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INDIAN COUNCIL OF MEDICAL RESEARCH

NIRTH
NATIONAL INSTITUTE OF RESEARCH IN TRIBAL HEALTH

ANNUAL REPORT 2020-21

Preface

It is with great pleasure and a profound sense of accomplishment that I present this preface for the annual report of the Indian Council of Medical Research (ICMR) National Institute for Research in Tribal Health, Jabalpur, for the period of 2020-2021. This period was marked by unprecedented challenges and unwavering dedication as the world grappled with the global COVID-19 pandemic. Our institute emerged as a beacon of scientific excellence, resilience, and service to the nation during this critical phase.

The year 2020-2021 will be remembered as a time of testing the limits of our capabilities and commitment. As the pandemic swept across the globe, our institute swiftly adapted its research priorities to address the pressing needs of the hour. The health and wellbeing of the tribal communities, often underserved and vulnerable, remained at the forefront of our efforts. The pandemic underscored the importance of robust and accessible healthcare infrastructure for all, and we embarked on a journey to contribute significantly to this cause.

During this period, the institute worked tirelessly to establish and strengthen diagnostic facilities in collaboration with the state government and ICMr head quarter. The provision of timely and accurate diagnostic services was crucial in containing the spread of the virus and mitigating its impact on communities. Our teams worked in synergy with local authorities to ensure that diagnostic tests were available to those who needed them, especially in the remote tribal regions.

One of the highlights of this period was the comprehensive sero survey conducted across Ujjain, Dewas, Indore, Gwalior and Shivpuri districts of Madhya Pradesh. This survey provided valuable insights into the prevalence and transmission dynamics of COVID-19 within these regions. The data generated from this survey not only informed public health strategies but also contributed to the scientific understanding of the virus's behaviour in diverse population groups.

It is with a sense of pride that I announce our institute's redesignated as a World Health Organization (WHO) collaborative center for indigenous peoples. This recognition underscores our commitment to advancing research, healthcare, and policy interventions that cater specifically to the unique health needs of indigenous communities. As a WHO collaborative center, we remain steadfast in our mission to contribute to the betterment of indigenous populations and provide a platform for global collaboration in this vital area.

As we reflect on the challenges and achievements of the 2020-2021 period, I extend my heartfelt gratitude to the dedicated scientists, researchers, healthcare professionals, and support staff of the institute. Their unwavering commitment, tireless efforts, and resilience were instrumental in navigating the turbulent times and achieving our goals.

I would also like to express my gratitude to secretory DRH & Director General of the Indian Council of Medical Research (ICMR) for continued support, guidance, and encouragement. Our collaborative efforts are a testament to the power of partnership in advancing scientific knowledge and public health outcomes.

As 2020-2021 period tested our mettle and reaffirmed our commitment to advancing health research for the betterment of society, particularly the tribal communities the challenges we faced only strengthened our resolve. I am confident that the future holds even greater possibilities for impactful research and meaningful contributions to public health in tribal communities of our country.

Dr. Aparup Das

Director, ICMR-NIRTH

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Title: Behavioral change in anopheline vectors in areas of insecticidal nets (ITNs/ LLINs) use in Madhya Pradesh and Chhattisgarh: a possible challenge to malaria elimination programme

PI : Dr. A. K. Mishra, Scientist E

Status : Completed

Date of initiation : May 2019

Funding Sources : ICMR Task Force

Background: Indoor residual spraying (IRS) and long-Lasting Insecticide treated bednets (LLINs) are the two strategies targeted for the control of adult vector species. While IRS and LLINs effectively target mosquitoes that bite humans (anthropophagic), and that feed and rest indoors (endophagic and endophilic), feeding and resting activities of vectors outside the human dwellings (HD) has been observed in some previous studies. Higher collections of *An. culicifacies* in cattle shed (CS) than in human dwellings, and sporozoite positive mosquitoes have also been detected in collections from CS in Madhya Pradesh. With the increased distribution and enhanced use of LLINs in many areas changes in vector behaviour from indoor resting to outdoor resting and from human dwelling to cattle shed has also been observed.

Madhya Pradesh is the largest state in the country (308252 km^2) having 50 districts and consists of sparsely settled forested hills with the forest area about 31% serving as reservoir for intense perennial malaria transmission. The state has about 60 million populations, 12 million of whom are classed as tribal. Tribal constitute about 18% of total population of the M.P. state. They are highly prone to malarial disease and as much as 30% of total malaria cases of the country reported from tribal population whereas their proportion is only 8.6% of the total population of nation. Chhattisgarh is endemic for malaria and contributes about 16% of annually reported malaria cases in the country with predominance of *P. falciparum* (NVBDCP).

This study is designed and planned to generate data on the behavioural changes that could have resulted due to use of IRS and LLINs for long periods. The studies planned would help in identifying such changes if any, and the proportions of vector species that are not resting and biting indoors in human dwellings where the IRS and LLINs are used, and also would identify where this population is now resting, biting and source of feeding. Thus, this study would help in targeting the entire vector species population by the national malaria control programme, and aid in accelerating the progress of elimination of malaria in the country.

Methodology: The study was conducted in 2 highly malarious districts viz. Dindori in Madhya Pradesh and Korea in Chhattisgarh (Figure 1A & B). Dindori (Pop. 704524) is one of the highest malarious district in Madhya Pradesh contributing 12% of malaria in the state while its population is only 1 % of the state population. District Korea (Population 659,039) is also highly malarious situated in the northern part of Chhattisgarh. Both districts are tribal forested having >80% ethnic tribe i.e. Gond. API of the area from the year 2014 to 2017 ranged from 1.5 to 6.4 in Dindori while it was 5.1 to 7.2 in Korea. LLINs were distributed in the year 2012, 13 and 2017. The area selected was covered with sufficient number of nets.

From each district, two CHCs were selected based on abundance of vector species, malaria prevalence and relatively longer period of LLIN use. In Dindori, CHC Bajag (high transmission) and Vikrampur (low transmission) and in Koria, CHC Khadgwa (high transmission) and Baikunthpur (low transmission) were selected. API of these CHCs from the year 2014 to 2017 ranged from 2.3 to 8.5 in Bajag CHC and from 0.8 to 2.1 in Vikrampur CHC in Dindori district while it was 5.7 to 8.6 in Khadgwa CHC and from 1.3 to 3.0 in Baikunthpur CHC in Korea district. From each selected CHC, three villages in plain, forest and foothill terrain were chosen for study.

Figure 1 A. Map of Madhya Pradesh showing study district Dindori_

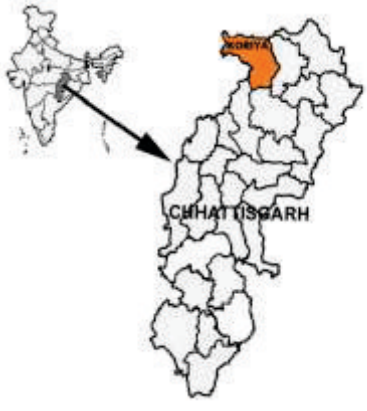


Figure 1 B. Map of Chhattisgarh showing study district Korea

The indoor resting mosquito collections were done by hand catch and pyrethrum spray collections in all 6 villages in each district covering 3 ecotypes viz. plain, forest and foothill. Light trap catches indoor and outdoor and mosquito landing indoor and outdoor on human were done in 3 villages in each district. The study involves laboratory and field evaluation components i.e. blood meal analysis, vector incrimination, sibling species identification, susceptibility tests etc. All the mosquitoes collected by different methods were identified using standard keys for species and abdominal conditions.

Laboratory processing was done for Vector incrimination, Sibling species determination and Blood meal analysis. Heads and thoraces of *An. culicifacies* and *An. fluviatilis* from all collections were stored in micro centrifuge tubes separately and assayed for the presence of malaria parasite by employing diagnostic PCR using the nested PCR protocol described by Snounou *et al.* An allele-specific PCR assay of Singh et al 2004 followed by AD-PCR and BCE-PCR assays described by Goswami et.al. 2006 was used for the identification of all sibling species of *An. culicifacies.* An allele specific polymerase chain reaction (AS-PCR) assay based on differences in nucleotide sequences in D3 domain of 28S ribosomal DNA for *An. fluviatilis* sibling species was used for identification. To determine the host feeding preferences, blood elutes were collected on Whatman filter paper No. 1 from the stomach of wild caught fully fed and semi gravid specimens of *An. culicifacies.* Blood elutes were analyzed by gel diffusion and by PCR methods. Insecticide susceptibility tests against *An. culicifacies* adults were conducted following WHO standard guidelines with the WHO prescribed discriminating dosages of the insecticides (DDT: 4%, malathion: 5%, deltamethrin: 0.05% and alphacypermethrin 0.05%), and with respective insecticide controls for comparison

Results: The study revealed that two known malaria vectors viz. *An. culicifacies* and *An. fluviatilis* are prevalent in both Dindori and Korea districts. Over all, vector proportion was found significantly higher in Dindori ($P<0.0001$) as compared to that in Korea ($P<0.0001$) (Table 1). *An. fluviatilis* was found slightly higher (1.5) in Korea than Dindori (1.0). During light trap collection also, *An. fluviatilis* catch was higher in Korea.

Table 1 Number and density of *An. culicifacies*, *An. fluviatilis* and total anopheline mosquitoes

Site	Districts	Hrs / traps/ rooms/ baits	*An. culicifacies*			*An. fluviatilis*			Total Anopheles	
			Nos	%	Density	Nos	%	Density	Nos	Density
Indoor Resting Collection	Dindori	204	3113	64.11	15.26	208	4.28	1.02	4856	23.80
	Korea	192	1835	50.34	9.56	286	7.85	1.49	3645	18.98
Light trap indoor	Dindori	51	108	35.06	2.12	20	6.49	0.39	308	6.04
	Korea	49	52	20.88	1.06	42	16.87	0.86	249	5.08
Light trap outdoor	Dindori	51	171	38.60	3.35	21	4.74	0.41	443	8.69
	Korea	48	129	25.75	2.69	74	14.77	1.54	501	10.44
Pyrethrum spray	Dindori	102	444	50.86	4.35	19	2.18	0.19	873	8.56
	Korea	94	175	33.52	1.86	29	5.56	0.31	522	5.55
Human landing Indoor	Dindori	102	6	42.86	0.06	1	7.14	0.01	14	0.14
	Korea	97	1	100.00	0.01	0	0.00	0.00	1	0.01
Human landing outdoor	Dindori	102	37	66.07	0.36	0	0.00	0.00	56	0.55
	Korea	96	24	68.57	0.25	6	17.14	0.06	35	0.36
Total Numbers in District Dindori			**3879**			**269**			**6550**	
Total Numebrs in District Korea			**2216**			**437**			**4953**	
G Total			**6095**			**706**			**11503**	

In this study, in both the districts, less proportion of anophelines and *An.culicifacies* density was observed inside the human dwellings (12%) where as it was significantly high in cattle sheds located at outside the houses (88%, Table 2). This change of behaviour of mosquitoes may be due to use of LLINs and IRS inside the houses. During night collections of human landing mosquitoes, it was found that most of the mosquitoes landed in early hours of night (Table 3). It is known that *An. culicifacies* maintains malaria transmission from July to October and accordingly two rounds of IRS (15th June to 31st July and 1st September to 15th October) were scheduled under the National Vector Borne Disease Control Programme for interruption of malaria transmission. In this study *An. culicifacies* density was found high in the month of August in all collections. (Figure 2A, B-7A, B)

Table 2 Mosquitoes collected from human dwellings and cattle shed

Species	Human Dwelling				Cattle Shed			
	Density		%		Density		%	
	Dindori	Korea	Dindori	Korea	Dindori	Korea	Dindori	Korea
An. culicifacies	3.6	1.67	11.79	8.72	26.92	17.45	88.21	91.28
An. fluviatilis	0.41	0.65	20.19	21.68	1.63	2.33	79.81	78.32
An. subpictus	0.61	1.28	11.15	24.95	4.84	3.85	88.85	75.05
An. annularis	0.62	0.52	9.68	8.56	5.76	5.56	90.32	91.44
An. pallidus	0.33	0.28	17.99	15	1.52	1.59	82.01	85
An. jepyoriensis	0	0.08	0	14.81	0.01	0.48	100	85.19
An. splendidus	0.06	0.05	16.22	8.93	0.3	0.53	83.78	91.07
An. theobaldi	0	0	0	0	0.06	0.06	100	100
An. barbirostris	0.01	0.02	2.04	4.17	0.47	0.48	97.96	95.83
An. maculatus	0	0	0	0	0	0	0	0
An. nigerrimus	0.01	0.01	11.11	12.5	0.08	0.07	88.89	87.5
An. vagus	0.04	0.01	13.79	4.76	0.25	0.21	86.21	95.24
An. tessillatus	0.01	0	50	0	0.01	0.08	50	100
An. jamesii	0.01	0	33.33	0	0.02	0.03	66.67	100
An. aconitus	0	0.07	0	11.11	0.03	0.58	100	88.89
Total Anopheles	**5.71**	**4.65**	**11.99**	**12.24**	**41.9**	**33.32**	**88.01**	**87.76**

Table 3 Human landing collection in different quarter of night

Time of Collection	Spceies	Human Landing Indoor		Human landing Outdoor	
		Dindori	Korea	Dindori	Korea
06 to 09 pm	*An. culicifacies*	4	0	8	3
	An. fluviatilis	0	0	0	1
	Total Anopheles	**6**	**0**	**10**	**7**
09 to 12 pm	*An. culicifacies*	1	0	24	13
	An. fluviatilis	1	0	0	3
	Total Anopheles	**7**	**0**	**33**	**17**
12 to 03 am	*An. culicifacies*	0	1	4	5
	An. fluviatilis	0	0	0	2
	Total Anopheles	**0**	**1**	**10**	**8**
03 to 06 am	*An. culicifacies*	1	0	1	3
	An. fluviatilis	0	0	0	0
	Total Anopheles	**1**	0	**3**	3
Total	***An. culicifacies***	**6**	**1**	**37**	**24**
	An. fluviatilis	**1**	**0**	**0**	**6**
	Total Anopheles	**14**	**1**	**56**	**35**

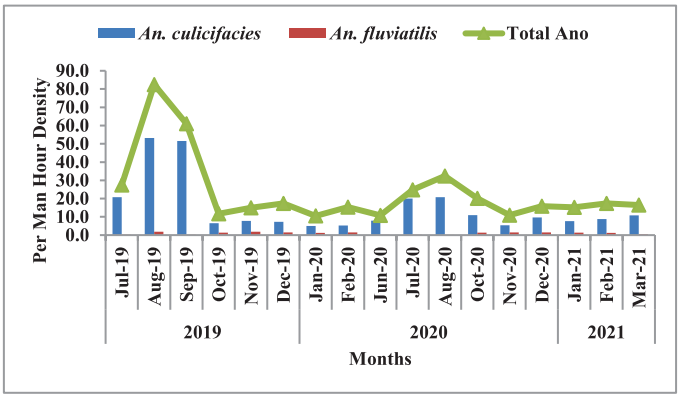


Figure 2 (A) Month wise Indoor Resting Collection in Dindori

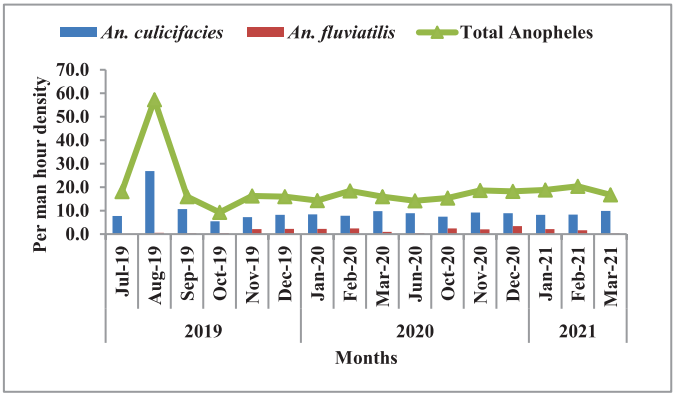


Figure 2 (B) Month wise Indoor Resting Collection in Korea

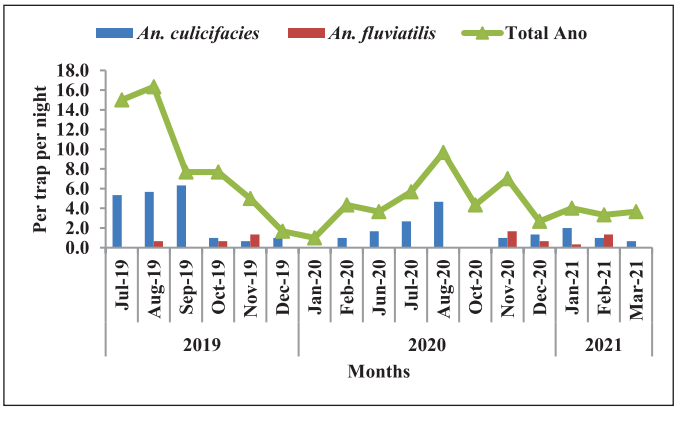


Figure 3 (A) Month wise Light trap indoor Collection in Dindori

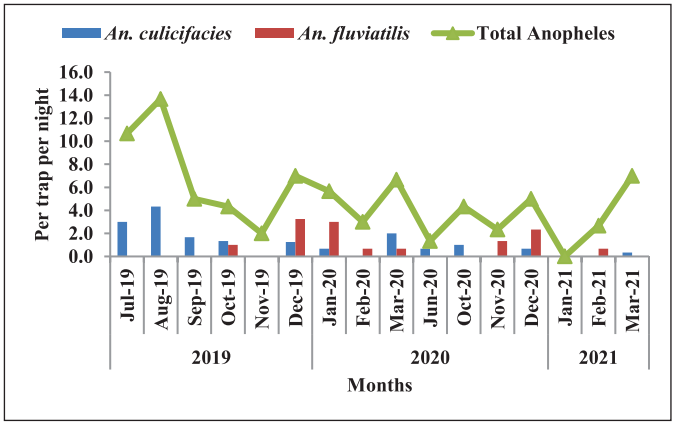


Figure 3 (B) Month wise Light trap indoor collection in Korea

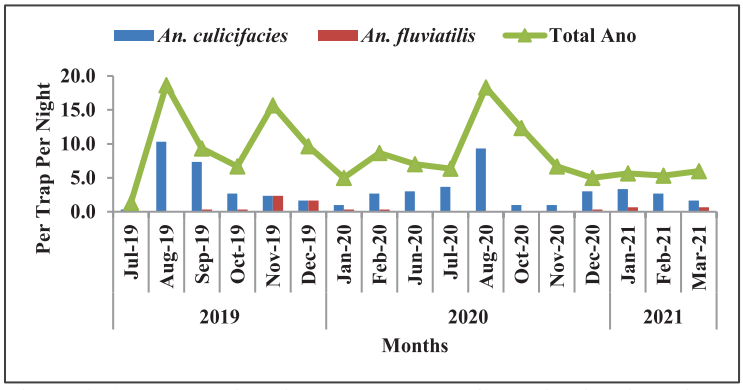


Figure 4 (A) Month wise Light trap outdoor Collection in Dindori

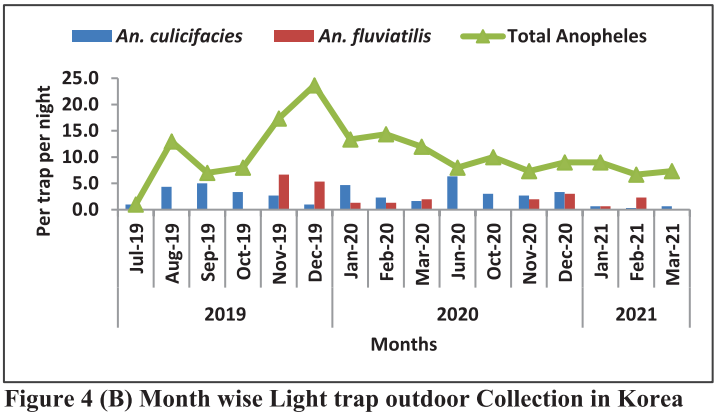


Figure 4 (B) Month wise Light trap outdoor Collection in Korea

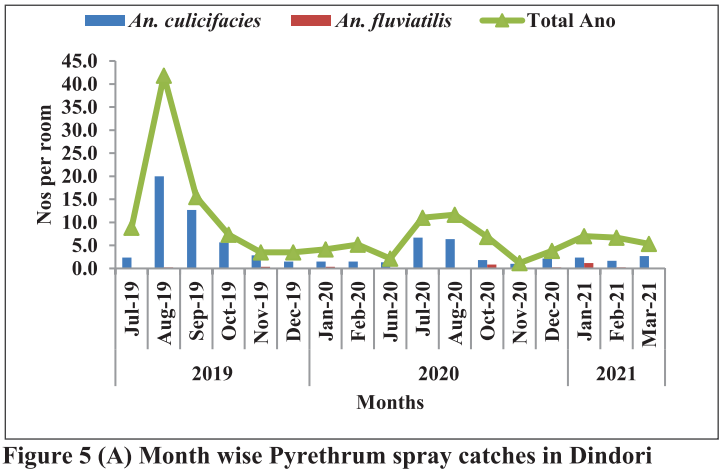


Figure 5 (A) Month wise Pyrethrum spray catches in Dindori

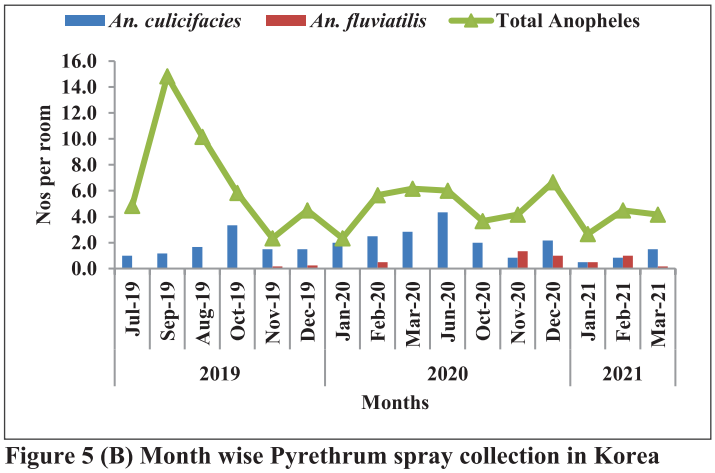


Figure 5 (B) Month wise Pyrethrum spray collection in Korea

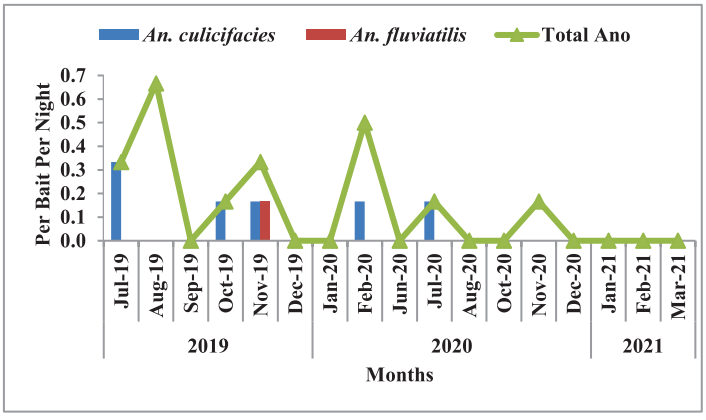


Figure 6 (A) Month wise Human landing indoor Collection in Dindori

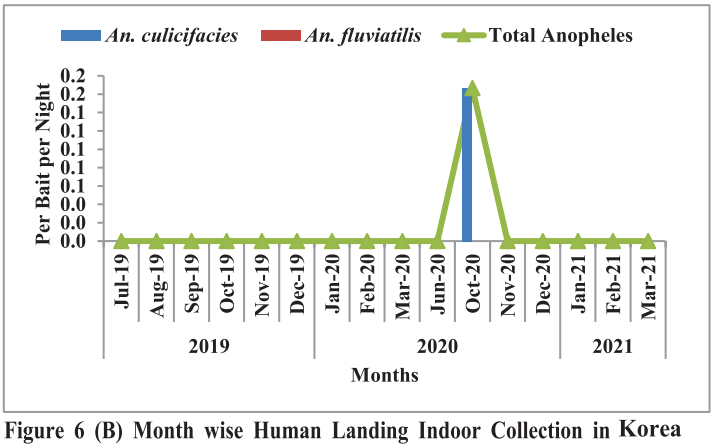


Figure 6 (B) Month wise Human Landing Indoor Collection in Korea

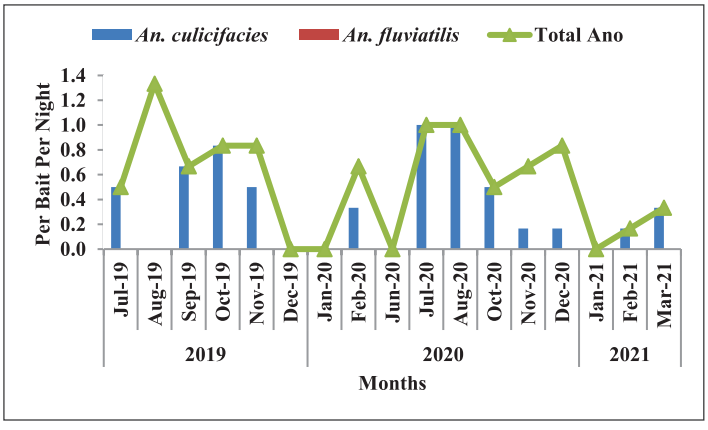


Figure 7 (A) Month wise Human landing outdoor Collection in Dindori

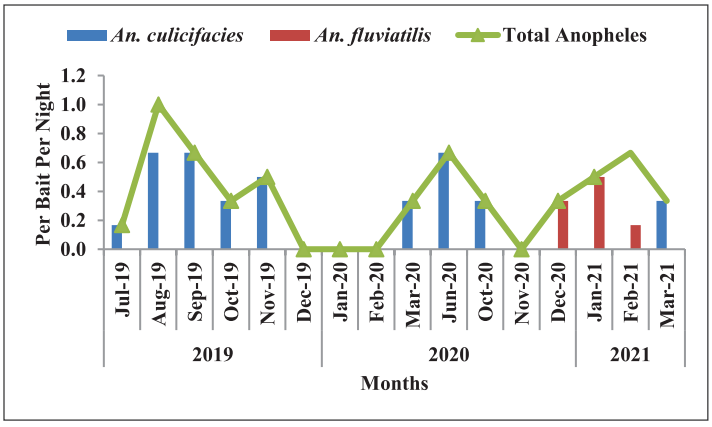


Figure 7 (B) Month wise Human Landing Outdoor Collection in Korea

During the study, mostly fed mosquitoes were caught in total, however, more unfed *An. culicifacies* mosquitoes were caught during light trap indoor catches and indoor and outdoor human landing catches. In human dwellings also, a large number of unfed mosquitoes were found may be due to the effect of LLINs using by the households inside the houses. However, in previous studies in the same area, sufficient numbers of fed mosquitoes were recorded inside the houses. When we separate the collection as in inside and outside of the houses, it was found that significantly more unfed mosquitoes (P<0.0001) were caught inside the houses (human dwellings, pyrethrum spray and light trap indoor) whereas significantly more fed were caught in outside of the houses i.e cattle shed, outdoor light trap and human landing outdoor (P<0.0001, Table 4).

