NCDC Newsletter

Quarterly Newsletter from the National Centre for Disease Control (NCDC)

FROM THE DESK OF THE DIRECTOR

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Director, NCDC

This issue of the quarterly NCDC Newsletter focuses on the evolving global situation of influenza in view of the emergence of avian influenza A (H7N9) in China and the need for a heightened monitoring of the situation in all countries. Described as one of the most lethal influenza strains, this novel virus is spreading in China and is also reported from Taiwan.

This newsletter also highlights some of the ongoing work at NCDC related to various communicable diseases, including evaluation of the vaccine preventable disease surveillance system in Delhi, global lessons from yaws elimination in India, the new initiative in acute encephalitis syndrome in Bihar, training on food borne diseases, and the revised guidelines on rabies prophylaxis.

The World Health Day, 7 April 2013 focused on Hypertension. With an estimated one third of the Indian population having hypertension, this clearly is a major risk factor for non-communicable diseases in the country. This, and other stories, namely an update on the new rotavirus vaccine, the global measles situation and trends in India, and possible areas of programmatic collaborations are presented under the "News and Events" section.

I hope you will find the NCDC Newsletter informative and useful. I sincerely look forward to your feedback!

LEAD STORY

Evolving Worldwide Influenza Situation Calls for Intensified Surveillance in the Country

A number of influenza viruses are in circulation in various parts of the world with an evolving scenario. The situation is being closely monitored for any emergence that may warrant urgent action. Two objectives of influenza surveillance are to ascertain 1) the transmissibility or ability to spread rapidly and 2) the virulence as seen by the case fatality rate. The following are three distinct influenza virus strains that are being monitored closely:

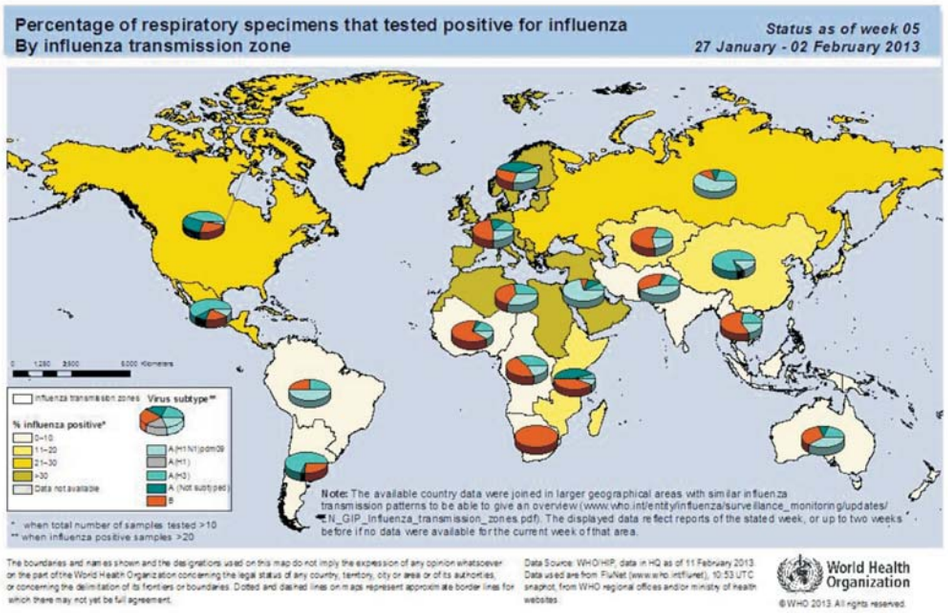
Pandemic H1N1 Influenza:

Influenza A(H3N2) virus is the predominant virus in the United States of America as the number of pneumonia and influenza-related hospitalizations among adults aged 65+ years continues to increase. Europe continues to witness influenza activity with the majority of countries reporting A(H1N1) virus. The H5N1 virus continues to remain endemic in poultry throughout Asia. The presence of various influenza virus strains in Asia present a unique challenge as there is a risk of a novel virus developing with the virulence of H7N9 (as described below) or H5N1 and the transmissibility characteristics of H1N1.

In India, from May 2009 to Feb 2013, a total of 24,5239 persons were tested at NCDC for H1N1 and 54,329 were found positive, with 3362 deaths. An upsurge of influenza A H1N1 cases has been observed since Jan 2013 and an increased number of samples have been received for testing (Fig).

Given that high mortality has been reported in the media, the Govt of India has provided guidelines for judicious testing, and treatment as follows:

Inside



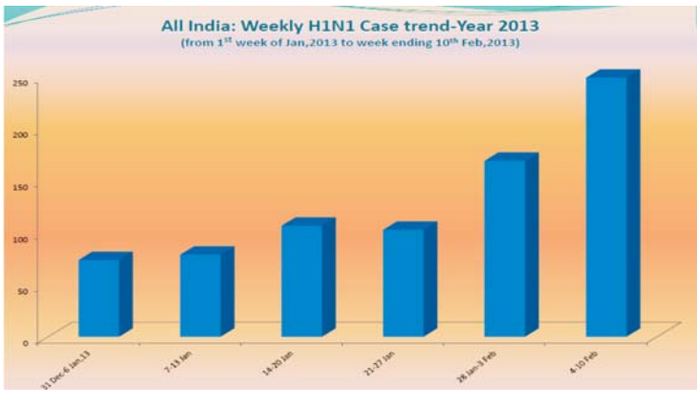
Category A: Patients with mild fever plus cough/sore throat with or without body aches, headache, diarrhoea and vomiting. These patients do not require Oseltamivir and should be treated for the symptoms mentioned above.

Category B: In addition to all the signs and symptoms mentioned under Category A, if the patient has high grade fever and severe sore throat, the patient may require home isolation and Oseltamivir;

In addition to all the signs and symptoms mentioned under Category A, individuals having one or more of the following high risk conditions shall be treated with Oseltamivir:

- ❖ Children with mild illness but with predisposing risk factors
- ❖ Pregnant women
- ❖ Persons aged 65 years or more
- ❖ Patients with lung , heart , liver or kidney disease, blood disorders, diabetes, neurological disorders, cancer and HIV / AIDS
- ❖ Patients on long-term cortisone therapy

Category C: In addition to the signs and symptoms of Category A and B, if the patient also has one or more of the following: breathlessness, chest pain, drowsiness, fall in blood pressure, sputum mixed with blood, bluish discoloration of nails; or, children with influenza-like illness with severe disease as manifested by somnolence, high and persistent fever, inability to feed well, convulsions, shortness of breath, or difficulty in breathing. All the patients mentioned in Category C require laboratory testing, immediate hospitalization and treatment.



