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DEVELOPMENT OF A FEASIBILITY MODULE FOR ROAD TRAFFIC INJURIES SURVEILLANCE

Road traffic injuries (RTIs) are the leading cause of human deaths in the world and leading contributor to the burden of disease world-wide. According to the World Report on Road Traffic Injury Prevention, 2004 nearly 1.2 million people die and 20-50 million persons are injured and disabled for the rest of their lives every year globally due to road traffic crashes. This burden amounts to 2.1% of all cause mortality and 23% of the mortality due to all injuries in the world. It has been estimated that 85% of these fatalities occur in low and middle income countries that drains off 1-2% of the country's GDP notwithstanding the adverse social, physical and psychological sufferings of the injured and disabled survivors.

Road traffic injury death rates constitute a rapidly growing problem, with global deaths from injuries projected to rise from 5.1 million in 1990 to 8.4 million in 2020². It has been predicted that rapid urbanization and motorization in the developing countries will account for much of the increase, and the rise will be steeper due to lack of appropriate road engineering and lack of injury prevention programmes in the public health sector³.

Official reports in India indicate that in 2006, 3.94 million road accidents had occurred in which 1,05,725 people were killed and 4.5 million were injured⁴. These constitute 33.6% of the total accidental deaths in the

country due to natural and unnatural causes. The death rate in India is 35 per 1000 vehicles, the highest in the world. These estimates are still not actual since many accidents go unreported due to lack of an organized system of injury data collection in the country. The high crash rate is compounded by the non-existence of organized care for the seriously injured. It is estimated that the potentially treatable injury cases are six times more likely to die in India than in any other organized system due to inadequate trauma care systems.

Recognizing the burden that road traffic injuries put on the economic, social and health care system, it is crucial to address its causes and consequences. Many governmental and non-governmental organizations, Ministries of Transport and of Health and Family Welfare, environmentalists, public health experts and urban planners have expressed concern on this burgeoning problem.

It is well known that road traffic injury is a multi-sectoral problem and integrates several sectors like the transport, urban development, road engineering, police, health and emergency care, NGOs, insurance, driver licensing, motor driving institutes and automobile manufacturers. Hence addressing the issue of traffic injuries requires the support of these agencies in sharing vital information. The Indian Council of Medical Research (ICMR), which is an apex

organization for biomedical and health research in the country, has been concerned about the growing health problems due to road traffic injuries. It has attempted to bring these stakeholders on a common platform so as to discuss the problem and arrive at a consensus on information sharing. National bodies, NGOs, the transport sector, public and private health sector, legislative sector, and national highway authorities have been addressing road injuries at their own level. It is essential to bring all of them together to develop a comprehensive programme for effective policies and programmes. The World Health Organization (WHO) has called the nations to generate activities targeted towards reducing the magnitude of injuries and deaths due to road accidents. One of the means of targeting resources and attention of the policy makers towards this issue is to generate authentic, good quality data. Since the health sector bears the major brunt, it becomes all the more imperative for health research organizations like ICMR to address this issue at the highest priority by strengthening the health information system.

National Burden of Road Traffic Injuries

According to the experts at the National Transportation Planning and Research Centre (NTPRC) the number of road accidents in India is three times higher than that prevailing in developed countries and second only to China which reported 4,50,254 road accidents and 98,738 deaths in 2005. The true numbers, however, may be much more than the officially reported figures as accidents in India are reported by diverse data sources. Gross underreporting and absence of a systematic injury data collection system further adds to the lack of authentic information. The National Crime Record Bureau (NCRB) in its annual report has informed that a total of 4,23,426 traffic accidents were reported during 2006 of which 3,94,432 (93.0%) were road accidents. The NCRB provided the following statistics in 2006:

