Report of the National Capacity Building Workshop on Air-borne Infection Control in India, held on 20th – 24th October, 2009 at LRS Institute of TB & Respiratory Diseases, New Delhi

The National Capacity Building Workshop on Air-borne Infection Control in India under the Revised National TB Control Programme was jointly organized by Central TB Division and LRS, Institute, New Delhi with financial support from WHO-India and technical assistance of WHO and CDC. This workshop was held at the Conference Room, 2nd Floor, OPD Building of Lala Ram Sarup Institute of TB and Respiratory Diseases, New Delhi on 20th – 24th October, 2009.

The invitees for this workshop were as follows
1. Members of National Airborne Infection Control Committee (NAICC)
2. Representatives from National TB Institutes like NTI, TRC, LRS
3. State Officials from Gujarat and West Bengal states
4. State Officials and representatives from Hospitals identified for field visit during the workshop at New Delhi

The detailed list of participants is given as annexure 1.

The objectives of the meeting were as follows:
1. To deliberate upon the draft guidelines on airborne infection control in health care and other settings in India.
2. To develop expertise of participants on the principles of airborne infection control in health care facilities and demonstrate the application of these principles to practical situations
3. To impart skills for facility risk assessments for airborne infection control measures and the development of recommendations for facilities to reduce risk of airborne infection transmission.
4. To develop model airborne infection control plans for different facility levels that could be adapted to most facilities in India
5. To develop plans for the pilot testing of national airborne infection control guidelines in a range of healthcare facilities.

The expected outcomes of the workshop were anticipated to be as follows:
At the end of the workshop participants should be able
- to explain the principles of infection control
- to conduct facility assessments for risk of TB transmissions
- to recommend specific administrative and environmental / engineering remedies to reduce TB transmission risk and
- to assist facilities in incorporating TB infection control in their infection control plans

The detailed agenda for the workshop is given as annexure 2.

Proceedings of Day 1: 20th October 2009

The workshop began with an inauguration session. Dr. SK Jindal, Chairman - National Airborne Infection Control Committee (NAICC) and Prof & Head, Dept of Pulmonary Medicine, PGI Chandigadh; Dr LS Chauhan, DDG TB, Central TB Division, New Delhi; Dr Puneet Dewan, MO-TB WHO SEARO; Dr Michele Pearson, MO-Div. of TB Elimination, CDC Atlanta; Dr R Chandrashekar, Sr Architect, DGHS, MoHFW (GoI), New Delhi; Dr. Rohit Sarin, LRS Institute, Delhi; Dr. Rupak Singla, LRS Institute, Delhi were the guests for the inaugural session.

Dr Rohit Sarin welcomed the dignitaries on the dais with floral bouquet and the participants from the NAICC and from West Bengal and Gujarat states. He invited the dignitaries on the dais to address the participants and share their thoughts on the event.

Dr. SK Jindal, NAICC Chairman, in his address, welcomed all the participants to the workshop. He appreciated the commitment showed by the participants by attending the workshop in spite of the short notice. He expressed that after the formation and streamlining of the NAICC, the draft guidelines on airborne infection control in health care and other settings has been developed and updated after intense deliberations in 2 NAICC meetings. He congratulated all the members of the writing group for this progress

and requested all participants to make the best out of the presence of eminent national an international faculty in this workshop to understand and imbibe the skills required to implement these infection control measures

Dr LS Chauhan (DDG-TB) was the next to address the gathering. He appreciated the progress made by NAICC in developing the draft national guidelines on airborne infection control. He explained the objectives and expected outcome of the workshop to the participants. He expressed that since the inception of the programme, early diagnosis and treatment of the infectious TB cases has been the key strategy under DOTS for preventing the further transmission of the disease. He stressed that this would continue to be the prime strategy however, the programme is now proactively willing to roll out the national infection control guidelines as one of the components on health system strengthening spelt out in the STOP TB Partnership – 2006 that has been endorsed and implemented by RNTCP. He conveyed that RNTCP would play a role in developing and disseminating the national guidelines and advocate its integration in the Indian Standards of Public Health under NRHM. He added that RNTCP would provide technical assistance to the general health system through the National and State Infection Control Committees. The support would be in terms of capacity building of administrators and supervisors in the national guidelines as well as training of health care workers and community awareness on infection control practices and proper use of personal protective equipments. He reiterated that application of these infection control measures at high risk facilities can be supported for up-gradation of IRLs, DOTS Plus Site and DMCs through RNTCP while for up-gradation of ART Centers; the provision is available through NACO. He stressed that the implementation of the infection control measures as per the guidelines and interventions based on risk assessment would be the responsibility of the general health system with support from NRHM, DMER and state governments. He requested all the participants to take advantage of the presence of renowned national and international experts facilitating this workshop to develop the skills required in terms of facility risk assessment and recommending specific feasible corrective actions to reduce the risk of transmission in the health care facility. He welcomed Dr Michele Pearson, CDC Atlanta and appreciated her gesture to facilitate the workshop and share her global experience in implementation of infection control measures. He concluded by requesting all participants and facilitators to further deliberate on the draft guidelines to make it practicable with necessary revisions and updates if required.

Dr Michele Pearson, in her guest address, congratulated the leaders of the national programme for the proactive step taken in developing the national guidelines and yearning to implement them. She expressed that there is limited experience on implementation of infection control measures in resource limited countries in the world and India can be a front runner in gaining and sharing with the world the experience in developing a realistic guidelines that is feasible for implementation in the field. She expressed her pleasure to be a part of the workshop and share international experiences on the subject. She concluded her address by expressing her gratitude to have her as a faculty to this workshop and wished RNTCP and all participants success in this endeavor.

The inaugural session concluded with a vote of thanks by Dr Rupak Singla, LRS Institute, New Delhi.

Dr Puneet Dewan briefly introduced the workshop contents and gave an overview of the infection control principles and practices that would be covered over the next 5 days.

This was followed by the presentation of "Administrative Controls – Outpatient Settings" by Dr Michele Pearson. The principles and experience in various countries in implementing these control measures were discussed at length in this presentation.