Table 4 Abdominal condition of *An.culicifacies* and *An. fluviatilis* inside and outside of the houses

Species	Site of Collection*	District	UF	UF %	F	F%	SG	SG %	G	G%	Total
An. culicifacies	Inside house (HD, LTI, HBI Pyrethrum spray)	Dindori	471	50.90	288	31.10	106	11.50	60	6.50	925
		Korea	190	49.00	133	34.30	43	11.10	22	5.70	388
	Outside of the house (LTO,HBO,CS)	Dindori	311	10.50	2263	76.60	243	8.20	137	4.60	2954
		Korea	211	11.50	1448	79.20	110	6.00	59	3.20	1828
An. fluviatilis	Inside house (HD, LTI, HBI Pyrethrum spray)	Dindori	38	46.30	39	47.60	3	3.70	2	2.40	82
		Korea	61	45.90	61	45.90	8	6.00	3	2.30	133
	Outside of the house (LTO,HBO,CS)	Dindori	34	18.20	147	78.60	6	3.20	0	0.00	187
		Korea	51	16.80	222	73.00	27	8.90	4	1.30	304

*HD- human dwelling, LTI- light trap indoor, HBI- human bait indoor, LTO- light trap outdoor, HBO- human bait out door, CS-cattle shed

The laboratory processing of Vector incrimination for sporozoite detection in the known vectors of malaria i.e. *An. culicifacies* and *An. fluviatilis* in the region, their sibling species determination and blood meal analysis revealed that two *An. culicifacies* from Dindori out of 5777 tested for vector incrimination from both the districts were found positive for malaria parasite showing very low infectivity (Table 5). All the sibling species of *An. culicifacies* viz. B, C, E and A/D are present in the area with high proportion of C (Table 6). *An. fluviatilis* T was identified the main subspecies. A total of 485 samples of *An. culicifacies* tested for blood meal source by PCR, the anthropophilic index (AI) was 2.9. The AI was almost similar in both the districts; however, all the human blood positive mosquitoes were collected from cattle shed. (Table 7). Further, *An. culicifacies* was found to be resistant to DDT, malathion and two

pyrethroids i.e. alphacypermethrin and deltamethrin as per susceptibility tests carried out in both the districts as per WHO procedure (Table 8).

Table 5. *An. culicifacies* and *An. fluviatilis* tested for the detection of malaria parasite

Year	Month	*An. culicifacies*				*An. Fluviatilis*			
		Dindori	+ve	Korea	+ve	Dindori	+ve	Korea	+ve
2019	July	167	0	80	0	0	0	0	0
	August	734	2*	375	0	24	0	6	0
	September	681	0	123	0	4	0	1	0
	October	58	0	37	0	14	0	1	0
	November	131	0	76	0	33	0	32	0
	December	100	0	85	0	21	0	47	0
	Total	**1871**	**2**	**776**	**0**	**96**	**0**	**87**	**0**
2020	January	60	0	136	0	18	0	45	0
	February	61	0	110	0	18	0	37	0
	June	109	0	125	0	2	0	20	0
	July	303	0	145	0	0	0	3	0
	August	304	0	52	0	1	0	9	0
	October	129	0	124	0	21	0	60	0
	November	96	0	132	0	23	0	63	0
	December	138	0	824	0	21	0	237	0
	Total	**1200**	**0**	**102**	**0**	**104**	**0**	**35**	**0**
2021	January	126	0	102	0	23	0	35	0
	Total	**126**	**0**	**1702**	**0**	**23**	**0**	**359**	**0**
G Total		**3197**	**2**	**2580**	**0**	**223**	**0**	**481**	**0**

Table 6. Sibling species composition of *An.culicifacies* and *An. fluviatilis*

Districts	*An. culicifacies*						*An. Fluviatilis*		
	B	C	E	A/D	Total identified	S	T	U	Total identified
Dindori	63 (11.1)	215 (38.7)	142 (25.1)	145 (25.7)	565	0 (0.0)	15 (60.0)	10 (40.0)	25
Korea	65 (12.4)	216 (41.1)	154 (29.3)	90 (17.1)	525	3 (6.7)	31 (68.9)	11 (24.4)	45
Total	**65 (11.7)**	**431 (39.5)**	**296 (27.1)**	**235 (21.5)**	**1090**	**3 (4.3)**	**46 (65.7)**	**21 (30.0)**	**70**

Table 7. Blood meal analysis

Districts	Human dwelling			Cattle shed			Total		
	Tested	Human +ve	AI	Tested	Human +ve	AI	Tested	Human +ve	AI
Dindori	40	0	0	160	6	3.75	200	6	3
Korea	35	0	0	250	8	3.2	285	8	2.8
Total	**75**	**0**	**0**	**410**	**14**	**3.41**	**485**	**14**	**2.88**

Table 8 Insecticide susceptibility test in Dindori and Korea

Districts	Year	Insecticide/ Control	Nos of mosquitoes exposed	% knocked down 1hr	% mortality 24 hr	Resistance status
Dindori	2019	DDT4%	60	6.7	16.7	R
		Mala 5%	75	49.3	68	R
		Alpha 0.05%	105	54.3	81.9	R
		Delta 0.05%	105	62.9	87.6	R
	2020	DDT4%	60	10	20	R
		Mala 5%	60	40	66.7	R
		Alpha 0.05%	105	36.2	76.2	R
		Delta 0.05%	105	41.9	79	R
	2021	DDT4%	60	8.3	20	R
		Mala 5%	60	33.3	65	R
		Alpha 0.05%	105	38	77.1	R
		Delta 0.05%	105	40	84.8	R
Korea	2019	DDT4%	45	4.4	20	R
		Mala 5%	60	35	68.3	R
		Alpha 0.05%	105	47.6	86.7	R
		Delta 0.05%	105	55.2	88.6	R
	2020	DDT4%	60	3.3	23.3	R
		Mala 5%	60	26.7	66.7	R
		Alpha 0.05%	105	51.4	76.2	R
		Delta 0.05%	105	56.2	81	R
	2021	DDT4%	30	10	36.7	R
		Mala 5%	30	33.3	56.7	R
		Alpha 0.05%	105	53.3	66.7	R
		Delta 0.05%	105	60.9	78.1	R

Malaria Elimination and Demonstration Project (MEDP) Mandla (under ICMR Asymptomatic Malaria Project: (Entomological surveillance and monitoring)

PI : Dr. A. K. Mishra, Scientist E

Status : Ongoing

Date of initiation : April 2019

Date of Completion :

Funding Sources : ICMR

Background: This study is a part of ongoing Mandla -Malaria Elimination Demonstration Project (M-MEDP) in Mandla district of Madhya Pradesh which is a public-private partnership (PPP model) collaborative project among Indian Council of Medical Research (through National Institute for Research in Tribal Health), Government of Madhya Pradesh (MP Govt.), and the Foundation for Disease Elimination and Control of India (FDEC-India, established by Sun Pharmaceutical Industries Ltd.). As per the Memorandum of Understanding among the ICMR through NIRTH, MP Govt. and FDEC-India, NIRTH has been designated to provide extensive technical support in malaria diagnostics, molecular characterization of malaria parasites using PCR and DNA sequencing and training of microscopists and entomological surveillance and identification of malaria vectors using molecular tools.

Knowledge of entomological aspects is the key to selecting appropriate vector control interventions and monitoring their impact on mosquito populations. Entomological surveillance can include assessments of species distribution, densities, aquatic habitats, feeding and resting behaviours, monitoring of the insecticide susceptibility of vector populations to insecticides. The study also includes the determination in change in infectious status of mosquito.

Objective : The overall objective of the project is to determine the sub-microscopic/ rapid diagnostic test (RDT) burden of malaria, molecular characterization of malaria parasites and entomological investigations of vector for control and managements.

Methodology: Mosquitoes were collected once in three months in nine village of different CHCs by Indoor Resting Collection, pyrethrum spray collection, light trap collections in outdoors and human landing collections in indoors and outdoors. The collected vectors were tested by PCR for the presence of species-specific sporozoites. The vectors were also tested once in a year for insecticide susceptibility status following standard WHO protocol. The report includes the results of surveys carried out in January, July and November months of the year 2020.

Results: A total of 962 anophelines were collected from the study villages by different collections (Table 1). The average indoor resting per man hour anopheline density (MHD) was 15.1 of which 68% were vector *Anopheles culicifacies* (62.7%) and *An. fluviatilis* (5.5%) followed by *An. subpictus, An.annularis* and *An.pallidus*. Other anophelines viz. *An.vagus, An.splendidus, An.nigerrimus, An barbirostris, An. theobaldi, An.maculatus, An.jamesi, An. pseudojamesi* and *An. jeyporiensis* were caught in very few numbers. The per man hour density of anophelines was almost similar in all 3 months (Table 2). The per room density was 2.2 in which vector proportion was 68%. The month wise proportion (Table 2) of anophelines was highest in July month (61%), however, of the total anopheline, the proportion of vector was highest in January (100%).

A total of 67 anophelines of 11 species by using 9 traps were collected from the study villages (Table 1). The average per trap per night catch of anophelines was 7.44 of which vector proportion was 58% (*An. culicifacies* 44.8% and *An. fluviatilis* 13.4%). The other anophelines were trapped in few numbers. The anopheline per trap catch was highest in july month (11.7) however, vector proportion was higher in January (80%, Table 2).

During the period of survey, only 2 *An. culicifacies* mosquito were caught in indoor landing catches, however, 11 *An. culicifacies* out of 17 total aniphelines, were caught in outdoor human landing collections (Table1). Month wise data shows that both 2 *An.culicifacies* in indoors were caught in July month and out of 11 *An. culicifacies*, 8 were caught in July and 3 in November (Table 2).

All the mosquitoes were identified using standard keys (Christophers 1934, Puri 1958, Wattal & Kalra 1961 and Nagpal and Sharma 1995) for species and abdominal conditions.
To determine the host feeding preference, blood elutes were collected on Whatman filter paper (No.1) from the stomach of wild caught fully fed and semigravid specimens of *An. culicifacies*. During the period, a total of 137 (23 from human dwellings and 44 from cattle shade) blood samples were taken of which 12 (5 HD and 7 CS) were positive for human blood.

A total of 537 *An. culicifacies* and 56 *An. fluviatilis* were processed for molecular detection of malaria parasites. We found that only one *An.culicifacies* was found positive for *P.falciparum* malaria parasites by ribosomal DNA PCR tests.These samples were tested for sibling species determination and identified as sibling species B, C, E and A/D. The proportion of *An. culicifacies* C was the highest (37.4%) followed by A/D and E, and lowest was subspecies B

(12.4%), Table 3). The sibling species distribution was found almost similar in each month. Out of 56 specimens of *An. fluviatilis* identified for sibling species, 42 (75.0%) were of species T (Table3).

Insecticide Susceptibility test against adult *An.culicifacies* mosquitoes was conducted according to WHO standard guidelines to ascertain the present susceptibility status. Results of the tests carried out during the period, revealed that the *An. culicifacies* the vector mosquito of this area is resistant to DDT, Malathion and the synthetic pyrethroids insecticide as the mortality of *An. culicifacies* observed was below 90%. (Table 4).

Cone bioassays were carried out to assess the efficacy of insecticide used in IRS program and also to assess the quality of IRS on different sprayed surfaces in the villages. The houses having different sprayed surfaces were selected for cone bioassays. The bioassays were done on day 1 and 30 post-spraying using WHO cones. The bioassays carried out in July month revealed 87% average corrected % mortality of *An.culicifacies* on one day post spraying and 40% on day 30 after spraying (Table 5).

Table 1. Mosquito density in different collection

Species	Indoor resting Collection			Pyrethrum spray			Light trap outdoor			Human bait indoor			Human bait outdoor			Total	
	Nos	(%)	MHD	Nos	(%)	Nos/ room	Nos	(%)	Nos/ trap	Nos	(%)	Nos per bait	Nos	(%)	Nos/ bait	Nos	(%)
An. culicifacies	512	62.7	9.48	36	60.00	1.33	30	44.78	3.33	2	100.00	0.11	11	64.71	0.61	591	61.43
An. fluviatilis	45	5.5	0.83	5	8.33	0.19	9	13.43	1.00	0	0.00	0.00	0	0.00	0.00	59	6.13
An. subpictus	79	9.6	1.46	12	20.00	0.44	5	7.46	0.56	0	0.00	0.00	2	11.76	0.11	98	10.19
An. annularis	57	6.9	1.06	0	0.00	0.00	1	1.49	0.11	0	0.00	0.00	1	5.88	0.06	59	6.13
An. vagus	26	3.2	0.48	5	8.33	0.19	5	7.46	0.56	0	0.00	0.00	1	5.88	0.06	37	3.85
An. splendidus	35	4.3	0.65	1	1.67	0.04	5	7.46	0.56	0	0.00	0.00	1	5.88	0.06	42	4.37
An. pallidus	40	4.9	0.74	1	1.67	0.04	5	7.46	0.56	0	0.00	0.00	1	5.88	0.06	47	4.89
An. nigerrimus	9	1.1	0.17	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	9	0.94
An. barbirostris	7	0.8	0.13	0	0.00	0.00	2	2.99	0.22	0	0.00	0.00	0	0.00	0.00	9	0.94
An. theobaldi	1	0.1	0.02	0	0.00	0.00	1	1.49	0.11	0	0.00	0.00	0	0.00	0.00	2	0.21
An. maculatus	1	0.1	0.02	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	1	0.10
An. jamsaii	1	0.1	0.02	0	0.00	0.00	3	4.48	0.33	0	0.00	0.00	0	0.00	0.00	4	0.42
An. tessellatus	0	0.0	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00
An. pseudojamesi	2	0.25	0.04	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	2	0.21
An. jeyporiensis	1	0.12	0.02	0	0.00	0.00	1	1.49	0.11	0	0.00	0.00	0	0.00	0.00	2	0.21
Total *Anopheles*	**816**		**15.11**	**60**		**2.22**	**67**		**7.44**	**2**		**0.11**	**17**		**0.94**	**962**	

Table 2. Month wise Mosquito density in different collections

Month	Species	Indoor resting			Pyrethrum spray			Light trap outdoor			Human bait indoor			Human bait outdoor			Total	
		Nos	%	MHD	Nos	%	Nos per room	Nos	%	Nos per trap	Nos	%	Nos per bait	Nos	%	Nos per bait	Nos	%
Jan-20	*An. culicifacies*	169	66.80	9.39	10	90.91	1.11	8	80.00	2.67	0	0.00	0.00	0	0.00	0.00	187	68.25
	An. fluviatilis	32	12.65	1.78	1	9.09	0.11	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	33	12.04
	Total *Anopheles*	253		14.06	11		1.22	10		3.33	0		0.00	0		0.00	274	
Jul-20	*An. culicifacies*	181	60.94	10.06	20	54.05	2.22	22	62.86	7.33	2	100.00	0.33	8	66.67	1.33	233	60.84
	An. fluviatilis	0	0.00	0.00	0	0.00	0.00	1	2.86	0.33	0	0.00	0.00	0	0.00	0.00	1	0.26
	Total *Anopheles*	297		16.50	37		4.11	35		11.67	2		0.33	12		2.00	383	
Nov-20	*An. culicifacies*	162	60.90	9.00	6	50.00	0.67	0	0.00	0.00	0	0.00	0.00	3	60.00	0.50	171	56.07
	An. fluviatilis	13	4.89	0.72	4	33.33	0.44	8	36.36	2.67	0	0.00	0.00	0	0.00	0.00	25	8.20
	Total *Anopheles*	266		14.78	12		1.33	22		7.33	0		0.00	5		0.83	305	

Table 3. Sibling species composition

Month	*An. culicifacies*					*An. fluviatilis*		
	B	C	E	A/D	Total identified	T	U	Total identified
January	20 (12.5)	59 (37.1)	40 (25.1)	40 (25.1)	159	23 (69.7)	10 (30.3)	33
July	27 (12.9)	75 (35.9)	50 (23.9)	57 (27.3)	209	1 (100.0)	0	1
November	20 (11.8)	67 (39.6)	38 (22.5)	44 (26.0)	169	18 (81.8)	4 (18.2)	22
Total	**67 (12.4)**	**201 (37.4)**	**128 (23.8)**	**141 (26.2)**	**537**	**42 (75.0)**	**14 (25.0)**	**56**

Table 4. Insecticide Susceptibility Test

Exp / Control	Insecticide	Replicates	Mosquito tested	KD / hr	Dead 24 hr	Corrected % Mortality
Exp	DDT 4%	7	105	4	29	27.6
	Malathion 5%	7	105	40	57	54.3
	Alphacypermethrin 0.05%	7	105	48	86	81.9
	Deltamethrin 0.05%	7	105	52	94	87.6
Control	DDT 4%	3	45	0	0	0.0
	Malathion 5%	3	45	0	0	0.0
	SP	3	45	0	3	15.0

Table 5. Cone bioassay test

Days after spray	Exp/ Control	Replicate	No of mosquito exposed	No. of knocked down after 1 hour	No of Dead after 24 hours	% knocked down	% mortality
1 Day	Exp	12	120	71	104	59.17	86.67
	Control	4	40	0	0	0.00	0.00
30 Day	Exp	12	120	28	48	23.33	40.00
	Control	4	40	0	0	0.00	0.00

Title: Impact of new, one-minute, sensitive diagnostic with innovative malaria elimination plan

PI : Dr. Praveen Bharti , Scientist E

Co -PI : Dr. Anil Verma Scientist B

Status: Ongoing

Date of initiation: Jan 2020

Date of Completion: Not applicable

Funding sources: India Health fund

Background: Malaria is the leading cause of death due to protozoan parasite and one of the major public health concerns in India. Majority of the burden is reported from tribal areas where there is need for early diagnosis and correct treatment. Malaria is primarily diagnosed by microscopy and rapid diagnostic test (RDT at primary health center (PHC) and community health center(CHC). These tools are either time consuming or less sensitive for low density cases. Therefore, there is an acute need for improved malaria diagnostics methods that are not only cost effective and fast but also advanced in many ways like highly accurate in sensitivity and specificity.

Objective: To evaluate new point-of-care malaria diagnostic device and its comparison with current gold standard tests to determine the accuracy of the new point-of-care instrument.

Methodology: The study is being conducted at the malaria clinic of ICMR-National Institute of Research in Tribal Health located at selected study sites in Udaipur (Rajasthan), Jhabua (M.P.) and Jagdalpur (Chhattisgarh). All febrile patients attending the OPD of selected PHC/CHC at study sites are screened for malaria using RDT, Microscopy and Device . A small amount of blood sample is collected using the venipuncture method after informed consent along with anthropological and demographic information for screening. A few drops of blood will be stored on Whatman fllter paper 42 for PCR analysis. The dried blood samples (DBS are stored at 4°C in a drying box containing sachets of desiccant at study sites and transported to NIRTH Jabalpur at 4°C/ dry ice. DNA extraction will be done using commercial kits (Qiagen) following the manufacturers' protocol. All the DNA samples will be stored at -20°C until used. Diagnostic results of RDT. Microscopy, PCR and Device will be compared to ascertain the accuracy of Gazelle (Device).

Results: The study is ongoing at Sheopur (M.P.), Kotra (Rajasthan) and Jagdalpur (CG). After screening of about 12000 fever cases, a total of 1700 volunteers were enrolled for the study at three study sites. A total of 345 samples (Kotra (73), Sheopur (60) and Jagdalpur (212)) were found malaria positive (*P.falciparum, P.Vivax, P. malariae, P. ovale* or mixed). Analysis of 1400 samples by PCR has revealed cases of Pf (23%), Pv (6.5%),Pm (0.14%), Pf+Pv (5.2%), Pf+Pm (0.7%), other mixed (0.6%) infections.

Conclusion: An extension till 30th November 2021 has been granted by the funding agency to achieve the desired sample size.

Title: Efficacy and safety of ACT for the treatment of uncomplicated Plasmodium falciparum in India : West Bengal, Odisha, and Telangana

PI : Dr. Praveen Bharti , Scientist E

Co -PI : Dr. Anil Verma Scientist B

Status: Completed

Date of initiation: 2019

Date of Completion:

Funding sources: WHO Country Office, India

Background with objective: The emergence and spread of antimalarial drug resistance in the Greater Mekong subregion is the cause of concern. Therefore, regular monitoring of the spread or evolution of antimalarial drug resistance in very crucial for the containment and better management of malaria in India. The general objective of this study is to assess the therapeutic efficacy and safety of AS+SP in West Bengal, Odisha and, Telangana.

Methodology: The study was conducted in one or two selected Primary health centers (PHC) or Community health centers (CHC) from 5 different states of India i.e. West Bengal, Odisha, Madhya Pradesh, Rajasthan and, Telangana. Febrile patients aged between 1 year and 60 years of age were screened for malaria parasite by microscopy and confirmed uncomplicated *P. falciparum* infection was asked to participate in the study. The demographic information (age, gender, body temperature) were recorded and malaria patients were enrolled as per the following criteria.

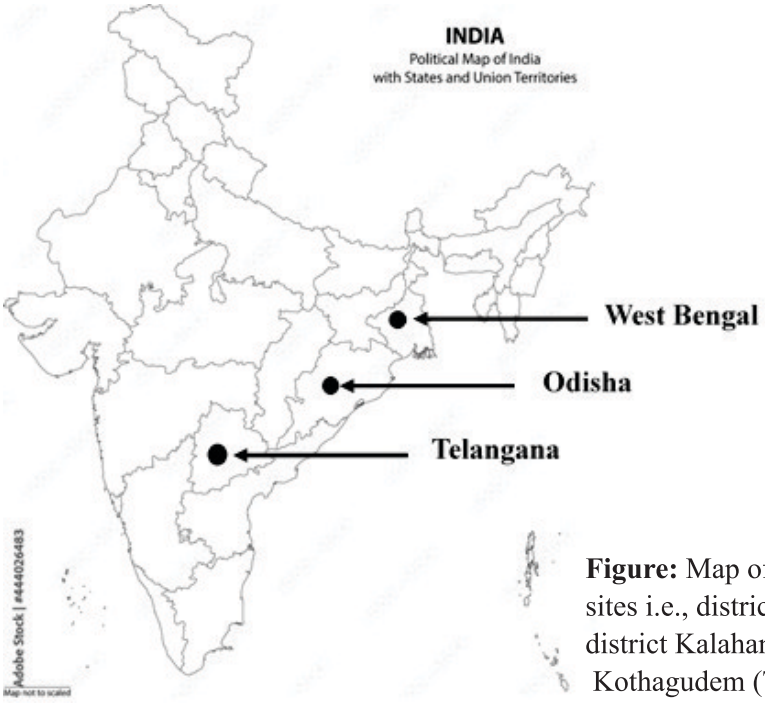


Figure: Map of India showing the study sites i.e., district Medinipur (West Bengal), district Kalahandi (Odisha), and district Kothagudem (Telangana).

Inclusion criteria

Symptomatic patients aged 1 year and above (>5 kg body weight) with uncomplicated malaria due to mono-infection of *P. falciparum* (detected by microscopy at parasitaemia of 1000 to 100,000/µL asexual forms, auxiliary temperature ⩾37.5 °C) and willing to comply with the study protocol for the duration of the study were included.

Exclusion criteria

Patients with general danger signs or signs of severe falciparum malaria, who were unable to drink, had severe vomiting, reported a history of convulsion 7 days prior to patient contact, presence of lethargy or decreased consciousness, inability to sit or stand, were all excluded. Patients who failed to complete treatment due to persistent vomiting or failed to attend scheduled visits during the first 3 days or withdrew their consent were also excluded.

After enrolment, AS+SP tablets were administered according to body weight, twice a day over 3 days. Clinical and parasitological parameters were monitored over a 28-day follow-up period to evaluate drug efficacy.

Results: A total of 1463 febrile patients were screened in two study sites i.e., Odisha and Telangana. No patients could be enrolled at the site in West Bengal due to low positivity. Out of 213 *P. falciparum* mono infections, more than 150 patients were enrolled in study. Out of which, the required number of patients (more than 72 at Odisha and Telangana) competed the 28 days follow-up. Adequate clinical and parasitological response (ACPR) was observed in 100% of cases. Neither early treatment failure (ETF) nor late clinical failure (LCF) was observed in this study.

Conclusion: The current regime of anti-malarial drugs (AS+SP) was found to effective at selected sites in Odisha and Telangana . There is no need for any alteration in the drug policy.

Title: Efficacy and safety of ACT for the treatment of uncomplicated *Plasmodium falciparum* in India, Madhya Pradesh and, Rajasthan

PI: Dr. Anil Verma, Scientist B

Status: completed

Date of initiation: February 2021

Date of Completion: December 2021

Funding sources: WHO Country Office, India

Background with objective: The emergence and spread of antimalarial drug resistance in the Greater Mekong subregion is the cause of concern. Therefore, regular monitoring of the spread or evolution of antimalarial drug resistance in very crucial for the containment and better management of malaria in India. The general objective of this study is to assess the therapeutic efficacy and safety of AS+SP in West Bengal, Odisha and, Telangana.

Methodology: The study was conducted in one or two selected Primary health centers (PHC) or Community health centers (CHC) from two different states of India i.e. Madhya Pradesh and Rajasthan. Febrile patients aged between 1 year and 60 years of age were screened for malaria parasite by microscopy and confirmed uncomplicated *P. falciparum* infection was asked to participate in the study. The demographic information (age, gender, body temperature) were recorded and malaria patients were enrolled as per the following criteria**.**

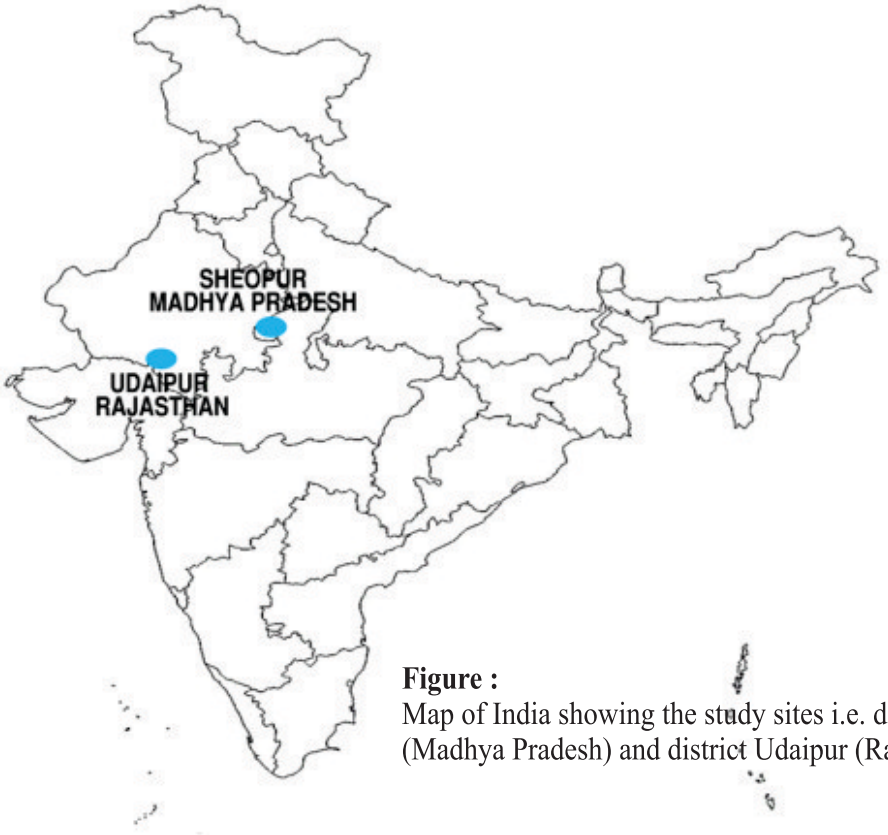


Figure :
Map of India showing the study sites i.e. district Sheopur (Madhya Pradesh) and district Udaipur (Rajasthan).