- **361** deaths and 1253 injuries per day due to traffic accidents
 - **290** deaths per day and 1241 injuries per day due to road accidents
 - **71** deaths and 12 injuries per day due to rail – road and other railway accidents
 - **65** deaths per day by truck/lorry and 52 deaths by two-wheeler
 - **297** deaths due to accidents per day in the age group 0-29 years
 - **286** deaths due to accidents per day in the age group 30-44 years
 - **279** deaths due to accidents per day in the age group 45 years & above
 - Nearly two-third (60.5%) of all persons killed in accidents in the country were between 15 to 44 years.
 - Maximum 'road accidents' (62,023) occurred between 3 p.m. to 6 p.m.
- In 2006, accidental deaths in children below 14 years (that comprise 30.4% of the population) were about 7.1% of the total deaths. Males were three times more affected than females. Truck/lorry accidents comprised 23% of the total accidents and in Delhi 24% victims were pedestrians. Several studies in Bangalore and Haryana have shown that injury problems are much higher than the official reported figures. In 2007 a total of 1,40,560 deaths due to traffic accidents were reported in India showing an increase of 6.8% as compared to previous year (2006). Of these, 1,14,590 deaths were due to road accidents, 22369 due to rail road accidents and 23,601 due to other railway accidents. The corresponding figures for 2006 were 1,05,725, 2353 and 23,574 respectively⁵.
- Studies in India have found that a majority of accidents occur either due to the driver's error or due to the negligence of the safety norms. Driver fatigue, drunken driving, dangerous overtaking, lane cutting, jumping of signals, erratic parking can be counted as major causes for the calamities on the roads. Poor road infrastructure, inappropriate urban design, lack of compliance with traffic regulations, inadequate enforcements have also contributed to this increase. There is very poor link between traffic crashes and hospital outcomes that results in high rates of underreporting. The poorest are the least likely to report. Pedestrians, bicyclists and motorized two wheelers have been identified as the most vulnerable group constituting 60-80% of road fatalities in India. Two wheelers, motorized (70%) and non-motorized (10-35%) vehicles are the main components of India traffic. It has also been observed that fatal crashes with pedestrians, bicyclists and motorized two-wheelers involving buses and trucks were in higher proportion (50-70%) than non fatal crashes. Occupants of two wheelers and occupants of public and private transport is another group of people constituting the majority, to be affected in road traffic injuries⁶. On highways, occupants of cars are the most vulnerable group, next to pedestrians⁷.

Road traffic injuries impact the family's productive opportunities as the male members who are the earning members of the family are the main victims. This may even result in the family falling into abject poverty to meet the health expenses of the injured⁸. Road related accidents cost India Rs.5000 millions every years, but there is no sign of any possible intervention. To despair, there is no available record of precisely how much developmental money is lost due to road related accidents, and how much compensation is paid to road accident victims. Of course, a number of projects are on across the country to provide timely and effective relief to the victims of road accidents. For instance, in Bangalore the Manipal Hospital has joined hands with the hospitals on highways and launched a project named Operation Sanjivini aimed at providing emergency assistance to accident victims on the highways. As part of the Operation Sanjivini the hospitals on the highways in association with the local NGOs will position well equipped ambulances at almost every 50-km stretch of the highways.

On the other hand, a voluntary organization – Lifeline Foundation has launched an ambitious Highway Research Project (HRP). Significantly so far under HRP more than 400 persons with critical injuries and over 300 people with major injuries have been saved. Based in Vadodara, HRP reaches to the accident spot immediately on getting the message. It has launched 14 projects for highway accident victims in the states of Goa, Karnataka, West Bengal and Kerala. The Emergency Management and Research Institute is another initiative that was launched in 2005 in Hyderabad by the Byrraju and Satyam Foundation. Their focus is on the 'Platinum 10 minutes' by providing fully-equipped, air-conditioned ambulances complete with defibrillators, ventilators and echo cardiograms. In a short span of time it saved more than 3500 lives with an average response time of less than 30 minutes. It is the most comprehensive, integrated and successful emergency management model which every state is trying to replicate in the country.