Then, Dr Ashutosh Aggarwal, Associate Professor, Department of TB & Chest Diseases, PGIMER Chandigarh made a presentation on "Administrative Controls – Outpatient settings: Recommendations in National Guidelines" on behalf of NAICC. This was followed by detailed discussion on modifications and updating required in this section in the national guidelines. This has been detailed in Annexure 3.

An observation visit was undertaken by the participants in 2 groups with 2 facilitators each to the OPD area, Registration area, Dispensary area, Sputum Collection and Radiology area at LRS Institute, New Delhi. Each of the groups made a brief presentation on the observations made pertaining to administrative infection control practices existing and suggestions for improvement for each of the areas. This was followed by interactions amongst the participants on the suggestions made.

Dr Michele Pearson presented "Administrative Controls – Inpatient Settings". The principles and experience in various countries in implementing these control measures were discussed at length in this presentation.

This was followed by a presentation on "Administrative Controls – Inpatient settings: Recommendations in National Guidelines" by Dr Puneet Dewan on behalf of NAICC. This was followed by detailed discussion on modifications and updating required in this section in the national guidelines. This has been detailed in Annexure 3.

The last presentation of the day was made on "Role of Health Facility Management" by Dr Malik Parmar, WHO Consultant – RNTCP, CTD on behalf of NAICC. The suggestions made by the participants during discussion on this section have been detailed in Annexure 3.

Proceedings of Day 2: 21st October 2009

Dr Michele Pearson presented "Environment / Engineering Controls – 1: Ventilation". The principles and experience in various countries in implementing these control measures were discussed at length in this presentation.

This was followed by a presentation on "Design in renovation to optimize natural ventilation – Case Study on ART Centre at RML Hospital" by Dr R Chandrashekhar. This was followed by detailed discussion on application value of the engineering modifications in context of the national guidelines and updating required in this section in the national guidelines. This has been detailed in Annexure 3.

Dr Michele Pearson then presented "Environment / Engineering Controls – 2: Air Cleaning". The principles and experience in various countries in implementing these control measures were discussed at length in this presentation.

This was followed by a presentation on "Environment / Engineering Controls –Recommendations in National Guidelines on Airborne Infection Control in healthcare and other settings in India" by Dr Puneet Dewan on behalf of NAICC. This was followed by detailed discussion on modifications and updating required in this section in the national guidelines. This has been detailed in Annexure 3.

An observation visit was undertaken by the participants in 2 groups with 2 facilitators each to the OPD Clinic room, Culture and DST Lab, Sputum Collection booth and MDR TB ward at LRS Institute, New Delhi. The objective of the exercise was to measure the air changes per hour (ACH) for each of the rooms visited. Each of the groups made a brief presentation on the calculations made pertaining to ACH and environmental infection control practices existing to achieve the requisite ACH specific to the site. Suggestions for improvement for each of the areas were also presented which was followed by interactions amongst the participants.

This was followed by a table top exercise with floor plan layouts and elevation on "Facility design and use". The scenario of the exercise was described by Dr Puneet Dewan. This was followed by detailed discussion on the solutions presented by each of the group and a sample solution for the scenario of the exercise.

Dr Michele Pearson then presented "Engineering Controls - 3: Ultraviolet light (UV light)". The principles and experience in various countries in implementing these control measures were discussed at length in this presentation that was followed by detailed discussion and sharing of local experience in using UVGI lights at LRSI and DOTS Plus Site Ahmedabad.

The 2nd day concluded by a brief outline on Facility Risk Assessment Tool to be used for the field visits to AIIMS and LNJP Hospital, New Delhi in 2 groups.

Proceedings of Day 3: 22nd October 2009

Both the groups proceeded early morning for Comprehensive Facility Risk Assessment field visits to AIIMS and LNJP Hospital, New Delhi with 2 facilitators each. The process for the comprehensive facility assessment began with discussion with the management of the institute followed by a detailed assessment of management practices, administrative controls and transmission risk in facility, environment engineering controls including using of space.

The groups returned back to LRS Institute by afternoon and presented their observations and suggestions for improvement in all fronts of infection control practices i.e. administrative controls, environmental/engineering controls and personal protective measures. The facilitators assisted the group to interact on key learning points from the field visit to understand better the process of facility risk assessment and to make practical recommendations that can be easily implemented to reduce the facility risk of transmission of airborne infections.

The 3rd day concluded by a brief outline on Facility Risk Assessment Tool to be used for the field visits to special settings like DOTS Plus Ward at RBTB Hospital and ART Center at RML Hospital, New Delhi in 2 groups.

Proceedings of Day 4: 23rd October 2009

Both the groups proceeded early morning for Facility Risk Assessment field visits to special settings viz. DOTS Plus Ward at RBTB Hospital and ART Center at RML Hospital, New Delhi with 2 facilitators each. The process for the facility risk assessment was similar to the visits on Day 3 followed by a detailed assessment of management practices, administrative controls and transmission risk in facility, environment engineering controls including using of space at the special settings.

The groups returned back to LRS Institute by afternoon and presented their observations and suggestions for improvement in all fronts of infection control practices i.e. administrative controls, environmental/engineering controls and personal protective measures at each of the high risk setting. The facilitators assisted the group to interact on key learning points from the field visit to understand better the process of facility risk assessment and to make practical recommendations that can be easily implemented to reduce the facility risk of transmission of airborne infections.

This was followed by presentation on Special Settings – Recommendations in National Guidelines for ART Center; DOTS Plus Ward; Culture and DST Laboratory by Dr Rajasekaran, Consultant – NACO; Dr RN Solanki, Dept. of TB & Chest Diseases, BJMC, Ahmedabad and Dr Anand, Microbiologist, NTI Bangalore respectively on behalf of NAICC. This was followed by detailed discussion on modifications and updating required in this section in the national guidelines. This has been detailed in Annexure 3.

Dr Michele Pearson then presented "Personal Respiratory Protective Equipments". The principles and experience in various countries in implementing these control measures were discussed at length in this presentation.

