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World Immunization Week: 24th -30th April

Swine flu scares in summer? Researchers discover new strain in India as H1N1 cases continue to rise

New Delhi looks like you need to take extra precautionary measures to keep diseases at bay, particularly flu. In spite of mercury crossing the 40 degrees C mark, various states, including Andhra Pradesh, Telangana, Maharashtra and Karnataka are seeing a sudden surge in swine flu cases and even deaths, which are being attributed to a new strain of novel human influenza virus (H1N1) in the country.

Earlier this year, researchers from the National Institute of Virology (NIV) in Pune have found that a new strain of the virus - called the Michigan strain - has been circulating since September 2016. The findings were based on the WHO's vaccine recommendations for 2017-18 for India and other countries in the northern hemisphere. WHO had hinted at a genetic diversification of the novel human influenza virus.

Thus the Michigan strain, which has been in circulation in the USA for the last two years, has been identified in Hyderabad and other parts of India.

Prior to the discovery of Michigan strain, the strain that has been existing in India and causing health scare thus far, since 2009 pandemic is California (vaccine strain is Acalifornia72009).

For 2018, WHO recommended a new H1N1 vaccine strain - A/Michigan/45/2015 - to replace A/California/7/2009, which has been in use as a vaccine strain since the 2009.

The Indian Council of Medical Research (ICMR), which runs the NIV, said they will be recommending a new vaccine for this flu season as the existing flu vaccine may be ineffective against the new strain.

While prevalence of swine flu during summer is a cause of concern, since the virus may become tolerant to intense heat, ICMR said they are monitoring the situation closely.

So far, more than 5,000 people have tested positive for the swine flu infection and over 100 people have died across the country this year.

By Zee Media Bureau: Apr 11, 2017

May Measurement month and screening over 2.5 million people

Hypertension is emerging as the most prevalent chronic health issue in the country. Taking a cue from several studies done on hypertension by the Indian Council of Medical Research (ICMR) and other medical institutions across India, the government has decided to take part in a global survey to measure blood measure. India is one of the 100 countries taking part in the May Measurement Month (MMM) 2017, a global initiative to raise awareness on the importance of blood pressure screening to tackle this epidemic.

This global initiative aims to screen 25 million individuals, under the aegis of International Society of Hypertension (ISH) and the World Hypertension League (WHL).

ICMR in association with Public Health Foundation of India, Centre for Chronic Disease Control, Indian Medical Association, Army Medical Corps, Association of Physicians of India, Association of Healthcare Providers of India, and several healthcare institutions will undertake a drive at around 500 sites across the country and take BP readings of over 2.5 million people. The data collated will be part of a global survey of men and women aged 18 to 65, who have not had their BP measured ever, or since 30 April 2016.

Hospitals, public health departments across various states, leading healthcare institutions, national institutes under the ICMR, select Indian Institutes of Technology (IITs) have been identified as screening sites for the campaign.

"Early detection of hypertension can delay non-communicable diseases (NCDs) and improve quality of life. Through this initiative we aim to raise awareness and also inculcate regular high BP monitoring by physicians. The data will also help formulate better policy and guidelines to tackle hypertension and NCDs in India," Dr Soumya Swaminathan, Director General, ICMR and Secretary, Department of Health Research, MoHFW, said.

Hypertension is a major public health issue and is responsible for the death of over 2.6 lakh Indians from urban and rural areas.

The Hindu, May 1, 2017

Pulmonary tuberculosis among tribals in India: A systematic review & meta-analysis

According to the report of Government of India, the tribal population in India is estimated to be 104.28 million, representing 8.6 per cent of the country's total population[1]. There is great heterogeneity across different tribal groups [2], which include a sub-category of particularly vulnerable tribes known as primitive tribes$_1$ now renamed as particularly vulnerable tribal groups (PVTG). There are gaping disparities in healthstatus between tribals and inhabitants of metropolitan areas.[3] Tribals face a number of health risks, including infant and maternal mortality, malnutrition, anaemia, and malaria[4]. Their vulnerability can be attributed to high rates of poverty, illiteracy, smoking, and alcohol use, as well as harsh and isolated living environments and poor access to healthcare[2,5,6]. The combination of increased susceptibility to health afflictions and poor health seeking behaviour is a cause of concern with regard to the management of highly prevalent, communicable diseases, such as tuberculosis (TB).

In 1997, the Government of India launched the Revised National TB Control Programme (RNTCP) to mitigate the high TB burden in the country[7]. The RNTCP introduced targeted pro-poor approaches for TB control, implementing specific tribal action plans. The National Sample Survey for Tuberculosis, carried out between 1955 and 1958, did not include tribal groups and, therefore, there are no nationwide TB burden estimates available for the tribal population[8]. However, there are a few epidemiological studies involving tribal communities[9-19]. Due to lack of a population-based estimate we carried out an in-depth review of these studies and conducted a meta-analysis to arrive at a single meaningful estimate of the TB prevalence for the tribal population.

Material & Methods

Identification and eligibility of studies: As the aim was to ascertain the prevalence of pulmonary TB among the tribal population in India, we selected and reviewed all tribal-focused, community studies, targeting a demographic population above or equal to 15 yr of age. Only those studies in which individuals were examined for TB through initial screening for standard TB symptoms (cough for > 2 wk, fever for > 2 wk, chest pain, and haemoptysis), and subsequently had their diagnosis confirmed by sputum smear and/or culture tests, were

selected. Though X-ray screening was also used when TB was suspected, this was not a required procedure given the potential inaccessibility of X-ray equipment in remote areas inhabited by tribal communities.

Table I. Assessment of quality of studies according to STROBE criteria

S. No.	Study details	STROBE items																				
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	Yadav *et al*, 2010[17]	□	□	□	-	□	□	□	□	-	□	□	□	□	□	□	-	×	□	×	□	□	□
2	Rao *et al*, 2010[14]	□	□	□	□	□	□	□	□	-	□	□	□	□	□	□	-	□	□	×	□	□	□
3	Chakma *et al*, 1996[18]	□	□	-	□	□	□	-	□	-	-	□	-	□	□	□	-	×	□	□	□	□	□
4	Rao *et al*, 2010[15]	□	□	□	□	□	□	□	□	-	□	□	□	□	□	□	-	×	□	□	□	□	□
5	Datta *et al*, 2001[11]	□	□	□	□	□	□	□	□	-	□	□	□	□	□	□	-	□	□	□	□	□	□
6	Narang *et al*, 1999[19]	□	□	□	□	□	□	□	□	-	□	□	-	□	□	□	-	□	□	×	□	□	□
7	Bhat *et al*, 2009[10]	□	□	□	□	□	□	□	□	-	□	□	□	□	□	□	-	□	□	×	□	□	□

1, title, and abstract; 2, background/rationale; 3, objectives, methods; 4, study design; 5, setting; 6, participants; 7, variables; 8, data sources; 9, bias; 10, study size; 11, quantitative variables; 12, statistical methods; 13, participants (groups); 14, descriptive data; 15, outcome data; 16, main results; 17, other analyses, discussion; 18, key results; 19, limitations; 20, interpretation; 21, generalizability, other information; 22, funding

□, good description; -, partial description; ×, no description

Search criteria: For the purpose of this meta-analysis, we attempted to include all population based, cross-sectional and cohort studies, both published and unpublished. No language restrictions were applied. Literature searches were conducted in PUBMEd using the following combination of keywords: "pulmonary tuberculosis", "tribals", "India", "prevalence", and "survey". The references cited in the articles retrieved were also reviewed, and those found relevant were selected. Additionally, research institutes working on tribal health were approached for TB prevalence reports. Only published studies were included in this meta-analysis.