Despite encouraging advancements in post-accident care, there is still a lot to be done to reduce the magnitude of injuries and deaths on the Indian roads. The WHO in its report has identified major steps in this direction. Improving the quality of information is one such step. Authentic data on morbidity and mortality will surely help in addressing issues related to prevention, resource allocation, manpower development and formulation of policies and programmes. In India, along with the resources

provided for curative services, a substantial amount should be earmarked for road safety and prevention of road traffic injuries. Resources allocated under trauma care are focusing on building and equipping high-tech hospitals. We need to have more trained and skilled manpower for prevention of injuries in India both at the medical college level and in health care institutions. In this scenario, intervention strategies that need to be developed require scientific basis, be sustainable over time, and geared towards making a change in the safety graph of road traffic injuries.

Development of Module

Recognizing the need of the hour, ICMR, with the support of WHO for the first time organized a workshop on Road Traffic Injuries in July 2006. Invited representatives from multiple agencies shared their ideas and experiences on research activities and data capture mechanism in road traffic injuries. The participants actively deliberated on the need for initiating an Injury Surveillance System. They also suggested initiating multicentric epidemiological surveys to address local and regional level planning purposes. To develop a system of data capture from multiple agencies, it was suggested that initially a short term feasibility study for developing a module for road traffic injuries be undertaken at two or three centres. Based on the experience gained from this study, a larger study could be initiated at the national level.

The twin centre pilot study of "Developing a feasibility module for Road Traffic Injury Surveillance" was initiated in Pune and Bangalore to test the feasibility of undertaking hospital based injury surveillance in rural-urban areas. A total of 33 hospitals (12 hospitals with more than 100 beds in Pune and 21 hospitals in Bangalore) participated in the study. Over 80% of these hospitals were private/private teaching hospitals. Training programmes were also held in these hospitals for doctors, nurses, residents and other hospital staff.

The study was conducted in four phases:

- Phase I : Preparatory phase (3 months): Training and capacity building of the hospital staff.
- Phase II : Data collection by the project staff (3 months)
- Phase III : Data collection by trained hospital staff (3 months)
- Phase iv : Report preparation (3 months)

A questionnaire containing personal details of the injured, brief details of the injury, details of the road traffic

injury, pre hospital care, injury management and outcome was developed, pilot tested, validated and administered. Efforts were also made to integrate information from the police and transport sector by providing the requisite training to the agency staff. The findings of the study have provided significant leads towards setting up a National Injury Surveillance System.

The data generated by the study is summarized as under:

External Cause of Injury

A total of 32,546 cases were recorded at the two centres during April-September, 2007 of which 28,115 (86.4%) were registered in the hospitals. The causes of injuries were reported in 32188 cases and for the remaining 358 cases the causes were missing.

Road traffic injuries accounted for 44% (14125) of the total causes of injuries. Injuries due to assaults constituted the second largest accounting for one-fourth of the total while falls and poisoning comprised 10 and 8% respectively.

Age-Sex Distribution

Children and young adults less than 25 years of age comprised almost a third of injured. Injuries occurred most frequently in 25-34 years. In all age groups more males presented with injuries than females.

Road traffic injuries were most frequent in the age group 15-44 years (71.4%). Falls, assaults, stabs, burns and hanging were also reported to be frequent in this age group. While there was male preponderance in all other injuries, the proportion of males and females was similar for burns and poisoning.

Location of the Injury

Among injuries other than road traffic injuries, one half occurred at home mainly due to assault (38.5%), poisoning (24.5%), falls (14.8%) and burns (10.9%). One fifth of the injuries that occurred on the roads were also due to other reasons *viz.* assault (62.6%), and falls (20.5%). In workplace 13.9% injuries occurred due to falls and 65% due to assaults and stab/cuts.

Activity at the Time of Injury

Most of the injuries occurred while people were either travelling (32.5%) or walking (17.7%) or working (10.8%).

While the road traffic victims were mainly injured when travelling in a vehicle (73%), 19.0% got injured while walking on the road side and the rest while standing or working on the road. Among those who got injured while walking, 46.7% were victims of road traffic injury and 30% were injured due to assaults. Assault was the main cause of injury for those who were standing (68.6%) or sleeping (30%). Ninety per cent of the sports injuries occurred while playing while more than 90% crush injuries occurred while working. Falls predominantly occurred among children playing on the ground. Sixty percent of the injuries occurred on city municipal roads and 19% on highways. Over 9% of the road traffic victims were injured while travelling on inner roads and rural roads.

