers and their family members, especially their children living with them in urban regions are suffering poor health protection.[5] They are almost entirely without any medical benefits. Immunization of migrant children is a serious

weakness. The immunization of migrant children in some main cities needs to be complete.

Vaccines help to prevent contagious diseases, while use of vaccines can also lead to adverse events, although serious events are extremely rare. When an enormous number of individuals are vaccinated – as happens in China – some side effects are unavoidable. However, the benefit provided by the use of vaccines far outweighs the burden of side effects. To ensure the highest safety profile possible, there is a need to monitor adverse events carefully. As most of vaccines are free of charge and used for children, the health authorities should certify the quality of vaccines, which are on the market.

References

1. 2004 International Review of the Expanded Programme on Immunization (EPI) in China: 8-9
2.www.moh.gov.cn/sofpro/cms/previewjspfile/mohjbyfkzj/cms_0000000000000000171_tpl.jsp?requestCode=40233&CategoryID=5512
3. Meiping Sun, (2009) Immunization ppt, Beijing CDC
4. The Law of the PRC on the Prevention and Treatment of Infectious Diseases
5. Shumei Zheng, Manshu Song, Lijuan Wu, Shanshan Yang, Jian Shen, Xiaoqin Lu, Juan Du ,Wei Wang. (2009) Public Health Genomics: China's Aspect. Public Health Genomics [Text]

PEER REVIEW
Not commissioned. Externally Peer Reviewed.

CONFLICTS OF INTEREST
The authors declare that they have no competing interests.

Table 1. China's Expanded NIP Vaccines and Target Diseases [3]

Vaccines		Target Diseases		Remarks
1	HepB	1	Hepatitis B	Pro-NIP vaccine
2	BCG	2	Pulmonary tuberculosis (PTB)	Pro-NIP vaccine
3	OPV	3	Poliomyelitis	Pro-NIP vaccine
4	Diphtheria and tetanus toxoid with acellular pertussis vaccine (DTaP)	4	Pertussis	Replaced vaccine
5	Diphtheria and tetanus toxoid vaccine (DT)	5	Diphtheria	
		6	Tetanus	
6	Measles-containing vaccine (MV)	7	Measles	Pro-NIP vaccine
7	MMR, MR, MM	8	Rubella	New added vaccine
		9	Mumps	
8	Japanese encephalitis vaccine (JapEnc)	10	Japanese encephalitis	Expand coverage
9	Meningococcal A vaccine (Men A)	11	DCSM	Expand coverage
10	Men AC			New added vaccine
11	HepA	12	Hepatitis A	New added vaccine
Vaccines above are children immunization plan vaccines, the below are vaccinated for susceptible people.				
12	Hemorrhagic fever vaccine	13	Hemorrhagic fever	New added vaccine
13	Anthrax vaccine	14	Anthrax	New added reserved vaccine for outbreak control
14	Leptospira inactivated vaccine	15	Leptospirosis	New added reserved vaccine for outbreak control

Figure 1 Pol3 and MCV coverage, 1983-2005

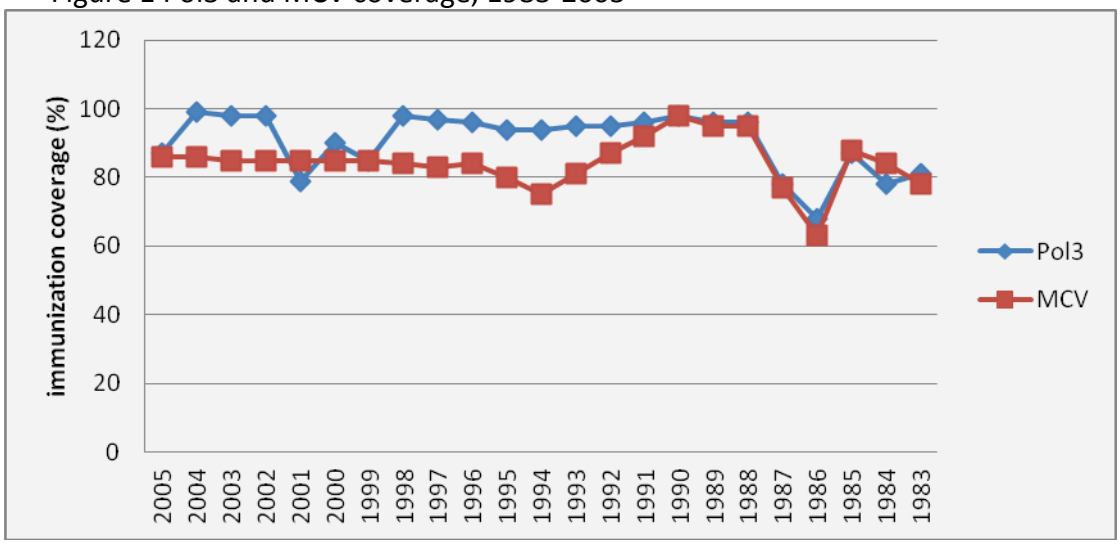

Figure 2 Poliomyelitis annual reported incidence, 1980-2005

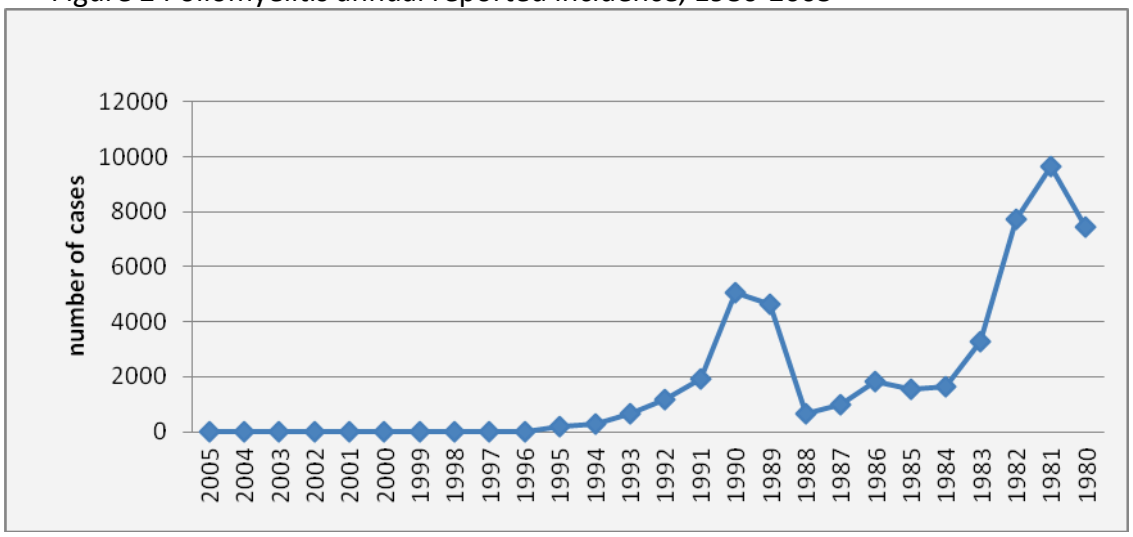

Figure 3 Measles annual reported incidence, 1980-2005