This was followed by a presentation on "Personal Respiratory Protective Equipments –Recommendations in National Guidelines on Airborne Infection Control in healthcare and other settings in India" by Dr Puneet Dewan on behalf of NAICC. A detailed discussion on modifications and updating required in this section in the national guidelines took place after the presentation. This has been detailed in Annexure 3.

Before the conclusion on Day 4, Dr Michele Pearson demonstrated the correct use of certain variety of N95 respirators, discussed about the fit test and invited all participants to practice the fit testing of these N95 respirators. All participants had a first hand exposure of the correct technique of applying the N95 respirators and check the fit of the respirators with a blow test.

Proceedings of Day 5: 24th October 2009

The participants were divided into 3 groups for group work, 2 groups with representatives of West Bengal and Gujarat states for development of State level action plan for rolling out NAIC Guidelines with timelines for pilot states and Dr Puneet Dewan explained the details that each of the group should incorporate in the plan under the following major heads:

- Advocacy with State Authorities
- Defining coordination and planning mechanisms
- Listing all variety of health facilities for pilot
- Capacity Building in risk assessment and training activities
- Facility Airborne Infection Control Plan development, integration in facility infection control

plan and approval with budgeting
- Implementation of AIC measures
- Supervision, Monitoring and Review Mechanisms
- Evaluation of Pilot

Both the groups had to finalize the timelines for each of the planned activities and submit the action plan to roll out NAIC Guidelines in the state. Each group had facilitators from NAICC.
The third group was formed of the remaining participants to review the draft national guidelines on airborne infection control and suggest any further updating or modifications required.

This was followed by the presentation of state action plans of the group work by each of the groups. Dr SK Sharma (Chairman, NTF), Dr D Behera (Director LRSI) and Dr LS Chauhan (DDG-TB) chaired the session. The detailed action plans of both states and the recommendations for improving the same have been enclosed in Annexure-4. DDG TB appreciated the efforts of both the state teams and requested both the states to take up strong advocacy with the Principal Secretary / Commissioner (Health), NRHM Mission Directors; DHS and DMER of West Bengal and Gujarat and initiate the process of formation of State Airborne Infection Control Committees as the first step towards pilot testing of the guidelines in both the states. The suggestions made by the third group working on the draft national guidelines were presented and the same have been enclosed in Annexure – 3. DDG TB informed that state representatives that the final guidelines would be circulated after all the suggestions for modifications and updating of the guidelines made during the workshop are considered by NAICC and incorporated in the existing draft guidelines.

Dr Puneet Dewan made the final presentation on "Summary of National Airborne Infection Control Guidelines and suggested improvements emerging from workshop". The suggested improvements emerging from the workshop are enlisted in annexure 3. This was followed by the discussion on the next steps for pilot testing of the guidelines in West Bengal and Gujarat. The timelines for the crucial steps in pilot testing of the guidelines were decided as follows:

1. Finalization of the National Guidelines on Airborne Infection Control – November '09 end
2. States to submit the detailed action plan for pilot testing of guidelines – December '09 mid
3. Operational Research Proposal development for pilot testing the feasibility of implementation of the national guidelines in 2 states – December '09
4. Pilot testing of the guidelines in 2 states – January to December 2010.

Dr SK Sharma, NTF Chairman appreciated the initiative taken by the programme and recommended to include it in the curriculum of doctors, nursing and other paramedical staff. He also informed that a presentation outlining the National Guidelines on Airborne Infection Control and the next steps would be made at the upcoming National Task Force Meeting at AIIMS, New Delhi.

This was followed by the concluding session. Dr LS Chauhan, DDG TB expressed his gratitude to the chief guests for making it convenient to come to the workshop. He thanked Dr Michele Pearson for her valuable time and technical inputs to build capacity of NAICC and State representatives on this crucial issue. He also thanked all the participants for their deliberations and suggestions to the programme for further improving the draft national guidelines on airborne infection control in health care and other settings in India. He expressed his appreciation to Dr D Behera and his team from LRS Institute, New Delhi for the excellent arrangements that were made for the workshop. He concluded by appreciating the efforts taken by STO Delhi and his team for arranging the field visits to various hospitals in New Delhi.

Annexure 1

List of Participants at the National Capacity Building Workshop on Airborne Infection Control in India – 2009:

1. Dr LS Chauhan, DDG TB, Central TB Division, New Delhi
2. Dr D Behera, Director LRSI, New Delhi
3. Dr SK Jindal, Chairman NAICC, Prof & Head, Dept. of Pulmonary Medicine, PGIMER, Chandigarh
4. Dr SK Sharma, Chairman NTF, Prof & Head, Dept. of Medicine, AIIMS, New Delhi
5. Dr R Chandrashekhar, Sr. Architect, GDB, DGHS, MoHFW (GoI), New Delhi.
6. Dr Sunil Gupta, Joint Director, National Centre for Disease Control, New Delhi
7. Dr K Sachdeva, CMO (TB), Central TB Division, New Delhi
8. Dr Michele Pearson, MO - Division of TB Elimination, CDC Atlanta
9. Dr Puneet Dewan, MO (TB), WHO-SEARO, New Delhi
10. Dr Rajeshwari Ramachandran, STP, WHO SEARO, New Delhi
11. Dr Ranjani Ramachandran, MO (TB Labs), WHO-SEARO, New Delhi
12. Dr N. Selvakumar, Scientist F, TB Research Centre, Chennai, Tamil Nadu
13. Dr Ashutosh Aggarwal, Associate Professor, Dept. of Pulmonary Medicine, PGIMER, Chandigarh
14. Dr A. Mahilamaran, Resident Medical Officer, Govt. Hospital of Thoracic Medicine, Tambaram, Chennai
15. Dr S Anand, Consultant Microbiologist, NTI Bangalore, Karnataka
16. Dr S Rajasekaran, Consultant (ART) – NACO, New Delhi
17. Dr Rupak Singla, LRS Institute, New Delhi
18. Dr Rohit Sarin, LRS Institute, New Delhi
19. Dr Khalid U. Khayyam, LRS Institute, New Delhi
20. Dr RP Vashist, State TB Officer, New Delhi
21. Dr S Dutta Choudhury, State TB Officer, West Bengal
22. Dr Nishith Kumar Pal, Professor, Department of Microbiology, IPGME&R, Kolkata, West Bengal
23. Dr Aniruddha Mukherjee, Technical Officer, Strategic Planning and Sector Reforms Cell, Dept of Health and Family Welfare, Govt. of West Bengal
24. Dr RN Solanki, Associate Professor, Dept. of TB & Chest Diseases, BJMC Ahmedabad, Gujarat
25. Dr TV Bhalodia, Director, STDC – Ahmedabad, Gujarat
26. Dr Neeti Babbar, MO, STC, New Delhi
27. Dr Charoo Hans, Professor & Head, Microbiology Department, Sec. Infection Control Committee, RML Hospital, New Delhi
28. Dr Ashwani Khanna, CMO(NFSC), Incharge, DOTS Plus Site, LNJP Hospital, New Delhi
29. Dr Arvind Gupta, Chest Specialist, RBIPMT Delhi
30. Dr Vinay Gulati, Associate Professor, Dept. of Medicine, AIIMS, New Delhi
31. Dr Deepak Gupta, Medical Officer - RNTCP, AIIMS, New Delhi
32. Dr Satish Kaipilyawar, Project Director, PATH India (India TB Programme), New Delhi
33. Dr Sheena Susan George, Technical Officer, PATH India, New Delhi
34. Dr Rahul Thakur, Programme Officer, NACO, New Delhi
35. Dr Sarabjit Chadha, WHO Consultant – DR TB, Central TB Division, New Delhi
36. Dr Malik Parmar, WHO Consultant - RNTCP, Central TB Division, New Delhi
37. Dr Silajit Sarkar, Medical Consultant, WHO-RNTCP (TAP), West Bengal
38. Dr Durba Paul, Medical Consultant, WHO-RNTCP (TAP), West Bengal
39. Dr Kiran Rade, Medical Consultant, WHO-RNTCP (TAP), Gujarat
40. Mr. Bhaskar Naidu, HEO, LRS Institute, New Delhi

Annexure 2

Revised National Tuberculosis Control Programme

National Capacity Building Workshop on Air-borne Infection Control in India

Organized by Central TB Division and WHO India

Dates: 20th – 24th October 2009 **Venue: LRS Institute, New Delhi**

Objectives:

1. *To deliberate upon the draft guidelines on airborne infection control in health care and other settings in India.*
2. *To develop expertise of participants on the principles of airborne infection control in health care facilities and demonstrate the application of these principles to practical situations*
3. *To impart skills for facility risk assessments for airborne infection control measures and the development of recommendations for facilities to reduce risk of airborne infection transmission.*
4. *To develop model airborne infection control plans for different facility levels that could be adapted to most facilities in India*
5. *To develop plans for the pilot testing of national airborne infection control guidelines in a range of healthcare facilities.*

Expected Outcome of the Workshop:

At the end of the workshop participants should be able

- *to explain the principles of infection control*
- *to conduct facility assessments for risk of TB transmissions*
- *to recommend specific administrative and environmental / engineering remedies to reduce TB transmission risk and*
- *to assist facilities in incorporating TB infection control in their infection control plans*

Day 1: 20th October 2009

Time	Topic	Facilitator
9.00 am to 9.30 am	**Registration and Refreshments**	
9.30 am to 10.15 am	**Inaugural Session:** **Welcome address: Dr. Rohit Sarin, LRS Institute, Delhi** **Address by: Dr. Jindal, Chairman, National Airborne Infection Control Committee, Prof & Head, Dept of Pulmonary Medicine, PGI Chandigadh.** **Address by: Dr. D Behera, Director LRS Institute, Delhi,** **Address by: Dr. LS Chauhan, DDG TB, CTD, Delhi** **Address by: Dr. RS Shukla, Joint Secretary-MoHFW, GOI** **Vote of Thanks: Dr. Rupak Singla, LRS Institute, Delhi**	
10.15 am to 10.30 am	Welcome, Introduction, Objectives, Expected outcomes of the workshop	**Dr. LS Chauhan, DDG TB, CTD**
10.30 am to 10.45 am	Refreshments	
10.45 am to 11.00 am	Introduction to program and Overview of infection control	**Dr. Puneet Dewan, MO-TB, WHO-SEARO**
11.00 am to 11.30 am	Administrative Controls – Outpatient settings	**Dr. Michele Pearson, MO-Div. of TB elimination, CDC Atlanta**
11.30 am to 12.00 pm	Administrative Controls – Outpatient settings: Recommendations in National Guidelines	**Dr. Ashutosh Aggarwal, Department of TB & Chest Diseases, PGI Chandigarh**
12.00 pm to 12.45 pm	Observation Visit to LRS Registration, Clinics, Radiology and Dispensary – existing practices, opportunities and challenges for administrative controls	**Group 1: Dr Puneet Dewan** **Group 2: Dr Michelle Pearson** **Group 3: Dr Rohit Sarin** **Group 4: Dr Rupak Singla**

12.45 pm to 1.30 pm	Presentation and Discussion on observations on administrative infection control practices.	**Dr. Michele Pearson, MO-Div. of TB elimination, CDC Atlanta**
1.30 pm to 2.15 pm	Refreshments	
2.15 pm to 2.30 pm	Review Administrative Controls & Short Video	
2.30 pm to 2.45 pm	Administrative Controls – Inpatient settings	**Dr. Michele Pearson, MO-Div. of TB elimination, CDC Atlanta**
2.45 pm to 3.00 pm	Administrative Controls – Inpatient settings: Recommendations in National Guidelines	**Dr. Sarabjit Chadha, WHO Consultant – DR (TB), Central TB Division**
3.00 pm to 3.45 pm	Exercise 1: In-patient segregation	**Introduction by Dr Puneet Dewan and Dr Malik Parmar**
3.45 pm to 4.00 pm	Refreshments	
4.00 pm to 4.30 pm	Presentations by 2 groups on their practices suggested for segregation	**Group presentation and critique by participants**
4.30 pm to 5.00 pm	Role of health facility management	**Dr Malik Parmar, WHO Consultant-RNTCP, Central TB Division**

