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Case Report

Innovative practical approaches for preventing the transmission of tuberculosis in resource limited health care settings

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ABSTRACT

Airborne infection control at health care settings remains a low priority especially in public health settings in India. Recent events of upsurge in cases of tuberculosis (TB), Drug resistant Tuberculosis (DRTB) and reported occurrence of health care workers (HCW) diagnosed with TB and DRTB in Maharashtra have highlighted the need to implement airborne infection control practices. Airborne infection control (AIC) guidelines in India recommend administrative control, environmental control, and personal respiratory protection measures. Public and private tertiary care institutes face many challenges to implement the airborne infection control measures in their settings. Practical solutions are needed to address these challenges. An innovative approach was implemented in tertiary care facility in Nagpur, Maharashtra. The approach included use of "Sunrise model" tool for implementing AIC activities with practical innovative approach of decompression & segregation of crowd in waiting areas using coloured coupons and re-organisation of spaces to reduce the risk of transmission in the hospital setting. Initial risk assessment of the facility was conducted by state airborne infection control committee members using a checklist as per the National Airborne infection guidelines and six month follow-up on recommendations of committee was done.

Practices of airborne infection control were improved with the use of 'Sun rise model 'as a tool and innovative approaches used for decompression of waiting area are feasible having potential for scale-up in other resource poor health care settings.

1. Introduction

Nosocomial transmission of Tuberculosis (TB) and drug resistant TB (DRTB), especially in health care settings, is a public health concern worldwide. Infection-control strategies to prevent *Mycobacterium tuberculosis* transmission in health care setting has not been a priority until recently when an outbreak of XDR TB in Tugela Ferry, KwaZulu-Natal Province,

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South Africa in 2006 where probable XDR tuberculosis transmission to HIV co-infected patients was associated with high mortality.[1]

These findings remind us similar outbreaks in 1990's, in which nosocomial transmission of drug-resistant strains were responsible for extensive mortality in HIV patients.[2–6]

Airborne infection control at health care settings remains a low priority especially in public health settings in India. Recent events of upsurge in cases of tuberculosis, Drug resistant Tuberculosis and reported occurrence of health care workers (HCW) diagnosed with TB and DRTB in Maharashtra have re-emphasized the importance of infection control to reduce transmission in health-care facilities and highlighted the need for health care facilities to implement airborne infection control practices.

In India tertiary care hospitals are overburdened with high patient load with overcrowding at registration counters, drug distribution counters, outside outpatient departments (OPDs) and waiting areas. Sometimes the patients share the same area where the health care workers and even visitors are crowded. Minimum ventilation measures in these overcrowded areas add to the risk of transmission of diseases like TB, drug resistant TB or other respiratory diseases. More often immune compromised patients especially HIV patients, paediatric patients and other vulnerable patients are exposed to risk of transmission in these health care settings.

Considering the urgent need to reinforce airborne infection control measures in India National airborne infection control guidelines were developed after pilot testing in three states. National Airborne infection control guidelines in India[7] apply to all health-care facilities and to high-risk areas which include TB & Chest clinics, Medicine clinics, Indoor wards, Drug resistant TB centers for DR-TB treatment, ART Centers, bronchoscopy suites, TB bacteriology culture laboratories, intensive care unit, and operating theatres.

Airborne infection control measures include three-main approaches, namely administrative control, environmental control, and personal respiratory protection measures as recommended in the WHO policy on TB infection control in health-care facilities, congregate settings and households.[8]

Despite availability of National Airborne Infection Control guidelines the practical implementation of airborne infection control measures in tertiary care settings remains a low priority. Innovative interventions to improve infection control measures in tertiary care settings are needed.

We therefore describe here the experience of implementing a tool "Sunrise model" and innovative approaches to implement airborne infection control measures at a tertiary health care center in Nagpur.

Baseline risk assessment was conducted by State Airborne infection control committee including members who were trained in the National Airborne infection control guidelines. Committee recommended key infection measures for facility.

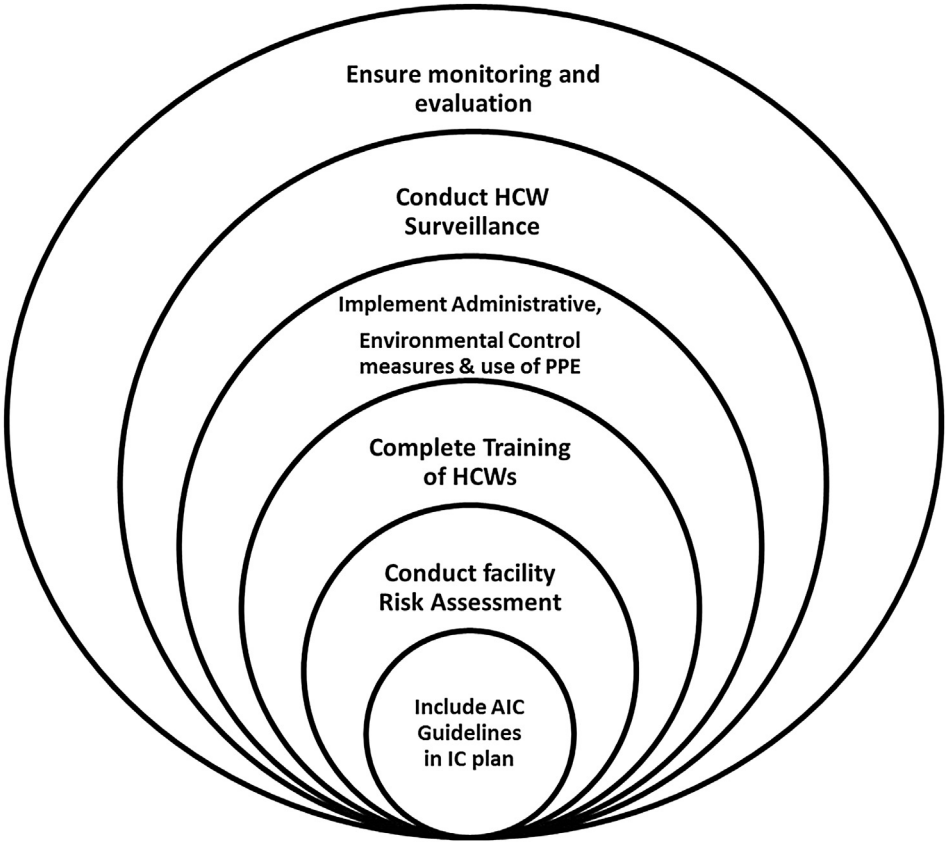

Fig. 1 – "Sunrise model" tool for implementing airborne infection control measures in resource limited health care setting. This includes six key components critical for ensuring airborne infection control measures to reduce the risk of transmission of TB in health care facility.