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REPORT OF ICMR–MRC MENTAL HEALTH SCOPING WORKSHOP

On
Aetiology and Life-Course of Substance Misuse and
Relationship with Mental Illness



UK Science
& Innovation
Network



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Aetiology and Life-Course of Substance Misuse
and Relationship with Mental Illness

26-28 February 2014 held at NIMHANS Bangalore, India.

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FOREWORD



Dr. Vishwa Mohan Katoch

MD, FNASc, FAMS, FASc., FNA
Secretary to the Government of India
(Department of Health Research)
(Ministry of Health & Family Welfare)
& Director-General, ICMR, New Delhi, India.

Mental health is the most essential and inseparable component of health. It is the state of mind in which the individual can experience sustained joy of life while working productively, interacting with others meaningfully and facing up adversity without losing capacity to function physically, psychologically and socially. It is undoubtedly a vital resource for a nation's development and its absence represents a great burden to the economic, political and social functioning of the nation. A concerted effort for nurturing, promoting and preserving positive mental health of fellow countrymen is undoubtedly an inseparable part of meaningful existence.

Drug abuse and addiction have negative consequences for individuals and for society. Many people do not understand why or how other people become addicted to drugs. It is often mistakenly assumed that drug abusers lack moral principles or willpower and that they could stop using drugs simply by choosing to change their behaviour. In reality, drug addiction is a complex disease, and quitting takes more than good intentions or a strong will; because drugs change the brain in ways that foster compulsive drug abuse, & quitting is difficult, even for those who are ready to do so (NIDA, 2012).

Under the ICMR-MRC Memorandum of Understanding (MoU), the area of Substance use and misuse was identified as a priority area for joint collaboration between ICMR and the MRC UK. In order to facilitate research initiatives which would benefit local populations and have global applications as well, this collaboration shall build grounds for future collaborative research beneficial to both the countries in developing and building competency as well as networks to address important mental health conditions. I am pleased to see the report of the ICMR-MRC collaborative workshop on "Aetiology and Life-Course of Substance Misuse and Relationship with Mental Illness" held at NIMHANS, Bengaluru, India from 26th to 28th February, 2014. This will mark the beginning of joint research adventures between the scientists of both countries on a range of issues deliberated and recommended in the workshop. I wish the coordinators of the program at ICMR and MRC all the success in implementation of the recommendations. It is hoped that scientific deliberations of the workshop will go a long way in addressing the mental health issues of substance abuse and identify gaps to rectify inadequacies in treatment and management of mental health service delivery in both the countries.

PREFACE



Dr D.K. Shukla

Scientist G & Head

Division of Non-Communicable Diseases

Indian Council of Medical Research, New Delhi, India.

There is a high burden of Non-Communicable Diseases (NCDs) including Mental Health in the Indian population. The Council has addressed the related research issues through its own Institutions and by funding individual investigators from various institutes in the country over several decades. Besides this, International partnerships are also of core importance to the ICMR. In February 2011, ICMR and MRC signed a Memorandum of Understanding (MoU) to collaborate and work together in areas of health research with special reference to Chronic Disease and Mental Health. Recognizing the timeliness of scaling up research on Substance Abuse and its associated problems, the ICMR & MRC identified it as an immediate area of mutual cooperation at the last Joint Working Group meeting held in London in June 2013. It was recommended that a Workshop be organized on the theme “ Substance Misuse and Relationship with Mental Illness “.

Consequently, a Workshop was jointly organized by ICMR & MRC which took place at NIMHANS during 26-28 February 2014. This cooperation between ICMR and MRC team leaders and participants for developing a long term research agenda in the area of Mental Health, substance abuse and depression was the theme. This endeavour invited participants from a wide range of expertise from India and UK on a common platform to present, discuss and suggest areas for collaborative research for investigators for both countries. I am confident that experts from India and the UK mutually benefited from expertise and resources of each other to address issues related to mental health problems, substance use and misuse, as well as depression while pursuing international partnership in achieving better health of the citizens of their respective countries. The wide canvas for research which was identified during the workshop will encourage multi-disciplinary approaches to address the identified issues for achieving health for all in the times to come.

MESSAGE FROM MRC



Dr Mark Palmer

Head of International Strategy
Medical Research Council , UK.

The continuing priority of the Medical Research Council (MRC) is to improve human health through world-class medical research. This means supporting excellent biomedical research, from fundamental lab-based science to longitudinal studies and clinical trials. We endeavour to produce skilled researchers and facilitate collaborative working to address issues related to health and well-being.

This workshop has provided the opportunity for the MRC and the Indian Council of Medical Research (ICMR) to discuss further the areas of joint interest in mental health. The significant burden placed on society by substance misuse, from both a health and economic standpoint, continues to increase and thus has been identified as a key issue for both the MRC and ICMR. The MRC is delighted to be working with ICMR, to develop an international joint partnership towards the common aim of addressing the problems caused by substance misuse and to further develop our knowledge of its relationship with mental health. Through the workshop described here, it was collectively highlighted that collaborative approaches are valuable for improved understanding of the implications of substance misuse, which will ultimately lead to the development of more effective interventions and treatments.

MESSAGE



Dr.P. SATISH CHANDRA

Director/Vice Chancellor Professor of Neurology
NIMHANS, Bangalore

Alcohol use disorders are one of the significant threats to public health of the global community. Despite the lower prevalence of alcohol use in India compared to developed countries, 25% of men in India have harmful and hazardous pattern of alcohol use and 5% of men have dependence pattern of alcohol use. Researchers from NIMHANS and other Indian addiction treatment centres have clearly established that harmful use of alcohol accounts for a large proportion of the health burden of India and also significant socio-economic cost. This recognition is exemplified in the recognition of the Government of India, in consonance with the World Health Organisation that alcohol abuse is one of the major modifiable risk factor implicated as a priority area for Non-Communicable Diseases (NCD) prevention and management programs.

Addictive disorders are increasingly recognised as chronic brain disorders which occur due to long-lasting brain changes consequent to repeated exposure to toxic substances like alcohol, tobacco and other drugs. It is also increasingly appreciated that some individuals, due to pre-existing brain-vulnerabilities may be more susceptible to develop addictive disorders than the general population. Research scientists from India and the United Kingdoms, who gathered during the mental health scoping workshop on “*Aetiology and life-course of substance misuse and relationship with mental illness*” at Bangalore, deliberated on the available and growing evidence that alcohol dependence is probably influenced by a combination of bio-psychosocial (developmental, environmental, genetic) mechanisms. The challenge for researchers in this field is to understand how environmental influences modulate gene expression to alter brain development, temperament and response to addictive substances to create the long-lasting and harmful behaviours so typical of addiction. The discussions strongly underlined the need to put in place long-term research designs which will be better able to study the developmental trajectory of such complex disorders. There is also an urgent need to translate such research into clinically appropriate preventive and treatment strategies.

We at NIMHANS were extremely pleased to co-host this important meeting organised by the Indian Council for Medical Research (ICMR) and the Medical Research Council of the United Kingdom (MRC, UK). I am optimistic that this workshop will lay the foundation for long term and meaningful collaborations between scientists from India and the UK working together to track down the causes and ultimately devise effective remedies for addictive disorders.

Executive Summary

Substance Use Disorder and includes such diseases as alcoholism and drug addiction. Substance use disorders (alcohol, cannabis & opiates) is a complex brain disease and is a major public health problem with an estimated prevalence in India to be around 35-50/1000 population (Math SB, 2010). Patients with Substance use disorders form almost one fourth of clinical load which any psychiatrist has to handle in their day to day practice (Chand PK et al, 2010). Among this group, a significant proportion of them have comorbid Psychiatric disorders (Kishore P et al, 1994, Vohra et al, 2003, Hemraj Singh N, 2005).

Substance use can be common in young people besides other age individuals having different patterns of use (bingeing, occasional or continual) and reasons. Where use is prolonged, heavy, or creating social or personal problems it may meet a 'diagnosis' for a substance use disorder/substance dependence or substance abuse. Although substance abuse and mental health disorders like depression and anxiety are closely linked, however, one does not directly cause the other.. In substance dependence, a person relies on a substance despite the problems caused by continuing its use. In addition to the social and personal problems of substance abuse, dependence leads also to cognitive, behavioural and physical symptoms if a person continues using.. ,

In order to develop an international partnership for addressing the problems caused by substance misuse ,the Indian Council for Medical Research (ICMR) and the Medical Research Council of the United Kingdom (MRC, UK) organised a Workshop on this issue at NIMHANS Bangalore during 26-28 February 2014. The Group while reviewing the current state of art of research on the identified theme of the workshop felt that there is potential for longitudinal (cohort) studies to assess risk factors for mental health. It was also noted that while India does not currently have any population-based cohorts, but in the UK this is a great strength. It was also realised that both countries have varied and distinct environmental factors, as well as societal changes influencing the development of substance abuse and mental disorders. While, the variety of environmental factors in India is unprecedented and distinct from industrialised countries, Investigations capturing this variety are likely to provide unique and relevant information about processes and mechanisms underlying mental disorders in emerging societies, and are thus of high international relevance for both biological mental health research as well as public health programmes. Studies potentially could include the capacity to include work on epigenetics/maternal influences, although it was acknowledged that this field was at a relatively early stage even in the UK.

The Group also discussed the effects of environmental influences including adverse childhood experiences and impact of perinatal factors. The Group suggested to conduct epidemiological surveys in both countries to document the rates of hospital admissions due to alcoholic liver disease, deaths due to complications of substance use (including suicide rates), road traffic accidents as a sequel of substance use and domestic violence cases. It was also felt that a community sample of children with scientifically defined low and high risk for substance use

categories be followed up to examine differences in environmental effects at multiple levels – individual, family and society. Environmental factors that are protective and harmful can be validated and appropriate integrative interventions at multiple identified levels can be studied. If possible, natural experimental designs to examine effects of natural disasters (e.g., floods or earth quakes) on patterns of substance use could be incorporated. It was also suggested to tap into data from the National Family Health Survey and National Sample Survey Organization.

It was concluded that cohort studies are vital, particularly in order to research susceptibility and risk factors. There was particular interest in studying both prevention and treatment in three different cohort types: high risk, those with the disorder, and a general population cohort. The Group was also of the view that the Indian side lacks data on the entity on dual diagnosis, whereas UK's strength was experience in population based co-morbidity surveys. The Group suggested to orient research to establish association between substance use and psychiatric illness using animal models . The Group also felt that India can plan studies on understanding of: prevalence of dual diagnosis, epigenetic studies, cohort studies, inter and intra cultural variations, symptom dimensions and their influence on course and outcome of substance use disorders and treatment effectiveness of pharmacological agents in the specific dual diagnosis.

The Group also discussed at length opportunities for research identified to carry out comparative studies between India and the UK, which potentially might include the large Indian community in the UK. While identifying various areas of mutual interest in the broad area of Mental Health and substance abuse, there was an intense need felt for extending cooperation in other areas of mental health as well and capacity building for augmenting expertise. The other areas which were identified for future area of collaboration were Brain Imaging for assessing molecules for treatment effectiveness, environmental influences on neural function, comparing treatments and outcomes between the UK and India, Bioinformatics related and large scale genomics studies besides large scale easily applicable assessments such as stress reactivity paradigms, blood related assessments, eye movement studies, EEG and biofeedback studies.

Workshop Programme

Date and Time	Programme
Wednesday, 26th February 2014	
1600 hours	Welcome – Dr D K Shukla, Head, Non-Communicable Diseases, ICMR
1610hours	Introductory Remarks regarding aims, objectives & programme – Prof Mathew Varghese, NIMHANS Dr Louisa Rahemtulla, MRC
1620 hours	Background of ICMR’s collaboration with MRC- Dr Mukesh Kumar Head-International Health Division, ICMR
1630 hours	MRC: Overview of MRC’s programme in Mental Health- Addictive Disorders – Dr Mark Palmer and Dr Catherine Moody, MRC ICMR: Overview of ICMR’s programme in Mental Health- Addictive Disorders – Dr Ravinder Singh, ICMR
1650 hours	Keynote Address- Prof Satish Chandra, Director, NIMHANS
1700 hours	Remarks from Presiding Officers- Mrs Dharitri Panda, Sr. Financial Adviser, ICMR Dr Mark Palmer, Director of International Strategy, MRC
1725 hours	Vote of Thanks- Dr Tripti Khanna, ICMR
1730 hours	Networking 2 minutes per delegate to introduce themselves
1830 hours	Depart NIMHANS for DHC’s residence
1900 hours	Dinner for all delegates- UK and Indian- hosted by British Deputy High Commissioner to India, Mr Ian Felton Hosted at Mr Felton’s residence
Thursday, 27th February 2014	
0900 hours	Tour of NIMHANS
1000 hours	Workshop starts (tea and coffee available) (Indian delegates arrive)
1015 hours	Welcome and explanation of day’s programme
1030 - 1100 hours	Topic 1: Differences in trajectories of endophenotypes of risk <i>Description. Differences in trajectories of endophenotypes of risk: brain development parameters and behaviours between children and adolescents at high and low risk and to examine which factors predict conversion to recognisable disease states.</i> Landscape presentations 1030 hours: UK- 15 mins Prof Gunter Schumann 1045 hours: India – 15 mins Prof Vivek Benegal

<p>1100 – 1200 hours</p>	<p>Breakout Session Topic 1 Break out groups to discuss UK and India strengths and weakness and identify potential areas of collaboration within topic <u>Differences in trajectories of endophenotypes of risk</u></p> <ul style="list-style-type: none"> • 4 groups x 8 or 9 people per group. Minimum 2 UK academics per group • Each group will have a pre-determined rapporteur who will feed back to the plenary group. 2 of the groups will have a UK rapporteur and 2 groups will have an Indian rapporteur. • Each group to have a facilitator i.e. someone from MRC/RCUKI/SIN. Facilitators will only help keep time, maintain flow of the discussions, help capture thoughts but will not contribute to the content of the discussions. <p>Each breakout group will be asked to come to a consensus on potential research questions which could benefit from UK India collaboration. The potential questions will be written on a flipchart and will be presented by the rapporteur at the plenary session. In order to reach this consensus they will be encouraged to consider the following points:</p> <ul style="list-style-type: none"> • What are the UK and Indian research strengths and weaknesses • Where are the research gaps and opportunities • What is the capacity in each community • What are the key challenges to collaborative working
<p>1200 – 1220 hours</p>	<p>Feedback Topic 1 Facilitators will ask rapporteurs to feedback to the other groups about their discussions and the research questions they decided upon (5 mins each) <u>Rapporteurs:</u></p> <ul style="list-style-type: none"> • Prof Gunter Schumann (UK) • Prof Louise Arseneault (UK) • Dr Janardhanan (India) • Dr Muralidharan (India)
<p>1220 – 1245 hours</p>	<p>Plenary discussion Topic 1 Academic Moderators Prof Hugh Perry and Prof Mathew Varghese will lead a plenary discussion to reach a group recommendation on the following points:</p> <ul style="list-style-type: none"> • Is the potential for UK India collaboration in this area? • What are the priority research questions to be addressed? • Are there key challenges specific to this area which would prevent/complicate collaborative working?

1245– 1400 hours	Lunch
1400 – 1430 hours	<p>Topic 2: Effects of environmental influences</p> <p><i>Description. Effects of environmental influences: including adverse childhood experiences and perinatal effects which impact brain development and manifest behaviours that underlie risk/vulnerability to addictive disorders, other high risk behaviours and other mental illness (e.g. depression)</i></p> <p>Landscape presentations</p> <p>1400 hours: UK- 15 mins Prof Anne Lingford-Hughes / Prof Jonathan Mill</p> <p>1415 hours: India – 15 mins Prof Satish Girimaji/Prof Sanjeev Jain</p>
1430 – 1530 hours	<p>Breakout Session Topic 2</p> <p>Breakout Groups (1430 - 1530 hours)</p> <p>Break out groups to discuss UK and India strengths and weakness and identify potential areas of collaboration within topic <u>Effects of environmental influences</u></p> <p>Activity as described for session 1</p>
1530 – 1550 hours	<p>Feedback Topic 2</p> <p>As described for session 1</p> <p><u>Rapporteurs:</u></p> <ul style="list-style-type: none"> • Prof Lingford-Hughes (UK) • Prof Jonathan Hill (UK) • Dr Biju V (India) • Dr Urvakhsh Mehta (India)
1550 – 1615 hours	<p>Plenary discussion Topic 2</p> <p>As described for session 1 - Led by Academic Moderators Prof Hugh Perry and Prof Mathew Varghese</p>
1615 hours	Wrap-up
1800 hours	<p>Dinner for all delegates (transport to and from the venue will be provided)</p> <p>Hosted by ICMR/NIMHANS</p>
Friday, 28th February 2014	
0920	Depart hotel to travel to NIMHANS
1000 – 1010 hours	Welcome and plan for the day
1010 – 1045 hours	<p>Background presentations</p> <p>Presentations to provide background on mental health burden and mental health care in the UK and India (15 mins each)</p> <ul style="list-style-type: none"> • Dr Alok Mathur (India) • Professors Jonathan Hill and Philip Cowen(UK)

1045 – 1115 hours	<p>Topic 3: The reciprocal relationships between substance use and other mental health conditions</p> <p><i>Description.</i> The reciprocal relationships between substance use and other mental health conditions – underlying diathesis or co-occurring disorders.</p> <p>Landscape presentations</p> <p>1045 hours: UK- 15 mins 1100 hours: India – 15 mins</p> <p>Prof Debashish Basu Prof Matthew Hickman</p>
1115 – 1215 hours	<p>Breakout Session Topic 3</p> <p>Breakout Groups</p> <p>Break out groups to discuss UK and India strengths and weakness and identify potential areas of collaboration within topic <u>The reciprocal relationships between substance use and other mental health conditions</u></p>
1215 – 1235 hours	<p>Feedback Topic 3</p> <p>As described for session 1</p> <p><u>Rapporteurs:</u></p> <ul style="list-style-type: none"> • Prof Philip Cowen (UK) • Prof Matthew Field (UK) • Dr Arun Kandasamy (India) • Dr Prabhat Chand (India)
1235 – 1300 hours	<p>Plenary discussion Topic 3</p> <p>As described for session 1 – Led by Academic Moderators</p> <p>Prof Hugh Perry and Prof Mathew Varghese</p>
1300 - 1400 hours	Lunch
1400 -1530 hours	<p>Future opportunities</p> <p>Rapporteurs for the 3 topic discussions give short summaries of the conclusions of their topic (1 rapporteur will present for each breakout session - 10 mins each)</p> <p>The UK and Indian Academic Moderators will lead a plenary discussion to conclude the outcomes of the workshop including:</p> <ul style="list-style-type: none"> • Would UK India collaboration be beneficial? • Which areas offer the best opportunities in the short and long term? • Which research questions should be prioritised? • Are there any challenges which need to be addressed?
1530 – 1600 hours	Wrap up
1600 onwards	Networking time or activity for academic attendees

Workshop Report

ICMR-MRC Mental Health Scoping Workshop was held at NIMHANS, Bangalore from February 26-28, 2014. The theme of the Workshop was “Aetiology and Life-Course of Substance Misuse and Relationship with Mental Illness”. The participants included delegates from UK, Indian delegates from across India, NIMHANS, AIIMS, PGIMER, North-East India, as well as other parts of India, besides officials from ICMR and MOHFW, Nirman Bhawan Delhi. The Workshop was declared open on 26th February 2014, at 4.00 pm with the Inaugural session .