Novel Avian Influenza A (H7N9) in China

Influenza A H7 viruses normally circulate among birds. The influenza A(H7N9) virus is among the group of H7 viruses. Although some H7 viruses (H7N2, H7N3 and H7N7) have been found to infect humans, no human infections with H7N9 viruses have been reported until recent reports from China.

As of 3 May 2013, a total of 127 patients having laboratory confirmed influenza A (H7N9) including 27 deaths (case fatality rate 22%) from China and 1 case from Taiwan have been reported. This novel virus has resulted from multiple reassortment from various sources and the preliminary gene analysis points out that although they have evolved from avian (bird) viruses, they also show signs of adaption to growth in mammalian species. Epidemiological investigation shows some of the confirmed cases had contact with animals or with an animal environment, especially in the wet market. The virus was found in a pigeon in a market in Shanghai. While nearly 80% cases are a result of poultry to person transmission; up to 20% of cases had no reported history of exposure to poultry. There are not as yet any reports of person-to-person transmission.

There are no vaccines currently available for the prevention of influenza A (H7N9). Laboratory testing conducted in China has shown influenza A (H7N9) viruses are sensitive to the anti-influenza drugs known as neuraminidase inhibitors (Oseltamivir and Zanamivir). The Chinese authorities and international agencies such as WHO are working tirelessly to educate the public regarding basic hand and respiratory hygiene and food safety measures to prevent further spread of infection.

Accentuating influenza surveillance activities in India

Since the first outbreaks of avian influenza in poultry were reported in the country in 2006, the need to initiate influenza surveillance was realized. All essential steps were taken and a network of 10 influenza laboratories under the Integrated Disease Surveillance Project (IDSP) was formed in 2008, through funding by the World Bank. Funding from the World Bank for the 10 laboratories ceased in 2012; thereafter, the Central Government funded the labs through IDSP. All ten laboratories were functional and active during the Influenza Pandemic A (H1N1) in 2009. Two more labs were added to the network in 2011 to strengthen influenza surveillance across the country. All the 12 laboratories under the network signed an MOU through which reagents were centrally procured and Grant –in –Aid was released to them under IDSP. They were provided reagents centrally, through NCDC to carry out influenza surveillance.

Influenza Surveillance by the IDSP laboratory network

Influenza surveillance in the country was strengthened as a result of the first case of pandemic influenza, reported in Hyderabad in May 2009.Labs utilize Real Time Polymerase Chain Reaction (RT-PCR) testing; information is provided to the state health authorities within 24 hours of receiving the clinical sample. Influenza surveillance is still active in the 12 IDSP laboratories network across India and diagnostic activities are performed when samples are referred by the state surveillance officer.

As a result of the pandemic, training and equipping Rapid Response Teams to investigate and contain influenza outbreaks, including supply of viral transport media for sample collection, was provided in the States. Antigenic characterization of virus has beencarried out on representative isolates every year, since 2009, to see if there are any changes in the circulating strains. Antiviral drug susceptibility on representative H1N1pandemic 2009 virus isolates has been carried out since 2009. No drug resistance gene has been found and there is no change in the strain over the years.

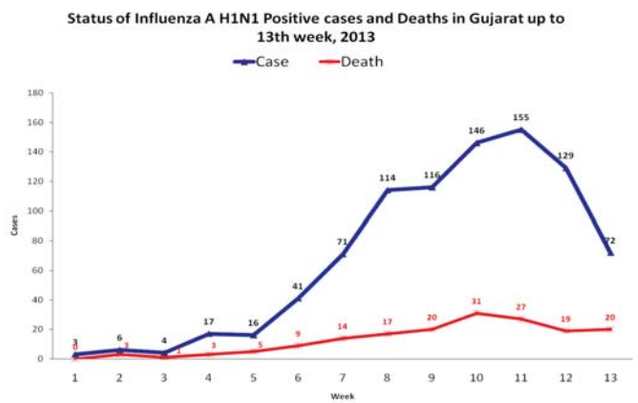
Pandemic H1N1 samples are being sequenced to determine the phylogeny of circulating strain & identify any mutations involved in drug resistance, virulence and pathogenicity of influenza A virus as well as any new mutations resulting in antigenic drift and shift of the circulating strain.

(Contributed by Dr. Archana Choudhry (Consultant, Outbreak Monitoring Cell), Dr. Nupur Gupta (Assistant Director, Microbiology Division), Mr. Sachin Kumar (Senior Research Fellow), Dr. Tanzin Dikid (Assistant Director, Epidemiology); Dr. Arvind Rai (Joint Director & HOD, Biotechnology Division), Dr.Shashi Khare (Addl. Director & HOD, Microbiology Division), and Dr. L.S. Chauhan (Director, NCDC).

Outbreak Update

Influenza A (H1N1) in Gujarat, March 2013

An increase in influenza A activity has recently been observed in several states including Rajasthan, Punjab and Delhi. Similarly, a surge in influenza A (H1N1) cases occurred in Gujarat in January 2013. Cases increased considerably in February, but have started to decline since the last week of March (Graph).



Of 1,598 cases tested from 1 January-17 March 2013, 652 (40.8%) were found positive for influenza A (H1N1) (pandemic). The positivity rate was much higher in 2013 when compared to previous years, as only category "C" cases were tested in the laboratories in 2013 as per national guidelines (Table 1).