Inclusion criteria: Symptomatic patients aged 1 year and above (>5 kg body weight) with uncomplicated malaria due to mono-infection of *P. falciparum* (detected by microscopy at parasitaemia of 1000 to 100,000/µL asexual forms, auxiliary temperature ⩾37.5 °C) and willing to comply with the study protocol for the duration of the study were included.

Exclusion criteria: Patients with general danger signs or signs of severe falciparum malaria, who were unable to drink, had severe vomiting, reported a history of convulsion 7 days prior to patient contact, presence of lethargy or decreased consciousness, inability to sit or stand, were all excluded. Patients who failed to complete treatment due to persistent vomiting or failed to attend scheduled visits during the first 3 days or withdrew their consent were also excluded.

After enrolment, AS+SP tablets were administered according to body weight, twice a day over 3 days. Clinical and parasitological parameters were monitored over a 28-day follow-up period to evaluate drug efficacy.

Results: A total of about 1600 febrile patients were screened on the both study sites. No patients were enrolled at Sheopur due to low malaria positivity rate. In Rajsthan, more than 72 cases who fulfilled the enrolment criteria as well as consented for the study were enrolled. Therapeutic efficacy was determined in 98.7% patients who had completed their 28 days follow-up while 1 patient withdrew from the study. Adequate clinical and parasitological response (ACPR) was observed in 100% of cases. Neither early treatment failure (ETF) nor late clinical failure (LCF) was observed in this study. Also, in most of the patients (96.3%) parasitemia was cleared within ⩾72hrs.

Conclusion: The current regime of anti-malarial drugs (AS+SP) was found to be effective at selected sites in Sheopur (M.P.) and Kota, Udaipur (Rajasthan) . There is no need for any alteration in drug policy.

Title: Tracking antimicrobial resistance and efficiency of malaria diagnostics in tribal areas of India to achieve elimination goals (Role: Co-PI, Indo- German Project).

PI: Dr. Anil Verma, Scientist B

Status: Ongoing

Date of initiation: July 2020

Date of Completion: Ongoing

Funding sources: ICMR-BMBF

Background with objective: Despite the success in control and prevention, malaria is a continuing threat to global development, with half the world's population living at risk of infection. India contributes about 80% of malaria cases in the WHO Southeast Asia Region and 4% of cases worldwide At a time when India is gearing up for malaria elimination by 2030 under the UN's sustainability goals, the emergence of anti-malarial resistance, HRP2/3 deletions, and diagnosis of low-density asymptomatic infections impose obstacles to this public-health priority. The aim of the project is to develop a surveillance and intelligence system for antimalarial-drug resistance, diagnostics efficiency, and disease transmission based on molecular/genetic information.

Methodology: The study is being conducted at the malaria clinic of ICMR-National Institute of Research in Tribal Health (ICMR-NIRTH) located at Late Baliram Kashyap Memorial Medical college formerly known as Maharani Medical College and Hospital, Jagdalpur. All patients attending the participating clinic are approached for participation in the study. Approximately 2 ml of venous blood sample are collected using vacutainer in sterile EDTA coated vial along with anthropological and demographic information. Thin and thick smear are prepared for microscopic examination and bivalent RDT are being used to provide onsite diagnosis of malaria infection. Blood samples are stored at 4°C/ liquid nitrogen at study site and transported to ICMR-NIRTH, Jabalpur in liquid nitrogen container for molecular analysis. All febrile cases tested positive by microscopy or RDT for malaria are given malaria treatment as per National Treatment Guideline.

Results: After preparation of SOPs and consent forms , a total of 70 blood samples have been collected with informed consent from enrolled malaria-positive patients. Microscopic analysis showed that 88% cases were caused by *P. falciparum*, followed by *P. vivax* (12.8%) and mixed infections (1.4%). The samples have been transported from Jagdalpur to ICMR-NIRTH Jabalpur. The molecular analysis of samples is going at ICMR-NIRTH Jabalpur

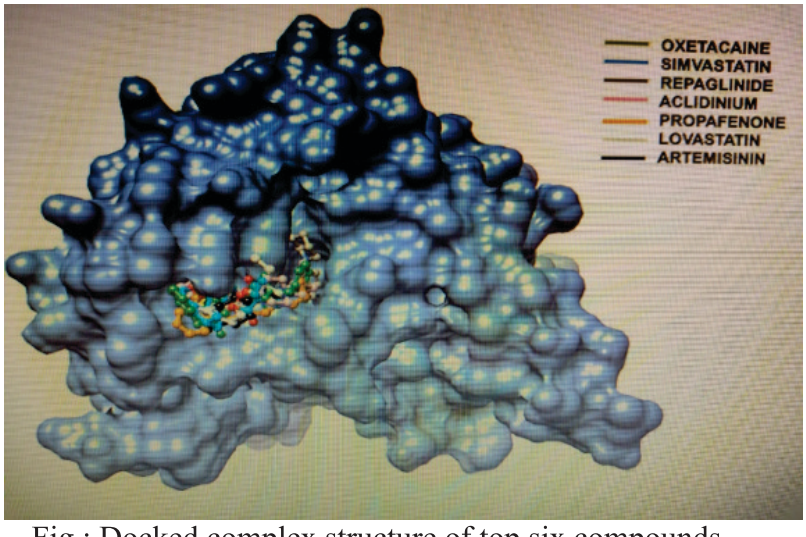


Fig : Docked complex structure of top six compounds in the binding pocket of PfPI3K

Further, Virtual screening of antimalarials was done to identify FDA approved drugs that can be used as antimalarial drug. We have designed a multimodal stratagem to identify approved drugs with a potential antimalarial activity using computational drug reprofiling. Our investigations suggest that oxetacaine, simvastatin, repaglinide, aclidinium, propafenone, and lovastatin could be repurposed for malaria control and prevention. Moreover, Molecular analysis and mathematical modeling is going on.

Title: Malaria control through *Wolbachia* – Vector replacement/reduction in ecosystem

PI : Dr. Vidhan Jain, Scientist D

Status : Completed

Date of initiation : 2018

Date of Completion : 2021

Funding Sources : Intramural

Background with objective: Wolbachia is a gram-negative bacterium present in up to 60% of insect species, including some mosquitoes and even nematodes. Mosquitoes with Wolbachia (wMel strain) are less able to transmit the arboviral diseases to people. Further insect eggs are killed by a cytoplasmic incompatibility (CI) when the sperm of Wolbachia-infected males fertilizes infection-free eggs. It is a maternally transferred (vertical) bacterium. wMelpop (shorten life of host), wAlbB, wCer, wMelCS, wRi, wBma are some of the strains that infect different insects/nematode and might be useful in disease control via reduced vector density/disease transmitting potential. In the present study we aim to detect, isolate, long term maintains and transinfect eggs of *An. culicifacies* and *An. stephensi* in the lab with suitable (considerable CI effect) Wolbachia strain for the establishment of mosquito lines carrying infection. Re-introduction of malaria threatens sustained elimination efforts. Vector resistance is increasing to a wide range of insecticides and bioenvironmental control of mosquito that includes; uses of larvivorus fishes, *B. thuringiensis* spraying (a naturally occurring soil bacterium), and sterile mosquito/insect technique (SIT) are not self-sustainable and is not widely applicable. Thus, an alternative approach for malaria control may be thought of (lesson from newly initiated World mosquito project for dengue control using Wolbachia) with following objectives.

1. To detect natural infections of Wolbachia in predominant malaria vector species from different geographical areas of India.
2. To isolate and culture Wolbachia on appropriate insect In-vitro cell lines.
3. To establish basic infrastructure such as insectary.

To establish Wolbachia (with known strains and newly characterized strains) carrying mosquitos' lines of *An. culicifacies* and *An. stephensi* with reduced/refractory malaria transmission ability to limit disease transmission in order to achieve and subsequently sustain malaria elimination targets by 2030.

Methodology:

Flies and culture media - Wild fruit flies (*D. melanogaster*) were caught from different sites around Jabalpur (Tilwaraghat, Gwarighat, Garha, Shaktinagar) by Banana trap method and transferred into the media. Drosophila were cultured on mixed fruit Juice Agar composed of 1.3% yeast extract, 1.3% agar-agar, 13.3% corn flour and mixed fruit juice (100 ml). Other flies were also collected.

Mosquito collection – Anophelines were collected from cattleshed, human dwellings from different ecotypes (plain, forest, and riverine around Jabalpur and identified using pictoral keys. Other mosquitoes were also collected.

DNA Template preparation – After using di ethyl ether insects were crushed using micropestle in sterile STE buffer. This was followed by Proteinase K incubation for 60 minutes at 55 deg C.

This was followed by brief centrifugation. Following 6M NaCl and isopropanol step nucleic acid was pelleted and washed with 70% alcohol and dissolved in TE buffer. Optical density of sample was taken using nanodrop (260/280). Templates were used for PCR detection.

PCR – To meet the objectives of the projects we used published 16S rRNA and Wolbachia surface protein PCR primer sequence that were Wolbachia specific and universal insect and eubacterial primers (O'neill et al, 1992; Werren et al, 2000, Aikawa et al, 2009).

DNA sequencing – 16S rRNA and Wolbachia surface protein amplicons of Wolbachia were sequenced using Sanger's sequencing.

qPCR - SYBR green based real time PCR (≈102 BP, conserved 16S rRNA region) was also used for Wolbachia detection among Anophelines.

Cytoplasmic incompatibility (CI) – Wolbachia infection was cleared from *D. melanogaster* using 0.5 mg Tetracycline for three generations. For percent egg hatching (oviposition on apple juice agar media) flies were crossed in three different combinations (Mw+xFw-, Mw+xFw+, Mw-xFw-) and hatching was observed for 32-36 hours at ideal humidity and temperature conditions.

CI gene expression analysis – *D. melanogaster* flies aged 2 days, 5 days were dissected for abdomen samples and crushed in TriZol. RNA was extracted and after quantitation and treated with DNAse, converted into cDNA (Bangalore genie kit). Insect's 18S rRNA used as Internal control and CIFA, CIFB and JUN region were considered for quantitation.

Phylogenetic analysis - Based on Wolbachia 16S rRNA gene sequence, phylogenetic analysis was done to reveal evolutionary relationship by applying maximum likelihood method with a bootstrap value of 1000 using MEGA 5.0.

Results : Wolbachia was detected in *D. ananassae* (10/30, 33.3%), *D. melanogaster* (1/1, 100%), *Culex quinquefasciatus* (7/8, 87.5%), *Armigerus subalbatus* (1/3, 33.3%), *Aedes albopictus* (4/5, 80.0%) and among different Anopheline host species (27/169, 16%). In all the wspec PCR positive insects, Wolbachia was also detected using wsp gene, but among anophelines only 2 pools were found positive for wsp out of 89 pools. Among a subset of 88 consecutive sample pools of Anophelines, real time PCR revealed 20.5% positivity. This is the first report highlighting detection of Wolbachia infection in a range of insect population including Anophelines from Central India. Sixteen percent (12/75) field *An. culicifacies* pools were positive for Wolbachia.
Studies of CI and associated gene expression revealed, percent egg hatching in the CI group (♂+W x ♀-W) was 44.3%, whereas in the Non-CI group1 (♂-W x ♀-W) and in the Non-CI group2 (♂+W x ♀ +W) egg hatching was 83.9% and 80.1% respectively. From day 2 to day 5 post-eclosion, there was an increase in the expression of CIF genes. Overall, data (2-5days) revealed that the CIF-A was significantly expressed at a higher level than CIF-B among male ($p = 0.0039$) and female flies ($p = 0.0090$). Among female flies' expression of the CIF-A was also higher compared to the JUN region ($p = 0.016$). Expression of the junctional region was higher than CIF-B. Only limited genotyping information is collected of CIF-A and CIF-B genes.

Conclusion : Natural Wolbachia infection was detected among Central India Anophelines. Wolabchia strain in *D. melanogaster* is found to exhibit high CI effects.

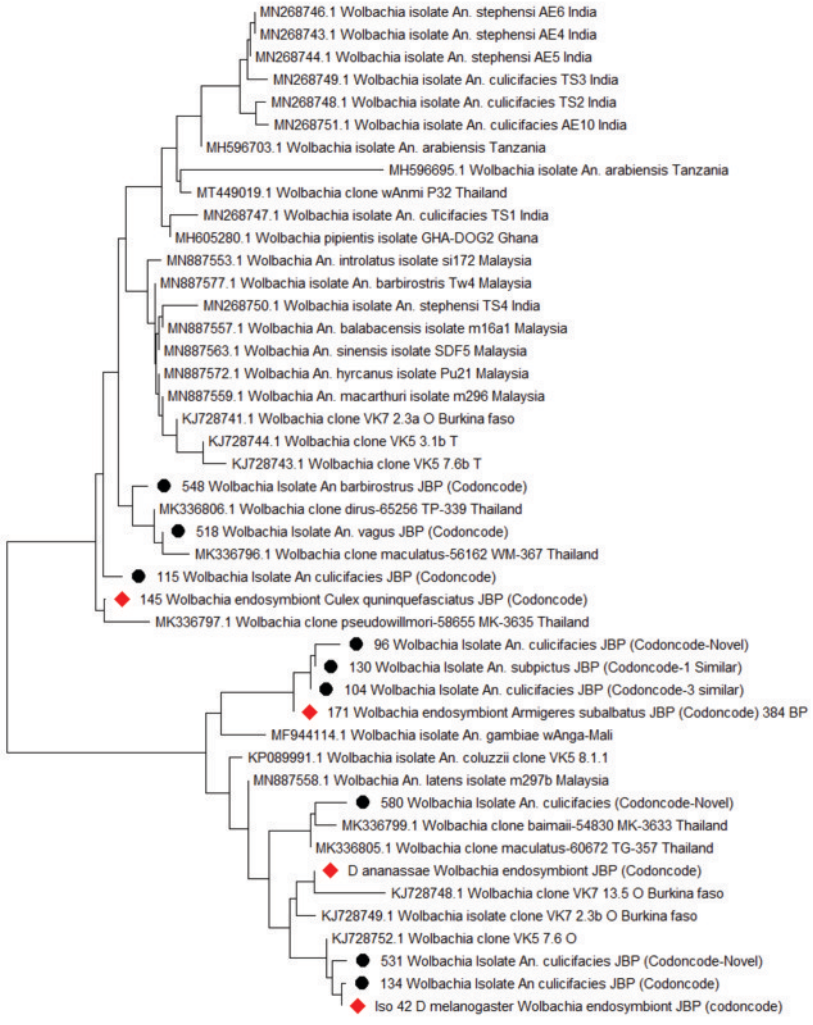


Figure 1: Phylogenetic association of 16S rRNA sequences of *Wolbachia* isolates detected among Anophelines and other insects of Central India. Central Indian sequences were shown by filled black/red diamond circle.

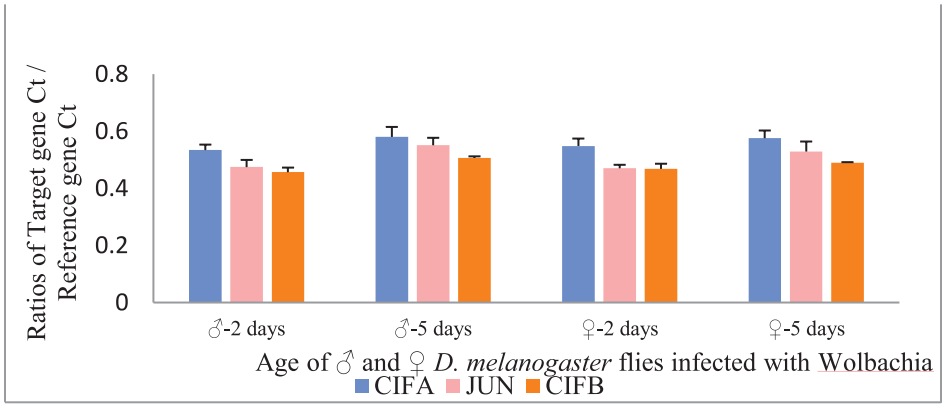


Figure 2: Cytoplasmic incompatibility factors gene expression (mean ± SD) among male and female *D. melanogaster fly* collected from Central India at two different time points (aged two days and five days). Bars showing standard deviation. Insect's 18S rRNA (housekeeping gene) is used to normalize the data.

Title: Assessment of Neonatal Screening Approaches for Sickle Cell Disease and The Effect of Early Intervention in Management of the Disease in Tribal Populations.

PI : Dr. S. Rajasubramaniam, Scientist E

Status : Ongoing

Date of initiation : October 2019

Date of Completion : May 2024

Funding Sources : ICMR

Brief background with objective : The inherited disorders of hemoglobin are the commonest monogenic disorders in India and pose major drain on our health recourses. Sickle cell disease is an important public health problem in India with highest prevalence amongst the tribal ethnic groups. Many children with sickle cell disease are at increased risk for severe morbidity (e.g. severe hemolytic anemia, splenic dysfunction, painful crisis and bacterial infections) and mortality during the first 3 years of life. At present there is no national neonatal screening program in India and children get identified only when they become symptomatic. There is therefore an urgent need to diagnose babies with sickle cell disease at birth so that complications can be ameliorated by early intervention and prophylactic penicillin and anti-pneumococcal vaccination can be started within the first few months.

Objectives: To undertake a newborn screening program for Sickle cell anemia in tribal populations of different states for (a) early detection (b) to understand the magnitude of the problem and (c) to understand the barriers for undertaking such program.

Establish a cohort to study the clinical trajectories of affected individuals.

Assess the benefit of early comprehensive care of affected babies.

Evaluate the genotypic and phenotypic correlation to understand role of genetic modifiers for disease severity.

Methodology: The cord blood samples will be collected from neonates from the umbilical cord or by heel prick up to 48 hours after birth on a Guthrie Card. The collected samples were processed using HPLC. Samples positive for sickle hemoglobin or any other variant was retested in 6 weeks along with parental and family screening. Affected children were registered and followed every 3 months for clinical evaluation.

Results: Two study sites in tribal dominated Dindori and Mandla Districts are screening all newborns in Samnapur CHC, Dindori District and Nainpur CHC Mandla District. During the report period 1619 new born babies were tested for various hemoglobinopathies (Table 1), among them 236 were found to be Sickle Cell carriers, 21 homozygous for Sickle Cell Disease and 4 was β-thalassemia carriers (Table 2).

At these study sites, targeted screening is also being carried out among pregnant women (2nd and 3rd trimester) attending the Gynecology OPD as per the request of local administration (Data not shown). For this screening pregnant women are tested for various hemoglobinopathies. If any pregnant women were found to be positive for Sickle Cell Trait/Disease or Beta-thalassemia trait/major, their spouses are tested. If the husband was also positive for trait or disease, then these couples were considered as "high risk". Their pregnancy was followed up and cord blood/fetalsample was collected at the time of delivery for testing of the suspected hemoglobinopathy.

1. Conclusion:

Table 1: Community wise distribution of new born screened in Madhya Pradesh

Name of the tribal area	Mandla (Nainpur)	Dindori(Samnapur)	Total
Name of tribal community screened	Gond &Baiga	Gond &Bharia	
Number of the villages screened	439	343	782
Scheduled Tribe	676	379	1055
Scheduled Caste	75	17	92
Other Backward Class	232	145	377
Muslims	8	3	11
Others	10	20	30
General	30	24	54
Number of the samples screened in each Study site	1098	615	1713

Table 2: Overview of hemoglobinopathies status among new born screened in Madhya Pradesh

Hemoglobinopathies	Mandla (Nainpur)	Dindori(Samnapur)	Total
Sickle Cell Carrier	160	81	241
Sickle Cell Disease	10	12	22
Beta Thalassemia Trait	3	1	4
Normal	912	518	1430
Other Variants	13	3	16

Title: Sickle Cell Anemia Control and Treatment

PI : Dr. S. Rajasubramaniam, Scientist E

Status : Ongoing

Date of initiation : October 2019

Date of Completion : May 2024

Funding Sources : ICMR

Background with objective : The successful eradication and control of communicable diseases in last 3 decades has highlighted the need to control common genetic disorders to improve the health status of rural Indian population, particularly the underprivileged communities. These communities carry high disease burden due to various hemoglobinopathies. In central India, especially in the tribal predominant states like Madhya Pradesh, haemoglobinopathies (sickle cell disease) is the most common genetic disorder and contributes significantly to Public Health Crisis. The persons with heterozygous (with single gene) state remain unaffected while the homozygous (with 2 copies of the gene) present various complications and die early in most cases. The heterozygotes remain undetected or unidentified leading to accumulation of sickle cell disease burden in the community. The technical and infra-structural facilities for diagnosis and management of sickle cell disease are uncommon in many district level hospitals. Although the disease is genetic in origin but with the help of modern health care facilities, screening and dedicated management, longevity and quality of life of affected individuals can be significantly improved.

Methodology: Screening of all newborn children, children of ages between the ages of 6-18 years (school going children), newly married couples, unmarried youth in all Block level hospitals or Community Health Centers and Ashram schools.

Districts hospitals to obtain facilities and technical expertise for diagnosis (confirmation) and management of sickle cell disease. Confirmation of suspected cases at ICMR-NIRTH.

All women attending Ante-natal clinic will be screened for sickle hemoglobin and β-thalassaemia trait using solubility test, CBC and NESTROFT. Diagnosis of suspected cases will be done at ICMR-NIRTH. Husband of the carrier / trait women to be screened for these disorders. High risk couples need be given appropriate counseling and awareness regarding disease profile. Patients with sickle cell disease and their parents will be given appropriate supportive health care and health education for prevention.

A special sickle cell clinic to be established in districts.

Mass awareness campaign on sickle cell disease especially focused on backward communities should be conducted in the state.

Health Education in Schools.

Results : Under this flagship program, scheduled training and monitoring of District level screening was delayed due to Covid19 pandemic and Lockdown. However, 41 district hospitals have obtained Bio-Rad D10 HPLC for carrying out screening and in-house testing of anemia and ANC patients are being carried out. About 40,000 patients have been tested so far in these centers.

Title: Evaluating morbidity profile of Sickle Cell anemia among Indian patients

PI : Dr. S. Rajasubramaniam, Scientist E

Status : Ongoing

Date of initiation : July 2018

Date of Completion :

Funding Sources : ICMR- Intramural

Background with objective: SCD is a public health problem affecting more than 3,00,000 births globally. SCD has predominant geographical distributions mainly affecting Sub Saharan Africa and India region.4The birth rates in this region are high and the number of new born with SCD is expected to increase by 30% by 2050. Due to unavailability of new born screening programs and lack of proper clinical management of SCD patients, these children have very high mortality.

Hydroxyurea (HU) is an oral drug proven to have laboratory and clinical efficacy on SCD patients. The severity of symptoms is reduced due to induction of HbF production. HU also exerts its effect on leukocytes, reticulocytes and the endothelium.

Brief methodology:

Brief results: During the report period 60, patients were recruited to receive hydroxy urea therapy. In all 423 patients have been recruited so far in the Sickle Cell Clinic since May 2018 till March 2021. Presenting Clinical symptoms were noted and appropriate therapeutic intervention was provided by Clinical in charge. The severity index showed decrease among study cohort with hydroxyurea therapy. Effect of Erythroid Kruppel like factor (KLF1) was examined in relation to mean hemoglobin levels, fetal hemoglobin, and effect of Hydroxy urea on disease severity.

Title : Morbidity Profile of Sickle cell disease in Central India

PI : Dr. Rajiv Yadav Scientist-E

Status : ongoing
Date of initiation: July 2020
Date of Completion: Ongoing
Funding Sources : Intramural

Objectives of the study:

- To study the clinical and hematological profile of the sickle cell disease patients.
- To develop strategies for management and prevention of the sickle cell disease in context to Central India.

Methodology: All the Registered Patients were referred from various OPD's of NSCB Medical College, Jabalpur and various district hospitals of the state to genetics laboratory of NIRTH for the diagnosis of haemoglobinopathies. Patients those identified as sickle cell disease were registered in sickle cell clinic for detail clinical assessment and follow up. The clinical history, clinical findings and various investigations were recorded in structural proforma and advised them to come for follow-up every three months.

Findings : Thirty eight sickle cell disease patients were registered in the Sickle cell clinic (in collaboration with Government Medical College, Jabalpur) during April 2020-March 2021. All these patients were from Balaghat, Damoh, Dindori, Jabalpur, Katni, Mandla, Narsingpur, Panna, Raisen, satna, Seoni, Shahdol. Sidhi, Singroli and Umaria districts. About 42% were Male and 58% were female. Majority (36.8%) of the patients was belonged to Scheduled caste and 10.5% were from tribal communities. About 31.6% were Other backward class and 21% were from Muslim & others. About 34% of patients had history of multiple blood transfusions (blood transfusions of more than 2 times) and 24% of patients had no history of blood transfusion. About 87% of the patients had their onset of the disease before 5 years of age followed by 5-10 yrs age (13%).

A total of 1241 SCD patients were registered in the SCD clinic up to March 2021. All the Patients and their parents were advised to avoid disease precipitating or aggravating factors like exposure to extreme climate, hard work, dehydration etc. and also advised to seek appropriate medical intervention quickly upon any minor ailment. They were given folic acid (5 mg) to be taken daily. The anti-pyretic and anti-inflammatory drugs were also given to take on emergency. Up to March 2021, a total of 788 SCD patients was regularly attended for follow-up. Severity index was calculated by converting the clinical observations into numerical value in these patients. After intervention, the percentage of severe and moderate cases has been reduced and shifted to mild category.

It is observed that supplementation with folic acid and quick administration of anti-pyretic/anti-inflammatory drugs along with health education to avoid disease precipitating factors shown positive effect to decrease the severity of the disease. A total of 127 registered SCD patients was died up to March 2021 and their mean age was 14.4

Highlight of project in 2-3 bullets:

Thirty eight sickle cell disease patients were registered in the Sickle cell clinic during April 2020-March 2021.

Majority (36.8%) of the patients was belonged to Scheduled caste and 10.5% were from tribal communities.

After intervention, the percentage of severe and moderate cases has been reduced and shifted to mild category.

A total of 1241 SCD patients were registered in the SCD clinic up to March 2021.

Title : The effect of Hydroxyurea on the clinical profile of Sickle Cell Disease patients in Central India

PI: Dr.Rajiv Yadav Scientist-E

Status : ongoing
Date of initiation:
Date of Completion:
Funding Sources : Intramural

Objectives of the study:

- To know the effect of hydroxyurea on the clinical profile of sickle cell disease patients.
- To study the hydroxyurea induced increase in HbF and other blood counts.

Methodology : The study will be carried out jointly by National Institute for Research in Tribal Health (NIRTH) and Netaji Subhash Chandra Bose (NSCB) Medical College & Hospital, Jabalpur.

Study Design: Interventional, Prospective as well as Retrospective Cohort study.

Study Area: Sickle cell disease patients of SCD clinic coming from different parts of Madhya Pradesh

Study Population: All the patients registered with SCD Clinic (New or old).

Findings: Till March 2021, A total of 422 SCD patients have received hydroxyurea. Among these,326 were in first followup and 253 patients were in second followup. 188 patients were in third followup and 132 patients were in fourth followup. 93 patients were in fifth followup. in more than 83% of patients, HbF was found to be increased. Severity index was calculated by converting the clinical observations into numerical value in these patients. It is observed that the percentage of severe and moderate cases has been reduced and shifted to mild category with continuous usage of HU.

Highlight of project in 2-3 bullets:

A total of 422 SCD patients have received hydroxyurea.

Fetal hemoglobin was found to be increased in more than 80% of cases.

Severity index of the disease was decreased with continuous usage of HU.

Very few side affects were observed.

Title: Molecular epidemiology and phylogenomics of leprosy bacilli using genome wide analysis.