In the Welcome address, **Dr D.K. Shukla**, Head (NCD), on behalf of the DG, ICMR, extended his warm welcome to all the participants of the ICMR-MRC jointly organized Mental Health Scoping Workshop, especially the guests from the United Kingdom and participants from all over India besides NIMHANS..

He said, “I am honoured to have you here in an Institute of Excellence, which does not need any introduction as far as the area of mental health, neurosciences and substance abuse are concerned. We are highly honoured to have distinguished participants from the United Kingdom, who have great contributions to the theme of this Workshop, which will be covered over a period of three days. We are also delighted to have Indian participants, who have equally illustrious contributions to the field of substance abuse. Please allow me to mention long collaboration with UK and our association with NIMHANS. India and UK are natural allies and in past we have conducted many workshops and Conferences jointly in the field of chronic diseases ,mental health as well as ageing. We have been immensely benefited with the organization of such events. I hope that the present Workshop will lead to newer collaborations and research activities.”.

In his introductory remarks, **Dr Mathew Varghese-Technical Coordinator (NIMHANS)** briefed the participants about aims and objectives of the Workshop. He informed the Group that the aim of the workshop is to bring together UK and Indian researchers to find out researchable areas and research questions of common interest in the area specifically substance abuse as well as mental health at large. The Workshop is also aimed at finding potential research partners in both the countries in relation to promoting human resource development in the area of Mental Health which can facilitate in carrying out future collaborative research projects of mutual interest. Dr Varghese also told the participants that the objective of the Workshop is to also identify institutes for training the interested researchers from both sides. The programme of the Workshop has been designed in a way to minimize the presentation and allowing more interaction among the participants during breakout sessions.

Dr Louisa Rahemtulla from MRC briefed the members about the objectives of the Workshop. These were to look into the potential for future collaboration in the area of Mental Health and substance misuse, to identify opportunities and potential research questions and to highlight challenges which may need to be overcome in order to enable beneficial collaboration. She

informed members that the Workshop would run in four main sessions with the first three sessions focusing on: differences in trajectories of endophenotypes of risk of substance abuse, effects of environmental influences and the reciprocal relationships between substance use and other mental health conditions. The final session's focus was future opportunities and to ascertain whether there is potential for UK-India collaboration in the area of substance abuse.

Dr Mukesh Kumar, Head (IHD) provided the background of the Indo-UK collaboration and its relationship with present workshop. He informed that the International Health Division (IHD) of ICMR, co-ordinates international collaboration in biomedical research between India and other countries as well as with national and international agencies such as Ministry of Science & Technology, Indian and foreign missions, WHO etc. There are few specific agreements signed by the Ministry of Health and Family Welfare with other countries and rest are those signed directly by ICMR with international organizations/ institutions such as INSERM (France), German Federal Ministry of Education and Research (BMBF), Helmholtz Association (HGF) in Germany, National Institutes of Health (NIH)/Centres for Disease Control (CDC), (USA), Canadian Institutes of Health Research (CIHR) Canada, University of Sydney and George Institute for International Health, (Australia), Medical Research Council (MRC) and London School of Hygiene and Tropical Medicine (LSHTM) in UK, Karolinska Institute (KI) in Sweden etc.

In November 2009 the Indian Council for Medical Research (ICMR) and the UK Medical Research Council (MRC) jointly hosted a workshop in New Delhi. Experts from India and the UK reviewed the current disease burden in their respective countries in cardiovascular disease, diabetes (especially the contribution of obesity and early-life under-nutrition in the aetiology of disease) and chronic obstructive pulmonary disease (in particular the role of smoking and indoor pollution in its development) together with the strengths, weaknesses and unmet needs of the existing research landscape in these areas. As a result of these discussions a number of research priorities were identified which formed the basis of a Call for proposals, specifically for Life Style Diseases. A total of 28 projects were identified of which only ten projects were found to be technically suitable and four collaborative projects were finally approved for funding by the two agencies.

Based on a long historical relationship, between Indian and UK researchers, the recent MOU between ICMR and MRC was signed in February 2010 which was expected to bring a greater formality and structure to such collaborations and to encourage joint research in a range of health areas including persistent, new and emerging infections besides chronic diseases. Both agencies have long histories dating back to the early part of the twentieth century and both have shared values and a common vision with regard to the funding of research which will provide a greater understanding of the origins of disease and promote improvements in human health; chronic non-communicable diseases and impacts of environmental change (including climate) on health. Subsequently, on 13th June, 2013 a Joint Steering Committee meeting was held at London wherein the need for collaboration was identified in terms of holding a workshop in the area of Mental Health.

Dr Ravinder Singh gave an overview of the ICMR's research in addictive disorders. Dr Singh briefed that changing trends through population surveys are not available on a year to year basis. The ICMR had however, carried out task force projects in the area of drug/substance dependence, which can be classified as community based surveys, educational intervention modules, development of drug abuse monitoring system, and treatment evaluation. The ICMR initiated its research activities in the field of substance abuse after Government of India published a Report on "Drug Abuse in India" in year 1977. The viability of a Drug Abuse

Monitoring System in the country was examined for the first time through a Task force project (ICMR) conducted at Delhi, Jodhpur and Lucknow in 1990 and provided one year data among 10,321 persons. In another study on the Effects of Intervention Programme on Non-Medical Use of Drugs in the Community looked into the effect of an intervention programme. The objectives of the study were to obtain base line data on (a) prevalence & incidence of non-medical use of drugs; (b) existing knowledge and attitudes towards such drug use; (c) Perceived drug related problems in rural, urban, industrial communities; and (d) to study the socio-demographic characteristics of users. The study subjects were included from Bangalore (Heavy Industry and Rural Population), Delhi (Medium Industry and Urban resettlement population), Dibrugarh (Tea Plantation and Rural Population), and Ranchi (Urban and rural tribal population). The effectiveness of health education programme depends on many explicit and implicit factors. The explicit factors amongst them are (a) a realistic target group, (b) clearly stated rigorous methodology, both in planning and execution, (c) selection of appropriate material and planned execution of the programme, (d) built in evaluation mechanisms (e) objective criterion of evaluation, (f) possibilities of midcourse corrections (g) combination of education with treatment and (h) community mobilization.

Another study: "Collaborative Study on Narcotic Drugs and Psychotropic Substances" looked into the idea of developing a monitoring system. The basic purpose of monitoring component was to develop methodology and test feasibility for implementing monitoring of drug abuse in the existing working system of treatment centres/agencies. "A Survey of Drug Dependents in the Community in Urban Megapolis Delhi" looked into the relationship of drug use and socio-demographic characteristics showed that drug use was positively related to age. The survey found out that drug use increased with increase in age. Education showed a negative correlation suggesting that drug use declined with rise in educational attainments. The drug use was high in urban villages, resettlement colonies and unauthorized colonies. The Survey also looked into dependent and non-dependent use of drugs in different types of residential colonies. It was seen that dependent drug use increased significantly in one year time duration from 1st survey to 2nd survey in resettlement colonies.

Dr P. Satishchandra, Director and Vice-Chancellor, NIMHANS in his Key Note address welcomed all the participants from UK as well as India. He briefly mentioned the history of NIMHANS which is a multidisciplinary Institute for patient care and academic pursuit in the frontier area of Mental Health and Neurosciences playing its various roles of education, service and research. The Institute was running as a Lunatic Asylum in the pre independence time which came into being in the latter part of the 19th century was renamed as Mental Hospital in 1925 by the erstwhile Government of Mysore. This hospital and All India Institute of Mental Health was established in 1954 by Government of India and was amalgamated on 27th December 1974, and thus was formed the autonomous National Institute of Mental Health and Neurosciences (NIMHANS). The priority gradient adopted at the Institute is service, manpower development and research. A multidisciplinary integrated approach is the mainstay of this institute, paving way to translate the results from bench to bedside. On 14th November 1994, NIMHANS was declared a Deemed University by the University Grants Commission, with academic autonomy. In the year 2012, NIMHANS was designated as an Institute of National Importance by an Act of Parliament. National Institute of Mental Health and Neurosciences has continued its illustrious tradition in the field of medicine and research in mental health. It is currently designated as an Institute of National Importance. Being a centre of excellence in the study of brain, mind and behaviour, it has uniquely combined patient care services with human

resource development and research. The patient care services at the institute are benchmarked for its quality and comprehensive nature. The 25 departments relentlessly pursue standards of excellence in academics and have several firsts to their credit. The basic, applied and translational research activities undertaken have resulted not only in the enhancement of patient care but also in policy planning and improved health care delivery at local, regional and national levels. Continuing its commitment, NIMHANS strives to be in the forefront to achieve its declared vision and dedicated mission. He also informed the Group about its collaboration with several countries and international institutions, recently being with the Liverpool University UK. He also praised ICMR regarding the recently launched Post-Doctoral Fellowship Special Scheme for Human Resource Development and the recently approved Centre for Advanced Research at NIMHANS which would start functioning from March this year, extending his warm welcome wished fruitful deliberations of the workshop.

Mrs Dharitri Panda, Senior Financial Advisor, ICMR remarked as Presiding Officer. She informed that, Chronic diseases such as cardiovascular disease, stroke, diabetes and chronic obstructive lung disease are now recognized the principle causes of death and disability in practically all nations as a concomitant of changing demography, i.e. economic development, urbanisation, and nutrition transition. There is now a growing epidemic of these diseases in the Indian population. Both ICMR and the MRC recognised the importance of new research to tackle these epidemics by joining the initiative to identify the grand challenges in chronic diseases. Giving reference to the news item which occurred in a national daily, The Indian Express, she shared her concern of the significant role being played by Mental Health with specific reference to Stress. She hoped that ICMR and MRC workshop will try and dissect out some areas for its potential for future research agenda, where Indian and UK researchers could, in collaboration, undertake studies which would help share and work on mutually viable research areas for both countries in the area of substance abuse. She also expressed her hope that there is a real opportunity to learn from each other's experiences to try and make a real difference to health outcomes in this enormously important area and towards this direction. She assured her all possible help as Senior Financial Advisor of ICMR for providing funds for projects identified for funding under the current MOU.

Dr Mark Palmer and **Dr Catherine Moody** apprised the Group with MRC's mission of encouraging and supporting high-quality research with the aim of improving human health besides help to develop skilled researchers, advance and disseminate knowledge and technology to improve the quality of life in the UK and worldwide. Giving an overview of the MRC Organogram and Operational structure they briefed the members about MRC spending broad disease category wise. Dr Moody informed that Mental Health and Neurosciences is an important research area of MRC for which approximately 20% of MRC's funds are spent. The annual spending in 2012 was nearly £111m. A comprehensive review of mental health research was published in 2010 in the Lancet. The Priority areas as reported therein are primarily on: severe mental illness, anxiety and depression; intellectual disabilities and pathways to mental wellbeing. MRC has also identified experimental medicine for mental health as an area of priority research besides population based approaches to identifying the risk factors of mental disorders and augment the flow of trainees into mental health research. The Group was also informed about strategy for addiction and substance misuse research of the MRC which was also published in the Lancet in 2010.

They also informed that MRC sits on cross Government Addiction and Drug Research Strategy Group as well as promoting dialogue with the public about medical research. In the recent past

1,400 grants to researchers in universities, medical schools and Research Institutions, 400 programmes within MRC's own units and institutes, 1,800 postgraduate students and 400 fellows have been supported up to March 2013.

On behalf of Secretary DHR & DG ICMR, Sr. FA –ICMR and the Heads of Division of IHD and the Division of NCD, Dr Tripti Khanna extended a vote of thanks to all the Collaborators & Organisers of the workshop viz....ICMR-MRC-RCUK ; besides all Participants and the hosts(NIMHANS) of the Workshop.

PLENARY SESSIONS

Topic 1: Differences in trajectories of endophenotypes of risk

The presentations and discussions focussed on description of the theme in terms of brain development parameters and behaviours between children and adolescents at high and low risk besides examining factors which can predict conversion in to recognisable disease states. Break out groups were asked to identify potential areas of collaboration within this topic, focusing on the following points:

- What are the UK and Indian research strengths and weaknesses?
- Where are the research gaps and opportunities?
- What is the capacity in each community?
- What are the key challenges to collaborative working?

The UK and Indian Academic Moderators initiated plenary discussion to reach a group recommendation on the following points:

- Is there any potential for UK India collaboration in this area?
- What are the priority research questions to be addressed?
- Are there key challenges specific to this area which would prevent/complicate collaborative working?

Presentations:

Were given by Dr Gunter Schumann on "Endophenotypes and Stratified Medicine in Psychiatry" and by Dr Vivek Benegal on "Differences in trajectories of endophenotypes of risk: Research Landscape – India" (See page number 12 for landscape presentations).

Discussions:

The Group discussed the research strengths and weaknesses of each country. It was agreed that India offers a fascinating field for research, particularly due to the environmental, social, cultural and ethnic diversity and the rapid changes that the country is currently experiencing; there was unanimous support for UK-India collaboration, investigating the differences and commonalities between the two countries. It was agreed that the large Indian community in the UK offered an additional research opportunity.

The potential for longitudinal (cohort) studies to study risk factors for mental health were highlighted by all breakout groups as being an area of key interest. Studies of this type to date in India had focused on high-risk patient groups in clinical settings. India does not currently have any population-based cohorts whereas in the UK this is a great strength. It was agreed that there were significant opportunities to develop longitudinal studies within India.

A multicentre approach within India across different geographical and cultural regions (i.e. urban, semi-urban, rural, tribal) was deemed critical to exploit the varied and distinct environmental factors, as well as societal changes influencing the development of substance abuse and mental disorders. The variety of environmental factors in India is unprecedented and distinct from industrialised countries where most studies on environmental effects on mental health and disorders have been conducted. Investigations capturing this variety are likely to provide unique and relevant information about processes and mechanisms underlying mental disorders in emerging societies, and are thus of high international relevance for both

biological mental health research as well as public health programmes. Challenges to this approach including the need to agree harmonised common minimum protocols and datasets were discussed.

Given the UK's experience of running longitudinal (cohort) studies, it was agreed that capacity building would be a valuable part of any UK Indo collaboration in mental health. This is likely to include developing expertise in areas such as developing and managing a cohort, design and recruitment, measurement approaches, data storage and analysis. The Farr Institute of Health Informatics Research in the UK was highlighted as being an important new organisation, set up specifically to deliver high quality cutting edge research linking electronic health data with other forms of research and routinely collected data as well as to build capacity in health informatics research. The MRC had also recently scoped UK capability in cohorts through a survey of national longitudinal cohort studies.

There was support for approaches that would look across a range of psychological disorders as clinical endophenotypes tend not to be specific to single disorders. Correspondingly it is helpful to develop standard protocols that cut across standard diagnoses of disorders. If possible, it was considered desirable for cohorts to be designed from the start to have, or have the capability for, an intervention arm as this could have early impact on clinical outcomes

Studies potentially could include the capacity to include work on epigenetics/maternal influences, although it was acknowledged that this field was at a relatively early stage even in the UK.

Topic 2: Effects of environmental influences

This session reviewed the plausible effects of environmental influences: including adverse childhood experiences and perinatal effects impact on brain development and its manifestations in behaviours that underlie risk/vulnerability to addictive disorders, and other high risk behaviours and mental illness e.g. depression. Break out groups discussed UK and India strengths and weakness and identified potential areas of collaboration within the topic: effects of environmental influences.

Presentations:

Were given by Dr Anne Lingford-Hughes on "Interaction between environmental influences and developing brain", by Dr Sanjeev Jain on "Overview of Epigenetics studies in India" and by Dr Satish Girimaji on "Effects of environmental influences-focus on children and adolescents"(See page number 12 .for all landscape presentations).

Discussions:

There was a consensus on studying environmental influences on developmental trajectories of substance use and other mental disorders.

Various diverse areas were highlighted as potential research gaps in this area. In order to examine the public health effects of government policy on liquor sales, it was suggested to conduct epidemiological surveys in both countries to document the rates of hospital admissions due to alcoholic liver disease, deaths due to complications of substance use (including suicide rates), road traffic accidents as a sequel of substance use and domestic violence cases registered. It was suggested to tap into data from the National Family Health Survey and National Sample Survey Organization.

It was also felt that a community sample of children with scientifically defined low and high risk for substance use categories be followed up to examine differences in environmental effects at multiple levels – individual, family and society. Environmental factors that are protective and harmful can be validated and appropriate integrative interventions at multiple identified levels can be studied. If possible, natural experimental designs to examine effects of natural disasters (e.g., floods or earth quakes) on patterns of substance use could be incorporated.

In order to account for cross-cultural differences in environmental influences, it was recommended to validate indigenous tools that are culturally salient yet tap common constructs of environmental influences. It was agreed that the measurement of environmental influences is not as robust and objective as measuring biological variables. The effects of potential bias in reports are high and hence multiple sources of information are required. This could bring in additional time and cost constraints. Tools to measure such environmental influences must cover diverse environmental structures across the two countries.

Topic 3: The reciprocal relationships between substance use and other mental health conditions

This session explored underlying diathesis of relationships between substance use and other mental health conditions. Break out groups discussed UK and India strengths and weakness and identified potential areas of collaboration within the topic. The UK and Indian Academic Moderators initiated plenary discussion to conclude the outcomes of the workshop including

benefits of collaboration besides identifying short term and long term opportunities for both countries scientific communities and the challenges that need to be addressed

Presentations:

Were given by Dr Alok Mathur, DGHS on the “National Mental Health Programme” and by Professors Jonathan Hill and Philip Cowen on “Mental Health Care in the UK”, Professor Matthew Hickman on “The reciprocal relationships between substance use and other mental health conditions (co-morbidity)”, and Dr Debashish Basu on “The relationship between substance use and other mental health conditions: Underlying diathesis or co-occurring disorders?” (See page number 12 for all landscape presentations).

Discussions:

Both countries had research and knowledge gaps when it came to understanding the relationship between substance abuse and other mental health disorders and the causal links between the two, as well as the relative influence of various comorbidities to include malnutrition, violence, family situation etc. A research opportunity exists to compare the differences between India and the UK in what could become a highly beneficial synergistic relationship.

UK cohorts were not set up optimally for research into substance use and the UK would also benefit from training further specialists in dual-diagnosis. However, in India the situation can be complicated due to the significant national variation in substance abuse and the current lack of standardised general population data. However, the vast availability of patients who have yet to be treated might provide an interesting opportunity to study phenotypes.

Cultural comparisons between the two countries might include, for example differing rates of cannabis use in each country. It was also suggested that rates of comorbidity may be lower in India than in western countries. The UK Indian population was again raised as a potentially interesting group. Intervention packages for addiction could include study of the effects of strong family support in different medical and psychosocial systems with post-clinic follow up to include association with the development of mental disorders.

By contrast, the Indian system of addiction clinics offers a well-documented patient base in certain geographical areas. The Indian National Mental Health Programme (NMHP) which is about to enter a third phase also offers an untapped opportunity to further the understanding of comorbidities. The NMHP which focuses on prevention and early recognition has recently set up four implementation centres for the district mental health programme in four different types of environment from urban to rural.