Day 2: 21st October 2009

Time	Topic	Facilitator
9.00 am to 10.00 am	Environment / Engineering Controls – 1: Ventilation a. General ventilation (buildings) b. Local ventilation (booths, hoods)	**Dr. Michele Pearson, MO-Div. of TB elimination, CDC Atlanta**
10.00 am to 10.30 am	Design in renovation to optimize natural ventilation – Case Study??	**Dr R Chandrashekhar, Senior Architect, DGHS Ministry of Health & Family Welfare, GoI**
10.30 am to 10.45 am	Refreshments	
10.45 am to 11.00 am	Environment / Engineering Controls – 2: Air cleaning a. Air filtration b. Room air cleaners	**Dr. Michelle Pearson, MO-Div. of TB elimination, CDC Atlanta**
11.00 am to 11.30 am	Environment / Engineering Controls – Recommendations in National Guidelines on Airborne Infection Control in healthcare and other settings in India	**Dr. Puneet Dewan, MO-TB, WHO-SEARO**
11.30 am to 12.30 am	Visit for Air Exchange Calculation Exercise 1. OPD Clinic Room 2. Sputum collection Booth 3. Culture & DST Laboratory 4. MDR Ward	**Group 1: Dr Puneet Dewan** **Group 2: Dr Michelle Pearson** **Group 3: Dr Rohit Sarin** **Group 4: Dr Rupak Singla**
12.30 am to 1.30 am	Group Presentation and Discussion on observations on environmental infection control practices.	**Dr. Michele Pearson, MO-Div. of TB elimination, CDC Atlanta**
1.30 pm to 2.15 pm	Refreshments	
2.15 am to 3.00 pm	Exercise 2: Facility Design and Usage	**Introduction by Dr Puneet Dewan and Dr Malik Parmar**
3.00 pm to 3.30 pm	Group Presentation on their practices suggested for facility design and usage	**Dr. Puneet Dewan, MO-TB, WHO-SEARO**
3.30 pm to 3.45 pm	Refreshments	
3.45 pm to 5.00 pm	Engineering Controls - 3: Ultraviolet light (UV light)	**Dr. Michele Pearson, MO-Div. of TB elimination, CDC Atlanta**
5.00 pm to 5.30 pm	Facility Risk Assessment Tool and Briefing on Field Visits to Health Facilities in New Delhi	**Dr. Puneet Dewan, MO-TB, WHO-SEARO**

Day 3: 22nd October 2009

Time	Topic	Facilitator
8.00 am to 9.00 am	Travel to health facilities in Delhi	
9.00 am to 12.00 pm	Field Visits for Comprehensive Facility Assessment – Discussion with Management – Assessment of Management Practices, Admin controls, Risk for transmission in facility, Environment engineering controls including using of space	**Group 1: Dr Puneet Dewan – AIIMS** **Group 2: Dr Michelle Pearson – LNJP Hospital**
12.00 pm to 1.00 pm	Travel back to LRS Institute	
1.00 pm to 2.00 pm	Refreshments	
2.00 pm to 3.00 pm	Prepare presentation on observations and suggestions on improvement	
3.00 pm to 4.00 pm	Group presentations and discussion (2 groups)	**Group presentation by participants**
4.00 pm to 4.15 pm	Refreshments	
4.15 pm to 5.15 pm	Group presentations and discussion (2 groups)	**Group presentation by participants**

Day 4: 23rd October 2009

Time	Topic	Facilitator
8.15 am to 9.00 am	Travel to health facilities in Delhi	
9.00 am to 11.00 am	Field visits to Special Settings (ART Centre, DOTS Plus Site) – Assessment of Admin controls, Environmental controls, and Management Practices – Fill up the risk assessment tool	**Group 1: Dr Puneet Dewan – RB TB Hospital DOTS Plus Site** **Group 2: Dr Michelle Pearson – RML Hospital ART Centre**
11.00 am to 11.45 am	Travel back to LRS Institute	
11.45 am to 12.00 pm	Refreshments	
12.00 pm to 12.20 pm	Special Settings – ART Centre Recommendations in National Guidelines	**Dr Rajasekaran, Consultant – NACO**
12.20 pm to 12.40 pm	Special Settings – DOTS Plus Ward Recommendations in National Guidelines	**Dr RN Solanki, Department of TB & Chest Diseases, BJ Medical College, Ahmedabad**
12.40 pm to 1.00 pm	Special Settings – Culture & DST Laboratory Recommendations in National Guidelines	**Dr Rajeshwari, STP, WHO SEARO**
1.00 pm to 1.30 pm	Preparation of presentation on field visits	
1.30 pm to 2.15 pm	Refreshments	
2.15 pm to 2.45 pm	Presentation and Discuss on observations and recommendations of field visits	**Group presentation by participants**
12.30 pm to 1.00 pm	Personal Respiratory Protective Equipment	**Dr. Michele Pearson, MO-Div. of TB elimination, CDC Atlanta**
4.30 am to 5.00 pm	Personal Respiratory Protective Equipments – Recommendations in National Guidelines	**Dr. Fraser Wares, MO-TB, WHO-India**
5.00 pm to 5.30 pm	Respirator Fit Testing Demonstrations	**Dr. Michele Pearson, MO-Div. of TB elimination, CDC Atlanta**