Eligibility of studies: The studies obtained through the search were included only if the following criteria were met: (i) should be community-based TB prevalence studies; (ii) have targeted members of tribal communities aged 15 yr and above; (iii) have done initial screening for standard TB symptoms (cough for>2 wk, fever for > 2 wk, chest pain, and haemoptysis); (iv) have both smear (for acid-fast bacilli, AFB) and culture tests done on the sputum samples collected. A positive case for TB is defined as being positive either by smear and or culture; and (v) reported an outcome measure – the TB prevalence based on smear and/or culture results.

Once qualifying studies for the meta-analysis were identified, TB positives reported in each study were adjusted to account for all eligible individuals in the sample who did not participate in TB screenings and/ or sputum testing (i.e. non-coverage). Based on these adjusted figures, TB prevalence rates (per 100,000 populations) were estimated for each of the studies. These estimates were used for the analysis.

The quality of the reporting of the included studies was assessed using the 22 items recommended by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement20 is shown in Table I. Items fulfilling the STROBE statement were considered positive.

Data analysis: As the studies were observational in nature, a random effects model was applied[21], to account for the possibility of heterogeneity among the studies, which was tested in terms of Cochran's Q statistic which is distributed as a chi-square statistic with k (number of studies) minus 1 degrees of freedom and $p<0.1$ is considered significant.

Further, the I^2 which describes the percentage of variation across studies, along with its 95 % uncertainty intervals (UI) was used to quantify heterogeneity. Power analysis for the effect size was also carried out.

Funnel plots, Begg's test and Egger tests were used to assess the publication bias. A sensitivity analysis by "remove one study" method[21] was performed to determine the stability of the analysis. An excel worksheet was used for the calculations.

Results

Study selection and data collection: Two authors (AS and CM), independently carried out the literature search, identified studies, and assessed their eligibility. A total of 20 studies were identified based on the keywords. Two additional studies were identified through a manual search of the retrieved articles' listed references. Additionally, institutes working with the tribal populations were contacted for TB studies. However, all recommended studies were published and, therefore, already covered by our search. Of the 22 studies, only 12 studies involved TB prevalence surveys of individuals aged 15 yr and above in tribal communities. Of the 10 studies that were not included, four were annual risk of infection studies involving children aged 1-9 yr[22-24], two were reviews[8,16], two surveyed general tribal health[25,26], one study only examined the microbiological aspect of TB[27], and one was a TB risk factor analysis[28]. Full texts of the publications were retrieved for the 12 selected studies. These publications were reviewed in-depth and independently by the two authors. Five[9,12,13,29,30] of the 12 studies were discarded by both, as these did not adhere to the inclusion criteria. Table II provides details of the studies included in the meta-analysis.

Reasons for exclusion: In a study conducted in the Kashmir valley[12], culture tests alone were performed (no smear tests were conducted). Furthermore, the study focused on culture negative individuals with abnormal X-ray findings. The number of culture positive cases was not provided.

In a large scale prevalence study in the Car Nicobar Islands[13], only smear tests were performed for detection of TB cases. Culture tests were not done. Similarly, in a study carried out in the Thiruvannamalai district, Tamil Nadu[9], only smear examinations were done. In a study in central India[29], the targeted population comprised individuals who were symptomatic and voluntarily visited a hospital and those who were identified in prior TB surveys. As this was not a community-based study, it was excluded. In a study in Madhya Pradesh[30], no sampling design was followed. The individuals were neither screened for TB symptoms nor X-rayed to assess their sputum eligibility. Sputum samples were randomly collected from individuals in selected communities. As the study did not screen for TB in the targeted community, it was excluded.

Included studies: Characteristics of the selected studies such as targeted population, type of sampling design adopted, community sample size, gender specific and overall TB prevalence per 100,000 population are shown in Table II.

Studies in Madhya Pradesh: There were five TB prevalence studies carried out in this region.

1. In 2008, a TB prevalence survey was conducted in the Madhya Pradesh region, targeting Baigas, one of the primitive tribes that reside in the Baiga chak area of Dindori district[17].

Table II. Characteristics of the studies included in the meta-analysis

S. No.	Author	Tribal population details	Place of study	Period of study	Sample size	Pulmonary TB prevalence (per 100,000) among		
						Males	Females	Both
1	Yadav *et al* (2010)[17]	*Baigas*	Madhya Pradesh	2008	1410	-	-	146
2	Rao *et al* (2010)[14]	*Bharia*	Patalkot valley, Chhindwara district, Madhya Pradesh	2008	1443	-	-	432
3	Chakma *et al* (1996)[18]	*Saharia*	Karhal Block, Morena district, Madhya Pradesh	1991 - 1992	6365	-	-	1500
4	Rao *et al* (2010)[15]	*Saharia*	Karhal Block, Sheopur district, Madhya Pradesh	2007 - 2008	11468	2156	933	1518
5	Datta *et al* (2001)[11]	*Malayali clan*	Jawadhu Hills, North Arcot distict, Tamil Nadu	1989	16017	1220	440	840
6	Narang *et al* (1999)[19]	*Mana, Pawara, Gond, Gond Gowari, Raj Gond* and other tribes	Ashti and Karanja Tehsils, Wardha district, Maharashtra	1989 - 1990	14808	110	258	184
7	Bhat *et al* (2009)[10]	*Saharia* and other tribes	Madhya Pradesh	2007 - 2008	23411	554	233	387

a

Due to logistical constraints, only 25 per cent of the population was surveyed. Five villages were randomly selected to achieve a sample size of 2100 and a complete census was carried out in these villages. All individuals aged 15 years and above were screened for chest symptoms indicative of pulmonary tuberculosis. Of the total population included in the study, 1410 were eligible for screening, of which 1374 were screened. Of those screened 115 (8.4%) were chest symptomatic. Two sputum samples were collected from each symptomatic individual. Only two of 115 tested positive based on smear and/or culture testing, translating to a TB prevalence of 146 per 100,000 population. gender-wise estimate of the TB prevalence was not provided. The study suggested that TB was not a major health problem among the Baigas, but continuous monitoring and implementation of TB control measures were necessary to keep the disease in check.