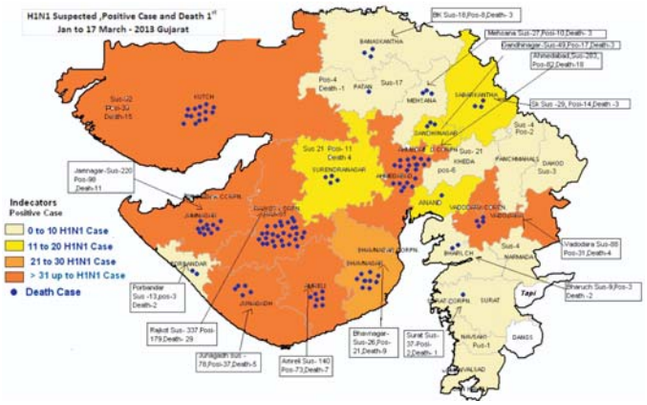
Table 1: Influenza A (H1N1) in Gujarat, 2009-2013 - Suspected/Positive Influenza A (H1N1) cases and deaths in Gujarat, 2009-2013 (upto 17 March 2013)

Year	No. of suspected cases tested for Influenza A (H1N1)	No. (%) of Cases positive for Influenza A (H1N1) (H1N1 positivity among suspected cases)	No. (%) of Influenza A (H1N1) cases died (CFR among positive cases)
2009	2731	697 (25.5%)	117 (16.8)
2010	6287	1682 (26.8%)	353 (21%)
2011	166	7 (4.2%)	3 (42.9%)
2012	599	104 (17.4%)	32 (30.8%)
2013	1598	652 (40.8%)	121 (18.6%)
Total	11381	1145.853 (27.6%)	(1386.933) (19.9%)

Twenty-one of the 26 districts of Gujarat reported confirmed influenza A (H1N1) cases till 17 March in 2013. Two-thirds of suspected cases (1072/1598), three-fourths of lab confirmed cases (471/652) and two-thirds of deaths (80/121) occurred in only 5 districts i.e. Rajkot, Jamnagar, Ahmedabad, Amreli, and Kutch. Only single cases occurred in almost all families and villages/colonies and both sexes were affected almost equally (Figure).

Regarding age distribution, 87% of lab confirmed cases occurred in persons aged 15 years and above. The case fatality rate (CFR) is less in 2013 when compared to previous years with an overall CFR of approximately 18.6% (121/652)

When comparing age groups, the CFR is significantly higher in older people (60 or more) and infants. The CFR was significantly more in females (22.2%) than in males (14.7%), reaching 34.4% in elderly females.



More than 63.2% (60/95) influenza A (H1N1) positive fatal cases had a history of co-morbid conditions such as diabetes (23/95), pregnancy (14/95), chronic heart disease (10/95), hypertension (10/95), chronic lung disease (8/95) or were in an extreme age group. Several cases had multiple risk factors. Almost half of the cases came to hospitals recognized for influenza A (H1N1) treatment after 5 days of onset of symptoms. Most of the cases had serious respiratory symptoms such as breathlessness or acute respiratory distress. Physicians mentioned many patients who died had received steroids before hospitalization. These factors and the prevalence of anemia may have also contributed to the high fatality rate, especially in females.

Necessary laboratory facilities for testing Influenza A (H1N1) have been made available in 3 medical college laboratories (Ahmedabad, Rajkot, Surat). Thirteen samples tested in the Medical College, Rajkot, were also tested in laboratories of NCDC, Delhi and NIV, Pune. The results were in concordance with the report given by Medical College, Rajkot. The virus was found to be sensitive to Oseltamivir in the laboratories of NIV, Pune.

Actions taken by the State Govt. included testing and management of cases free of cost, equipping identified hospitals with ventilators and cardiac monitors, training of doctors in both public and private sectors, availability of Oseltamivir and PPE in adequate amount, biomedical waste management, chemoprophylaxis and vaccination for health care personnel, and IEC to increase awareness among the community and health professionals.

Guidelines related to patient categorization, hospitalization, clinical management, infection control, and laboratory testing were provided by the Govt of India to all states and available on the MOHFW dedicated website (www.mohfw-h1n1.nic.in) need to be more closely followed. The most critical issue to ensure early diagnosis and case management in order to prevent mortality. There is also a need to analyze data on all suspected/confirmed/fatal cases to determine all the risk factors for infant mortality in Gujarat.

(Contributed by Dr. Jagvir Singh and the Central Team visiting Gujarat to investigate the H1N1situation)

NCDC Highlights

Focusing on Food Borne Infections as an Important Cause of Morbidity and Mortality in India

Of the outbreaks reported to the Integrated Disease Surveillance Project (IDSP), approximately 60% are related to food borne infections. However, there are challenges in determining the etiological agent of the outbreaks due to inadequate laboratory-based surveillance for food borne infections. There is a need to develop guidelines to establish a network for laboratory based surveillance of food borne infections in the country, utilizing the existing health care system infrastructure.

Based on the identified need, one consultation meeting and one training workshop were organized by CDC/WHO-India/NCDC at Delhi and Kolkata during the month of February.

1. Consultation Meeting at National Centre for Disease Control (NCDC), Delhi, 11-12 Feb 2013

Three foodborne experts from CDC Headquarters, Atlanta, participated in the meeting: Dr. Tom Chiller, Associate Director of Epidemiological Sciences, Division of Foodborne, Waterborne, and Environmental Diseases; Dr. Ian Williams, Chief, Outbreak Response and Prevention Branch Division of Foodborne, Waterborne and Environmental Diseases and National Centre for Emerging and Zoonotic Infectious Diseases; and Dr. Rajal Mody, Epidemiologist, Enteric Diseases Epidemiology Branch. Other participants included State Surveillance Officers (SSOs), Officials from Central Food Laboratories and State Food Laboratories, GDD-India Centre, NCDC and WHO.

The meeting highlighted the challenges of globalization and food trade on Foodborne Diseases, information related to the Global Warning System for major animal diseases (GLEWS), the International Food Safety Authorities Network (INFOSAN), and the importance of Foodborne Disease Outbreak Surveillance as a tool to determine public health action.

As a result of the presentations and discussions, an action plan was developed which included the following components (i) Pilot surveillance will be initiated in two districts in three states. The states will be selected on the basis of epidemiologic capacity, existing public health infrastructure, laboratory capacity and willingness to incorporate the India Epidemic Intelligence Service (EIS) Programme into food borne investigations; (ii) The coordinator at the State level for food borne outbreak investigations will be the IDSP State Surveillance Officer; and (iii) Pilot states/districts will receive additional training on food borne outbreaks.

The action plan also specified the priority pathogens for which laboratory capacity should be enhanced in clinical laboratories: *Vibrio cholerae* and *Vibrio parahaemolyticus*, Salmonella spp, Shigella spp, *Staphylococcus aureus* including detection of toxin, and *Bacillus cereus.*

2. Epidemiology/Laboratory Training Workshop on Foodborne Disease Outbreak Investigations, NICED, Kolkata, 14-16 February, 2013

The workshop was organized with the objective to build epidemiology and laboratory capacity, within the pilot states, to effectively detect and investigate food borne disease outbreaks. The course featured hands-on microbiology training and a case study for epidemiologists to work through the steps of investigating a food borne outbreak.