It was concluded that cohort studies are vital, particularly in order to research susceptibility and risk factors. There was interest in studying both prevention and treatment in three different cohort types: high risk, those with the disorder, and a general population cohort.

The Group was of the view that the Indian side lacks data on the entity on dual diagnosis whereas UK's strength was experience in population based comorbidity surveys. The Group felt need to orient research to establish association between substance use and psychiatric illness through animal and in vitro studies. The Group also felt that India can plan studies on understanding of: prevalence of dual diagnosis, epigenetic studies, cohort studies, inter and intra cultural variations, symptom dimensions and their influence on course and outcome of substance use disorders and treatment effectiveness of pharmacological agents in the specific dual diagnosis.

Topic 4: Future opportunities discussion

The Group discussed at length opportunities for research identified to carry out comparative studies between India and the UK, which potentially might include the large Indian community in the UK as well. Intervention studies set up to compare treatments and outcomes between the UK and India were an exciting possibility. While identifying various areas of mutual interest in the broad area of Mental Health and substance abuse there was an intense need felt for extending cooperation in other areas of mental health as well and capacity building for building expertise in cohort studies, including workshops, exchange programmes, and short term fellowships. It was agreed that this could be incorporated in project proposals where appropriate.

Piloting the establishment of new Indian longitudinal cohort studies: All participants recognised the importance of setting up these important national resources for the understanding of mental health, resilience and risk in the Indian population. It was important to learn from experience in UK studies and it may be wise initially to support a series of feasibility or pilot studies for desired cohorts, to determine if the design and approaches proposed would be practicable and be able to address the key research questions being investigated. On the issue of scale and cost, there was potential to use an adaptive approach with uniform standardised basic measurements (including temperament, environmental measures, EEG or eye tracking) in different geographical and cultural regions (i.e. urban, semi-urban, rural, tribal) and across various age groups. These can be complemented by more differentiated assessments, including neuroimaging and genetic analysis in specialised centres (i.e. urban). This approach would allow feasibility testing under diverse conditions while maintaining a pattern of assessments, which facilitates state of the art investigations integrating different levels of observation.

Standardisation and harmonization of evaluation measures and where feasible, making standards inter-operable with UK measures from the outset would facilitate comparative assessments between countries. All measures (biological, genetic, imaging, psychological, social, environmental) would need to be validated in an Indian setting. In order to select/develop social culturally cogent social and environmental measures it might be beneficial to engage with experts from related specialties. Also, external expertise in electronic health data assessment might be sought. Post-mortem brain storage and analysis was already available at the NIMHANS centre but perhaps could be used for joint collaborative studies. Preference should be given to an endophenotypic categorisation approach rather than to classification by disease. Symptom complexes such as reward dependence that were relevant to studies of addiction were known to cut across diagnostic boundaries, which made the standard clinical diagnosis less relevant.

The Group also felt that it would be interesting to support a combination of high-risk clinical based cohorts – an approach which is already established in India – and general population cohorts. Further, a large-scale study across the lifespan beginning in childhood, including with accelerated longitudinal design was likely to be particularly advantageous. General population cohorts allow the study of risk factors on the natural evolution of disorders. High-risk clinical cohorts offer the potential to stratify groups by risk or disease trajectories and would be available more immediately for intervention studies although this capacity ideally should be inbuilt to any cohort study design. Clinical cohorts of high-risk (e.g. unstable family background; alcoholic parents etc.) and low-risk children, bipolar affective disorder and substance use disorders were all cited to be of interest for research. Factors to be examined in

a study of addiction included brain mechanisms, genetics, temperament, psychology, impulsivity and reward seeking behaviour.

Concluding Session:

Dr Mark Palmer, on behalf of the MRC, and Dr Harpreet Sandhu and Dr Tripti Khanna, on behalf of ICMR, thanked all the members for their contribution in making the workshop successful with fruitful contributions sharing the State of Art of Research on the theme of the workshop and identifying knowledge gaps in the broad areas identified during the discussions within the broad framework as per the MOU signed in 2011. The Group unanimously agreed that under the current MOU, a Call for Proposal may be floated at the ICMR as well as MRC web site addressing issues brought out during the presentations. "It was also agreed that training could be incorporated in project proposals only under short term exchange visits wherever required"

Within the remit of the themes discussed at the workshop, the following areas for joint collaborative researches were suggested and will be considered further by the MRC and ICMR.

- Cohort studies & Piloting the establishment of new Indian longitudinal cohort,
- Early brain development and its consequence for subsequent psychopathology,
- Brain Imaging for assessing molecules for treatment effectiveness,
- Environmental influences on neural function,
- Epigenetics of psychiatric and substance use disorders,
- Compare treatments and outcomes between the UK and India,
- Large scale easily applicable assessments such as stress reactivity paradigms, blood related assessments, eye movement studies, EEG and biofeedback studies could be done in common – in both UK & India,
- Bioinformatics related and large scale genomics studies,
- Studying medication naïve ill population is an advantage which may be much higher in India and this may be particularly relevant in examining biological factors and
- Indian migrants in the UK form a unique population and they might form an important population to study endophenotypes and the impact of environmental factors.

Landscape presentations

Topic 1: Differences in trajectories of endophenotypes of risk

“Endophenotypes and Stratified Medicine in Psychiatry”- Dr Gunter Schumann

Dr Gunter Schumann apprised the Group that as per Global Burden of Disease Study 2010, Lancet 2013, Mental and Substance Use Disorders account for 7.4% of DALY, 0.5% of YLL, but 22.9% of Years lived with Disability (YLD) and Global years lived with disability (YLDs) for most Mental and Behavioural Disorders has not decreased since 1990. He stressed that Psychiatric disorders as defined by DSM and ICD criteria are based on clustering a variety of behavioural symptoms that tend to occur together over defined time periods to harmonize diagnosis and clinical practice. This has led to the perception of neuropsychiatric indications as “natural” and distinct disease entities. Development of psychopharmacological drugs depends on the identification of specific biological targets, which influence the neural mechanisms underlying behavioural target symptoms. These mechanisms do not fully correspond to the observational DSM and ICD diagnostic classifications. Therefore, the identification and development of new drugs has been hampered resulting in disinvestment from pharmaceutical companies and limiting therapeutic progress.

Dr.Gunter Schumann then presented the endophenotype concept and the research domain criteria of NIMH. He drew attention to Genome-wide pleiotropy between psychiatric disorders and apprised the Group with European efforts towards a stratified medicine for mental disorders. He briefed the group about the longitudinal, multicentric IMAGEN study investigating the biological basis of reinforcement-related behaviour in normal brain function and psychopathology using functional and structural neuroimaging, as well as genetic and epigenetic analyses in a cohort of 2000+ adolescents. This study investigates the neurobiological basis of individual differences in brain activity during reward, impulsiveness and emotional reactivity at 14, 16 and 19 years. He also presented a systematic analysis of brain activation during reward anticipation and their relation to distinct clinical phenotypes using weighted network analysis of brain activity in 1544 individuals. Genome-wide association analysis of a reward sensitivity cluster characterised using this approach identified association with VPS4a and suggestive association with FRMD4a. His results point towards a novel molecular mechanisms regulating reward sensitivity in a sustained way independent of immediate responsiveness to rewarding stimuli, which may explain the enduring nature of disorders associated with reward dysfunction.

His presentation suggested the following strengths and areas for future collaboration from UK side:

- Experience in setting up and maintaining cohorts,
- Relating psychopathology to neuroimaging, -omics ,
- Standardisation and QC, data banking,
- Embedding results in a wider scientific context (infrastructure/networks) and
- Bioinformatics and biostatistics.

Areas of future collaboration:

Early brain development and its consequence for subsequent psychopathology.

Environmental influences on neural function.

Population neuroscience.

Challenge: Optimizing fit between brain activation, cognitive function and clinical outcome measures

“Differences in trajectories of endophenotypes of risk: Research Landscape –India”- Dr Vivek Benegal

Dr.Vivek Benegal apprised the Group with genetics research of substance use disorders in India with specific reference to projects conducted at AIIMS Delhi on:

Dopamine receptor polymorphisms in alcohol dependence: Case-control association analysis, Dopamine D2 receptor polymorphisms and susceptibility to alcohol dependence besides Association of ADH1B and ALDH2 gene polymorphisms with alcohol dependence and Association of ANKK I polymorphism with co-morbid alcohol and nicotine dependence. He also informed the Group about ANKK I polymorphism Studies from dried blood samples and the ongoing studies assessing SNPs in various mono-aminergic pathways in alcohol and opioid dependence.

He then put forth the theoretical framework and mechanism of influence of negative environmental factors in altered gene expression compounded by substance abuse. He also presented the differences in brain volume ie..smaller volumes in critical brain regions responsible for “adult functions” (Benegal 2007-Addiction Biology) and the differences in growth trajectories of R. PFC., R Amyg and R Hc & Developmental Trajectory of NAA/Creatinine and the delay in reaching age-appropriate volumes as well as reduced white matter volume and age related maturation in the high risk subjects as evident though MRS scans. He briefed the Group with the results of MRS study of Glutamine/glutamate ratio, prefrontal cortical volume and externalizing symptoms in children of alcoholics. The results of the study indicated that high risk subjects had a reduced glutamine/glutamate ratio vs LR subjects. HR subjects have higher Externalizing behaviour scores.HR subjects had reduced PFC volumes, which correlated with glutamate levels and externalizing behaviour scores correlated well with glutamate levels in PFC .He also presented the fMRI study results showing Brain regions with significantly greater connectivity with posterior cingulate cortex in high risk subjects in comparison to LR (REST analysis) and the TMS study results as reported by his team in research publication by Muralidharan K., Venkatasubramanian G, Pal PK, Benegal V (2008) **Addiction Biology** on reported deviance in Brain Inhibitory Capacities in Alcohol-naïve Male Offspring of Alcoholics. He also presented results as reported by Gautham et al regarding cognitive deficits as seen in children of alcoholics vis a vis non-alcoholics and the study results on altered emotional reactivity and reaction to social cues. He reported that a large number of brain endophenotypes / markers of brain development appear to indicate the presence of a brain development delay ---associated with the manifestation of a spectrum of externalising behaviors: Poor attention allocation, impulsivity, difficulty in learning from mistakes, novelty seeking, oppositionality and conduct sx . He also reported that HR young adults receive increased CNS reinforcement from ATOD.. but lower negative signals of intoxication leading to frequent drug use and bingeing. His presentation also stated that HR subjects showed hyper-activation of L. para-hippocampal [BA- 34), L. superior temporal [BA-

38] and bilateral cerebellum in comparison with LR subjects vis-à-vis LR subjects demonstrated significant hyper-activation of right prefrontal cortical regions (BA-46, BA-10 & BA-6) in comparison with HR subjects ($p < 0.005$ uncorr). He then summarized the factors that add to the vulnerability to addictive disorder viz..family history, early use, availability, toxic stress, externalizing behaviour spectrum,co-morbid mental illness; and, the differences between high risk and low risk in terms of delayed maturation of brain regions – GM +WM tracts, leading to differences in growth trajectories of brain functions, (metabolic activity and state of CNS hyperexcitability, Altered neurotransmitter system capacities, Altered cognitive-emotional and behavioral capacities), Altered response to ATOD leading to repeated persistent use, Early prolonged neuroadaptations (Early onset dependence).

Topic 2: Effects of Environmental Influences

“Interaction between environmental influences and developing brain”- Professor Anne Lingford-Hughes

Professor Anne Lingford-Hughes informed the Group that in terms of burden of disease alcohol abuse ranks as a leading cause. She explained about the course of alcohol/drug use, & misuse and addiction. In England, 24% of the population (33% men & 16% women) indulge in hazardous use of alcohol (Statistics on Alcohol: England, 2011 [NS]) and NICE clinical guidelines indicate that nearly 4% (m=6% f=2%), or 1.1 million people have an alcohol dependence disorder ([http:// guidance.nice.org.uk/CG115](http://guidance.nice.org.uk/CG115)).

She then presented the results of ALICE-RAP Project (Addictions and lifestyles in contemporary European societies-Reframing Addictions Project) which has used multi-disciplinary approach involving experts from different fields like Economics, public policy, anthropology, genetics, neuroscience, psychology, sociology along with inputs from marketing, history, youth studies, cross-European perspectives, gambling). The objective of the study is to produce a series of models that map the determinants of different stages of addictive behavior for all substances, namely risky and harmful use, which includes addiction, continuing use or stopping use. She then provided highlights from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) study on Hazard rates for alcohol and drug use disorders (Hasin et al 2007 & Compton et al. 2007 Arch Gen Psychiatry), which revealed that the ages of onset for alcohol abuse and dependence were around 22 years old with hazard rates for both disorders peaking at 19 years old.

She also presented the results of study by Tapert & Schweinsburg (2005) which showed that during adolescence several important developmental processes continue, such as pruning and reductions in brain volume, leaving those connections and circuits that are being used. Exposure to alcohol and other drugs during adolescence therefore may alter, particularly, the function of frontal-striatal and limbic circuits as they mature during late adolescence and early adulthood.

She pictorially presented Brain architecture and connectivity changes through adolescence (Cunningham, M et al., 2002) and the brain areas where volumes are smaller in younger adults than adolescents (Sowell, E.R. et al., 1999) and frontal connections which are not fully developed.

She also presented the estimated effects of alcohol pricing policies on health and health economic outcomes in England-Epidemiological (Robin Purshouse et al., Lancet 2010). The study suggested that total bans of supermarket and off -license discounting are effective, in particular young adult drinkers aged 18–24 years are affected by policies that raise prices in pubs and bars. A 50p minimum/UK unit (8g) would result in 2930 fewer deaths, 92 200 fewer hospital admissions and £274 million lower spending. In another study, she informed the Group that those adolescents who become heavier alcohol drinkers showed significantly less activation during response inhibition task (go-nogo) than those who went on to remain non to minimal drinkers throughout adolescence (Norman et al 2011).

All drugs of abuse increase dopamine concentration in the nucleus accumbens of the mesolimbic system and described which regions of brain and which chemical systems are important in different stages of drug use, misuse and addiction: help with prevention and treatment and the integrated –omics approach to neuropsychiatric disorders.

“Overview of Epigenetics studies in India”- Dr Sanjeev Jain

Dr.Sanjeev Jain presented an overview of epigenetic studies in India. He informed about Conrad Waddington, leading embryologist and geneticist from the 1930s to the 1950s, who is remembered mainly for his concepts of the 'epigenetic landscape' and 'genetic assimilation' Giving summary of researches done in India especially, Early stress-age dependent biphasic changes in Hippocampal Neurogenesis, BDNF expression and cognition (Suri et al Biol.Psychiatry 2013; 73;658-666 -Rat study of epigenetic changes in gene expression in BDNF IV in response to early stress due to maternal separation);Epigenetic, Genetic and the study on Environmental Interactions in Esophageal Squamous Cell Carcinoma from Northeast India (Talukdar et al 2013, Plos One) examined the interaction of various modes of nicotine abuse towards inducing promoter hypermethylation of multiple tumour suppressor genes. It reported significantly higher methylation frequencies in tobacco chewers than non chewers for all the four genes under study. He then presented the plausible association of early life experiences /environmental factors and epi-genetic modifications ($p < 0.01$ Ravi and Kannan: IJHG 2013, Epigenetics in the Nervous System). He put forth the relationship of environmental factors and its outcome of Schizophrenia in India. In this context he gave the classic example of famines in 1878 and decrease of the insane in famine districts vis a vis the non-famine districts and the consequent haplotype differences. He also presented the results of a research paper showing Severe forms of alcoholism phenotype associated with an increased frequency of the Taq A1 allele at the DRD2 locus and onset of alcohol dependence (ICD-10) before 25 years of age, patients who had two first-degree relatives with alcohol dependence. This study revealed that allele frequencies did not differ between the two groups.(Polymorphisms at the DRD2 locus in early-onset alcohol dependence in the Indian population Shaikh KJ, et al. Addict Biol. 2001 Sep;6(4):331-335). He presented results of “Study of Dopamine Transporter Gene DAT1/SLC6A3 polymorphism (VNTR) and Alcohol dependence in South Indian Population” by Brij Kishore et al which showed significant differences between alcohol dependence cases with complicated withdrawal vis a vis normal controls though no difference between allele frequencies of allele A9 between simple and complicated alcohol withdrawal. He also briefly apprised the results of study by Shankarappa.B & Murthy .P which indicates a higher prevalence of the thermo stable variant of MTHFR C677T in alcohol dependent subjects. This higher activity might enable maintenance of adequate levels of methionine even in the background of decreased absorption of folate in these individuals. He also concluded with the remarks that overall there appears to be lower methylation among alcoholic subjects

and treatment appears to result in improvement of methylation. He also reported the data on sales of IML and easy availability of liquor as per reported news items of national dailies.

"Effects of environmental influences-focus on children and adolescents"- Dr Satish Girimaji

Dr. Satish Girimaji presented the interplay between major developmental pathway leading to substance misuse & the likely role of environmental factors in the prevalence and pattern of substance use which he supported with various studies done in India. Study conducted by Malhotra et al 2002, reported externalizing disorder CD = 1.14 % ,ADHD = 0.9 % ,Other externalizing = 0.8%; Kerala prevalence study by Hackett et al (1999) on 1400 children showed Externalizing disorder (CD, ODD, Hyperkinetic disorder, CD family context) at 4 % and the risk factors were found to be lower reading score, poverty score, lower social class .The ICMR study conducted by Srinath et.al. revealed(N = 1578), Hyperkinetic disorder (ADHD): 1.6 % ,ODD: 0.9 % , Conduct disorders: 0.2 % ,Others: 0.3 % . Total prevalence of externalizing disorder was 3 % with Risk factors (all disorders): physical abuse and parental mental disorder. The Kanke conduct disorder study done in 2006 by Sarkhel reported 4.6% prevalence in n-240 school going children in 10-15 yrs age group with nicotine/alcohol use in 50% of them. Study at Mumbai in 5-14 years N=250 by Patil etal showed ADHD = 4.3% ,CD = 2.7% , ODD = 1.2 % and the risk factors as revealed by the study were low parental education, parents not living together, large nuclear families.

Cross cultural comparison study by Hackett et.al. 1991 revealed a much less prevalence of CD and ED & the risk factors as reported by these studies were More integrated family structure - less divorce, less single mothers, extended family support, presence of family rituals Active discouragement of aggression, Active encouragement of pro-social behaviours, Greater monitoring and supervision of behaviours. Dr. Girimaji concluded that recent trends indicate Increasing prevalence, Decreasing age of initiation, Increasing use of hard drugs, and Increasing report of girls using substances.