2. In 2008, a TB prevalence survey was conducted among the Bharia tribes residing in all 12 villages of the Patalkot Valley of the Chindwara district[14]. A complete census of the population in these villages was carried out and individuals aged 15 years and above were screened for chest symptoms. Of the 2586 individuals in these villages, 1443 were eligible for screenings, of which 1390 were screened. Of the screened individuals, 92 (6.6%) were found to be chest symptomatic. Two sputum samples were collected from every symptomatic person, resulting in coverage of 100 per cent. Of these 92, six were found to be positive for AFB, translating to a TB prevalence of 432 per 100,000 population. Gender-wise data were not reported. The study revealed that the TB disease burden among Bharias did not vary from the TB burden among non-tribals estimated in other studies.

3. In 1996, a TB prevalence survey was conducted in 37 villages located in the Karhal block of the Morena district targeting the *Saharia* tribe (a primitive tribal group)18. These villages were randomly selected based on the probability proportional to size method (PPS). Both tribals (*Saharia*s) and non-tribals residing in the selected villages were included. Of the 11097 individuals (aged 15 years and above) included in the study, 6365 were tribals and 4732 were non-tribals. All eligible individuals were screened for chest symptoms suggestive of TB. Among the tribal group, 445 individuals were chest symptomatic. Two sputum samples (spot and overnight testing) from 436 individuals were collected. Ninety six individuals tested positive for TB (by smear and/or culture tests), translating to a TB prevalence of 1500 per 100,000 for tribals. Gender-wise data have not been reported. Children between three months and nine years underwent tuberculin skin tests, revealing an overall infection rate of 16.9 per cent.

4. Between 2007 and 2008, a community based TB prevalence survey was conducted in the Karhal block of the Sheopur district among the *Saharia* tribes[15]. All tribal villages with a predominant tribal population (>80%) were considered for the study. Villages from this pool were randomly selected till the required sample size of 11,000 was achieved. A complete census was carried out in selected villages and all individuals aged 15 years and above were screened for chest symptoms. Two sputum samples were collected from those who were symptomatic or had a previous history of TB treatment. Of the 11468 eligible individuals, 11116 were screened for chest symptoms. Of these, 1269 (11.4%) were found to be chest symptomatic, with males recording a significantly higher rate than females (15.2 and 8.0%, respectively). Sputum samples were obtained from 1268 individuals, resulting in a coverage of 99.9 per cent. Of these, 166 (13.1%) were found to be TB positive by smear and/ or culture tests, translating to a TB prevalence of 1518 per 100,000 population. Males had a TB prevalence of 2156 per 100,000, which was significantly higher than that of females (933 per 100,000). There was a positive relationship between age and TB prevalence, with an increase in prevalence from 546 per 100,000 in individuals aged 15-24 yr to 3086 per 100,000 for individuals over 55. This study also reported that there was no improvement in the TB situation for *Saharias* 15 years after the initial survey was completed, despite the involvement of the National TB control Programme (NTP) in the region. The study also suggested that the high TB prevalence found among the *Saharia* tribe in this study needed further investigation, considering that a similar study among the same tribe reported a significantly lower prevalence (387 per 100,000), similar to that of the non-tribal population in the country.[10]

5. In 2009, another TB prevalence study was carried out targeting the *Saharia* tribe in Madhya Pradesh[10]. A multi-stage stratified cluster sampling design was adopted. In the first stage, 25 per cent of districts were selected using systematic sampling. In stage II, 25 per cent of the blocks in these districts were randomly selected. In stage III, the required number of villages (65) was randomly selected using the PPS method. A survey of individuals aged 15 yr and above was carried out in the selected villages and details regarding TB chest symptoms and previous history of TB were elicited. Two sputum samples were collected from persons with chest symptoms or a previous history of TB treatment. Of the 23411 individuals, 22270 were screened for symptoms. Of these, 1770 (7.9%) were chest symptomatic, with males recording a significantly higher rate than females (9.1 and 6.9%, respectively). Sputum samples were collected from 1703 individuals. Of these, 83 tested positive for TB, as confirmed by smear and/or culture tests, translating to a TB prevalence of 387 per 100,000 population. The findings revealed that the TB prevalence among males (554 per 100,000 population) was more than double than that observed for females (233 per 100,000 population). Additionally, the study reported a significant, positive relationship between TB prevalence and age, with an increase in prevalence from 174 per 100,000 population for individuals aged 15-24 yr to 990 per 100,000 population in individuals over 55.

Study in Maharashtra: In 1998, a study was conducted on the prevalence of sputum-positive TB among Ashti and Karanja tahsils in the Wardha district[19]. Both tribals and non-tribals were surveyed. A total of 46 tribes were included in the survey, with three predominant tribes (Gond, Gond Gawari, and Raj Gonds) constituting 87 per cent of the total tribal population. The remaining population included individuals from Mana and Pawara primitive tribes among others. Of the 14,808 tribals aged 15 yr and above, 2.1 per cent (2.7% of males and 1.5% of females) presented with chest symptoms. These figures were less than those observed for non-tribals (2.1% for males, 1.3% for females, and 1.7% combined). Two sputum samples were collected from each symptomatic individual and a TB prevalence of 184 per 100,000 (confirmed by smear and/or culture test) was calculated after subtracting the figures related to 5-14 yr of age. Females were found to have a significantly lower prevalence (110 per 100,000) than males (257 per 100,000). It was also observed that while predominant Gond tribes had TB prevalence similar to that of the non-tribal population in India (ranging from 100 to 196 per 100,000 population), primitive tribes, namely Mana and Pawara, had significantly higher prevalence (ranging from 612 to 730 per 100,000 population). Additionally, all TB cases in Mana tribes were found among females, while all cases in Pawara tribes were found among males.

Study in Tamil Nadu: In 1989, a TB prevalence study was implemented targeting a Malayali tribal community in the North Arcot District of Tamil Nadu in the Jawadhu Hills[11]. A stratified simple random sample selected from 24 panchayats formed the study population. All villages in the selected panchayats were enumerated. A total of 16017 individuals aged 15 years and above were screened for chest symptoms and also X-rayed. Of these, 3347 (20.9%) had chest symptoms or abnormal radiological findings (24.6% for males and 17.0% females). Two sputum samples were collected from 3301 individuals resulting in a coverage of 99 per cent. One hundred and twenty six tested positive for TB (using smear and/or culture tests), translating to a TB prevalence of 840 per 100,000 population. Drug susceptibility tests were also conducted for 78 culture positive cases. Eighty eight per cent were sensitive to all three drugs: isoniazid, rifampicin, and streptomycin. Twelve percent were resistant to isoniazid and 1.6 per cent were resistant to both isoniazid and rifampicin. The study also documented the influence of screening methods on prevalence estimates, as both symptom screenings and X-rays were carried out. TB detection was more accurate when both methods were employed. Additionally, age and gender specific patterns were reported. There was a significantly higher TB prevalence observed for males (1220 per 100,000) than for females (440 per 100,000). A positive relationship between TB prevalence and age was also found, with an increase in prevalence from 260 per 100,000 individuals aged 15-24 to 1500 per 100,000 for individuals above 55.