Practical sessions in the lab included performing isolation, biochemical identification, antimicrobial susceptibility testing and serotyping of Salmonella spp and *Vibrio cholerae* O1. Safe handling practices for working with samples containing these organisms were also described and finally isolates of Salmonella spp, *Vibrio cholerae* O1 and *Escherichia coli* were also provided to the participants for their respective institutes.

Evaluation of the Vaccine Preventable Diseases Surveillance System, Delhi

Vaccines have made a major contribution to public health but vaccine preventable diseases (VPD) are still responsible for a significant number of deaths among under-five children. Although India witnessed a reduction of almost 80% of cases of measles and diphtheria in the last 2 decades, it still contributed to 47% of global measles mortality and 20% global diphtheria mortality in 2010-

VPD surveillance, focusing on measles and diphtheria, is important to detect outbreaks, assess disease burden, define epidemiology, and identify high risk populations and areas with gaps in coverage. It is also required to document the impact of vaccination programs, to evaluate the effectiveness of current vaccines and vaccination policies, and to identify needed changes in program strategies leading to disease control or elimination.

Since there had not been an evaluation conducted of the VPD surveillance system in Delhi, we chose to evaluate the VPD (measles and diphtheria) surveillance system of Delhi. The evaluation included with the specific objectives to describe the surveillance system, evaluate the system with respect to defined attributes as per the Centers for Disease Control and Prevention (CDC) guidelines, and propose recommendations for strengthening the system.

Methods: We reviewed the available data for the measles and diphtheria surveillance system of North Delhi District (district randomly selected) from 4- 8 February 2013. Data collection was based on interviews of the state and district Health Management Information System (HMIS) cell and hospitals and dispensary staff using a semi-structured questionnaire which included information about the description of the system, data collection, flow of information, compilation, analysis and dissemination of reports. We also conducted a thorough review of available documents such as protocols, operational manuals, training documents and hospital and dispensary records.

Results: Surveillance for vaccine preventable diseases is conducted by four reporting systems: Integrated Disease Surveillance Project (IDSP), HMIS, Central Bureau of Health Intelligence (CBHI) and the National Polio Surveillance Project (NPSP). In this study we focused on the HMIS— a web-based reporting system initiated in Delhi in April 2008. The HMIS has the following objectives:

1. To create electronic medical records
2. To provide early alerts on disease trends and cause of deaths as per international codes for disease surveillance and rapid action
3. To monitor identified indicators
4. To enable comparisons of efficiency and performance among hospitals
5. To provide tools for effective health policy making and planning.

In HMIS, the data are collected through passive surveillance. Surveillance information is provided by the Auxiliary Nurse Midwives (ANMs) and is transmitted from the facility to the district to the state and finally to the national level. Data is collected on a monthly basis; information is stored both in hard and soft copies and in the portal as well. Data are analyzed by the HMIS nodal officer at the district level, and by the Monitoring and Evaluation officers and Program officers at both the state

and national level. Data are analyzed on a monthly, quarterly and annual basis. Reports are disseminated via mail from the national level and in the form of monthly review meetings at the state and at district levels.

Evaluation of the Health Management Information System: Overall, the system is useful as it provides trends in diseases, identifies early VPD epidemics, and provides mortality data for measles. HMIS is an important source of data for evaluating immunization coverage at the national, state and district levels.

The surveillance system is simple to use; there is only one form to fill out monthly, quarterly, and annually. There are two indicators for measles and diphtheria cases and one for measles deaths. Case definitions are easily understood by the users. Data collection and the flow of data are clear and well-understood by field staff. Data entry, analysis and dissemination procedures are simple. The data entry is done online by the Data Entry Operators (DEOs) with separate facility-wise user ids which simplify the field staff work, as they only need to collect the information and not enter it. The only challenge is the forms are long (4 pages) and take an average of 30 minutes to complete.

We observed completeness in reporting of forms (93.8% (845/900) from April 12 to Jan 13) and systemic support (manpower, infrastructure, funds) for effective functioning of HMIS. The level of adherence to the guidelines and methodology of the surveillance system was high among the visited sites, which indicates the acceptability of the surveillance system. The main challenge was there is almost non-existent participation from the private sector [3.3% (15/450)], despite the high participation of public facilities (98%).

The data quality is good for case data but poor for mortality data. There is a built-in data verification tool for checking validation errors. Interquartile range, upper and lower limits and outliers are calculated and evaluated for each variable. Periodic trainings are being conducted at all levels. Feedback is shared in monthly review meetings. Facility reporting is good as 94% (845/900) of the facilities have reported (April 2012 to January 2013). However data are incomplete for measles deaths in 90% of the forms. Furthermore, the system is unable to capture gender and age for cases of measles and diphtheria.

The system however provides incomplete representation as the system does not capture the majority of private sector cases [captures only 3.3% (15/450)]. The overall representativeness is 17.1% (15 private + 75 government out of 450 private + 75 government reporting units i.e. 90/525). Furthermore, this system does not capture measles and diphtheria cases for individuals older than 5 years, nor does it capture diphtheria deaths.

The timeliness of HMIS 2012-13 needs improvement. Only 42% (38/90) of reporting units reported on time for January 2013. Although the planning was done with clear timelines of various activities at the state level, there was a delayed release of funds due to administrative reasons, delayed recruitment of manpower and delayed completion of trainings.

Discussion and conclusions: The main strengths of the HMIS are that it is a web-based reporting system and information is transmitted in a relatively short time. Facility-wise data are available and indicators on program, mortality, human manpower and infrastructure are available on the web portal. Data factsheets, reporting status and data validation tools are also available on the web portal. This evaluation is subject to limitations. The results of this evaluation cannot be generalized to the entire Delhi state. Furthermore, many health facilities showed resistance in providing data. Another limitation is only a relatively small number of stakeholders and records were interviewed/reviewed.

The HMIS reporting system uses standard definitions and reporting mechanisms. Data validation is standardized and documented. The overall quality of the surveillance system is good. The system is meeting its objectives. However improvement is needed in the timeliness of reporting and in representativeness. Furthermore, all government hospitals should be encouraged to report through HMIS.