PI : Dr. Pushpendra Singh, Scientist E

Status : Ongoing

Date of initiation : December 2020

Date of Completion :

Funding Sources : ICMR

Background with objective: Leprosy, caused by *Mycobacterium leprae*, is a chronic disease known to affect the skin, the peripheral nerves, mucosal surfaces of the upper respiratory tract and the eyes. *M. leprae* strains have been classified into 16 genotypes (1A to 4P) based on the unique single nucleotide polymorphism present on different loci. However, the existing PCR based SNP detection methods are unable to differentiate a vast majority of the strains. India harbors over 60% of cases detected globally each year. There is a need of genome-wide information of *M. leprae* strains prevalent in India to identify the SNPs which can differentiate them further and thus can be useful for molecular epidemiology of leprosy. With majority of Indian strains deduced as SNP-type 1D (one of the 16 genotypes) in India, the current methods are not suitable for molecular epidemiological studies in India. Genome wide analysis of very few Indian strains of *M. leprae* has been done so far which is not sufficient and is necessary for better identification of phylogeographically informative genomic markers for molecular epidemiology. Such investigation requires primarily the extraction of pathogen DNA from the clinical samples followed by DNA enrichment and whole genome sequencing and bioinformatics analysis. The identified SNPs would allow the identification of *M. leprae* genotypes and the drug resistance related mutations (if any, particularly among the relapsed cases). In addition, we also aim to design a simple assay for detection of *M. leprae* DNA using colorimetric isothermal amplification and its detection by PCR-RFLP. Hence this study would lead towards the development of point of care method of detection of *M. leprae* in clinical samples using field friendly tests.

Methodology : To achieve better yield of bacterial DNA, host biopsy tissue disintegrating enzymes and chemicals such as trypsin, collagenase dispose and NaOH treatment were employed as mentioned elsewhere (Avanzi et al, 2016; Benjak et al, 2018). In chemical treatment with chemical such as NaOH, 4% the sample was treated with equal volume for 15 min treatment followed by 15 min centrifugation at 10,000g and washing with PBS. Enzymatic treatment with 0.5 U collagenase, dispose and 10mg/mL trypsin was carried individually or in combination for the host tissue lysis.

NGS library preparation of *M. leprae* genomic DNA was carried out following manufacturer's instructions. The sample underwent the DNA fragmentation step where the genomic DNA was enzymatically cut resulting in shorter fragments. In the next step specific and unique adaptors were ligated to the fragmented genomic DNA resulting into a library. This library was amplified for the whole genome sequencing.

For Loop mediated PCR amplification (LAMP) method, six pairs of loop primers were designed targeting the repetitive element (RLEP) region in the *M. leprae* genome with the help of the NEB LAMP primer designing tool.

Brief results: Patient samples from suspected leprosy patients (based on the clinical criteria) were collected and DNA was isolated. The isolated DNA was checked for the presence of the *M. leprae* by targeting the detection of RLEP region through PCR. The RLEP positive samples were taken forward for SNP genotype determination by using PCR and Sanger sequencing to amplify the region containing the SNP type 1D specific target SNPs. The RLEP positive samples were also checked with PCR and Sanger sequencing for any mutation responsible for drug resistance occurring in the drug resistance determining region in three genes of *gyrA, folP1* and *rpoB*. The samples with acceptable DNA concentration were chosen for the genomic library preparation for Illumina NGS platform. The library preparation steps included the genomic DNA fragmentation, adaptor ligation and library amplification. The RLEP positive clinical samples are also planned on to be included for the isothermal amplification method once the evaluation of the loop primers is done. The loop primers comprise of three pairs: loop primer B1 and loop primer F1 (outer primers); loop primer B1C and loop primer F1C (complimentary primers) and loop primer B2 and loop primer F2 (inner primers). The loop primers, contain sequences complementary to the single stranded loop region on the 5' end of the dumbbell-like structure, which provide an increased number of starting points for DNA synthesis for the LAMP method. The loop primers are key component of the LAMP technique and can amplify the target region by self-annellation and extension at a single temperature. Hence, primer designing was done keeping the inclusion of target region and the LAMP primers in consideration.

Title: Genomic Markers for pathological variants and transmission of leprosy bacilli

PI : Dr. Pushpendra Singh, Scientist E

Status : Ongoing

Date of initiation : 2020

Date of Completion :

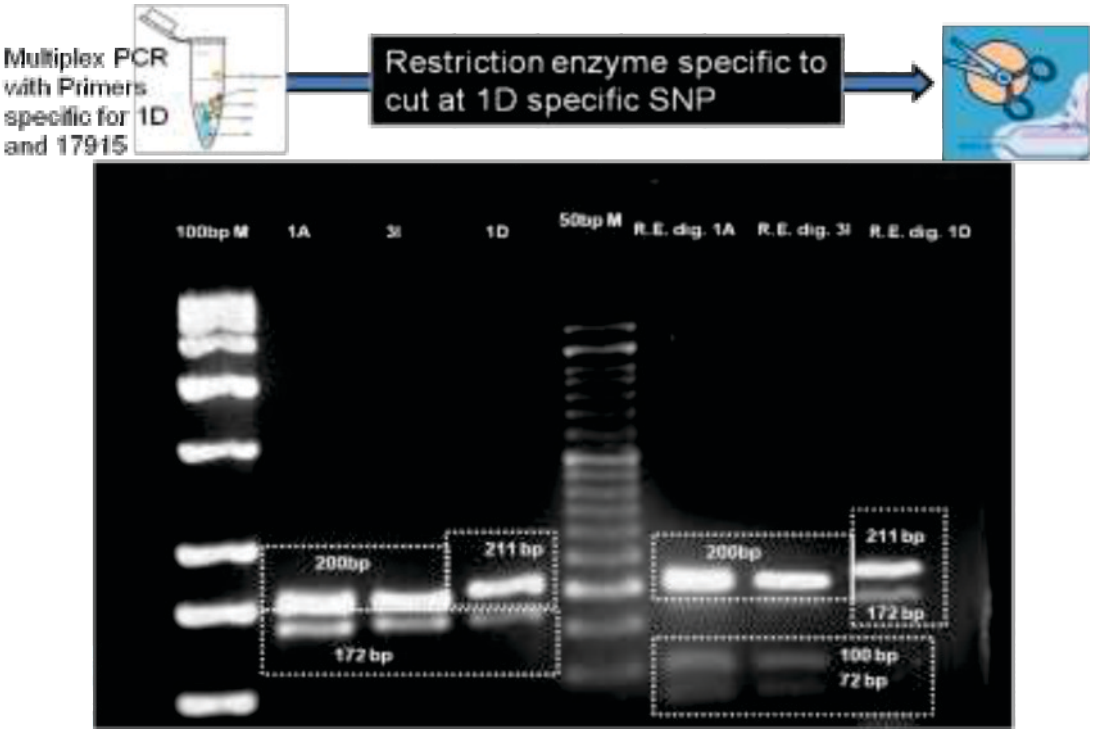
Funding Sources : R2STOP - Canada

Background with objective : *M. leprae* is an uncultivated organism. The currently available genomic data of *M. leprae* is obtained only from the highly bacillated cases representing the lepromatous pole of the disease spectrum. It is important to study additional genomic information from the paucibacillary cases (often representing the tuberculoid pole of disease spectrum). Besides, this ability to study the paucibacillary cases is also required for understanding the transmission of *M. leprae* at community level and for identification of possible bacterial genetic association with disease spectrum. Obtaining sufficient bacterial DNA, which is relatively free from host DNA, is therefore very important priority for gaining genomic insights into full spectrum of leprosy using the single nucleotide resolution made possible by the Whole Genome Sequencing (WGS) approaches. Therefore, in this project, we aim to develop a cost-effective bait system for the enrichment of *M. leprae* DNA and apply it for sequencing of clinical specimens representing broad spectrum of the disease and geographical origin. The comprehensive genomic information will identify new informative markers for local transmission and bacterial genomic variations associated with pathological differences of the disease.

Methodology : Biopsy samples from patients suspected for leprosy were collected and DNA extraction was carried out. These samples were checked with RLEP primers for the presence of *M. leprae*. Samples from patients targeting these ID-specific SNPs by PCR Sequencing and confirmed their presence in most of the Indian strains. This confirms that the genotype 1D is the most predominant genotype in India and therefore its identification using simple methods can enable detection and simultaneous genotyping. Based on this observation, we have now developed this assay into a PCR-RFLP assay which doesn't require sequencing for genotyping of *M. leprae*. (Figure given below). This assay was validated on more strains. In addition to the predominance of the 1D genotype in Asian countries, it is also present in many other countries such as Venezuela, Malawi, Guyana etc. Another genotype which is very common is the 3I genotype

Results : By comparative genomics, we observed that the 3I strains have a single copy of a 11-base repeat at position 17915 while all other genotypes have two copies of the same, creating a visible 11 bp difference in the amplicon size that can be demonstrated on a 2% agarose gel.

Conclusion: (in case of completed project) Ongoing study


Multiplex PCR with Primers specific for 1D and 17915
Restriction enzyme specific to cut at 1D specific SNP
100bp M
1A
3I
1D
50bp M
R.E. dig. 1A
R.E. dig. 3I
R.E. dig. 1D
200bp
211 bp
172 bp
200bp
211 bp
172 bp
100 bp
72 bp

Title: Comparative Mycobacterial genomics by whole genome sequencing for identifying phylogeographic markers and novel mutations associated with drug resistance in tribal population

PI : Dr. Pushpendra Singh, Scientist E

Status : Ongoing

Date of initiation : 2020

Date of Completion :

Funding Sources : Intramural

Background with objective: Leprosy manifests diverse clinical spectrum (tuberculoid and lepromatous poles) comprising of paucibacillary and multibacillary cases. The role of pathogen genomic features/pathological variants in this spectrum is poorly understood, owing to the paucity of *M. leprae* genomes from the cases representing tuberculoid/paucibacillary cases. It is important to study additional genomic information from these cases for understanding the transmission of *M. leprae* at community level and for identification of possible bacterial genetic association with disease spectrum. Therefore, in this project, we aim to for sequencing of clinical specimens representing broad spectrum of the disease and diverse geographical origins. This will help in identifying the genomic markers suitable for monitoring local transmission and pathological variants of leprosy bacilli.

Methodology : We used enzymatic and/chemical treatment to minimize host DNA in Sample Libraries (Illumina NGS kit). Then we prepared PCR-amplifiable *M. leprae* DNA-baits with a separate adapter and amplified the Bait Library with biotin primers to get Biotin Bait Library (BBL). This BBL was then used for enriching *M. leprae* DNA from Sample Libraries (SL) for obtaining improved coverage of *M. leprae* genome in samples wherein very limited *M. leprae* DNA is present such as paucibacillary specimens. In addition, we compared the available genomes of *M. leprae* genomes in databases and have identified genomic variants/loci. Along with this

Results : A total of 17 NGS libraries have been prepared and ready for sequencing. So far 5 SNPs have been found in the DRDR region of gyrA (antibiotic dapsone) in the 8 number of samples out of 145 RLEP positive tested samples. Similar investigations are underway with the RRDR region of *M. leprae*. These new and novel SNPs will be correlated with the existing data of SNPs available from world-wide and Indian geographical data of *M leprae* strains to establish any correlation between the SNPs and tribal population.

Title: Establishment of SL VRDL at ICMR-NIRTH, Jabalpur

PI : Dr. P. V. Barde, Scientist E

Status : Ongoing

Date of initiation : Dec 2019

Date of Completion :

Funding Sources : DHR, Govt. of India

Brief background with objective: This project aims to establish a viral diagnosis and research laboratory at this institute with objective

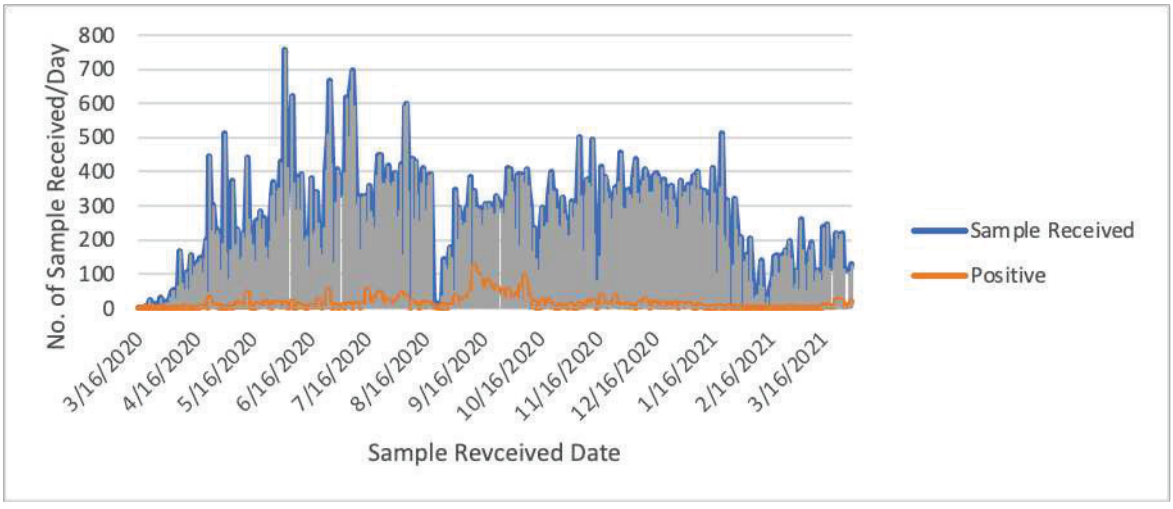
To provide diagnosis of viruses of public health importance
To conduct research on viruses of public health importance
To conduct outbreak investigates in collaboration with state health authorities

Brief methodology: Samples referred from different government health facilities were tested using serological and molecular tools. Diagnosis for more than 20 viruses is provided following syndrome-based approach as per DHRs protocol followed across the country.
Research work on molecular and serological characterizations of viruses, epidemiological trends of virus's clinical relationship with molecular characteristic are done.
The laboratory helps state government during Outbreaks, epidemics and pandemics by providing timely diagnosis, helping in field invitations suggesting control majors and future precautions etc.

Brief results: In 2020-2021 we tested nearly one lakh samples of COVID-19 from 20 district of MP, highest sample from Katni (28.75%) followed by Narsinghpur (24.15%), Balaghat (19.03%), Jabalpur (12.50%), and others.

In addition, the SL-VRDL lab also did following works:

Laboratory also provided diagnosis, serotyping etc of dengue.
Diagnosis for more than 2000 samples for hepatitis was provided
Diagnosis for Measles for more than 1000 samples was provided.
Training for state health officials for Dengue Chikungunya ELISA was provided
Training for state health officials and medical collage staff (n=27) for COVID 19 diagnosis was provided.



Number of sample received/day (blue line) and number of positive cases (red line) are presented in Figure above.

Title: Community-wide screening for M.tb. DNA in sputum samples

PI : Dr. Ravindra Kumar, Scientist B

Status : Completed

Date of initiation : Dec 2020

Date of Completion :

Funding Sources : Intramural

Background with objective: Tuberculosis (TB) elimination program in India relies on detecting symptomatic patients through molecular diagnosis and providing speedy treatment, leaving individuals with no classical symptoms of TB (asymptomatic) behind in the population. Considering the contribution of such asymptomatic individuals to transmission of TB, it is important to timely identify them, especially in high-endemic settings. However, no community-level study has so far been conducted to record the incidences of asymptomatic cases in India. Therefore, this study was planned to know whether *Mycobacterium tuberculosis*, the causal pathogen of TB is prevalent in individuals presenting no classical symptoms in a highly endemic populations belonging to Saharia tribe, a Particularly Vulnerable Tribal Group (PVTG) in India

Methodology: We performed molecular epidemiological study in 15 villages (n= 808) of Pohri block, Shivpuri district, Madhya Pradesh, India following population-wide random sampling of both symptomatic (ns=216) and asymptomatic (na=592) individuals. Though a total of 890 subjects were involved in the study, the sputum samples for the qPCR test could be collected only from 808 subjects. Detection of *M. tuberculosis* in sputum samples was done using TaqMan chemistry-based qPCR assay.

Results: Sixteen (2.7%) individuals were found to be positive of *M. tuberculosis* among the 592 asymptomatic cases. The prevalence of *M. tuberculosis* DNA positivity was comparable between symptomatic (2.3%) and asymptomatic (2.7%) individuals.

Conclusion: The present findings, though preliminary, pending large-scale screening approaches in other high-endemic populations employing both classical and advanced diagnosis methods, are daunting. Such community-wide screening approaches should therefore be integrated in the program to help achieve the target of a TB-free India by the year 2025.

India Hypertension Control Initiative

PI: Dr. Tapas Chakma, Scientist G

Status: Ongoing

Date of Initiation: April 2018

Date of Completion :

Funding: Extramural

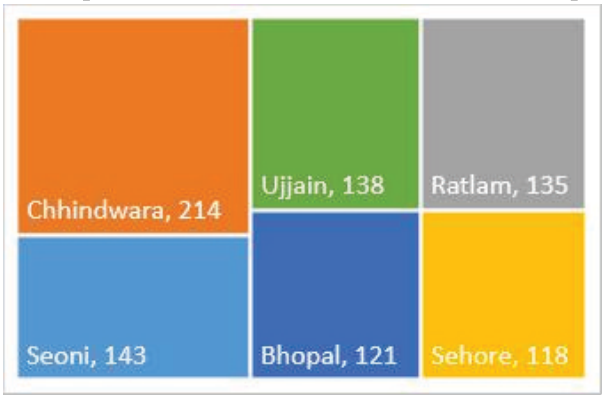
Objectives of the study:

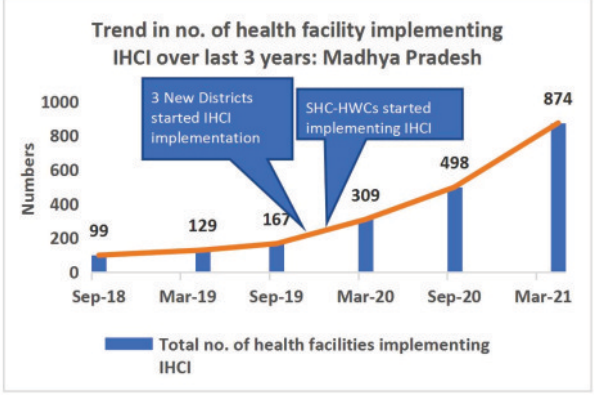
The objective of the project is to reduce cardiovascular disease morbidity and mortality in India. Projects main focus on the major risk factor namely hypertension.

- Implement an intervention package to improve hypertension treatment and control rates in India.
- Identify major policy interventions to reduce consumption of artificial trans-fat and of sodium (Details of this component are yet to be worked out).

IHCI program was launched initially in 3 districts i.e. Bhopal, Chhindwara and Ratlam. Later, 3 more districts were included for IHCI program implementation since Oct.'19 i.e. Sehore, Seoni & Ujjain. Till 30th April 2021, IHCI program was launched in 869 health facilities in 6 districts, including 564 SHC-HWCs. District wise details were as follows:

Graph 1: District wise no. of Health facilities implementing IHCI:



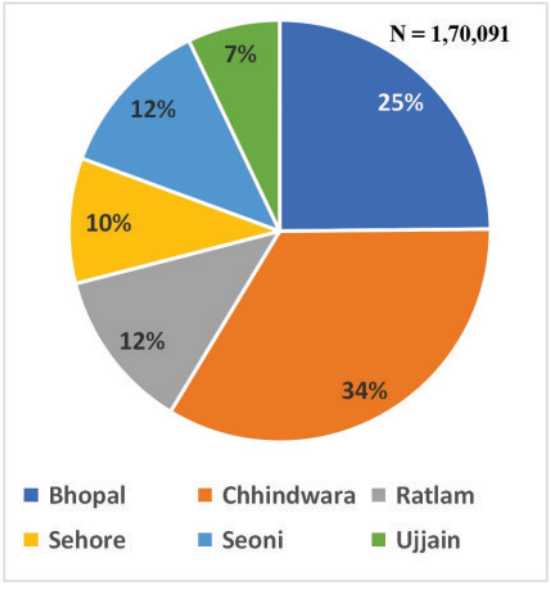


Till 30th April 2021, total Hypertension patients registered and put on treatment were 1,70,091, i.e. 14.6% of expected Hypertensive patients in 6 districts of Madhya Pradesh. Proportion of Hypertensive patients that were registered among 6 districts were as follows:

Graph 2: District wise proportion of HTN patients registered& registrations against estimation: Till Apr.'21

Table 1: District wise estimated Hypertensives registered

District	Total Registrations	Estimated hypertensives registered
Bhopal	42,267	13.6%
Chhindwara	57,521	27%
Ratlam	20,974	16.2%
Phase I Total	**1,20,762**	**18.5%**
Sehore	16,335	10.1%
Seoni	20,949	19.8%
Ujjain	12,045	15%



Key indicators of the IHCI program: 1) Quarterly BP control rate 2) Annual BP outcome at Community level

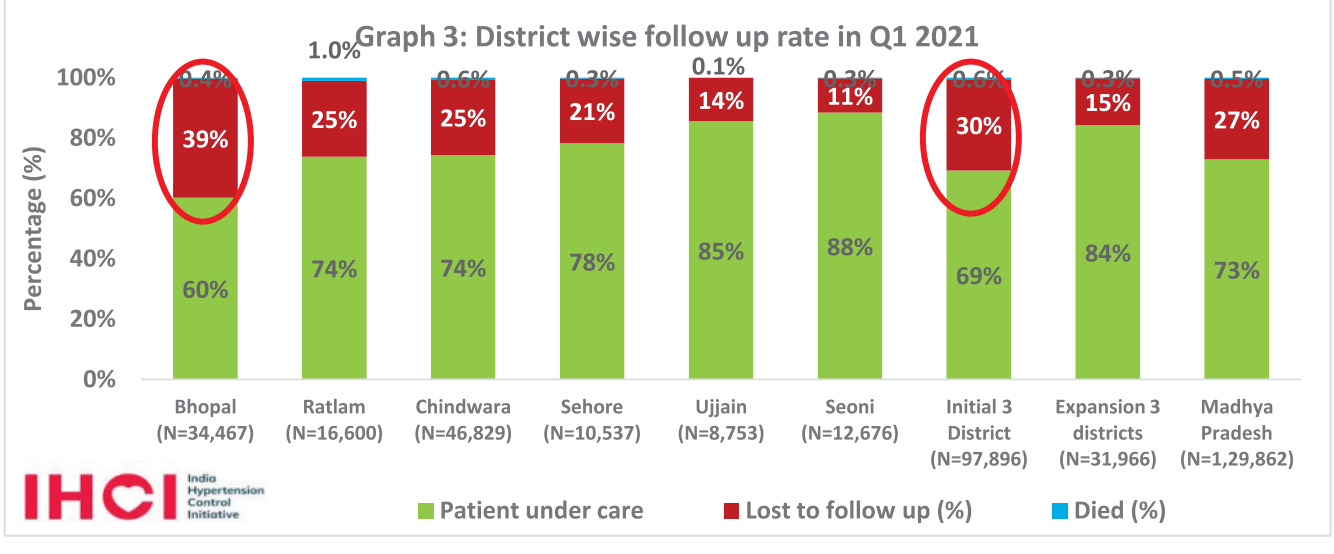
As per pre-decided interval, in April 2021, annual cum quarterly report for year 2021 was planned. State has given the letter to all 6 districts for carrying out the annual report outcome with help of WHO technical teams in the districts. Detailed report is as follows:

Section 1: Annual Blood pressure outcome for year 2021:

A) Criteria and classification for Annual BP outcome 2021 assessment:

a. **Cohort:** All patients registered since beginning of program till 31st December 2020
b. **Blood pressure reading:** All cases registered since beginning of program till 31st December 2020, BP reading of these patients documented during Jan.-Mar.'21 in follow up visit
c. **Classification** based on latest BP reading (At least one visit during 3 months)
   i. If <140/90 mmHg- **Control (C)**
   ii. If >=140/90 mmHg- **Uncontrol (UC)**
   iii. If not a single visit during Jan.-Mar.'20 **- Missed visit (MV)**
   iv. If not a single visit for past 12 months i.e. Apr.'20-Mar.'21 **– Lost to follow-up (LTF)**
   v. If NCD staff / ASHA calls to given no. and confirms death of the registered patients **– Death (D)**

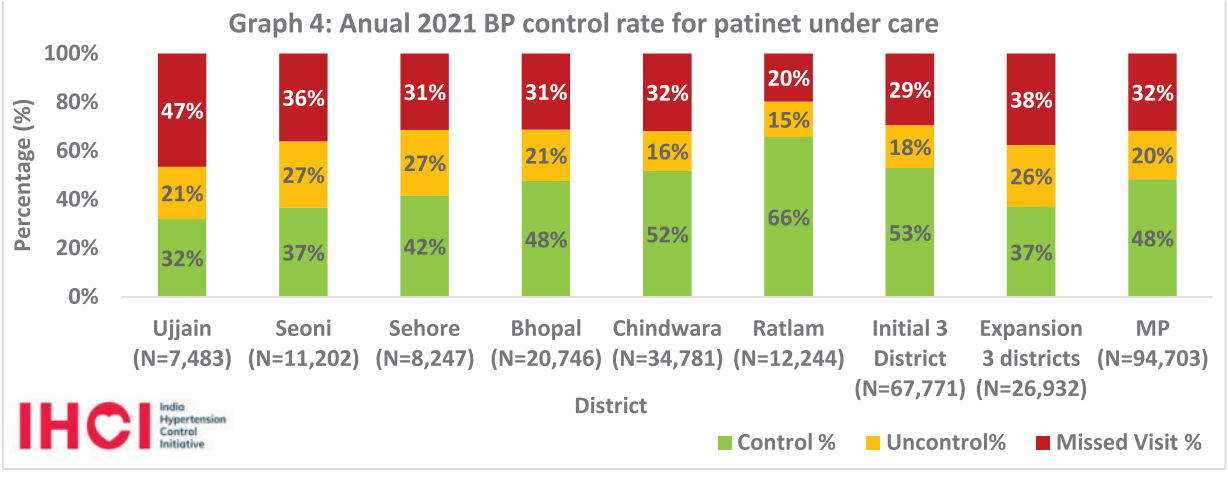
B) District wise "Patients Under Care" for patients registered till Dec.'20, followed-up in Q1 2021:



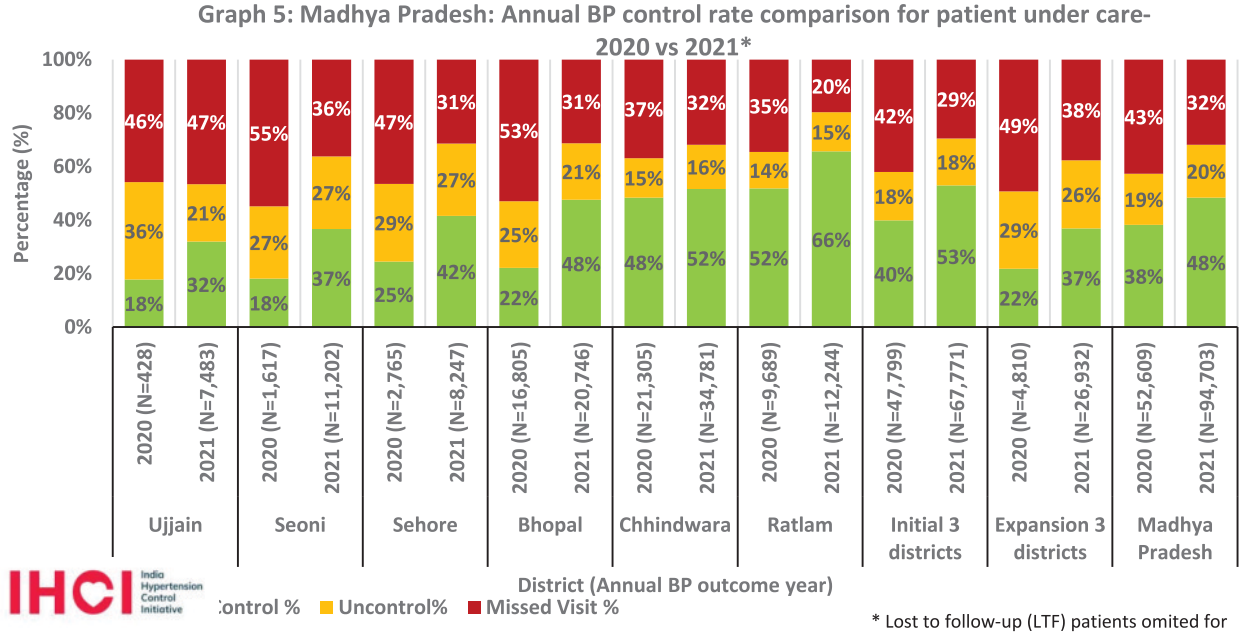
The graph 3 above shows **avg. 27% registered patients "Lost To Follow-up"** i.e. did not have even a single visit in last 12 months i.e. Apr.'20 to Mar.'21. Maximum patients "Lost to follow-up" were in Bhopal (39%), followed by 25% each in Chhindwara & Ratlam. This shows that patients' retrieval system is not uniform across the districts, also the follow up by ASHA is minimal in all districts. Patient calling to those who had Lost to follow up has also been minimal, specially at high OPD load facilities like DH, CH & CHC.Only 0.5% patients reported to be died out of total registrations.