Meta-analysis:

Overall estimate - The pooled estimate, based on the random effects model, was 703 per 100,000 population with a 95% CI of 386-1011. The heterogeneity measure of Cochran's Q of 11.0 was significant, resulting in a P value of 0.08 and an I^2 of 48 per cent (with a 95% UI of 0-78%). A power analysis of the effect size by the random effects model showed this study had 51 per cent power. A forest plot with the pooled estimated (marked as a diamond with a vertical dotted line) with a 95% CI, as obtained from the random effects model, is displayed in Fig. 1. Also depicted are the TB prevalence estimates from the individual studies (marked as circles) along with their 95% CIs. Our calculations indicated that 48 per cent of the variation observed in the pooled estimate was due to heterogeneity among the studies, suggesting that there were inconsistencies across the studies included in this analysis. Subgroup analyses to determine possible causes of heterogeneity and publication bias could not be performed, given the limited number of studies.

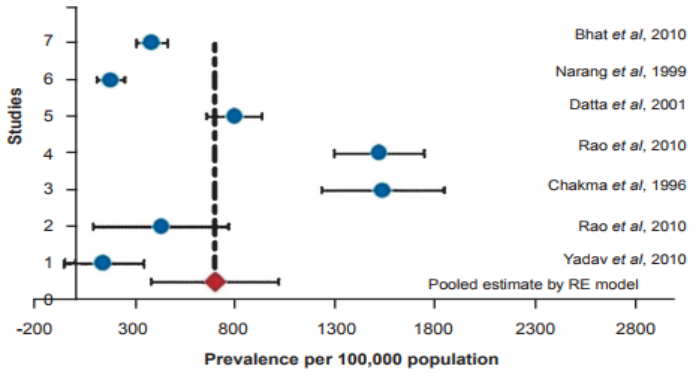

Fig. 1. Forest plot of meta-analysis of the TB prevalence among tribals based on seven studies.

Gender-wise estimates - Of the seven studies, four provided gender-wise TB prevalence rates. Estimated TB prevalence based on the random effects model indicated that females had a lower prevalence (398 per 100,000 with a 95% CI of 167–628) than males (999 per 100,000 with a 95% CI of 444 -1553). However, the heterogeneity statistic, I^2, was 53 and 54 per cent for females and males, respectively, further suggesting inconsistencies across the studies.

Publication bias - An attempt was made to assess the publication bias, however, the funnel plot method and other tests were underpowered due to small number of studies. Hence, we could not assess the publication bias.

Sensitivity analysis - A sensitivity analysis was performed, which indicated that when a particular study was removed, the resulting pooled estimate still fell within the 95% CI of the original pooled estimate. Though this suggested the stability of our results, heterogeneity among studies persisted. The sensitivity analysis is graphically depicted in

Fig. 2, where the vertical dotted line is the actual pooled estimate we calculated using the random effects model along with its 95% CI. Also displayed in parentheses is the heterogeneity measure, I^2, obtained after the removal of a study.

Discussion

This meta-analysis pointed to a pooled pulmonary TB prevalence estimate of 703 per 100,000 for the tribal population which was significantly higher than that estimated for India (256 per 100,000)[31]. This estimate greatly differs from the RNTCP annual report estimation of only 80 smear positive cases per 100,000 tribal population (RNTCP report, 2011, unpublished). This variance may be attributed to methodological differences in determining the prevalence of TB. The studies reviewed here adopted active case finding, entailing large-scale screening and testing of individuals in tribal communities as compared to passive case finding adopted in RNTCP. Taking into consideration the limited number of studies among the tribal population, this estimate was higher than the culture positive TB prevalence estimates among the non-tribal populations in a rural district of Bangalore[32] (Nelamangala: 152 per 100,000 population) and Tamil Nadu33 (Thiruvallur: 388 per 100,000 population). This pooled estimate however, needs to be treated with caution, considering the level of heterogeneity across the studies. While I^2 statistic indicated moderate heterogeneity, Q statistic demonstrated a significant heterogeneity among studies, indicating that there were differences among the studies, rather than due to chance. The possible reason for a power of 51 per cent for this analysis could be the small number of studies. Heterogeneity could be due to variations in study characteristics including (i) the time period when the studies took place (between 1991 and 2010) (ii) areas covered (particularly for the *Saharia* tribe) (iii) methodological approach (two studies did a complete enumeration of the study population, while the other studies reported multi-stage cluster or stratified random sampling procedures for the surveys), and (iv) the composition of the studied population (only one study[19] reported the tribal composition of the targeted community).

The variance could also be attributed to the influence of various screening methods adopted to assess the TB prevalence rates. In the study conducted in Tamil Nadu[11], it was found that the TB prevalence was underestimated when symptom screenings or X-rays alone were performed.

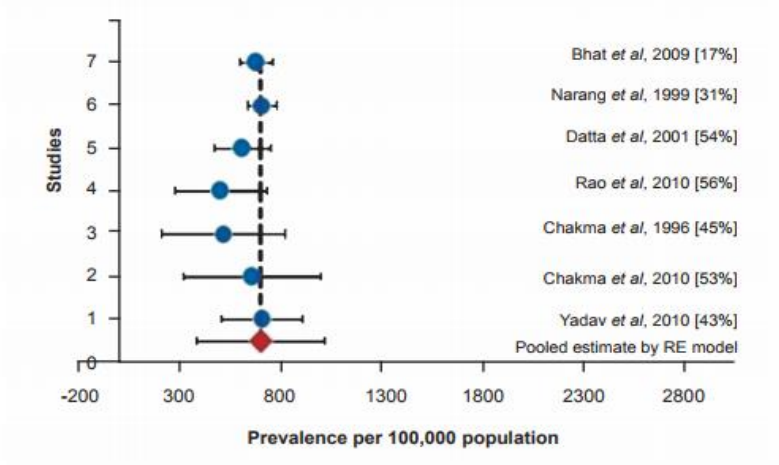

Fig. 2. Sensitivity analysis showing the changes in pooled estimate along with the hetetogeneity measure when that study is removed. Percentage given in parentheses are I^2 values.