The data has revealed that two-wheeler riders were the most frequently injured accounting for 30.1% of road traffic victims. Majority of them (66%) belong to the age group of 15-34 years while 17% are in the age group 35-44 years. Among pedestrians who constituted 24% of the total road traffic victims almost all the age groups, except children below 5 years were found to be equally vulnerable to road traffic injuries, the maximum being in 25-34 years (18.3%). Pedal cyclists constituted 17.0% and two wheeler pillion riders about 10.5% of all road traffic victims.

Type of Collision

Majority of injuries that occurred among two-wheeler riders/pillion riders and pedal cyclists was due to skidding (46%) and falling (40%). However, 11-18% of victims among these got injured due to the vehicle getting hit from the back or from side or head-on collision. Three wheeler drivers and occupants got injured due to hit from the back or front or side and also due to overturning. In fact, 27.3% of the occupants of three wheelers got injured due to overturning. Drivers and occupants of cars and other four wheelers got injured mostly due to head on collision (23-27%) and hitting a fixed object (20%) or getting hit from the back by another vehicle. Passengers of the bus usually got injured by falling from the moving bus.

Risk Factors for Road Traffic Injuries

Helmet use among two wheeler riders and severity of injuries

Only 25.2% of the injured two wheeler riders reported wearing helmet at the time of injury, 51% were not wearing helmet and for 24% the information was not available. In

all age-groups the number of non-users was almost double the number of users. Injury severity among two wheeler riders ranged from 41% mild injuries, 45% moderate and 14% severe injuries. It was observed that non-users of helmets suffered more serious injuries than the users.

Seat belt use among car drivers and occupants and severity of injuries

Among the injured four wheeler drivers only 9% reported wearing seat belts at the time of injury and 38.5% were not wearing seat belts. This information on the rest 53% was not available. Of the injured, 49% had moderate and 33.3% mild injuries. Severe injuries were reported by 18%. Those who did not wear seat belt were more seriously injured as compared to those who wear seat belts.

Alcohol use among the road traffic victims

Only 7% of the injured and 0.9% of the counterpart (those who hit the injured) reported being under the influence of alcohol at the time of the injury.

Severity, nature of injury and body part injured

Among road traffic victims there were more cases of moderate and mild injury than severe injury. Of the 13244 road traffic victims, 41.8% cases had mild injuries, 44.3% moderate and 13.9% severe injuries. The pedestrians, pedal cyclists and two wheeler riders constituted the majority of severely injured cases (70%) as compared to other road users. Car/bus drivers and occupants had moderate injuries (47-53%) while three wheeler occupants and drivers sustained mild to moderate injuries more frequently (42.50%). Over 35% of the injured truck drivers reported with moderate to severe injuries. Most injuries resulted in cut and open wound (34%), fractures (23%) and haematoma and wounds (17%). About 11% injuries resulted in abrasion and sprain.

Among the road traffic victims 42.1% of the injuries affected the lower limbs. Upper limb injuries were reported by 33.7% victims while head injuries occurred in 40.0% cases. Face injuries occurred among 27% cases. The upper and lower limbs and head injuries were the most frequent among the two wheeler riders. Among them head and face injuries occurred more among those who were not wearing helmets (61% and 36%) as compared to those who were wearing helmets (16.3% and 16%).

Pre-hospital care and treatment management of road traffic victims

Most of the victims (89%) of road traffic accidents were conscious at the time of admission to the hospital. Only 1% were brought dead and 6.4% were unconscious. Among those who were injured on municipality roads, 41% received first aid care. This proportion was less compared to 64% victims on highways and 75% victims on rural roads who received first aid. Most of the injured (97%) were taken care at the primary care level by the doctors. About one half of the injured (48%) reached the hospital on their own while more than one-fifth were referred by government hospitals and 10.3% were referred by private hospitals. Only 19% of the victims were transported by ambulances, 44% on private vehicles or taxis and 28% on auto rickshaws. Police vans were very rarely used (2.3%). Majority of the victims were brought to the hospital by family members (59%) while 25% were shifted to the hospital by some known persons.