A new term **"Patient under care"** has been coined to denote those patients who had at-least one follow up visits in past 12 months (i.e. Apr.'20 to Mar.'21) and who have been newly registered during these past 12 months.

C) District wise proportionate Annual 2021 BP control rate for patients under care:



D) Annual BP control rate comparison for 2020 vs 2021 for patients under care:



As per graph 4 & 5, among the patients under care, there was **overall improvement in BP control rate from 38% in 2020 to 48% in 2021**. Noticeable improvement in BP control rate (>10%) in 5/6 districts except Chhindwara district where improvement was 4%.**"Missed visit"** patients (who have not visited atleast once in past 3 months) were still very high (>30%) in all the districts except Ratlam (20%)

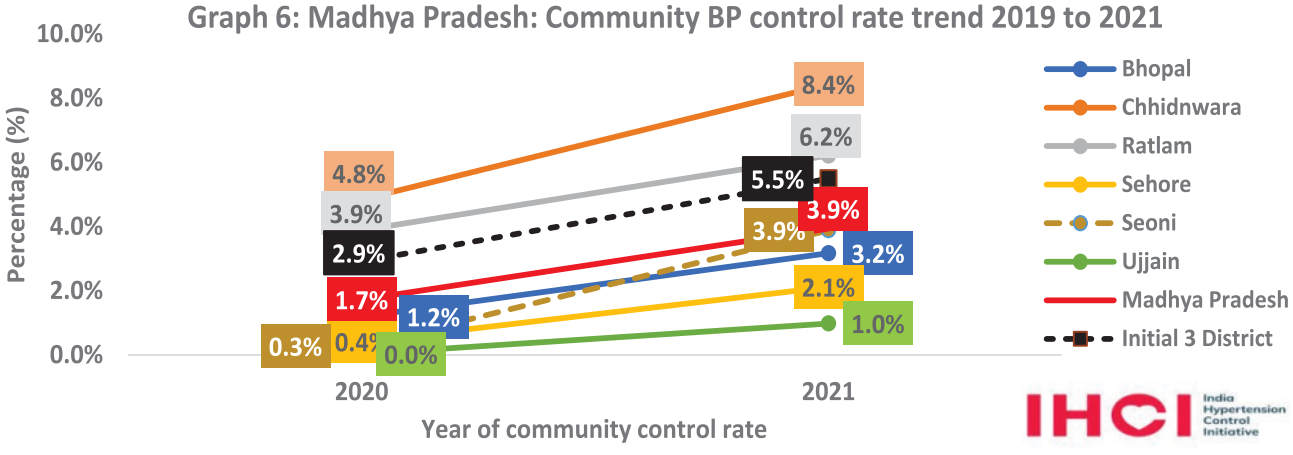
E) District wise Community BP control Rate for year 2021:

Table 2: District wise Annual BP outcome for year 2021			
District	**No. of patients with controlled BP (Q1 2021)**	**Expected HTN patients**	**Community BP control rate %**
Chindwara	17,971	2,12,837	8.4%
Ratlam	8,039	1,29,369	6.2%
Seoni	4,106	1,05,567	3.9%
Bhopal	9,869	3,11,058	3.2%
Sehore	3,430	1,61,732	2.1%
Ujjain	2,395	2,42,994	1.0%
Madhya Pradesh	**45,810**	**11,63,557**	**3.9%**
Initial 3 District	**35,879**	**6,53,264**	**5.5%**
Expansion 3 districts	**9,931**	**5,10,293**	**1.9%**

The table 2 shows the key program indicator i.e. Community BP control rate for year 2021. **Among 3 initial districts avg., 5.5% patients had their BP under control, out of total hypertensives across districts.** Highest in Chhindwra (8.4%) and lowest in Bhopal (3.2%). Among Expansion 3 districts, highest control was in Seoni (3.9%) and lowest in Ujjain (1%). This table shows need for increasing the registration as well as need to improve BP control rate by implementing & monitoring the appropriate patients' retrieval strategies across 6 districts.

F) Trend in Community BP control rateover past 3 years:

Graph 6: Madhya Pradesh: Community BP control rate trend 2019 to 2021

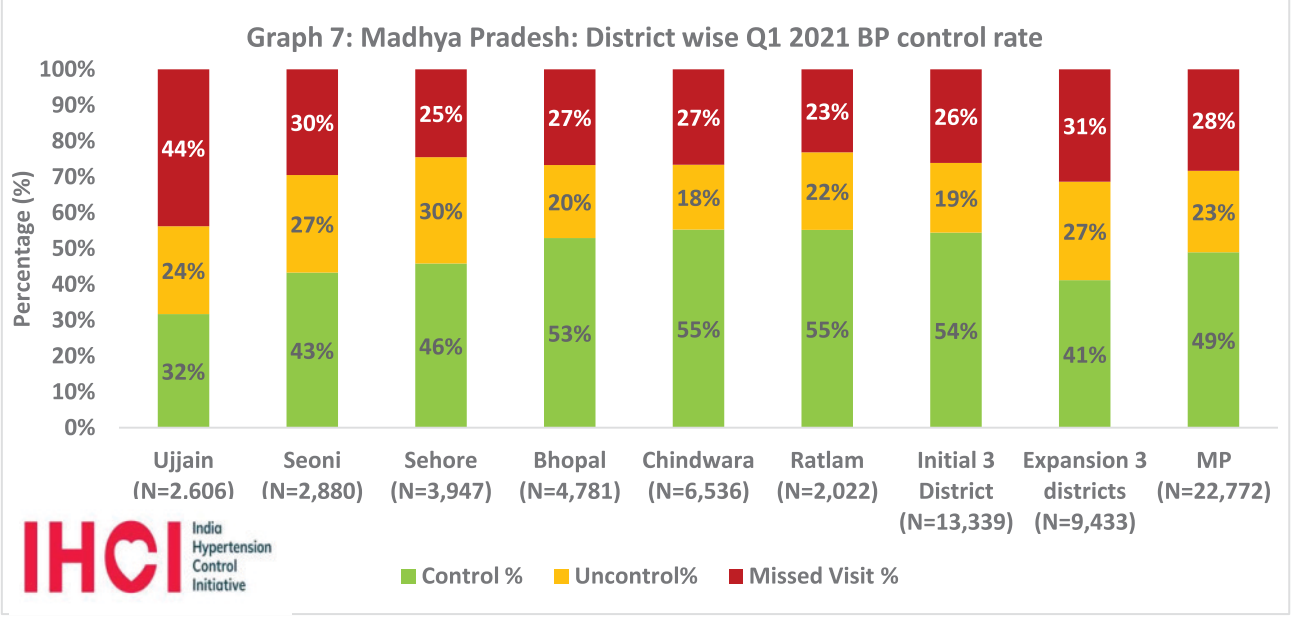


Section 2: Quarterly BP control rate for Q1 2021:

A) Criteria and classification for quarterly BP control rate for Q1 2021 assessment:

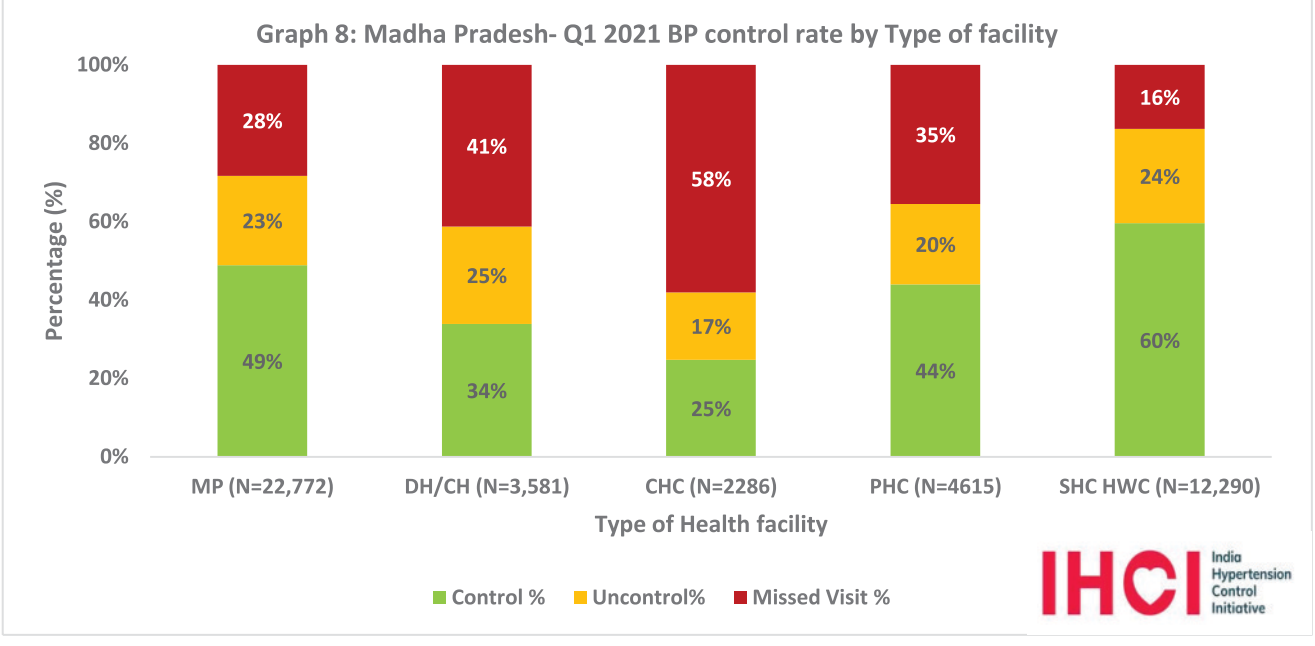
a. **Cohort:** All patients registered during Oct.'20 – Dec.'20 (3 months)
b. **Blood pressure reading:** All cases registered during Oct.'20 – Dec.'20, BP reading of these patients documented during Jan.-Mar.'21 in follow up visit
c. **Classification** based on latest BP reading (At least one visit during 3 months)
   i. If <140/90 mmHg- **Control (C)**
   ii. If >=140/90 mmHg- **Uncontrol (UC)**
   iii. If not a single visit during Jan.-Mar.'21 **Missed visit (MV)**

B) District wise Blood pressure control rate: Q1_2020



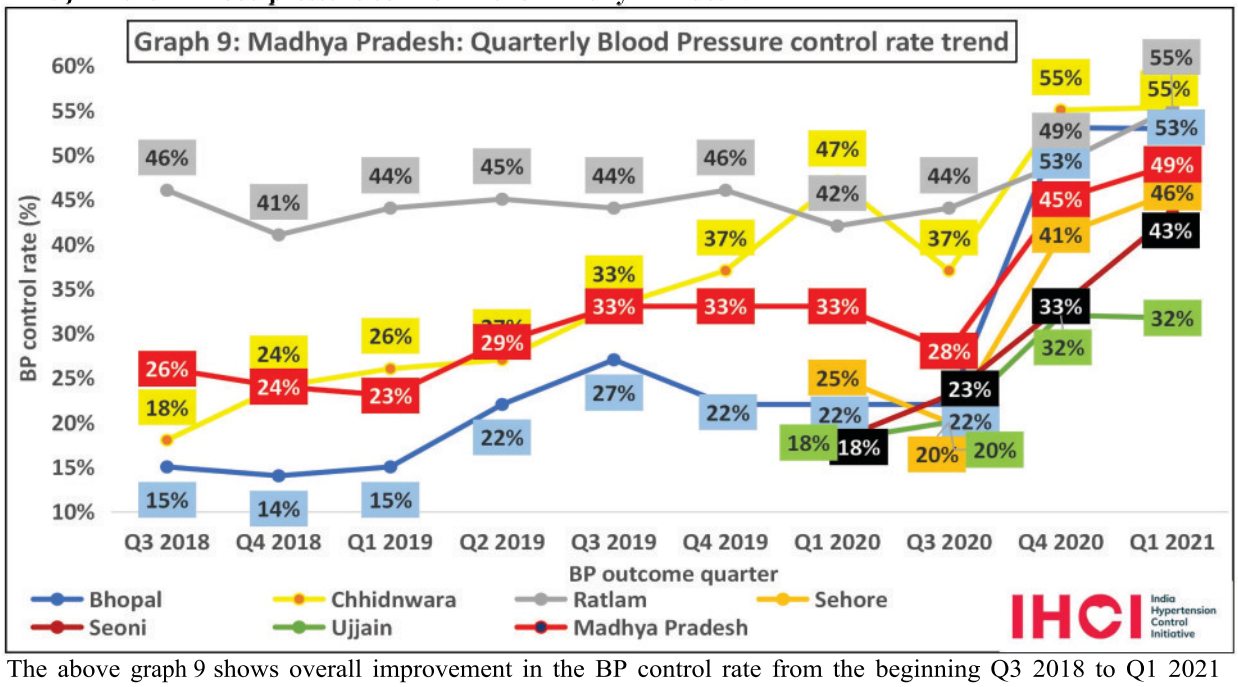
The above graph 7 shows Quarterly BP control rate was 49% among 6 districts in Q1 2021. Among 3 initial districts, BP control rate was 54%, highest 55% each in Chhindwara and Ratlam. In Bhopal It was 53%.Among 3 expansion districts, it was 41%. Highest in Sehore (46%) and lowest in Ujjain(32%). In Seoni it was 43%. Retention rate was <25% in Ratlam only. Rest all districts had >=25% missed visits, shows sub-optimum patients retrieval efforts.

C) Health facility wise Blood pressure control rate& retention rate:



The above graph 8 shows Retention rate were better in PHCs and SHC-HWCs. BP control rate is better if care given closure to patients' home. However, the BP control rate was much lower than expected at CHCs, points towards need for strengthening CHC NCD clinics further across all 6 districts.

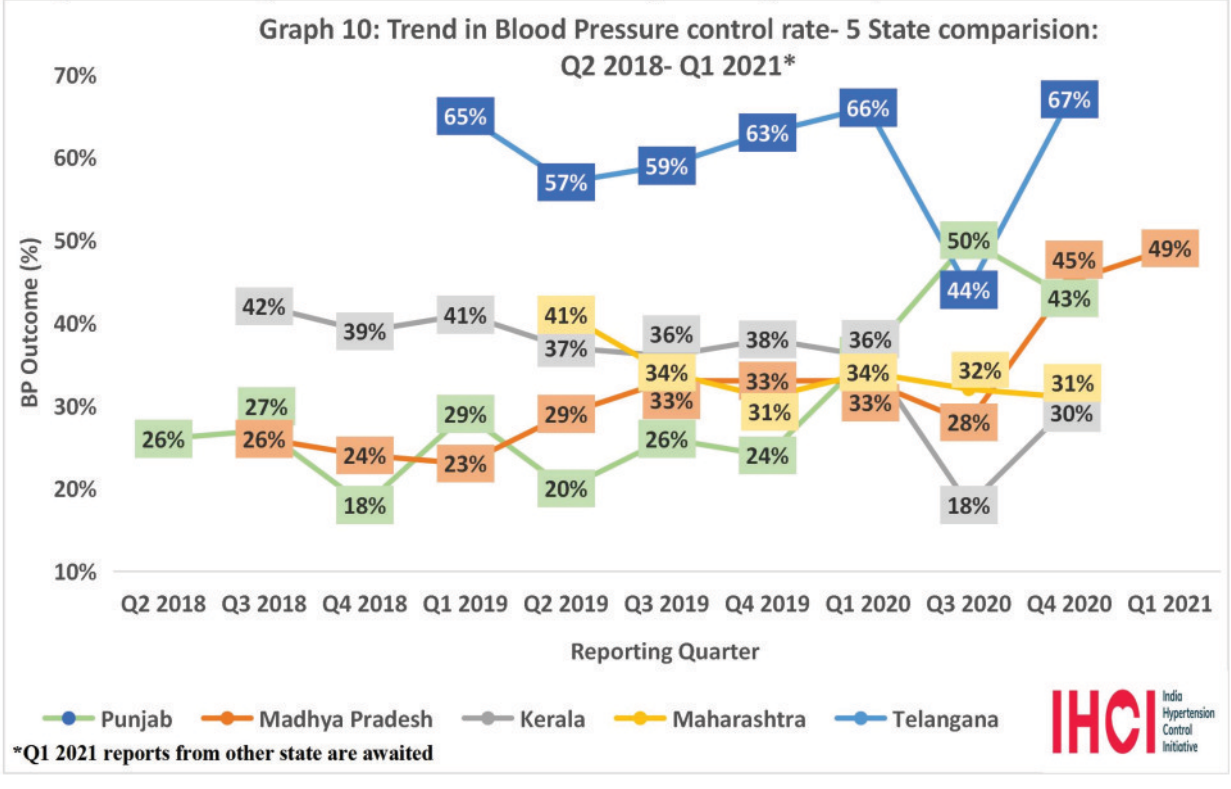
D) Trend in Blood pressure control rate for Madhya Pradesh:



The above graph 9 shows overall improvement in the BP control rate from the beginning Q3 2018 to Q1 2021 across MP.

In recent Q1-2021, there was improvement in BP control rate to 49% as compared to 45% in previous quarter Q4 2020. There was good improvement in Seohre, Seoni & Ratlam. No change in Ujjain.

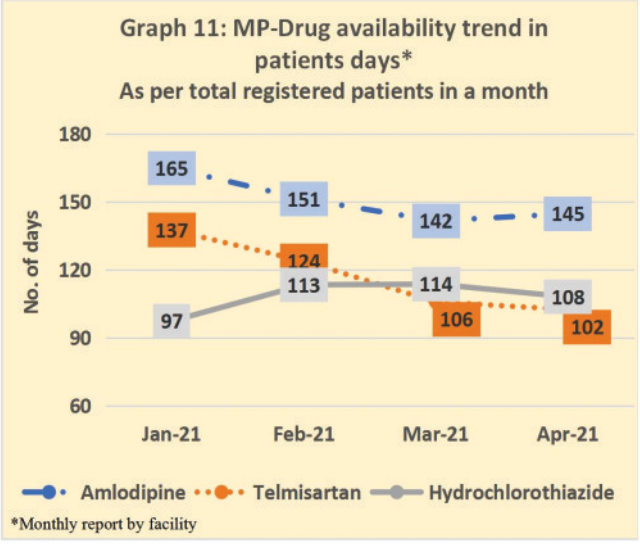
E) Trend in Blood pressure control rate - 5 states comparison: Q2 2018- Q1 2021:

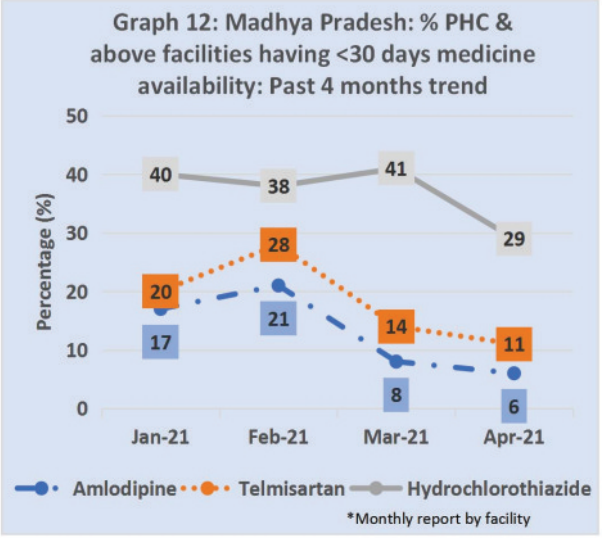


The Graph 10 above shows there is gradual but consistent improvement over different quarter for Madhya Pradesh. Q1 2021 from other states is awaited.

Consistently highest BP control rates was achieved in Telangana state, **one of the key reason is having dedicated NCD staff nurse till from DH, CH, CHC till PHC level.**

F) Drug availability trend over past 4 months with % Health facilities having <30 days stock:





As per graph 11, the drug availability has been more than 90days for all protocol antihypertensive drugs over past 4 months. As the same time, drug distribution has been a challenge, as >10% health facilities had <30 days stock for al protocol drugs with improvement in recent months, as per graph 12 above.

Key Observations:

Total patient registration **till 30 April 2021 – 1,70,091 (14.6%** of expected Hypertensive registered)

Proportion of estimated hypertensive population registered so far ranged from **5 % to 27%** across the IHCI districts, which is very low.

The number of registrations continued to increase through past few months. But there was remarkable reduction in Apr.'21 amid COVID-19 surge.

Overall Quarterly BP control was **49% for MP.** The control rate was 53%, 55% and 55% in Bhopal, Chhindwara and Ratlam respectively.

Among patients on treatment who regularly visited the health facilities, nearly **23% did not have blood pressure under control (Treatment inertia).**

Overall **Missed visit patients were 28%.** The Missed visit rate was higher in Ujjain (44%) & lowest in Ratlam (23%). Also, **Lost to follow up patients were 27%** of total registrations till Dec.'20

Retention rate were better in SHC-HWCs and PHCs. Very poor retention rates at CHCs and DHs

With availability of rate contract and empowered decentralized procurement, overall drug availability appears good. However, there are/were issues related to non-uniformity/equitability of availability. Many health facilities, specifically SHC-HWCs, reported without stocks of second & third-line drugs too.

Drug availability up-to health facility level is available in public domain which is very good for public awareness and monitoring by officials/program managers. However, non-updating of data by health facility is reported to a concern.

Title: Study of socio-behavioural dimentions of RTI in Lahaul & Spiti, Himachal Pradesh: A pilot study

PI : Dr. K. B. Saha, Scientist F

Status : Completed

Date of initiation : February 2020

Date of Completion : March 2021

Funding Sources : Intramural

Background with objective: This is a pilot study to understand the gravity and prevalence of the reproductive tract infection (RTI) and poor hygiene among the reproductive aged women residing in inaccessible, difficult high attitude areas in Lahaul and Spiti region of Himachal Pradesh, India, where health resources are scarce and overwhelming majority of the population is tribal. During winter the temperature drops below freezing point as a result the domestic water usually remains scarce in the area. Extreme cold, paucity of water may promote poor personal hygienic practices and this in turn may enhance RTI disease.

Objective : The study was designed with the objective to understand the magnitude and the pathogens of the RTI particularly due to poor hygienic practices at Lahaul and Spiti district of Himachal Pradesh.

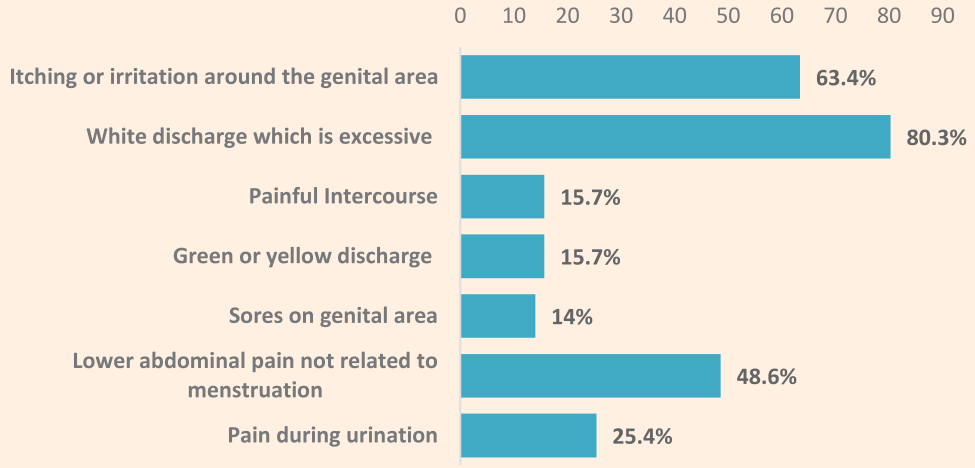
Methodology: A total sample of 720 women in the age group 14 to 49 years were interviewed with a pre-tested interview schedule from 69 villages from the blocks Keylong and Udaipur in the district Lahaul and Spiti. Women were screened through reported symptoms followed by laboratory investigations of their vaginal swabs. The sampling was purposive in nature.

Results: Around to 61% of the women reported one or the other symptoms of RTI. Most of the symptoms as reported were related to discharge (Fig.1). Among the symptomatic women, who provided vaginal swabs, 58.2% were found to be positive for RTI by Gram Staining & microscopy. Clue cell and yeast cells were mostly detected indicating the presence of bacterial vaginosis and candida. Trichomonas vaginalis was also evident among 59% of the samples provided by Wet mount test.

Conclusion: There is a need to increase the awareness and strengthen the health delivery system for early detection and treatment leading to healthy life of females particularly in reproductive age group in this high altitude, difficult area of tribal dominance in Himalayas.

Fig.1: Type of Symptoms of RTI reported

N = Any symptoms reported (350)



Title: Malaria treatment pattern in tribal dominated areas in Madhya Pradesh

PI : Dr. K. B. Saha, Scientist F

Status : Completed

Date of initiation : September 2019

Date of Completion : March 2021

Funding Sources : ICMR, New Delhi

Background with objective: About 80% of malaria cases in the country are confined to areas consisting only 20% of population residing in tribal, hilly, difficult and inaccessible areas. According to NVBDCP data, approximately 50% of all malaria deaths in India occur in tribal dominated areas. Madhya Pradesh state has the highest tribal population in the country where malaria control is complex because of its geographical terrain such as hills and hillocks, valleys, forests and modest health infrastructure. In year 2010, the NVBDCP introduced Artemisinin-based-Combination Therapy (ACT) in the country and to speed up the efficient diagnosis of malaria, Rapid Diagnostic Kits (RDT) was also introduced. Thus, it is felt essential to understand the pattern of the treatment followed by the service providers and utilized by the community.

Methodology : The study was planned to conduct survey in selected tribal dominated districts in a state - two districts with 25-50% tribal population and other with $\geqslant$ 50% tribal population. The districts are selected based on the proportion of tribal population and Malaria Slide Positivity Rate (SPR) according of National Vector Borne Diseases Control Programme (NVBDCP) data. The four selected districts for the study are Alirajpur, West Niwar (Khargone) from western, and Dindori and Sidhi districts from eastern parts of the state. The minimum desired sample size was 40,000 individuals, further assuming an average of 200 households per village in tribal areas – at least 40 villages needed to cover about 8000 households.