When both methods were used, there was a 25 per cent increase in detection of pulmonary TB. Also, in this study a drug susceptibility testing was performed, revealing that approximately 12 per cent of TB cases were isoniazid resistant and 1.6 per cent were both isoniazid and rifampicin resistant. These findings suggest the need for a standardized method of TB and resistant TB screening to ensure timely interventions.

This review has also provided insight into some of the socio-demographic patterns of TB among the tribal populations studied. Two studies indicated that TB prevalence among males was higher than that observed among females[10,15]. These studies have also reported that the prevalence of chest symptomatic was higher for males than for females, with one study reporting prevalence of chest symptomatic among males being twice of what was observed in females (554 per and 233 per 100,000 respectively)[10]. Higher TB prevalence rates in men than in women have been reported among the general population also. This has been attributed to alcohol use/drugs, smoking, work environment and differences in exposure, risk of infection, and progression from infection to disease[34-39]. It has also been observed that TB incidence in males and females differ significantly from the age of 25 yr and that men are more likely than women to develop the disease from this age[40]. These findings could also be applicable to understanding the higher prevalence rates of TB among the tribal male population.

Some of the studies in this analysis reported an age dependent trend, with older individuals being more at risk[10,11,15]. These patterns are similar to those observed in the non-tribal population[10,18,41-48]. This may be because older people are more likely to be under diagnosed and be infected with the disease from a latent infection acquired years or decades ago. Other possible issues may be attributed to delays in seeking care[49] low socio-economic status, poor nutrition and metabolism and co-infection or previous disease. The observed high prevalence of pulmonary TB among the older age groups in tribal population needs to be further understood.

The studies included in this analysis were limited in number and target only a few (around seven) of the numerous tribal groups (over 600) found throughout the country1. Further, five of the seven studies included were based on the tribal population from the state of Madhya Pradesh alone. Therefore, the pooled estimate does not accurately reflect the pulmonary TB prevalence in the tribal population as a whole and needs to be treated with caution. Due to this limited number it was not possible to perform an assessment of the publication bias (an important measure for any systematic review or meta-analysis) as the relevant tests were underpowered due to small number of studies, or a subgroup analysis, necessary to identify the specific reasons for heterogeneity among the studies.

In conclusion, our findings indicate a large variation in pulmonary TB prevalence estimates among different studies and limited coverage of the tribal population, highlighting the imperative need to comprehensively and accurately assess the TB burden among the tribal population in India. The findings also suggest the need for a standardized method of TB and resistant TB screening to ensure timely interventions. Methodological strategies need to be considered to reach the unreached and obtain a true estimation of the disease burden. Further, it is critical to understand the health-seeking behaviours of tribal people, especially of chest symptomatic, to increase their access to healthcare services. The potential role of the tribal community in TB control activities, including the identification and referral of symptomatic for care, also needs to be explored.

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(This article contributed by Beena E. Thomas, Srividya Adinarayanan, C. Manogaran & Soumya Swaminathan National Institute for Research in Tuberculosis (ICMR), Chennai, India Reprint requests: Dr Beena E. Thomas, National Institute for Research in Tuberculosis (ICMR) No: 1, Mayor Sathyamoorthy Road, Chetpet, Chennai 600 031, Tamil Nadu, India Adapted from Indian J Med Res 141, May 2015, pp 614-623

ICMR News

Influenza 'circulating' in Kashmir, 26% samples test positive: DG ICMR

In response to queries e-mailed by Greater Kashmir, the Director General (DG) of the Indian Council of Medical Research (ICMR), Dr Soumya Swaminathan responded that "influenza season has commenced" in Kashmir and that "Influenza- B has predominated the positivity."

Zehru Nissa Srinagar, Publish Date: Apr 14 2017

ICMR to maintain record of people with rare diseases

To reach out to the people suffering from rare diseases-there are over seven crore such patients in the country—the Indian Council of Medical Research (ICMR) has for the first time set up a registry to record such cases which would help in research and enhance innovation in the segment.

A disease or disorder is defined rare in India when it affects fewer than 1 in 2,500 individuals.

The most common rare diseases include Haemophilia, Thalassemia,Neuromuscular disorders, Sickle-cell Anaemia and Primary Immune Deficiency in children, auto-immune diseases, Lysosomal storage disorders such as Pompe disease, Hirschsprung disease, Gaucher's disease, Cystic Fibrosis, inborn errors of metabolism, Hemangiomas and certain forms of muscular dystrophies.

Thursday, 11 May 2017 | Archana Jyoti | New Delhi

Indian Council of Medical Research Will Implement UN Standards on Clinical Trials

The Indian Council of Medical Research has decided to follow UN standards. The standards concern all the clinical trials that are conducted. The Bill & Melinda Gates Foundation has also agreed on the same. The Indian Council of Medical Research (ICMR) along with some of the leading healthcare bodies and other trusts has decided to adopt UN health agency's recommendations to register and publicly disclose results of all clinical trials they fund or support. The participating bodies have all agreed to develop and implement policies within the next 12 months that require all trials they fund, co-fund, sponsor or support to be registered in a publicly-available registry. They also agreed that all results would be disclosed within specified timeframes on the registry or by publication in a scientific journal.

"We need timely clinical trial results to inform clinical care practices as well as make decisions about allocation of resources for future research," said Dr Soumya Swaminathan, Director-General of the Indian Council of Medical Research.

"We welcome the agreement of international standards for reporting timeframes that everyone can work towards," Swaminathan said.

Press Trust Of India | Updated: May 20, 2017

Diabetes Turning Into Epidemic; Urban Poor, Rural Rich Worst Hit

As the numbers for diabetes, one of India's biggest ailments, continue to shoot up, the disease has now entrapped the vast number of urban poor. The latest results from an ongoing survey conducted by the Indian Council of Medical Research and the Department of Health and Family Welfare showed higher prevalence of diabetes among the lower socioeconomic status (SES) groups in the "urban areas of the more economically developed states".

Aradhna Wal | News18.com, June 8, 2017

Pilot project launched by ICMR to track hidden dengue cases

The Indian Council of Medical Research (ICMR) has launched a pilot project in Pune to find hidden cases of dengue. According to ICMR officials, "The project involves developing a smart electronic surveillance system that might help predict a dengue outbreak "More than 1 lakh dengue cases were recorded in India last year.

As per the statement given by Dr Soumya Swaminathan, director general, ICMR to one of the daily newspaper, "The reported cases are just the tip of the iceberg. To get a true picture of the dengue burden, a pilot project is being rolled out that aims at preparing a smart electronic surveillance system for dengue. Pune has seen large number of dengue cases in the past few years. The effort is to network with all healthcare providers to find hidden cases and identify hotspots in the city."

As part of the project, the team headed by Dr A C Mishra, former director of National Institute of Virology has collected more than 2,000 serum samples to detect antibodies against the dengue virus in the community and help prepare the electronic surveillance system for the city.