Of the road accident victims who were transferred to hospitals, 35% were treated and sent home while 46% were admitted for medical and surgical care. One fifth of the injured were treated in the emergency room and referred to another hospital. Outcome data was available for only 6004 (42.5%) victims. Of these, 4462 (74.3%) recovered and improved, where as in 18.6% the condition worsened, 140 (2.3%) died and rest (4.8%) shifted to another hospital. It was observed that the more the severity of injuries worse was the outcome. Among mild injuries more than 90% recovered while among severe injuries only 51% recovered, 31% worsened, 8% died and the rest were shifted to another hospital.

Conclusions

Road traffic injuries have become a growing burden on the health sector. Enormous resources are spent on acute and long-term care of the injured. However, due to lack of good quality data on their geographical distribution and on contributing factors there is still a lot to be done in terms of their prevention and control. One impediment in this effort is the multi-sectoral nature of this problem. Since road traffic injuries involves persons, vehicles and road, their prevention also involves cooperation from automobile manufacturers, road engineering, urban planning, enforcement agencies, insurance and of course health sector. In fact the health sector bears the brunt of all this since the injured has to be treated and taken care of in the hospitals. Hence it is important for the health

sector to address the issue working in close cooperation with other agencies. This study is the first step in this direction.

The data from 32546 injured cases were obtained during a period of six months. Since it was a pilot study no effort was made to exclude non-serious cases.

The data have shown that 64% of the injuries that were reported in the hospitals were unintentional, 24% intentional and 8% suicides. The majority of the injuries occurred in 15-44 years which is the most productive years of life as several other studies have shown. Males are predominantly more in number than females. Road traffic injuries constituted 44% of the total number of injuries. Assaults were only slightly less (39%). This indicates that injuries due to violence are no less than traffic injuries. As observed in many other studies the most vulnerable road users were pedestrian and two wheeler riders. Helmet and seat belt use was less than 25% while severity of injuries was more in non-users. Enforcement on these two aspects is therefore very essential. Injuries to upper and lower limbs, head and face were most common. Most of the injured were taken to the hospital in private vehicles and taxis. Ambulances were used only in 19% cases.

The findings from the study have given leads for a national injury surveillance programme that can either be a vertical programme or could be incorporated in the existing health system. This method has proved to be adaptable for use in other hospital settings after sorting out issues for local settings. The major areas that need to be addressed for a sustainable injury surveillance network are:

- Resource allocation for infrastructure
- Recruitment of participating agencies in the network
- Capacity building of agencies for additional work
- Regular training and orientation programmes
- Constant support and encouragement

In India road safety is the responsibility of the Ministry of Road Transport and Highways and the Police Department, with the role of Ministry of Health and Family Welfare being limited to trauma care following road traffic accidents^{9,10}. The World Report on Road Traffic Injury Prevention calls for governments to make road safety a priority¹¹. In the words of Dr. Lee Jong-Work,

former Director-General of the World Health Organization, "To often, road safety is treated as a transportation issue, not a public health issue, and road traffic injuries are called "accidents", although most could be prevented. As a result many countries put far less effort into understanding and preventing road traffic injuries than they do into understanding and preventing diseases, that do less harm¹². Road safety, although often misunderstood to merely provide admonitions to be careful, is part of broader field of injury control that deals with unintentional and intentional injuries. It is a scientific field like that used to control any other health problem, that involves the use of surveillance and research to understand the extent and nature of the problem, the determination of risk factors, targeting these factors using scientifically based prevention strategies, and assessment of outcome of such interventions".

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This write-up is based on the report of an ICMR Study entitled "Development of a Feasibility Module for Road Traffic Injuries Surveillance" prepared by Dr. Bela Shah, Scientist G and Head, and Dr. Geetha R. Menon, Scientist B, Division of Non-Communicable Diseases, ICMR Headquarters, New Delhi; and Dr. G. Gururaj, National Institute of Mental Health and Neurosciences, Bangalore and Dr. Murlidhar Tombe, B.J. Medical College, Pune.