Results : To complete desired sample size 49 villages were selected covering around 44,000 individuals. Two rounds of survey (Pre and post Monsoon season) was supposed to be conducted. Due to COVID-19 pandemic and shortage of fund only pre-Monsoon season survey was completed. The preliminary analysis of the data revealed that of the total symptomatic individuals interviewed 4% were reported to have malaria and mostly of *P. vivax*. The NVBDCP guideline of prompt diagnosis and treatment was not followed properly in the tribal areas even though the tribal community is aware of the services. But fever is not considered seriously by the tribal community and their faith on traditional healing system delays service utilization. Further the guideline for main line drugs for *P. falcifarum* and *P. vivax* are not followed by the frontline workers such as ASHA, etc. while treating the patients. More over drugs particularly ACT are available in insufficient quantity with the frontline workers. ASHAs considered malaria services as not a priority work rather they are more concerned about services related to maternal and child health and immunization.

Conclusion : There is a need to generate awareness among the masses particularly among the tribal population to improve the health utilization for malaria services. At the same time there is a need to motivate and equiped the frontline workers particularly the ASHAs with all antimalarial drugs and RDTs such that programs focus on prompt diagnosis and treatment for malaria becomes reality in these outreach areas.

Title: Mobile Application for Immunization Data in India (MAIDI): Piloting of an App developed by ICMR

PI : Dr. K. B. Saha, Scientist F

Status : Completed

Date of initiation : June 2019

Date of Completion : September 2021

Funding Sources : BIRAC, Govt. of India

Background with objective: In India, vaccination coverage varies considerably from state to state, with the lowest rates in the central region. To fill the gap and to have real time data on childhood immunization a study was proposed by ICMR to develop a mobile application tool and subsequently its piloting in different states particularly in the rural areas. The main objective is to achieve improvement in coverage of immunization by strengthening capabilities and establishing a common platform for beneficiaries, health care providers and health system through this innovative mobile application. NIRTH team along with representative from ICMR Headquarters, New Delhi went to District Immunization Officer (DIO), Jabalpur, to discuss the integral part of the project in November 2020. DIO after listening about MAIDI suggested to initiate the piloting at the Private nursing homes/hospital of Jabalpur Urban and this strategy is expected to be beneficial to State Government, since the immunization data from private hospitals remains grossly underreported and thus the immunization percentage remains to 68% approximately. Accordingly, representative from ICMR and NIRTH team consented and the list of 44 private nursing homes/ hospitals is procured from the Data Manager, District Hospital (Victoria hospital), Jabalpur.

Methodology : The MAIDI App was developed by ICMR for its application through android mobile phones. After visiting all the 44 private nursing homes/ hospital by the NIRTH team, it was found that only 14 private hospital/ nursing homes are providing the antenatal, natal and post-natal care services. A letter was issued from DIO to all these private nursing homes/hospitals to cooperate the ICMR-NIRTH team in piloting the MAIDI App. Details of all the responsible persons concerned with immunization in these institutes were collected and they were trained on the use of MAIDI app.

Results: The piloting was done during 9th February 2021 to 30th august 2021. It was found that of the 14 nursing homes/hospitals only six of them reported Anti-natal, Delivery and Post-natal services. COVID was one of the reason attributes for this purpose. During the period under report from the HIMS portal we have received total institutional deliveries as 10,894. While these private nursing homes particularly the six private nursing homes/hospitals (Jabalpur Hospital, Samadhan Hospital, Sutikagrah Hospital, Gupteshwar Hospital, Sanjeevan hospital and K.J.Memorial hospital) reported us 854 institutional deliveries and 846 live births. The total registrations made in MAIDI App was 708. That is 84% coverage (708/846). Around 16% of the registered babies were administered OPV-O within the planned scheduled. While most of them administered after the

planned date. It is found the hepatitis B virus vaccination was not administered within the planned schedule. Its only 20% of the registered babies were immunized with the planned date of vaccination. MAIDI recorded that around 16% of the registered babies were immunized with BCG within the scheduled date of vaccination. Most of them vaccinated beyond planned scheduled. While we could see that for all other vaccines (Oral Polio Vaccine-1 (OPV-1), Rotavirus Vaccine (ROTA-1), IPV-1, Conjugate Pneumococcal Vaccines-1 (PCV-1), Pentavac PFS Vaccine-1 (PENTA-1), Oral Polio Vaccine-2 (OPV-2), Rotavirus Vaccine-2 (ROTA-2), Pentavac PFS Vaccine-2 (PENTA-2), Oral polio vaccine-3 (OPV-3), IPV-2, PENTAVALENT-3) MAIDI recorded that it was administered to the registered babies with the scheduled time and the range varies from 94% to 98%.

Visit to DIO office by NIRTH team & ICMR representative

ICMR representative imparting training to the NIRTH investigators as well as hospital staff

Visit by MAIDI Project Technical Officer from NIRTH to different Children wards at different Nursing Homes while piloting MAIDI

Conclusion : While piloting the MAIDI App in the private nursing homes we could understand the weakness of these health care units in recording and reporting the vital information related to immunization which is very important for the success of developing good health of infants and reduction of mortality and morbidity. The MAIDI model is an important app which is expected to record the proper immunization and feedback mechanism and this is very important for the success of any programme. The state government must adopt it and implement it rigorously to follow/ practice both in government and in private health care units/ hospitals/ nursing homes.

Title: Impact of COVID-19 on Maternal and Child health services through the public health system in India. Site: Central Zone-Madhya Pradesh (National Task Force Study).

PI : Dr. Dinesh Kumar, Scientist E

Status : Completed

Date of initiation : September 2020

Date of Completion : January 2021

Funding Sources : ICMR, New Delhi

Background with objective: The impact of COVID-19 on maternal and child health services is yet to be ascertained in India. However, experiences from even developed countries have shown disruption of essential health services especially health services for the pregnant mothers and new born. Although outreach services for MCH care has been restricted, Government has taken measures to ensure that beneficiaries visit peripheral facilities on particular dates as informed to them telephonically or through ASHAs. The study has been launched in six zones in the country. ICMR-NIRTH Jabalpur was one of the participating centers among the six centers' in this multi-centric study. The study was completed with following aim and objectives;
Aim: To assess the impact of COVID-19 on access to and utilization of MCH services in India.

Objectives

1. Assess trends of antenatal care visits, maternal and pediatric admissions, institutional deliveries, emergency obstetric care, abortion care, new born care and postnatal care at the health care facility level during COVID-19 epidemic.
2. Assess trends of childhood immunization during the COVID-19 outbreak.
3. Assess and understand the health seeking behavior of women with respect to MCH services during the COVID-19 epidemic.
4. Assess the challenges and response strategies of the health system delivering MCH services during the COVID-19 epidemic.

Methodology : The study was a cross sectional and quantitative study using secondary data from HMIS and primary data collected through structured interview questionnaires. The study was carried out in among health care officials who engaged in maternal and child health care section in Government public health care hospitals and MCH beneficiaries. The data was collected through Rapid Assessment Survey (RAS) in selected 2-red zone districts Indore and Jabalpur and 1-green zone district Mandala in Madhya Pradesh. Rapid Assessment Survey (RAS) using structured questionnaires through telephonic interviews of both the health care officials, workers and MCH beneficiaries was done. According to RAS, a telephonic interview was adopted to gather information on antenatal care visits, maternal and pediatrics admissions, institutional deliveries and new born care at the health care facility level, childhood immunization, health seeking behavior among beneficiaries of MCH services and challenges and response mechanisms of the health officials or health care workers delivering MCH services during COVID-19 epidemic. From each district at the level of district head quarter six health officials (District Immunization Officer, District Program Manager (NHM), District Monitoring and Evaluation Officers (NHM), Gynecologist/Obstetrician, SNCU Pediatrician In charge, NRC staff nurse) and block level health officials (Senior Medical officer/ Medical Officer in Charge, ASHA/ANM) and MCH beneficiaries were covered.

Conclusion : A total of 132 sample was covered, 18 health care officials from district level, 24 health care officials at Block level of concern district level and 90 MCH beneficiaries. The details of sample covered for each MCH services; 51 currently pregnant women, 50 ANC mother, 32 delivery cases, 22 Post-natal care (PNC) and 55 child immunization. National level analysis to be done centrally by host Institute NIMS, New Delhi for publication through reputed scientific journals to wide dissemination for public benefits. The all data entered in CSPro software along with project report submitted to host institute. The country level analysis according to objectives of the study to be done by host institute NIMS, New Delhi for compilation, analysis, results and interpretation for dissemination and documentation centrally and for publication through reputed scientific journals to wide dissemination for public benefits.

Fig.1; Field visit to conducted the physical interview with DIO & MCH beneficiary in district Mandla

Fig.2; Visit to CMHO office Jabalpur for coordination and cooperation

Title: Understanding tribal culture, lifestyle, animal husbandry activities and cause of death in five tribes of India through establishment of tribal habitats in ICMR- NIRTH, Jabalpur.

PI : Dr. Dinesh Kumar, Scientist E

Status : Ongoing

Date of initiation : 1st January 2019

Date of Completion :

Funding Sources : Ministry of Tribal Affairs (MoTA), New Delhi

Brief background with Objective:

Tribal culture and lifestyle are different and it varies by geographical regions. The lifestyle of culture is indirectly correlated the Health. On details health affairs among human being in the community is an outcome of several factors, to which ecology and environment contribute to major proportion. Disproportional interactions (shifting away of balance between environmental factor and lifestyle of communities) bring disease collision. Therefore, it is considered that all kinds of disease. Therefore, constitution of traditional tribal huts inside a tribal health research institute will help to propelling further research not only of health issues and other areas of Indian tribes.

The study is following four specific objectives;

1. To study the living pattern particularly socio-cultural aspects, food habits, animal husbandry, and health issues of the 5 identified tribal communities by interaction and collaboration with them.
2. To invite traditional artisans along with their colleagues of 5 different tribes to NIRTH campus and built their representative huts exactly simulating a traditional hut of their own community.
3. To understand daily (day to day) life style, washing, cleaning, cooking, defecating, eating and sleeping habits of typical tribal family from each of the tribal community.
4. To use the five tribal habitats as models for dissemination of knowledge generated with other community members, researchers, institutes related with tribal studies.

Brief methodology:

The study is being carrying out among five tribes; 3 primitive tribes (Baiga, Bharia and Saharia) from M.P, 1 primitive tribe (Hill Korwa) from Chhattisgarh and 1 tribe (Bhil) from Rajasthan) in different 3 States in the country. Accordingly, the 3 ideal Hut Model of primitive tribes Baiga, Saharia and Bharia resided in M.P.The survey work (data collection) is going on.

Brief results:

The summary of work doneaccordingly, the 3 ideal Hut Model of primitive tribes Baiga, Bharia and Saharia residing in Madhya Pradesh has been established in the Institute. We had also developed handmade glass frame 3D model of individual tribal hut for the dissemination and presentation of lifestyle & culture of these primitive tribes. The study focused to describe their lifestyle, cultural, causes of poor health and its associations.The cross-sectional descriptive survey with probability proportion to size sampling technique was applied for data collection among the different tribes. Data was collected by trained investigators (project staffs) through structured interview schedule after explained the content and obtaining written consent from all the respondents. The survey work (data collection) has been completed of four tribes Baiga, Bharia, Saharia and Bhil tribes. A total of 411 households surveyed throughout the 22 village. Annual progress report was submitted timely and based on the progress of work done the funding agency Ministry of Tribal Affairs, New Delhi has sanctioned the 2nd instalment of grant-in-aid to ICMR-NIRTH Jabalpur. The study is in progress.

Title:Lifestyle intervention program on health seeking behavior, malnutrition and malaria prevention in Ashram school children of Dindori district in Madhya Pradesh (Extramural study)

PI : Dr. Dinesh Kumar, Scientist E

Status : Ongoing

Date of initiation : 1st February 2019

Date of Completion :

Funding Sources : National Academy of Sciences India (NASI), Allahabad

The benefits of healthy lifestyle are well known. A healthy diet and physical activity are the key elements for achieving optimal health. The largest child of tribal families is studying in Ashram school which provide free fooding and lodging in school setting. The children lodging/residing in the school campus depend on available foods and minerals, etc., for growing and achieving the health condition chronically. The responsibility of welfare of children rests with the society and the authority. Hence, empowering the school children will help not only in improving health but also for taking decision making in right way. The study aimed to implement school-based lifestyle intervention activities for benefits to tribal children with following objectives.

Short term objective:

1. To organize a school-based multi-component healthy lifestyle program focusing on diet, physical exercise, and necessary training/ workshops.
2. To establish an enabling school environment with integrated (well-defined) canteen guidelines.
3. To create awareness on WASH (water, sanitation and hygiene) among children, teachers and support staff for a healthier climate.
4. To evaluate the net impact and utility of the lifestyle intervention program.

Long term objective:

1. To sensitize, encourage and promote adoption on a healthy lifestyle and healthy eating (diet) among ashram school students.
2. To encourage informed and rational decision-making right and bright future.

Brief methodology:

The study was carried out in 8 Ashram schools (4 Boys & 4 Girls school) children of Sahapura block in Dindori district. The study plan is to complete in three phases; baseline survey, IEC implementation and impact evaluation survey with pre and post-interventionstudy design.

Selected students who were studying in class 6th to 12th class within the age group 11-18 years. A total sample of 300 students were covered comprising 147 girls and 153 boys in baseline survey(phase-I).Kinds of the IEC education materials are such as one banner and nine posters containing different messages about the waterborne disease, personal hygiene, menstrual hygiene, nutrition, malnutrition, physical activities, school environmental program lifestyle

activities, malaria and vector-borne diseases (dengue, chikungunya, swine flu) for enhancing the knowledge among the students.

Brief results:

The study is being carrying out in Ashram schools in Ashram school children of Shahpura block in Dindori district in M.P. The study has covered the 8 Ashram schools; 4 from Boys & 4 from Girls school. The life style intervention program focused to educate through implementing the IEC on life skills education and health care awareness including general health awareness, awareness on WASH and awareness program on girls Health.The first phase, baseline survey has completed with the covering of 4 Boys and 4 Girls Ashram schools. A total of 300 students investigated of them 153 boys and 147 girls are found. The data collected on health seeking behaviors parameters, nutritional aspects with anthropometric measurements and awareness on malaria prevention after explaining the content and written consent. Developed the IEC materials grounded on research components and base line findings. The implementation of IEC intervention education initiated with sensitizing in all targeted schools in terms of mass communication, lecture mode and interpersonal discussion with the students. A total 40 lecture has delivered in 8 ashram school as on average 5 lectures in each school. The 1st round lifestyle IEC education implemented in ashram schools along with covered two selected villages as community approach specially for reducing the child malnutrition and sensitization on health care. The 2nd round lifestyle IEC education intervention implementation work has also been completed, covering the sensitization of parents of malnourish children in 2 tribal villages. Written Annual Progress Report and submitted to funding agency to releasing the grant of 2nd year of work.

The study is under progress.

Title:Improving the Health Care Access for Achieving Universal Health Coverage (UHC) among Scheduled Tribes: An Implementation Research in Saharia's of Sheopur and Shivpuri districts of M.P

PI : Dr. Dinesh Kumar, Scientist E

Status : Ongoing

Date of initiation : 14 February 2020

Date of Completion :

Funding Sources : ICMR-New Delhi

The utilization of health care services is not adequate in tribal-rural areas in the country. Assess the people's health care access in the vulnerability segment of population in context of poverty & livelihood insecurity is prime issues. Therefore, the object is to develop implementation strategies towards achieving universal health care coverage by identifying and addressing the implementation barriers to improving access to health care services of assured quality without suffering financial hardship to the people through the existing health care systemswith aim of following broad and specific objectives;

Broad Objective;

To develop implementation strategies towards achieving universal health coverage by identifying and addressing the implementation barriers to improve access to health care service of assured quality without suffering financial hardship to the people as well as public health services through the existing health care systems.

Specific Objectives;

1. Assessing health needs and healthcare decision making processes to understand the healthcare-seeking and to assess the capacity of the existing PRI systems and community groups/committees to negotiate for better services.
2. To understand the facilitators and barriers in the healthcare service delivery, from both people's and providers' perspective.
3. To develop, implement and test an implementation strategy with some innovative approaches to improve the access to quality and affordable healthcare, including (a) improving leadership and governance, etc., (b) improving the health human resources, (c) improving financing, drugs, equipment &supplies and (d) promoting community involvement for improved access and utilization.

Brief methodology:

Formative Research/baseline survey (phase-I) has been completed as per project protocol. A cross-sectional survey was carried out among Saharia tribe who living in poor socioeconomic condition in Sheopur district of M.P. The data were collected by trained investigators through specific observation based during July 2020 to March 2021. A total of 2040 household was surveyed through selected 40 villages under 4-PHC/CHC. Of them, 336 MCH household was surveyed as sub sample for Quantitative Household Survey. 91 outpatients and 48 in-patients were covered under Exit Interview Survey, 21 (4-PHC/CHC,4-SHC and 13 HWC) health centers has been covered under Health Facility Survey and 78(24- IDI with KIs, 8-Traditional healers and 20 with Health workers, 4-Medical Officers,7-MLHPs,3- Top Level Health Administrators & 12- FGDs).

Brief results:

Summary findings/Results:The results revealed that tribe has poor socioeconomic condition and morbidities. About 42.5% houses were found of mud house with thatched roof. Average annual income was found Rs 76980+-37636 and Median income Rs 72000. About 45.5% as one member of household experienced at least one episodic illness while 8.2% has chronic illness and 5.3% got death in the past 12 months. Out of 636 women 82.4% were in the age between 20-29 years. About 51% women got marriage at below 18 years and got first delivery below 20 years of age and 3.3% pregnancy resulted in abortion. Out of 636 women, 87.6% reported that they had taken at least one ANC check-up. About 81% had taken first ANC check-up in first trimester and 7.4% in second trimester. About 35% women consumed some IFA tablets and 45% consumed all tablets. About 51% women got 2-Tetanus Toxoid immunizations and 7% got 1-TT dose. More than 90% women reported pregnancy related complications during the most recent pregnancy. Most (81%) of the child birth was found normal whereas, home delivery (53%) was found higher than hospital delivery (46%). About 75% women had taken postnatal care services and 14.3% children received vaccines. Overall, 18.7% at least one episodic/chronic/hospitalization were found among the studied population (9,210). Higher proportion of fever (51%) members were seen as episodic illness. About 46% TB as chronic illness were observed among them, 14.3% taking treatment as home remedies, etc. Out of 91 outpatients the disease and illness were seen as cough (37.5%), joint pain 29%, 21% diabetes and fever of each, snake/animal bite 12.5%, etc. Reason for patients to get admitted was body pain, weakness, dizziness (27%), Anemia 19%, delivery services 19% and for ANC services 42%, etc. Most of the health facilities were found shortage of manpower, equipment and essential medicine while MCH services found insufficient in few health centers. Conducted IDIs and FGDs concluded that low awareness of health care services, cultural believe as faith on god/goddess, deity, traditional healer, poor road condition and public transport, etc., is the barriers from community side and the health care provider may make the more attention to provide the health services when they(tribal community) need. Written the report after analyze the data of all variables resulted in 189 tables with explanation putted in Annual Progress Report (APR) and submitted to funding agency ICMR New Delhi for PRC meeting and for the sanction and releasing the grant of 2nd year of research.

Title: Revitalizing ethnomedicine among the Baiga of Madhya Pradesh - An exploratory research

PI : Dr. Nishant Saxena, Scientist B

Status : Ongoing

Date of initiation : April 2019

Date of Completion :

Funding Sources : ICSSR - IMPRESS, Ministry of Education, Govt. of India, New Delhi

Background with objective:
The ethnomedical practices prevalent in tribal communities are present since the time immemorial. Tribes are considered to be relics of human ancestry and these age-old practices have ensured the survival and perpetuation of tribes and their culture. The central and focal point of this traditional medicine system in tribes is the healer and this institution is generally carried forward from one generation to the next. In the present study the traditional tribal healer is designated as ethnomedicine practitioner (EMP). Little efforts have been made to understand the practices of these EMPs from both the healer and patient perspective and this is the main objective of the present study in addition to identifying the EMPs operating in the study area and creating an inventory of these traditional specialists. The study has been undertaken in the Baiga tribe residing in the Dindori district of Madhya Pradesh (MP). It is worth mentioning here that Baiga tribe is one of the three PVTGs (Particularly Vulnerable Tribal Groups) of MP.

Methodology : The study area under the ambit of present study is the *'Baigachak'* of Dindori district which customarily comprises of 52 villages in Bajag, Samnapur and Karanjia tehsils of the district where Baigas have settled since a long time. It is a two-part study focusing on compiling the inventory of EMPs in the study area using snow-ball method, followed by the in-depth data collection using semi-structured interview schedules canvassed among both the EMPs and patients who availed treatment from EMPs.

Results : As the study was community-based and involved rigorous interaction at the grass-root level, therefore the successive waves of the Covid-19 pandemic and lockdowns affected the progress of the project significantly. The research personnel had to face hardships in entering tribal villages and interacting with the community members because of the ongoing pandemic. In spite of this, the research team was successful in identifying and collecting data from more than 100 EMPs or '*Gunia'* as they are named locally in the study area. Also, data was collected from more than 250 patients of these EMPs. Moreover, details of about ninety-three herbal formulations being used by the traditional healers to cure and manage different health issues were also recorded and it was ensured that such medicinal plants are present in the Tribal Traditional Medicinal Plants Garden at the ICMR-NIRTH campus. Data analysis is ongoing and proceedings of the interactive workshop conducted previously (on 09.08.2019) with EMPs and healthcare workers has been published in the journal *Current Science*.

Relevant figure/ graph

Figure: Tribal Traditional Medicinal Plants Garden at the ICMR-NIRTH campus

Figure: Exchanging notes with the traditional healer, tribal patients and their care-givers

MRHRU, Datia 2001-2002

At the MRHRU in Badonikhurd, Datia (M.P.), one intramural entitled "**Profiling of diseases prevalent in Datia district"** was carried out which evaluated and analysed the disease profile of the Datia District of Madhya Pradesh.

Profiling of diseases prevalent in Datia district:

Data was gathered for the **second project** from medical records held at the Government Medical College in Datia. To ascertain the most typical patient presentations, these records were analysed. This study had access to 138,756 patient data in total. Department-by-department analysis showed that most records were concerning pneumonia, suppurative otitis media, anaemia in women, superficial dermatophytosis, and respiratory tract infections. According to hospital records, the majority (16,890, 53%) of the 31,550 records of patients who visited the general medicine department had reported respiratory tract infections, which were followed by acute diarrheal disorders (n = 8,800, 27.9%). A total of 35,460 patient records were accessible in the dermatological department, of whom n = 17,089 (48.2%) had complaints of superficial dermatophytosis (48%).

Records of 21,400 patient visits to the ENT department show that 33% of those visits resulted in therapy or a prescription for chronic suppurative otitis media. There were records for 1,433 patient visits in the obstetrics and gynaecology department, with severe anaemia (461, 32.1%) and gestational diabetes mellitus (427, 29.7%) being more prevalent than other presentations. There were 3,255 patient records in the paediatrics department, and the most common diagnoses were pneumonia and diarrhoea (41 and 35%, respectively). In the department of pulmonary medicine, a total of 24,504 patients were recorded, of whom the majority (n = 13,342, 54.4%) displayed signs of an upper respiratory tract infection. Patient visits to the surgery department totalled 20,281 (n = 9,092/20,281 = 44.8%), with the majority of those appointments being for stomach discomfort. A total of 873 patient records from the department of psychiatry were available, and 524 (or 60%) of those records mentioned depressive illnesses such as depression and anxiety.

The overall health issues impacting people in Datia's urban and rural areas are reviewed in-depth in this study. The study's inability to show additional connections with age and gender due to the lack of such data, however, was a severe flaw. However, these results will aid in setting the agenda for interventions and establishing goals for obtaining better health for everyone, especially those residing in rural and tribal areas. Assessing local health challenges is made easier for policymakers by looking at the disease profile in a certain area.

Figure 1: Building of MRHRU Badoni, Datia.

Figure 2: Molecular Biology Laboratory at the MRHRU Badoni, Datia.

INTERMEDIATE REFERENCE LABORATORY FOR RNTCP

The TB laboratory of the institute is functioning as TB C & DST Lab for NTEP and provides support to NTEP using various tests like culture, microscopy and CBNAAT. During the period of 2020-2021 a total of 3595 tests were performed by CBNAAT. Of these 683 were positive for M. tuberculosis and 130 were resistant to rifampicin. Laboratory also processed 3638 specimens for culture on Liquid culture media for Diagnosis of TB and follow up of MDR TB. A Total of 6423 specimens were tested for First line LPA of these 489 were resistant to Isoniazide, 158 were resistant to rifampicin while 416 were resistant to both the drugs, 1277 specimens were tested for Second line LPA and out of these 333 were resistant to fluoroquinolone, 13 were resistant to second line injectable drugs while 44 were resistant to both the classes of drugs.

STATE REFERENCE LABORATORY & ICTC

At Present SRL Jabalpur is having 100 ICTCs under its observation as per MPSACS of which 95 ICTCs are active and 83 have participated in the JULY EQAS 2023. A total of 29 Blood Banks are connected to SRL for External Quality Assurance Scheme (EQAS) activity of SRL. HIV laboratory of the institute is a NABL accredited facility and functions as ICTC and State Reference laboratory for M.P. State AIDS Control Society.

The ICTC is the testing unit where 404 tests were done in reference year of which 146 were positive.

CENTRAL LIBRARY

Library and Information Centre at the institute continues to support and cater the documentation and information needs of the Scientists, staff and researchers of the centre as well as other institute like Netaji Subhash Chandra Bose Medical College, Veterinary College, Home Science College, Rani Durgavati Vishwavidyalaya, etc. It also extends services to research personal from other universities/institutes.

Library is equipped with modern furniture, air conditioner, compactors and display racks for displaying of latest arrivals, i.e. books and periodicals for its readers. Meeting the challenges posed by technology driven world, it exemplifies the use of digital environment for creating, applying and utilizing information with its automated library collection online databases/e-resources etc. The objective of these e-resources is to provide-retrieve full text of online articles and conduct specific searches relevant to the user from multiple publishers. Alert messages regarding new developments and recent arrivals in library are provided through e-mails from time to time. Photocopies of available literature are provided for research use.