SEMINARS/ SYMPOSIA/ CONFERENCES/ WORKSHOPS ETC SUPPORTED BY ICMR

S. No.	TITLE	DATE/ DURATION/ PLACE	ORGANISERS
1.	Seminar on Prospects and Avenues For In-Vivo Studies on Animal Models and Human Volunteers For Treatment of Oral Cancer	4-5 April, 2017 Durg (C.G.).	Shri Rawatpura Sarkar Institute of Pharmacy, Durg
2.	Induction Training Workshop for ICMR Scientists: Research Methods & Research Administration	3-7 April, 2017 Chennai.	ICMR-National Institute of Epidemiology, Chennai
3.	National Workshop on Assessment and Management of Vestibular Disorders	6-7 April, 2017 Mysore	All India Institute of Speech & Hearing, Mysore
4.	International Library and Information Professionals summit (I-Lips) 2017 on Dynamics of Library for Excellence in Electronic revolution	6-8 April, 2017 Mohali (Pb.).	Indian Institute of Science Education & Research (IISER), Mohali
5.	Workshop on Research Issues In Medical Image Processing	10-12 April, 2017 Kochi (Kerala).	Rajagiri School of Engineering & Technology, Kochi.
6.	National Conference on Biotechnology and Environment (NCOBE2017)	10-11 April, 2017 New Delhi.	Jamia Millia Islamia, New Delhi.
7.	Research Methodology Workshop on Biomedical Research	11-13 April, 2017 Srinagar (J&K).	Govt. Medical College Srinagar (J&K), Srinagar
8.	National Conference on Interdisciplinary Trends in Pharmaceutical Research-3rd Annual Convention of APTI Punjab State Branch	12-13 April,2017 Sahauran (Kharar) Mohali (Pb.)	University School of Pharmaceutical Sciences, Rayat-Bahra University Mohali (Pb.)
9.	Conference on Emerging Trends in Bioelectronics, Information and Communication Technologies	12th April, 2017 Tiruchengode	K.S. Rangasamy College of Technology, Tiruchengode
10.	Workshop on Capacity Building of Ethics Committees For Clinical Research in India	10-11 April, 2017 Mangalore	Kasturba Medical College, Mangalore
11.	IV Annual Conference of UP and UK Chapter of Indian Association of Paediatric Surgeons	15th April, 2017 Aligarh (UP).	Aligarh Muslim University, Aligarh
12.	Workshop on Art & Science of Writing a Paper	14-15 April, 2017 Bhopal (Mp).	Chirayu Medical College & Hospital, Bhopal
13.	Workshop on Head and Neck Dissection Workshop-2017	20-22 April, 2017 Pune	Armed Forces Medical College, Pune
14.	National Stakeholders Workshop on Respectful Maternity Care	20-21 April, 2017 New Delhi.	Centre for Catalyzing Change, New Delhi
15.	Seminar Cum Workshop on Bio Inspired Design Summer Fest 2017 (BIDSF-17)	21-22 April, 2017 Vellore (TN).	School of Biosciences & Technology, Vellore

16.	NPSICON 2017 (2nd Annual Conference of Neuropathology Society of India)	21-23 April, 2017 Bangalore.	National Institute Of Mental Health & Neurosciences (NIMHANS), Bangalore
17.	National Conference on Occupational RespiratoryDisorders-Ncord-2017	21-22 At Raipur (C.G). April,2017	Raipur Institute of Medical Science, Raipur
18.	Seminar on Laboratory Animal Health and Quality Improvement Through Improvised Sanitation, Hygiene and Sterilization Procedures	24th April, 2017 Hyderabad	National Centre For Laboratory Animal Sciences. ICMR-National Institute of Nutrition Hyderabad
19.	Workshop on Cancer in Women: Prevention & Early Detection	25-26 April, 2017 Tiruchengode (Namakkal) TN	Vivekanandha College of Engineering for Women, Tiruchengode
20.	Consultation Meeting on The National Initiative For Rare Disorders	26-27 April, 2017 New Delhi.	AIIMS, New Delhi
21.	27th National Conference of Parasitology	25-27 April, 2017	ICMR-National Institute of Traditional Medicine & KLE University, Belagavi, Bangalore
22.	Consultation Meeting on The National Initiative For Rare Disorders	26-27 April, 2017 New Delhi.	AIIMS, New Delhi
23.	Conference on Clinical Pharmacology for Healthy Ageing	28th April-1st May, 2017 At Mumbai	National Chair Clinical Pharmacology, National Institute For Research in Reproductive Health (NIRRH), ICMR
24.	Workshop on Advanced Instrumental Techniques In Herbal Drugs Research	28-29 April, 2017 Rajkot (Guj.).	Atmiya Institute of Pharmacy, Rajkot
25.	Pre-Congress Workshop on Research Communication and Soft Skill Training In North Zone Yuva Fogsi Conference	28th April, 2017 Lucknow	King George Medical University, Lucknow
26.	Seminar on Emerging Applications of Data Mining In Medical Domain	27-28 April, 2017 Pachal (Namakkal) TN	PAAVAI Engineering College, Pachal
27.	Seminar on Adolescent Suicides- Interface of Cultural Hypocrisy and Social Competency	28-29 April, 2017 Guwahati	Girijananda Choudhary Institute of Management & Technology Guwahati
28.	Infoquest-2017,National Workshop on Recent Advance in Health Information Management	28-29 April, 2017 Manipal (Kar.).	School of Allied Health Sciences, Manipal University, Manipal
30.	Conference on Cataract Catalyst 2017	29-30 April, 2017 Chennai	Medical Research Foundation, Chennai
31.	Conference on Controversies and Consensus Protocols in Thyroid Cancer (Thyrocon)	29-30 April, 2017 Pondicherry	JIPMER, Pondicherry
32.	Symhealth 2017- International Conference on Healthcare in a Globalizing World	04/05/2017 3 days Pune	Symbiosis Centre Of Health Care, Pune
33.	3rd international conference on sensing, signal processing and security	04/05/2017 2 days Chennai	St. peter’ s College of Engineering & Technology, Chennai
34.	CME on Evidence Based Fetal Care and Vith Aiims Workshop On Fetal Medicine	07/05/2017 5 days NEW DELHI	AIIMS, New Delhi
35.	Workshop on Orientation of Stakeholders on Deceased Organ & Tissue Donation & Transplantation	08/05/2017 1 day PATNA	Indira Gandhi Institute of Medical Sciences
36.	Short Course on Project Management In Public Health	09/05/2017 4 days Gandhinagar (Guj.)	Indian Institute of Public Health Gandhinagar
37.	International Conference on Emerging Technologies in Food and Nutrition Forsocietal Health Care (ICFNS-2017)	11/05/2017 2 days New Delhi.	JNU New Convention Centre, Jawaharlal Nehru University, New Delhi