(Contributed by Dr. Kapil Goel, India EIS Officer 2012)

Updating National Guidelines on Rabies Prophylaxis

National guidelines on Rabies prophylaxis and intradermal inoculation of cell culture vaccines (http://www.nicd.nic.in/Rabies_Guidelines.pdf) were formulated in 2007 in an expert group meeting at NCDC, Delhi. In the last six years, there have been newer developments in rabies prophylaxis and a need was felt to review and revise the national guidelines to ensure uniformity in post-exposure prophylaxis. NCDC and the WHO Collaborating Centre (WHO CC) on Rabies Epidemiology, organized an expert group meeting to revise the national guidelines on rabies prophylaxis on 6 February, 2013. Meeting participants included experts from major anti- rabies centres, public health institutes, laboratories, ICMR, CDC-Atlanta, policy makers from Ministry of Health and Family Welfare—EPI and DCGI office, anti-rabies vaccine manufacturers from public and private sector, and Rabies Immunoglobulin (RIG) manufacturers from public and private sector.

The meeting included discussions related to the currently available ERIG: its highly purified preparations are safe and there are no scientific grounds for performing a skin test prior to administering ERIG. The treating physician should be prepared to manage anaphylaxis which, although rare, could occur during any stage of administration.

It was agreed that intradermal (ID) administration of anti-rabies vaccines should be implemented in the major anti-rabies centres across the country to provide wider coverage of PEP in available quantity of vaccine, which also makes

PEP cost-effective. However, it was emphasized that only the vaccines and schedule approved by DCGI should be used for ID administration and, as per requirement, these vaccines should have the stated potency of > 2.5IU/IM dose, and irrespective of reconstituted volume, a unit dose of 0.1ml must be administered per site.

The meeting reiterated the recommendation that a five dose regimen (Essen schedule) of administering antirabies vaccines by intramuscular route be continued in clinics where occasional animal bite victims report. Re-exposure and pre-exposure guidelines were also solidified. The revised national guidelines on rabies prophylaxis will be shortly uploaded on the NCDC web site.

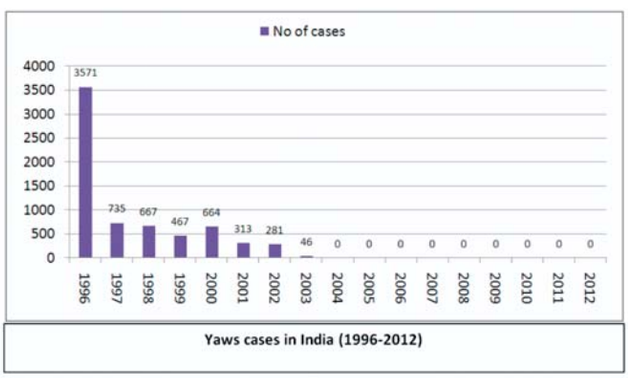
(Contributed by Dr. Mala Chabbra and Dr. Veena Mittal, NCDC, Delhi)

Eradicating Yaws from India and Global Lessons

Yaws is one of the non-venereal endemic trepanometosis, caused by *Treponema pallidum* subsp. *pertenu,e* affecting mainly skin and bones. It is a Gram-negative, spiral-shaped bacterium, member of the Spirochaetaceae, and closely resembles morphologically and serologically with other subspecies of *T pallidum*, which causes syphilis. It is a contagious disease and spreads by direct skin-to-skin contact in warm and humid environments, affecting mainly children in remote rural, hilly and tribal regions.

Yaws is the first disease targeted for eradication by WHO, as early as the second World Health Assembly (WHA) (Resolution 2.36); resulting in campaigns against yaws in 46 countries by WHO and UNICEF between 1952 to 1964. This resulted in the reduction of estimated cases from about 50 million cases to less than 2.5 million cases. As of now, the exact status of yaws is uncertain in different countries except 14 countries of African and South-east Asian regions, who reported to WHO (2008-2011).

The disease is considered amenable to eradication due to the fact there are new effective tools in the form of point-of-care rapid diagnostic test, effective oral treatment, humans are the only reservoir of infection (spread by direct contact), and it remains to be a focalized disease. Following the successful eradication of Smallpox and Guinea Worm, the Government of India set the target of eradicating the scourge of yaws.



Yaws cases in India (1996-2012)

The Yaws Eradication Programme was initiated as a pilot in 1996, in Koraput district of Odisha, which was later scaled to 51 endemic districts in 10 states who had reported yaws. The programme strategy adopted active case finding, treatment of both cases and contacts, capacity building of human resources, intensive information, education and communication, monitoring and supervision including inter-search surveillance, advocacy with involvement of other departments including tribal welfare.

The strategy resulted in a significant decline in cases from 3,571 in 1996 to zero cases in 2004; the last case to be reported in India was in 2003 in the state of Odisha. Since 2003, there have been no yaws cases reported in India. Sero-surveillance among children under the age of five has also remained negative since 2008. In the absence of any reported cases of yaws in India for three consecutive years, India was declared to have eliminated yaws in 2006, with the aim to achieve yaws free status in coming years.

(Contributed by Dr. SK Jain, Head, DPD, NCDC, Delhi)

New Initiative on Acute Encephalitis Syndrome (AES) Surveillance, Muzaffarpur District, Bihar

AES is an emerging public health problem in India. A large proportion of AES outbreaks go unclassified in the absence of a definitive laboratory diagnosis of an etiological agent. AES outbreaks have been reported from Muzaffarpur district of Bihar since 1995. Various agencies have investigated the AES outbreaks at Muzaffarpur in the past but none could find definite clinico-epidemiological linkages or reach a laboratory confirmed diagnosis in these outbreaks.

In this context, NCDC has taken a pro-active initiative to systematically investigate the AES problem in Muzaffarpur, Bihar in 2013. Based on the CDC/NCDC AES Lucknow Workshop (2012) proceedings and suggestions, the Epidemiology Division at NCDC, in collaboration with GDD-IC, prepared a draft operational plan for an AES study in Muzaffarpur, Bihar for 2013. The proposed operational plan of surveillance consists of 4 inter-linked components:

1. Hospital based retrospective and prospective data collection
2. Multidisciplinary environmental investigations
3. Laboratory surveillance
4. Integrated data management and analysis

Initially, a team of officials from NCDC-Delhi and Patna branch, India EIS officers and MPH students (2012-2014 cohort) visited Muzaffarpur for one week during the first week of March 2013 to collect retrospective data from three major public and private health facilities in the district. Hospital pediatric inpatient and mortality records of 2012 and 2013 were screened for any acute CNS development to gain an estimate of the annual burden of AES cases, their distribution and correlates. Collected data is currently under analysis at NCDC Delhi. Based on initial findings from this exercise, previous outbreak investigations at Muzaffarpur, and the Lucknow AES Workshop (2012) proceedings, an operational case definition, as well as clinical, laboratory and environmental data collection tools and operational protocols have been finalized. This standardized data collection protocol will be implemented for new AES cases admitted during the known outbreak period of 2013. NCDC will train the three local institutions scheduled to participate and monitor the surveillance. The data and laboratory samples collected on new AES cases will be transferred to NCDC for analysis.