The risk factors can broadly be grouped into: Individual, Family, Social & Special populations. Stress and resilience in children has been seen to be due to: academic stress, bullying, inadequate life skills, low confidence, low mood, low self-esteem, peer influence / peer pressure, formation and maintenance of deviant peer groups, dropping out of school. Risk factors due to family reasons include: low parental supervision, disturbed parent-child relationship, discordant intra-familial relationships, marital discord, domestic violence, intra-familial child abuse, "broken families", multi-problem families. Risk factors due to social /community reasons could be due to recent social changes, changing family / social systems and erosion of family / social supports, media exposure, non-traditional lifestyle, ease of access – "pub culture", liberal attitude towards substances: "it is cool to drink / smoke / take hash", lack of healthy recreational facilities. In special populations it has been observed that runaway children, working children and street children are at a special risk for substance use. The future research agenda can consider focussing on finding out risk and protective factors through population based studies, finding out protective factors and identification of modifiable risk factors besides focusing on promotive / preventive / early intervention studies and/or longitudinal studies of at risk populations.

Topic 3: The reciprocal relationships between substance use and other mental health conditions

"National Mental Health Programme" –Dr.Alok Mathur, DGHS

Dr. Mathur informed the Group that Mental Disorders account for 12% of the global burden of disease; trends indicate this will increase to 15% by 2020 (World Health Report, 2001). Most of them (>90%) remain un-treated in developing countries (WHO, 2005). Approximately, 6-7 % of population in India suffers from mental disorders (Reddy & Chandrashekhar, 1998). The GOI's has launched several programmes like National Mental Health Program (1982), District Mental Health Program (1996), National Mental Health Program re-strategized (2003) and the Mental Health Manpower development scheme (2009). The objectives of the NMHP are to ensure the availability and accessibility of minimum mental healthcare for all in the foreseeable future; to encourage the application of mental health knowledge in general healthcare and in social development; and to promote community participation in the mental health service development. The Total outlay for the 11th Plan was Rs 1000 crores though the Total Approval being Rs. 623 crore. The Components of NMHP in the last plan (11th Plan) included manpower development, establishment of Centres of Excellence (Rs. 30 cr) as well as PG Training Departments of Mental Health facilities (Rs. 51 L – 1.0 cr) besides the Spillover activities of Xth five year Plan viz... Modernization of State Mental Hospitals (Upto Rs. 3.0 crore), Up-gradation of Psychiatric Wings of Medical Colleges/General Hospitals (Upto Rs.50 lakhs). Besides this the DMHP (Rs. 46.37 L/yr) was also geared for- Early detection & treatment, Prevention & Promotion Services (Life Skills Education, Work place stress management, Suicide Prevention), Training & Research, IEC ,Monitoring (Record Keeping)IEC (Rs. 10 cr/yr).

Dr. Mathur also briefly discussed the several Constraints and barriers in the optimal utilization of mental health care due to low priority given to mental health, lack of regular flow of funds to States/UTs due to a lack of skilled manpower in mental health, lack of capacity in the states to utilize the funds, lack of monitoring, non-submission of UCs on time to the Govt. of India. Dr. Mathur then apprised the Group with the district and sub-district level activities of NMHP during the 12th Five Year Plan as approved under National Health Mission comprising of District Mental Health Programme involving Public Private Partnership Model Activities, Day Care Centre, Residential Continuing Care Centre, Long Term Residential Continuing Care Centre, Community Health Centres, Primary Health Centres ,Mental Health Services, & Mental Health Helpline.

The District Mental Health Program (DMHP) envisages provision of basic mental health care services at the community level, 123 districts have been covered under the scheme & it is proposed to expand DMHP to 565 districts in a phased manner. The Manpower (on contractual basis): Psychiatrist, Clinical Psychologist, Psychiatric Nurse, Psychiatric Social Worker, Community Nurse, Monitoring & Evaluation Officer, Case Registry Assistant, Ward Assistant/ Orderly are involved for running the program. The Financial support @ Rs. 83.2 lakhs per DMHP (2013-14) has been demarcated. There are basically two components: Service and Out Reach.

1. Service provision: comprises of provision of mental health outpatient & inpatient mental health services with a 10 bedded inpatient facility.

2. Out-Reach Component: involves Satellite clinics: 4 satellite clinics per month at CHCs/ PHCs by DMHP team, and Targeted Interventions viz like Life skills education & counselling in schools, College counselling services, Work place stress management, and Suicide prevention services are also aimed. However, health being a State subject, States can propose state specific targeted interventions according to regional needs in their PIPs. -Sensitization & training of health personnel: at the district & sub-district levels, Awareness camps: for dissemination of awareness regarding mental illnesses and related stigma through involvement

of local PRIs, faith healers, teachers, leaders etc and Community participation through Linkages with Self-help groups, family and caregiver groups & NGOs working in the field of mental health besides Sensitization of enforcement officials regarding legal provisions for effective implementation of Mental Health Act .The Public Private Partnership (PPP) Model activities provides for provision of services of Psychiatrist/ Clinical Psychologist in case they are not available, Long-term Continuing Care/Rehabilitation services and trainings/sensitization to school/college teachers for imparting life-skills to students (financial support @ Rs. 5 lakhs per NGO). The Day Care Centre/ Residential Continuing Care Centre(stay up-to 6 months)/ Long Term Residential Continuing Care Centre (long stay)aims is to provide continuing care in the community for patients with chronic debilitating Mental illness or destitute mentally ill patients in partnership with Non Government Organisation(NGO)s; for service provision from skilled mental health personnel drawn from DMHPs/ Mental health Service component along with SMHA to monitor such facilities. The Financial support for Day Care Centre is @ 50,000 per centre per month, for Residential Continuing Care Centre is @ 75,000 per centre per month and for Long Term Residential Continuing Care Centre @ @ 75,000 per centre per month. For Other Mental Health Services activities there is provision for getting it delivered through Community Medicine dept. of medical colleges with or without Psychiatry department so as to deliver basic mental health services on DMHP pattern and for this financial support of 10 crore / year is earmarked. Each Community Health Centers is provided with a post of One Medical Officer & one Clinical Psychologist or Psychiatric Social Worker on contractual basis besides Provision of outpatient services, counseling services & referral of severe mental disorder patients to district hospital for management and follow up. At the Primary Health Centers there is provision for Two Community Health Workers on contractual basis; and the Community Health Worker (CHW) is assigned the work to help patients (with support from psychiatric social worker based at the district hospital) gain access to support groups, day care facilities, higher education, vocational skills and employment facilities, certification, reservations and other benefits. There is also a Mental Health Helpline in partnership with NGOs; which is a 24 hours dedicated help line for public to provide information on mental health resources, emergency management, information pertaining to destitute mentally ill patients, registration of complaints on Human Rights Violation of mentally ill and assistance on medico-legal issues.

Tertiary level activities of NMHP during the 12th Five Year Plan are yet to be approved which will comprise of Manpower Development Schemes, establishment of Centres of Excellence ,Up-gradation of two Central MH Institutes to provide Neurological and Neuro-surgical Facilities on the pattern of NIMHANS (CIP, Ranchi & LGB, Tezpur), Support to Central and State Mental Health Authorities, establishment of Mental Health Review Commission & its Boards. It will also comprise of funds for Research & Survey, Monitoring & Evaluation, Central IEC, Central Mental Health Team and establishment of Mental Health Information System/Training/Workshops etc. Under the Manpower Development Scheme A (COE) iUp-gradation of 10 existing mental hospitals/ institutes/ Med. Colleges will be taken-up to start/strengthen courses in psychiatry, clinical psychology, psychiatric social work & psychiatric nursing. Under Scheme B (PG Training Departments of Mental Health facilities) Government Medical Colleges/ Government Mental Hospitals will be supported for starting / increasing intake of PG courses in Mental Health. Financial support of Rs. 1.92 to 2.45 cr per dept. would be provided. The support includes physical work for establishing /improving department in specialties of mental health, equipment, tools and basic infrastructure & for engaging required faculty for starting/ enhancing the PG courses. Support for faculty would be provided to the 27 PG Departments in Mental Health Specialties already established during the 11th Five Year

Plan. It is also proposed to Up-grade the two Mental Health Institutes LGB Regional Institute of Mental Health, Tezpur and Central Institute of Psychiatry, Ranchi. Basic Neurological & Neurosurgical facilities to be included on the pattern of NIMHANS. The kind of support would involve physical work for establishing departments in Neurology & Neurosurgery, equipment & tools and for engaging required faculty. Mental Health Care Bill, 2012 provides for establishment of Mental Health Review Commission & Mental Health Review Boards (in 35 States/ UTs).

At the National level a Central Mental Health Team would be established for NMHP to supervise and implement the programme. This team would function under the overall supervision of the Mental Health division. This team would also provide support to the Central Mental Health Authority. The central level dedicated website will be introduced to provide on hands information on mental health resources, activities, plans, policy and programmes. Extensive mass media activities will be supported at district and sub-district level. The support for TV /RADIO programmes and innovative media campaigns on mental health in vernacular languages through local channels and other media.

"Mental Health Care in the UK"- Professors Jonathan Hill and Philip Cowen

Professor Cowen outlined key developments in psychiatric provision in the UK including the deinstitutionalisation of mental health care in the 1940s, the introduction of antipsychotic and antidepressant medication, and the establishment of community psychiatric nurses in the 1950s. The Mental Health Act of 1959 stimulated community care of psychiatric patients and establishment of Community Mental Health Teams in the UK.

The first point of contact for patients is usually primary care. Severe disorders such as psychosis, bipolar disorder, refractory depression, severe personality disorders are generally referred to hospital based mental health services. Many less severe mental health problems are treated in primary care. There are also specialist mental health services for children and adolescents, the elderly, substance use, and forensic disorders. Care for substance use disorders has become fragmented between various care providers including charities, NHS and private agencies. The latter has been encouraged by Government.

Wittchen et al, 2011 estimated that the annual burden of mental disorders and other brain disorders in Europe affects about one third of the European population (165 million people), less than one third of whom receive treatment.

The survey suggested that the most common mental disorders are anxiety disorders (14%), insomnia (7%), major depression (7%), somatoform disorder (6%), alcohol and substance misuse (5%), ADHD (5%) and Dementia (1-30%, depending on the age of population). Of these the most burdensome in terms of years lived with disability are depression, dementias and alcohol and drug use disorders.

Current treatment approaches in the UK increasingly emphasise psychosocial approaches with various kinds of psychological treatments together with social measures designed to increase patient empowerment, through combating stigma and social exclusion. There is a growing 'recovery' movement where mental illness is seen in terms of a personal journey, leading to self-acceptance and social engagement. Psychological treatment has been based mainly on cognitive approaches but there is growing use of Mindfulness (derived from Buddhism). Professionals are encouraged to practice using the principles of evidence based medicine,

which emphasises the importance of basing treatment on the outcome of meta-analyses of randomised studies. Treatment is usually based on published guidelines, for example, those issued by NICE.

Current neuroscience approaches have utilised new genetic techniques because most serious mental disorders are highly heritable; however, the genetic architecture for most disorders looks complex with many genes of small effect. Because of this, current genetic markers have yet to prove helpful in refining diagnosis or developing novel treatments. Brain imaging, particularly fMRI, is proving increasingly useful in elucidating the functional neural circuitry of psychiatric disorders; however, imaging has still not gained a place in routine clinical management of psychiatric disorders. It is widely felt that part of the problem in gaining a better understanding of the neurobiological basis of psychiatric disorder are the unsatisfactory clinical classification schemes which are based on diagnostic reliability rather than validity. There is growing interest in the multilevel analysis of behavioural phenotypes such as those outlined in the Research Domain Criteria produced by the NIMH. There is also an increasing emphasis on translational research in which findings from animal experimental studies can be more rapidly deployed in humans to give a new impetus to drug discovery. Current industry models of drug development have not yielded novel agents and many companies are withdrawing from the field of psychotropic drug development.

Professor Hill presented an overview of Child and Adolescent Mental Health in the UK. In the UK it is estimated that 10% pre-pubertal children have mental health problems as compared to US where it is estimated to be 20%. The most common disorders are externalizing problems: aggression, disruptive behaviours, ADHD. An increasing prevalence of Autistic Spectrum Disorder has been reported. Mainly boys are afflicted and long term outcome is poor, hence there is a priority to treat early. In adolescents the prevalence of mental disorders is approx. 15% and there is a marked increase at puberty of affective disorders, self-harm, emergent borderline personality disorder, self-harm, and all of these disorders are seen more in females than males. The estimated prevalence of binge drinking is 20% in 16 year olds, and there is increasing alcohol use in under 16s. Child and Adolescent Mental Health Services (CAMHS) generally have an upper age limit of 16, while provision for 17 – 25 year olds varies across the country. Most of the referrals are made through General Practitioners with waiting times typically around 10 weeks. The health care team composition commonly includes Child Psychiatrist, Clinical Psychologists, Nurse Practitioners, and Specialist Therapists such as family therapists and psychodynamic child psychotherapists. CAMHS services are run by NHS Trusts but are generally not on hospital sites. The key points of this overview are listed below.

Drugs and Alcohol

- Variations in provision, some as part of CAMHS and other specialist services
- Survey in Manchester of attenders aged 14 - 16 – almost all using both alcohol and cannabis, plus range of other drugs (Marshall et al 2012)
- 25% in clinical range for ADHD on the Connors
- Externalizing problems on the SDQ 45% (9% in the general population)

Training

- Child and Adolescent Psychiatrists – 5 years medical, 2 years medical and surgical, 3 years core psychiatry, 3 years specialist, includes prescribing and psychological treatments

- Clinical Psychology – 3 years psychology degree, 1 – 4 years Clinical Assistant or Research Assistant, 3 years Clinical Training
- Specialist Therapists – 3 years Therapeutic Training
- Nurse Practitioners – Mental Health Nursing plus variable additional training.

Assessment

- Highly variable
- Child Psychiatrists may emphasise ‘diagnosis’, Clinical Psychologists ‘formulation’.
- Use of standard measures, formal testing, direct observation, all highly variable
- Complex problems admitted – one in-patient unit 15 beds per 2.5 million population
- Biological measurement very rare other than prior to prescribing

Treatment

- National Institute for health and care Excellence (NICE!)
- Reviews evidence and makes recommendations – highly influential
- Generally recommends behavioural or psychological treatments first line, even for disorders such as ADHD and depression
- Duration of treatments generally 6 – 12 sessions, at one to two weeks intervals

Recent Developments

- Family nurse partnership
- Early intervention over the first 5 years
- Parent training for ‘at risk groups’
- Specialist services for ‘looked after’ children
- School based interventions
- Intensive interventions for adolescent antisocial problems – Multisystemic Therapy, Treatment Foster Care
- Informative heterogeneity, e.g. callous unemotional traits, informative co-morbidity, e.g. externalizing and depression

Key Issues

- Phenotypes unsatisfactory – heterogeneity and co-morbidity, make generalization from trials problematic
- The majority of child and adolescent mental health problems do not reach the clinics
- Childhood disorders commonly persist, adolescent disorders commonly recur - little known about how to improve long term outcomes
- Early universal ‘public health’ interventions, versus reactive treatments for established disorders
- Child maltreatment major independent risk for child and adult disorders – unsolved public health threat

Differences in trajectories of endophenotypes of risk

“The reciprocal relationships between substance use and other mental health conditions (co-morbidity)”- Professor Matthew Hickman

Professor Matthew Hickman presented overview of co-morbidity in population and treatment services – with additional examples on externalising/antisocial behaviour and substance use, internalising behaviour/depressive symptoms and alcohol use; cannabis and psychosis, and substance use and suicide.

Population surveys: Historic and recent cross-sectional population surveys of mental health show strong associations between substance use and mental health disorders. For instance, Farrell et al (BJP 2001; 179: 432-43) from the 1995 Co-morbidity survey showed that 45% of drug dependent people, 30% of alcohol dependent people, and 22% of nicotine dependent people had a mental health disorder respectively, compared with 12% of non-substance dependent people. Thus, drug-dependent subjects are about three times more likely to have a mental health disorder compared with non-drug-dependent subjects (OR=3.25); alcohol dependent subjects had a greater than two-fold odds of having a mental health disorder (OR=2.20); and nicotine dependent subjects had a 60% increased risk of mental health disorder (OR=1.60).

The 2005 Psychiatric Morbidity Survey (Adult psychiatric morbidity in England, 2007) presented rates of Common Mental Disorders (age standardised CMD) and excessive alcohol use by ethnic group. In general CMD rates were higher among women than men – of interest to the workshop was that the largest rates of CMD were among South Asian women (age-standardised rate of 34.3%) – three times the rate of South Asian men (at 10.3%). There was little difference after standardisation of CMD rates by ethnic group among men, however, among women; rates of all CMDs (except phobias) were higher among South Asian women compared to other ethnic groups. In contrast, the proportion of people that report excessive or harmful alcohol use was higher among white ethnic groups compared to other ethnic groups. For example, 35.8% of white men were hazardous drinkers, compared with 18.6% of black men and 12.0% of South Asian men. Black and South Asian women were also less likely to be hazardous drinkers than white women (4.6% and 3.1%, compared with 16.6% respectively).

Co-morbidities between CMD and alcohol use and other forms of substance use by ethnic group were not published – but available for further comparative research with co-morbidity surveys conducted in India.

Clinic population surveys: Weaver et al study (BJP-2003) of people in Drug Treatment Population (Prevalence of Psychiatric Disorder –COSMIC study) showed very high rates of co-morbidity. Psychosis at ~8% was 9 times higher than the general population; nearly $\frac{3}{4}$ had any mental health disorder, 37% personality disorder; 27% severe depression; 40% minor depression and 19% severe anxiety. The study also showed that community drug services failed to detect a substantial proportion of the patients with a comorbid disorder. A parallel study in community mental health services also showed high levels of co-morbid problem drug use (29.8%) and harmful / hazardous alcohol use (25.5%). The services also failed to detect a substantial proportion of these patients. The study concluded that aggregate need presented by co-morbid patients cannot be managed by parallel or serial treatment models or cross-referral – but needs to be managed by services themselves and involve better training of mental health and drug and alcohol staff on assessing and managing comorbidity.

Conduct Disorder/Antisocial Behaviour: Conduct problems in early childhood are consistently shown to be one of the strongest predictors of substance misuse in later adolescence and adulthood. Moffit has proposed a taxonomy of conduct problems (which has been generated also in ALSPAC (Avon Longitudinal Study of Parents and Children) <http://www.bristol.ac.uk/alspac/> & Barker et al AJP 2009). The taxonomy and trajectories suggest that there maybe three distinct groups of conduct problems, defined by age at onset, and differentiable in terms of both aetiology and course. On the one hand, childhood onset problems are thought to stem from individually based risks (neuropsychological and temperamental/genetic) which, in conjunction with adverse early rearing conditions, go on to

produce the problematic personality traits that maintain long-term antisocial lifestyles. 'Adolescence-limited' conduct problems, by contrast, are thought to be relatively free of such individual risks, whereby individuals become involved in delinquent behaviours primarily as a result of environmental influences, and finally a third, 'childhood limited' sub-group is found in many samples. ALSPAC will be able to confirm and test whether the different conduct trajectories have a different relationship with alcohol and substance misuse in adulthood. What is equally important, however, is how to intervene and reduce the risk of substance misuse. A promising intervention – that needs to be corroborated and tried in other settings was published recently in JAMA Psychiatry (2013; 70(3):334-342) on Selective Personality targeted intervention program. The results of the primary outcomes of this randomized trial indicate long-term benefits of the intervention on drinking outcomes for those high risk students selected and randomized to receive brief personality-targeted interventions.