38.	Workshop on Biomedical Signal Processing and Computational Biology for Healthcare Applications	12/05/2017 5 days Chennai	B.S. Abdur Rahman Crescent University, Chennai
39.	National Seminar on Current Regulations on Herbal Drugs & Food Supplements	16/05/2017 1 day New Delhi.	School Of Pharmaceutical Education & Research, Jamia Hamdard, New Delhi
40.	ASSOCHAM Women's Health Confluence on Prevention and Cure of Cancers and Thyroid Disorders	18/05/2017 1 day New Delhi	Delhi
41.	3rd Uttar Pradesh & Uttarakhand Chapter of IATP, 2017 on Human Malaria: Challenges and Future Advances	19/05/2017 2 days Haldwani (Nanital) UKH.	Govt. Medical College, Haldwani (Nanital)
42.	Conference on Clinical Pharmacology for Healthy Ageing	28/05/2017 4 days Mumbai	National Chair Clinical Pharmacology, National Institute for Research in Reproductive Health (NIRRH), ICMR, Mumbai
43.	Seminar on Challenges in the Research on Orthopedic Implant Materials	29/05/2017 2 days Arasur (Villupuram) TN	V.R.S. College of Engineering & Technology, Arasur
44.	National Conference on Body Donation, Embalming and Related Issues	28/05/2017 1 day Faridkot (Pb.)	Dasmesh Institute Of Research & Dental Sciences
45.	Intensive Summer Workshop on Ethics and Research (I-Swear)	29/05/2017 4 days, Mangalore	Centre For Ethics, Yenepoya Medical College, Yenepoya University, Mangalore
46.	Symposium on Micronutrient Deficiencies and Non-Communicable Diseases: Indian Scenario	30/05/2017 1 day Hyderabad	ICMR -National Institute Of Nutrition (NIN), Hyderabad
47.	Seminar on Advancements In Machine Learning Techniques For Medical Imaging	08/06/2017 2 days Pollachi, (TN)	P.A. College of Engineering & Technology, Pollachi
48.	Symposium on Pharmacovigilance 2017 Current Status and Future Prospects	10/06/2017 1 days, Gandhinagar	K.B. Institute of Pharmaceutical Education & Research (KBIPER), Gandhinagar
49.	Stable Isotopic Techniques in Human Nutrition-Introductory Workshop	12/06/2017 2 days, Bangalore	St. John's Medical College & Hospital, St. John's Research Institute, St. John's National Academy Of Health Sciences, Bangalore
50.	Seminar on Embracing Mobile Health Care Technology	14/06/2017 2 days, Pollachi	P.A. College Of Engineering & Technology, Pollachi
51.	Seminar on Rehabilitation	16/06/2017 1 days, Belagavi	KLE University's Jawaharlal Nehru Medical College, Belagavi
52.	National Workshop on Pharmacoeconomics	16/06/2017 2 days, Puducherry	Pondicherry Institute of Medical Sciences, Puducherry
53.	Seminar on Internet of Things (IOT) in Non-Invasive Health Care Systems	21/06/2017 2 days, Tiruchengode TN	K.S. Rangasamy College of Technology, Tiruchengode
54.	Seminar on Indigenous Herbs and Bone Health	21/06/2017 2 days, Coimbatore	Karpagam University, Coimbatore
55.	Seminar on Smart Healthcare Monitoring System For Reducing Human Mortality Rate Using IOT	22/06/2017 2 days, Thalavapalayam	M. Kumarasamy College of Engineering, Thalavapalayam

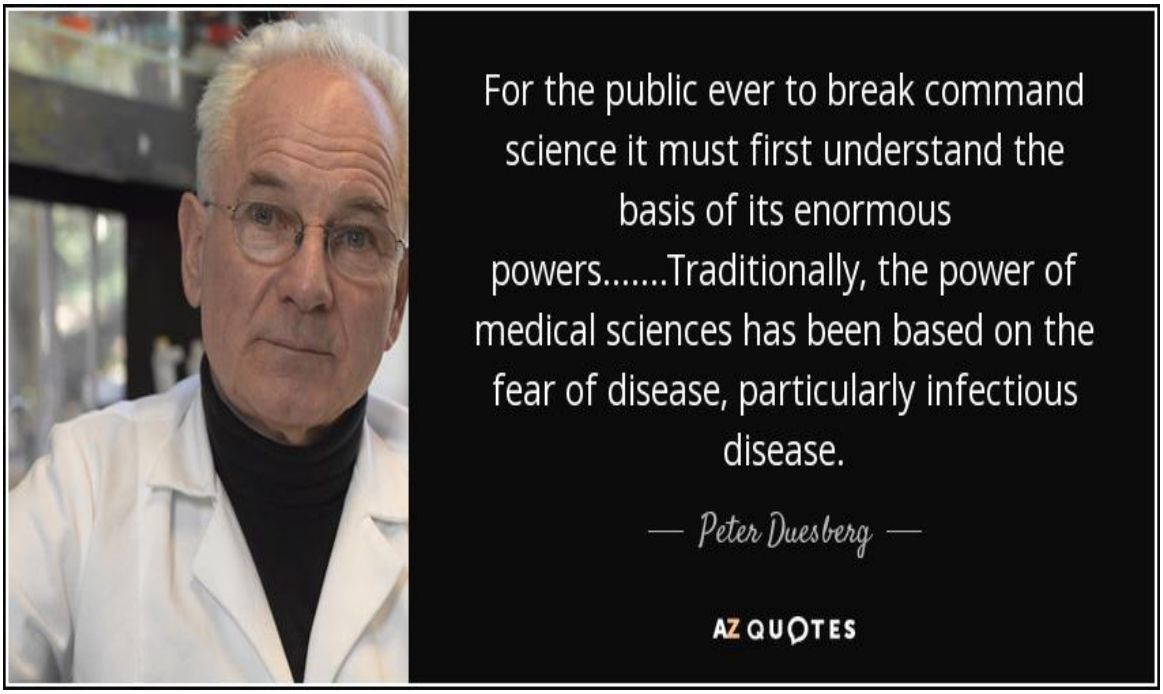
56.	Seminar on Big Data Analytics for Healthcare Applications	23/06/2017 2 days, Gangarampalayam (TN)	IFET College of Engineering, Gangarampalayam (TN)
57.	Nursing Conference on Essentials of Informed Consent in Hospitals	23/06/2017 1 day, Chennai	Apollo College of Nursing, Chennai
58.	Seminar on Machine Learning Techniques for Medical Image Applications	23/06/2017 2 day, Gangarampalayam	IFET College of Engineering, Gangarampalayam