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Meetings attended

Dr. T Chakma Scientist G

Workshops /Conferences/Meetings attended (1/4/20 to 31/3/21)

1. Attended a meeting on "Sickle cell disease among Tribals in MP" at Satpura Bhawan Bhopal on 4th June 2020
2. Attended a meeting on "Sickle cell disease among Tribals in MP" with principal secretary Health on 9th September 2020.
3. Attended a meeting on "COVID-19 preparedness" at Office of District Magistrate Jabalpur on 10th October 2020
4. Selection committee member for Veterinary Consultant on 12th October 2020
5. Attended Review meeting of the Mental Health Project on 25th November 20020
6. Attended IHCI review meeting of MP on 3rd December 2020
7. Attended IHCI review meeting of CG on 7th December 2020
8. Delivered a lecture on diagnosis of COVID-19 in a webinar organized by Jigyasa, Jabalpur on 17th December 2020.
9. Review of IHMI programme at Chhindwara on 14th December 2020 with CMHO
10. Review of IHMI programme at Seoni on 15th December 2020 with CMHO
11. Attended IHCI review meeting of CG on 25th January 2021
12. Delivered a lecture on diagnosis of COVID-19 on the occasion of science day, on 28th February 2021
13. Delivered a lecture on "Fluoride and health risks" in an international webinar organized by "Future Earth" Indian Institute of Science, Bangalore on 11th March 2021
14. Attended IHCI sentinel site review meeting of MP on 22nd March 2021

Dr. K. B. Saha, Scientist F

1. April 22, 2020, attended the Nodal Communication Officer's (NCOs) meeting with Communication unit of ICMR, New Delhi through Zoom conferencing on the issue "Handling communication for COVID-19.
2. December 30, 2020, as one of the Co. investigators from NIRTH and as a resource person delivered training and lecture through virtual conference related to IEC/BCC reorientation programme of Malaria Elimination Demonstration Project (MEDP). Malaria field coordinators (MFCs) of the MEDP project were the target group.
3. February 28- March 4, 2021, visited RMRC, Gorakhpur as invited by the institute's Director Dr. Rajnikanth Shrivastava and attended the meeting related to issues of Keylong field station.
4. March 11, 2021, attended the urgent meeting through virtual conferencing organized by the Communication and Policy Division of ICMR, New Delhi related to organizing of Prime Minister's Amrit Mohotsav at ICMR-NIRTH, Jabalpur to mark India @ 75 years of Independence.
5. Delivered a talk with presentation through video conferencing in a two-day National Workshop "Methods and Approaches for Health Research in Social Sciences". My topic was Using ACSM tools in Health research: Communicating with community. in collaboration with Vellore Institute of Technology, Amravati and Central University of Karnataka on 26/6/2021.

6. Attended and presented data on IEC related activities on malaria diagnosis and treatment in community at Mandla and also need assessment of ASHA related to malaria as part of MEDP at 5th Malaria Elimination Advisory Group (MEAG) meeting on 6/8/2021.
7. Attended and briefed on the scope to undertake TB studies on Sahariya of Madhya Pradesh at Socio- Behavioural Networking on TB research. Organized ICMR-NIRT, Chennai through VC on 17/8/2021.
8. Attended and presented India @ 75 Amrit Mohotsov Campaign idea of ICMR-NIRTH at Western Hub Meeting of Nodal communication Officers of ICMR Institutes on 17/11/2001.
9 July 27-30, 2020, organized 4 days workshop on sensitization on Cyber Security at ICMR-NIRTH, Jabalpur.
10. November 18-20, 2020, conducted a training workshop for the recruited staff and site P.I. and Co.P.I. on Mobile Application for Immunization Data in India (MAIDI) app developed by ICMR, New Delhi. Dr. Salaj Rana, Scientist B from ICMR visited as resource person. Met District Immunization Officer and also visited ANM/ASHA of the PHC Shahpura and briefed them about the MAIDI app.
11. November 18-21, 2020, conducted 2 days training workshop through virtual conference with the scientist & staff of the ICMR-NIRTH, field station at Keylong to make them as "agent of change"/ IEC campaigner for conducting "ICMR-Jan Andolan" against COVID-19 an awareness programme.
12. November 23-24, 2020, conducted the "ICMR-Jan Andolan" in the market and other places of public interest at Keylong, Lahaul & Spiti district of Himachal Pradesh in collaboration with the state government health authorities.
13. December 10, 2020, helped the institute to organize the Curtain Raising Ceremony of India International Science Festival 2020 (IISF 2020) at ICMR-NIRTH through virtual conference. Hon' ble Union Minister of Science & Technology, Earth Sciences and Health and Family welfare, Government of India, Dr. Harsha Vardhan spoke on the occation as Chief guest and delivered the presidential address and Dr. Samiran Panda addressed on behalf of DG, ICMR. Extended the Vote of Thanks.
14. Delivered lecture on role of social scientists in health research to the faculty and the students of Social Science Division of the Central University of Koraput, Odisha and also helped the Director to sign the Memorandum of Understanding with the said university on 21/12/2021 to 24/12/2021. I also act as Nodal officer for academic and research exchange between ICMR-NIRTH and the Central University of Koraput, Odisha.
15. Attended the stakeholders meeting related to Keylong Field station functioning at Deputy Commissioners Office, Keylong, Himachal Pradesh on 14/7/ 2021. Visited Keylong as a Nodal Officer for Keylong field Station from ICMR-NIRTH, handed over the possession of documents related to equipment/furniture, vehicles and the documents related to land meant for constructing of FS building to Nodal Officer of the field station from RMRC, Gorakhpur in presence of Director, RMRC, Gorakhpur, Accounts Officer, NIRTH, former Administrative Officer, NIRTH, Accounts/ Admn. Officer from RMRC Gorakhpur and all the staff of the field station on 16/7/2021.

16. Helped the office to organize the visit of the Governor of Madhya Pradesh, His Excellency, Hon'ble Shri Mangu Bhai Patelji at ICMR-NIRTH, Jabalpur on 7th & 8th December 2021.
17. As Chairperson judged the poster sessions organized as part of "Azadi ka Amrit Mohotsav" on 10/12/2021. Also conducted and helped the office to organize various activities under Amrit Mohotsav as instructed by ICMR from time to time.
18. Delivered a talk on National Science day at NIRTH on 29th February 2022.
19. Helped the office in organizing the foundation Day and extended the Vote of thanks. The programme was graced by the Hon'ble Vice Chancellor of Rani Durgawati Vishwa Vidyalaya, Jabalpur Dr. Kapil Deo Mishra ji on 1st March 2022.
20. Helped the office in organizing the International women's Day and delivered a talk on the programme on 8th March 2022.
21. Survey technique & survey schedule on COVID-19 for scientist & staff of former ICMR-NIRTH field station at Keylong, Himachal Pradesh during 6-9th September 2021.
22. Survey technique & survey schedule on COVID-19 for scientist & staff of ICMR-NIRTH and its appointed field investigators for Madhya Pradesh and also for former ICMR-NIRTH field station at Keylong, Himachal Pradesh for survey at Lahaul & Spiti during 13-15 September 2021.
23. Data entry workshop on COVID-19 social survey at tribal areas of Madhya Pradesh and Himachal Pradesh on 18th November 2021.
24. Organized an IEC training on COVID-19 preventive measures and vaccine hesitancy with the COVID-19 social survey team members at all the sites of Madhya Pradesh and Keylong, Himachal Pradesh as part of "Azadi ka Amrit Mohotsav" on 2 December 2021.

Dr. A. K. Mishra, Scientist E

1. Attended virtual ICMR-NIRTH expert group committee meeting on 22-23 October 2020 and presented and discussed about new and ongoing projects.
2. Organized Vigilance Awareness Week at ICMR-NIRTH, Jabalpur from 27th October to 2nd November 2020 and conducted various activities as per guidelines of ICMR and Central Vigilance Commission.

Dr. P. V. Barde, Scientist E

1. Delivered lectures on COVID-19 diagnosis and research at ICMR-NIRTH in three online symposia.
2. Meetings/ conference/symposium organized Training for state health officials for Dengue Chikungunya ELISA was provided
3. Training for state health officials and medical collage staff (n=27) for COVID-19 diagnosis was provided

Dr Pushpendra Singh, Scientist E

1. February 2021: Gave a talk titled as 'Rapid methods for genotyping that bypass conventionality' in an invited Pecha Kucha talk during the workshop "Towards a One Health Approach to Study Leprosy" conducted by Leiden University Medical Centre, Netherlands.
2. Participated with an e-poster titled as 'Mycobacterium leprae genotypes and drug resistance mutations in Jabalpur district of Madhya Pradesh' in the 31st Biennial Conference Hyderabad conducted by Indian Association of leprologists (IAL) (April 2021).
3. Participated in workshop on Next Generation Sequencing Data Analysis for Clinical Diagnostics held from 25th Oct 2021 to 29th Oct 2021 conducted by National Genomics Core, Centre for DNA Fingerprinting and Diagnostics, Hyderabad (October 2021).

Dr Dinesh Kumar, Scientist E

1. Participated in Virtual Global Symposium on 'Human Resources for Health: Optimizing the Health Workforce for Accelerating the Universal Health Coverage in India' held on 3rd & 4th December 2020 Organized by The National Institute of Health and Family Welfare, New Delhi
2. Participated in Virtual Project Review Group (PRG) meeting of National Taskforce Project of Universal Health Coverage (UHC) on 11 January 2021 was held from the Division of Socio-Behavioral & Health Systems Research, (SBHSR), ICMR-New Delhi.
3. Participated in Virtual Workshop on Qualitative Health Research Methodology (QHRM) during 18-19 January 2021 was held from the Division of Socio-Behavioral & Health Systems Research, (SBHSR), ICMR-New Delhi.
4. Attended Virtual 'Publishing Webinar-Tips from the Editors' at Indian Council of Medical Research, on 30 March,2021
5. Participated in 'National level webinar on 'Geomedical Health Hazards and Environmental Problems in Tribal Areas: Issues, Challenges and Opportunities' on 17/09/2020 organized by School of Environmental and Earth Sciences, KBC North Maharashtra University Jalgaon sponsored by The National Academy of Sciences (NASI), Prayagraj.
6. Participated in Virtual Orientation Training on 'Impact of COVID-19 on Maternal and Child Health Services through the public health system in India' during 27th and 28th August 2020 organized by NIMS. New Delhi.
7. Attended project zoom meeting on 30 September 2020 of 'Impact of COVID-19 on Maternal and Child Health Services through the public health system in India' organized by NIMS. New Delhi.
8. Attended Orientation Training on 'CSPro Data Entry Program' on 20/10/2020 for 'Impact of COVID-19 on Maternal and Child Health Services through the public health system in India' organized by NIMS. New Delhi.
9. Meeting attended in analysis plan and completed the preliminary analysis for the study 'Impact of COVID-19 on Maternal and Child Health Services through the public health system in India' on 24 February 2021.

10. Participated in the international virtual seminar on 'Sickle Cell Disease: Global Perspective and Indian Scenario'- held on the occasion of 'World Sickle Cell Day': conducted by ICMR-NIRTH, Jabalpur on 19/06/2021
11. Participated in the Two-Day National Workshop on 'Methods and Approaches for Health Research in Social sciences'-organized in virtual mode; Jointly organized by ICMR-NIRTH Jabalpur, VIT-AP University and Central University of Karnataka on 26-27 June 2021
12. Participated in 'iThenticate-Publish with Confidence'-held online via video conferencing: conducted by Turnitin, South Asia on 15/07/2021

Dr. Vidhan Jain, Scientist D

1. Meetings/ conference/symposium attended webinar on "National policy for vector control measures to reduce reliance on DDT" on 15th January 2021 organized by CSIR-NEERI, SHWMD, Nagpur.
2. Attended webinar on "Environmental contamination of DDT and Phasing it out from Public Health Programs" on 29th January 2021 organized by CSIR-NEERI, SHWMD, Nagpur.
3. Attended Roll Back Malaria meeting on Partnership to End Malaria joint Partner Committees on 22 February and 23 February 2021 via Zoom.
4. Attended International Seminar (Webinar) on "Pandemic Losses: Ways to Overcome" from March 18th-20th, 2021 organized by University of Engineering & Management, Jaipur, Rajasthan, India.

Dr Surendra kumar, Scientist D

1. Meeting Attended on World Sickle Cell day 19th June 2021 by video conferencing
2. Attended Workshop on Method and approaches for health research in Social science on 26th and 27th June 2021 Video conferencing
3. WORLD NO TOBACCO DAY 31st May 2021, has celebrated and delivered a lecture through video conferencing. and also attended video conferencing meeting from ICMR- NICPR Noida for WNTD
4. Attended virtual meeting between Central University Odisha at Koraput and NIRTH
5. Gave a talk titled as 'Rapid methods for genotyping that bypass conventionality' in an invited Pecha Kucha talk during the workshop "Towards a One Health Approach to Study Leprosy" conducted by Leiden University Medical Centre, Netherlands (February 2021).
6. Participated with an e-poster titled as 'Mycobacterium leprae genotypes and drug resistance mutations in Jabalpur district of Madhya Pradesh' in the 31st Biennial Conference Hyderabad conducted by Indian Association of leprologists (April 2021).
7. Meetings/conference/symposium organized a Webinar Series on "Genomics4Health" for Postgraduate and graduate students
8. Publications during the period with impact factor Sharma M, Dwivedi P, Gupta N, Patel P, Singh P. Restriction enzyme digestion of Mycobacterium leprae RLEP sequences enhances the specific detection via LAMP and conventional PCR.

Dr. Nishant Saxena, Scientist B

1. Delivered talk entitled "Bridging Gaps in Access to Public Health in Tribal Areas of India: Connecting Science and Community" in the International Union of Anthropological and Ethnological Sciences (IUAES) Congress 2020, 9-14 March 2021, Sibenik, Croatia (online format).
2. Delivered invited talk on "Revitalization of Local Healthcare Traditions" in the SAMVAD 2022 programme on Tribal Health and Evaluation of Health Systems in the Scheduled Areas organized by the National Commission for Scheduled Tribes (NCST), New Delhi, 15-16 March, 2022.
3. Participated in International Webinar Series on Humanity and Technology (virtual mode) organized by Department of Anthropology, Kalahandi University, Bhawanipatna, Odisha.
4. Attended webinar - "iThenticate - Publish with Confidence", 15 July 2021 (virtual mode) organized by Turnitin South Asia division.
5. Attended Elsevier webinar on Essential Tips for Publishing in High Impact Journals, 8 July 2021 (virtual mode).
6. Organized and Convened a panel at the IUAES Congress 2020, Sibenik, Croatia (9-14 March 2021, online format) entitled "Coming of age for the traditional medicine system of indigenous populations: Is connecting the unconnected the way forward?" which had 12 oral presentations (3 international and 9 national participants). The panel was supported by IUAES Commission on Medical Anthropology and Epidemiology.
7. I was part of the Organizing Committee of ICMR-NIRTH for the Curtain Raiser Event of 6th India International Science Festival 2020 (IISF) on 10th December 2020 presided over by Dr. Harsh Vardhan, Hon'ble Union Minister for Science and Technology, Earth Sciences and Health and Family Welfare, GoI as the Chief Guest on this occasion. The august gathering was also addressed by Prof. Balaram Bhargava, Secretary, DHR, MoHFW and DG ICMR, Shri Jayant Sahasrabudhe, National Organizing Secretary, Vijnana Bharati (VIBHA).

Dr Anil Verma, Scientist 'B'

1. Attended a meeting on best practices or innovation to maintain continuity of essential services in time of Covid on 18/6/2020
2. Attended workshop on cyber security and cyber awareness on 29/7/2020.
3. I was part of the Organizing Committee of ICMR-NIRTH for the Curtain Raiser Event of 6th India International Science Festival 2020 (IISF) on 10th December 2020 presided over by Dr. Harsh Vardhan, Hon'ble Union Minister for Science and Technology, Earth Sciences and Health and Family Welfare, GoI as the Chief Guest on this occasion. The august gathering was also addressed by Prof. Balaram Bhargava, Secretary, DHR, MoHFW and DG ICMR, Shri Jayant Sahasrabudhe, National Organizing Secretary, Vijnana Bharati (VIBHA).

EVENTS

The honourable member of the Parliament of Indian (Lok Sabha) (Jabalpur constituency), Shri Rakesh Singh has visited ICMR-National Institute of Research in Tribal Health (ICMR-NIRTH), Jabalpur on 02.04.2020 to oversee the diagnostic activities and facilities of Novel Coronavirus (nCOVID-19).	
safsdafa The Divisional Commissioner Jabalpur Division, Jabalpur, Shri Ravindra Kumar Mishra [I.A.S.] has visited ICMR-National Institute of Research in Tribal Health (ICMR-NIRTH), Jabalpur on 12.04.2020 to oversee the diagnostic activities and facilities of Novel Coronavirus (nCOVID-19).	
As per the direction of the Indian Council of Medical Research (ICMR), New Delhi, a team consisting of scientists, technical staff, project staff from National TB Prevalence Survey and other different projects from ICMR-National Institute of Research in Tribal Health (ICMR-NIRTH), Jabalpur conducted the national sero-survey for SARS-CoV-2 in 3 districts of Madhya Pradesh i.e. Ujjain, Dewas and Gwalior in phase-I from 14.05.2020 to 18.05.2020 and Indore district in phase-II	
On the occasion of "World Environment Day 2020" 5 June 2020, a mass plantation programme 'celebrating biodiversity' was organized at ICMR-National Institute of Research in Tribal Health (ICMR-NIRTH), Jabalpur campus on 05.06.2020 (during the Swachh Bharat Abhiyan programme)	

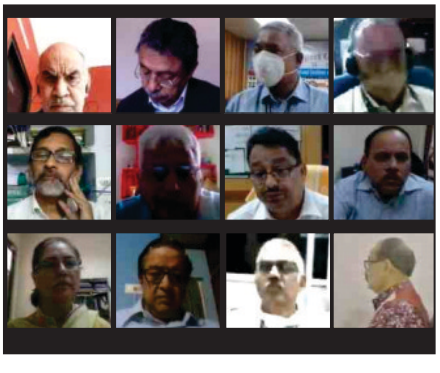
The ICMR-National Institute of Research in Tribal Health (ICMR-NIRTH), Jabalpur celebrated 74th Independence Day of India with grandeur, pride, zeal and enthusiasm, following certain COVID-19 preventive measures such as maintaining adequate social distancing, wearing of masks etc.

भारत सरकार, गृह मंत्रालय, राजभाषा विभाग एवं भारतीय आयुर्विज्ञान अनुसंधान संस्थान परिषद मुख्यालय, नई दिल्ली के निर्देशानुसार, राजभाषा हिंदी के प्रचार-प्रसार और सरकारी कामकाज में हिंदी के प्रयोग को बढ़ावा देने के उद्देश्य से प्रति वर्ष की भांति इस वर्ष भी आईसीएमआर – राष्ट्रीय जनजाति स्वास्थ्य अनुसंधान संस्थान, जबलपुर में 7 से 21 सितंबर, 2020 के दौरान 'हिंदी-पखवाड़ा' मनाया गया। कोविड-19 संबंधी दिशानिर्देशों का पालन सुनिश्चित करते हुए इसके अंतर्गत सरकार के निर्देशानुसार अधिकारियों एवं कर्मचारियों के लिए हिंदी वाद-विवाद एवं हिंदी कविता-पाठ प्रतियोगिताओं का आयोजन किया गया, जिनका समस् त स्टाफ के लिए ऑनलाइन लिंक के माध्यम से प्रसारण किया गया।

भारत सरकार आई.सी.एम.आर. – राष्ट्रीय जनजाति स्वास्थ्य अनुसंधान संस्थान, जबलपुर, में ''कोरोना (कोविड-19)'' के खिलाफ जन आंदोलन अभियान मनाया गया

भारत सरकार, सूचना एवं प्रसारण मंत्रालय द्वारा जारी एवं भारतीय आयुर्विज्ञान अनुसंधान परिषद मुख्यालय, नई दिल्ली द्वारा प्रेषित निर्देशों के अनुसार 'आईसीएमआर- राष्ट्रीय जनजाति स्वास्थ्य अनुसंधान' (आईसीएमआर – एनआईआरटीएच), जबलपुर में 08 अक्टूबर 2020 को ''**कोरोना (कोविड-19)**'' के खिलाफ जन आंदोलन अभियान मनाया गया।

Expert Group Meeting was held through video conferencing at the ICMR-National Institute of Research in Tribal Health (ICMR-NIRTH), Jabalpur on 22nd – 23rd October, 2020 under the chairmanship of Dr. P L Joshi, Chairman of Joint Scientific Advisory Committee of ICMR and Former Director NVBDCP, New Delhi. Prof. Aditya Prasad Dash, Hon'ble Vice-Chancellor, Asian Institute of Public Health University, Bhubaneswar



The Vigilance Awareness Week - 2020 was observed at the ICMR-National Institute of Research in Tribal Health (ICMR-NIRTH), Jabalpur from 27 October, 2020 to 02 November, 2020	
ICMR-National Institute of Research in Tribal Health (ICMR-NIRTH), Jabalpur organized the Curtain Raiser Ceremony of 6th India International Science Festival (IISF-2020) on 10th December 2020 Hon'ble Union Minister for Science and Technology, Earth Sciences and Health and Family Welfare, Government of India, through video conferencing deliver a talk.	
The 38th Foundation Day of CMR-National Institute of Research in Tribal Health (ICMR-NIRTH), Jabalpur was celebrated with zeal and enthusiasm on 1st March 2021 through video conferencing. The event was started with welcome address, activities, achievements and the future plans of the institute by Dr. Aparup Das, Scientist 'G' and Director, ICMR-NIRTH, Jabalpur. Prof. Balram Bhargava, Secretary to the Government of India Department of Health Research, MoH&FW and Director General, ICMR and the Chief Guest of the programme, Prof. Kristan Schneider, Department of Applied Computer Sciences & Biosciences, University of Applied Sciences Mittweida, Germany delivered the foundation day lecture on "Malaria molecular surveillance - bridging from theory to application".	

APPENDICES

COMMITTEES

INSTITUTIONAL ETHICS COMMITTEE (IEC)

Name of Existing Member and Affiliation	Designation	Discipline
Dr. Shashi Khare Retd. Prof Gynecology and Ex-Dean, NSCB Medical College, Jabalpur	Chairperson	Medical (Gynecology)
Dr. Sharad Jain Prof. of Pathology, NSCB Medical College, Jabalpur	Member	Medical (Pathology)
Dr. Rajesh Sharma Prof. and Head, Dept. of Pharmacology and Toxicology College of Veterinary Science and Animal Husbandry, NDVSU, Jabalpur	Member	Pharmacology
Dr. Uma C. Saha Prof. General Management and Development, XIDAS, Jabalpur	Member	Social Science
Mr. Jamal Akhtar Baig Director, ENFORCE (NGO) Area Colony, Bhopal (M.P.)	Member	NGO Representative
Mr. Sankalp Sanghi Advocate, High Court of Madhya Pradesh, Jabalpur	Member	Law
Shri Komal Prasad Vishwakarma Vill.-Mukunwara, Post- Ghatpipaliya Dist: Jabalpur	Member	Community Leader
Dr. Avyakt Agarwal Asst. Prof (Pediatrics), NSCB Medical College Jabalpur	Member	Medical (Pediatrics)
Dr. Riti Seth Asst. Prof (Microbiology), NSCB Medical College Jabalpur	Member	Microbiology (Basic Science)

Dr. Rajiv Yadav Scientist 'D', ICMR-NIRTH, Jabalpur	Member	Medical (Pharmacology)
Dr. Tapas Chakma Scientist 'G' ICMR-NIRTH, Jabalpur	Member Secretary	Medical (Epidemiology)

CPCSEA - INSTITUTIONAL ANIMAL ETHICS COMMITTEE

Name of Existing Member & Affiliation	Designation	Discipline
Dr. Aparup Das, Scientist- G and Director, ICMR, NIRTH, Jabalpur	Chairperson	
Dr. Jyothi Bhat, Scientist – E, ICMR-NIRTH, Jabalpur	Member	Scientist from different discipline
Dr. S. Rajasubramaniam, Scientist – E, ICMR-NIRTH, Jabalpur	Member	Biological Scientist
Dr. S. Sambath, Scientist-C, Zoological Survey of India, Jabalpur	Member	Scientist from different discipline
Dr. Prateek Kumar Jain, Adina Institute of Pharmaceutical Sciences, Sagar, MP	Member	CPCSEA Main Nominee
Dr. Surendra Jain, Sagar Institute of Research and Technology – Pharmacy, Bhopal, MP	Member	Scientist from outside the institute (Nominated by CPCSEA)
Shri. Rakesh Kumar Gawaly, RKDF College of Pharmacy, Bhopal, MP.	Member	Socially Aware Member (Nominated by CPCSEA)
Dr. Manjunathachar H.V. , Scientist – B, ICMR-NIRTH, Jabalpur	Member Secretary	Veterinarian and Member Secretary

INSTITUTIONAL BIOSAFETY COMMITTEE

Name of Existing Member and Affiliation	Designation
Dr. Aparup Das Scientist- G and Director ICMR- NIRTH, Jabalpur	Chairman
Dr. YK Bansal Plant Tissue Culture Lab. Dept. of Biosciences, RDVV, Jabalpur	DBT Nominee
Dr. Riti Jain Seth Associate Professor Dept. of Microbiology NSCB Medical College, Jabalpur	External Expert
Dr. Tapas Chakma Scientist- G ICMR- NIRTH, Jabalpur	Biosafety Officer
Dr. S. Rajasubramaniam Scientist – E ICMR-NIRTH, Jabalpur	Internal Member
Dr. Pradip V. Barde Scientist-D, ICMR- NIRTH, Jabalpur	Internal Member
Dr. Praveen Kumar Bharti Scientist-D ICMR- NIRTH, Jabalpur	Internal Member

Institute Local Building Monitoring Committee-(Capital Works)

Sh. S.S. Mehta	Executive Engineer (Retd.), PWD	**Chairman & External Expert**
Sh. Mahtab Alam	Executive Engineer (Retd.),	External Expert
Sh. Gyan Chand Jain	Administrative Officer, ICMR-NIRTH	Member
Sh. Pramod Kumar	Account Officer, ICMR-NIRTH	Member
Sh. RK Thakur	Section Officer (Stores), ICMR-NIRTH	Member Secretary

Dissemination of Information Committee

Dr. Jyothi Bhat	Scientist-E,	ICMR- NIRTH	Chairperson
Dr. Ravendra K.Sharma	Scientist-E,	ICMR-NIRTH	Member
Dr. Pradip Barde	Scientist-E,	ICMR-NIRTH	Member
Dr. Arvind Verma	Pr.Tech.Offic er	ICMR-NIRTH	Member
Sh. Avinash Dubey	Technician-A,	ICMR-NIRTH	Member

Rapid Response Team

Dr. Tapas Chakma	Scientist-G,	ICMR-NIRTH	Chairman
Dr. Jyothi Bhat	Scientist-E,	ICMR- NIRTH	Member
Dr. Pradip Barde	Scientist-E,	ICMR-NIRTH	Member
Seven supporting Staff (Technical /Others)			

Library Committee

Dr. K.B. Saha	Scientist-F,	ICMR- NIRTH	Chairman
Dr. S. Rajasubramaniam	Scientist-E,	ICMR- NIRTH	Member
Dr. Ravendra K. Sharma	Scientist-E,	ICMR-NIRTH	Member
Sh. Gyan Chand Jain	Admn. Officer,	ICMR-NIRTH	Member
Sh. Pramod Kumar	Accounts Officer,	ICMR-NIRTH	Member
Sh. S.N. Singh	Pr.Technical Officer,	ICMR -NIRTH	Member Secretary

Anti –sexual Harassment Committee

Dr. Jyothi Bhat	Scientist-E,	ICMR-NIRTH	Chairperson
Dr. Alpana Abbad	Pr.Tech.Officer,	ICMR-NIRTH	Member
Dr. Uma Saha	Professor	XIDAS Jabalpur	Outside Expert
Sh. L.S. Kaushal	Sr. Tech. Officer-C,	ICMR-NIRTH	Member

Annual Report Committee

Dr. Jyothi T.Bhat	Scientist-E,	ICMR- NIRTH	Member
Dr. K.B. Saha	Scientist-F,	ICMR- NIRTH	Member
Dr. P.V. Barde	Scientist-E,	ICMR-NIRTH	Member
Dr. Ravendra K. Sharma	Scientist-E,	ICMR- NIRTH	Member
Dr. Vidhan Jain	Scientist-C,	ICMR-NIRTH	Member
Dr. Nishant Saxena	Scientist-B,	ICMR-NIRTH	Member
Dr. Manjunathachar H V	Scientist-B,	ICMR-NIRTH	Member
Dr. Anil Verma	Scientist-B,	ICMR-NIRTH	Member
Dr. Arvind Verma	Pr.Tech. Officer,	ICMR -NIRTH	Member
Dr. Smt.Alpana Abbad	Pr.Tech. Officer,	ICMR -NIRTH	Member
Sh. Arvind Kavishwer	Pr.Tech. Officer,	ICMR -NIRTH	Member
Mrs. Nazia Anwar Ali	Tech. Officer – 1,	ICMR-NIRTH	Member
Dr. Prakash Tiwari	Tech. Assistant,	ICMR-NIRTH	Member