MPH FE scholars, EIS Officers with NCDC Patna Branch Officer in Muzzafarpur, Bihar

A multidisciplinary approach has been adopted to study the environmental profile of low and high affected villages/ blocks based on data of 2011 and2012 outbreaks. The 2013 investigation will include specialists from various disciplines including epidemiology, microbiology, entomology, pediatrics, agriculture science, toxicology, and animal science. Experts will visit the affected district during the pre-, in- and post-season known for the AES outbreak. Environmental data for new AES cases will be collected through home visits using specifically designed environmental data collection tools. The findings from all components of this surveillance will help to develop a hypothesis, which will be subsequently be tested through analytical study designs.

(Contributed by Dr. Aakash Shrivastava and Dr. Anil Kumar, Head, Epidemiology, NCDC, Delhi)

Multidisciplinary Experts Deliberate on the Epidemiological Aspects of Acute Encephalitis Syndrome (AES), 4 April 2013

The first meeting of multidisciplinary experts to study AES at Muzaffarpur, Bihar was held at NCDC, Delhi on 4 April 2013.The meeting was chaired by the Director, NCDC and attended by invited external and internal experts from NCDC and GDD-IC.

The objectives of the meeting were to deliberate on available published or unpublished literature relevant to their discipline that pertains to the clinical/laboratory profile of AES and the environmental profile of Muzaffarpur or Bihar, which will contribute to the team's understanding of AES in this region. The meeting also allowed the team an opportunity to understand the findings from the previous two outbreak investigations at Muzaffarpur, Bihar and to strengthen the clinico-epidemiological, environmental and laboratory instruments of the 2013 AES investigation.

During the meeting, the overall operational plan for the 2013 AES study was presented. The invited experts presented the current knowledge of AES in their discipline and how they/their institutes may contribute to these components. The meeting ended with an agreement that all invited institutions and experts will continue to be part of the AES endeavour and would provide inputs needed from their expertise to NCDC and others as soon as possible.

(Contributed by Dr Nidhi and Dr. Anil Kumar, Head, Epidemiology, NCDC, Delhi)

Scientific Writing Workshop at NCDC, 9-10 May, 2013

Publishing scientific papers are important for researchers to document their work and share their findings the global scientific community.

In order to train India EIS Officers and other interested participants, a workshop on scientific writing is scheduled to be held from 9 -10 May, 2013 at NCDC, New Delhi. The interactive workshop will be taught by four faculty members, two each from CDC and India. The workshop will include how to choose the appropriate way to document scientific findings, the various styles for documenting components of a scientific paper, how to choose an appropriate journal, how to respond to a reviewer's comments, as well as appropriate ethics of scientific writing. The workshop is also proposed to include a hands-on exercise on how to write a scientific manuscript using data collected by the India EIS Officers.

By the end of the workshop the participants should be able to understand the importance of research paper writing, including issues like ethical clearance, authorship, and plagiarism related to scientific publication.

(Contributed by Dr. Debasish Chattopadhaya, Addl Director, NCDC, Delhi)

News and Events

CDC Director's Visit to NCDC

On 30 January, Dr. Thomas Frieden, Director of the US Centers for Disease Control & Prevention, met with Dr. LS Chauhan, Director NCDC, the first cohort of the India EIS Officers, and India EIS Advisors while in New Delhi.

The EIS Officers presented their surveillance evaluation plans and gave feedback on the India EIS Programme. Dr. Jai P Narain, Senior Advisor to the EIS Programme, briefed him on plans for the second cohort, including recruitment and advocacy efforts. Dr. Frieden discussed the importance of surveillance systems and surveillance data in epidemiological evaluations and encouraged the EIS officers to continue to work hard in this important new programme.

World Health Day 2013 Focuses on Hypertension

The focus of the World Health Day this year (7 April) was on Hypertension or high blood pressure. Hypertension is one of the most important contributors to heart disease and stroke – which together make up the world's number one cause of premature death and disability. In India, one third of the population is estimated to have hypertension which contributes to thousands of deaths from cardiovascular disease each year. It also increases the risk of kidney failure and blindness. Detecting high blood pressure is the first step in preventing and controlling hypertension. All adults in the country should get their blood pressure measured at least once a year. When you know your blood pressure level, you can then take steps to control it.

Dr Larry Brilliant Discusses Global Health Threats, 5 February, 2013

Dr Larry Brilliant, the visionary physician, epidemiologist, philanthropist, and technologist visited NCDC on 5 February 2013 and shared his experiences with Dr. LS Chauhan, Director NCDC, GDD-IC and NCDC team members relating to smallpox and polio eradication programs in India and recent emerging infections.

He also visited media scanning & verification cell and discussed the current real-time disease surveillance technology for better prevention and control of disease

Dr Larry Brilliant with Media Scanning Team

Dr. Brilliant, currently serves as President and CEO of the Skoll Global Threats Fund and is an MD and MPH, with board-certification in preventive medicine. He lived and worked in India for ten years and led the successful World Health Organization smallpox eradication program. He is the recipient of many awards, including the International Public Health Hero (2004), the TED Prize, 2006, Time Magazine 100 Most Influential People, Top 20 Scientists and Thinkers and the UN Global Leadership Award (all in 2008).

Rotavirus: a Leading Cause of Severe Childhood Diarrhea

Dr. Umesh D. Parashar, Lead, Viral Gastroenteritis Team, CDC, Atlanta, USA was invited to NCDC, Delhi to deliver a talk on "Recent Advances in Understanding & Prevention of Viral Gastroenteritis." According to Dr. Parashar, rotavirus is the leading cause of severe acute gastroenteritis (AGE) in children under 5 years of age worldwide. In both developing and industrialized countries, approximately one-third of AGE hospitalizations in children under 5 are attributable to rotavirus infection.