Depression and alcohol: There has been much debate on the nature and direction of the association between alcohol and depression. A recent meta-analysis of the associations between alcohol use disorders (AUD) and major depression (MD) (Boden et al. *Addiction*, 2011; 106, 906–914) showed a two-fold increase in both directions (from AUD to MD, and from MD to AUD). The interpretation of the findings, however, suggested that the direction was more likely to be from AUD to MD – as opposed to a “self-medication model” in which MD led to increased risk of AAD. Structural Equation Models (SEM - *Arch Gen Psychiatry*. 2009; 66:260-6) provide support for a causal linkage between AUD and MD. The relationship also is stronger between measures of alcohol dependence and MD. Further research, however, is required in order to clarify the nature of the causal link, and the importance that targeting problem alcohol use may have for prevention of depression. Cross-cultural studies especially would be of value as confounders of the association between alcohol use and depression will be different – and therefore, if the findings are consistent will strengthen the evidence.

Cannabis and psychosis: Epidemiological data has showed a consistent association between cannabis exposure and psychotic symptoms. For example, Moore et al systematic review (*Lancet* 2007; 370: 319–28) shows a two-fold increase in psychosis outcomes and “heavy” use of cannabis. Cannabis use in the UK has increased markedly since the 1970s (Hickman et al *Addiction* 2007; 102: 597-606) with perhaps a four-fold increase in incidence and a ten-fold increase in period prevalence to approximately 4.3 to 5 million people in early 2000s. Trends in schizophrenia diagnoses, however, have not increased. A recent study based on ALSPAC (Gage et al *Psychological Medicine* 2014 <http://dx.doi.org/10.1017/S0033291714000531>) showed that after adjustment for tobacco use the association between cannabis and psychotic symptoms was attenuated to the null, whereas an association remained between heaviness of tobaccos use and psychotic symptoms. The relationship between cannabis and psychosis is complex and its interpretation remains controversial. In the absence of robust genetic markers for cannabis use in adolescence, there is a need for establishing cohort studies in populations with different confounders and different relationships between tobacco and cannabis – such as India.

Substance use and suicide: Mental disorder and substance use are important predictors and modifiable factors or targets in relation to suicide prevention (Gunnell et al *BJPsych* 2005). Wilcox et al (*Drug and Alcohol Dependence* 76S (2004) S11–S19) shows in a meta-analysis that people with a diagnosed alcohol or substance use disorder have 9-10 times higher risk of suicide than the general population. Other ecological studies also show that sales in vodka sales and alcohol consumption are positively associated with rates of suicide.

Research Landscape –India

“The relationship between substance use and other mental health conditions: Underlying diathesis or co-occurring disorders?”- Dr Debashish Basu

Dr Debashish Basu’s presentation tried to analyse the plausible relationship of substance use between and other mental health conditions and, how strong is the association, & what is the nature of the association? The presentation broached the underlying diathesis along four questions namely: Whether substance use “causes” psychiatric disorders; whether psychiatric disorders “causes” substance use; if psychiatric disorders are not “causing” Substance use or vice versa, but influencing course and outcome of each other then both substance use and psychiatric disorders may stem from “common underlying vulnerabilities or diatheses”.

From his paper from Journal of Immunology .of Dual Diagnosis 2013, 9(1), Retrospective chart which presented review of patients attending DDTC from January 2000 till December 2010. Diagnoses made clinically, and confirmed by consultant psychiatrists following detailed evaluation of 5116 available records, 678 (13.2%) had a diagnosis of another non-substance psychiatric disorder. In another research from Kafle et al 2014 ,”PRISM validated prospective data from OPD DDTC”41% had a diagnosable psychiatric disorder, 15% substance-induced (ten times retrospective estimates) and 26% independent (double of retrospective estimates). In another study from Prabhat Chand & Murthy P et al from Comprehensive Psychiatry 2014, 55, 165-169 reports 20% of the population reported current substance use disorder (excluding nicotine) in 139 treatment-naïve first-episode psychosis, Current alcohol dependence in 17.3%, Cannabis dependence in 3.6% which however, are though substantially lower rates than reported from USA, UK, Australia (25-40%, but these are still MUCH higher than general population rates in India for both Alcohol dependence (~5%) & Cannabis dependence (<1%). In another paper on Substance induced psychiatric disorder- a 13 year data from a De-addiction centre and its clinical implications Of 5257 available records, [cf. Prospective PRISM data], 74 (1.4%) had a diagnosis of substance-induced psychotic disorder. The study showed patients attending DDTC from January 1997 till December 2009 wherein diagnoses was made clinically, and confirmed by consultant psychiatrists following detailed evaluation (Asian JI. Of Psychiatry 2012 Basu et al). In another study by Goswami, Mattoo & Basu, IJMS, 2003- Courses of substance use and schizophrenia in dual diagnosis of 22 cases of dual diagnosis- Substance use was found to precede onset of schizophrenia in 2/3rd of cases, Substance use preceded exacerbation of schizophrenic course in 1/3rd of cases, But overall no significant association between courses of substance use and schizophrenia was seen. Further giving references from NIMHANS studies which has shown association of externalizing symptoms with high risk for alcoholism (Benegal et al, 2009 onwards) suggested that Externalizing does not explain all drug dependence .The vast majority of psychiatric comorbidity in SUD comprise of internalizing (depression and anxiety) and other (e.g., bipolar, psychotic) disorders. Adult ADHD and Antisocial Personality Disorder comprise small proportions of dual diagnosis in India (cross-cultural differences?). Thus, Externalizing disorders explain only a small part of DD. So, probably other factors must be operating). Similarly giving reference of an article from Ghaemi SN et al. (2005). Journal of Affective Disorders, 84(2-3), 273-277 of data of 189 patients attending DDTC found Bipolar disorder spectrum disorder 21% scored above cut of more than 13 in a score ranging from 0-2 but clinical diagnosis of BPAD was only 4%.

He summarized the leads from various researches as following:

- Substance use and psychiatric disorders are not merely co-occurring conditions, but have a significant association
- The association is less strong than seen in western population, but strong enough to raise concern
- The directions, and causes, of this association are multiple viz
 - Primary substance use → Secondary psychiatric disorders
 - Primary psychiatric disorders → Secondary substance use
 - Primary “common vulnerability → Secondary both substance use and psychiatric conditions Externalizing spectrum is one such common diathesis, but...It is neither necessary, nor sufficient. Other such underlying diatheses could be...Bipolar spectrum, Internalizing spectrum & Cognitive/neurophysiological spectrum. There may be important cross-cultural similarities& differences in these that need to be studied.

Rapporteur Reports: Summaries of the Discussions

Topic 1: Differences in trajectories of endophenotypes of risk

- Difference in the nature of cohort: UK has the strength of more epidemiologically relevant population based cohorts where as India has predominantly clinic based cohorts. Even though clinic based sample might be smaller, it would certainly complement the larger epidemiological cohort and also would answer more illness related / biological questions.
- Clinic based samples in India would aid in better phenotype characterization and outcome quantification appears to be predictably better. It also aids to test an intervention with greater ease.
- Studying larger samples and studying various disorders in psychiatry with their relationship to substance use would give a trans-diagnostic platform to understand the pathogenesis.
- It was discussed that certain important yet easily recognizable parameters such as cognition, temperament and emotion regulation could be assessed without difficulty in India. However, there is a need for culturally validated assessments (eg: cognitive) so that there is uniformity in deriving meaningful results and comparisons. In addition cultural differences (phenotype assessment) and ethnic differences (eg: for genetic studies) remain major challenges.
- Large scale easily applicable assessments such as stress reactivity paradigms, blood related assessments, eye movement studies, EEG and biofeedback studies could be done in common – in both UK & India.
- It was discussed that bioinformatics related and large scale genomics related inputs can be derived from the UK side since there is ample expertise there.
- Studying medication naïve ill population is an advantage which may be much higher in India and this may be particularly relevant in examining biological factors and brain imaging studies and molecules for gauging treatment.
- Indian migrants in the UK form a unique population and they might form an important population to study endophenotypes and the impact of environmental factors.
- Capacity building through recruiting dedicated man power in the form of faculty would be an important step towards achieving collaborative work.

Topic 2: Effects of environmental influences

- There were many different aspects of environmental influences, which would be valuable to investigate (wealth, nutrition/metabolic factors, family/cultural/spiritual environments, urban/rural environments). For example, in India vitamin deficiencies appears alongside alcohol addiction which tended not to be as apparent in UK cases, however there might be merit in evaluating risk factors in UK Indian populations
- Differences in the use of substances in the two countries were highlighted. (For example the use of inhalants in India versus the use of amphetamines in the UK).
- The opportunity for analysis of the effects of Government policy on substance use was highlighted. Upcoming changes to Government of India alcohol initiatives meant that natural experiments to contrast behaviours before and after the changes would be possible.
- Studies of the effects of parental alcohol abuse in children, both population studies and in high-risk groups, were highlighted as being of key interest.
- Public and patient involvement (PPI) is a key part of population studies and it was discussed that the UK has significant experience in this area. PPI is extremely important when dealing with sensitive issues and when patient commitment for longer-term studies is required.
- The importance of harmonising data collection and measurement (e.g. diagnosis, severity, imaging, tissue for genetic analysis) was agreed by all participants.

Topic 3: The reciprocal relationships between substance use and other mental health conditions

- Indian side was found to have a lack of data on the entity on dual diagnosis
- UK's strength was its population based co-morbidity surveys
- The establishment of association between substance use and psychiatric illness can be done with help of animal and cell line studies as the confounders can be easily addressed. With that knowledge it can be translated on to the human beings
- India needs to plan studies on understanding of
 - Clinic and community based prevalence of dual diagnosis
 - Study on symptom dimensions instead of disorders and how do they influence of course and outcome of substance use disorders
 - Establishing association between substance use and psychiatric studies - epigenetic studies, cohort studies
 - Studies reflecting the intercultural and intra-cultural variation
 - Course and outcome studies
 - Formulation of community based treatment packages and testing out the same
 - Treatment effectiveness of pharmacological agents in the specific dual diagnosis
- In most of the areas UK side has expertise to provide the techniques and Indian side has excellent clinical backup. So collaboration is feasible and plausible in all these areas.

Annexure I
List of UK Delegates

UK Delegates

Sr. No.	Name	Organisation
1.	Prof Phil Cowen	University of Oxford
2.	Prof Anne Lingford-Hughes	Imperial College
3.	Prof Jonathan Mill	University of Exeter
4.	Prof Matthew Hickman	University of Bristol
5.	Prof Louise Arsenaault	King's College London
6.	Prof Matthew Field	University of Liverpool
7.	Prof Jonathan Hill	University of Manchester
8.	Prof Gunter Schumann	King's College London
9.	Prof Hugh Perry	University of Southampton
10.	Dr Louisa Rahemetulla	MRC, UK
11.	Dr Catherine Moody	MRC, UK
12.	Dr Mark Palmer	MRC, UK
13.	Sukanya Kumar-Sinha	RCUK India
14.	Geeny George Shaju	RCUK India
15.	Sunil Kumar	SIN, Bangalore

Annexure-II
List of Indian Delegates

Indian Delegates

1.	Dr Savita Malhotra	PGIMER, Chandigarh
2.	Dr SudhirKhandelwal	AIIMS, Delhi
3.	Dr AnjuDhawan	AIIMS, Delhi
4.	Dr DebashishBasu	PGIMER, Chandigarh
5.	Dr Saurabh Ghosh	ISI, Kolkata
6.	Dr CRJ Khess	CIP, Ranchi
7.	Dr RP Beniwal	RML, Delhi
8.	Dr SK Deuri	LGB, Tezpur
9.	Dr Kamal Kalita	LGB, Tezpur
10.	Dr R.K.Lenin Singh	RIMS, Manipur
11.	Dr Rajesh Kumar	IHBAS, Delhi
12.	Dr Sanjeev Jain	NIMHANS, Bangalore
13.	Dr Mathew Varghese-Workshop Coordinator	NIMHANS, Bangalore
14.	Dr Vivek Benegal	NIMHANS, Bangalore
15.	Dr Pratima Murthy	NIMHANS, Bangalore
16.	Dr Prabha S. Chandra	NIMHANS, Bangalore
17.	Dr Satish Girimaji	NIMHANS, Bangalore
18.	Dr JP John	NIMHANS, Bangalore
19.	Dr G Venkatasubramanian	NIMHANS, Bangalore
20.	Dr Rose Dawn Bharath	NIMHANS, Bangalore
21.	Dr Meera Purushottam	NIMHANS, Bangalore
22.	Dr Muralidharan K	NIMHANS, Bangalore
23.	Dr Arun Kandasamy	NIMHANS, Bangalore
24.	Dr Prabhat Chand	NIMHANS, Bangalore
25.	Dr Janardhanan	NIMHANS, Bangalore
26.	Dr Biju V	NIMHANS, Bangalore
27.	Dr Urvaksh Mehta	NIMHANS, Bangalore
28.	Dr P Satish Chandra	NIMHANS, Bangalore
29.	Dr V Ravi	NIMHANS, Bangalore
30.	Dr Shoba Srinath	NIMHANS, Bangalore
31.	Dr Alok Mathur	MoH&FW

Organisers

32.	Ms Dharitri Panda	ICMR, Delhi
33.	Dr D K Shukla	ICMR, Delhi
34.	Dr Mukesh Kumar	ICMR, Delhi
35.	Dr Harpreet Sandhu	ICMR, Delhi
36.	Dr Ravinder Singh	ICMR, Delhi
37.	Dr Tripti Khanna- Workshop Coordinator	ICMR, Delhi

Annexure III **CV-UK Delegates**



Professor Louise Arseneault

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Professor Arseneault's research focuses on the study of harmful behaviours such as violence and substance dependence, their developmental origins, their inter-connections with mental health, and their consequences for victims. In the early stages of her career, she examined harmful behaviours as a developmental outcome, primarily in adolescents and in adults. Over time, her focus broadened to include harmful behaviours as causes of psychiatric disorders. She is currently taking a developmental approach to investigate how the consequences of violence begin in childhood, by studying bullying victimization and child maltreatment. Her research aims are to answer questions relevant to psychology and psychiatry by harnessing and combining 3 different research approaches: developmental research, epidemiological methods and genetically-sensitive designs. Her work incorporates biological as well as social measurements. Her studies are based on data from well-known longitudinal cohorts such as the Montreal Longitudinal Cohorts, the Dunedin Multidisciplinary Health and Development Study and the Environmental Risk (E-Risk) Longitudinal Twin Study, a nationally-representative sample of families with twins in England and Wales.

She played a key role in the setting up and development of the MRC funded E-Risk Study and has now taken over its leadership as PI of the renewed support from the MRC with a 5-year programme grant of £3 million. She has also been developing another important nationally-representative cohort, the National Child Development Survey (NCDS), with funding from a Mid-Career Fellowship Award from the British Academy.

Louise obtained her PhD in Biomedical Sciences from the University of Montreal in 1998 where she examined the influence of perinatal complications on the development of antisocial behaviours. She moved to London 15 years ago to pursue and develop her research interests and holds both Canadian and British nationality.



Professor Phil J Cowen

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Professor Cowen is trained in medicine at University College Hospital, London, and then in psychiatry at King's College Hospital. He came to Oxford to work in the MRC Unit of Clinical Pharmacology under David Grahame-Smith. In his laboratory he studied the basic neuropharmacology of serotonin and its application to clinical psychopharmacology. Since 1983 he's been MRC Clinical Scientist and Honorary Consultant Psychiatrist in the Department of Psychiatry in Oxford. He was elected to

a personal chair in Psychopharmacology in the University in 1997 and the Academy of Medical Sciences in 2001.

Phil's main interests are in the biochemistry and treatment of mood disorders, particularly the pharmacological management of resistant depression. He is senior author of the Shorter Oxford Textbook of Psychiatry.



Professor Mathew Field
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Professor Field was an undergraduate student at the University of Swansea before undertaking a D Phil in Experimental Psychology at the University of Sussex, which he received in 2001. He then worked as a postdoc at the University of Southampton before taking a faculty position at the University of Liverpool in 2004, where he has remained ever since.

His work on cognitive processes in psychopharmacology, addiction and motivated behaviour is highly regarded and he was awarded the British Psychological Society Spearman Medal in 2009.

He has published extensively on a range of topics including executive function and implicit cognition in addiction, with a focus on alcohol use disorders. His research has been funded by the MRC, Wellcome Trust and Economic and Social Research Council, and he is an Editorial Board member of several high ranking addiction journals including *Addiction*, *Drug and Alcohol Dependence*, and *Psychopharmacology*.

Matt also conducts public engagement and outreach activities to disseminate alcohol and addiction-related research to the public, and was an expert advisor to Alcohol Concern's 'Dry January' campaign in 2014.



Professor Jonathan Hill
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Jonathan Hill is Professor of Child and Adolescent Psychiatry at the University of Manchester, and Honorary Consultant in Child and Adolescent Psychiatry, at Manchester Children's Hospital and the Tavistock Clinic London. His research focuses on the relationship between adverse and advantageous experiences in childhood and mental health in children, adolescents and adults. Currently heading a longitudinal study, funded by MRC, of foetal and infancy origins of early aggression and other disruptive behaviour problems, examining the interplay between biological, psychological and social perspectives processes.

Recently published findings show long lasting associations between prenatal anxiety and depression and later child functioning, modified by maternal stroking, consistent with epigenetic findings in animals, and gene by environment interactions in early development.

Previous work funded by MRC has examined long term effects of child sexual abuse and the early developmental sequelae of cleft lip and palate.

He has developed several measures of child and adult functioning, including the original and revised Adult Personality Functioning Assessment which has been used extensively in personality disorder research. Jon believes that in psychiatry and psychology conceptual and empirical work have to go hand in hand, and his conceptual proposals were laid out in 'Mind, Meaning and Mental Disorder', OUP, 2004 written jointly with Derek Bolton.

Jon has visited India once before as a student, and worked in Gandhian projects around the country. While working in Wardha (Maharashtra) he had the interesting experience of meeting Vinoba Bhave!



Professor Matthew Hickman
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Matt Hickman is a Professor in Public Health and Epidemiology at Bristol, and Honorary Public Health Consultant at NHS Bristol and Public Health England. He is the director of NIHR Health Protection Research Unit on Evaluation of Interventions, and a member and co-investigator of UK CRC Public Health Centre of Excellence (DECIPHer: Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement) and NIHR School of Public Health Research.

His research programme focuses on epidemiology and public health consequences of drug misuse – including adolescent substance use, and epidemiology and prevention of HCV and drug related mortality with grants from MRC, NIHR, NIH and Wellcome Trust. He is the Deputy Regional Editor of Addiction, and was a member of the recent Academy Medical Sciences Working Group on Brain Science. He chairs an NIHR doctoral research award panel and NICE Clinical Guidance Group on Hepatitis C, and recently chaired the NICE Programme Development Group on Hepatitis Case Finding.

He is a member of the Scientific Committee of European Monitoring Centre on Drugs and Drug Addiction, the Cochrane collaboration on Drugs and Alcohol, and NHS Advisory Group on Hepatitis.