Day 5: 24th October 2009

Time	Topic	Facilitator
9.00 am to 9.30 am	Discussion on Developing Facility Level Airborne Infection Control Plan	**Dr. Michele Pearson, MO-Div. of TB elimination, CDC Atlanta**
9.30 am to 10.30 am	Group work on Facility level airborne infection control plan development for the 4 institutes of Delhi visited by respective groups	
10.30 am to 10.45 am	Refreshments	
10.45 am to 11.30 am	Presentation of facility level plans by 2 groups	**Group presentation by participants**
11.30 am to 12.30 pm	**For State Teams:** Group work on development of State level action plan for rolling out NAIC Guidelines with timelines for pilot states – Advocacy with State Authorities – Defining coordination and planning mechanisms – Listing all variety of health facilities for pilot – Capacity Building in risk assessment and training activities – Facility Airborne Infection Control Plan development, integration in facility infection control plan and approval with budgeting – Implementation of AIC measures – Supervision, Monitoring and Review Mechanisms – Evaluation of Pilot Timelines to finalize and submit the action plan to roll out NAIC Guidelines in the state **For other participants:** Open Group to visit LRS Culture and DST Laboratories	**Group 1: Dr Puneet Dewan** **Group 2: Dr Michele Pearson** **Group 3: Dr Ranjani Ramachandran**
12.30 pm to 1.30 pm	Group presentations on State Action Plans on rolling out NAIC guidelines in 2 pilot states	**Group 1: DHS – West Bengal** **Group 2: DHS – Gujarat**
1.30 pm to 2.15 pm	Refreshments	
2.15 pm to 3.30 pm	**Valedictory Session:** **Presentation on brief report of the deliberations**	

Annexure 3

Modifications and Update suggested in the National Guidelines on Airborne Infection Control in health care and other settings during discussions after presentation of each section in the workshop

Administrative Controls – Outpatients:

- Training material of the staff in infection control and material for patient education in approaches and strategies need to be developed to supplement the national guidelines.
- Challenge of convincing the administrators for adopting policies and strategies of triage, fast tracking and segregation as there is a threat of reinforcing stigma of TB & additional burden of space and human resource on the institute. Thus administrators and health care workers should be carefully sensitized by the NAICC and SAICC.
- Emphasize and advocate to administrators that strategies and measures would prevent spread of infection in health care and other settings.
- NAIC guidelines should be applicable for all health care facility from large tertiary care hospitals and peripheral primary health care institutes (PHCs). Different challenges would call for different approaches and strategies of infection control. The guidelines should spell out all possible and applicable strategies and approaches as options for facility administrators to choose from.
- NAIC guidelines would enable health facility preparedness for handling larger pandemics if the IC measures are institutionalized in the system.
- Advocate that it is doable and issues about sustainability and integrating the measures as part of routine system of hospital administration across all sectors and facilities.
- IEC on infection control at OPD area should be directed not only to cough cases but to all cases and visitors of the facility.
- Temporal segregation to cough clinics may be considered.

Administrative Controls – Inpatient Settings:

- Modality of assessment of impact of IC measures at the pilot sites need to be discussed and finalized as Tuberculin Skin Test (TST) may not be a feasible idea in high TB burden countries.
- Sputum microscopy may be considered as a tool for impact assessment. New blood assays are available that are not impacted by BCG which may be considered. Cost and lab capacity issues may be bottle necks to identification of an appropriate tool.
- Sensitivity of ensuring that the language of segregation does not reflect promotion of stigma.
- Specific section on sputum collection and disposal need to be added in the guidelines. This also needs to be reflected adequately in the patient education tools.

Managerial Controls:

- Capacity building of the PWD engineers and incorporating infection control in the training courses of structural engineers and architects dealing with health care establishments may be organized in country.
- List of specific strategic actions points to be listed down by the team as practical options at facility level administrators.
- Facility Managerial Committee may include
    - Representation at NAICC to include
        - Nursing director
        - Biomedical engineers
        - Civil society
    - Representative at SAICC – to include
        - Large interested private sector - states to take a call on this.
- Incorporate abstracts of these guidelines in the Nursing and Medical Colleges UG/PG Curriculum through MCI & NCI. The upcoming National Task Force workshop for Medical Colleges would be a good opportunity to advocate this.

Environment/Engineering control:

- In high risk settings, upper room UVGI with adequate circulation of air to ensure exposure of the entire volume of the room air over a period of time may be considered as a complementary option if adequate ventilation is difficult to be achieved.

Ultraviolet Germicidal Irradiation (UVGI):

- Clarity needed on number of UVGI lights required per cu feet in different settings.

- Details on appropriate installation and maintenance of UVGI lights need to be annexed in the guidelines.
- Details of the agencies dealing in assessment tools like UV meters, Venometers, Anemometers etc. need to be provided to the states.

Lessons learnt from visits to ART Centre at RML Hospital, New Delhi

- Preventive maintenance of infection control measures and infrastructure is mandatory
- Capacity building of the PWD engineers and incorporating infection control in the training courses of structural engineers and architects dealing with health care establishments
- Caution over technologically driven interventions without sustained commitment and commitment of maintenance.
- With limitations or non availability of the Venometer, a crude measure of ACH is the proportion of floor area covered by window area. If window area is > 10% of the floor area ACH > 6 would be assured.

Special Area – ART Centre

- Guidelines for ART Centre can be applied to Link ART Centers and Community Care Centers.

Special Area – MDR TB

- A section on counseling of relatives of the patients needs to be included in the guidelines.
- Infection control practices in the community need to be included in the guidelines.

Special Area – Laboratory

- Procedure of sputum disposal needs to be detailed in the guidelines.

Group recommendations on Draft Guidelines:

- Administrative Control:
    - Chest Symptomatics need to be clarified – whether we restrict to 2 weeks
    - Modalities – Algorithms on Category of suspects and actions required may be considered
    - Maintenance and budget at facility level need to be kept.
    - Decompressing of OPD by restricting attendants of the patients need to be highlighted.
- Mechanical Ventilation:
    - A paragraph on desert coolers need to be considered in the guidelines as it is widely used. Risk of infectious material from desert coolers as aerosolization is greater in this.
- Preferably Separation in place of Isolation Wards:
    - This section to be written in line with the National RNTCP Guidelines
- Cough Hygiene:
    - CTD IEC resource centre is reviewed for Cough Hygiene that can be included in the guidelines as a reference.
- Monitoring and Evaluation:
    - Documenting any unintended consequences or adverse effects of these IC interventions need to be considered in the recording reporting formats and M&E.
    - Risk Benefit analysis may be considered in the pilot. Prospectively documenting cost and worth of it during the pilot is recommended.