India suffers the greatest mortality burden of rotavirus among all countries, alone accounting for approximately one-fifth (~100,000) of the estimated global deaths from rotavirus. Data from the Indian Rotavirus Surveillance Network, reported rotavirus, strain 116E, was found in approximately 39% of 4,243 children under 5 years of age admitted to 10 hospitals located in seven cities across India over a 2-year period from 2005–07. . Based on these and other data, rotavirus has been estimated to cause approximately 457,000-884,000 hospitalizations and 2 million outpatient clinic visits each year in Indian children, incurring healthcare costs of 2.0–3.4 billion (US$ 41–72 million).

Two live, oral vaccines—RotaTeq (Merck and Co.) and Rotarix (GSK Biologicals)—are currently licensed in over 100 countries worldwide. RotaTeq, a pentavalent vaccine is administered as a three-dose series concomitantly with the first three DPT vaccine doses. Rotarix, a monovalent vaccine, is administered as a two-dose series concomitantly with the first two DTP vaccine doses. While RotaTeq and Rotarix differ in composition and schedule, both vaccines

were found to be highly efficacious (85–98%) against severe rotavirus. India is among the countries, which has yet to introduce a vaccine against rotavirus in its national immunization programme. However, both RotaTeq and Rotarix are licensed in India and are available in the private healthcare sector.

In addition, vaccine manufacturers in India are currently developing several candidate rotavirus vaccines. The most advanced candidate is a monovalent vaccine based on the rotavirus strain 116E.

This vaccine showed promising results in an immunogenicity trial, and a phase 3 multicentre clinical trial is currently ongoing at sites in Delhi, Pune and Vellore, with results anticipated soon. In addition, multivalent bovine–human reassortant rotavirus vaccines developed by two other Indian manufacturers are in earlier stages of clinical development, and thus potentially several indigenously manufactured rotavirus vaccines may be available for use in India within next couple of years.

Editorial on Prospects for Routine Childhood Vaccination against Rotavirus in India can be accessed in the National Medical Journal of India, 25 (5), 2012

Dr. Lillian Orciari talks about the One Health Approach to Rabies Control

Dr. Lillian A. Orciari, Rabies Program, CDC-Atlanta, visited NCDC on 6-7 February 2013. As a guest speaker, she delivered a presentation titled, "A One Health Approach to Cost Effective Rabies Control and Prevention" at the weekly Tuesday Afternoon Seminar for EIS Officers, MPH students, NCDC and NVBDCP faculty. During her visit to the WHO CC, Rabies laboratory, detailed discussions were held on laboratory techniques and diagnosis. She demonstrated a field-based Direct Rapid Immunohistochemistry Test (DRIT) developed at CDC-Atlanta. During her visit to Delhi, Dr. Lillian also participated in the expert group meeting to revise national guidelines on rabies prophylaxis held at NCDC, Delhi.

Morbidity and Mortality Weekly Report

Global Control and Regional Elimination of Measles, 2000–2011

Widespread use of measles vaccine since 1980 has led to a substantial decline in global measles morbidity and mortality; measles elimination* has been achieved and sustained in the World Health Organization (WHO) Region of the Americas (AMR) since 2002. In 2010, the World Health Assembly established three milestones for measles eradication to be reached by 2015: 1) increase routine coverage with the first dose of measles-containing vaccine (MCV1) for children aged 1 year to ≥90% nationally and ≥80% in every district or equivalent administrative unit; 2) reduce and maintain annual measles incidence to <5 cases per million; and 3) reduce measles mortality by 95% from the 2000 estimate (*1*). The Global Vaccine Action Plan (GVAP) includes monitoring progress toward achievement of goals to reduce or eliminate measles in four WHO regions by 2015 and five WHO regions by 2020 (*2*).† This report updates the previous report (*3*) and describes progress in global control and regional elimination of measles during 2000–2011. Estimated global MCV1 coverage increased from 72% in 2000 to 84% in 2011, and the number of countries providing a second dose of measles-containing vaccine (MCV2) through routine services increased from 97 (50%) in 2000 to 141 (73%) in 2011. During 2000–2011, annual reported measles incidence decreased 65%, from 146 to 52 cases per 1 million population, and estimated measles deaths decreased 71%, from 542,000

coverage in three WHO regions was ≥90% (Table 1). The number of countries with ≥90% MCV1 coverage increased from 83 (43%) in 2000 to 123 (63%) in 2011. Of countries reporting district-level MCV1 coverage, the proportion reaching ≥80% MCV1 coverage in ≥80% of districts increased from 49% (72 of 148) in 2003 to 56% (87 of 156) in 2011; in 2011, 34% (53 of 156) reported ≥80% MCV1 coverage in all districts. Of the estimated 20.1 million infants who did not receive MCV1 in 2011 through routine immunization services, 11.1 million (55%) were in five countries: India (6.7 million), Nigeria (1.7 million), Ethiopia (1.0 million), Pakistan (0.9 million), and the Democratic Republic of the Congo (DRC) (0.8 million).

During 2000–2011, the number of countries providing a second dose of measles-containing vaccine (MCV2) through routine services increased from 97 (50%) to 141 (73%). Overall, 225 million children received measles vaccination during 39 supplemental immunization activities (SIAs)¶ conducted during 2011. Among those 39 SIAs, 17 (44%) had >95% reported measles vaccine coverage, 12 (31%) included rubella vaccination, 15 (38%) included oral polio vaccination, and 14 (36%) included one or more child health interventions, in addition to vaccinations (Table 2).

For more details, please see http://www.cdc.gov/mmwr/pdf/wk/mm6202.pdf

Odisha Health Minister Releases IDSP Annual Report, 2012

The Annual Report of the Integrated Disease Surveillance Programme Odisha (IDSP-2012) was released on 8 March 2013 by Dr. Damodar Rout, Honorable Minister Health & FW, Mr. Pradipta Kumar Mohapatra, Principal Secretary Health & Family Welfare, Dr. Megha Khobragade, Asst Director NCDC, GOI, Dr. Balakrishna Panda, Director, Public Health, and Dr. Nalinikanta Das, DHS. According to the Health Minister "Disease surveillance plays an important role during outbreaks of communicable diseases like Diarrhea, Malaria, Dengue, etc and leads to healthier Odisha".

The sincerity of the IDSP staff is key to combat outbreaks of various diseases. Let us work hard towards a healthier Odisha. During the event, awards were given to four IDSP staff working in the state: Dr. P.K.Sbudhi, DSMO, Rayagada, Dr. Lalit Mohan Rath, ADMO (PH), Ganjam, Dr. M.Baig ADMO (PH), Kendrapara, and Dr. P.K. Behera, ADMO (PH), Nabarangpur.