ICMR NEWS

The following meetings of various technical groups/committees of the Council were held:

Meetings of Task Forces (TFs)/Expert Groups (EGs) held at New Delhi:

TF on Foetal Origin of Coronary Artery Disease	September 7, 2009
EG of Indian Diabetes Study of North-East	September 9, 2009
EG on Translational Research of National Cancer Registry Programme	September 10, 2009
TF on Breast Cancer	October 1 & 14, 2009
TF on Registry of People with Diabetes in India with Young Age at Onset	October 30, 2009
EG on Mental Health Needs Assessment and Service Delivery Model in Tsunami Affected Population in Coastal Tamil Nadu	November 30, 2009

Meetings of Project Review Committees (PRCs)/Other Meetings held at New Delhi:

PRC on Oncology	September 14-15, 2009
PRC on Oral Health	September 25, 2009
PRC on Ophthalmology	October 12, 2009
PRC on Mental Health	October 20, 2009
PRC on Environmental Hygiene & Occupational Health	October 26, 2009

Meeting of Canada-India Networking Initiative on Cardio-Vascular Health	November 11, 2009
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Meeting of Core Committee on Neurosciences	November 13, 2009
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PRC on Experimental Medicine and Surgery and Anaesthesia	November 19, 2009
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PRC of North-East Projects	November 20, 2009
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PRC on Biomedical Engineering	November 30, 2009
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Hon'ble Shri Ghulam Nabi Azad, Union Minister for Health and Family Welfare, gave away various ICMR Prizes and Awards to Outstanding Biomedical Scientists of the Country in a function held at Vigyan Bhawan, New Delhi on September 18, 2009.

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Participation of ICMR Scientists in Scientific Events:

Dr. Vas Deo, Scientist E and Officer-in-Charge, National Institute of Malaria Research (NIMR), Field Station, Guwahati, and Dr. A.M. Khan, Scientist D, Regional Medical Research Centre (RMRC), Dibrugarh, participated in the VI European Congress of Tropical Medicine and International Health at Verona (September 6-10, 2009).

Dr. R. Ramakrishnan, Scientist E, National Institute of Epidemiology (NIE), Chennai, participated in a meeting with scientists of Swiss Tropical Institute at Basel (September 6-12, 2009).

Dr. G.B. Nair, Director and Dr. Dipika Sur, Scientists E, National Institute of Cholera and Enteric Diseases (NICED), Kolkata, participated in the Meeting of Diarrhoeal Diseases and Enteric Vaccine Advisory Committee at Benalmadina, Malaga (September 7-8, 2009).

Dr. M.K. Chakrabarti, Scientist F, NICED, Kolkata, participated in a meeting w.r.t. the collaborative project entitled "Developing vaccines against diarrhea caused by *Escherichia coli* and *Shigella* and in the International Conference on Vaccines for Enteric Diseases at Malaga (September 8 and 9-11, 2009 respectively).

Dr. Vahab Ali, Scientist C, Rajendra Memorial Research Institute of Medical Sciences (RMRIMES), Patna, participated in the IX Awaji International Forum on Infection and Immunity at Awaji Island, Japan, (September 8-11, 2009).

Dr. Samiran Panda, Scientist E, NICED, Kolkata, participated in the meeting of UNDOC Project on Prevention of Transmission of HIV among Drug Users in SAAARC Countries at Thimpu (September 10-16, 2009).

Dr. Deepa Bhartiya, Scientist C, National Institute for Research in Reproductive Health (NIRRH), Mumbai, participated in the Oncofertility Consortium Conference 2009 at Chicago (September 13-16, 2009).

Dr. Triveni Krishnan, Scientist D, Dr. Mamta Chawla Sarkar and Dr. Sandipan Ganguly, Scientists C and Dr. Hemant Koley, Scientist B, NICED, Kolkata, participated in a meeting to discuss Collaborative project on Emerging Infectious Diseases at Bangkok (September 16-17, 2009).

Dr. Neena Valecha, Scientist F, NIMR, New Delhi, participated in the Expert Advisory Committee Meeting of Medicines for Malaria Venture at Amsterdam (September 22-23, 2009).