Matt's recent work has won the Royal College of General Practitioner (RCGP) paper of the year 2010 and European Monitoring Centre on Drugs and Drug Addiction paper of the year 2011 and 2012.



Professor Anne Lingford-Hughes
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Professor Lingford-Hughes studied medicine at the University of Oxford, gaining a BA in Physiological Sciences (preclinical) in 1983. She completed her PhD on the pharmacology of cholecystokinin receptors in the brain at University of Cambridge. She undertook a

post-doc at NIMH, USA examining the pharmacology of the GABA receptor. Returning in 1988 to University of Oxford, she completed her clinical training. She was trained at The Bethlem and Maudsley Hospitals in Psychiatry. In 1995 she was awarded a Wellcome Clinical Training Fellowship to investigate the GABA-A receptor in alcoholism using in vivo imaging (MR & SPECT) at the Institute of Psychiatry with Professor Kerwin and Dr Marshall.

After completing this fellowship and psychiatry training she joined Professor Nutt's team at the University of Bristol in 2000 as senior lecturer/Consultant. Anne returned to London to take up Chair in Addiction Biology in 2009 at Imperial College. She is also Consultant Psychiatrist at CNWL NHS Foundation Trust where she has a particular interest in pharmacotherapy of alcoholism and comorbidity.

Anne leads a multidisciplinary team with Professor Nutt using neuroimaging to characterize the neuropharmacology of alcohol and opiate addiction and pathological gambling. She currently holds several MRC grants using MR and PET exploring the GABA and opioid systems in these disorders and is member of a collaboration between Imperial College, Manchester (Deakin, Elliott) and Cambridge (Robbins, Everitt) that has set up an MR and behavioural platform to characterize pharmacological modulation of common relapse vulnerabilities e.g. reward, impulsivity, emotional salience.

Anne also conducts clinical trials in addiction. She also provides pharmacological expertise about substance misuse to NICE and led British Association for Psychopharmacology's addiction guidelines. She is handling editor for British Journal of Psychiatry and Assistant Editor for Addiction.



Professor Jonathan Mill

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Jonathan Mill is Professor of Epigenetics at the University of Exeter Medical School and also heads the Psychiatric Epigenetics group at the Institute of Psychiatry, King's College London. He graduated with a degree in Human Sciences from Oxford University before undertaking his PhD in molecular genetics at the Institute of Psychiatry. He was awarded a CIHR fellowship to train in epigenetics at the University of Toronto, before returning to the Institute of Psychiatry to establish the Psychiatric Epigenetics group in the MRC Social, Genetic and Developmental Psychiatry Centre, and moving to Exeter in 2012. His group utilizes cutting-edge methods to explore the role of epigenetic processes in complex disease phenotypes, with a particular focus on neuropsychiatric disorders.

Current areas of research include: 1) genome wide investigations of DNA methylation in post-mortem brain tissue for disorders including schizophrenia, bipolar disorder, autism and Alzheimer's disorder; 2) investigating the role of epigenetic variation in mediating phenotypic/disease discordance between genetically-identical individuals (i.e. monozygotic twins, inbred animals); 3) elucidating how external environmental factors mediate long-term changes in gene expression via epigenetic alterations; 4) identifying novel imprinted regions of the genome, and their role in mediating parent-of-origin effects in psychiatric disorders; and 5)

exploring interactions between the epigenome and inherited DNA sequence variation, with the aim of undertaking an integrated genetic-epigenetic approach to disease.

His group represents the only research team outside North America focused on epigenetic studies in psychiatry and has been successful in obtaining funding from the Medical Research Council (MRC), the Royal Society, the National Institutes of Health (NIH), Autism Speaks, the BBSRC, NARSAD, the British Medical Association, the National Institute of Health Research (NIHR), the American Asthma Foundation, and the Alzheimer's Research Trust. Of note, they were recently funded as part of the NIH Epigenomics Roadmap Initiative, representing the only award made under this scheme outside of North America. More information on their work can be found at www.epigenomicslab.com.



Professor Hugh Perry
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Hugh Perry was appointed Professor of Experimental Neuropathology at the University of Southampton in 1998. His research interests are in the field of interactions between the immune system and nervous system, and in particular how systemic infection and inflammation play a role in driving the progression of neurodegenerative disease.

He has published more than 300 peer-reviewed papers. He has sat on research advisory and funding panels for a number of different groups and chaired the Cellular and Molecular Neuroscience panel of the Wellcome Trust 2004-2007. He has acted as a consultant for biotechnology and pharmaceutical companies in the area of neuroinflammation and neurodegenerative disease.

He was elected a Fellow of the Academy of Medical Sciences (2005), was a member of the Nuffield Council on Bioethics (2006-2012) and recipient of a Royal Society Wolfson Research Merit Award (2011). He is currently Chair of the MRC Neurosciences and Mental Health Board.



Professor Gunter Schumann
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Professor Gunter Schumann is the Chair of Biological Psychiatry, King's College London, Institute of Psychiatry (IOP).

He is a Professor of Biological Psychiatry and Head of the Section of Addiction Biology at the Social, Genetic and Developmental Psychiatry Centre (MRC), and Honorary Consultant at South London and Maudsley NHS Foundation Trust (SLaM), working at the National Psychosis Unit.

Before joining the IOP in 2005, he was trained (postgraduate) and worked at Harvard University, at the University of Freiburg and at the Central Institute of Mental Health, University of Heidelberg, Germany.

Gunter's general research interests are in etiological and diagnostic stratification of psychiatric patients to identify neurobehavioural phenotypes, which allow the development of predictive and prognostic biomarkers. His group thus works on the identification of neurobehavioural mechanisms of psychiatric disorders, including addictions. The group pursues an interdisciplinary approach, using neuroimaging, functional genetic and epigenetic methods as well as molecular biological and bioinformatic techniques.

He is coordinating an FP6 European research project IMAGEN - Reinforcement-related behaviour in normal brain function and psychopathology. IMAGEN is a longitudinal, multi-centre functional and structural genetic-neuroimaging study of a cohort of 2000+ 14 year old adolescents, which investigates the neurobiological and genetic basis of individual differences in brain responses to reward, punishment and emotional cues in adolescents.

In addition to the European Commission, Gunter's research group receives funding from the MRC and FAS (Sweden).

Annexure IV **CV-Indian Delegates**



Dr Sanjeev Jain
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Dr. Sanjeev Jain is Professor of Psychiatry, at Molecular Genetics Laboratory, NIMHANS. Dr Jain graduated in 1980 (MBBS) from the Maulana Azad Medical College, New Delhi. In 1983 he obtained his DPM (Diploma in Psychological Medicine), and later in 1985, his MD, from NIMHANS Bangalore.

Dr Jain's research has explored several aspects of genetics: alleles that contribute to risk for psychiatric and neurological disease, familial clustering of illnesses; correlates between imaging, neuropsychological functions, linguistics and physiological markers and genetics. Several genetic studies from the Centre of Addiction Medicine as part of MD theses have carried out in the laboratory to understand the genetics of alcoholism.

He is a co PI in the ICMR funded project on the 'Genetics of Alcohol dependence', and several candidate genes are being analysed in his laboratory as part of this research.



Dr Vivek Benegal
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Dr Benegal is Professor of Psychiatry, Centre for Addiction Medicine, NIMHANS.

His research work encompasses the following:

Neurobiology and genetics of vulnerability to alcohol dependence-involving the definition and characterization of a common vulnerability diathesis [the "externalizing syndrome"] which underlies substance dependence, and other early-onset psychiatric disorders, through the study of multiple risk-endophenotypes [brain morphology (MRI volumetry) – metabolism (glutamate/GABA ratio on magnetic resonance imaging) –function (CNS disinhibition studied using EEG, ERP, Transcranial magnetic stimulation and fMRI), autonomic function (heart-rate-variability) – externally manifest behaviours (clinical and family studies) and the peculiar response to alcohol and other drugs (subjective response to ethanol) and gene x environmental relationships in influencing vulnerability] .

Epidemiology of alcohol misuse in India - a] documenting the hazardous-harmful patterns of alcohol misuse (including the contribution of illicit beverages) in India with special emphasis on the harms from alcohol to persons other than the drinker; this has led to the interest in developing appropriate and replicable interventions at the primary health care level and the use of clinical decision support systems to enable primary health care workers to provide the

basic steps of a stepped care model of health delivery for mental illnesses and alcohol and tobacco related disorders; b] research on substance use and its impact on under-researched, high-risk, hidden populations: street and working children, victims of disaster; women (including the first assessment of normative drinking patterns and its impact on women in India).

Translational research -Application of newer pharmacotherapies and behavioural interventions to bedside practice, which has included the use of newer anti-craving agents like Baclofen; supplementation of the treatment-as-usual with atomoxetine/methylphenidate in early onset substance users; alpha-theta biofeedback and yoga in persons with an externalizing diathesis.

Policy and Advocacy - influencing alcohol policy and the public discourse on alcohol related problems in India- especially the move towards developing an Alcohol Policy for India and for incorporating alcohol interventions in preventable risk factors for all Non-Communicable Diseases in India. Involved in the planning of the Alcohol Atlas of India as well as the alcohol policies of various state governments.



Dr Pratima Murthy
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Dr Murthy is Professor of Psychiatry, Centre for Addiction Medicine, NIMHANS. She completed her medical graduation from the Bangalore Medical College and her Diploma and MD in Psychiatry from NIMHANS, Bangalore. She spent a brief stint in the UK on the overseas psychiatrists' training programme and

obtained a diploma in psychological medicine from the University of Manchester. She is an international associate of the Royal College of Psychiatrists.

Professor Murthy's primary area of expertise is in the field of addiction. At NIMHANS, she was in-charge of the Centre for Addiction Medicine between 2006 and 2013. Strengthening human resources to deliver intervention, setting up data management systems, comprehensive interventions including aftercare and the development of toxicology facilities were important areas of focus during this period. She has served as an ad-hoc consultant to the International Labour Organization, the United Nations Office on Drugs and Crime, the Colombo Plan and the World Health Organization on initiatives in the area of substance use prevention and management. She has mentored several students in carrying out research in the area of addiction. She has also authored several training manuals for addiction treatment and has been an international trainer in the area of tobacco cessation and workplace interventions for addiction prevention and treatment. She has been involved in the development of national guidelines for tobacco cessation and in providing training to build capacity for tobacco cessation nationally. She has been involved in the formulation of training guidelines for post-graduate psychiatry. She has been a co-director on the Fogarty ICHORTA Training Programme in behavioural disorders.

Some of her primary research areas within addiction include treatment and outcome of substance use related disorders, genetic underpinnings of addiction and related disorders, gender and substance use and foetal alcohol spectrum disorders. She has been involved in

epidemiological, clinical and community studies in the area and is particularly interested in translational research. Developing and assessment of workplace interventions, assessing substance use and mental health problems in prison, human rights and mental illness have been some of her primary contributions. Recently, she is leading a team to develop manualised training to address risk factors for non-communicable diseases, particularly alcohol and tobacco. Professor Murthy also has a keen interest in the history of psychiatry and with Professor S, Jain, has a Wellcome UK supported project on tracing the history of psychiatry in the region. She also has an interest in human rights and forensic psychiatry.



Dr Satish Chandra Girimaji,
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Dr Girimaji is Professor, Department of Child & Adolescent Psychiatry, NIMHANS. He has around 30 years of experience as a faculty in psychiatry/child and adolescent psychiatry at NIMHANS. His research specialisation includes intellectual disability & other neurodevelopmental disorders- biomedical, psychiatric and management, child and adolescent psychiatry - clinical aspects, mental health promotion, psychotherapy. His current research projects include molecular genetics of primary microcephaly, genetics and

neurobiology of autism.



Dr Mathew Varghese
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Dr Varghese is Professor of Psychiatry & Head, Dept. of Psychiatry, NIMHANS. He has been faculty at the Department of Psychiatry, NIMHANS for 30 years. His work at NIMHANS involves clinical services (Adult, Geriatric, Community and Family), postgraduate teaching, research and administration. At present he heads the department of psychiatry from 2013.

Dr Varghese's special areas of interest are psychogeriatrics, family psychiatry and psychosocial rehabilitation. Since 1998 he is one of the founding members of the International 10/66 Dementia Research Group and a member of the World Federation of Neurology Dementia Research Group. He heads the multidisciplinary team at the Geriatric Clinic; NIMHANS from 1999. He has developed family intervention manuals for use with caregivers of persons with dementia and schizophrenia. He was an investigator on the World Mental Health survey in India. He has many on-going research projects supported by international and national agencies like the Fogarty International Centre, Wellcome Trust, ICMR, the Department of Science and Technology and Dept. of Biotechnology, India. His current research covers the clinical and neurobiological aspects of dementia involving neuropsychological tests, genetics, imaging and proteomics.

He has also worked with the government on reviews of mental health programs and facilities in India. He is on the governing board of the Alzheimer's and Related Disorders Society of India (ARDSI), the World Association for Psychosocial Rehabilitation (India), and rehabilitation centres like the Richmond Fellowship Society (RFS-I) and the Medico Pastoral Association. He was the President, Indian Psychiatric Society (Karnataka Chapter) and is the Vice President,

ARDSI (Bangalore). He is the National Coordinator for the National Dementia Strategy of the ARDSI and the coordinating editor of the Dementia India Report 2010.



Dr Prabha S Chandra
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Dr Prabha S Chandra is Professor of Psychiatry, NIMHANS. She has been faculty at NIMHANS for over 25 years. She initiated the Perinatal Psychiatry outpatient services and a Mother Baby inpatient unit at NIMHANS. This service, which focuses on patient care, research and training, is the first of its kind in Asia. Her research spans 20 years of exploring the links between mental health and gender specific issues especially maternal mental health. Current research projects include:

- Examining the impact of mental health in each trimester of pregnancy on fetal outcomes, in a cohort of 650 pregnant women in Bangalore. (ICMR funding)
- The biology of mother infant bonding
- The impact of a mobile phone based psychological intervention for HIV positive women on ART and its impact on psychological measures, treatment adherence, CD4 counts and viral load. – NIH/ICMR funding
- The role of emotional recognition and other ToM tasks on mothering among women with schizophrenia

In 2011, her team's essay on *Measuring Research Quality in India* got the Research Council of UK India award in a competition by RCUK, India. She is the regional representative for Asia in the International Association for Women's Mental Health and has recently received the Dr Channi Kumar Oration award by The Marce International Society for Perinatal Psychiatry, Paris, 2012. In January 2014, she was awarded the Liverpool India Fellowship, 2014 which will enable her to work in Liverpool University in their maternal mental health research and infant observatory later this year.

Dr Meera Purushottam
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Dr Putshottam is Senior Scientific Officer, Molecular Genetics Laboratory, NIMHANS. She graduated (Microbiology) from the Bombay University in 1985. She later obtained her M.Sc in Biotechnology from Pune University. In 1994, she was awarded a Ph.D from the Indian Institute of Science, Bangalore for her work on chromatin organisation of unusual DNA structures.

She has been working on the genetics of neuropsychiatric illness including alcohol dependence using case control approaches. Dr Purushottam has been interested in the epigenetic influence in psychiatry. The correlations of alcohol dependence with family history as well as effect of environment are strong indicators of possible epigenetic effects.

She is working on a DST project 'Epigenetics of Alcohol dependence' where a DNA methylation signature in alcohol dependent subjects before and after treatment for alcohol withdrawal is under study.



Dr Sudhir Kumar Khandelwal
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Dr Khandelwal is Professor of Psychiatry and Head, Dept of Psychiatry, AIIMS, New Delhi and Head, NDDTC, AIIMS. His research interests include Neuro-Psychiatry, General Adult Psychiatry, Mental Health Services and Policy. He has carried out epidemiological studies on alcohol abuse and mental disorders in India and Nepal. He has been awarded Honorary

Membership of The Royal College Psychiatrists.

He was appointed as Regional Coordinator, South-East Asia Region of the Global Network for Research in Mental and Neurological Health. He has worked on the Country Mental Health Profiles of India, Nepal and Thailand under this Network. He was the Regional Coordinator of the International Consortium for Mental Health Policy and Services.



Dr Anju Dhawan
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Dr Dhawan is Professor of Psychiatry, National Drug Dependence Treatment Centre, AIIMS, New Delhi. Her research interests include opioid substitution treatment, adolescent drug abuse, inhalant abuse, substance use in pregnancy, abuse liability assessment, spirituality and substance use. She has been an investigator in 6 funded projects and co-investigator in 12 funded projects including

multicentre projects and those funded by WHO, UNODC (ROSA). Current on-going project is a multicentre study on Methadone Maintenance Treatment funded by UNODC and recently completed nation-wide study on Assessment of substance use and correlates in children funded by NCPCR.

She has been awarded the AIDS Training and Research Programme Fellowship for 3 months duration at University of California in Los Angeles in 2004. She was awarded Membership of WHO Expert Advisory Panel on Drug Dependence (Abuse Liability Evaluation). She is a member WHO expert group on Development of treatment guidelines for treatment of SUD in pregnant women; member of the Working Group on Drug Abuse and Addiction among children constituted by NCPCR; and member of the Task Force Committee for development of strategic, long term and result oriented approach to Substance Abuse Reduction and Capacity Building constituted by the Ministry of Social Justice and Empowerment, Govt. of India.



Dr Savita Malhotra

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Dr Malhotra is Professor of Psychiatry and Head, Department of Psychiatry at Postgraduate Institute of Medical Education and Research (PGIMER) Chandigarh.

She obtained her Bachelor of Medicine & Bachelor of Surgery (1973) from H.P. Medical College Simla; MD in Psychiatry (1976) & PhD (1985) from Postgraduate Institute of Medical Education and Research Chandigarh and Fellow of National Academy of Medical Sciences (1998). She has been on the faculty since 1979 and Head of the Child

and Adolescent Psychiatry Services in the Dept. of Psychiatry at the Postgraduate Institute of Medical Educational and Research, Chandigarh.

She has also been actively involved with several national and international societies and organizations: Indian Association for Child & Adolescent Mental Health (Past President and now Life President); International Association for Child and Adolescent Psychiatry and Allied Professions (Assistant Secretary General and Adjunct Secretary); Member and Consultant Education Committee of the World Psychiatric Association; and Temporary Advisor World Health Organization in the past. Currently she is President of the Asian Society for Child and Adolescent Psychiatry and Allied Professions; and Board Member of Child Psychiatry Section of the World Psychiatric Association, and past president of Indian Association for Social Psychiatry.

Dr Malhotra is a recognised resource person in mental health and child mental health at the national and international level. He has published over 170 articles, 50 book chapters and 6 books. She has received several (24) academic awards from various professional societies at the national and international levels.

Main areas of research include epidemiology of childhood psychiatric disorders, neurobiology of childhood onset schizophrenia and pervasive developmental disorders; temperament and psychopathology in children; acute and transient psychotic disorders; long term course and outcome of schizophrenia; and telepsychiatry application in delivering mental health care in remote areas in north India.