Forthcoming conferences & meetings

- **First India Epidemic Intelligence Service (EIS) Conference**
  Dates: 24-26 October 2013
  Venue: National Centre for Disease Control
  22 Sham Nath Marg, New Delhi-110054
  Theme: Epidemiology in the Context of Emerging Infections and Noncommunicable Diseases
  For details: www.indiaeisconference.com

- **The Third International Conference on Dengue and Dengue Hemorrhagic Fever 2013 (Dengue 2013)**
  Dates: 21-23 October 2013
  Venue: The Imperial Queen's Park Hotel in Bangkok, Thailand.
  Theme: "Global Dengue: Challenges and Promises".
  For details: www.dengue2013bangkok.com

- **The 11th International Congress on AIDS in Asia and the Pacific (ICAAP11)**
  Dates: 18-23 November 2013
  Theme: Asia/Pacific Reaching Triple Zero: Investing in Innovation
  Venue: Bangkok, Thailand

  Contact person:
  Mr. Pairojana Sornjitti (Secretary General)
  ICAAP11 Local Organizing Committee (LOC) Secretariat
  Population and Community Development Association (PDA)
  E-mail: secretariat@icaap11.org
  Tel: + 66 2 2229 4611-28 ext 404

- **16th International Congress on Infectious Diseases (ICID)**
  Dates: 2-5 April 2014
  Venue: Cape Town, South Africa
  Contact: info@isid.org

- **American Society for Tropical Medicine & Hygiene 62nd Annual Meeting**

  Dates: November 13-17, 2013 (Wednesday through Sunday)
  Venue: Marriott Wardman Park, Washington, DC

  Call for Abstracts:
  Submission Deadline: May 2, 2013
  Late Breaker Abstract Submission Deadline: August 22
  Follow www.astmh.org/blog for updates, wrap-ups and news from the meeting

Important Health Days

World Health Day
7th April 2013

World Malaria Day
25th April 2013

World Hepatitis Day
19th May 2013

World Environment Day
5th June 2013

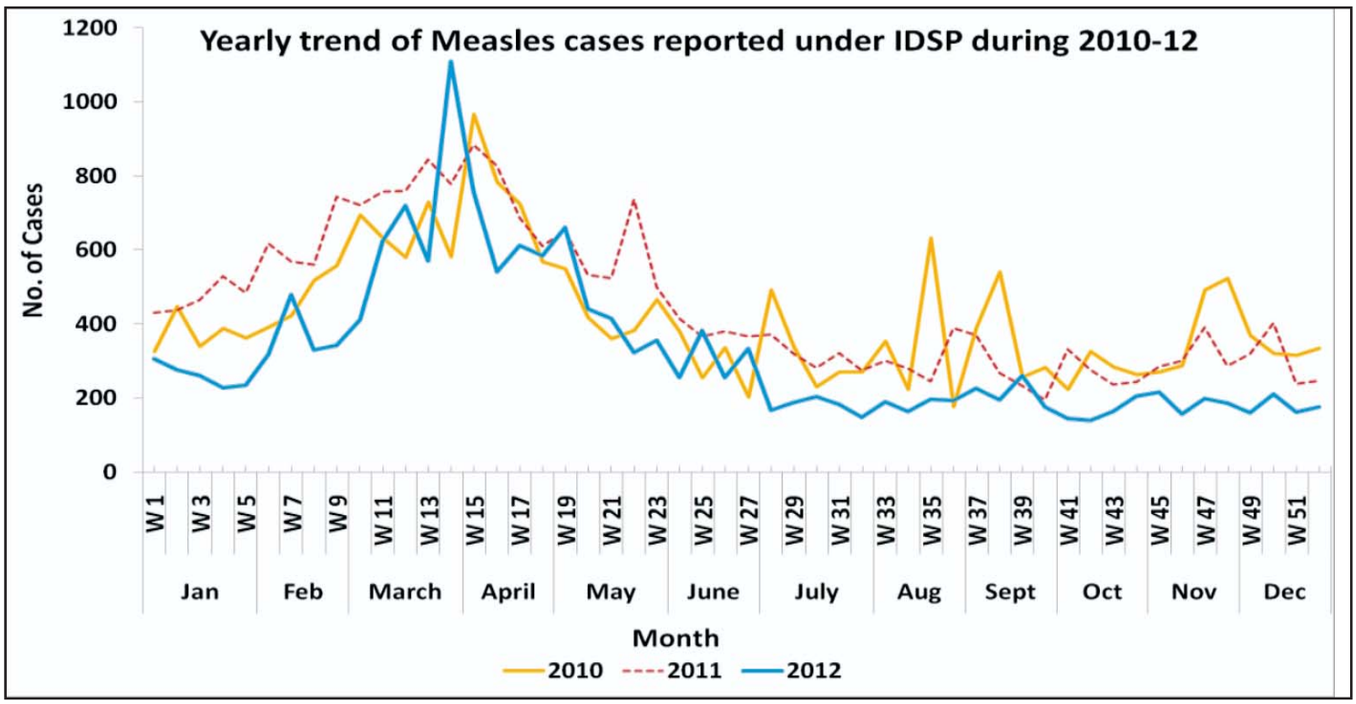
World Blood Donation Day
14th June 2013

World Population Day
11th July 2013

Monitoring Disease Trends

Measles in India, 2010-2012

Measles is an important cause of morbidity and mortality among the children of India despite available safe and cost-effective vaccines. The WHO Global Measles and Rubella Strategic Plan, 2012-20, focuses on the implementation of five core components relating to monitoring disease. The plan focuses on effective surveillance, development/maintenance for outbreak preparedness, rapid response efforts to outbreaks, and management of cases are closely linked to IDSP/NCDC. The trend of measles cases reported during 2010-12 is shown below.



The yearly trend of measles cases, reported by IDSP, shows a seasonal (spring) increase in incidence between February and May with a peak in March. However, outbreaks occur throughout the year. The number of states reporting more than 1,000 measles cases has declined between 2010 and 2012. During 2010-12, the average measles incidence per lakh population was highest in Northeastern and Northern states.

(Contributed by: Dr. Amit Karad, Praveen G, Prasun Sharma, & Dr. Jagvir Singh, IDSP, NCDC Delhi)

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