Dr. A.H. Bandivdekar, Scientist D, NIRRH, Mumbai, participated in the HIV Acute Infections Meeting at Boston (September 22-23, 2009).

Dr. Geetanjali Sachdeva, Scientist D, NIRRH, Mumbai, participated in Royal International Twin Congress – X Congress on Reproductive Biomedicine and V Congress on Stem Cell Biology at Tehran (September 23-25, 2009).

Dr. R.S. Paranjape, Director, National AIDS Research Institute (NARI), Pune, participated in the WHO Consultation on the Development of a Global Network of WHO Collaborating Centres, Knowledge Hubs, and Technical Partners on HIV/AIDS at Geneva (September 24-25, 2009).

He along with Dr. C. Dayaraj, Scientist D and Dr. P.S. Shah, Scientist C, National Institute of Virology (NIV), Pune also participated in the VIII International Consortium on Anti-Virals (ICAV) International Symposium at Corsica (October 3-6, 2009).

Dr. L.S. Savardekar, Scientist D, NIRRH, Mumbai, participated in the XXV Western Institutional Review Board Annual Meeting at Seattle (September 25-26, 2009).

Prof. Arvind Pandey, Director, National Institute of Medical Statistics (NIMS), New Delhi, participated in the XXVI IUSSP International Population Conference at Marrakech (September 27 – October 2, 2009).

Dr. B.K. Tyagi, Scientist F and Officer-in-Charge, Centre for Research in Medical Entomology (CRME), Madurai, participated in the TDR/WHO's II African Biosafety Training Course at Bamako (September 28 –October 2, 2009).

Dr. Beena E. Thomas, Scientist B, Tuberculosis Research Centre (TRC), Chennai, participated in the National Meeting of the Behavioural and Social Sciences Research Network of the Centre for AIDS Research at Boston (September 28 – October 2, 2009).

Dr. A.B. Patel, Scientist C, National Institute of Occupational Health (NIOH), Ahmedabad, participated in the International Programme on Chemical Safety (IPC) Training Programme at Cardiff (September 30 – October 1, 2009).

Dr. T. Longwah, Scientist F, National Institute of Nutrition (NIN), Hyderabad, participated in the VIII International Food Data Conference at Bangkok (October 1-3, 2009).

Dr. Byomkesh Manna, Scientist E, NICED, Kolkata, participated in the III Vaccine Global Congress at Singapore (October 4-6, 2009).

Dr. P. Uday Kumar and Dr. A. Laxmaiah, Scientists E, Dr. M. Vishnu Vardhana Rao, Scientist D, Mr. M. Maheshwar, Mr. G.M. Subba Rao, Dr. I.I. Meshram, Dr. V. Sudarshan Rao, Scientists C and Dr. N. Harishankar, Scientist B, NIN, Hyderabad, participated in the XIX International Congress of Nutrition 2009 at Bangkok (October 4-9, 2009).

Dr. Poonam Salotra, Scientist E, Institute of Pathology (IOP), New Delhi, participated in the Kaladrug-R Lab Coordination Meeting at Antwerp (October 7-9, 2009).

Dr. G.B. Nair, Director, Dr. N.S. Chatterjee, Scientist D, Dr. A.K. Mukhopadhyaya, Dr. Santasabuj Das and Dr. Sulagna Basu, Scientists C, NICED, Kolkata, participated in the XLIV US-Japan Conference on Cholera and Other

Bacterial Enteric Infections at San Diego (October 12-14, 2009).

Mr. R.S. Jadi, Scientist C, NIV, Pune, participated in the VII Global Measles and Rubella Laboratory Network Meeting at Geneva (October 12-14, 2009).

Dr. Pradeep Das, Director, RMRIMS, Patna, participated in the South-West Regional Symposium for Global Health at Albuquerque (October 13-14, 2009). He also participated in the Expert Group Meeting on Quality Assured Vector Management for Visceral Leishmaniasis Control at Kathmandu (November 16-17, 2009).

Dr. N. Selvakumar, Scientist F, TRC, Chennai, participated in the II Meeting of the Global Laboratory Initiative on Expanding and Accelerating Access to Tuberculosis Diagnostics and Laboratory Services at Veyrier-du-Lac (October 15-16, 2009).