Dr Debasish Basu,

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Dr Basu is Professor of Psychiatry, PGIMER, Chandigarh. He was awarded the NIDA INVEST International Research Fellowship (NIDA, USA); NHS International Fellowship (NHS, UK); Tilak Venkoba Rao (ICMR); Marfatia, Bhagwat, PPA (IPS); Balint, GC Boral (IASP). Dr Debasish Basu, MD, DNB, MAMS, is Professor of Psychiatry in the Drug De-addiction & Treatment Centre (DDTC), Department of Psychiatry, Postgraduate Institute of Medical Education & Research (PGIMER), Chandigarh, India, where he is involved in psychiatric service,

postgraduate psychiatric teaching, research and administration. Earlier, he has worked as a NIDA-INVEST Fellow at Yale University, Connecticut, USA, and recently as a Consultant Psychiatrist in the Mersey Care NHS Trust, Southport, England.

Dr Basu has been awarded with several honours, distinctions, and awards, both at national and international levels. At the national level, he has received a total of 22 awards, some of which are: Tilak Venkoba Rao Award of the Indian Council of Medical Research (2000); Marfatia Award of the Indian Psychiatric Society for best original scientific paper, as co-author (1998) and principal author (2013); Bhagwat Award, for best original paper by a young member of the Indian Psychiatric Society, as sole author (1992); Balint Award of the Indian Association for Social Psychiatry, for the best narrative-experiential account of a therapist-patient relationship, as sole author (1997), and others.

At the international level, he was awarded the NIDA-INVEST International Research Fellowship by National Institute on Drug Abuse (NIDA), National Institutes of Health (NIH), USA, under its International Visiting Scientists and Technical Exchange (INVEST) Program, for one year. He conducted research in the area of addiction psychiatric genetics with Professor Joel Gelernter at the Division of Psychiatric Genetics, Department of Psychiatry, Yale University School of Medicine, New Haven, Connecticut, USA, in 2002-2003. He was also awarded the NHS International Fellowship by the National Health Service, Department of Health, Government of the United Kingdom, under its NHS International Fellowship Programme, to work as a Consultant Psychiatrist in General Adult Psychiatry in Mersey Care NHS Trust, Southport, Merseyside, UK, for a period of two years (2004-2006).

Dr Sailendra Kumar Deuri,

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Dr Deuri is Professor of Psychiatry and Director, Lokopriya Gopinath Bordoloi Regional Institute of Mental Health (LGBRIMH), Tezpur, Assam. He obtained his MBBS from Guahati University, DPM from CIP, Ranchi and MD in Psychiatry from NIMHANS, Bangalore. He has also worked as the WHO Post Doctoral Fellow to NSW institute of Psychiatry, Australia. His specific areas of research interest include forensic and rehabilitation psychiatry. Dr Deuri has also been a policy adviser for planning of Mental Health services for the north-east region of India. He has been a member of various state, provincial, zonal and national mental health committees in government, semi government and non government professional bodies constituted for policy and administrative matters. He has also been a co-opted member on health policy committee of North East Council a Govt of India agency and for Central Plan Scheme Ministry Health & Family Welfare, in the north-east region. He has held positions of secretary and president of the state branch of the Indian Psychiatric Society and is a member, National Mental Health Policy Body.



Dr C R J Khess

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At present Dr Khess is serving as a professor of psychiatry at Central Institute of Psychiatry, which is a Postgraduate teaching institute under the Ministry of Health and Family Welfare.

Since July 1999, he is heading the De-addiction Centre, which is a 60-bedded unit. De-addiction centre was started in this institute with the aim of serving as a centre of excellence for the Eastern region of the Country. He has published about 100 papers in various national and international journals.

Dr Rajkumar Lenin Singh
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Dr Singh is Professor and Head, Department of Psychiatry, Regional Institute of Medical Sciences, (RIMS) Manipur. His research experience includes work in the following: (a) National Household Survey of Drug and Alcohol abuse in India-(As local co-ordinator for Manipur, Nagaland, Mizoram state) undertaken by Govt. of India and sponsored by UNDCP in 2000-01, (b) Epidemiology of Mental Disorders- A longitudinal Study in Manipur, (Part of the national and sponsored by WHO-India as principal Investigator (2002-2005), (c) NICED-IHBAS-RIMS Collaborative Study on HIV/AIDS and Drug abuse in Manipur as Principal Investigator, undertaken by ICMR, New Delhi, (2006- 2008), (d) Screening and Management of Attention Deficit Hyperactivity Disorder (ADHD) amongst school children. Sponsored by Dept. of Science and Technology, Imphal – Principal Investigator, (e) Institutional and Counselling Capacities of Counselor Training Institutes- Project. He has been the Faculty In Charge of SR-RIMS, Imphal, SAKSHAM. He has also worked as the Nodal Officer – A Feasibility and Effectiveness Study on Methadone Maintenance Treatment (MMT) Programme in Manipur. He is also the Training Coordinator, Training for Management of Substance Abuse funded by NFCDA, Ministry of Finance, Government of India.



Dr Kamal Narayan Kalita
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Dr Kalita is Associate Professor of Psychiatry, Lokopriya Gopinath Bordoloi Regional Institute of Mental Health, Tezpur. He obtained his MBBS from the Guahati University in 2001 and MD in Psychiatry from the same university in 2006. In 2009, he obtained his PGDHHM from IGNOU. In 2013, he has received a Certificate in Research Methodology, from IIPH. Dr Kalita's areas of special interest are research methodology, substance problems, community mental Health, mental health promotion and legislature.



Dr Saurabh Ghosh,
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Dr Ghosh is Professor, Human Genetics Unit, Indian Statistical Institute Kolkata. He graduated in 1993 from the Indian Statistical Institute, Kolkata. In 1995, he obtained his M Stat and in 2001 he received his PhD from the same institute. In 2002, he worked as a post-doctoral fellow (Genetic Epidemiology) at the Washington

University, St. Louis, USA.

Dr Ghosh's expertise is in the area of Statistical Genetics and Genetic Epidemiology. While his primary interest lies in the development of model-free statistical methods for genetic mapping of complex genetic traits with special emphasis on quantitative traits, he has been involved in the statistical analyses in a large number of collaborative studies on a wide spectrum of complex disorders, the most significant being major psychoses, alcoholism and Type 2 Diabetes. His current research foci are modelling pleiotropy by analysing multivariate phenotypes and exploring novel methods for identifying rare genetic variants using both genome-wide association scan as well as next generation sequence data.



Dr John P. John
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Dr John is Additional Professor of Psychiatry and Adjunct Faculty of Clinical Neurosciences, NIMHANS. He underwent post-graduate training in Psychiatry at NIMHANS and post-doctoral training in MRI analyses at the Washington University School of Medicine, St Louis, MO, USA. He has been a faculty at NIMHANS since 2002. His area of clinical specialization is General Adult Psychiatry. His research interest is in linking multi-modal brain imaging techniques (sMRI, fMRI, MRS, DTI, EEG, ERP, PSG) and genomics in understanding the neurobiology of schizophrenia, dementia and other neuropsychiatric disorders, as well as of different cognitive states.

He is the Officer-in-Charge of the Multimodal Brain Image Analysis Laboratory (MBIAL) at the Neurobiology Research Center at NIMHANS.

Dr Venkatasubramanian Ganesan
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Dr Venkatasubramanian is Additional Professor of Psychiatry & Wellcome Trust /DBT India Alliance Senior Fellow, NIMHANS. He graduated from the Stanley Medical College, Chennai in 1998. He obtained his MD in Psychiatry from NIMHANS in 2001 and later went on to receive a Ph.D. in Psychiatry in 2013 from the same institute. In 2003-2004 he was awarded a Clinical Research Fellowship from the University of Sheffield, UK. He is currently the Assistant Editor of Indian Journal of Psychological Medicine and the Co-ordinating Editor of Asian Journal of Psychiatry. His research interests include translational psychiatry, schizophrenia, evolutionary neuroscience, neuroimaging, psychopharmacology, tDCS. He has received several awards for his research work which include the ICMR Tilak Venkoba Rao Award (2007) and the Scopus Young Scientist Award in Medicine (2006). In the field of substance use, he has published extensively in journals such as Addiction Biology and American Journal of Addiction.



Dr Prabhat Chand
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Dr Chand is Associate Professor of Psychiatry, Centre for Addiction Medicine, NIMHANS.

His research specialisation is in substance use disorder, comorbidity, and training manpower in addiction. He has obtained his MD in Psychiatry from PGIMER, Chandigarh. In 2013, he received a Fellowship in Public Health, from the University of New Mexico, Albuquerque USA.

He has conducted workshops on substance use disorder management for primary health physicians, has been a master trainer for Buprenorphine maintenance treatment for Opioid users, trainer for initiating and setting up of tobacco cessation services for Dentists, Psychiatrist and other health professionals and has worked towards public awareness on alcohol and nicotine among college students.

Rose Dawn Bharath
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Dr Rose Dawn Bharath is Associate Professor of Neuroimaging and Interventional Radiology & Faculty In charge, Advance brain imaging facility- Center for cognitive neurosciences. She obtained her MBBS from Bangalore University. She also holds degrees of Diplomate of the National Board, New Delhi in Radiodiagnosis and Doctor of Medicine in Neuroradiology from NIMHANS, Bangalore. Her research interests are Functional Neuroimaging and Diagnostic Radiology, Multimodal Neuroimaging, fMRI and EEG methodology and clinical application, Neuroimaging application in psychiatric disorders, movement disorder, epilepsy.

She has ten years experience in imaging techniques with seven years of exclusive neuroimaging expertise. She is generating protocols and paradigms for functional MR Imaging and independently conducting the FMRI examination. She is equipped with the necessary skills on data analysis with the use of Matlab and SPM, CONN, fNC, FSL-FEAT/MELODIC, Freesurfer and Brain Voyager. She is also familiar with the softwares for Diffusion tensor imaging and Voxel based morphometry, besides other tools for quantitative brain imaging like magnetization transfer imaging, T2 relaxometry, perfusion analysis Proton and phosphorus MR Spectroscopy. She has good knowledge on Simultaneous EEG-fMRI paradigm designing using Eprime-2 and data Processing Using Brain Analyzer, sLORETA, SPM8, GIFT since the last year.



Dr Muralidharan. K,
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Dr Muralidharan. K. is currently Associate Professor of Psychiatry at the National Institute of Mental Health and Neuro Sciences (NIMHANS), Bangalore. He is an alumnus of NIMHANS, having completed his MD from here and has been working as a faculty at NIMHANS since 2007. He has also worked as a visiting Assistant Professor at the University of British Columbia (UBC), Vancouver, Canada from July 2012-June 2013.

Dr Muralidharan has been involved in research in the areas of transcranial magnetic stimulation (TMS), electroconvulsive therapy, bipolar disorder and alcohol dependence. He has used single-pulse and paired-pulse TMS to investigate cortical excitability-inhibition imbalance as a potential endophenotype for alcohol dependence, for which he was nominated for the Enoch Gordis Research Recognition Award. The main findings of this work are that there are deficits in cortical inhibition, particularly involving the GABA-B receptors and also deficits in transcallosal conduction in individuals at high-risk for alcohol dependence. During his term at the mood disorders centre at UBC, he has also worked on neurocognitive deficits as markers of disease progression in early bipolar disorder and has published recently in this area. He is currently involved in investigating TMS and inflammatory markers as endophenotypes of bipolar disorder, using TMS-EEG and TMS-fMRI to cross-sectionally distinguish unipolar from bipolar depression and investigating the effects of yoga on heart rate variability and TMS markers of cortical inhibition in depression and anxiety disorders.

He is the recipient of many awards including the RSA Young Investigator Award in 2008 and the Asian Young Psychiatrist Award in 2011.



Dr Rajesh Kumar

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Dr Rajesh kumar is Associate Professor, Department of Psychiatry, Institute of Human Behaviour & Allied Sciences (IHBAS), Delhi.

Dr Rajesh Kumar received his MBBS from Patna University in 1996 and MD in Psychiatry, from AIIMS, New Delhi in 2001. He worked as a senior resident in the Department of Psychiatry at All India Institute of Medical Sciences, New Delhi before joining IHBAS, where he is the Consultant In-charge of Male Psychiatric Wards (General Male Adult

Ward & Forensic Psychiatry Ward). He is also the faculty coordinator for District Mental Health Programme under National Mental Health Programme at IHBAS. His research experience includes studying psychiatric morbidity among first-degree relatives of opioid dependent patients, performing a post-marketing surveillance of higher strength buprenorphine and in studying epidemiology of mental disorders using prospective study designs.

Dr Arun Kandasamy

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Dr Kandasamy is **Assistant Professor of Psychiatry, NIMHANS**. His areas of research interest are adolescence and addictive behaviour, dual diagnosis, emergencies in addiction medicine, course and outcome of addiction related disorders. He has been the sub-investigator of a study titled "Efficacy and safety of Baclofen GRS for treatment of Alcohol Dependence: A randomized, double blind, Placebo controlled, comparative, parallel groups, multi-centric, 12 week study" protocol No. CLR_09_23 funded by Grant from Sun Pharma Advanced Research Company (SPARC). He has also been involved in a study on pattern and outcome of inhalant use disorders in patients registered at CAM, NIMHANS from 2007-2012 and another study titled "Substance use disorders in Physicians-a tertiary care centre based study" from 2008-

2013. Currently, he is a co-investigator of a project titled "Stigma experience and related barriers of help-seeking in psychosis, depressive disorders and alcohol use disorders: An exploratory study"- Funded by NIMHANS grant and a co-investigator in another research project titled "Prevalence of Internet Addiction and its correlation with temperament in students of IIT Kharagpur". He is the Co- Principal Investigator of Regional Technical Training Centre (RTTC) at NIMHANS under the grant from Global Fund for AIDS, Tobacco Round 9 (GFATM Rd9) India HIV-IDU.

Dr Janardhanan.C. Narayanaswamy

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Dr. Narayanaswamy is Assistant Professor, DST-Innovation in Science Pursuit for Inspired Research (INSPIRE) faculty, NIMHANS. He is clinically affiliated to the OCD clinic and Schizophrenia Clinic at NIMHANS. His research Affiliations are Translational Psychiatry Laboratory, Cognitive Neurobiology Division. Neurobiology Research Centre at NIMHANS. His areas of research interests are elucidating imaging & immune biomarkers for Obsessive compulsive disorder, Examining bio-signatures predicting the medication response, examining the neurobiological markers/endophenotypes in high-risk subjects, Brain stimulation methods- Transcranial Direct Current Stimulation (tDCS). He has won multiple national and international awards for his original researches.



Dr Urvakhsh Meherwan Mehta

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Dr Mehta is Assistant Professor of Psychiatry & Wellcome Trust /DBT India Alliance Early Career Fellow NIMHANS.

He did his MBBS (2006) from the Mysore Medical College & Research Institute, Mysore and MD in Psychiatry from NIMHANS, Bangalore (2010). He is currently the Principal Investigator of a project titled Modulating Mirror Neuron Activity in Schizophrenia: A Novel Translational Application of MRI-Guided Transcranial Magnetic Stimulation: Grant from WellcomeTrust-DBT India Alliance, Early

Career Fellowship. His other research work includes development of an indigenous tool to develop a test battery to assess social cognition in the Indian context, studies on clinical significance and neurobiology of social cognition in schizophrenia (funded by ICMR and Department of Biotechnology, Government of India).

Dr Mehta is involved in psychiatric clinical care and translational research. His area of research interest has been to study schizophrenia from the perspective of it being a social brain disorder. He is specifically keen on exploring the neurobiological basis of social cognition impairments in schizophrenia (e.g., mirror neuron dysfunction) and develop novel methods to modulate brain regions involved in these complex cognitive abilities and thus enhance them by using non-invasive brain stimulation techniques. Dr Mehta is also an avid music and sports enthusiast.



Dr Shoba Srinath
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Dr Shoba Srinath is a Professor in the Department of Child and Adolescent Psychiatry at National Institute of Mental Health (NIMHANS), Bangalore. She has been the head of the Child and Adolescent psychiatry services from 1986.

Dr Shoba's major areas of clinical and research interests are childhood autism, obsessive compulsive disorders and affective disorders in the young. She has undertaken a number of research projects. They have been in the areas of epidemiology, obsessive compulsive disorders, mood disorders and autism. The unit has also been a participant in a number of Multi center drug trials funded by the industry.

She has been a member of the Executive Committee of the WHO – ICIDH, International task force 1999. She has also received the Dr DS.Raju Memorial Oration Award at the Annual conference of IPS- AP Chapter, Warangal on 13th July 2003. Her other awards include, Dr B. Gopalakrishna Rao Memorial Oration at IMA Shomoga on 11th Sept. 2004 and Dr LGP Achar Memorial Oration Award Lecture at KANCIPS 2005, Bangalore.



Dr V. Ravi
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Dr. Ravi is Professor & Head, Dept. of Neurovirology, Registrar, NIMHANS. He established a modern diagnostic and research Neurovirology laboratory the Department of Neurovirology, NIMHANS, which he started in 1985. During the past two and a half decades, his major interests include Public Health Virology, Pathogenesis and Immune response of viral infections of CNS and development of indigenous diagnostic assays. He has been responsible for the investigation of several outbreaks of viral diseases such as encephalitis, dengue, chikungunya and H1N1 in the country. His research has centred on the development of rapid, sensitive and specific diagnostic methods for the diagnosis and immunology of viral infections of the human central nervous system. Dr Ravi, has been involved in the development of three important indigenous diagnostic products in collaboration with Xcyton Diagnostics Pvt. Ltd., Bangalore. They include ELISA kits for detection of antibodies HIV, Japanese encephalitis virus and Cysticercus cellulosae. Additionally, he has developed a HIV 1 subtype C specific Real Time PCR viral load assay which is awaiting technology transfer to the industry. In collaboration with XCyton Diagnostic Industries, Bangalore, he has recently developed with in which a 'macro-array chip' has been developed for simultaneous detection of 24 viruses causing Acute Encephalitis Syndrome (AES). In collaboration with Dept. of Psychiatry, Dr Ravi is involved in a number of research projects on "Psychoneuroimmunology" especially Schizophrenia and Obsessive Compulsive disorder.

Dr Ravi has one European patent to his credit and over 128 research papers published in peer-reviewed journals. He has contributed 22 chapters to books and monographs. He is a master trainer for NACO, Government of India (GOI), New Delhi, and a member of Technical

Resource Groups of NACO on Lab Diagnosis, Anti-Retroviral Therapy and Early Infant Diagnosis. He is also serving as a member of the Scientific Advisory Committees of several institutions in the country such as National Institute of Virology, Pune, National Institute of Nutrition, Hyderabad, and National AIDS Research Institute, Pune. In addition, he also serves as an expert member of several National Task Force committees of ICMR (JE, H1N1), Department of Biotechnology (Diagnostics and Vaccines, Infectious Disease Biology) of GOI. Awards and honours: He is a recipient of several awards including the prestigious Sir CV Raman Young Scientist award, Dr JB Srivastav Oration Award of the ICMR for Eminent Medical Virologist, Dr SC Agarwal Oration Award of Indian Association of Medical Microbiologists (IAMM), 'Eminence in Virology' award of Indian Virology Society. Dr Ravi is also decorated with two prestigious fellowships- The Fellowships of the National Academy of Medical Sciences (FAMS) and the Indian Academy of Sciences (FASc). He has been appointed as the technical expert for many national and international committees and has served as a Short Term Professional for the WHO South East Asia Regional Office, New Delhi, in 2006- 2007 and as a consultant for WHO on several occasions thereafter on AIDS, H1N1 and Acute encephalitis syndrome. He was also the President of the Indian Association of Medical Microbiologists (IAMM) for the year 2011.