Summary of additional improvements to guidelines recommended by workshop:

- Expand role of engineers, nursing, and civil society in National-level coordinating body
- Emphasize health facility preparedness for handling larger pandemics if the IC measures are institutionalized in the system.
- The guidelines should provide possible strategies for different facility levels (tertiary hospital to PHC)
- Guidelines should be incorporated in medical and nursing college curriculum (through MCI and NCI)
- Include counseling/education of patients and families, including standard content for counseling
- Some practical guidance for sputum disposal in community should be provided
- Guidelines for ART centers should apply to Link centers and Community care centers
- Passive surveillance of TB disease in Health care workers should be practiced in large hospitals
- Simple reporting would need to be integrated in existing reports in some way
- Guidelines, or national level body, should address capacity building of the PWD engineers and incorporating infection control in the training courses of structural engineers and architects dealing with health care establishments
- Should be explicit in cautioning against use of technologically driven interventions (mechanical ventilation, UVGI) without sustained commitment and clear commitment of maintenance and budget.

Annexure 4

State Action Plan for feasibility assessment of adopting National Airborne Infection Control Guidelines

Action Plan - Gujarat State:

Introduction

- A state level coordinating body will be formed for Infection Control responsible for policies adoption & planning & implementing IC named as 'State Infection Control Committee' – annual meet
- A sub-committee under this will be formed named as 'Airborne Infection Control Sub-committee' which will be responsible for planning, implementation, monitoring, evaluation and research activities focusing on airborne component of Infection Control as well as coordination with other disciplines – monthly meet for first three months, then quarterly

Aim & Objective

- Pilot Testing of National Airborne Infection Control Guidelines for
    - Feasibility
    - Effectiveness (including economic component)
- Establish TB surveillance system in HCWs
- Compare effectiveness of selected interventions through OR
- Exploring possibilities to formulate guidelines for private health care facilities

Steps

- Formation of State level Airborne Infection control sub-committee under Infection Control Committee
- Sensitization of stake holders on AIC (all levels)
- Baseline assessment of Infection risk in different HC settings / situational analysis
- Selection of HC facilities for pilot
- Prioritization of interventions
- Planning of interventions for implementation
- Training & coordination
- Implementation & supervision
- Monitoring & Evaluation
- Operational Research
- Surveillance of HCWs
- ACSM

Advocacy at state level

- One day sensitization programme
    - 1 Mission Director, SHS
    - 5 Additional Directors (Health, Medical, ME, RCH, FW)
    - 10 State level Programme Officers (All national Programmes)
    - 6 Regional directors
    - 1 Director, SIHFW
- One day sensitization Programme (multidisciplinary)
    - PWD Engineers 4-5
    - Finance Consultant, SHS
    - State level Accountant (all Programmes)
    - Representatives from State IMA
    - Representatives from State Medical / dental / ayurved / homeopathic / nursing Council
    - Representatives from GPCB
- Capacity building for training at state level – ToT
    - Pooling from STC, STDC, IRL, Medical College, DTOs, MO-TCs, PHFI, GLRA, PATH,

Coordination mechanisms

- Monthly meeting of 'State Airborne Infection Control sub-committee'
- Chairman – Mission Director, SHS
- Vice Chairman – Adl Director. Health
- Member Secretary – STO
- Members –
    - Director Medical Education and Research
    - Project Director, SACS
    - Additional Project Director, SACS: Member
    - Director, STDC
    - Regional / Divisional Dy. Directors
    - Dy. State TB Officer
    - IRL Microbiologist
    - RNTCP and NACP consultants
    - Architects and Engineers from State PWD
    - Representative of DOTS Plus Site Committee
    - Representative of Centre of Excellence (ART Centre
    - State IMA Secretary
    - State GPCB director
    - Director, AYUSH
    - Director, Nursing Education
    - Principal, CEPT
    - Chairman, Apollo, Hospital IC Committee

Focal points

- State level Advocacy – Dr. T. V. Bhalodia (Director, STDC, Ahmedabad) with NAICC
- Training – Dr. T. V. Bhalodia (Director, STDC, Ahmedabad)
- IC assessments at facilities – Dr. K. R. Pujara (CMO-TB)
- Coordination with PWD – Dr. P. V. Dave (Adl, Director, Health)
- Follow-up assessment – Dr. K. R. Pujara (CMO-TB)
- TB surveillance in HCW – Dr. Rajesh Solanki
- Monitoring & Evaluation - Dr. T. V. Bhalodia (Director, STDC, Ahmedabad
- Operational Research – (WHO Consultant)

Facilities for intervention (Total 13)

- Two Medical College Hospital : 1 Govt. & 1 Pvt
    - Govt Medical College, Vadodara (SSG Hospital)
    - Karamsad Medical College, Anand
- Two Civil Hospital
    - Sola Civil hospital
    - Palanpur Civil Hospital (PPM model - Whockardt)
- Two District TB Centers
    - Rajkot
    - Petlad
- Two CHCs
    - CHC Bavla (Ahmedabad)
    - CHC (Panchmahal district)
- Two PHCs
    - PHC Sanathal (Ahmedabad)
    - PHC Virpur (Kheda)
- Three Private HCF : 1 NGO, 1 Private, 1 corporate
    - Bhansali Trust Hospital (Radhanpur)
    - Apollo Hospital
    - Aarambh Hospital - Dr Tanish Modi (Ahmedabad)

Interventions

Facility	Individual plan required	Planning Support from individual plan	Budgetary support for interventions	Risk Assessment duration	Risk Assessment deadlines
Med college hospital	Yes	HICC	NRHM – (RKS) / Pvt. Trust	3 day per hosp	January 2010
Civil hospitals	Yes	HICC	NRHM – (RKS) / Pvt. Trust	3 day per hosp	January 2010
DTC	Yes	SAICC-SC	NRHM / RNTCP	1 day / DTC	Dec 2009
CHC	Yes	SAICC-SC	NRHM – (RKS)	1 day / CHC	Feb 2009
PHC	No	SAICC-SC	NRHM – (RKS)	1 day / PHC	Feb 2009
Private HCF	Yes	HICC / SAICC-SC	NRHM / Pvt. Trust	1-2 day / HCF	March 2009