Various Technical Committees/Groups Meeting

The following meetings of various technical committees/Groups of the Council were held in April-June 2017		
1.	5th Meeting of Performance Evaluation Committee for the functioning of ICMR	05/04/2017
2.	Division of Informatics Systems and Research Management (ISRM) Special meeting to review the progress of biomedical informatics centre of ICMR	05/04/2017
3.	"Meeting to initiate further action on registry for rare diseases"	06/04/2017
4.	Selection committee meeting for award of emeritus medical scientist	10/04/2017
5.	Meeting of expert committee on "TB Diagnostic"	18/04/2017
6.	6th Meeting of Performance Evaluation Committee for the functioning of ICMR	18/04//2017
7.	ICMR Awards/Prizes-2015&2016 : The selection committee meeting for ICMR awards/prizes-2015&2016	18/04/2017
8.	IND meeting	18/04/2017
9.	NTF Project meeting on:- comparative evaluation of genetic and biochemical profile in postmenopausal osteoporotic and age matched healthy women"	20/04/2017
10.	Scientific Advisory Group (SAG) Meeting(HRD)	21/04/2017
11.	Meeting of the assessment review committee	24/04/2017
12.	Meeting of peer review committee	26/04/2017
13.	Brain storming session on large scale health survey carried out by different agency in India	26/04/2017
14.	Scientific Advisory Committee Meeting on "CAR on Evidence Based Child Health"	27/04/2017
15.	Meeting to Finalize the Proposal on "GANGA"	28/04/2017
16.	May Measurement Month 2017 (MMM2017)	01/05/2017 to 31/05/2017
17.	The meeting of the "Expert Committee for screening of the applications of the clinical trial sites"	01/05/2017
18.	7th Meeting of performance evaluation committee for the functioning of ICMR	02/05/2017 to 03/05/2017
19.	Data Management board cum experts committee meeting on "Effect of non-ionizing Electro Magnetic Field (EMF) on human health"	03/05/2017
20.	Informatics, Systems and Research Management Leprosy Monitory System	05/04/2017
21.	Review projects on regional centres for "Antimicrobial resistance surveillance network"	05/05/2017

22.	Investigator Meeting on Phase-III clinical trial with an Intranasal Injectable Male Contraceptive (RISUG)	05/05/2017
23.	Expert review meeting to review the progress of task force study under joint ICMR-ICAR activities	05/05/2017
24.	NAC-SCRT subgroup meeting to draft 10 point document for practitioners : BMS	05/05/2017
25.	Combined project review committee meeting of haematology, biochemistry, immunology, allergy and anatomy	09/05/2017
26.	Expert group meeting of revision of common protocol for uniform evaluation of public health pesticides including Biolarvicides for use in vector control	12/05/2017
27.	The meeting of the "Expert Committee for short listing the clinical trial sites for individual studies"	12/05/2017
28.	Selection committee meeting for one post of Data Entry Operator Grade-A on contractual mode in the Indian journal of medical research (IJMR) Editorial Unit)	12/05/2017
29.	The Meeting of ICMR international fellowship programme for biomedical scientists senior/Young 2017-18	15/05/2017
30.	Project advisory & review committee and Data Safety Monitoring Board (DSMB) meeting, Discussion on the PVR study	15/05/2017
31.	The meeting of the ICMR condemnation board To speedy condemnation of obsolete items of the council's institutes/centres/Hqrs.	17/05/2017
32.	The meeting of GBD India cancer expert group	18/05/2017
33.	Expert group meeting on strengthening of morbidity management and disability prevention of lymphatic filariasis	22/05/2017
34.	Brainstorming on prioritization of mental health research	22/05/2017
35.	Expert group meeting of multi-centric project on "Pesticides"	23/05/2017
36.	The meeting of the "Expert group and the working group on therapeutics along with lead PI's of the project to discuss and finalize	29/05/2017
37.	Ms. Hon Jill Hennessy, 'Honourable Minister for Health and ambulance services, State Govt. of Victorian, Australia, Executive council meeting	30/05/2017
38.	Expert group meeting on fellowships to review new fellowship projects and annual/final reports	31/05/2017
39.	Expert group meeting on the global burden disease India vector borne neglected tropical diseases	31/05/2017
40.	The meeting to examine the new proposals received from companies for ICMR technologies for collaboration	31/05/2017
41.	The meeting to finalize the policy on public-private partnership	31/05/2017
42.	Trends in nutrition outcomes, determinants and intervention coverage in India: insights from the national family health survey-4	31/05/2017
43.	Interview for the post of Senior Project Research Fellow(SPFR)-2 post (ITR Division)	01/06/2017
44.	Task force meeting on quality standards of Indian Medicinal Plants Unit (IMPU Divisions)	02/06/2017
45.	8th meeting of performance evaluation committee for the functioning of ICMR	02/06/2017
46.	A meeting of the national steering committee to review the result of triple drug study	02/06/2017
47.	Expert group meeting to consider proposal under medical innovation scheme	05/06/2017
48.	23th sub-committee meeting of National Apex Committee for Stem Cell Research and Therapy (NAC-SCRT)	07/06/2017
49.	Project review committee to review the new proposal and final reports under RMC projects	08/06/2017
50.	Data management training workshop for TB/MDR-TB	14/06/2017
51.	A meeting to discuss on brain storming session on multi drug resistant candida auris outbreaks in India	14/06/2017
52.	!8th meeting of NAC SCRT	14/06/2017
53.	Brain storming meeting on gall bladder cancer	16/06/2017

54.	Expert group meeting on BEMPU device	16/06/2017
55.	Task force group meeting on Evaluation of development of neurosurgery skills by hands on skill training and interactive virtual training under Dr. Ashish Suri Department of Neurosurgery, AIIMS, New Delhi	16/06/2017
56.	Editorial Board Meeting of the Indian journal of Medical Research (IJMR)	21/06/2017
57.	A meeting to discuss on use of antimicrobials in animals suffering sum drugs which are critical for human	22/06/2017
58.	122nd Health Ministry's Screening Committee meeting (HMSC)	22/06/2017
59.	Meeting of CBBTDEC of DCGI	23/06/2017
60.	Meeting for revamping ICMR website, mobile application development and social media management	23/06/2017
61.	Meeting of the cardiovascular mortality working group	27/06/2017
62.	Selection committee meeting for two posts of research associate - I on contractual mode in the Indian Journal of Meeting Research(IJMR Unit)	28/06/2017
63.	PRC of HIV/AIDS	28/06/2017
64.	Training workshop under ICMR task force study : Assessment of Iodine status among pregnant women in selected districts in India	28/06/2017to 29/06/2017
65.	Meeting of all the investigators of the multi statistics project orientation of standard operating procedure and grant management	30/06/2017
66.	Expert group meeting on new treatment for Polycystic Ovary Syndrome (PCOS)	30/06/2017



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