Dr. Atul Juneja, Scientist C, NIMS, New Delhi, participated in the V Asia Pacific Conference on Reproductive and Sexual Health Rights at Beijing (October 18-20, 2009).

Dr. P.K. Nag, Director, NIOH, Ahmedabad, participated in the VIII Meeting of the Network of WHO Collaborative Centres in Occupational Health at Geneva (October 18-23, 2009).

Dr. V.D. Ramanathan, Scientist F, TRC, Chennai, participated in the AIDS Vaccine Conference-2009 at Paris (October 19-22, 2009).

Dr. Mamta Chawla Sarkar, Scientist C, NICED, Kolkata, participated in the LVII Japanese Domestic Congress of Virology at Tokyo (October 24-27, 2009).

Dr. R.K. Nandy, Scientist C, NICED, Kolkata, participated in the Training Course in Clinical Immunology at Seoul (November 2-6, 2009).

Dr. V. Murhekar, Scientist F, Dr. R. Ramakrishnan, and Dr. Vidya Ramachandran, Scientists E, and Dr. Tarun Bhatnagar, Scientist C, NIE, Chennai, participated in the V TEPHINET South East Asia-Western Pacific Bi-Regional Scientific Conference at Seoul (November 2-6, 2009).

Dr. A.C. Mishra, Director, NIV, Pune, participated in the XI Meeting of the WHO Advisory Committee on Variola Virus Research at Geneva (November 4-5, 2009).

Dr. P. Jambulingam, Director, Vector Control Research Centre, Pondicherry, participated in the IVM Stakeholders Meeting at Geneva (November 11-13, 2009).

Dr. Vijay Kumar, Scientist C, RMRIMS, Patna, participated in the Workshop on Kala-azar Research in Indian Sub Continent at Kathmandu (November 16-17, 2009).

Dr. Neeru Singh, Director, RMRC for Tribal Health, Jabalpur, participated in the LVIII Annual Meeting of the American Society of Tropical Medicine and Hygiene at Atlanta (November 16-20, 2009).

Dr. Raj Kamal and Dr. Joy Kumar Chakma, Scientists C, National JALMA Institute for Leprosy and Other Mycobacterial Diseases, Agra, participated in the XI World Congress of Paediatric Dermatology at Bangkok (November 17-20, 2009).

Dr. Dipika Sur, Scientist E, NICED, Kolkata, and Dr. Alex Eapen, Scientist C, NIMR, Delhi, participated in the LVIII Annual Meeting of American Society of Tropical Medicine and Hygiene at Washington D.C. (November 18-22, 2009). Dr. Eapen also participated in the Meeting of Global Infectious Diseases Trainers at Washington D.C. (November 23-26, 2009).

Trainings/Fellowships/Short-term Courses:

Dr. Damodar Sahu, Scientist D, NIMS, New Delhi, participated in a WHO Short-term Course in Epidemiology and Biostatistics at Prince of Songkla University, Hat Yai (October 6 – November 13, 2009).

Dr. K. Bhaskarachary, Scientist C, NIN, Hyderabad, participated in the IX International Graduate Course on the Production and Use of Food Composition Data in Nutrition at Wageningen, Netherland (October 11-24, 2009).

Dr. S.A. Raju Bagadi, Scientist B, IOP, New Delhi, availed ACSBI Fellowship to Study the Role of Micro RNAs in Prostate Cancer Progression at the University of Virginia for One year (w.e.f. October 15, 2009).

Hindi Day Celebration:

As part of Hindi Day Celebrations the Hindi Publication Unit of the Division of Publication and Information, ICMR Headquarters, New Delhi organized a popular scientific lecture in Hindi on "What is Swine Flu and Its Prevention" by Prof. Sarman Singh, Head, Division of Laboratory Medicine, Department of Medical Microbiology, All India Institute of Medical Sciences, New Delhi on September 16, 2009. Scientists of ICMR Headquarters and Delhi based ICMR Institutes/Centres participated in the programme.

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