Deadlines

Facility	**Formation of coordination bodies at institutional level (Deadlines & Focal points with TOR)**	**Training departmental heads (Duration 3 days)**	**Training of HCW (Duration 1 day)**	**Supervision / M & E**
Med college hospital	**Dec 2009**	**March 2010**	**June 2010**	**Monthly visit**
Civil hospitals	**Dec 2009**	**March 2010**	**June 2010**	**Monthly visit**
DTC	**----**	**Jan 2010**	**March 2010**	**Monthly visit**
CHC	**Dec 2009**	**March 2010**	**March 2010**	**Monthly visit**
PHC	**----**	**March 2010 (2 days)**	**March 2010**	**Monthly visit**
Private HCF	**Dec 2009**	**March 2010**	**March 2010**	**Monthly visit**

Surveillance of TB among HCW

- Only in high risk settings
  - 1 MDR-TB ward
  - 1 ART Center
  - 1 IRL (C&DST lab)
  - 2 DTC (for Pilot)
  - 10 DMC (for pilot)
  - 20 DOT centers (for pilot)
- Surveillance for infection - Initial TST & FU TST on annual basis (three monthly for MDR-TB ward staff) for all initial negative
- Screening for active TB - clinical & CXR (if required) + Sputum smear & culture on annual basis for all

Action Plan - West Bengal:

Objectives

- To have an airborne infection control plan as per national policy in place at the identified health facilities by the end of Dec, '09 where administrative control strategies, PPE and environmental control strategies will be ready for implementation.
- Administrative control strategies and PPE to be in place by end of march,2010.EC plan ready for implementation by 2010-11
- Expansion plan will be ready by the end of March 2010.

Advocacy with state authorities

- Addl. Chief Secretary (Health), DHS, NRHM Mission Director- already sensitized.
- DME - will be sensitized.
- Secretary PWD- To be sensitized (letter from ACS, Health)
- Deputy Director Nursing
- Jt. Director Planning, Public health
- Advocacy for resource mobilization from NRHM, RKS and other state sources.
- Scheduled visit by a team of international experts in this field will act as a curtain raiser

Advocacy with district authorities

- Letter from ACS (Health) to DM
- Letter from DHS to concerned CMOHs & administrators of selected health authorities.
- Letter from DME to the Principal, MSVP of the selected medical colleges.
- Initial one to one meetings with the district authorities for sensitizing them.
- DM,CMO & Executive engineers invited to attend inaugural & valedictory session of the trainings

The health facilities to be in pilot phase

- Medical college: R.G.Kar Medical College, Kolkata, North Bengal Medical college
- District hospital: South 24 pgs, Hugli, KochBihar
- Rural hosp: Khoribari, Tarakeswar
- BPHC: Sulkapara, Padmerhat
- IRL
- DOTS PLUS Sites: RATB, KSRay TBH (With DMCs and DOT Centers of above facilities)

Training plan

<table>
<tr><th>Sly.</th><th>Target Group for training</th><th>Duration of training</th><th colspan="2">Trainers</th></tr>
<tr><td>1</td><td>Hospital administrators & members of hospital AIC</td><td>2 days</td><td colspan="2" rowspan="2">Nationally trained persons</td></tr>
<tr><td>2</td><td>Medical personnel</td><td>1day</td></tr>
<tr><td>3</td><td>Paramedics</td><td>1 day</td><td rowspan="3">Lectures and prepared handouts</td><td rowspan="3">Trained members of hosp AIC Committee</td></tr>
<tr><td>4</td><td>Nursing staffs</td><td>1day</td></tr>
<tr><td>5</td><td>Group-D</td><td>1day</td></tr>
</table>

Facility Infection Control Plans:

- The selected facilities will develop their plan with support from the state AIC members.

Monitoring and Evaluation:

- A Monitoring evaluation cell will be developed constituting the state and district & health facility members which will periodically monitor all the activities.

- An initial baseline survey of the health facilities will be done and a repeat assessment regarding Administrative & environmental controls will done there and it can be a part of OR
- Periodic health checkups for HCWs in the selected health facilities can be initiated.

Plan with timelines (1)

Sl no	Activities	November,09		December,09		January,10		February,10		March, 10	
		WK-1-2	WK-3-4	WK1-2	WK-2-3	WK-1-2	WK-2-3	WK-1-2	WK-2-3	WK-1-2	WK-2-3
1	Formation of state airborne infection control committee										
2	Identification of the health facilities to be under pilot testing										
3	Budgeting & Resource mobilization for training.										
4	Formation of airborne infection control committee in identified health facilities										
5	Training and risk assessment										
6	Administrative control strategy & PPE to be finalized										
7	Environmental control plan for the selected health facilities										
8	State level workshop for civil and electrical engineers.										
9	Monitoring & Evaluation										

Recommendations on State Action Plans for pilot testing of NAIC guidelines:

- Pilot should focus on engaging with all participants
- State level advocacy need to the strongest interventions
- Funding for interventions to be mobilized by SAICC through NRHM / RKS / Hospital / Medical College Budgets.
- Formats of reporting and recording and monitoring indicators would be developed as part of the pilot.
- Focal point for Monitoring and Evaluation at the national and state level needs to be identified.
- If Infection Control Committees are established in the state in view of the H1N1 Pandemic, this pilot plan of 2 states should be integrated in this committee.
- Concept is that these guidelines have to be incorporated in the Indian Public Health Standards under NRHM.
- Priority Interventions should be according to the NAIC guidelines.
- NAIC guidelines should be integrated under the NABH accreditation protocol.
- Pre, repeat and post facility risk assessments would lead us to the outcome of the feasibility and effectiveness of interventions recommended.
- No separate committees recommended at hospital level.
- Architects and Engineers of PWD / PIU also need to be sensitized in NAIC guidelines and action plan.