Dr P Satish Chandra

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Dr Satish Chandra is the current Director and Vice Chancellor of the prestigious neuropsychiatry institute in South Asia i.e. National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore. He has received several prestigious fellowships including that from NIH (Fogarty NIH) and worked in National Institute of Neurological Disorders (NINDs), Bethesda in the area of Neuro-epidemiology of Epilepsy. His research interests encompass Epilepsy, Electroencephalography and Evoked potentials, Neuroepidemiology and Neuroinfections including NeuroAIDS. He

has performed original research in the area of "Hot water epilepsy" as well as "NeuroAIDS" which has been recognized internationally. He has been the Principal investigator of research on Longitudinal Neurological Progression of HIV 1 and HIV 2, a prestigious RO 1 grant from NIH USA. He is also actively involved in community neurology and has initiated Epilepsy Control programme in India.

His honors include:

- International Neurosciences Fellowship at National Institute of Neurological Disorders and Stronkes (NINDs), NIH, Bethesda for an year
- Senior visiting fellowship at "Raymond Way Research Group" at the Institute of Neurology, Queen Square, London, UK for six months
- Asia Oceanian Outstanding Achievement Award in Epilepsy' from the Commission on Asia Oceanian Affairs, ILAE at the 8th Asia Oceanian Epilepsy Congress, Melbourne, Australia, in 2010 for his outstanding contributions to the field of Epilepsy in this region.
- The prestigious 'AmruthModyUnichem Prize' for Neurology (outstanding research in Epilepsy) from Indian Council of Medical Research (ICMR), New Delhi in 1998.
- Hindustan Ciba Geigy-Gold Medal for his research paper on Epilepsy in two consecutive annual conferences (1991 and 1993) of Neurological Society of India

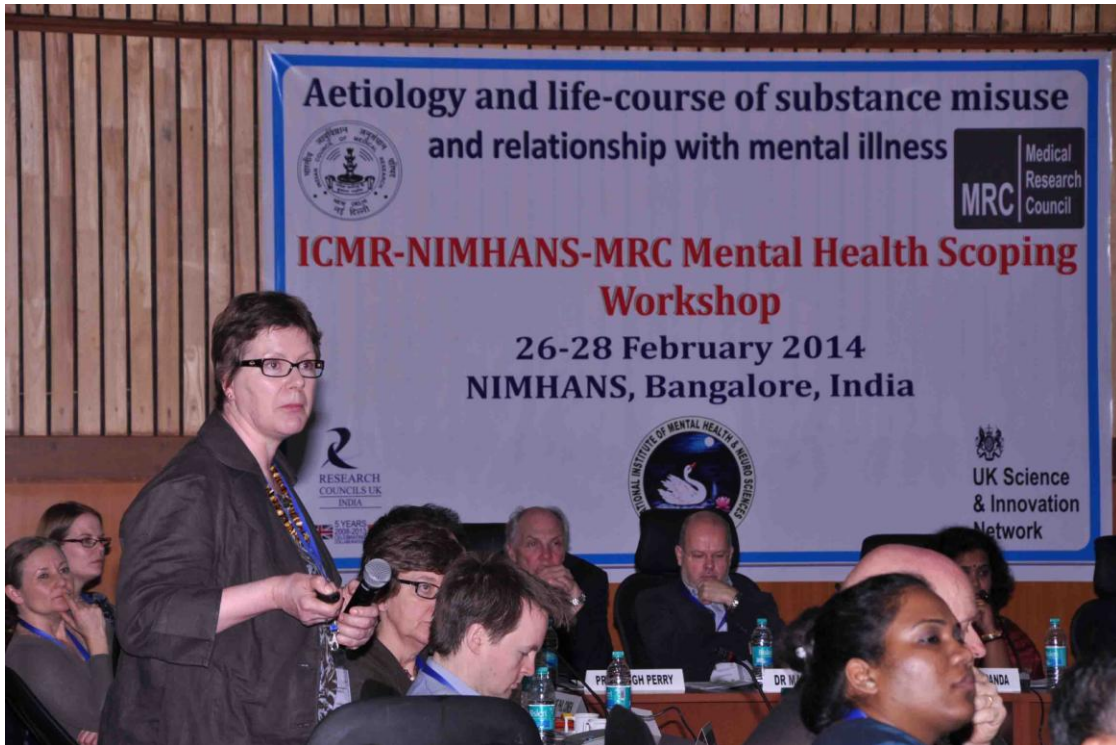
- Paper selected for 'Young Investigator Award' at the International Epilepsy Congress, Oslo, Norway in 1993.

The other positions he has held are:

- President, Indian Academy of Neurology (IAN), 2011-12
- Vice-President, Indian Epilepsy Society (IES), 2010-2012 and 2012-2014
- President, Indian Epilepsy Association (Bangalore Chapter), 2007-08
- President, Bangalore Neurological Society (BNS), 2009-11
- President, Karnataka Neurosciences Academy (KNA), 2012-13
- Associate Editor of Neurology India, Epilepsy Digest, Annals of Indian Academy of Neurology and Zonal Advisory Member for JAPI

Annexure V
Glimpses of the Workshop









Annexure VI CV-UK Organisers



Dr Mark Palmer
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Dr Palmer graduated in Biochemistry from the University of Oxford where he also completed his doctorate on the murine immune response to influenza. He has 11 years' post-doctoral experience in molecular biology working on the genetics of sex-determination at the Imperial Cancer Research Fund, Prion Diseases at St. Mary's Hospital Medical School and as a lecturer at Imperial College, London, working on Alzheimer's

disease.

Mark joined the Medical Research Council's Research Management Group in 1999 where he first had responsibility for structural studies and then for global infections. In 2006 he was appointed Director of International Strategy which sits within MRC's Strategy Group.

Mark has responsibility for MRC's international policy and coordination of global health strategy. He is Chairman of the Governing Council of the International Agency for Research on Cancer (IARC), chairman of the General Assembly of the European and Developing Countries Clinical Trials Partnership (EDCTP) and vice-president of the Board of Trustees of the Human Frontiers Science Programme (HFSP). He sits on the Governing Council of the European Molecular Biology Laboratory (EMBL) the European Molecular Biology Conference (EMBC) and the Court of Governors of the London School of Hygiene and Tropical Medicine. Dr Palmer has been the UK lead for the Health Theme of the European Commission's Framework Programme 7 and will be the lead for health in Horizon 2020.



Dr Catherine Moody
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Dr Moody has degrees in Pharmacology from the University of London, at King's then University College. Her thesis on non-adrenergic cholinergic innervation of smooth muscle was followed by post-doctoral research on smooth muscle contractile mechanisms at the National Heart and Lung Institute, London and the University of Massachusetts Medical School. She also gained experience in molecular biology at the University of Washington.

Since late 1991 she has worked within Research Programmes Group at the Medical Research Council in a range of biomedical areas. She undertook a period of secondment from 2004 to 2007 as Deputy Director of the Nuffield Council on Bioethics.

Catherine is currently a senior Programme Manager within the Neurosciences and Mental Health Board team with responsibilities for the scientific areas of neurodegenerative diseases and stroke. Major ongoing projects include the development of a UK Dementias Research Platform and the European Joint Programme on Neurodegenerative Diseases.



Dr Louisa Rahemtulla

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Dr Rahemtulla joined the MRC's International Strategy Team in 2012 as an International Programme Manager. She was previously a Corporate Affairs Manager at the MRC and a Policy Advisor for the Department for Business, Innovation and Skills. Her background is in chemistry with a PhD focused on novel materials for tissue engineering



Sukanya Kumar-Sinha

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Sukanya is Deputy Director at RCUK India. She leads on various programme activities and negotiations around building UK-India research collaborations. She joined RCUK India in October 2008. Prior to this she worked with the UK Border Agency office in New Delhi as Team Leader-Visa Support Officer. She has also, previously, worked with The Times of India as Executive in editorial quality audit.



Geeny George Shaju

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Geeny is the Office and Communications Manager at RCUK India. She joined RCUK India in July 2012. Previously she worked with the UK Border Agency also based in the British High Commission, New Delhi. She has worked with the British High Commission for more than seven years. Geeny has studied Sociology at Delhi University and has a post-graduate diploma in International Law.



Dr Tom Wells

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Tom is the Deputy Director, Science and Innovation Network and based in the British Deputy High Commission Bangalore office. He joined the Science and Innovation network in 2012, and prior to this worked for the Department for Business, Innovation and Skills in London as a Policy Advisor in the Science and Society Team, specialising in science and the media. He is a chemist by training and studied at the University of York. Following this he worked for Unigema (now Croda International) developing renewable ingredients for personal care products, some of which were patented with him as the inventor. There after Tom gained his PhD from Imperial College, researching new ways of making biodegradable plastics.



Sunil Kumar
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Sunil works as Senior Science and Innovation Advisor and is based in the British Deputy High Commission Bangalore office. He leads on developing research collaborations in Bioengineering, medical sciences, biopharma and space. He has varied interests ranging from aerospace, environmental sciences, media to life-sciences. He has MSc in Environmental Science and diplomas in Environmental Law and Mass Communication.

Sunil has a work experience of 15 years. He started his career working on ant diversity and behaviour at Indian Institute of Science. Later he worked on areas such as traditional conservation practices, protected areas and water pollution at the Centre for Environment Education. He also worked as a journalist at Deccan Herald writing on science and environment. He also worked on knowledge management with an IT company. Prior to joining the Science and Innovation Network, Sunil worked with UK Trade and Investment as a lead officer for the aerospace sector. Sunil has authored two books and more than 200 popular articles.



Sheryl Anchan
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Sheryl works as Science and Innovation Advisor and is based in the British Deputy High Commission Mumbai office. She joined the Science and Innovation Network in 2006 and works very closely with the senior adviser to support the network's work on life sciences. Sheryl has a significant experience in working with a range of stakeholders across government, academia, research and development institutions and industry in India and the UK. She is well-placed to facilitate linkages and build stronger ties between scientific communities in India and the UK within the life sciences sector. She has played an important role in raising the profile of the network and its activities through various media including the website. She has an academic background in Botany and Horticulture.

Annexure VII
CV-India Organisers



Ms Dharitri Panda is an Officer from the **Indian Civil Accounts Service (1987 Batch)**.

She has done double Masters – One in Sociology from Jawahar Lal Nehru University (JNU) and another in Public Policy & Sustainable Development from TERI, Delhi with an M.Phil. in Sociology from JNU. She has travelled widely abroad and participated in prestigious training Courses such as Global Flagship Course in World Bank Institute, Washington & trained in Public Policy Courses at Yale University, University of Austin, Texas, Brandeis University, Boston, Freie University, Berlin, Germany and School of Public Policy, Atlanta, USA. At present she is posted as Sr. Financial Advisor in Indian Council of Medical Research under Ministry of Health & FW. Before joining ICMR she was working as Chief Controller of Accounts in Ministry of Health & FW and has played a key role in streamlining the financial, budgeting and accounting framework of the Ministry as well as ICMR.



Dr D.K. Shukla
Scientist –G & Head, Division of Non Communicable Diseases(NCD), Indian Council of Medical Research, Ansari Nagar, New Delhi 110029

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Dr D. K Shukla is presently working in the Division of Non Communicable Diseases (**NCD**) of ICMR, New Delhi as Scientist-G & Head (NCD) to provide scientific, technical and administrative support in conducting the extramural research in the different areas of Non Communicable Diseases and also providing support to 7 ICMR permanent institutes located in different places in the country. He has a vast experience of working more than 30 years in the Division of Non Communicable Disease under different capacity in the Council. He has completed his Ph. D degree in Biostatistics from AIIMS, New Delhi. He is the member of Doctoral Committee for Ph.D. and M.D. at AIIMS New Delhi and other academic institutions. He has published around 50 articles in the national and international Journal. He participated various international and national conference and made presentation and also chaired different sessions in the conference. His area of specialization is in the planning, monitoring, analysis and report writing of various epidemiological studies under different areas of NCD such as Cancer, Cardiovascular Disease (CVD), Mental Health Neurology etc., carried out by the Council during last 30 years under Division of Non Communicable Disease. His areas of interest mainly in the NCD Surveillance, Burden of NCD Disease and Risk Factors of NCD, computing and application of various statistical tools in the area of NCD.



Dr Mukesh Kumar,

Head, International Health Division, Indian Council of Medical Research, Ansari Nagar, New Delhi 110029

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Dr Mukesh Kumar is working in the International Health Division (IHD) of ICMR, New Delhi as Deputy Director General (Sr. Grade)/Scientist-F/ Head (IHD) to assist coordination, monitoring and evaluation of international cooperation in biomedical sciences / health research between India and other countries as well as with international agencies under specific agreements / memoranda of understanding / joint statements.

He has represented ICMR, India as a member in various Joint Working Groups/ Joint Steering Committees for discussions/review and joint evaluation of bilateral/multilateral programmes between India and countries like USA, Canada, France, Germany, UK, Bulgaria, Vietnam, Hungary, Myanmar, Argentina, China, Slovenia, Mozambique, Cuba, Italy, Russia, Poland, Croatia, Sweden, Australia, Norway, Finland etc. coordinated by the Ministries of Science & Technology and Health and Family Welfare, Govt. of India (GOI) and ICMR.

He has successfully undertaken a WHO sponsored project during 2002-04 on competence building among young scientists in universities / medical colleges and research institutions in India and he was Investigator for an-ad-hoc project for development of a document on international collaborative research projects approved by the Health Ministry's Screening Committee. He is the Member Secretary for ICMR-INSERM ((India -France), ICMR-CIHR (India-Canada), ICMR-HGF ((India -Germany) and ICMR – Univ. of Minnesota, USA etc. Of late, ICMR has entered into research partnership with Karolinska Institute, Sweden, London School of Hygiene and Topical Medicine (LSHTM) and Medical Research Council, UK which are also co-ordinated.

He managed an virtual Indo-German Science Centre for Infectious Diseases (IG-SCID) under ICMR-HGF MoU signed during the visit by His Excellency the Prime Minister of India to Germany in April, 2006 and renewed in May, 2011 and was the Principal Investigator of an ad-hoc project on "Managing IG-SCID".

Dr Mukesh Kumar also assists the International Health Division for its programmes like ICMR International fellowships and transfer of biological material. He is the Member Secretary of Health Ministry's Screening Committee (HMSC) for consideration of international collaborative research projects in health research.



Dr Harpreet Sandhu

Scientist 'E', International Health Division, Indian Council of Medical Research

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Dr Harpreet Sandhu has been working in the International Health Division (IHD) at the Headquarters office of Indian Council of Medical Research, New Delhi since 2002. With a PhD in Parasitology from Post Graduate Institute of Medical Education and Research, Chandigarh, she has been actively engaged in teaching and training programmes for students and scientists. She is now extensively engaged in facilitating and coordinating the international collaboration

in biomedical research between India and other countries such as France, Germany, USA, Canada, Sweden, United Kingdom, Finland, Australia, with Global Alliance for Chronic Diseases(GACD), National Institute of Health & Care Excellence(NICE), UK; Foundation for Innovative New Diagnostics(FIND), Switzerland and various national & international agencies such as World Health Organization, Wellcome Trust, European Commission, Bill & Melinda Gates Foundation, Ministry of Science & Technology etc. Various bilateral agreements / MOUs / Joint Statements in various areas of health science have been signed by ICMR either directly or through Ministry of Health & F.W. with most of these countries.

Dr Sandhu is involved in research management, guidance and administrative work related to promotion of international health research. Awareness on procedural formalities and other issues related to international collaboration is created through exchange of scientific information, seminar talks/ conferences and bilateral meetings under mutual agreements signed with international organizations. Dr Sandhu has been trained at Harvard School of Public Health, Boston, USA and German Reference Centre for Ethics in the Life Sciences (DRZE) / Institute of Science and Ethics (IWE), Bonn, Germany on Ethical Issues in International Health Research.

Dr Sandhu is also engaged in the ICMR International Fellowship Programme of ICMR for research training and exposure of Indian biomedical scientists in various countries as well as offering opportunities to scientists from developing countries to come and work in Indian institutes/laboratories. She is involved in the consideration of various cases related to sanction of permission for international transfer of human biological material for research/commercial purposes by ICMR. The activities related to Biological Weapons Convention are coordinated with Ministry of External Affairs, Govt. She is also closely associated with the other activities of the Division including organization of international scientific meetings and workshops both at the Headquarters and at other Institutes.



Dr Ravinder Singh,
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Dr Ravinder Singh is working as Scientist C, Division of NCD, ICMR Hqrs, Ansari Nagar, New Delhi. He is medical graduate with expertise in Community Health. He has keen interest in Research in the areas of Mental Health, Geriatrics, Disasters, Disability and Environmental Health. Dr Singh has keen interest in the areas of Stress and Ageing. He has initiated various task force studies on

Gujarat Earthquake, Tamil Nadu Tsunami, Urban Mental Health, Suicide Behaviour and Determinants of Functional Status of Older Persons in India. He has prepared Report of the task force on "Mental health morbidity and service needs in Tsunami affected population in Coastal Tamil Nadu", "Development of NCD Surveillance Network in India", "Disaster Management and Mental Health", Monograph on Mental Health Research in India, "Reappraisal of the Situational Analysis of Current Scenario of Drug Abuse and HIV/AIDS in the North-Eastern Region of India", Report of the Indo-US Partnership Workshop on "Drug Abuse and HIV/AIDS in NE Region of India". He presented a paper on the "Drug Abuse and HIV/AIDS in NE Region of India" at International Conference at NIMHANS on 12th February 2006. He has organized various Conferences/Workshops like ICMR –WHO Workshop on "Disaster Management and Mental Health", Indo-US Workshop on "Emergency Response and

Preparedness”, “Reappraisal of the Situational Analysis of Current Scenario of Drug Abuse and HIV/AIDS in the North-Eastern Region of India” and Indo-US Partnership Workshop on “Drug Abuse and HIV/AIDS in NE Region of India”. He has attended national and International Conferences in India and abroad and presented papers on various issues related to mental health and ageing. He also submitted a paper on Research Priorities in Geriatrics in South East Asia Region for the SAARC countries.



Dr Tripti Khanna,
Scientist E, Indian Council of Medical Research New Delhi.
triptikhanna@ymail.com

Dr Tripti Khanna has been working at Indian Council of Medical Research since 1983. With a PhD in Mental Health, has been actively engaged in research management, guidance and administrative work related to technical review, processing and monitoring of NCD researches carried out and funded by ICMR in the area of NCD with special reference to Mental Health, Orthopaedics, Urology, Nephrology, Otorhinolaryngology, Disability & rehabilitation etc. She is an ICMR-NIH trained Bio-Ethicist besides FERCAP (Thammasat-Thailand). She has also formal training from WHO in Health Systems Research as well as Health Care Financing from Chulalongkorn, Bangkok. She is Ethics Committee member of the Jawahar Lal Nehru University besides other Institutions. She is also the Chief coordinator of all Indo-Foreign projects of the Division of NCD.