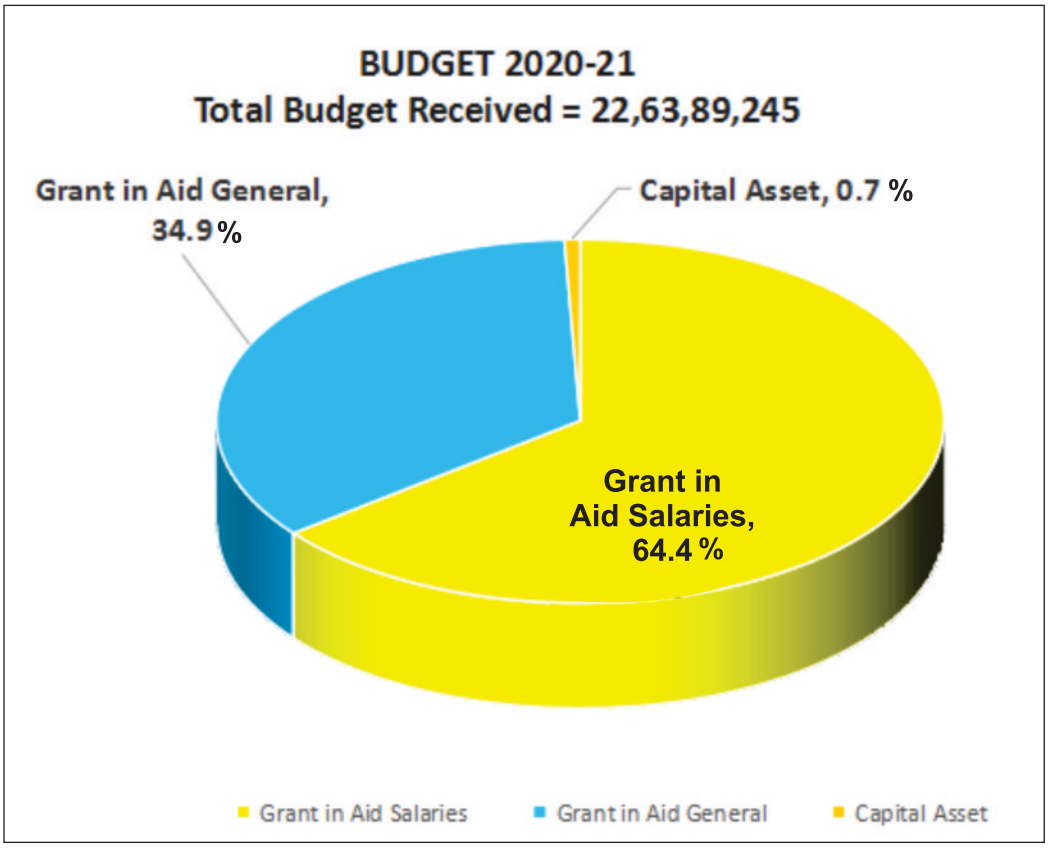
Publication Screening Committee

Dr. Aparup Das	Scientist-G & Director,	ICMR- NIRTH	Chairperson
Dr. Tapas Chakma	Scientist-G	ICMR- NIRTH	Member
Dr. K. B. Saha	Scientist-F	ICMR-NIRTH	Member
Dr. S. Rajasubramaniam	Scientist-E	ICMR-NIRTH	Member
Dr. R. K. Sharma	Scientist-E	ICMR-NIRTH	Member
Dr. P. V. Barde	Scientist-E	ICMR-NIRTH	Member
Dr. V. G. Rao	Scientist-G	ICMR-NIRTH	Member
Dr. Nishant Saxena	Scientist-B	ICMR-NIRTH	Member Secretary

BUDGET 2020-21

Total Budget Received = 22,63,89,245

S.No.	Head	Grant Received	Percentage		
1	Grant in Aid Salarie	14,57,50,972	64.4	Grant in Aid Salaries	64.4
2	Grant in Aid General	7,90,31,791	34.9	Grant in Aid General	34.9
3	Capital Asset	16,06,482	0.7	Capital Asset	0.7
		22,63,89,245			



राजभाषा नीति के कार्यान्वयन एवं अनुपालन से संबंधित प्रगति प्रतिवेदन विवरण

आईसीएमआर–राष्ट्रीय जनजाति स्वास्थ्य अनुसंधान संस्थान, जबलपुर में भारत सरकार, गृह मंत्रालय, राजभाषा विभाग की राजभाषा नीति के समुचित कार्यान्वयन एवं अनुपालन के लिए सतत प्रयास किए जा रहे हैं। प्रतिवेदन अवधि के दौरान इस संस्थान में हिंदी के प्रगामी प्रयोग एवं सरकारी कामकाज में हिंदी के प्रयोग को बढ़ावा देने हेतु किए गए प्रयासों का संक्षिप्त विवरण इस प्रकार है:–

1. राजभाषा कार्यान्वयन समिति

राजभाषा विभाग के आदेशानुसार इस अनुसंधान संस्थान में 'राजभाषा कार्यान्वयन समिति' गठित है:–

1. डॉ. अपरूप दास, निदेशक – अध्यक्ष
2. डॉ. कल्याण ब्रत साहा, वैज्ञानिक 'एफ' – सदस्य
3. श्री ज्ञानचंद जैन, वरिष्ठ प्रशासनिक अधिकारी – सदस्य
4. श्री द्वारका प्रसाद लोधी, लेखा अधिकारी – सदस्य
6. श्रीमती फिलोमिना लकड़ा, अनुभाग अधिकारी (भंडार) – सदस्य
7. श्री हाकिम सिंह ठाकुर, कनिष्ठ हिंदी अनुवादक – सदस्य

प्रत्येक तीन माह में इस समिति की बैठक होती है, जिसमें इस अनुसंधान संस्थान में राजभाषा कार्यान्वयन एवं अनुपालन की स्थिति की समीक्षा की जाती है तथा सरकार द्वारा निर्धारित लक्ष्यों को प्राप्त करने हेतु आवश्यक उपायों की संस्तुति की जाती है। प्रतिवेदन अवधि तक इस समिति की कुल 93 तिमाही बैठकें आयोजित की जा चुकी हैं।

2. हिंदी पत्राचार एवं टिप्पणी–लेखन

प्रतिवेदन अवधि के दौरान इस केन्द्र द्वारा 'क' क्षेत्र को मूलत: हिंदी में लगभग 50 प्रतिशत और उससे अधिक पत्राचार किया गया। साथ ही सरकार द्वारा निर्धारित लक्ष्य के अनुरूप हिंदी पत्राचार को 'क' क्षेत्र के अलावा 'ख' एवं 'ग' क्षेत्रों के साथ भी मूल हिंदी पत्राचार को बढ़ाने के लिए प्रयास किए जा रहे हैं। अधिकांश फाइलों पर भी हिंदी में टिप्पणियां लिखी जाती हैं। पिछली बैठकों में संस्थान द्वारा मूल हिंदी पत्राचार एवं मूल रूप से हिंदी टिप्पणी–लेखन का प्रतिशत और बढ़ाए जाने तथा संस्थान में प्रतिवर्ष हिंदी की नई पुस्तकों की खरीद पर कार्यान्वयन के कदम उठाए गए हैं।

3. धारा 3 (3) एवं राजभाषा नियम–5 का अनुपालन

राजभाषा अधिनियम, 1963 (यथासंशोधित 1967) की धारा 3(3) के अनुपालन में सामान्य–आदेश/परिपत्र, सूचना के अंतर्गत रिक्त पदों के विज्ञापन, निविदा सूचना एवं निविदा प्रपत्र आदि निर्दिष्ट दस्तावेजों के अतिरिक्त रिक्त पदों के विज्ञापन आदि भी हिंदी/द्विभाषी रूप में जारी किए जाते हैं।

4. प्रशिक्षण

इस संस्थान के अधिकांश अधिकारियों एवं कर्मचारियों को हिंदी का कार्यसाधक ज्ञान/प्रवीणता प्राप्त है और प्रशासनिक अनुभागों – स्थापना, लेखा एवं भंडार अनुभागों में तैनात कर्मचारियों द्वारा अधिक से अधिक मूलत: हिंदी में सरकारी कामकाज निष्पादित करने का प्रयास किया जाता है।

राजभाषा विभाग के निर्देशों के अनुसार, जिन कर्मचारियों को हिंदी टंकण एवं हिंदी आशुलिपि के सेवाकालीन प्रशिक्षण की आवश्यकता थी, उन सभी को हिंदी शिक्षण योजना, राजभाषा विभाग, जबलपुर कार्यालय से हिंदी टंकण/हिंदी आशुलिपि का प्रशिक्षण दिलाया गया है। वर्तमान में केवल एक आशुलिपिक हिंदी आशुलिपि प्रशिक्षण के लिए शेष हैं, उन्हें शीघ्र ही हिंदी शिक्षण योजना के माध्यम से हिंदी आशुलिपि का प्रशिक्षण दिलाया जाएगा।

5. विभागीय परीक्षाओं में द्विभाषी प्रश्न-पत्र उपलब्ध कराना

सरकार द्वारा जारी निर्देशों के अनुसार इस केंद्र में अधीनस्थ सेवाओं की भर्ती परीक्षा एवं विभागीय परीक्षाओं में द्विभाषी प्रश्न-पत्र उपलबध कराए जा रहे हैं।

6. प्रशिक्षण कार्यक्रमों एवं वैज्ञानिक विषयों पर व्याख्यानों में हिंदी को प्रमुखता

इस संस्थान में अनुसंधान कार्य से संबंधित प्रशिक्षण कार्यक्रमों और वैज्ञानिक व्याख्यानों आदि में हिंदी को प्राथमिकता प्रदान की जाती है, जिससे अधिक से अधिक लोगों तक इसका लाभ पहुँच सके।

7. हिंदी-दिवस/हिंदी-पखवाड़ा

राजभाषा विभाग के निर्देशों के अनुसार हिंदी के प्रचार-प्रसार एवं मूलत: हिंदी में सरकारी कार्य करने को बढ़ावा देने के उद्देश्य से संस्थान में प्रति वर्ष हिंदी-दिवस एवं हिंदी-पखवाड़ा मनाया जाता है। इस दौरान निदेशक महोदय द्वारा सभी अधिकारियों एवं कर्मचारियों से सरकारी कामकाज अधिकाधिक हिंदी में करने की अपील की जाती है एवं अधिकारियों व कर्मचारियों के लिए हिंदी की विभिन्न प्रतियोगिताएँ आयोजित की जाती हैं।

इस वर्ष 07.09.2020 से 21.09.2020 तक 'हिंदी-पखवाड़ा' मनाया गया। 'कोविड-19' वैश्विक महामारी की असामान्य परिस्थिति को ध्यान में रखते हुए राजभाषा विभाग द्वारा 'हिंदी-पखवाड़ा' एवं उसके अंतर्गत हिंदी प्रतियोगिताओं के आयोजन के संबंध में कार्यालय ज्ञापन सं. 11034/02/2019-रा.भा.(नीति) दिनांक 31 जुलाई, 2020 के माध्यम से जारी निर्देशों का अनुपालन करते हुए संस्थान में इस वर्ष केवल दो हिंदी प्रतियोगिताओं – हिंदी वाद-विवाद और हिंदी कविता-पाठ का आयोजन किया गया और कोविड-19 के सामाजिक दूरी बनाए रखने सहित सभी मानक उपायों का पालन करते हुए केवल प्रतिभागी वैज्ञानिकों/अधिकारियों एवं कर्मचारियों को बारी-बारी से प्रस्तुति हेतु बुलाया गया तथा वीडियो लिंक के माध्यम से समस्त स्टाफ को उसे उनके कार्यस्थल पर प्रसारित कराया गया। दिनांक 21.09.2020 को 'हिंदी-पखवाड़ा' के समापन के अवसर पर संस्थान के निदेशक डॉ. अपरूप दास ने हिंदी प्रतियोगिताओं के विजेताओं को संबोधित कर उन्हें आगे और अच्छे प्रदर्शन के लिए प्रेरित किया तथा प्रमाण-पत्र एवं नकद पुरस्कारों से उनका उत्साहवर्धन किया।

दिनांक 10.09.2020 को संपन्न हिंदी वाद-विवाद और 14.09.2020 को हिंदी कविता-पाठ प्रतियोगिताओं के विजेताओं तथा उन्हें प्रदान किए गए नकद पुरस्कारों की सूची इस प्रकार है:-

क्र.सं.	प्रतियोगिता	पुरस्कार प्राप्त करने वाले अधि./कर्म.	नकद पुरस्कार
1.	हिंदी वाद-विवाद प्रतियोगिता		
	प्रथम	डॉ. पुष्पेन्द्र सिंह, वैज्ञानिक-ई	रु. 5000/-
	द्वितीय	डॉ. सुयश श्रीवास्तव, वैज्ञानिक-बी	रु. 3000/-
	तृतीय	श्री विवेक कुमार चौकसे, तकनीकी सहायक	रु. 2000/-
	सांत्वना (1)	डॉ. सुयश श्रीवास्तव, वैज्ञानिक-बी	रु. 1000/-
	सांत्वना (2)	श्री सुरेश कुमार परोहा, प्रयोगशाला सहायक	रु. 1000/-
2.	हिंदी कविता-पाठ प्रतियोगिता		
	प्रथम	श्री सुरेन्द्र सिंह मेहरा, तकनीशियन (1)	रु. 5000/-
	द्वितीय	श्री दीपचंद खातरकर, वरि. तकनीशियन (3)	रु. 3000/-
	तृतीय	श्री विवेक कुमार चौकसे, तकनीकी सहायक	रु. 2000/-
	सांत्वना (1)	श्री अविनाश कुमार दुबे, तकनीशियन (2)	रु. 1000/-
	सांत्वना (2)	श्री सार्थक सोनी, आशुलिपिक	रु. 1000/-
		योग-	रु. 24,000/- (कुल राशि - चौबीस हजार रुपए मात्र)

STAFF LIST

S.No.	NAME	DESIGNATION
1	Dr. Aparup Das	DIRECTOR
2	Dr. Tapas Chakma	SCIENTIST `G'
3	Dr. K. B. Saha	SCIENTIST `F'
4	Dr. Jyothi T. Bhat	SCIENTIST `E'
5	Dr. Ashok Kumar Mishra	SCIENTIST `E'
6	Dr. S. Rajasubramaniam	SCIENTIST `E'
7	Dr. Pushpendra Singh	SCIENTIST `E'
8	Dr. Rajiv Yadav	SCIENTIST `E'
9	Dr. Dinesh Kumar	SCIENTIST `E'
10	Dr. Pradip Vijay Barde	SCIENTIST `E'
11	Dr. Praveen Kumar Bharti	SCIENTIST `E'
12	Dr. Surendra Kumar	SCIENTIST `D'
13	Dr. Vidhan Jain	SCIENTIST `C'
14	Dr. Nishant Saxena	SCIENTIST `B'
15	Dr. Ravindra Kumar	SCIENTIST `B'
16	Dr. Suyesh Shrivastava	SCIENTIST `B'
17	Dr. Anil Kumar Verma	SCIENTIST `B'
18	Sh. Gyan Chand Jain	SENIOR ADMIN. OFFICER
19	Sh. Dwarka Prasad Lodhi	ACCOUNTS OFFICER
20	Mrs. Filomina Lakra	SECTION OFFICER
21	Sh. Subhash Godbole	P.T.O.
22	Dr. Smt. Alpana Abbad	P.T.O.
23	Dr. Bal Krishna Tiwari	P.T.O.
24	Dr. Arvind Verma	P.T.O.
25	Sh. Ajay Kumar Goel	P.T.O.
26	Dr. Manoj K. Bhondeley	SR.TECHNICAL OFFICER
27	Sh. Praval Shrivastava	SR.TECHNICAL OFFICER
28	Dr. Mendi, P. S. S. Singh	SR.TECHNICAL OFFICER
29	Mrs. Reena Shome	TECHNICAL OFFICER-C
30	Sh. Rajendra K. Minocha	TECHNICAL OFFICER-B
31	Sh. Ashok Kumar Gupta	TECHNICAL OFFICER-B
32	Sh. Anil Gwal	TECHNICAL OFFICER-B
33	Mrs. Canina Luke	TECHNICAL OFFICER-B
34	Sh. Lalit K. Sahare	TECHNICAL OFFICER-B
35	Sh. Mahendra Jaidev Ukey	TECHNICAL OFFICER-B
36	Mrs. Nazia Anwar Ali	TECHNICAL OFFICER-B
37	Dr. Nisha Thakur	TECHNICAL OFFICER-B
38	Sh. Subhash S. Kumbhare	SENIOR TECHNICIAN (3)
39	Sh. Purushottam Patel	SENIOR TECHNICIAN (3)
40	Sh. Shri Ram Mishra	SENIOR TECHNICIAN (3)
41	Sh. M. P. Tiwari	SENIOR TECHNICIAN (3)
42	Sh. Ashok Kumar Saini	SENIOR TECHNICIAN (3)

S.No.	NAME	DESIGNATION
43	Sh. Ramesh Kumar Gond	SENIOR TECHNICIAN (3)
44	Sh. Ghanshyam Ahirwar	SENIOR TECHNICIAN (2)
45	Sh. Ajesh Kumar Dubey	SENIOR TECHNICIAN (2)
46	Sh. Vijay Kumar Kachhi	SENIOR TECHNICIAN (2)
47	Sh. Hakim Singh Thakur	JR. HINDI TRANSLATOR
48	Sh. Subash Chandra Muduli	PERSONAL ASSISTANT
49	Sh. Sri Krishna	TECHNICAL ASSISTANT
50	Dr. Prakash Tiwari	TECHNICAL ASSISTANT
51	Sh. Arvind Jaiswal	ASTT. RESEARCH SCIENTIST
52	Sh. Ajay Saxena	ASTT. RESEARCH SCIENTIST
53	Mohd. Tabib Khan	HEALTH EDUCATOR
54	Mrs. Kiran Awasthi	LAB.TECHNICIAN
55	Sh. Manohar Lal Burman	FIELD WORKER
56	Sh. Sudhir Kumar Sen	INSECT COLLECTOR
57	Sh. Ramesh Kumar Bhatia	INSECT COLLECTOR
58	Sh. Mohan Singh Patel	INSECT COLLECTOR
59	Sh. Jagdish Prasad Kostha	FIELD LAB.ATTENDANT
60	Sh. Tulsi Das Kanoujia	FIELD LAB.ATTENDANT
61	Sh. Prem Lal Dahiya	FIELD LAB.ATTENDANT
62	Sh. Tara Chand Rai	FIELD LAB.ATTENDANT
63	Sh. Ajay Mohan Kanojiya	FIELD LAB.ATTENDANT
64	Sh. Sanjeev Kumar Shukla	FIELD LAB.ATTENDANT
65	Sh. Lal Singh Gond	FIELD LAB.ATTENDANT
66	Sh. S. K. Dubey	DRIVER
67	Sh. S. K. Gautam	DRIVER
68	Sh. Raju Harijan	DRIVER
69	Sh. Lalju Singh	PEON
70	Sh. Sahas Ram Shukla	LAB. TECHNICIAN
71	Sh. Kaushal Kumar Shukla	FIELD LAB.ATTENDANT
72	Sh. Hari Barman	TECHNICIAN (2)
73	Sh. Surendra K. Jhariya	TECHNICIAN (2)
74	Sh. Shashikant Tiwari	TECHNICIAN (2)
75	Sh. Prakash Sangle	TECHNICIAN (1)
76	Sh. Surendra Singh Mehra	TECHNICIAN (1)
77	Sh. Ramswaroop Uikey	TECHNICIAN (1)
78	Sh. Baishakhu Lal	UPPER DIVISION CLERK
79	Sh. Narendra K. Jhariya	UPPER DIVISION CLERK
80	Sh. Pramod Kumar Choubey	UPPER DIVISION CLERK

S.No.	NAME	DESIGNATION
81	Sh. Sarthak Soni	STENOGRAPHER
82	Sh. Sharad Kumar Kosta	UPPER DIVISION CLERK
83	Sh. Rahul Koshta	LOWER DIVISION CLERK
84	Sh. Vikas Kumar Gupta	LOWER DIVISION CLERK
85	Ms. Anjali Rajput	LOWER DIVISION CLERK
86	Sh. K. Venu Gopal Rao	LABORATORY ASSISTANT-1
87	Sh. Suresh Kumar Jaiswal	LABORATORY ASSISTANT-1
88	Sh. Umesh Prasad Gautam	LABORATORY ASSISTANT-1
89	Sh. Anil Vinodia	LABORATORY ASSISTANT-1
90	Sh. Ramesh Kumar Ahirwar	LABORATORY ASSISTANT-1
91	Sh. Malikhan Singh	LABORATORY ASSISTANT-1
92	Sh. Ram Kumar Mehra	LABORATORY ASSISTANT-1
93	Sh. Summat Singh	LABORATORY ASSISTANT-1
94	Sh. Ajay Kumar Soni	LABORATORY ASSISTANT-1
95	Sh. Sukhlal Vishwakarma	LABORATORY ASSISTANT-1
96	Sh. Jagdish Prasad Thakur	LABORATORY ASSISTANT-1
97	Sh. Suresh Kumar Burman	LABORATORY ASSISTANT-1
98	Sh. Suresh Kumar Pareha	LABORATORY ASSISTANT-1
99	Sh. Madan Singh Maravi	LABORATORY ASSISTANT-1
100	Sh. Prem Singh Gond	LABORATORY ASSISTANT-1
101	Sh. Sone Lal Dumar	LABORATORY ASSISTANT-1
102	Sh. Ganga Bahadur	LABORATORY ASSISTANT-1
103	Sh. Pritam Lal Gond	LABORATORY ASSISTANT-1
104	Sh. Pappu Lal Dumar	LABORATORY ASSISTANT-1
105	Sh. Kamta Prasad Jaiswal	LABORATORY ASSISTANT-1
106	Sh. Hira Lal Choudhary	FIELD WORKER
107	Sh. Ramesh Kumar Pasi	PEON
108	Mrs.shashi Prabha Mishra	LABORATORY ATTENDANT-2
109	Sh. Shamshad Ali Ansari	LABORATORY ATTENDANT-2
110	Sh. Santosh Kumar Haldkar	LABORATORY ATTENDANT-2
111	Sh. Santosh Kumar Maravi	LABORATORY ATTENDANT-1

TRANSFERRED OUT FROM NIRTH 2020-21

1	Dr. Ravindra Kumar Sharma	Scientict-E	NIMS, New Delhi	31.05.2020
2	Dr. Manjunathchar H.V.	Scientict-B	NARFBR, Hyderabad	31.05.2020
3	Shri Pradeep Kumar Tiwari	Technician-2	BMHRC, Bhopal	22.07.2020
4	Shri Vinay Kumar Valmik	Lab. Attendant-2	RMRIMS, Patna	19.02.2021
5	Dr. Sneha Bhandari	Tech. Assistant	NIREH, Bhopal	23.02.2021
6	Shri Anup Kr. Vishwakarma		RMRC, Dibrugarh	23.02.2021
7	Smt. Sandhya Sharma	Assistant	NIREH, Bhopal	01.03.2021
8	Shri Santosh Kr. Patkar	Technician-2	RMRIMS, Patna	05.03.2021
9	Shri S.E. Matkar	SO	ICMR, HQ, New Delhi	21.09.2020
10	Shri Rohit Agrawal	Assistant	NIREH, Bhopal	16.03.2021
11	Shri Amol B. Mun	Technician-2	NIREH, Bhopal	16.03.2021
12	Dr. Shweta Mishra	Tech. Assistant	NIREH, Bhopal	16.03.2021
13	Shri Vivek Kumar Chouksey	Tech. Assistant	NIREH, Bhopal	19.03.2021
14	Shri Shashi Bhushan Dubey	Tech-1	RMRIMS, Patna	30.03.2021
15	Shri Nitish Singh Parihar	Tech. Assistant	RMRIMS, Patna	30.03.2021
16	Shri Avinash Kr. Dubey	Tech.-2	ICMR, New Delhi	30.03.2021
17	Dr. Shiv Kumar Singh	Sr. Tech-2	RMRC, Gorakhpur	31.03.2021

TRANSFERRED IN TO NIRTH

1	Dr. Nisha Thakur	TO-B	NICPR, Noida	04.01.2021
2	Sh. Arvind Jaiswal	ARS	NIMR FU, JBP	25.01.2021
3	Sh. Ajay Saxena	ARS	NIMR FU, JBP	25.01.2021
4	Mohd. Tabib Khan	HE	NIMR FU, JBP	25.01.2021
5	Sh. Hira Lal Choudhary	FW	NIMR FU, JBP	25.01.2021
6	Sh. Manohar Lal Burman	FW	NIMR FU, JBP	25.01.2021
7	Sh. Sudhir Kumar Sen	IC	NIMR FU, JBP	25.01.2021
8	Sh. Ramesh Kumar Bhatia	IC	NIMR FU, JBP	25.01.2021
9	Sh. Mohan Singh Patel	IC	NIMR FU, JBP	25.01.2021
10	Sh. Jagdish Prasad Kostha	FLA	NIMR FU, JBP	25.01.2021
11	Sh. Tulsi Das Kanoujia	FLA	NIMR FU, JBP	25.01.2021
12	Sh. Prem Lal Dahiya	FLA	NIMR FU, JBP	25.01.2021
13	Sh. Tara Chand Rai	FLA	NIMR FU, JBP	25.01.2021
14	Sh. Ajay Mohan Kanojiya	FLA	NIMR FU, JBP	25.01.2021
15	Sh. Sanjeev Kumar Shukla	FLA	NIMR FU, JBP	25.01.2021
16	Sh. Lal Singh Gond	FLA	NIMR FU, JBP	25.01.2021
17	Sh. S. K. Gautam	DRIVER	NIMR FU, JBP	25.01.2021
18	Sh. Raju Harijan	DRIVER	NIMR FU, JBP	25.01.2021
19	Sh. Lalju Singh	PEON	NIMR FU, JBP	25.01.2021
20	Sh. Ramesh Kumar Pasi	PEON	NIMR FU, JBP	25.01.2021
21	Sh. Sahas Ram Shukla	LAB. TECH.	NIMR FU, JBP	02.02.2021
22	Sh. Kaushal Kumar Shukla	FLA	NIMR FU, JBP	02.02.2021
23	Sh. S.k. Dubey	DRIVER	NIMR FU, JBP	02.02.2021
24	Mrs. Kiran Awasthi	LAB.TECH.	NIMR FU, JBP	08.02.2021

RETIREMENT

1	Dr. C. G. Raut	Scientist F	Ritired	
2	Shri R.K. Handa	Assistant	Retired	30.06.2020
2	Smt. Maya Pandey	TO-B	Retired	31.07.2020
3	Shri Munna Lal	MTS	Retired	31.10.2020
4	Shri Chandan Karforma	TO-C	Retired	30.11.2020
5	Shri R.K. Minocha	TO-B	Retired	31.03.2021
6	Shri Shankar Lal Jha	Lab. Asstt.-1	Death	03.09.2020
7	Shri Bhagwani Prasad Kol	SO	Death	30.03.2021
8	Dr. Prakash Tiwari	Tech. Assistant	Resigned	09.03.2021